SIEMENS

SIMATIC

Process Control System PCS 7 SIMATIC BATCH V9.0 SP1

Operating Manual

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Preface

1

Purpose of the "SIMATIC BATCH" manual

This documentation provides you with a complete overview of the automation of discontinuous batch processes with SIMATIC BATCH. The documentation supports you in installing and commissioning the software. The procedures for process cell configuration and the creation of batch recipes are described.

You will find information about the software components, areas of application, configuration options, and commissioning of SIMATIC BATCH in the SIMATIC PCS 7 environment.

The following basic questions are answered in this document:

- What is SIMATIC BATCH?
- What are the software components that make up SIMATIC BATCH?
- Which areas of application is SIMATIC BATCH suitable for in the SIMATIC environment?
- How is SIMATIC BATCH planned, configured and operated in the PCS 7 environment?
- How do you migrate your existing BATCH project to a project that uses the new functions of this version?

Validity of the manual

This manual is valid for the software package, SIMATIC BATCH V9.0 SP1.

Language support for the SIMATIC BATCH software and the documentation

The following languages are supported:

- Engineering components and documentation: English, German, French, Chinese and Japanese
- Runtime components: English, German, French, Spanish, Italian, Chinese and Japanese

Readme files

You will find important information regarding installation on the system / product DVD in the following documents:

- SIMATIC PCS 7: *PCS 7 Readme*
- SIMATIC BATCH: *Readme*

During the SIMATIC BATCH installation routine, you are given the opportunity to open the readme file and read its contents. Following installation, the documents are available in SIMATIC > Product Notes > Language Selection.

Documentation relating to SIMATIC BATCH

The following table shows the documentation relating to SIMATIC BATCH at a glance. You can find the documentation in PDF format after installation of SIMATIC BATCH under **Start > SIMATIC > Documentation > Language selection**.

Documentation as manual	Contents
SIMATIC BATCH manual	Basic and reference information that explains the procedures for configuration and recipe creation with SIMATIC BATCH.
SIMATIC BATCH Blocks Manual	Reference information that explains the function, layout, integration, and interconnection of blocks in the CFC or SFC editor.
SIMATIC BATCH - Report Views Programming Manual	Explains how you create your own report templates for reading out the SQL database. Describes all contents and structures of the BATCH data in the SQL database.
SIMATIC BATCH - COM API Manual	Describes the Application Programming Interface (API) for BATCH object and data access. Examples with source code show how the interface is used.

Additional documents and online help files can be found in the installation path of SIMATIC BATCH:

Documentation as manual/online help	Storage location and content
SIMATIC BATCH - PlugIn concept Manual, Programming Manual - available in English only	Path: \\ProgramData\Siemens\Automation\Batch\Example\PlugIn This description contains instructions that enable you to develop your own plug-in modules for SIMATIC BATCH. This involves an external validity check which is used instead of the SIMATIC BATCH check.
SIMATIC BATCH - Report Views online help	Path on the SIMATIC BATCH server: \\ProgramData\Siemens\Automation\Batch\Example\Views
SIMATIC BATCH - COM API online help	Path: \\ProgramData\Siemens\Automation\Batch\Example\BFApi_doc

Options for accessing the documentation related to SIMATIC BATCH and SIMATIC PCS 7

You can conveniently access all of the documentation for SIMATIC PCS 7 on the PCS 7 web page www.siemens.com/pcs7-documentation (http://www.automation.siemens.com/mcms/industrial-automation-systems-simatic/en/manual-overview/tech-doc-pcs7/Pages/Default.aspx).

Additional helpful documents, FAQs, applications, and tools can be found on the Siemens Industry Online Support page at http://support.automation.siemens.com (http://support.automation.siemens.com).

My Documentation Manager (http://support.automation.siemens.com/WW/view/en/38715968) gives you the option of compiling specific documentation contents into your own manual.

Security information

2

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit:

http://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

http://www.siemens.com/industrialsecurity.

What's new? 3

3.1 Support for new operating systems

SIMATIC BATCH V9.0 SP1 and SIMATIC PCS 7 V9.0 SP1 support the operating system Windows Server 2016 Standard Edition (64-bit).

3.2 Standard report for batches

If you use a PH in a plant configuration, the message texts from the OS are now displayed in the standard report in the language of the report.

Until now, the message texts from the OS were always shown in English.

Product introduction and installation 4

4.1 What is SIMATIC BATCH?

What is SIMATIC BATCH?

SIMATIC BATCH is a SIMATIC PCS 7 program package with which discontinuous processes, known as batch processes, can be configured, planned, controlled and logged.

Simple batch processes with configurable sequential control systems are automated with the CFC and SFC tools included in the PCS 7 Engineering System. When you have more complex requirement of a recipe control strategy, you use SIMATIC BATCH. With SIMATIC BATCH, recipe structures are designed, modified and started graphically on an operator station or on a separate PC.

All process and operator data can be collected for a specific batch during batch execution and can then be processed and printed out in a batch report.

Possible applications of SIMATIC BATCH

SIMATIC BATCH is suitable for batch processes of any complexity. It provides simple support for batch applications ranging from small to extremely large.

The outstanding features of SIMATIC BATCH are as follows:

- Simple, graphic recipe creation
- Control and monitoring of recipe execution with the same graphic representation as used in recipe creation
- Two modes for working through the recipe logic, PC-based and AS-based
- Control strategy with data from multiple programmable logic controllers
- Integrated permission management with detailed access permissions
- Integrated logging of all events (including manual intervention) for comprehensive production documentation
- Simple and clear batch planning, when required with interfacing to higher-level PPS systems
- Modular expandability
- Application of NAMUR and ISA-88 standards

4.2 Functions of SIMATIC BATCH

SIMATIC BATCH supports you throughout all the stages involved in the automation of batch processes. The functions provided by SIMATIC BATCH can be divided into four basic areas:

- Recipe system:
  Creation and management of any number of master recipes and library operations
- Batch planning:
  Planning and replanning of batches and production orders
- Batch control:
  Execution, visualization and control of batches released for production and the corresponding control recipes as well as visualization of the current unit allocation
- Batch data management:
  Acquisition, storage and report creation of batch data

4.3 Components of SIMATIC BATCH

4.3.1 BATCH interface blocks

Introduction

SIMATIC BATCH uses the new functionality of the SFC types in the engineering system to define operation and phase types. As an alternative, SIMATIC BATCH continues to provide special interface blocks as the communications interface to the processing programs on the automation system. These blocks known as BATCH interface blocks ship with SIMATIC BATCH as a block library.

Additional information: "Setting up the equipment module with interface blocks IEPH and IEOP (Page 172)"

Definition

The BATCH interface blocks form the communications interface between SIMATIC BATCH and the processing programs of the process cell control system in the automation system. The BATCH interface blocks are implemented as CFC blocks and are inserted in the CFC charts according to their function and stored in the corresponding hierarchy folders in the plant view in the SIMATIC Manager.

Functions

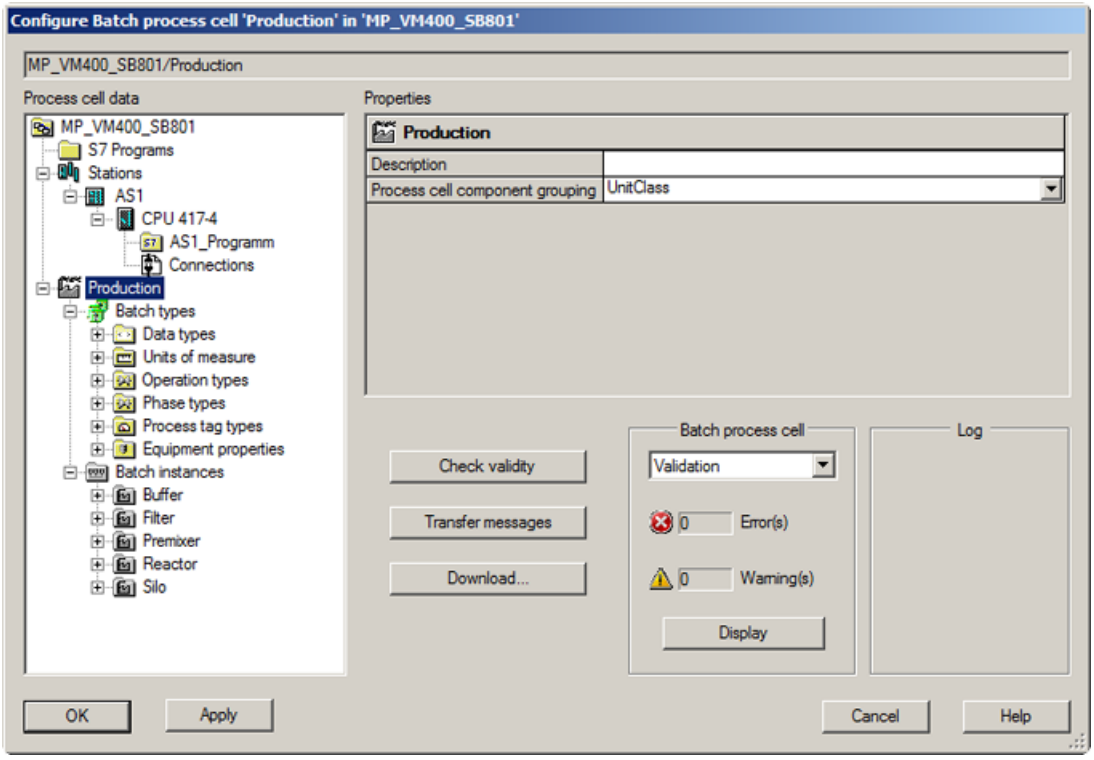
Using the BATCH interface blocks along with SIMATIC BATCH, makes the following functions available:

- Controlling the running of the process:
  The IEPH/IEOP blocks are used for this purpose. These provide the commands (for example start or hold) of the recipe control steps from the batch control to the processing blocks (for example: SFC_CTL or user blocks). The processing blocks report their current statuses back to the batch control.
- Allocating or releasing a unit by a control recipe:
  The UNIT_PLC block is used for this purpose.
- You use the TAG_COLL blocks to collect process values to create transition conditions and for logging measured value sequences in the batch report.
- Transferring setpoints and process values:
  The IEPAR blocks are used for this purpose. The batch control writes the recipe parameters (setpoints) for the processing blocks to these blocks via the IEPH/IEOP blocks. The processing blocks write the result data (process values) to the IEPAR blocks so that they can be stored as batch data by the batch control once again using the IEPH/IEOP blocks.

4.3.2 BATCH configuration dialog

Software components in the SIMATIC Manager

The BATCH configuration dialog is opened in the SIMATIC Manager using the **Options > SIMATIC BATCH** menu. As an alternative, you can also open it using the "SIMATIC BATCH" shortcut menu of any object in the SIMATIC Manager.



Functions in the BATCH configuration dialog

In the BATCH configuration dialog, the following tasks are performed after you have created the basic automation (SFC / CFC) in the SIMATIC Manager:

- Updating, compiling and downloading the S7 program (objects)
- Updating, compiling and downloading stations (SIMATIC station, for example SIMATIC S7-400)
  - CPU for example 417-4, specifying the memory configuration and assignment for the recipe logic
  - Compiling and downloading the S7 program (charts) The CFC charts of the units assigned to the S7 program are opened.
  - Displaying, updating, compiling and downloading connections

- Batch process cell
  - Validating the batch process cell
  - Transferring messages of the batch process cell to the higher-level PCS 7 OS
  - Downloading a batch process cell
- Generating, creating and deleting batch types
- Propagating batch types in a multiproject
- Compiling, creating and deleting batch instances.
- Merging batch instances in a multiproject

Additional information

BATCH engineering (Page 200)

4.3.3 BATCH Launch Coordinator

The BATCH Launch Coordinator is responsible for the following:

- Operator control and monitoring of SIMATIC BATCH
- Monitoring the BATCH server applications

The icon of the BATCH Launch Coordinator is displayed within the task bar. If you right-click the icon, a shortcut menu opens in which commands are available for selection. Additional information can be found in the first reference below.

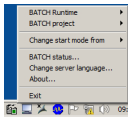


Figure 4-1 BATCH Launch Coordinator shortcut menu

Startup characteristics

The BATCH Launch Coordinator can be started automatically or manually. For automatic start after computer logon, the Batch process cell must be loaded and WinCC Runtime must be activated.

If the BATCH Launch Coordinator is not started automatically, start it using the **Start > All Programs > Siemens Automation > SIMATIC > Batch > SIMATIC BATCH Launch Coordinator** command.

Starting the BatchCC

The BATCH Launch Coordinator creates the preconditions for starting BatchCC. BatchCC cannot be connected to the database of the loaded batch process cell until SIMATIC BATCH displays the status "running". BatchCC will display a corresponding information dialog on startup until SIMATIC BATCH is ready.

Additional information

Information on the BATCH Launch Coordinator (Page 271)

"System characteristics" tab (Page 1007)

4.3.4 BATCH control server

Definition

The BATCH Control Server is a component of SIMATIC BATCH. The BATCH Control Server handles communication with the process and controls and monitors execution of the current batches.

The BATCH Control Server does not have its own user interface. The BATCH Control Server is started using the Launch Coordinator on the BATCH server or, in a redundant system, on both BATCH servers.

BATCH Control Server tasks

The BATCH Control Server (BCS) performs a variety of detailed tasks. The most important functions are the following:

- Establishing a communication connection to the automation system
- Generating the control recipe
- Downloading the control recipe to the automation system
- Processing the recipe synchronization
- Generating messages on the server status
- Controlling the redundancy mechanisms
- Failure monitoring (watchdog)

To acquire batch data (messages), there is a connection to the message server and to the process data acquisition of the PCS 7 OS (WinCC).

Establishing a communication connection to the automation system

The BCS in conjunction with the communication channel (via S7 DOS) ensures the communication with the process. It monitors the execution of the current batches.

In contrast to the PC-based concept, the AS-based concept has direct process access via the communication channel.

Transferring step information and control recipe requests

The BCS transfers data to the AS via the S7 DOS communication channel. Commands and parameters are sent to the automation system. The BCS receives status and process values.

Generating the control recipe

Once a batch has been started in the BatchCC or on the PCS 7 OS, the BCS allocates the unit on the AS, generates the associated control recipe, and sends it to the AS.

Downloading the control recipe to the automation system

The complete control recipe for one unit is loaded in a permanently assigned data block on the AS using S7 communication.

All of the step and recipe structure data is stored in the data block.

Processing the recipe synchronization

If a synchronization line is reached during execution of a control recipe, the automation system sends a frame to the BCS. In addition to the batch ID, the frame also contains the synchronization number that is unique within a recipe.

A signal is sent to the AS when all units involved in synchronization reach the synchronization line. The batch execution is then resumed simultaneously in all units.

Generating messages on the server status

The BATCH Control Server generates status messages for the BatchCC and the AS link. The messages are stored along with the corresponding message numbers in PCS 7 Alarm Logging.

Generating the batch report

After a batch is started, the batch data is saved in the online data storage of SIMATIC BATCH. In order to display and/or print out batch data, a print preview window and the batch report are available.

Checking state of process cells in the event of a problem in the automation system

In the event of a problem in the AS (AS in STOP), the active automation functions go into error mode. Depending on the setting under Properties > "AS operating parameters" tab under "SFC start-up after CPU restart", the SFC / SFC type is automatically reset or retains its state. Operator intervention is needed in both cases. We would only recommend a restart or resumption of the function once the state of the process cells has been checked.

4.3.5 BATCH CDV

If you use a Process Historian in your plant configuration, you do not need BATCH batch data management (BATCH CDV). BATCH CDV is automatically deactivated.

Definition

BATCH CDV is a component of SIMATIC BATCH. It is a server component responsible for acquisition, storage and reporting of batch data.

BATCH CDV does not have its own user interface. BATCH CDV is controlled as a server application by the BATCH Launch Coordinator service. The status of the application is displayed via the "BATCH Status" button in the shortcut menu of the BATCH Launch Coordinator.

Functions

The "BATCH CDV" server handles the following three tasks:

- Collects and stores WinCC messages.
- Collects and stores WinCC measured values. Only the measured values configured in the running batches are collected and stored.
- Closing batches. This process is divided into two steps. The transition state "Closing" leads to the final state "Closed".

Saving measured value and message data

BATCH CDV was enhanced so that the collected measured value and message data can only be written to the hard disk when sufficient disk space is available.

In addition, a batch can only take the "Closed" status when all batch-specific measured value data have been collected and written to the hard disk.

Note

Batches can no longer be closed if there is not enough space on the hard disk.

Cause:

A batch can only take the "Closed" status after it has first taken the "Closing" status and all batch-specific measured value and message data have been collected and written to the hard disk. If there is not enough hard disk space, the collected measured value and message data cannot be saved.

Remedy:

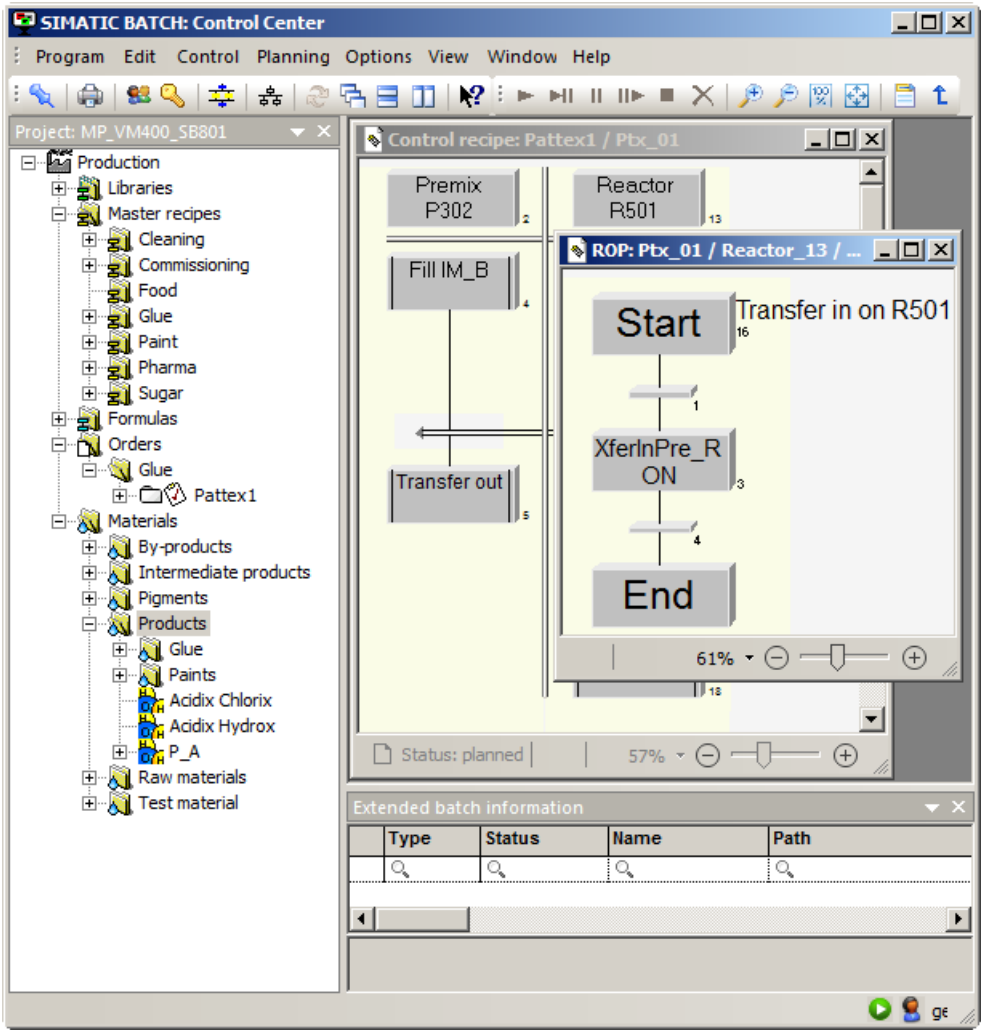
As soon as there is enough hard disk space, the pending measured value and message data is written to the hard disk. If a batch has the "Closing" status at this point in time, it is automatically closed after the pending measured value and message data has been saved.

4.3.6 Batch Control Center (BatchCC)

Definition

The BATCH Control Center (BatchCC) is the central component in SIMATIC BATCH for batch planning and batch control. The BATCH Control Center manages all the data relevant to SIMATIC BATCH. This means all BatchCC data can also be displayed in reports.

The Batch Control Center is started on the BATCH servers according to the settings made in the BATCH Launch Coordinator.



Functions

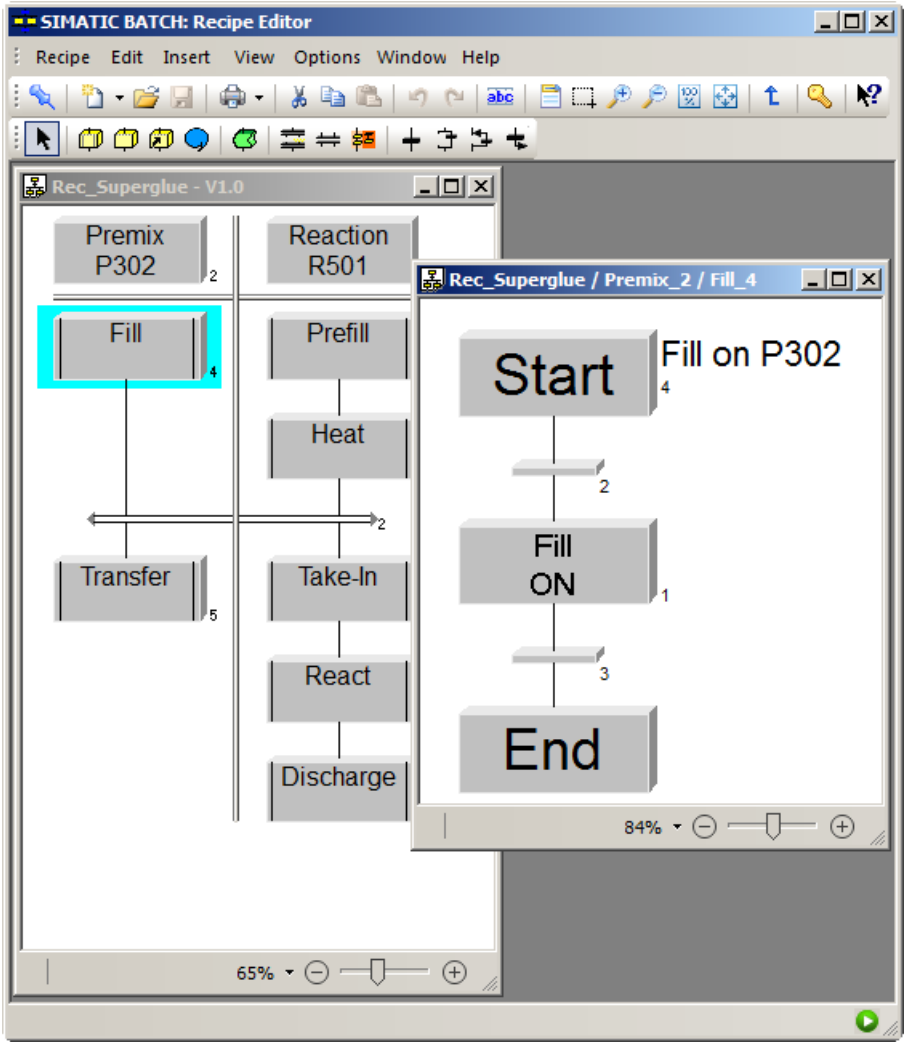
With the BATCH Control Center, you can do the following:

- Read in the process cell data from the basic control
- Specify the user permissions for all functions of BATCH
- Define the names and codes of the materials used
- Manage master recipes and start the BATCH Recipe Editor to configure the recipe structure
- Manage libraries with recipe elements (library operations)
- Edit and manage the formula categories and corresponding formulas
- Plan production orders using master recipes and batches
- Start and control batch executions
- Monitor and troubleshoot batch executions
- Display recipe and batch data in reports.

4.3.7 BATCH Recipe Editor

Definition

The BATCH Recipe Editor (RE) is part of SIMATIC BATCH and provides you with a graphical user interface for creating and modifying master recipes and library operations. Recipe creation is based on the BATCH objects from the BATCH process cell configuration in the engineering system (ES) of SIMATIC PCS 7, for example, by ISA-88 type definition of the process cell, units and equipment modules.



Functions

With the BATCH Recipe Editor, you can do the following:

- Create new master recipes and library operations.
- Modify existing master recipes and library operations (structural or parameter modifications).

- Display the master recipes and library operations in reports.
- Release master recipes and library operations for testing or for production.
- Validate recipes.

When performing these tasks, the familiar functions known from MS Windows programs such as paste, cut, copy, undo and redo can be used on single or grouped objects.

4.3.8 Assembling BATCH data in reports

Reports

Printed reports ensure the documentation of your batch processes. Reports for the following objects are available with SIMATIC BATCH:

- BATCH process cell
- Libraries
- Master recipes
- Formulas
- Batches

The standard report templates are provided for all types of reports. Report templates are used for clear and structured visualization of the data. The shortcut menu of a selected object contains the "Print" and "Print Preview" commands for objects. Commands for navigating, viewing, printing, and exporting reports are included in a toolbar of the print preview window.

Additional information

Object reports (Page 511)

4.3.9 BATCH OS controls

OLE custom controls (OCX) for SIMATIC BATCH

We provide you with SIMATIC BATCH OS controls for operating and monitoring batch processes on a PCS 7 OS client. In a template screen that is available after installing SIMATIC BATCH, you will find all the BATCH OS controls for operator control and monitoring of a Batch process cell.

Graphical user interface on a PCS 7 OS

You can use the BATCH OS controls as a graphical user interface (GUI). They are configured in the WinCC Graphics Designer for process mode. In process mode (WinCC Runtime), all the necessary interventions for batch mode can be implemented from a PCS 7 OS using BATCH OS controls.

Additional information

SIMATIC BATCH OS controls (Page 621)

4.4 Operating modes in SIMATIC BATCH

4.4.1 Introducing the operating modes "AS-based" and "PC-based"

BATCH block for both operating modes

When you create the master recipes, you can specify whether or not they are processed AS-based or a PC-based for each recipe unit procedure (RUP). This is only possible if the new block "UNIT_PLC" from supplied block library is configured in the relevant RUP.

What makes the AS-based operating mode possible?

The AS-based mode can only be implemented by using the new unit block "UNIT_PLC". With the new AS-based mode, you can influence recipes being processed on the AS using the UNIT_PLC block.

Note

Units with more than one AS

AS-based operation is not possible in units that have more than one AS on which the equipment phases/operations are configured. In projects with such units, the AS-based operating mode must be disabled in the BATCH configuration dialog (0% memory allocation).

Which functions are not supported in the AS-based operating mode?

- Flat recipes are not available.
- The "online structure changes (OSC)" from SIMATIC BATCH version 7.1 SP1 with which structure changes could be made to the recipe logic during the running of a batch is not possible in AS-based mode.

Memory requirements of the CPU and runtimes in AS-based mode

The following table provides an overview of the amount of CPU memory occupied by SIMATIC BATCH blocks in the AS-based mode.

Memory allocations	Description	Memory required in KB
Static part. Occupied by system.	Communication (Event Send)	56
	Function blocks	60
	Function calls	41
Dynamic part. Occupied by settings in the BATCH configuration dialog.	per unit	57
	per recipe unit procedure (RUP)	128

The following table shows the runtimes of the most important recipe structures that result from the processing of a recipe unit procedure and are required to calculate a cycle time.

Recipe structure	AS runtime
Completing recipe phase (average measured value)	1.8 ms
Updating setpoint (average measured value)	0.07 ms
Processing a transition (average measured value)	4 ms
Starting recipe phase (average measured value)	1.9 ms
Processing a recipe phase (average measured value)	2 ms

You can find an example of how to determine the memory requirements and the runtime in the section "Measured results for calculating the performance of both operating modes (Page 76)".

4.4.2 Concept expansion

Reason for expansion of the concept

Continuously increasing demands for higher product quality while simultaneously maintaining full plant capacity have caused a variety of branches in the manufacturing industry to improve and optimize their batch processes again and again.

For example, the food and beverage industry thus expect deterministic and above all fast step change times from a batch control system because slow step changes can result in a reduction in product output.

Requirements for fast batch processes

The determining logic of step changes is a basic requirement for both fast and parallel process sequences, which need to be synchronized to specific steps. Fast process sequences, for example, enable configuration of exact deceleration points for dosing, while precise parallel sequences accelerate the material transfer to synchronization steps.

The following requirements must be met to obtain the needed fast batch processes:

- Clear reduction of the step change times to less than one second
- Clearly defined deterministics for the step change times for batch processing

Characteristics of SIMATIC BATCH

When compared with previous versions of SIMATIC BATCH, this version allows faster batch control. The following features characterize SIMATIC BATCH in AS-based mode:

- Shifting of the recipe logic to the automation system (BATCH block UNIT_PLC)
- Reduction of the communication paths and communication traffic
- Shorter reaction times
- SFC time optimization due to event-driven calls

Compatibility with SIMATIC PCS 7 and SIMATIC BATCH

The proven functionalities, such as engineering, convenient recipe management, and operator control and monitoring of the process, remain available. Added to this are the deterministic algorithm and the performance at step changes while the runtime system on the AS is activated.

Hierarchical recipes are created in three levels: RUP, ROP, and RPH. These recipes are executed in the automation system as batches. Either the BATCH Control Center or the BATCH OS controls are used for operator control and monitoring of recipes.

Online functionalities, such as creating and starting batches, are available not only in BatchCC but also with the new BATCH OS controls on a PCS 7 OS.

Offline and project functions, such as "Updating process cell", "Permission management", "Role management", and the creation of materials, formulas, and formula categories continue to be used exclusively in BatchCC.

Recipes for AS-based operation continue to be created with the Recipe Editor of SIMATIC BATCH and their use is checked there. For recipes that have parts executed on the AS, additional constraints were included in the validation. There is a check to determine whether free memory blocks are available on the AS to execute selected recipe parts during runtime.

Use of existing recipes

With suitable system knowledge, existing hierarchical recipes from previous versions of SIMATIC BATCH can be reconfigured for AS-based operation.

4.4.3 Shifting of the recipe logic to the AS

Acceleration of recipe execution steps

An essential measure for accelerating recipe execution steps is the shifting of the recipe logic from the BATCH control server to the automation system. It results in substantially faster as well as deterministic step change times.

In comparison to a server, the automation system operates deterministically because the individual cycles of organization blocks are controlled in it. On the server, in contrast, the execution times of the cycles can vary depending on the load of the CPU.

Moving the recipe logic also results in changes to the system architecture. As can be seen in the figure "Shifting the recipe logic", the BATCH control server is connected to the AS via a separate communication channel (S7DOS). The result is shorter and simplified communication paths.

Communication path between BATCH control server and automation system

The new concept in AS-based mode uses a direct communication channel for faster and more stable data exchange between the BATCH control server and the automation system. This channel is based on S7 DOS and allows the BATCH control server direct access to the process.

The communication channel has the following tasks:

- Downloading blocks with the control recipe for the sequence of a unit
- Sending control commands to the recipe control
- Transferring step data from the automation system to the BATCH control server
- Transferring setpoint values, process values and measured values from the automation system to the BATCH control server

The communication connections between AS and BCS are created automatically by the BATCH configuration dialog.

Data communication between the server and automation system

The following figure, "Reducing the communication volume" shows how the individual software components were changed to reduce the volume of communication.

Impact on the processing time and memory of the AS

The greater the number of currently active unit recipes on the AS, the less memory space or processing time is available for the remaining automation tasks on the AS.

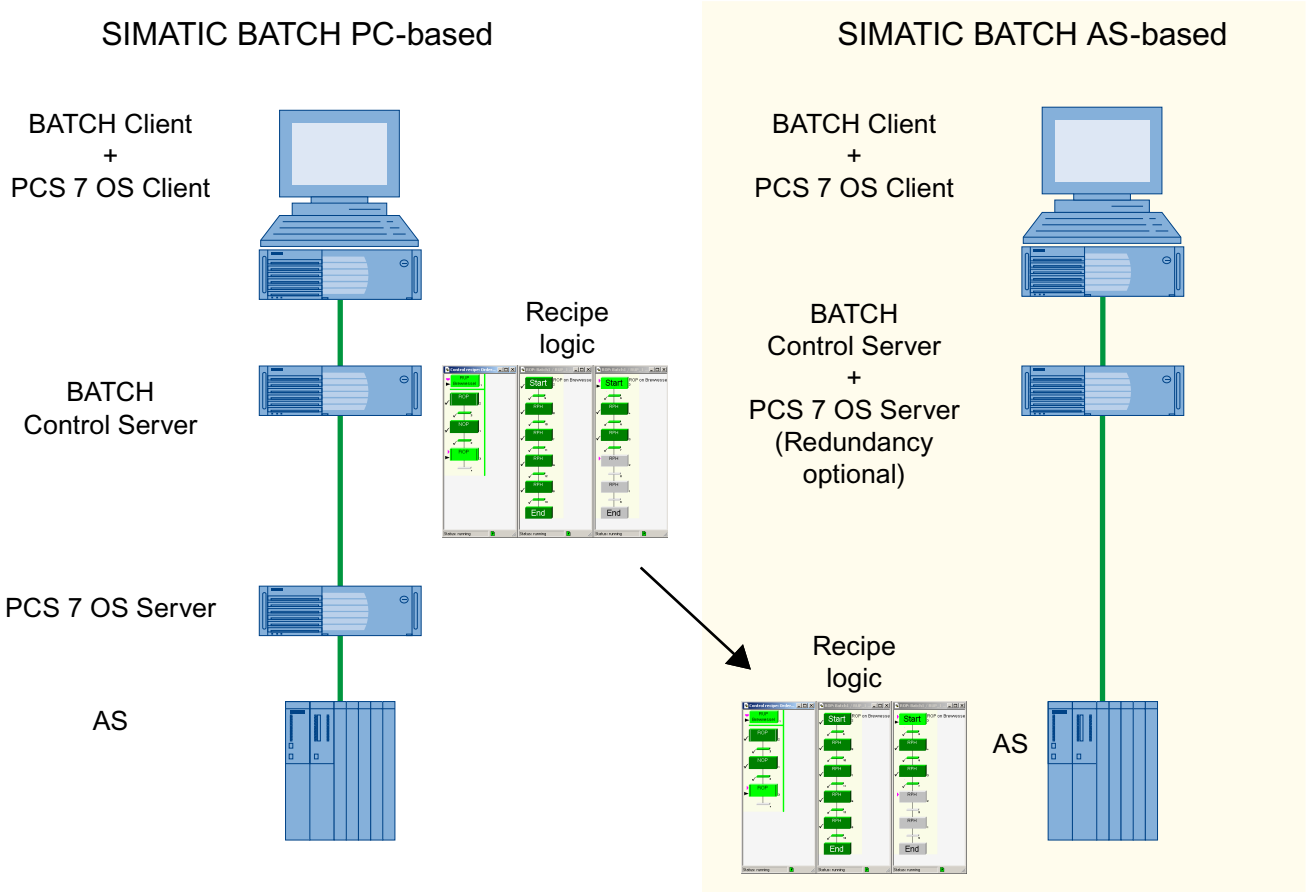


Figure 4-2 Shifting the recipe logic

Operator control of the process on a PCS 7 OS using BATCH OS controls

To create and operate batches including visualization of the control recipes of currently running batches, SIMATIC BATCH provides a template screen on a PCS 7 OS with all the necessary BATCH OS controls.

Which recipe phases continue to be processed in the BATCH control server?

The following list shows all recipe phases that are still processed in the BATCH control server in AS-based mode:

- Unit allocation (preferred unit, the longest out of use, operator selection and process parameters)
- Synchronization lines between two units
- Cross-unit transitions and command steps
- Operator instructions

Additional information

Obtaining the memory configuration and setting the allocation (Page 220)

BATCH OS controls (Page 621)

4.4.4 Recipe levels and sequence of a recipe

Recipe levels and recipe logic

In AS-based mode, SIMATIC BATCH allows a reduction and a reproducibility of step change times with the following recipe control runtime functions that have been shifted to the automation system:

- Unit/RUP level
- Recipe level 1/ROP level
- Recipe level 2/RPH level
- Logic of the individual control units

Recipe level 2 / RPH level contains the recipe logic and its accelerated execution via the SFC type or SFC chart.

The logic of the individual control units describes the user configuration on the AS.

The system blocks required for recipe control and the runtime system are grouped together in the SIMATIC BATCH blocks library.

Recipe execution

The mapping of the recipe execution in the AS is made with the following block classes:

1. RUP level -> UNIT_PLC block
2. ROP level -> EOP block (level 1)
3. RPH level -> EPH block (level 2)

Recipes in the automation systems are assigned to the units as control recipes. This property allows the distribution of a project over several automation systems.

If communication with the SIMATIC BATCH control server is interrupted, the AS continues to run to the next synchronization line in the recipe or to a reference (transition or command block) to another unit recipe. Events are temporarily stored on a unit-specific basis until the configured communication buffers are full.

The volume of data that may be put into interim storage depends on the corresponding volume of batch communication.

4.4.5 Recipe processing in runtime

Control recipe definition

The complete controller information required to execute a batch in the automation system is called the control recipe. This information is distributed over units and loaded into the automation system by the BATCH control server. Each unit is assigned one or more data blocks for storage of unit recipes.

Control recipe request from the AS

A control recipe is requested by the AS. The unit recipe procedure is then generated in the BATCH control server and loaded into the data block for the UNIT block.

The start of a unit is initiated by:

- The order system (BatchCC) on the BATCH control server
- The SIMATIC BATCH OS controls on the PCS 7 OS

Recipe synchronization

Recipe synchronizations are loaded in the AS with the control recipe. When a recipe synchronization line is reached during the control of a unit, the the following individual actions occur:

- The AS sends a frame to the recipe synchronization in the BATCH control server. In addition to the batch ID, the frame also contains the synchronization number that is unique within a recipe.
- The BATCH control server determines the participants of the synchronization with the first frame. The synchronization definition is read for the recipe for this purpose. The definition includes the recipe unit procedures (RUPs) involved in the synchronization.

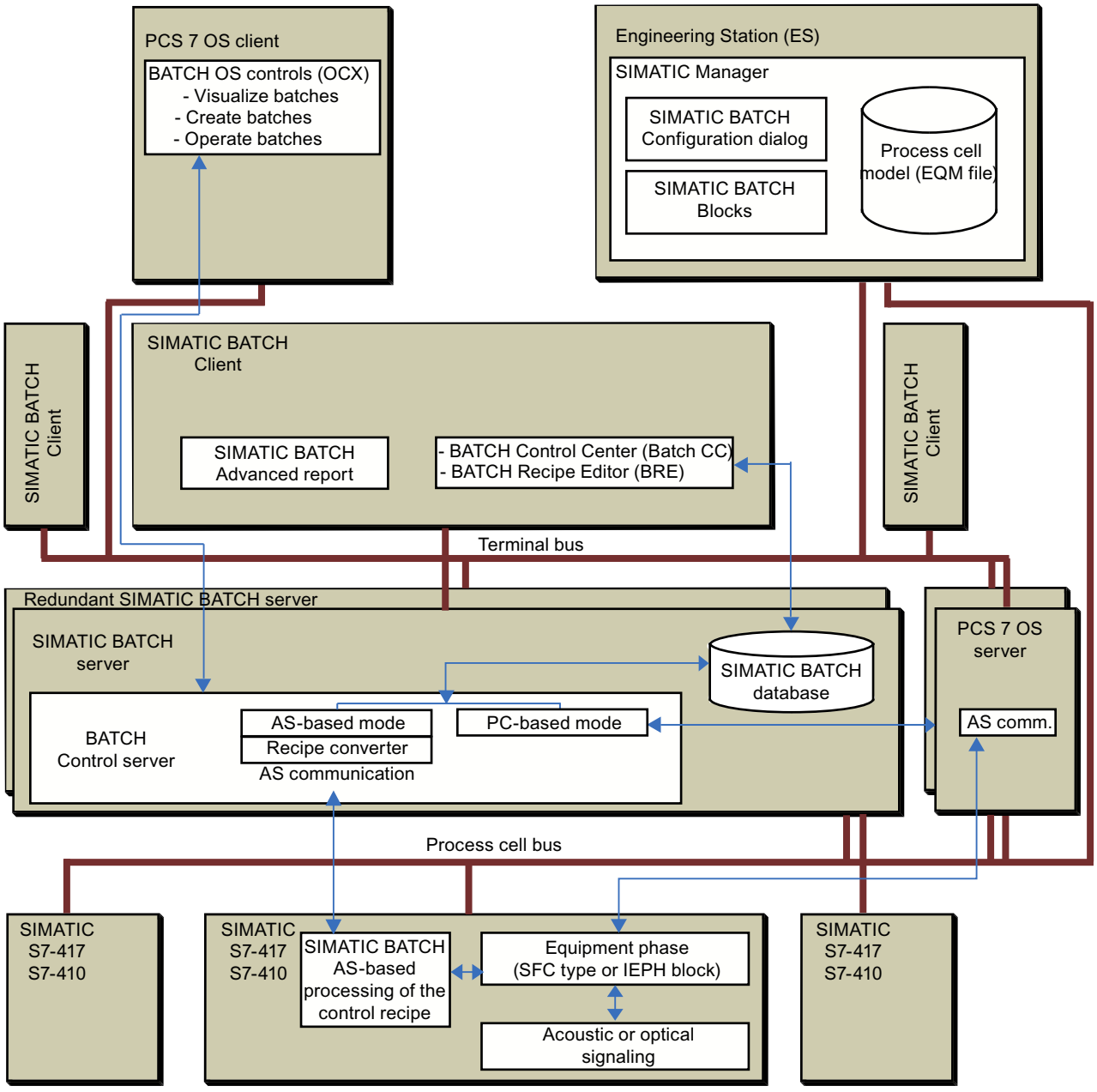
- The BATCH control server determines the unit candidates for this batch. The candidate information includes which unit is selected for this RUP in the current batch.
- If the conditions of a synchronization are met, the BATCH control server will set an "acknowledgment bit". The acknowledgment bit is set in the AS for each participating unit.
- The execution in all units is then simultaneously resumed in the AS.

4.5 Possible configurations

4.5.1 System software architecture

System and software architecture.

The following figure shows the hardware components involved in the system (colored gray) that are interconnected via bus systems (colored brown) Software program packages or parts of software program packages (colored white) of SIMATIC BATCH are shown for each hardware component involved in the process. Blue lines with directional arrows roughly show the interaction of the components of the software packages.


PCS 7 OS client
BATCH OS controls (OCX)
- Visualize batches
- Create batches
- Operate batches
Engineering Station (ES)
SIMATIC Manager
SIMATIC BATCH Configuration dialog
SIMATIC BATCH Blocks
Process cell model (EQM file)
SIMATIC BATCH Client
SIMATIC BATCH Client
SIMATIC BATCH Client
SIMATIC BATCH Advanced report
- BATCH Control Center (Batch CC)
- BATCH Recipe Editor (BRE)
Terminal bus
Redundant SIMATIC BATCH server
SIMATIC BATCH server
SIMATIC BATCH database
BATCH Control server
AS-based mode
Recipe converter
AS communication
PC-based mode
PCS 7 OS server
AS comm.
Process cell bus
SIMATIC S7-417 S7-410
SIMATIC S7-417 S7-410
SIMATIC BATCH AS-based processing of the control recipe
Equipment phase (SFC type or IEPH block)
Acoustic or optical signaling
SIMATIC S7-417 S7-410

4.5.2 Distribution of the SIMATIC program packages

SIMATIC software packages and their distribution variants

When installing these SIMATIC software packages on PCs, the following main distribution variants are possible.

Variant	Name	Installation of the SIMATIC program	Assessment and purpose
1	Single station system	All program packages are installed on one PC Example: Engineering station (ES), OS server, OS clients, BATCH server, BATCH client, RC server, RC client.	Process connection to AS from this PC. Limited performance, engineering and process mode not separate. For example for small process cells or when working with Getting Started.
2	Simple multiple station system	Installation of the program packages for an ES and the installation of all other program packages on a separate PC. Example: OS server, OS client, BATCH server, BATCH client, RC server, RC client.	Process connection to the AS from the ES and the separate PC. Better performance. Engineering and process mode separated. Industrial system.
3	Multiple station system	All program packages are installed on different PCs The following program packages can be installed on different PCs. Example: Single PC as ES, single PC as BATCH server, single PC as OS server, single PC as RC server, single PC as BATCH client, OS client and RC client,	Process connection to AS from the ES, from BATCH server and OS server. Best performance in conjunction with a fast network. Engineering and process mode separated. Industrial system.

Data storage systems

SIMATIC BATCH operates with the following three databases:

- Project DB: Storage of user permissions
- Offline DB: Storage of recipes, formulas, materials
- Online DB: Storage of the batches

During installation, the BATCH databases or BATCH shared folder with the databases are created in the specified location on your hard disk or in a new folder path.

BATCH server

When you install the BATCH server program package on a PC, the following BATCH applications are installed:

- BATCH control server (BCS)
- Batch data management (CDV)
- SIMATIC BATCH Server (SBS)
- BATCH databases
- BATCH Launch Coordinator

BATCH clients

When you install the BATCH client program package on a PC, the following BATCH applications are installed:

- Batch Control Center (BatchCC / BCC)
- BATCH Recipe Editor (RE)
- BATCH OS controls
- API interface

Additional information

You will find a detailed description of the possible distribution of the SIMATIC BATCH program packages in the manual *Process Control System PCS 7; PC Configuration*.

4.5.3 Client / server architecture of SIMATIC BATCH

Client/server architecture

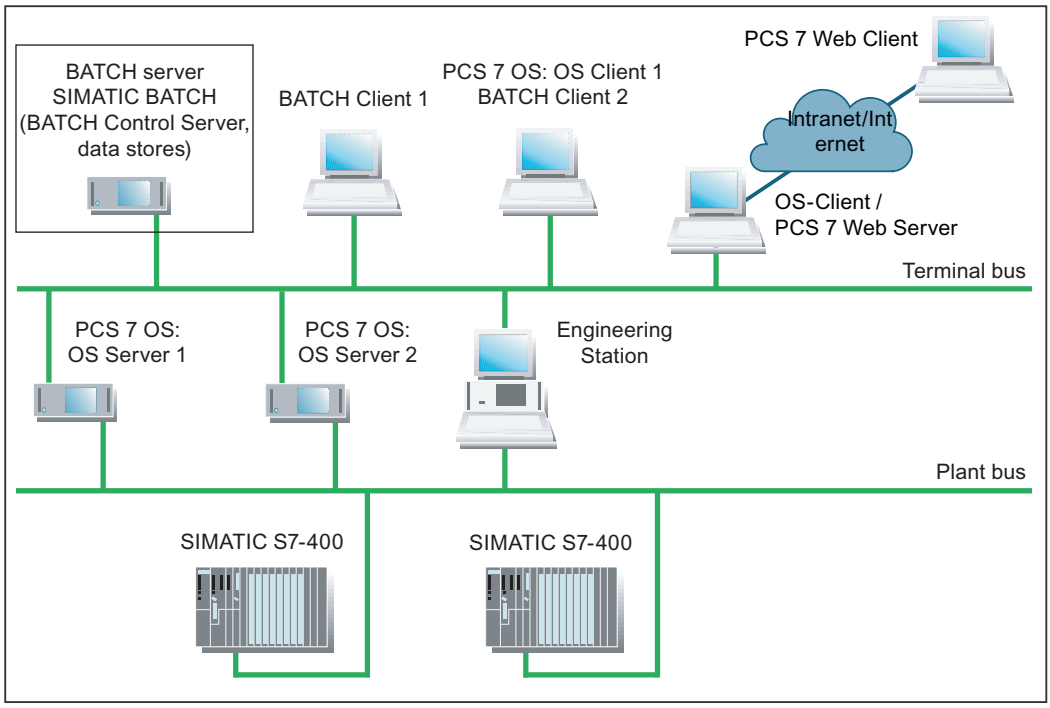
The SIMATIC BATCH software package is normally installed on more than one PC. PCs are set up as BATCH clients are always at least one PC as BATCH server. All the BATCH stations involved work with the same process cell project. The BATCH server provides the services for the BATCH clients that form the interface to the operator, in other words function as operator control terminals.

PC-based mode: Interaction with PCS 7 OS server

In process mode (runtime), SIMATIC BATCH is linked to the PCS 7 OS servers.

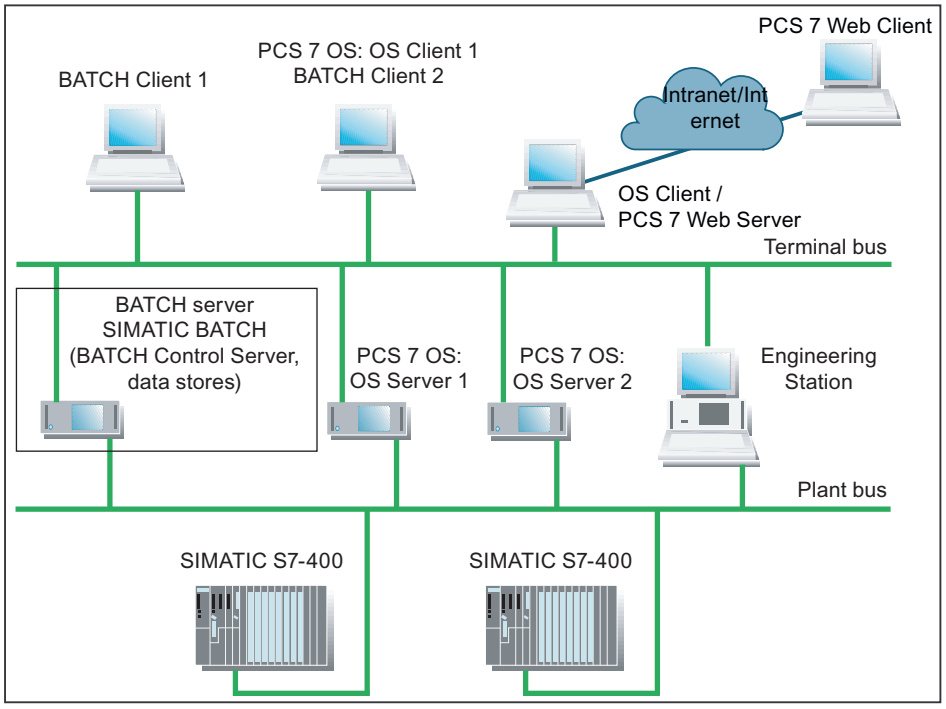
Communication with the automation system, for example writing recipe parameters or reading process values, is handled by the data manager of the PCS 7 OS server. In other words, a BATCH server does not need its own interface to the automation system for the PC-based mode.

The "BATCH server" and "OS Server" program packages should, whenever possible, be installed on separate PCs to improve performance. In the batch process cell configuration, the PCS 7 OS servers that are relevant for the batches are made known to the BATCH server. BATCH clients can run on a separate PC as well as together with an OS client on a PC. The PC configuration of this mode is shown in the following figure.


BATCH server
SIMATIC BATCH
(BATCH Control Server,
data stores)
BATCH Client 1
PCS 7 OS: OS Client 1
BATCH Client 2
PCS 7 Web Client
Intranet/Int
ernet
OS-Client /
PCS 7 Web Server
Terminal bus
PCS 7 OS:
OS Server 1
PCS 7 OS:
OS Server 2
Engineering
Station
Plant bus
SIMATIC S7-400
SIMATIC S7-400

AS-based mode: Interaction with the automation system

In contrast to the PC-based mode, a BATCH server in the AS-based mode requires a network connection to both the terminal and plant bus. This ensures direct communication between the BATCH server and the AS via a separate communication channel. Via this channel, the control recipes on the automation system are accessed while the runtime system is operating. To accelerate a step change, for example, switch to next signals are set in the control recipe and therefore in the automation system.



multiple station system (distributed system)

SIMATIC BATCH supports the model of multiple station systems or distributed systems. This means that you can install the software program package relevant to the application on every PC of a multiple station system. You can, for example, configure your project in such a way that all stations involved including the AS can be accessed from an engineering station.

Simple multiple station system (distributed system with a PCS 7 OS as BATCH server and OS server)

The configuration described up to now applies to a multiple station system or distributed system. For small projects, there may be only one PCS 7 OS. In this case, the BATCH server and the OS server are installed on this PCS 7 OS. This PC must have the process connection to the AS. The ES is installed on a separate PC. This provides a network connection to the terminal and plant bus and therefore to BATCH clients and the AS.

Configuration on an engineering station

BATCH servers, BATCH clients and OS servers and OS clients are configured in the SIMATIC Manager of the Engineering Station and downloaded from there to the target stations.

Maximum number of BATCH clients

A maximum of 40 BATCH clients can be connected to one BATCH server.

Keep in mind that BatchCC and BATCH OS controls are considered to be BATCH clients.

4.5.4 Interface to MES/ERP

With the *SIMATIC BATCH - COM API* interface, you can link the online and offline functions of SIMATIC BATCH to an OEM system or to any MES/ERP application. The API interface offers a COM connection (data format XML).

To learn about the possible uses and configuring options, please refer to the associated online help or manual. You will find the online help named "bfapicm_a.chm" in the following path ".. \SIEMENS\BATCH\Api_Example\BFApi_doc". Double-click on the file to open the online help. The manual can be opened as a PDF file under Start > All Programs > Siemens Automation > SIMATIC > Documentation > English > SIMATIC BATCH - COM API.

4.5.5 Redundancy

4.5.5.1 Introduction

Availability

To increase the availability of the batch control and to allow a software update during operation, SIMATIC BATCH provides the option of installing a redundant BATCH server. If there is a failure in the redundant system, there is a standby/master failover between the redundant BATCH servers.

Redundancy is achieved with redundant BATCH servers each with local data management. To safeguard data and to allow the batch applications to access the current data, the data is constantly synchronized between the two local data management systems - a data replication.

This ensures that after the failure of one BATCH Control Server or database server, the redundant server can continue to work with the same data without the loss of data or gaps in the documentation.

Configuring and commissioning

Note

Requirements

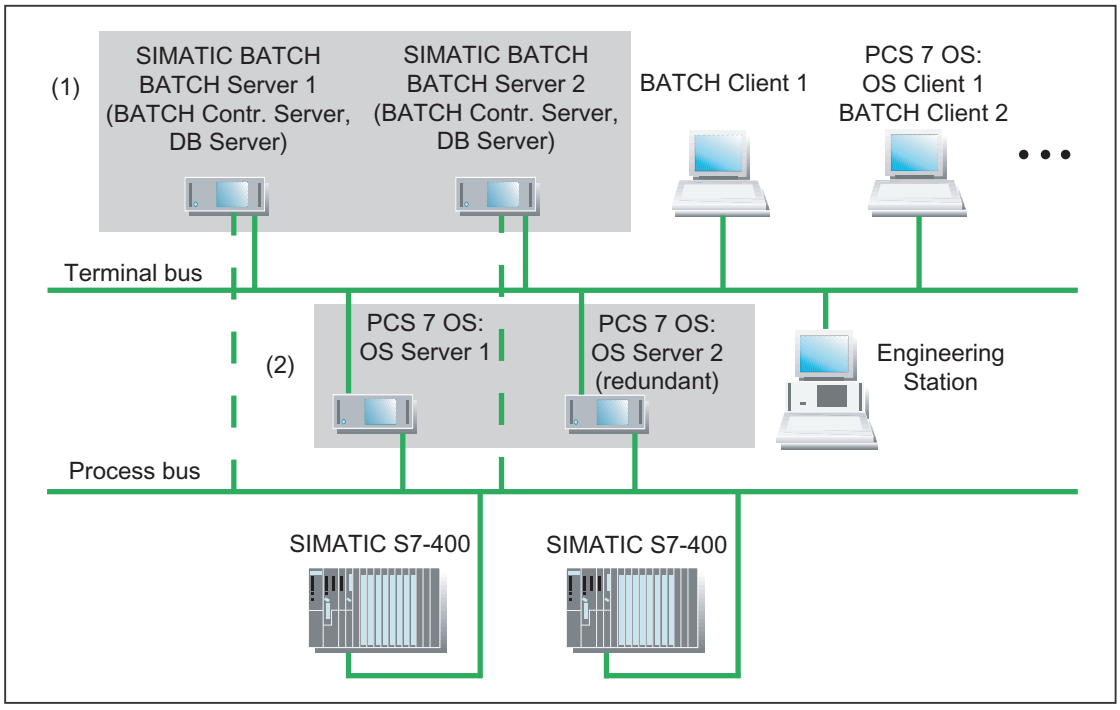
To establish the software and hardware requirements and when configuring and commissioning redundant servers in the SIMATIC PCS 7 system, you should always consult your Siemens representative.

References for redundant PCS 7 OS

An introduction to the general redundancy mechanisms is provided in the function manual *Process Control System PCS 7; Fault-tolerant Process Control Systems*. This documentation is on the "PCS 7; Electronic Manuals" CD. This is general documentation describing the overall concept of availability in PCS 7. This also includes, for example, more information on the redundant PCS 7 OS.

4.5.5.2 Example configuration - Fault-tolerant Batch Control

The figure below shows an example configuration with a redundant BATCH server and redundant PCS 7 OS (WinCC):



(1) Redundant BATCH server

Redundancy is achieved with two BATCH servers with a standby/master failover. The redundancy of the BATCH servers ensures the following if a BATCH server fails:

- All BATCH clients (with the BATCH Recipe Editor and BatchCC (batch planning, batch control)) are immediately operable again following the failover and
- permanent acquisition of the Batch data continues.

(2) OS redundancy of the standard PCS 7 operator stations

The redundancy of the distributed PCS 7 operator stations with an interface to the SIMATIC S7-400 is achieved by interconnected OS servers with data synchronization and backup of the archive data. The WinCC archives of the redundant OS servers are synchronized and contain the same data. The functionality is implemented with the "Redundancy" optional software of WinCC. For a description of the "Redundancy" optional software, refer to the manual *SIMATIC HMI; Options*.

The redundancy of the PCS 7 operator stations ensures that the batch processes will continue uninterrupted even if one of the two OS servers fails. The operator remains informed about the status of the process cell and can still intervene in the process.

4.5.5.3 Behavior in runtime

Failover of the BATCH server

The BATCH Control Server and Batch data management (Batch CDV) are permanently active on both redundant BATCH servers. From the prospective of the BATCH server, there is no preferred server; in other words, both BATCH servers access the same OS server when there are no failures in the system.

If the BATCH server configured as the master fails, there is a failover to the BATCH server (standby). This then becomes the master.

Possible causes of a failover

- Failure of the BATCH server PC (master), e.g. hardware fault or "blue screen"
- Failure of the network connection of the BATCH server PC. The BATCH server no longer detects a client or its redundant BATCH server.
- Failure of a BATCH server application, e.g. BATCH Control Server, batch data management (CDV), SIMATIC BATCH Server (SBS).

Failover of the BATCH clients

If the BATCH server (master) fails, the BATCH clients automatically fail over to the standby BATCH server.

Startup, hot restart of the BATCH clients

Note

Failover time

Following a failover of the BATCH servers, the BATCH clients can only be operated again after a certain time has elapsed.

A message window opens informing you that the BATCH server is currently not obtainable. The message window disappears after a successful failover. This indicates that the server application is ready for operation again. If the redundant BATCH server is not ready to take over, the message "BATCH server is in error state (postponed)" is displayed on the PCS 7 OS. When the redundant BATCH server becomes ready to take over, the redundant BATCH server automatically takes over the server application.

As long as the message window is displayed, the BATCH client cannot be operated. You can, however, close the client application by clicking the "Quit application" button. On completion of the failover, the BATCH client can be started again.

Process control messages

In the event of a failover, a process control message is displayed on the message OS.

4.5.5.4 Data replication

Synchronizing databases

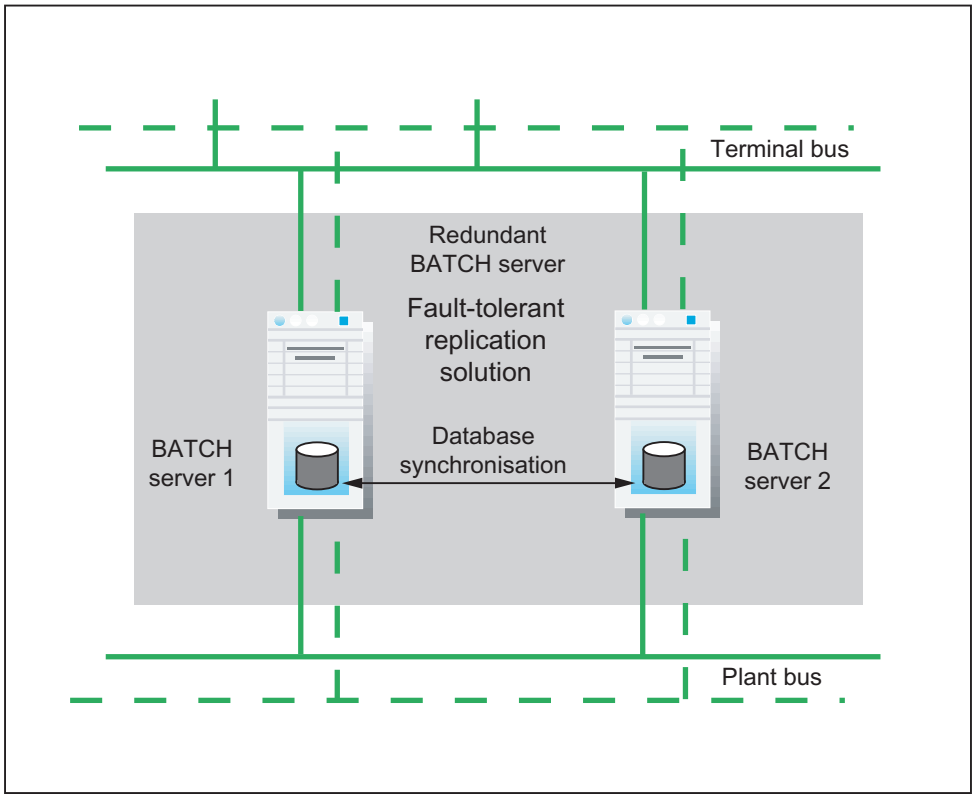
Each redundant BATCH server of a server pair (master, standby) has its own local database. To continually synchronize the two local databases, an independent second network adapter is used for each of the two server PCs. The following tasks are performed via this connection:

- Lifebeat monitoring of the redundant partners
- Data replication
- Data consistency between the redundant partners

This ensures that both BATCH server always use the same database.

Redundancy switchover, start sequence of the BATCH servers, database synchronization with WinCC message

- An interruption of the replication connection (extra network adapter in both redundant SIMATIC BATCH server PCs with network cable) affects the communication between the AS and the BATCH server. The communication is blocked for approximately 20 s. This means that the process (batch) continues running but its visualization in the BATCH Control Center or in the BATCH OS controls is updated after a delay of up to 20 s.
- When starting a redundant BATCH server or during a redundancy switchover, the databases of the standby server are synchronized with the databases of the master server. Do not abort the copy procedure needed for this, e.g. by powering down/switching off one of the BATCH servers. If you do, you will have to reset the BATCH database of the standby server.
- A "Restart dialog" appears on the previous master once a switchover to a redundant pair of servers caused by an error has occurred. Please follow the restart request to correctly restart the PC. All active programs are closed when you acknowledge the restart request.
- If you power down both BATCH servers on a redundant system with a time lag, when restarting the BATCH server you will have to firstly restart the server you powered down last. If you don't do this, there is a risk of you losing batch measurements and messages from the period of the time lag.
- When starting and ending database synchronization between the master and standby servers, the WinCC messages "Data synchronization started" and "Data synchronization complete" are produced.



Hardware requirements

- Redundant BATCH servers always require an additional network adapter independent from the terminal and plant bus. These network adapters can be of the same type.
- The additional network adapters must be installed in your PCs (redundant BATCH server pair) in free PCI slots.
- Make sure that you read the information in the relevant SIMATIC PCS 7 documents, especially the document *Process Control System PCS 7; PCS 7 - PC Configuration*.

Software requirements

- Installation of SIMATIC PCS 7
- Batch data replication is performed exclusively via an independent, additional network adapter in both PCs.
- The network adapters are configured within the operating system (IP addresses and subnet mask).
  - Subnet mask: The network adapter for the data replication must not be in the same subnet as the network adapter for the communication with the BATCH clients via the terminal bus/with the AS via the plant bus.
  - The addresses (IP and subnet mask) of the two PCs must be in the same network, otherwise no communication is possible between the redundancy partners.

Configuration

The network configuration of the independent network adapter for a redundant BATCH system is project-independent. It is performed in the "Simatic Shell" system folder in Windows Explorer.

1. Right-click on the "Simatic Shell" folder and select the shortcut menu command "Redundancy Settings ...".
2. In the "Serial Interface" area, select "none, or the following symbol "----------".
3. In the "Network adapter" area, select the adapter that has been configured and is now available.
4. Close the dialog with "OK".
5. Open the "Network connections" dialog. Open the "Advanced Settings" dialog with the menu command **Advanced > Advanced Settings**. Use the buttons in this dialog to set your connections in the correct order. First configure the "Terminal bus" and "Plant bus" connection and then the "Batch replication connection".

   Note

   Check that a log is not selected in the adapter settings for the plant bus (file and print sharing).

6. Repeat steps 1-5 for the redundancy partner.

Result

You have now configured the required communication for the redundancy partners and can no perform database replication for SIMATIC BATCH.

4.5.5.5 Configuration of the redundant BATCH server

Configuration of applications on objects

WARNING

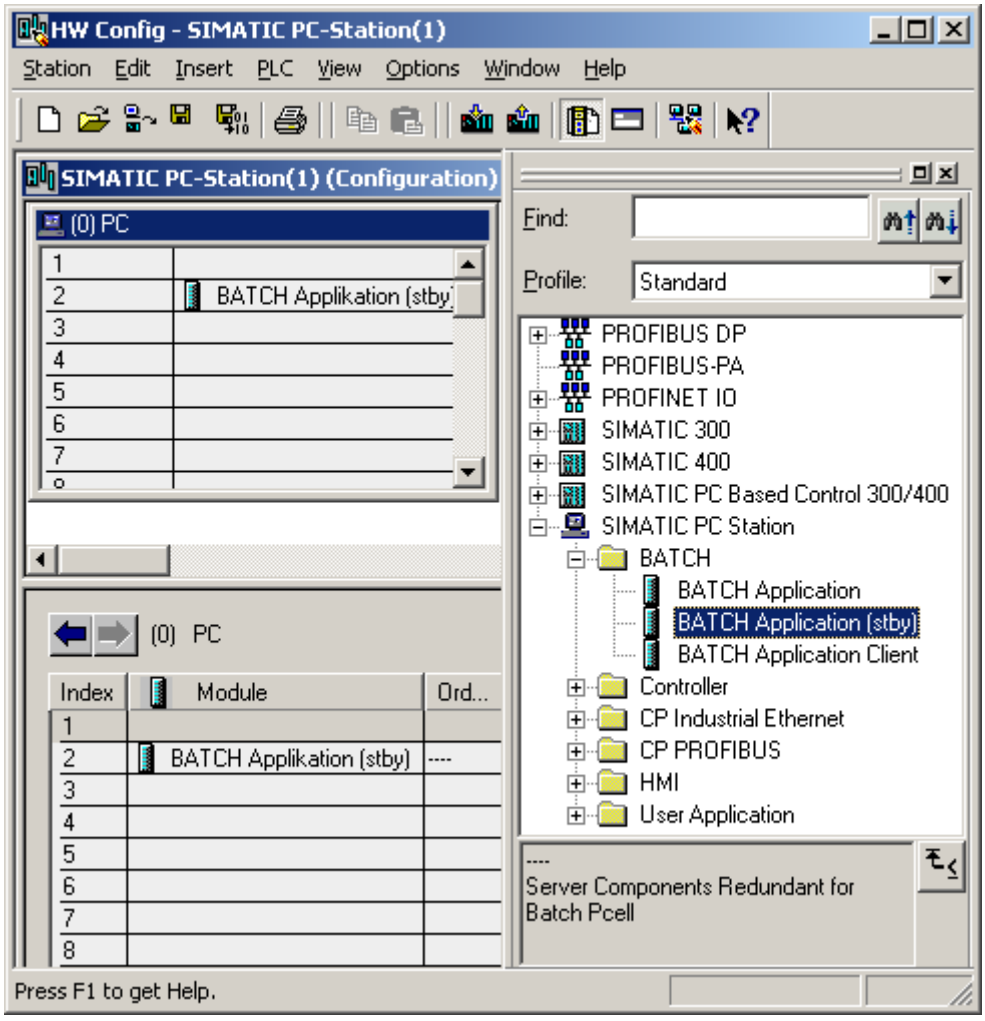
Computer names

Configuring applications (WinCC, SIMATIC BATCH, ...) on separate "SIMATIC PC station" objects and then merging them to create one PC station by assigning the same computer name to the "SIMATIC PC station" objects is not permitted.

Follow the steps in the SIMATIC Manager outlined below:

1. Select the project in the Component view.
2. Select the menu command Insert > Station > SIMATIC PC Station.
   Result: A new SIMATIC PC station is inserted in the current project.

3. Set the computer name of the PC station.
   - To do this, select the SIMATIC PC station.
   - Select the menu command Edit > Object properties.
   - Enter the computer name in the last field.
4. Configure this SIMATIC PC station in HW Config.
   - To do this, select the SIMATIC PC station.
   - Select the menu command Edit > Open object.
     Result: HW Config opens.
   - Insert a batch application from the hardware catalog:
     Path in the hardware catalog: Standard > SIMATIC PC-Station > BATCH > BATCH application (stby).



Select the menu command Station > Save and compile.

Result:

The inserted "BATCH application (stby)" object appears in the Component view below the SIMATIC PC station.

4.5.5.6 Information on network connections

Requirements:

The following are requirements for network adapter, serial connection and redundancy connection:

- A redundant BATCH server must have a second network connection independent of the terminal bus and plant bus. This is used for BATCH data replication.
- The serial connection (COM interface) may no longer be used in conjunction with SIMATIC BATCH. It must be removed from "old systems".
- In principle, the redundant connection between both BATCH servers can be produced using a crossed network cable (cross over cable) or a switch.

4.5.5.7 Configuring network connections

Introduction

Network configuration of a redundant batch system is not dependent on the project. There is therefore no need for configuration of batch redundancy in batch engineering, as was previously undertaken in the project settings in the BATCH configuration dialog.

Procedure

1. Network configuration for the redundant BATCH server is undertaken via the "Simatic Shell" folder in Windows Explorer. You will find more information in the online help for SIMATIC BATCH in the Redundancy > Data replication section.
2. If you are installing BATCH and WinCC servers on a PC, ensure that you use the following settings in the "Redundancy" WinCC Editor:
   - Connection to redundant partner via serial interface: Select "none".
   - Connection to redundant partner via network adapter (MAC address): Select the network adapter you used for data replication and close the dialog using the "OK" button.

4.5.5.8 Important additional information

Redundant server pair

- In a compact system (WinCC server and batch server on same PCs), the "Start SIMATIC BATCH automatically after starting WinCC" setting should only be made once the BATCH process cell (database) has been created. If this is not done, booting the system will be interrupted with an error under the precondition "Just one server switched on, no client started, BATCH process cell still not created".
- In a distributed system (WinCC server and batch server on different PCs), the "Start SIMATIC BATCH automatically after starting WinCC" setting is blocked.
- When starting a redundant BATCH server or during a redundancy switchover, the databases of the standby server are synchronized with the databases of the master server. Do not abort the copy procedure needed for this, e.g. by powering down/switching off one of the BATCH servers. Otherwise, the database of the standby server will have to be reset.
- If a redundancy failover occurs during active client applications, e.g., during actions such as archiving batches, updating process cell, starting a print preview or a print operation, the current actions may be adversely affected.
- If there is a redundancy failover after the command "Update process cell" is executed on a client, it is possible that this command will not be executed.
  Follow the steps below:
  - Close the client.
  - Start the client.
  - Execute the "Update process cell" command.
- A "Restart dialog" appears on the previous master once a switchover to a redundant pair of servers caused by an error has occurred. Please follow the restart request to correctly restart the PC. You should first close active programs.
- Both when starting and ending database synchronization between master and standby, the WinCC messages "Data synchronization started" and "Data synchronization complete" are produced.
- Batch data management There are no longer any restrictions for the start order of the BATCH server in a redundant system. The system automatically connects to the valid project database. You should, however note that following any total system failure in a distributed system, the servers must be started up in the following order. First start the WinCC server and wait until its redundant WinCC server is synchronized. Start the BATCH server only when this completed.

Downloading the BATCH process cell data

When loading the BATCH process cell data from the BATCH configuration dialog, both the BATCH server (master and standby) and all BATCH clients defined in the project are supplied with data. However, this data is not valid in the BATCH system immediately after downloading, but rather not until a defined point in time when this data is applied by the BATCH system. Data is applied through the following actions:

- The distribution of the components and the BATCH server configuration, e.g. CDV on/off, are applied during startup of the BATCH server PC (master and standby).
- The BATCH process cell data is applied in the BCC through the active user action "Update process cell".

In the case of a redundant system, the BATCH process cell data is not automatically synchronized on the redundant BATCH server when just one BATCH server PC is started up. This means that when you restart a BATCH server, it is imperative that you also restart its redundant BATCH server. Inconsistent BATCH process cell data between redundant partners could lead to the following situations, for example:

- Messages and measured values are recorded on the master (CDV on) but not on its standby (CDV off).
- Communication between the redundant BATCH servers may be faulty.
- Errors may occur in the recording of messages and measured values by the PCS 7 OS.
- Completely different BATCH process cells may be present on the two BATCH servers because the databases are not synchronized.

Additional information

BATCH engineering (Page 200)

4.5.5.9 Automatic hot restart

What safety strategies are there when using redundancy?

A redundant server pair provides protection for your process against failure. New mechanisms are available to ensure that there is a failover and hot restart if a problem occurs.

- Prevention on exiting a SIMATIC server application with redundancy
- Automatic hot restart of server applications after problem; cannot be recognized by the user
- Isolation of SIMATIC BATCH server in an error state
- Isolation of the server applications in an error state
- Automatic hot restart of a SIMATIC BATCH server after status check of the partner server

Prevention on exiting a SIMATIC server application

If you want to exit a SIMATIC server application (WinCC server, BATCH server, Route Control server) for whatever reason, you must make sure that the partner server is fully capable of taking over. In other words, all the applications running on the server must also run on the partner server and be ready for operation.

If the result of the application check is negative, a warning dialog is displayed when you exit a server application informing you that the partner server is not fully capable of taking over and you will be asked whether you really want a redundancy changeover to the partner server.

If you click "Yes", the server application will be exited even though the partner server is not ready to take over.

If you click "No", the dialog will be closed without any action being taken.

Automatic hot restart of SIMATIC server application

An automatic hot restart does not require any operator control. The process runs in the background. The BATCH server applications can be restarted automatically when a problem occurred. This does not affect redundancy.

The aim is to keep running in process mode at all times. If a SIMATIC server application changes to the error state and needs to be exited, make sure that it is restarted automatically.

The following requirements must be met before SIMATIC server applications will restart automatically:

- Requirements for installation: As of these versions, the restart mechanisms are included in the software packages to be installed.
  - SIMATIC PCS 7 V6.1 SP4 or higher
  - SIMATIC BATCH V6.1 SP3 HF18
- Requirements for configuration:
  - Automatic hot restart and isolation of the SIMATIC BATCH server are only supported in a redundant configuration.
  - All the mechanisms are available for the following redundant environments: Redundant WinCC server, redundant BATCH server, redundant Process Historian, redundant maintenance server and redundant Route Control server.
- Requirements in the operating system and project settings:
  - WinCC Autostart must be configured so that the next time the PC is started up, the corresponding project is opened and activated in the WinCC Explorer. The "AutoStart configuration" dialog is available from the Start menu with **Start > SIMATIC > WinCC > Autostart.**
  - In the BATCH Launch Coordinator, one of the two options "Start SIMATIC BATCH automatically after starting WinCC" or "Start SIMATIC BATCH automatically, independent of WinCC" must be activated.
  - If you also use SIMATIC Route Control, turn on the automatic activation in the shortcut menu of the Route Control server.

An automatic hot restart following a server application error, can run as follows:

- Initial situation: Server and partner server are ready for operation
- Error on the server
- Partner server becomes master
- The dialog for a restart is ready to start on the server.
- All network connections (terminal bus, plant bus, crossover connection) are terminated. The network adapters of this terminal bus and crossover connection are disabled. The server is isolated.
- After a dynamic time dependent on the system, the server automatically acknowledges the restart request with "OK" and is restarted.
- Once the server returns, the databases of the partner server and server are synchronized.

4.5.5.10 Failure behavior of the BATCH server in AS-based mode

Failure of the BATCH server

In AS-based mode, batches are processed in the CPU. If the BATCH server fails, any batches that have started are processed to the end if the BATCH server does not need to intervene in the recipe execution, for example for synchronization or due to an operator dialog. Otherwise, the individual units used in the control recipe continue to the next synchronization line and then wait for communication with the BATCH server.

The situation still remains that if there is a sudden failure of the SIMATIC BATCH standby PC (hardware defect, power failure, network connection to the database broken down), the BATCH server can no longer store the AS frames in the database of the standby PC (redundant storage for data backup/replication). The timeout time for recognizing the failure is set to 20 seconds for technical reasons. If more frames are generated in the AS within these 20 seconds than the internal AS buffer can store, the batches currently running on the AS change to the "Held" status. This default setting can be changed for specific units in the AS.

Additional information is available in the manual SIMATIC BATCH Blocks V9.0 SP1 > Interface blocks > BATCH Interface Blocks > UNIT_PLC > Command interface for influencing the entire unit.

Temporarily storing events in the AS in the buffer memory

If the communication from the AS to the BATCH server breaks down or the server itself fails, batch processing in the automation system continues until the next synchronization line or to the end of the batch. This is also the response in a redundant scenario during the failover phase and in the event of both BATCH servers failing. The corresponding events (the number depends on the size of the AS memory) are stored temporarily in the AS until they are fetched by the runtime component of the BATCH server.

When the buffer is full, the AS sends a message to the PCS 7 OS. You can use a parameter on the UNIT_PLC block to specify whether the control recipe should continue to run or whether the unit should switch to a previously defined state.

Additional information is available in the manual SIMATIC BATCH Blocks V9.0 SP1 > Interface Blocks > BATCH Interface Blocks > UNIT_PLC > Settings for communication monitoring and for the communication buffer.

4.6 Configuration limits

4.6.1 Definition of configuration limits

Definition

The quantity structure in SIMATIC BATCH describes the quantitative load on the process control system when executing batch processes.

Based on the quantity structure, you can calculate the number of automation systems for the planned process cell and select suitable dimensions for the SIMATIC BATCH server. This is intended to reduce the automation costs and to improve the quality, yield, safety, process cell utilization and productivity.

Quantity structure information can, however, only provide a rough guide for planning the components of a process cell. For example, batches with a short duration (minutes up to a few hours) with large numbers of setpoints can put significantly more load on a SIMATIC BATCH server or an automation system than batches with few setpoints and a duration of several days.

4.6.2 Structures of batch process cells

Process cell configuration with SIMATIC BATCH

One possible structure of a complex SIMATIC BATCH process cell is shown in the following figure.

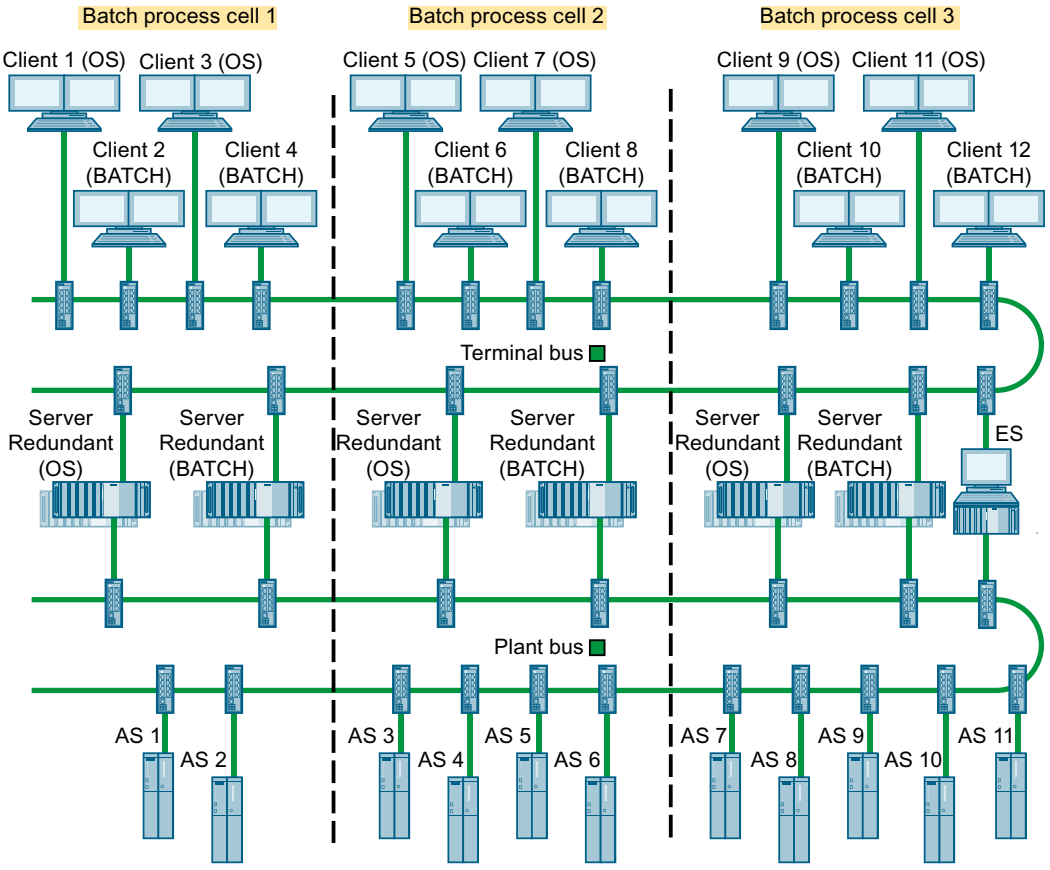


Figure 4-3 Process cell configuration

Operating batch process cells

The "Process cell configuration" figure shows that three batch process cells can exist completely independently of each other on one common terminal and plant bus. With very complex process engineering plants with an extremely large quantity structure a distribution over several batch process cells is necessary.

Process cell design

Important characteristic values for the dimensions of your batch process cell are as follows:

- Number of automation systems per batch process cell
- Number of clients per batch process cell

- Number of servers per batch process cell
- Number of batch process cells in a process control system
- Here, you need to take the performance specifications of SIMATIC PCS 7 into account.

Process cell design

The performance of a SIMATIC BATCH process cell depends on different factors.

Factors are, for example:

Static

- Recipe size
  - Number of TRPs (RUPs), ROPs (ROPs), RF (RPHs), parameters, transitions

Dynamic

- Batches
  - Step transition times
  - Loop runs
  - Tags/Trends
  - Alarms
  - Runtime
  - Operator inventions, print, print preview, close/archive batches
- Orders
  - Number of planned, released batches
  - Number of active batches
  - Number of closed, archived batches

Hardware configuration

- Server
  - Main memory configuration
  - Hard disk size
  - Hard disk type
    SSD or conventional
- Number of clients
- Number of ASes
- Number of OSes
- Connection of a Process Historian, MES/ERP system
- Network connection
  For example 10BASE-T, 100BASE-T, 1000BASE-T ... 40GBASE-T
- Storage location of the database
  Shared hard disk with system or own hard disk

- Size and fragmentation of the database
- SIMATIC BATCH server and WinCC Server on the same or on separate computers

Additional information

- Manual *Process Control System PCS 7, Engineering System, Connecting Network Nodes to Ethernet*
- Manual *Process Control System PCS 7; PCS 7 - PC Configuration*

4.6.3 Basics for calculating the performance of both operating modes

The data shown provides you with guide values that indicate which load states related to typical data or basic data can be reached in your BATCH process cell both in PC-based and AS-based mode and how you can select suitable dimensions for your process cell. This allows you to estimate overload situations in advance and to include these in your planning.

The measured results are shown in the following section "Measured results for calculating the performance of both modes".

Hardware and software basics

The following hardware and software was used:

- Automation system used CPU 417-4XT05-0AB0
- The PC used for the measurements is equipped with the hardware recommended by SIMATIC PCS 7
- In PC-based mode, the blocks relevant to SIMATIC BATCH are installed in OB32 (1 second cycle), recommendation from the section "Introduction" (Page 163)

Engineering data (equipment properties)

Number of units	50
Number of materials	100
Number of qualities per material	2

Recipe data

To calculate the performance data, a hierarchical recipe with the following characteristic data is used.

Configured recipe data in the BATCH Control Center:

Number of RUPs per RP	10
Number of ROPs per RUP	10
Number of RPHs per ROP	15
Number of RPHs in simultaneous branches	5

Number of transitions per ROP	15
Number of conditions per transition	5
Number of header parameters per recipe / formula	100 / 10
Number of parameters per RPH	15
Number of parameters per control strategy	10
Number of active RUPs per RP	3
Number of process tags per RUP	5
Number of process tags per ROP	3
Number of configured electronic signatures (ESIG) in an RP	3
Number of of active RPHs within a batch	3

Batch data

Number of planned batches	100
Number of batches per order	100
Number of batches to be created simultaneously	100
Number of released batches	100
Number of batches to be released simultaneously	100
Number of batches running simultaneously	100
Number of of active RPHs within a batch	3 PC-based 30 AS-based
Number of of active RPHs within a batch process cell	30 PC-based 350 AS-based
Number of opened batches (control recipes) on all BATCH clients	30
Number of batches to be completed simultaneously	50
Number of batches to be archived simultaneously	30
Number of batches to be deleted simultaneously	30
Number of active BATCH clients (BATCH Control Center)	5
Duration of the RPH	10 min
Duration of the transition	10 s
Acquisition cycle of the archive tags	10 s
Execution of step change	simultaneous

4.6.4 Measured results for calculating the performance of both operating modes

The measured values depend on the project, the equipment and load of the PC being used and can differ from the times shown here. The times were calculated with the hardware recommended by SIMATIC PCS 7.

Result, measured value (offline)

For the measured times, it is assumed that the step changes execute simultaneously and are not processed with a time offset. Simultaneous step changes mean maximum load.

Acquired data:

Action	Runtime
Creating a recipe / library	< 2 s
Deleting a recipe / library	< 4 s
Creating a formula	< 2 s
Deleting a formula	< 2 s
Creating a material	< 2 s
Deleting a material	< 2 s
Releasing for testing / production	< 90 s
Opening a recipe / library	< 4 s
Checking a recipe for validity / releasing	< 75 s
Creating an order	< 2 s
Creating a batch	< 20 s
Release batch	< 75 s

Result, measured value (online)

When processing the basic recipe described, a PC equipped with a size of the SIMATIC BATCH online database has a 30% processor load.

Definition of step change: A step change means that a recipe phase was completed, a transition run through and the following recipe phase was started. This means that at least 3 recipe objects are involved in a step change. In practice, however, there are often more than 3 recipe objects involved, for example in simultaneous branches, alternative branches or when there is synchronization. As an average value, approximately 5-7 recipe objects are assumed per step change.

Action	Runtime
Start batch	< 3 s
HOLD command	< 2 s!
RESUME after HOLD command	< 2
PAUSE command	< 2 s
RESUME after PAUSE command	< 2 s
Close batch	5 to 10 min
Archive batch	< 50 s
Change parameter	< 3 s
Step change time	4 s PC-based < 1 ms AS-based

Result of the AS runtimes for AS-based mode

The measured results shown in the following table serve as the basis for the calculations made below.

Recipe structure	AS runtime
Completing recipe phase (average measured value)	1.8 ms
Updating setpoint (average measured value)	0.07 ms
Processing a transition (average measured value)	4 ms
Starting recipe phase (average measured value)	1.9 ms
Processing a recipe phase (average measured value)	2 ms

These measured values result in a step change time of 8.4 ms (1.8 ms + 5 * 0.07 ms + 4 ms + 1.9 ms + 5 * 0.07 ms) for a recipe phase with 5 parameters. As a result, with, for example, 100 simultaneously active recipe phases and 32 simultaneous step changes, the recipe processing time can be calculated as follows:

Recipe processing time = 32 * 8.4 ms + 100 * 2 ms = 469 ms.

This calculation does not, however, apply to parallel branches, alternative branches or when there is synchronization since more than three recipe objects are then involved in a step change. 32 simultaneous step changes with such constructs would lead to a loss of performance.

A reduction in the number of simultaneous step changes increases the number of simultaneously active recipe phases and vice versa.

To guarantee optimum performance in the automation systems, remember the following:

- The calculated total cycle time (times for communication, firmware, recipe processing and user program) should always be shorter than the cycle time of the OB in which the UNIT_PLC and the user blocks are installed.
- Take into account all the CPU requirements relating to the cycle time (you should also refer to the documentation for the automation system S7-400 CPU Data).

Distributed over all the automation systems connected to the BCS, the BCS can:

- Have a brief peak load (max. 1 s) of up to 200 simultaneous step changes. In this case, a maximum of 200 recipe phases that do not execute a step change can also be active. To ensure that the BCS and AS continue to operate synchronized with each other following such peak loads, you must ensure a recovery time of that least 60 s.
- Be run in continuous operation with not significantly more than 350 simultaneous, active recipe phases. In this case, an average of 2 step changes may be active per second.

Result of the determination of memory requirements (data blocks) for AS-based mode

The following table shows the minimum memory requirements (data blocks) of the CPU for AS-based mode.

Memory allocations	Description	Memory requirements in KB
Static part. Occupied by system.	Communication (Event Send)	56
	Function blocks	60
	Function calls	41

Memory allocations	Description	Memory requirements in KB
Dynamic part. Occupied by settings in the BATCH configuration dialog.	per unit	57
	per recipe unit procedure (RUP)	128

Based on the recipe data from the section "Basics for calculating the performance of both modes", the actual memory requirements can be calculated as shown below.

Note

For this performance determination, the units must be configured within one automation system and the recipe unit procedures must all be active at the same time.

Sample calculation (AS-based mode only)

Memory allocations	Description	Memory requirements in KB
Static part. Occupied by system.	Communication (Event Send)	56
	Function blocks	60
	Function calls	41
Dynamic part. Occupied by settings in the BATCH configuration dialog.	10 units	570
	10 simultaneously running recipe unit procedures (RUP)	1280
Memory requirements	Total in KB:	2007

Based on this calculation, it can be seen that the AS requires at least 2007 KB of memory for the recipe logic. You set the memory required for the recipe logic as a percentage of the entire work memory in the BATCH configuration dialog for the CPU.

To determine the amount of required memory for a CPU, you need to add the standard BATCH blocks (SFC type, SFC, IEPH etc.) and the blocks for process control (drivers, actuators, sensors etc.).

Typical performance data for the two operating modes

The following quantity structure for AS-based mode represents a complex process cell.

Requirement for the AS: A recipe of the size shown below can be downloaded to and processed for the recipe logic assuming that the AS has a work memory capacity of 30 MB, 60% of which is being utilized.

Result: The following table specifies from a SIMATIC BATCH perspective how the automation system can be configured taking into account the conditions listed above.

Automation system (AS)	Number
Setpoints/parameters per RPH	48 setpoints/parameters per recipe phase with a maximum of 5 text string setpoints/parameters and a maximum of 32 characters per text string
RPHs per ROP	96 recipe phases and transitions (total quantity) per recipe operation (ROP)
ROPs per RUP	20 recipe operations (ROPs) per recipe unit procedure (RUP)
RUPs per AS	16 units per AS with 48 setpoints/parameters per recipe phase (RPH)

BATCH capacity limits	Number
Number of batches that can run simultaneously in a batch process cell	64
Number of recipe phases (RPH) that can run simultaneously in a batch	150
Number of recipe phases that can run simultaneously in a batch process cell	300

Regardless of the data listed in the table above, in each AS a maximum of 100 recipe objects, for example recipe operations, recipe phases and transitions, may change their status per second. In this case, the time taken for recipe processing accounts for approximately 60 to 70% of the maximum automation system cycle load.

We recommend that you do not process more than 300 active recipe phases on a BATCH server (nor a redundant server).

Note

Number of recipe phases running simultaneously

Depending on the frequency and how often step changes occur, the SIMATIC BATCH server can process significantly more than 300 active equipment phases/operations.

Report creation and archiving

SIMATIC BATCH can process data (XML archive file) up a maximum of 200 MB in a report. This applies only when using the XML format with SIMATIC BATCH version V7.0 or earlier. With SIMATIC BATCH V7.0 SP1 or later, this restriction no longer applies to reports due to the use of a new XML format.

This quantity of data is made up as follows:

- Size of the batch process cell (PCell)
- Number of recipe phases/recipe operations run through Also include multiple processing in loops.
- Number of recipe parameters
- Number of trends and the number of measured values per trend. Also take into account the duration of the recording and cycle time.

The following average data quantities can be used for an estimate:

- approx. 1.1 MB for 100 recipe phases
- approx. 0.5 MB for 100 recipe parameters
- approx. 0.05 MB for 1 trend with 300 measured values
- approx. 0.1 MB for 1 trend with 600 measured values

The situation could be critical with the following recipe constellations:

- Recipe phases run through large numbers of loops.
- Incorrect cycle times are configured for trend archives in WinCC.

The number of measured values is calculated from the duration of the trend divided by the acquisition cycle time (for example 6000 s runtime for the trend / 10 sec. cycle time = 600 measured values). The number of measured values for trends can be limited to approximately

1000 measured values that are adequate for a good overview. A maximum of 50000 measured values are possible per trend.

Note

A cycle time of 1 second and 24 hours runtime mean 86400 measured values.

A recipe with 1500 recipe phases would result in an archive data size of approximately 30 MB for approximately 6 hours runtime.

Exceeding the specified recommendations means that batch reports and possibly also the archiving of batches are no longer possible.

4.7 Security aspects

With the increasing networking of processes in automation, matters concerning all aspects of IT security are becoming more and more important. Consider all security aspects before commissioning the hardware and software. You will find information about this with the following link: www.siemens.com/pcs7-documentation (http://www.automation.siemens.com/mcms/industrial-automation-systems-simatic/en/manual-overview/tech-doc-pcs7/Pages/Default.aspx)

SIMATIC PCS 7 makes the following documentation available:

- **PCS 7 Compendium Part F - Industrial Security**
  This document presents the "Defense in Depth" security concept with example configurations.
- **SIMATIC PCS 7 Security Manuals**
  These documents contain important information on the following topics:
  - Security concept
  - Virus scanners

Note

Security aspects of SIMATIC BATCH

Shared directories, data, and archives must be continuously protected by suitable security mechanisms. Note this for the following functions, in particular:

- **Archiving batches** (Batches > Archiving > Archiving method (Page 805)
  If you are using one of the following methods for archiving, the storage locations of the archives must be protected:
  - "Directory"
  - "FTP server"
- **Protecting backup files** (Backup (Page 1052)/Restore) (Page 1052) and Export/Import (Page 354)
  You must protect these files (.sbx) because SIMATIC BATCH does not provide recognized protection mechanisms for these files at present. One possibility is to create access permissions for accessing the directory.
- **Printing in BatchCC/BATCH Recipe Editor in process mode**
  XPS/PDF printer drivers typically enable access to the operating system.
  If you want to prevent access to the operating system, the XPS/PDF printer drivers should not be available or selectable in print dialogs. Remove such devices or printers in the Windows Control Panel.
- **Settings for secure process mode**
  To prevent intervention in the operating system, you need to configure the user rights accordingly. Remove all rights that are not absolutely necessary for process mode.
  To prevent intervention in the operating system, you need to configure the user rights accordingly. Remove all rights that are not absolutely necessary for process mode.
  We recommend that you do not grant rights for the commands "Back up", "Export" and "Import" for process mode, as these commands could allow intervention in the operation system.
  The assignment of rights enables you to regulate all access in accordance with your own wishes and thus guarantee secure process mode.

SIMATIC BATCH system

To increase security, we recommend that you use the "NTLM" mode for communication of the SIMATIC BATCH system.

Additional information

- You will find information about the "NTLM" mode in the following section: Configuring the security settings on the SIMATIC BATCH server (Page 84).
- You will find information on the archiving method "SQL Server" in the sections:
  - Basic principles (Page 500)
  - Create SQL Server database (Page 501)
  - Setting up an SQL server (Page 503)
  - Batches > Archiving > Archiving method (Page 805)
  - User credentials (Page 918)

4.8 Configuring the security settings on the SIMATIC BATCH server

Security settings

You can increase the security of the communication of the SIMATIC BATCH system.

We recommend that you set the "NTLM" mode.

- The following applies for a new installation as of version V8.2:
  On completion of the setup, configure the "NTLM" mode manually on all servers involved.

  Note

  Configuration must be carried out once after installation.

- The following applies to updates of a version lower then V8.2:
  The system is automatically configured in the "Compatible" mode.
  To use the increased security, configure the "NTLM" mode manually for all servers involved.

Note

With a redundant server set the same mode on both servers.

Requirements for manual configuration

- In Windows a user account (login) incl. password has been created.
- The user is a member of the SIMATIC BATCH, SIMATIC HMI and a member of the administrators group.
- The user has the right "Login as service" (1).
- We recommend that you set the runtime of the password so that it never elapses.
- BATCH Runtime and the BATCH project are exited.

Procedure

1. Right-click on the symbol "BATCH Launch Coordinator" in the Windows taskbar.
2. Select the command "**Change security settings ...**".
3. Click on the "Yes" button. in the "User Account Control" dialog box.
4. Select the "NTLM (recommended)" option.

5. Enter the user name in the "Login" input box.
   - For the local user
     " \User name"

     Note

     Even if "dots" are shown in the input box for the password, you need to enter a valid password.

   - For the user of a domain
     "Domain\User name"
6. Enter the password in the input box.
7. Click on the "OK" button.
8. Select the command **BATCH Project > Start**.

Result

The SIMATIC BATCH server system uses the NTLM mode.

Note

If the password elapses, the user is disabled or deleted, the SIMATIC BATCH server system does not operate.

"Compatible" mode

If the "NTLM" mode does not work correctly, change the mode to "Compatible".

In this mode, the SIMATIC BATCH server system operates as in the past.

Additional information

You will find information on security aspects the section Security aspects (Page 82).

(1) You will find information on the right "Login as service" in the documentation of Windows.

4.9 Installation

4.9.1 Delivery type of SIMATIC BATCH

Program packages

SIMATIC BATCH is delivered in different program packages for engineering and process mode (Runtime). Within the setup of SIMATIC PCS 7, you choose the appropriate programs for installation depending on the intended use of the PC.

Note

Files installed by setup

All files that are installed with the setup of the product are required for fault-free function of the product.

The following commands, therefore, are not permitted for the files installed by the setup:

- Delete
- Replace
- Rename
- Move
- Edit

The following program packages are available for SIMATIC BATCH:

Table 4-1 BATCH program packages and their components

Intended use	Program package	Components	Licenses
PC as engineering Station (ES) with BATCH engineering.	BATCH engineering	• BATCH Base • BATCH Builder • BATCH Blocks • BATCH WinCC Client Options • BATCH WinCC Server Options • BATCH WinCC APL Client Options	Without license
PC as BATCH Single Station with all available BATCH components for engineering and runtime (WinCC and BATCH).	BATCH Single Station	• BATCH Base • BATCH Builder • BATCH Fast Objects • BATCH Client • BATCH server • BATCH Blocks • BATCH WinCC Client Options or BATCH WinCC APL Client Options • BATCH WinCC Server Options	• BATCH Server or BATCH Single Station System • BATCH Single Station User or BATCH Client and BATCH Recipe System • BATCH Unit
PC as classical BATCH Server with BATCH Runtime	BATCH server	• BATCH Base • BATCH server • BATCH Fast Objects	• BATCH Server or BATCH Single Station System • BATCH Unit
PC as OS Server with WinCC Runtime, BATCH Faceplates, and BATCH Communication Connector	OS Server for BATCH	• BATCH WinCC Server Options • BATCH WinCC Client Options or BATCH WinCC APL Client Options	Without license
PC as OS Client with BATCH Faceplates	OS Client for BATCH	• BATCH WinCC Client Options or BATCH WinCC APL Client Options	Without license
PC as classic BATCH Client	BATCH Client	• BATCH Base • BATCH Client	BATCH Single Station User or BATCH Client and BATCH Recipe System
Information server on which the SIMATIC BATCH reports are created	-	• Information Server - BATCH Options	Without license

You install the required SIMATIC BATCH software package on the appropriate PCs depending on the type of system you have. The accompanying license keys are required to use the BATCH software packages. The acquired license keys are managed with the Automation License Manager.

The SIMATIC BATCH COM API package is an optional package for SIMATIC BATCH. It provides you with an interface for accessing SIMATIC BATCH data and initiating actions with

function calls. If the license key is not available, you still have read access to the data. With the license key, you also have write access to the data.

Additional information

You will find additional information on licenses in the section "Licenses (Page 91)".

4.9.2 SIMATIC BATCH Basic

Licensing characteristics of SIMATIC BATCH Basic

SIMATIC BATCH Basic requires no separate installation. A BATCH client that checks the license keys on a BATCH server to distinguish SIMATIC BATCH and SIMATIC BATCH Basic. The scope of functions for BATCH clients depends on the license keys transferred to the BATCH server. BATCH clients are, for example, instances of BatchCC, BATCH OS controls or API clients.

If a BATCH server contains both the license key for SIMATIC BATCH and the license key for SIMATIC BATCH Basic, the higher license key is used with full functionality.

Functional scope of SIMATIC BATCH Basic

The following functions are not available or only available in restricted form in SIMATIC BATCH Basic:

- The "Libraries" and "Formulas" folders are not displayed in the project tree of BatchCC. The libraries and formulas can therefore not be used.
  If you import a system backup containing libraries or formulas, the two folders and the objects they contain are shown in BatchCC. In this case, the library or formula can be released, but not the recipe that uses the library or formula.
- No "Synchronization" tab in the properties dialog for recipe engineering. This means the connection to MES (MES_Sync_Request) cannot be configured or used.
- No "Transfer parameters" tab in the properties dialog for recipe engineering. This means the connection to SIMATIC Route Control cannot be configured or used.
- No release of recipes that contain command steps or monitoring objects. A list of errors preventing release is displayed for the plausibility check and and attention is drawn to insufficient licenses.
- No OSC. This means recipe structures cannot be changed in runtime.
- No electronic signatures (ESIG). This means that electronic signatures cannot be configured in the recipe engineering or subsequently used in batches.
- The use of the following extended recipe structure elements (extended SFC structures) is not possible:
  - Insertion of library references
  - Insertion of command steps
  - Insertion of monitoring

Display of the reduced range of functions in the user interfaces

If you license SIMATIC BATCH Basic, the functions described above are either not displayed in the interface menus and dialogs, or they are grayed out. In both cases, the functions are not available.

Handling of structural elements from recipes through restore and import

Recipes that you obtain through import or restore in BatchCC are subjected to a plausibility check. If these recipes contain elements such as "Monitoring", "Command step" or "Library reference", the plausibility test will fail because the contained recipe elements are not licensed. Save these recipes with a new name, remove the objects preventing release, and release the recipe once again.

4.9.3 Notes on installation

Important information in the readme files

When installing SIMATIC BATCH, the hardware and software requirements for SIMATIC PCS 7 apply.

The requirements for the installations are described in the file "SIMATIC BATCH readme (online)" and in the "PCS 7 readme (online)".

These files are only available as Internet download to always keep them up-to-date.

You can find the links to the files in the section "Preface (Page 27)".

Requirements

- Data backup
  Save your project data to a backup file.
- Compatibility
  SIMATIC BATCH may only be installed in the context of SIMATIC PCS 7, including service packs and updates.
  The SIMATIC BATCH version must be compatible with the SIMATIC PCS 7 version.
- Administrator rights
  SIMATIC BATCH can only be installed with administrator rights in the respective operating system.
  Users require the rights of the "Users" user group.
- BATCH shared folder "sbdata" with the share name "BATCH"
  When you reinstall SIMATIC BATCH, you specify the folder path to be used at the start of the installation. To locate the shared folder in Windows Explorer for editing, select the BATCH share in Computer Management under Shares and click "Open" in the shortcut menu.

Installation procedure

SIMATIC BATCH contains a setup program that installs the software automatically. Depending on the operating system configuration, the setup program starts automatically once the DVD is inserted in the drive. If this does not happen, you can start the setup program manually from the DVD.

The wizard started with the setup program guides you through the installation procedure step by step and, after querying the user data and required configuration, starts the actual installation process.

Access permissions for the operating system set by SIMATIC BATCH

After the installation, SIMATIC BATCH configures the local group "SIMATIC BATCH" in the Windows user and group management. The members of this group have full access to the SIMATIC BATCH shared folder "sbdata" . The user who installed SIMATIC BATCH and the local administrator are entered automatically in this group. Additional members of this group must be added manually by an administrator.

Additional information

You can find detailed information about the installation requirements of the PC stations for PCS 7 plants in the manual *Process Control System PCS 7; PCS 7 - PC Configuration*

4.9.4 Readme file with the latest information

Readme file

Note

Make sure that you read the latest information on SIMATIC BATCH in the SB readme file on the software DVD.

How to open the readme file:

- Double-click on the sb-readme.mht file on the DVD ROM
- During the product setup, click the "Readme" button in the right-hand pane for the "BATCH Base ..." component
- From the Start menu of Windows:
  In the **SIMATIC > Documentation > Readmes > Language selection** area.

4.9.5 Licenses

General information

SIMATIC BATCH is a licensed software product. To use it, you require licenses.

A license is issued as a right for the use of products. The representatives of this right are:

- CoL (Certificate of License)
  The CoL is proof of the license. The product may only be used by the license owner or authorized persons.
- License key
  The license key is the "technical representative" of the license ("electronic license stamp").

Software protected in this way may only be used if the Automation License Manager (ALM) finds installed license keys for the respective installed software package.

See the table below for SIMATIC BATCH client licensing. In ALM, you can configure which PC in the network should be searched for license keys.

SIMATIC BATCH server license keys must be located on the SIMATIC BATCH server concerned, as the employed SIMATIC BATCH software will search for them there. If the appropriate license keys are not detected, a dialog regularly appears informing you of the missing license keys, which is inconvenient while you are working.

The license keys required for SIMATIC BATCH can be found on the data storage medium provided.

To transfer the license keys from the data storage medium to the hard disk of the PG/PC concerned, use the "Automation License Manager" program.

Enter "**Automation License Manager**" in the search box of the Windows Start menu to open the program.

If you have followed the SIMATIC PCS 7 installation instructions, you will already have transferred the required license keys from the data storage medium to the hard disk of the corresponding PG/PC during the installation of SIMATIC PCS 7. If not, you can subsequently transfer the required license keys to the PCs at any time using the "Automation License Manager" program.

Use the "Automation License Manager" program to transfer the license keys from the PG/PC back to the data storage medium.

Transferring license keys

The number of individual license keys is recorded by a counter. When transferring a license key from the data storage medium to the hard disk of a PC, the counter on the data storage medium is decremented by 1. If the counter (number of licenses) reads "zero", no more license keys are available on the data storage medium.

You can find detailed information on handling licenses in the basic help of the SIMATIC Manager and in the Automation License Manager help.

Extending license keys

If you need a larger number of units due to the requirements of your project, you will need to use ALM to transfer a new, extended license key from the data storage medium to the respective PC. In SIMATIC BATCH, the license key for units is derived from the number of "UNIT_PLC" unit blocks used.

Installing license keys later

Restart your PC.

After the restart, install the license keys with the help of the "Automation License Manager" program.

If BATCH license keys are added later to a BATCH client on which BatchCC has already been started, BatchCC needs to be restarted. Only then will the new license keys be used.

Maximum distribution of SIMATIC BATCH software for use with all option packages

Depending on the use of a PC, e.g. as a BATCH server (BATCH master server, BATCH standby server) or BATCH client, different license keys are required on the relevant PC.

SIMATIC BATCH offers license keys for the following intended uses:

Intended use	License key/product	Version	Note
SIMATIC BATCH server	BATCH server	V9.0	This license is required on a BATCH server PC. In the case of a redundant configuration, this license is required on both BATCH server PCs. If this license is available on a BATCH server, it offers a connected BATCH client the full range of functions in BatchCC.
	BATCH Basic	V9.0	This license is required on a BATCH server PC. In the case of a redundant configuration, this license is required on both BATCH server PCs. If this license is available on a BATCH server, it offers a connected BATCH client a limited range of functions in BatchCC.
	BATCH 1 Unit	-	This license is required on BATCH server PCs. In the case of a redundant configuration, this license is required on both BATCH server PCs. The number 1 indicates the number of possible, configurable units.
	BATCH 10 Units	-	This license is required on BATCH server PCs. In the case of a redundant configuration, this license is required on both BATCH server PCs. The number 10 indicates the number of possible, configurable units.
	BATCH 50 Units	-	This license is required on BATCH server PCs. In the case of a redundant configuration, this license is required on both BATCH server PCs. The number 50 indicates the number of possible, configurable units.
	BATCH Expansion (500MB)	V9.0	This license is required on a BATCH server PC as soon as more than 1500 GB is needed for processing batches. For a redundant configuration, this license is required on both BATCH server PCs. A license expands the available work memory by 500 MB. Install the corresponding number of licenses if you want to expand the work memory by more than 500 MB. The license values are added up. In the case of a redundant configuration, this license is required on both BATCH server PCs. Caution: When the licensed memory capacity is reached, no batches can be released and released batches cannot be started. Running batches are not affected.
	BATCH Web Client	-	This license is required on a BATCH server PC. In the case of a redundant configuration, this license is required on both BATCH server PCs. This license entitles you to monitor and operate SIMATIC BATCH on a Web Client via SIMATIC BATCH OS controls. The number of BATCH Web clients is determined by the license. Licenses are available for 1 BATCH Web client and 5 BATCH Web clients.
	BATCH API	V9.0	This license is required on BATCH server PCs. In the case of a redundant configuration, this license is required

Intended use	License key/product	Version	Note
			on both BATCH server PCs. The license authorizes you to use the Application Programming Interface.
	Upgrade package BATCH server	V9.0	Entitles you to install the latest updates of SIMATIC BATCH on a BATCH server.
	BATCH Single Station System	V9.0	This is a license bundle, containing the following individual licenses: BATCH Server.
SIMATIC BATCH Client	BATCH Client	V9.0	This license is required on each PC on which BatchCC is to be installed and used, regardless of whether this is a BATCH server or a BATCH client. Any number of BatchCC and BATCH OS Control instances can be started and operated on this PC.
	BATCH Recipe System	V9.0	This license is required on each PC on which recipe engineering is to be performed, regardless of whether this is a BATCH server or a BATCH client.
	Upgrade package BATCH Client	V9.0	Entitles you to install the latest updates of SIMATIC BATCH on a BATCH client.
	BATCH Single Station User	V9.0	This is a license bundle, containing the following individual licenses: BATCH Client and BATCH Recipe Editor.

SB server products: You must have a BATCH UNIT license key on a SIMATIC BATCH server. Depending on the number of configured units in your BATCH process cell, it may be necessary to transfer additional UNIT license keys. UNIT license keys can be summed or counted here. Example: With a BATCH 10 UNITs and a BATCH 50 UNITs, you can operate a BATCH process cell with 60 units.

SB client products: The SIMATIC BATCH client license keys are searched for both locally on a specified PC and on a PC specified in the network. The method of searching for license keys in the network must be configured in the Automation License Manager.

SIMATIC BATCH server license keys, such as BATCH UNIT license keys, are searched for on the SB server. The message about missing license keys is, however, output on a SIMATIC BATCH client.

Note

BATCH engineering: The number of units is the sum of the "UNIT_PLC" BATCH interface blocks. The number of configured and used units is displayed in the log that can be opened from the BATCH configuration dialog.

Note

Missing license keys

If neither trial licenses nor BATCH licenses are detected on BATCH PCs, all the actions you want to perform on BATCH clients are prohibited, except for the operation of batches that are already active. You can continue to operate, complete, and archive active batches.

Additional information

- Display number of units (Page 216)
- Manual *Process Control System PCS 7; PCS 7 - PC Configuration*
- Manual *Process Control System PCS 7; Licenses and configuration limits*
- Manual *SIMATIC; Automation License Manager*

4.9.6 Installing the components of SIMATIC BATCH

Installation

You start the SIMATIC BATCH installation programs during the SIMATIC PCS 7 system setup. On-screen prompts guide you step by step through the entire installation. The SIMATIC PCS 7 system setup is started with the normal Windows procedure for installing software.

Note

Make sure that you read the information on installing SIMATIC BATCH in the *SB-readme* file. The readme file is on the same DVD as SIMATIC BATCH. You will find detailed information on installing and configuring the PC stations for SIMATIC PCS 7 process cells in the manual *Process Control System PCS 7; PCS 7 - PC Configuration*.

Installation options for the software components

The installation program of SIMATIC BATCH guides you through the installation.

Note that with a multiple station system, the installation program must be run on every client/ server PC.

At the start of the installation, the following software components are available for selection:

- BATCH Base (basic software, API; does not need to be selected as it is installed automatically)
- BATCH Builder (BATCH engineering)
- BATCH Client (Batch Control Center, BATCH Recipe Editor)
- BATCH Fastobjects (for database server)
- BATCH server (BATCH control server, batch data management)
- BATCH WinCC Client Options or BATCH WinCC APL Client Options (block icons and faceplates in classic or APL design, BATCH OS controls, and BATCH online help)
- BATCH WinCC Server Options (block icons and faceplates in classic or APL design)
- BATCH blocks (SIMATIC BATCH blocks)
- Information Server BATCH Options (templates for batch reports on an Information Server)

All components are installed automatically. At the end of the installation, you will be asked for the path where you want to create the BATCH shared folder (database folder) "sbdata". The

location suggested as standard will vary depending on the operating system. You can also specify your own folder path. Note that, depending on the operating system, it may be a hidden folder that you only make visible by changing certain folder options.

You can find the folder path to the BATCH shared folder as follows: Open the "Shares" folder in Computer Management under System > Shared Folders > Shares. The shared folder name is "BATCH" and the folder path is also displayed.

BATCH BUILDER (BATCH Engineering)

Note

BATCH engineering is only installed if SIMATIC PCS 7 (SIMATIC Manager) has already been installed on the ES PC. It is possible to install only BATCH engineering on an ES PC without client or server functionality. This installation is perfectly adequate for configuring batch objects and their distribution. The BATCH blocks must be installed separately, if required.

BATCH WinCC Client Options or BATCH WinCC APL Client Options

BATCH faceplates and block icons are supplied in two variants:

- In the standard classic "BATCH WinCC Client Options" form
- In the style of the Advanced Process Library "BATCH WinCC APL Client Options"

Note

Installation of Client Options

Only one selection is possible during installation.

If one variant is already installed, SIMATIC BATCH setup only offers an update for this variant. However, you can convert to the other variant at any time after you have uninstalled the previous variant. Make sure that the same variant of the "BATCH WinCC Options" is installed and used throughout the entire system (ES, OS server, OS clients).

The following steps are crucial for automatic update to the new picture objects in APL style:

- Installation of the "BATCH WinCC APL Client Options" component
- Plant Hierarchy - Create / update block icons or compile the OS with the "Picture Tree" option.

  Note

  Manually update process pictures which do not include automatically created and interconnected picture objects. Picture objects which you have copied manually from the "@PCS7Typicals_Batch.pdl" file and pasted into your process pictures are deleted.

- Running the OS Project Editor in WinCC.

Note

Web plugins

A special web plugin is available for both variants of the WinCC Client Options. Depending on your selection, the corresponding web plugin is installed on a web server using the following path:

<Path(1)>\Siemens\webplugins

The Web Configurator copies the installed web plugin to the following path:

<Path(1)>\Siemens\WinCC\Webnavigator\Server\Web\install\custom

A web client receives its plugin from this path.

If you select a variant change of the faceplates, the corresponding web plugin is deleted in the following path:

<Path(1)>\Siemens\webplugins

However, the Web Configurator does not delete the corresponding web plugin under <Path(1)> \Siemens\WINCC\Webnavigator\Server\Web\install\custom. Both web plugins can then be installed on the web client which can result in errors.

There are several options to prevent that an incorrect web plugin in installed on a web client:

- Always install the currently used web plugin on the web client in the end
- Only install the currently used web plugin on new web clients
- Delete the previous web plugin manually in the following path <Path(1)>\Siemens\WINCC \Webnavigator\Server\Web\install\custom

(1) Depending on the operating system installed

Uninstalling

Note

If you remove SIMATIC BATCH, you must always do this before removing the plant hierarchy (SIMATIC PH).

Installation in a redundant system

Note

A few particular requirements must be observed in a redundant PCS 7 system. A detailed description of the installation can be found in section "Redundancy (Page 58)".

4.10 Plant update

Introduction

The following section describes the basic procedure for a plant update.

Read the information in the "PCS 7 Readme" file before beginning the system update.

A plant update includes:

- Replacement of existing hardware, such as PC, AS memory, network adapters
- If applicable, the installation of new operating systems, such as Windows 7 Ultimate / Enterprise SP1 (64-bit) and Windows Server 2012 R2 Update Standard Edition (64-bit)
- Installation or reinstallation of SIMATIC PCS 7 with SIMATIC BATCH = software update. For the update, there are two possible options:
  - With use of new functions
  - Without use of new functions
- Update of PCS 7 project with SIMATIC BATCH = project update

Notes

- It is possible to use a "PC image" for the supported operating systems.
- If you select a 64-bit operating system, you may need to replace existing CP1613 A1 type communications processors with a new CP1613 A2 for BATCH servers, BATCH clients and the ES.
- If you use the "AS-based" mode, it may be necessary to expand the memory of your automation systems.
- Software update
  Please note the following when updating the software of a SIMATIC BATCH server from V8.x to V9.0 SP1:
  If the server security setting for a SIMATIC BATCH server V8.x is set to "NTLM" or "Compatible" mode, you have to make the server security settings again after updating the software to V9.0 SP1. This step is essential for starting the SIMATIC BATCH server.
  You can find information on security settings in section "Configuring the security settings on the SIMATIC BATCH server (Page 84)".
- New installation of a SIMATIC BATCH server
  Configure the security settings on the SIMATIC BATCH server before you start the SIMATIC BATCH system.
  You can find information on security settings in section "Configuring the security settings on the SIMATIC BATCH server (Page 84)".
- As of SIMATIC BATCH V7.0, enumerations are supported for the BOOL data type. If you use this type, now it will be interpreted as ENUM and no longer as BOOL. This results in a type change during generation, which means that the plausibility check will mark the release of such recipe objects as invalid when you update the plant in BatchCC. If you want to use recipe parameters of the Enumeration data type in master recipes, configure the ENUM data type instead of BOOL in the PCS 7 engineering.

- If you have configured a redundancy status display of the SIMATIC BATCH server in a process picture on a WinCC client in a previous version of SIMATIC BATCH, it must be removed in order to update the system to SIMATIC BATCH V9.0 SP1. Instead, use the icons in the status bar of BatchCC to display and check the status of the BATCH server.
- Report templates on an Information Server
  Install report templates only from a SIMATIC BATCH version x to version x+n. Otherwise, the report templates of the newer version are deleted.

Software update

You can update PCS 7 projects of the following SIMATIC BATCH versions to SIMATIC BATCH V9.0 SP1:

- **SB AS based**
  - SB AS based V6.1 (incl. SPs and HFs) (only with Siemens Support)
  - SB AS based V7.0 (incl. SPs and HFs)
- **SB**
  - SB V6.0 (up to SP3 and HFs) via SB V6.0 SP4 via SB V6.1 SP3
  - SB 7.0 (incl. SPs and HFs)
  - SB 7.1 (incl. SPs and HFs)
  - SB V8.0 (incl. SPs and UPDs)
  - SB V8.1 (incl. SPs and UPDs)
  - SB V8.2 (incl. SPs and UPDs)
  - SB V9.0

Special notes

If the software was updated from one of the following versions as of V8.0, the SB data can only be updated using Restore (in the BCC).

- SB V6.0 (up to SP4 including HFs)
- SB V6.1 (incl. SP3 and HFs)
- SB V7.0 (incl. SP1 and HFs)
- SB V7.1 (incl. SP1 and HFs)
- SB V7.1 (incl. SP2 and HFs)

Preparations for a software update

1. Archive closed batches in the BATCH Control Center.
2. Create a backup of your BATCH process cell in the BATCH Control Center.
3. Archive your PCS 7 project in the SIMATIC Manager.
4. If necessary, replace existing hardware, such as PC, AS memory, network adapters.

5. Select the recommended Windows operating systems for the PCs of your process cell configuration (SB servers, SB clients).
6. Install the operating system.
   You can use images that have already been created.

Software update (standard)

1. Update the software on the engineering station (ES).
2. Update the software on the SB server computer.
3. Update the software on the SB client computer.
4. After a successful update and reboot of the computer, start your SB system.

Note

Since on a single station system, the SB server and the SB clients are installed on one computer, a software update is only required once.

Software update during operation (SUIR)

To keep the process continuously controllable during a software update, a redundant SB server is required.

Note the following order during the procedure:

1. Update the software on the engineering station (ES).
2. Update at least one SB client and the SB standby server.
3. Start the updated SB client and the SB standby server after successful updating and rebooting the computers.
4. Check the status of the SB server.
   The SB server data on the standby server are compared completely with the master server when the standby server reports the status "Listening".
   You can check the status of the SIMATIC BATCH server using the symbol of the BATCH start coordinator or using the shortcut menu command "BATCH status...".
5. Check the corresponding WinCC status messages in the Alarm Logging "CDV on BATCH server "server name": CDV is ready for operation".
   The message is only displayed when no PH is configured.
   The SB standby server is ready to take over when the WinCC status message is displayed.
6. Shut down the SB master server.
   This produces a redundancy failover.
   The updated SB standby server becomes the SB master server.
7. Update the previous SB master server and all clients that have not yet been updated.
8. After a successful update and reboot of the computers, start the previous SB master server and the SB clients.
   The previous SB master server is now the SB standby server.

9. Check the status of the SB server.
   The SB server data on the standby server are compared completely with the master server when the standby server reports the status "Listening".
   You can check the status of the SIMATIC BATCH server using the symbol of the BATCH start coordinator or using the shortcut menu command "BATCH status...".
10. Check the corresponding WinCC status message in the Alarm Logging "CDV on BATCH server "server name": CDV is ready for operation".
    The message is only displayed when no PH is configured.
11. The update of the redundant SB system is now complete.

Note

Older versions cannot be upgraded to version SB V9.0 SP1 during operation.

Note the paragraph "Software update in Runtime (SUIR)" in the section "Notes".

Procedure after a software update

1. License all the PCS 7 software components used on all PCs in the Automation License Manager.
2. Retrieve your PCS 7 project in the SIMATIC Manager.
3. In HW Config, configure new hardware components, for example, a new communications processor.
4. Open all the current block libraries and update the blocks used in your PCS 7 project with the command **Options > Charts > Update block types**.
5. If you use the "AS-based" mode, the "IUNIT_BLOCK" block from older SIMATIC BATCH versions must be replaced in all CFC charts by the extended block, "UNIT_PLC". To do this, drag it directly from the SIMATIC BATCH library to the corresponding CFCs and interconnect it again if necessary.
6. Update the "UNIT_PLC" block in the CFC editor under **Options > Block types... > New version ...**. This transfers the block from the chart folder to the block folder, "Offline".
7. Compile and download the CFC charts to the automation system.
8. Compile all PCS 7 operator stations (server, clients). Then, open each individual PCS 7 OS station within your PCS 7 project on the ES and run the OS project editor. When the WinCC Explorer is closed for each PCS 7 OS, download the current data to the appropriate destination stations.

9. Perform the following configurations in the BATCH configuration dialog:
   - If you use the "AS-based" mode, specify the current memory configuration and select the percent to be allocated to the recipe logic in the AS.
   - Generate and propagate batch types
   - Compile and merge BATCH instances
   - Adapt and update settings, if necessary
   - Transfer BATCH messages to the relevant PCS 7 OS
   - Download BATCH server. You may be notified about other actions that need to be performed. Process cell data can only be downloaded to the BATCH server after performing the remaining actions.
10. Start process mode on all servers (OS, BATCH).
11. Perform a restore on a BATCH client and update the process cell data in BatchCC.

4.11 Time-of-day synchronization

Time-of-day synchronization of all components involved

PCS 7 time-of-day synchronization must be planned, configured and used with SIMATIC BATCH.

The time on the AS serves as the basis for the time stamping of recipe element status transitions. This time must be synchronized with the time of the PCS 7 OS server and the clients so that entries in the BATCH reports and message list can be put into correct chronological order.

Additional information

- Set time of day (Page 515)
- Additional information can be found on the Siemens Industry Online Support page by entering the manual title: *PCS 7 Time Synchronization*

4.12 System properties

System properties

Note the following system properties for your configuration:

- Batches that use flat recipes cannot be executed in AS-based mode.
- Visualization and operator control of batches with flat recipes is not supported in the BATCH OS controls.
- The interface blocks from SIMATIC BATCH V4.x contained in your project can continue to be used in SIMATIC BATCH. A reconfiguration is not possible, however.
- Valid only for recipe unit procedures (RUPs) executed in AS-based mode: Character strings containing more than 32 characters are truncated. Example: STRING values within transition conditions. At the start of the batch, a recipe conversion takes place in which character strings exceeding 32 characters are truncated.
- Number formats: When numbers are entered, displayed, and used further within SIMATIC BATCH, a comma is converted to a period. This means that a period is used as the decimal separator. A thousand separator is not used or displayed.
- In batch logs, process values are always output for the configured control strategy in the master recipe. If there is a control strategy discrepancy between SIMATIC BATCH and the function or operation type (EPH/EOP), the process values for the parameters are not fully logged.

Monitoring of free disk space on the BATCH server

The system monitors the free disk space on the BATCH server. You set the values for monitoring in the "Warning messages and errors" project settings.

You can find additional information in the section "Warning/Error (Page 792)".

Monitoring the currently used work memory on the BATCH server

The system monitors the currently used work memory on the Batch server at the start of specific actions.

Special actions include:

- Release a batch
- Start a batch

If more than 80% of the work memory is used, a message window is displayed in BatchCC and in the OS controls and a message is entered in the message system.

New batches cannot be started until enough memory is available.

Impermissible characters

The naming convention SIMATIC Manager prohibits the following characters: " / \ [ ] : | < > + ; , ? " * = . ! @ { } space

The names "EPH", "EOP", "UNIT", and "UNIT_PLC" are key words. Please do not use these names for name assignment of an SFC type in SIMATIC Manager. In addition, the following characters are not permitted when assigning names (name of the control strategy): Special characters except underscore and space

When the name of the control strategy is changed, for example, from "CONTSTRAT1" to "contstrat1" in the characteristics dialog for SFC types, this change to the control strategy name is not applied after the generation of the batch types.

The following characters are not permitted when assigning names of WinCC projects: . , ; : ! ? " ' + = / \ @ * % [ ] { } < > space

The following characters are not permitted in AS/OS connection names: . : ? " ' \ * % space

The following characters are not permitted when assigning names of hierarchy folders: . " ' / \ %

The following characters are not permitted in global declarations (enumerations): Space " % . ' \ ? * : @

Note

Also note the extensive information in the online help of PCS 7 OS (WinCC Information System). Search there for "impermissible characters". We recommend that you never use special characters when configuring in the SIMATIC Manager. The only exception is the special character [_] (underscore).

Rules for entering floating-point values

Rules for entering floating-point values have been set to ensure uniform input, display, conversion, calculation and recalculation of floating point values in the SIMATIC Batch products.

The following table lists the rules on:

Rule	Explanation
1	Value range Unsigned with a maximum of 9 digits before and a maximum of 6 digits after the decimal point
2	Before and after the decimal point The value should be entered with one digit before and one point after the decimal point. Entered as the first character of the decimal point, shown as "0" before the decimal after exiting of the input field. Entered as the last character of the decimal point, shown as "0" after the decimal after exiting of the input field.
3	Invalid value entered The value is displayed in red.
4	Invalid value applied If an invalid value is entered, a message window appears when you confirm the entry with the "OK" button.

Rule	Explanation
5	BatchCC/RCE If the source of a value in an editable field shows a value that is not within the range of values, it is displayed in red. This value cannot be stored in the system, even if the system only accesses it. The value must be changed to a valid value before the value can be confirmed with the "OK" button. Click the "Cancel" button if the value should not be changed.
	OS controls If an invalid value is entered in a line, the line cannot be saved.
6	Exponential format The input is not supported. The display of these values is possible if, for example, other areas of PCS 7 (Faceplates, AS, CFC...) deliver these values.

4.13 BATCH server: Work memory and license key "BATCH Expansion (500MB)"

A SIMATIC BATCH server allows use of 1500 MB of work memory without additional license keys.

License key "BATCH Expansion (500MB)"

A license key "BATCH Expansion (500MB)" expands the available work memory by 500 MB. Install the corresponding number of licenses if you want to expand the available work memory by more than 500 MB. The license values are added up.

Note

Due to the enhanced performance of the BATCH server, the basic work memory required (even for small configuration limits) may increase by up to 50 % compared to previous versions.

Check the available work memory on the BATCH servers prior to an upgrade. If necessary, expand the available work memory.

Contact Customer Support if you need specific support and information for the expansion.

How is the used work memory calculated?

The SIMATIC BATCH system only takes into account the work memory that is directly assigned to batch processing.

Other information, such as process cell data, is not included in the calculation.

The information provided by the Windows operating system (Task Manager, Performance Monitor, etc.) does not reflect the calculated work memory directly.

To display the calculated work memory, use the "SIMATIC BATCH/Expansion License memory usage in MB" performance indicator in the Windows tool "Performance Monitor".

Checking the licensed work memory

When a batch is released or started, the system checks the work memory in use. In addition, the available work memory is checked regularly.

If less than 200 MB of licensed work memory is available, a message is generated in the PCS 7 OS message system; it is also signaled in BatchCC and in the OS controls.

Behavior with missing license key

- **BatchCC and OS controls**
  If the work memory used exceeds the licensed work memory, the command "Start batch" or "Release batch" is rejected and chained batches or batches configured for automatic start are no longer started.

  Note

  A message is generated in the PCS 7 OS message system. Running batches are not affected.

  Once sufficient work memory is available again, you can start and release batches again.

- **SIMATIC BATCH API**
  When the work memory used exceeds the licensed work memory, the commands "Start" and "Release" are no longer executed by the SIMATIC BATCH API and rejected.

Additional information

System properties (Page 105)

4.14 Using online help

4.14.1 Using help

Introduction

Information on SIMATIC BATCH is described centrally in the SIMATIC BATCH online help.

Contents

For configuration the SIMATIC BATCH online help offers access at any time to the complete documentation, which consists of the following components:

- Online help
- Release notes with important up-to-date information on SIMATIC BATCH
- SIMATIC BATCH installation instructions

Open SIMATIC BATCH help

- In the BATCH Control Center or in the recipe editor open the SIMATIC BATCH online help via the "Help Topics" menu item in the "Help" menu. Alternatively you can open the SIMATIC BATCH online help via the <F1> button.
- If you are using the SIMATIC Manager, open the SIMATIC BATCH online help by selecting an object in any view and then selecting "SIMATIC BATCH" in the context menu. In the BATCH configuration dialog "Configure batch process cell..." click on help.

4.14.2 Search

Searching in the online help

Introduction

The "Search" tab offers various options for configuring your search for maximum effectiveness.

Expanding a search

To search for a complex term, use "*" as a wildcard. The asterisk stands for any character in any quantity

- Example: Searching for "*alarms" locates all topics containing the following words: "Alarms," "system alarms" "analog alarms" and "discrete alarms".

Note

In addition to the "*", the search item must contain at least one other non-wildcard character.

If you do not know the exact spelling of a term or you are searching for a series of terms, use "?" as a wildcard. The question mark stands for any single character at this position.

- Example: Searching for "T?p?" locates all topics containing the following words: "Type", "Tips", but not "Types".

Full-text search

To perform a full-text search, use quotation marks.

- Example: The "configuring graphic" search string returns all topics containing these words.

Search with Boolean expressions

You can perform a search with a logic operation by linking the search strings with the Boolean operators AND, OR, NEAR or NOT. Click the arrow next to "Enter search strings".

- Example: The search string "graphic" AND "configuring" returns all topics containing the word "graphic" and the word "configuring".
- Example: The search string "graphic" OR "configuring" returns all topics containing either the word "graphic" or the word "configuring," or both.
- Example: The search string "graphic" NOT "function key" returns all topics containing the word "graphic" but not the term "function key".
- Example: The search string "graphic" NEAR "configuring" returns all topics containing the word "graphic" and, within the next eight words, the word "configuring," or vice versa.

Note

When a search string contains one of the words AND, OR, NEAR, or NOT, the search item is interpreted as a Boolean expression. To nest a Boolean expression, use parentheses. Example: ("Graphic" AND "configuring") OR ("Graphic" NOT "function key").

Search for similar words

To search for words with similar spelling, enable "Search for similar words".

- Example: When "Search for similar words" is enabled, the search string "Mayor" returns all topics containing the words "Mayer," "Moyer," and "Meyor".

Search in titles

To restrict the search for the search string to topic headers, enable "Search in titles only".

Search in search results

To restrict the search to those topics returned by the last search, enable "Search previous results". This sets a closer range of topics found.

Note

To search across all topics again, disable "Search previous results".

Sorting search results

To sort the topics found in alphabetical order, click "Title" or "Position". The topics are sorted in alphabetical order according to their title or position. The parent chapter associated with the topic found is indicated under "Position".

Reusing a search

In order to reuse one of the recent search strings, click the 'Enter search strings" arrow. Select a search string from the recent list, then click "Show topics".

Note

A search string is added to the recent list only if at least one topic was found containing the search string.

Highlighting search strings

In the view of a topic found, all instances of the search string are highlighted.

Note

Click the "Options" toolbar button to enable or disable highlighting of search strings.

Search within the topic

To search for terms within a topic, press <Ctrl+F>. You can search for whole words only, define the search direction, or case-sensitive. When "Whole words only" is disabled, the search string "Process" returns the term "ProcessValue" also. When "Whole words only" is enabled, only the word "process" is found.

4.14.3 Navigation

SIMATIC BATCH online help

To access a chapter, click on one of the main topics in the navigation window. The subordinate topics are shown in the right side of the display window.

SIMATIC BATCH online help toolbar

Symbol	Brief description	Availability
	Hides the navigation area containing the tabs. In this case the SIMATIC BATCH online help requires less space on the screen.	The navigation area is shown.
	Shows the navigation area containing the tabs.	The navigation area is hidden.
	Navigates to the recently opened topic.	This is not the first topic shown.
	Navigates to the next topic in a recent list of topics.	The topic is not the last in the list of recent topics.

Note

Icons labels are shown in the operating system language.

Tabs in the navigation area

The SIMATIC BATCH online help in the navigation area has multiple tabs. You access the online help topics differently in each tab.

Tab	Meaning
Contents	In the table of contents you have direct access to every topic of the SIMATIC BATCH online help.
Index You can also open the "Index" tab directly in SIMATIC BATCH in the "Help" menu via the "Index" command.	Use keywords to find specific topics in the index. The string entered must match one of the keywords in the index. A keyword is assigned one or several topics. To display one of the topics found click on the "Display" button. You can also open a displayed topic by double-clicking it. To display the structure of the content of the displayed topic, click the "Contents" tab.
Searching You can also open the "Search" tab directly in SIMATIC BATCH in the "Help" menu via the "Search" command.	A search item is used to conduct a full-text search for topics. Click on the "Show topics" button. Topics containing the search item in the header or text are located. To display one of the topics found click on the "Display" button. You can also open a displayed topic by double-clicking it. To display the structure of the content of the displayed topic, click the "Contents" tab.

"Contents" tab

Topics are organized into sections and subsections in the table of contents.

The buttons in the "Contents" tab have the following meaning:

Symbol	Meaning
	Click the icon to display the subsections and topics included in this section. The topic is displayed unchanged in the topic area.
	Click the icon to hide the subsections and topics included in this section. The topic is displayed unchanged in the topic area.
	Click the icon to display the overview for this section. Double-click the icon to display the overview for this section and, simultaneously, the subsections and topics included in this section. Select the "Open all" command in the shortcut menu for this icon to display the overview for this section and, simultaneously, all subsections and topics of the table of contents. Navigate to subsections and topics of this section in the overview in the topic area.
	Click the icon to display the overview for this section. Double-click the icon to display the overview for this section and, simultaneously, to hide the subsections and topics included in this section. Select the "Close all" command in the shortcut menu for this button to display the overview for this section and, simultaneously, to hide all subsections and topics of the table of contents. Navigate to subsections and topics of this section in the overview in the topic area.
	This is a "Basics" topic.
	This is an "Example" topic.
	This is an "Operating instruction" topic.

"Search" tab

The other search options are described in the "Search" section.

Navigation bar in the display window

The SIMATIC BATCH online help has a navigation bar that is located at the top of the display window. The navigation bar provides links to other topics. The links are organized by link type. If you move the cursor to a link type, a list of additional links is displayed. Clicking a link brings you to the required information.

Note

A link type is not available in the navigation bar if no links of that type exist for the displayed topic.

Link type	Meaning
In the section	Links to headers of the displayed topic.
Instructions Color:	Links to handling instructions. Subjects that are classified as Operating instruction, whose title bars are shown in light brown in the display window.
Examples Color:	Links to examples. Subjects that are classified as Example, whose title bars are shown in light green in the display window.
Basic principles Color:	See also links to background information e.g. definitions, details, GUI. Subjects that are classified as Basics, whose title bars are shown in light blue in the display window.
Events	Events of previously viewed links.
Options > Start	This calls the main help page.
Options > Back	Navigates to the recently opened topic.
Options > Next	Navigates to the next topic in a recent list of topics.
Options > Glossary	Opens the help glossary.

Navigating with the keyboard

Instead of the mouse, use the keyboard to navigate.

Operation	Function
<Right>	Displays in the table of contents the subsections and topics included in the section.
<Left>	Hides in the table of contents the subsections and topics included in the section.
<Up>	Moves one row up in the table of contents.
<Down>	Moves one row down in the table of contents.
<Page up>	Scrolls upwards in the table of contents.
<Page down>	Scrolls downwards in the table of contents.
<Enter> or <Input>	Open or close the selected chapter

Technological basics complying with ISA-88.01

5

5.1 Which standards is SIMATIC BATCH based on?

Standards

SIMATIC BATCH was developed on the basis of the ISA-88 (1995) Batch Control, Part 1: Models and Terminology standard.

Use of SFC

In the "Technical Report" ISA-TR88.0.03-1996, the use of SFC (Sequential Function Charts, DIN/IEC 1131) as a graphic language for describing recipe procedures is also recommended. The creation of recipes with the BATCH Recipe Editor follows the structures and functions described in this standard.

5.2 Introduction of technological terms

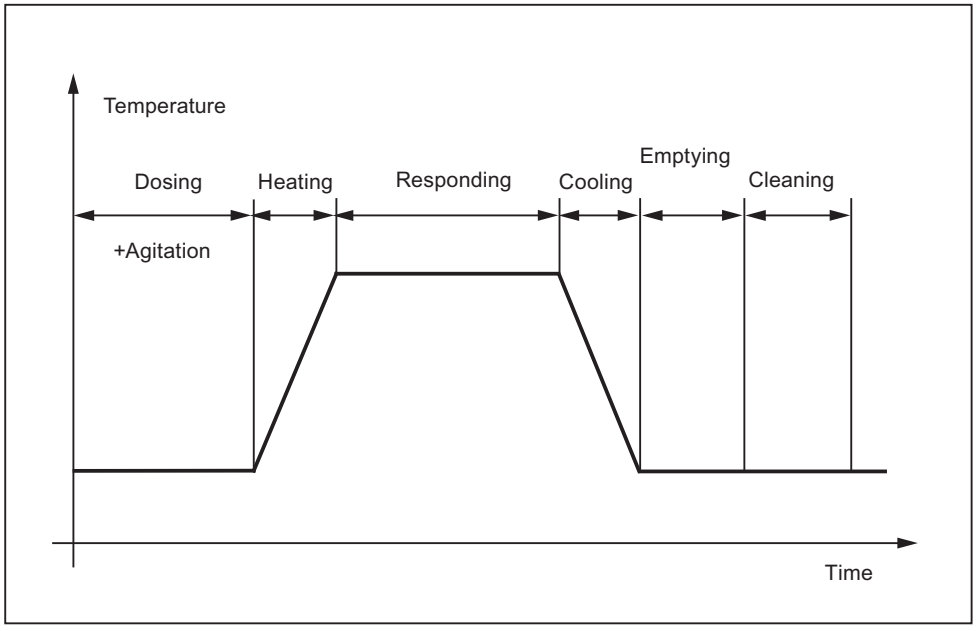
The following definitions are mainly excerpts from the ISA-88 (1995) standard Batch Control, Part 1

Batch process.

A process that leads to the production of finite quantities of material by subjecting quantities of input materials to an ordered set of processing activities over a finite period of time using one or more pieces of equipment.

The product manufactured in a batch process is known as a batch. Batch processes are discontinuous processes.

Typical equipment phases of a batch process



Batch

- A material that is being produced or that has been produced by a single execution of a batch process.
- An "imaginary" object representing the procedure for producing material at any point within the process.

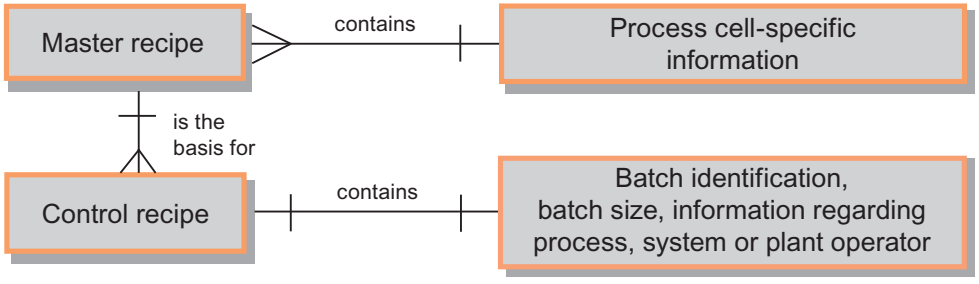
Note: Batch means both the material created by and during the process as well as the unit that represents the manufacturing procedure for this material. Batch is used as an abstract contraction of the words "the production of a batch".

Recipe

The necessary set of information that uniquely defines the production requirements for a specific product. A recipe is the set of rules and information required to define how a product is manufactured.

Two types of recipe are used in SIMATIC BATCH:

- Master recipe
- Control recipe



Master recipe

A type of recipe that accounts for equipment capabilities and may include process cell-specific information. A master recipe is an indispensable recipe level without which control recipes cannot be created or batches produced.

Master recipes can contain material and production parameters as standardized, calculated, or fixed values.

A master recipe can be derived from a general or site recipe from the enterprise level (refer to the standard IEC 61512-1: 1997).

Control recipe

A type of recipe which, through its execution, defines the manufacture of a single batch of a specific product.

The control recipe is a copy of a particular version of the master recipe that is then modified as necessary with information for planning and execution making it specific to a single batch.

A control recipe can also be modified during the production of a batch. Examples:

- Definition of the equipment actually used in the control recipe at the start of the batch or at the time it becomes known.
- Modification of the procedure due to an exceptional event.

Control strategy

Different and (in terms of the same run) mutually exclusive equipment phases of the same equipment module = control strategy of this equipment module.

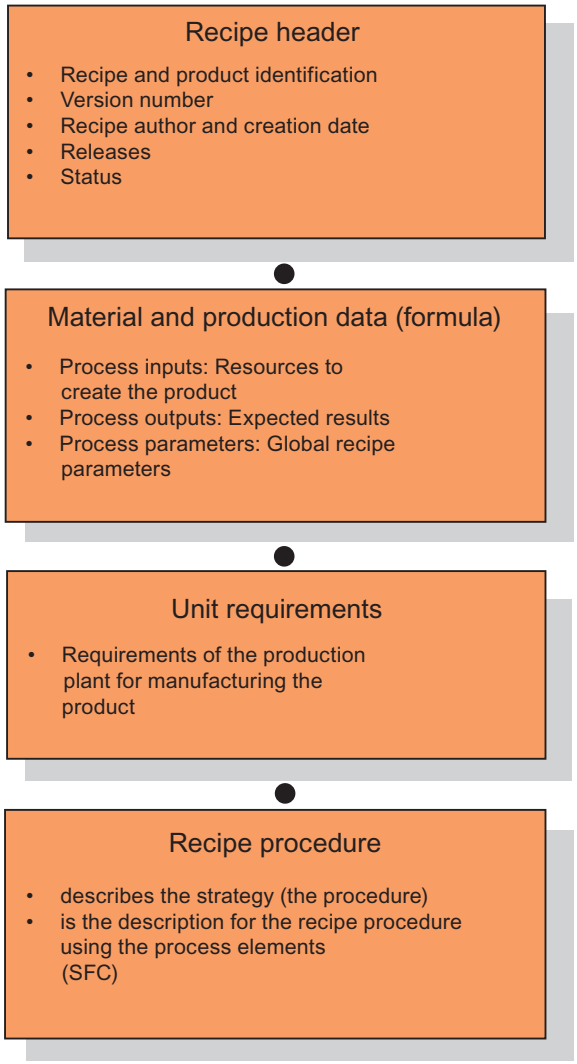
Process

A sequence of chemical, physical, or biological activities for the conversion, transport, or storage of material or energy.

5.3 Basic structure of a recipe

Components of a recipe

Recipes contain the following four categories of recipe information:



See also

Material and production data (formula) (Page 122)

Basic structure of a recipe procedure (Page 123)

5.4 Material and production data (formula)

Material and production data (formula) for recipe creation is comprised of:

- Process inputs
- Process outputs
- Process parameters

Process inputs

Process inputs are the input materials (resources) required to make the product. Each input material has the following characteristics:

- Name of parameter
- Name of the input material
- Low limit of the quantity
- Setpoint of the quantity
- High limit of the quantity
- Physical unit
- Name of the scaling algorithm

Process outputs

The process outputs are the output materials (main, interim, by and waste products) resulting from the manufacture of a product. Each output material has the following properties:

- Name of parameter
- Name of the product
- Name of the output material
- Low limit of the quantity
- Setpoint of the quantity
- High limit of the quantity
- Physical unit
- Name of the scaling algorithm

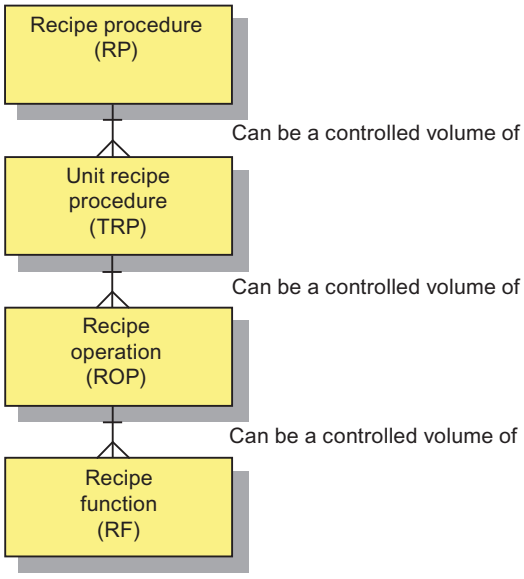
Process parameters

Process parameters are physical parameters such as speed, pressure or temperature.

Process parameters can also be logic parameters and character chains:
For example, release number of loop of type integer or material information HCL of type string or Boolean values e.g., releases.

5.5 Basic structure of a recipe procedure

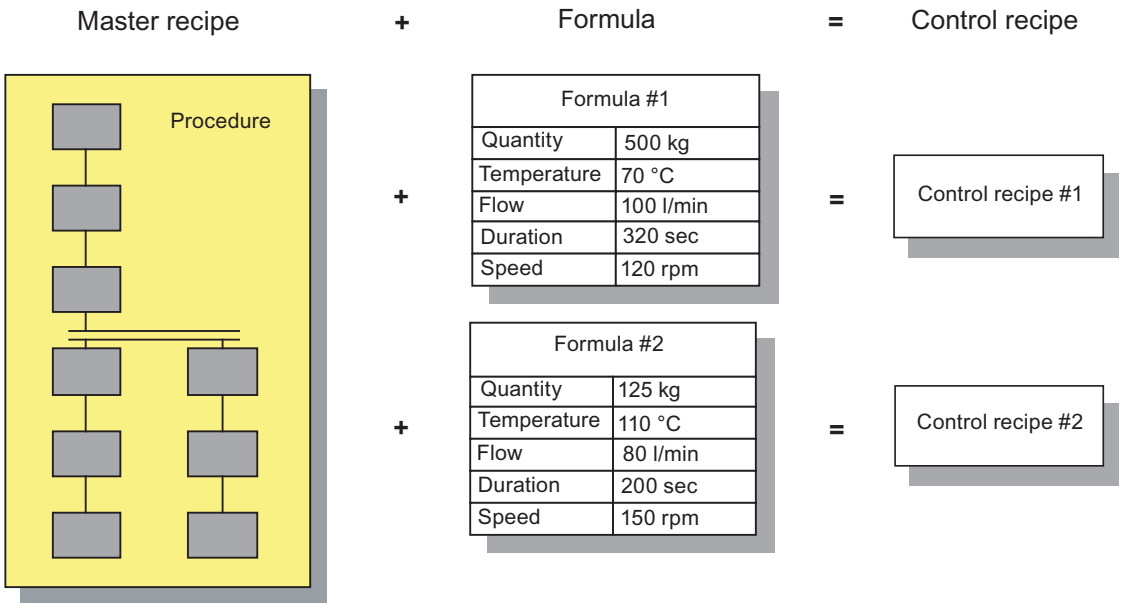
Recipe procedure and its elements according to the standard:



5.6 Relationship between master recipe, formula and control recipe

How the control recipe is formed

By assigning formulas to a master recipe, a variety of control recipes can be created for a process cell or a grouping of equipment belonging to a process cell. The schematic below illustrates this relationship.



5.7 What is a formula category?

Definition

A formula category is a grouping of recipe formulas associated with a single master procedure each having the same attributes. The only differences between the formulas of a formula category are the concrete parameter values.

The formula category is a therefore a "template"/a "type" for different material and production data records.

The formula category contains the parameters that can be manipulated by the operator via a formula during batch planning. These parameters are included in the formula category with their data type and unit of measure.

Note

Formula categories can be defined independently of the recipe.

Purpose

Working with formula categories makes it much easier to maintain master recipes based on the same recipe procedures. Modifications only need to be made at one point (of a recipe procedure) and not in all recipe procedures.

ISA-88 does not mention the formula category. However, the formula category does not contradict the formula definition in ISA-88, instead it expands it (see also "Models of the ISA-88 Standard").

See also

Material and production data (formula) (Page 122)

Relationship between master recipe, formula and control recipe (Page 124)

5.8 Internal and external formulas

To support you better when using formulas and formula categories, BATCH makes a distinction between internal and external formulas.

Internal formula

If you want to keep your material and production data directly in the master recipe procedure, you can do this in the "internal" formula in the master recipe. The parameters can be set there during the creation of the master recipe procedure and modified during batch planning and/or also while a batch is executing.

External formula

If you want to manage several material and production data lists separate from the master recipe procedure, you can do this using "external" formulas belonging to a formula category. You simply need to assign a master recipe procedure to the external formula to establish the association with the master recipe procedure. The parameters of external formulas can also be modified during batch planning and/or while a batch is executing.

5.9 ANSI/ISA-88.01 models

5.9.1 Overview of the ISA-88 standard models

Introduction

The following sections describe those models of the ISA-88 standards that relate directly to the use of SIMATIC BATCH. You will find information on other topics in the standard itself.

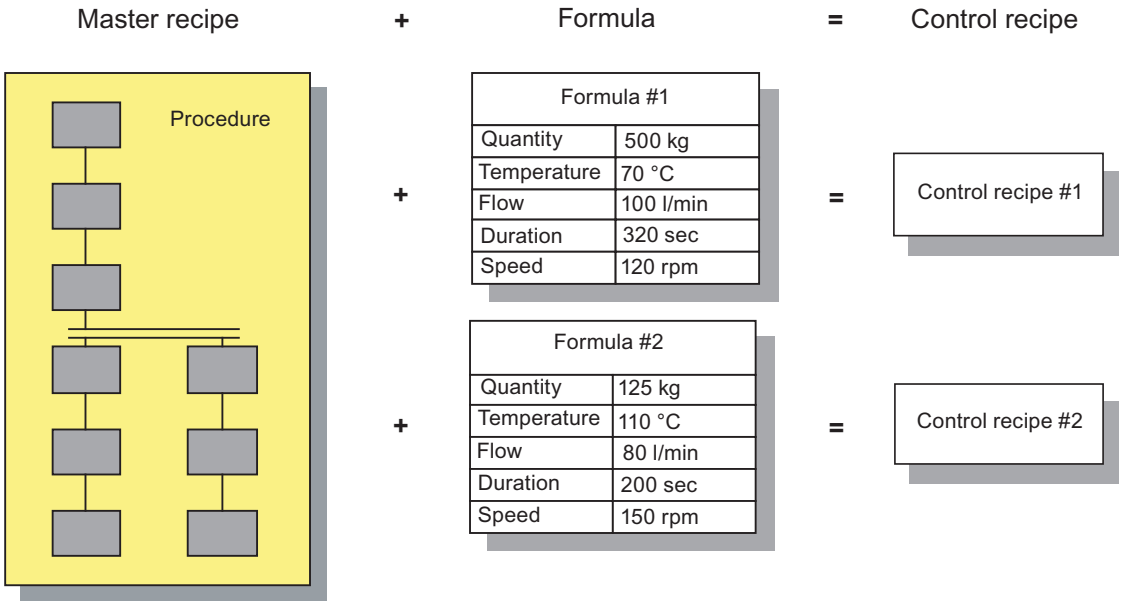
Models of the ISA-88 standard

The following models of the ISA-88 standard provide the foundation for batch-oriented control strategies with SIMATIC BATCH:

- Procedural control model
- Physical model
- Process model

Hierarchical structure of the models

The figure below illustrates the hierarchical structure and relationship of the models – from the sequential control on the equipment as far as the processing functionality.



Implementation of the models

The hierarchical structure of the models is the basis for the configuration of the batch-oriented control strategies with PCS 7:

- The plant hierarchy of your process cell is structured in the SIMATIC Manager (Plant view) on the basis of the physical model.
- You structure the recipes for batch control with the BATCH Recipe Editor based on the procedural control model.

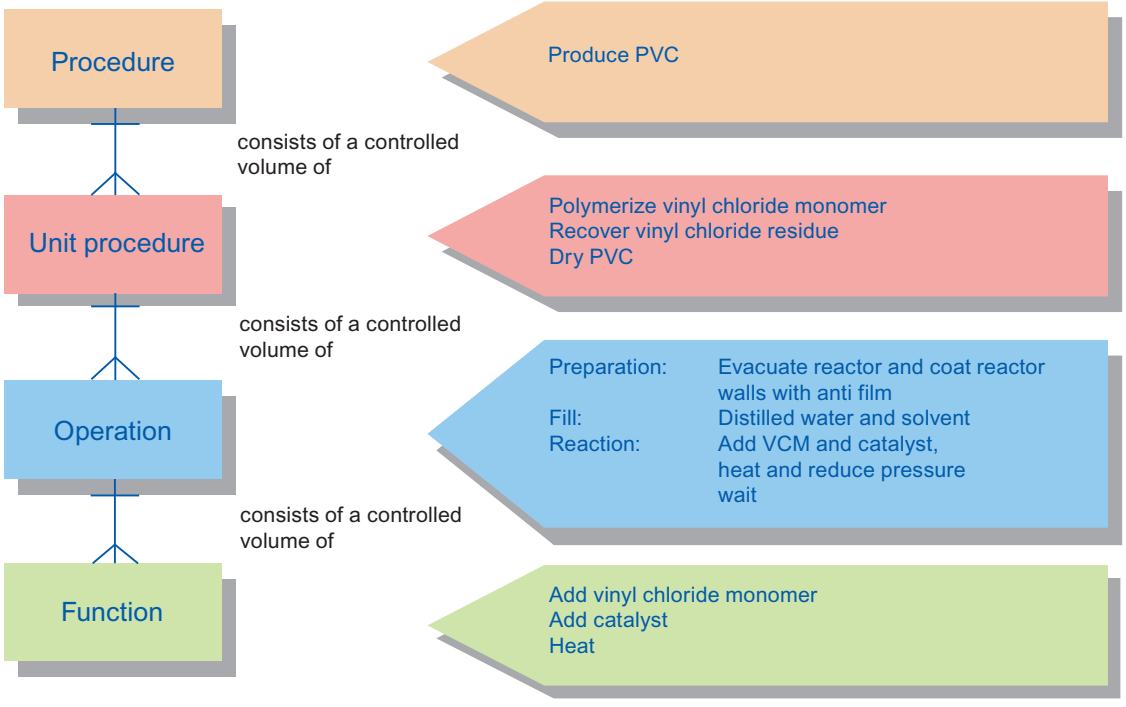
See also

Structure of the plant hierarchy (Page 150)

Implementation of the hierarchy in the BATCH Recipe Editor (Page 538)

5.9.2 Procedural control model

Procedural control model with example – how is it something made?



Equipment phase

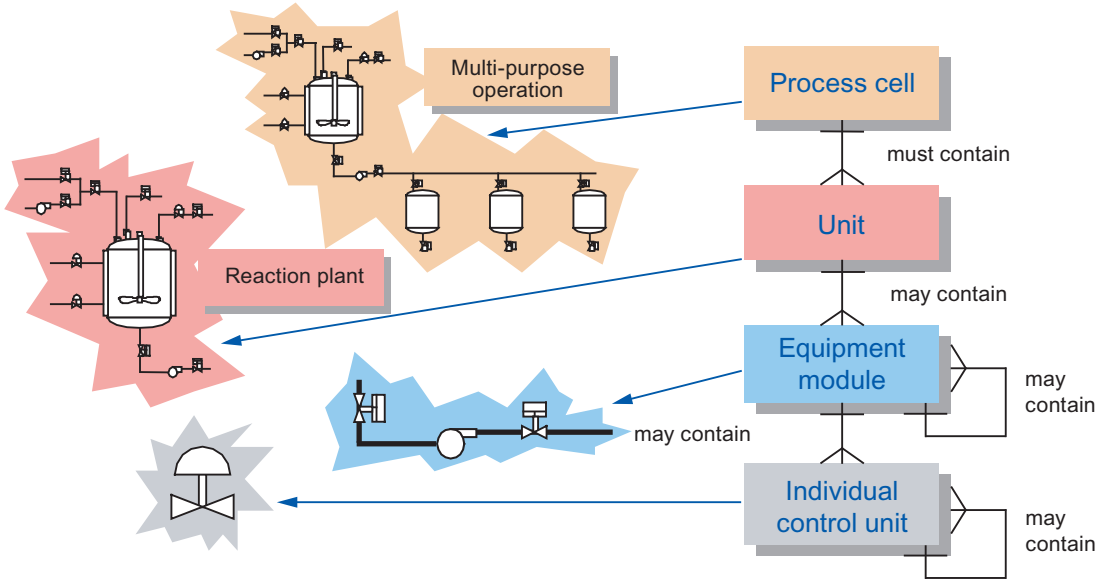
An equipment phase is the smallest element of procedural control that can accomplish a process-oriented task. The purpose of an equipment phase is to define or cause a process-oriented action.

Characteristics of an equipment phase:

- Can be subdivided into smaller parts in the form of steps and transitions (as described in IEC 848: 1988).
- A step can cause one or more actions
- The execution of an equipment phase can result in:
  - Commands to basic control
  - Commands to other equipment phases (either in the same or another equipment entity)
  - The collection of data

5.9.3 Physical model

Physical model with example – What do we use to produce?



Process cell

A process cell contains all the equipment required to make a batch. Process cells are often divided into trains. A train is made up of all units and other equipment that can be used by a particular batch. Trains can be left unchanged from batch to batch or can be defined differently for each batch.

Unit

A unit is made up of equipment modules and control modules. A unit is an independent grouping of equipment usually centered around a major piece of processing equipment, such as a mixing tank or reactor.

Characteristics of a unit:

- A unit can execute one or more major processing activities, such as react, crystallize and make a solution.
- Units operate relatively independently of each other.
- A unit often contains a complete batch of material at some point in the processing sequence of the batch.
- A unit cannot process more than one batch at the same time.

Equipment module

An equipment module can be made up of control modules and subordinate equipment modules. An equipment module is usually centered on a piece of processing equipment, such as a filter.

Characteristics of an equipment module:

- Can be part of a unit or stand-alone grouping of equipment within a process cell
- Can carry out a finite number of specific minor processing activities, such as dosing or weighing
- Can, but does not need to contain the raw materials for a batch

Control module

A control module is a collection of measuring equipment, actuators, other control modules and associated processing equipment that can be operated as a single unit from the point of view of control engineering.

A control module can also be made up of other control modules. For example, a dosing control module could be defined as a combination of several automatic on/off valve control modules.

Control modules are not included in the procedural model or in the process model.

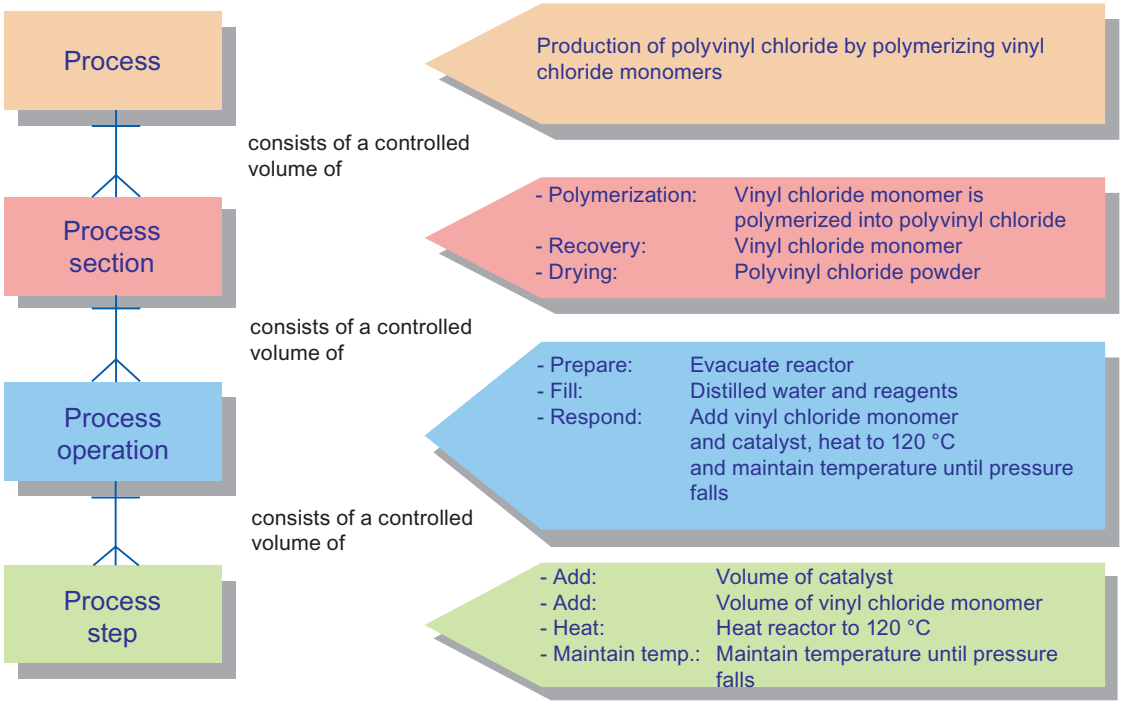
This means that they cannot be addressed in SIMATIC BATCH either.

See also

Overview of the ISA-88 standard models (Page 127)

5.9.4 Process model

Process model with example – What do we want to produce?



Introduction to SIMATIC BATCH 6

6.1 Getting started

Requirement

The components of the basic package of SIMATIC BATCH are installed on the PG/PCs of the BATCH OS (BATCH server, BATCH clients) and those of the engineering system.

Basic procedure

If you are working with SIMATIC BATCH for the first time, the following table gives you an overview of the most important steps.

Process cell configuration (Page 134)	1. Process cell configuration in the Engineering System (ES) (Page 246) 2. Compiling the process cell data in single project engineering (Page 222) 3. Downloading the process cell data to the target system (Page 224) 4. Reading process cell data into SIMATIC BATCH (Page 320)
Permission management (Page 135)	1. Specifying user permissions (Page 310)
Recipe creation (offline) (Page 136)	1. Editing materials (Page 325) 2. Creating and processing master recipes (Page 327) 3. Creating and processing library operations (Page 328) 4. Validating recipes (Page 347) 5. Releasing the recipes for production (Page 349) 6. Creating a new formula category (for external formula only) (Page 336) 7. Creating formulas (for external formula only) (Page 337) 8. Interconnecting parameters between master recipe and formula (Page 339)
Process mode (Page 137)	1. Creating production orders (Page 382) 2. Creating and processing batches (Page 379) 3. Releasing batches (Page 406) 4. Starting production of a batch (Page 445) 5. Operator control during batch production (Page 447) 6. Report creation of batches (Page 515) 7. Archiving batches (Page 500)

6.2 Process cell configuration

Configuration of the batch process cell takes place along with the basic engineering of the S7-400 on the Engineering Station (ES) of SIMATIC PCS 7 in SIMATIC Manager (for example phase and operation types, equipment properties, user data types, units of measure, etc.).

The Batch process cell data are compiled on the Engineering Station and are transferred to the database (project directory) of SIMATIC BATCH using the "Download target system" function.

Using the "Read in process cell" or "Update process cell" function in BatchCC, the process cell data of BatchCC are read in to the BATCH clients.

6.3 Permission management

SIMATIC BATCH uses the central user management of PCS 7.

You define user roles for SIMATIC BATCH (for example operator) and their assignment to the defined Windows user groups using the SIMATIC Logon software. Within SIMATIC BATCH (BatchCC), you can restrict the user permissions of a user role even further - for a specific computer and for a specific unit.

6.4 Recipe creation

Reading in the batch process cell data (Batch engineering data) on any BATCH client with BatchCC allows the creation of offline data. You create the materials, formula categories and formulas with the Batch Control Center. You create libraries and master recipes with the Recipe Editor. Releasing master recipes, library elements and formulas allows their use in process mode.

6.5 Process mode

The first phase of process mode is batch planning. Here, a production order is created first. This is divided into individual batch orders (at least one) that are then released and started. The actual Batch processing programs (equipment phases) run on the programmable controller and are coordinated by the batch control (BATCH Control Server). Communication with the equipment phases is done through the WinCC data manager.

The batch data management (Batch CDV) also makes use of individual WinCC components. From the measured value archive, the values for the required measured value sequences are obtained for the batch report and all batch-relevant messages are filtered out of the message archive.

A further important process function is the operator control and monitoring of a batch or the control recipe. This takes place partly in SIMATIC BATCH itself and partly using Batch faceplates in WinCC (OS).

Engineering 7

The section "Engineering" describes all the configuration steps that you make in the SIMATIC Manager. Before you implement your automation solution with SIMATIC PCS 7 and SIMATIC BATCH, you should take the following into consideration.

Which form of project should be selected and how will the engineering be done?

- Project or multiproject (select PCS 7 project type)
- Single project engineering or multiproject engineering
- Central or distributed multiproject engineering

The process cell configuration depends on the automation task

What does the automation task involve? The process cell configuration is the result of this question. The following process cell components need to be planned:

- AS: number, memory, redundancy
- PCS 7 OS server: Redundancy
- PCS 7 OS clients / multiclients
- BATCH server: Redundancy
- BATCH clients
- Network: span, redundancy
- Uninterruptible power supply (USP)
- Central archive server

The plant structure of your batch process cell is based on the automation task:

- Number of units?
- Number of equipment phases?

Engineering of the basic automation

A batch process is automated using the programs on the automation systems (AS). This so-called "basic automation" is created with CFC and/or SFC for the specific AS. The software charts to be created are managed in the plant hierarchy in the SIMATIC Manager. For SIMATIC BATCH, specified hierarchy levels must be complied with.

Additional information

Structure of the plant hierarchy (Page 150)

Setting up the equipment module with SFC types (Page 176)
Type description of the process cell (Page 234)

7.1 General information on SIMATIC Manager

- If you want to load a batch process cell (PCell) other than the current one in the BATCH configuration dialog (ES), the BATCH Launch Coordinator must not be active or must be restarted afterwards.
- During compile/download of the stations in the BATCH configuration dialog, the "Unknown" operating state means that the automation system can be reached and that the CFC charts can be downloaded.
- In the global declarations, the following restrictions apply to SIMATIC BATCH:
  - To avoid needing to adapt projects, object names (enumerations, enumeration values, units of measure) created once should no longer be changed in the global declarations.
  - To ensure consistency in the multiproject, the global declarations in all projects of a multiproject must be identical.
- OB 80 (cycle timeout)
  OB 80 prevents the automation system changing to STOP if there is sporadic cycle overload. In the AS-based operating mode, this OB must exist in the block folder of the project and therefore in the AS. You will find additional information in the manual "STEP 7 - Programming with STEP 7" in section 23.9.6.
- Changing the symbolic computer name of the PCS 7 OS
  If you change the symbolic computer name of the OS in your project, you will then need to reassign all the BATCH archive tags previously configured for this OS in the BATCH configuration dialog.
- Special characters in names:
  - Special characters are not permitted in the path to the target OS computer because the BATCH data is not downloaded otherwise.
  - You should not use special characters in SIMATIC PCS 7 names (computer names, tag names, archive tag names). A comma "," is generally not permitted in tag names (process tags, archive tags, etc.).
  - Project names, picture names and computer names can only contain ASCII characters.

7.2 Basic engineering for PCS 7

Configurations in the SIMATIC Manager

Steps in configuration for PCS 7 basic engineering

1. Set up a new project in the SIMATIC Manager
   - File > New or File > "New project" wizard
   - CPU: Read product information
   - Insert global declarations.
2. Configure AS
   - Insert hardware: Communication module
   - Set up AS network connections
   - Adapt local data.
   - Copy blocks from the SIMATIC BATCH block library to your user project.
   - Specify reserved areas for data blocks and functions in the CFC.
   - Adapt the plant hierarchy to the specific project.
   - Configure objects. Insert CFCs in the plant hierarchy folder, install and interconnect blocks in the CFCs, insert SFCs / SFC types in the chart folder of the CPU, set the mode in the SFC, set the category and the mode in the SFC type and install and configure transitions and actions.
3. Configure the PCS 7 OS server and PCS 7 ES
   - Insert hardware: BATCH application and communication processor for Industrial Ethernet
   - Project-specific: Assign computer and object names
   - PCS 7 OS: Set up network connection
   - NetPro: Set up the WinCC connection to the AS
   - Configure Station Configuration Editor
   - In the WinCC Explorer: Check the computer name.
4. Configure PCS 7 OS standby server (if required)
   - Insert hardware: BATCH application (stby) and communication processor for Industrial Ethernet
   - Project-specific: Assign computer and object names
   - PCS 7 OS: Set up network connection
   - NetPro: Set up the WinCC connection to the AS
   - Configure Station Configuration Editor

5. Configure PCS 7 OS client (if required)
   - Insert hardware: BATCH application client
   - Assign computer and object names for specific project
   - PCS 7 OS: Set up network connection
   - In the WinCC Explorer: Check the computer name.
6. Configuring PCS 7 OS process pictures
   - Save "SIMATIC BATCH OS Controls" template screen under a different name
   - Allocate the plant hierarchy
7. Insert an additional AS into the project
   - Insert SIMATIC 400 station
   - Perform configuration steps starting from "Configure AS"

7.2.1 Using the PCS 7 Wizard

Possibly include in introduction or merge with introduction.

When you create a new single or multiproject, you can also use the PCS 7 wizard in SIMATIC Manager. This allows you to create a single project or multiproject with one project, including a PC station both for the BATCH server and for a BATCH client.

Starting the Wizard

In the SIMATIC Manager, select the menu command **File > "New Project" Wizard** and follow the instructions in the dialogs.

Settings for SIMATIC BATCH

In the 3rd dialog box "Which objects will be used in the project?", the "SIMATIC BATCH" option is available. Select this option and three further options appear on the right in the same dialog box. Select the project version you require. Once the PCS 7 wizard is completed, the PC stations are visible in the Component view.

7.2.2 Configuring BATCH servers, BATCH clients and AS

7.2.2.1 Installing on BATCH servers and BATCH clients

You will find an overview of the Batch applications that can be installed on BATCH servers and BATCH clients and the required licensing in the following manuals:

- *Process Control System PCS 7; PCS 7 - PC Configuration*
- *Process Control System PCS 7; Licenses and configuration limits*

7.2.2.2 Basics of configuration

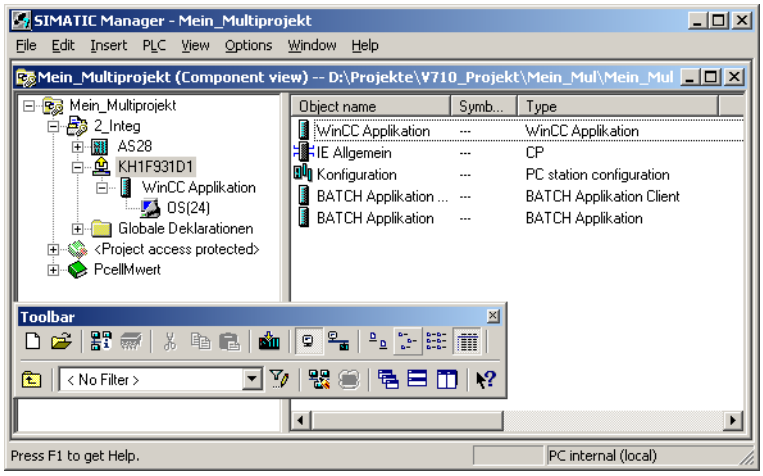
Principle

The BATCH server and the BATCH clients of a process cell project generally run on different PCs. To download the process cell data of a project and distribute it to these PCs, a **SIMATIC PC station** is created for the BATCH server (BATCH control server, DB server) and each BATCH client in the Component view of SIMATIC Manager.

Note

Configuring applications (WinCC, SIMATIC BATCH, ...) on separate "SIMATIC PC station" objects and then merging them to create one PC station by assigning the same computer name to the "SIMATIC PC station" objects is not permitted.

Structure of the Batch project in the SIMATIC Manager (component view)



Functions available for BATCH configuration

Object	Meaning	Available functions
BATCH Application Client	BATCH client application	• Configuring the BATCH clients (Page 147)
BATCH Application	BATCH control server or data storage system	• Configuring the BATCH server (Page 146)

Object	Meaning	Available functions
 BATCH Application (stby)	Only in a redundant system: BATCH control server or data storage system standby	• Configuration of the redundant BATCH server (Page 64)
 WinCC Application  OS	WinCC application on PCS 7 OS	• Compiling the OS (Page 198)

BATCH application client

"BATCH application client" stands for the BATCH Recipe Editor, the Batch Control Center (BatchCC) for batch operation and observation, and batch data management.

BATCH application

"BATCH application" is the representative for

- DB server project: Storage of user permissions
- DB server offline: Storage of the recipes, formulas, materials
- DB server online: Storage of the batches
- BATCH control server (BCS)

BATCH application [stdby]

"BATCH application [stdby]" stands for the redundant applications:

- DB server project: Storage of user permissions
- DB server offline: Storage of the recipes, formulas, materials
- DB server online: Storage of the batches
- BATCH control server (BCS)

7.2.2.3 Configuring the BATCH server

Rules

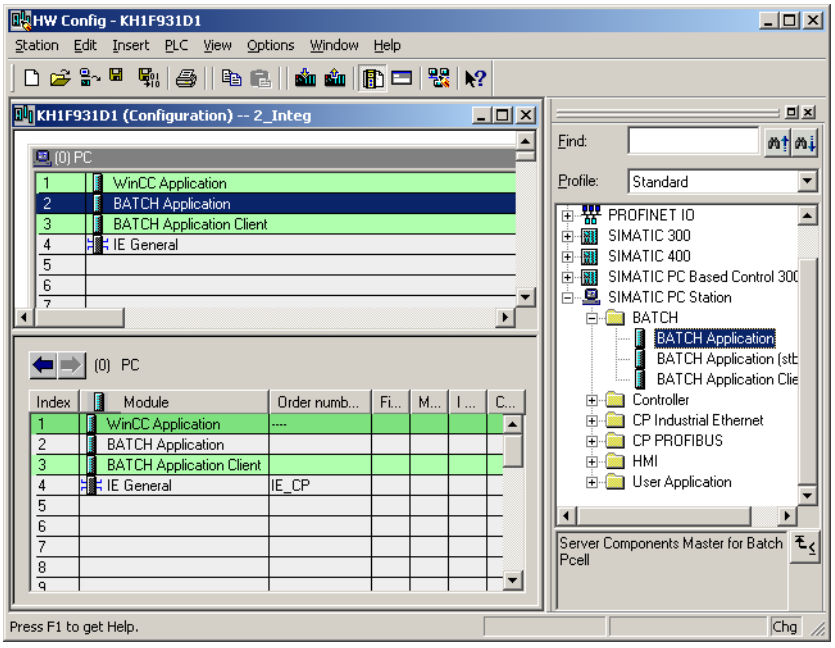
- A SIMATIC PC station must be created and configured with a "BATCH application" in HW Config for the PC on which the BATCH server runs.
- If you wish to work locally on the engineering station with BATCH server/clients (single station project engineering) you only need to configure one PC station with server and client application, where the computer name is left empty or the local computer name is entered.

⚠ WARNING
Configuring applications (WinCC, SIMATIC BATCH, ...) on separate "SIMATIC PC station" objects and then merging them to create one PC station by assigning the same computer name to the "SIMATIC PC station" objects is not permitted.

Procedure in the SIMATIC Manager

1. Select the project in the Component view.
2. Select the menu command **Insert > Station > SIMATIC PC Station**.
   Result: A new SIMATIC PC station is inserted in the current project.
3. Set the computer name of the PC station:
   - To do this, select the SIMATIC PC station.
   - Select the menu command **Edit > Object properties**.
   - Enter the computer name in the last field.

4. Configure this SIMATIC PC station in HW Config.
   - To do this, select the SIMATIC PC station.
   - Select the menu command **Edit > Open object**.
     Result: HW Config opens.
   - Insert a batch application from the hardware catalog:
     Path in the hardware catalog: **Standard > SIMATIC PC Station > HMI > BATCH application**.
     If you are using a redundant BATCH server, select "BATCH application (stdby)" instead.



5. Select the menu command **Station > Save and compile**.

Result

In the component view, below the configured SIMATIC PC station you will see the object

BATCH Application

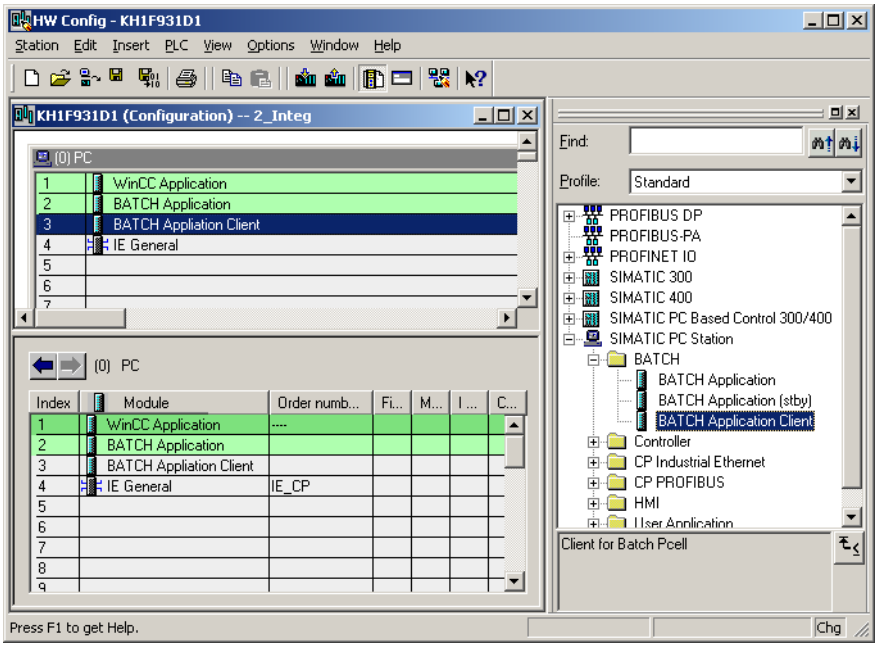
7.2.2.4 Configuring the BATCH clients

Rules

- A SIMATIC PC station must be created and configured with a "BATCH application client" in HW Config for every PC on which a BATCH client application runs.
- BATCH clients can also run on PC stations on which no OS client (multiclient) is installed.

Procedure in the SIMATIC Manager

1. Select the project in the component view.
2. Select the menu item **Insert > Station > SIMATIC PC Station**.
   Result: A new SIMATIC PC station is inserted in the current project.
3. Set the computer name of the PC station.
   - To do this, select the SIMATIC PC station.
   - Select the menu item **Edit > Object Properties**.
   - Enter the computer name in the last field.
4. Follow the same procedure and install a SIMATIC PC station for each additional BATCH client in the project.
5. Configure these SIMATIC PC stations in HW Config.
   - To do this, select the SIMATIC PC station.
   - Select the menu item **Edit > Open Object**.
     Result: HW config opens.
   - Insert a batch client application from the hardware catalog: On a BATCH client, you insert an additional WinCC application if the BATCH client is operated along with an OS client on one PC.
     Path in the hardware catalog: **Standard > SIMATIC PC Station > HMI > BATCH application client**.



6. Select the menu item **Station > Save and Compile**.

Result

In the component view, below the configured SIMATIC PC station, you will see the following object.



7.2.2.5 Adapting the CPU for AS-based mode

Adapt local data

The memory requirements of the local data of your CPU must be calculated for AS-based mode and then possibly adapted. This is necessary for every CPU in your PCS 7 project.

Procedure

1. Open any CFC chart in the relevant S7 program.
2. Select the menu item Options > Chart Reference Data.
3. Select the menu item View > Local Data.
4. Use the local data table that is displayed in the steps described below.
5. Open your project with the component view in SIMATIC Manager.
6. In the SIMATIC manager, open the HWConfig. hardware configuration
7. Select the CPU in the rack.
8. Use the shortcut menu to select the object properties of the CPU.
9. Click on the "Memory" tab in the open dialog. You will see the local data arranged in priority classes.
10. Adapt the amount of memory for the local data in accordance with the displayed local data referred to in point 4.

Note

Optimization of local data

Use the procedure described above to optimize your local data within the priority classes

7.2.3 Plant hierarchy

7.2.3.1 Structure of the plant hierarchy

Introduction

With the plant hierarchy, the engineering system provides you with the means of recreating the technological structure of the process cell in the PCS 7 system. The objects such as CFC/SFC charts, OS reports, or OS operator pictures are added in the plant hierarchy.

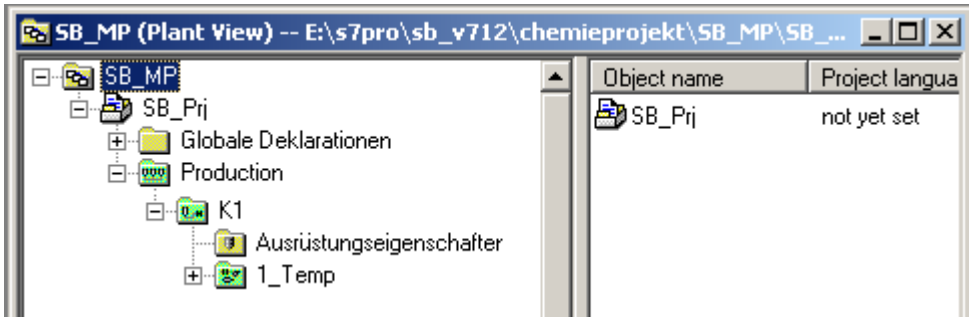
Structure of the plant hierarchy

The highest levels are decided by the system when you create a new project or multiproject. The next hierarchy levels can either be neutral folders or folders with configuration data for SIMATIC BATCH. This is decided in the object properties of the relevant hierarchy folder in the "S88 type definition" tab under the object type properties.

In multiproject engineering, the top level is the "Multiproject" object, below that you will find the individual projects and the process cell below these projects.

For the configuration data for SIMATIC BATCH, the three hierarchy folders shown in the schematic below are necessary (these are generally known as batch hierarchy folders):

- Process cell hierarchy folder (Page 156)
- Unit hierarchy folder (Page 156)
- Equipment module hierarchy folder (Page 157)



Technological significance of the Batch hierarchy folders

The three Batch hierarchy folders have the following defined technological meanings according to the ISA-88 standard:

Batch hierarchy folder	Level	Meaning
Process cell	Level 2	Within a project, only one process cell can currently be created. A recipe can therefore only access phases of this process cell. Examples of the process cell level might be polymerization plant, dyehouse, colored pigment plant, or multipurpose plant.
Unit	Level 3	Several units can be defined in one process cell. These units can be used within a recipe. Examples of units might be neutralization, extraction, distillation, or preparation.
Equipment module	Level 4	Several equipment modules such as a dosing or bottling machine can be defined in a unit. Equipment phases such as heating, cooling, ventilating, emptying can be created for the equipment modules.

Included in the naming scheme (yes/no)

The name of the project exists once and is not included in the naming scheme for tags in WinCC. All other folders can be included in the naming scheme during configuration.

Note

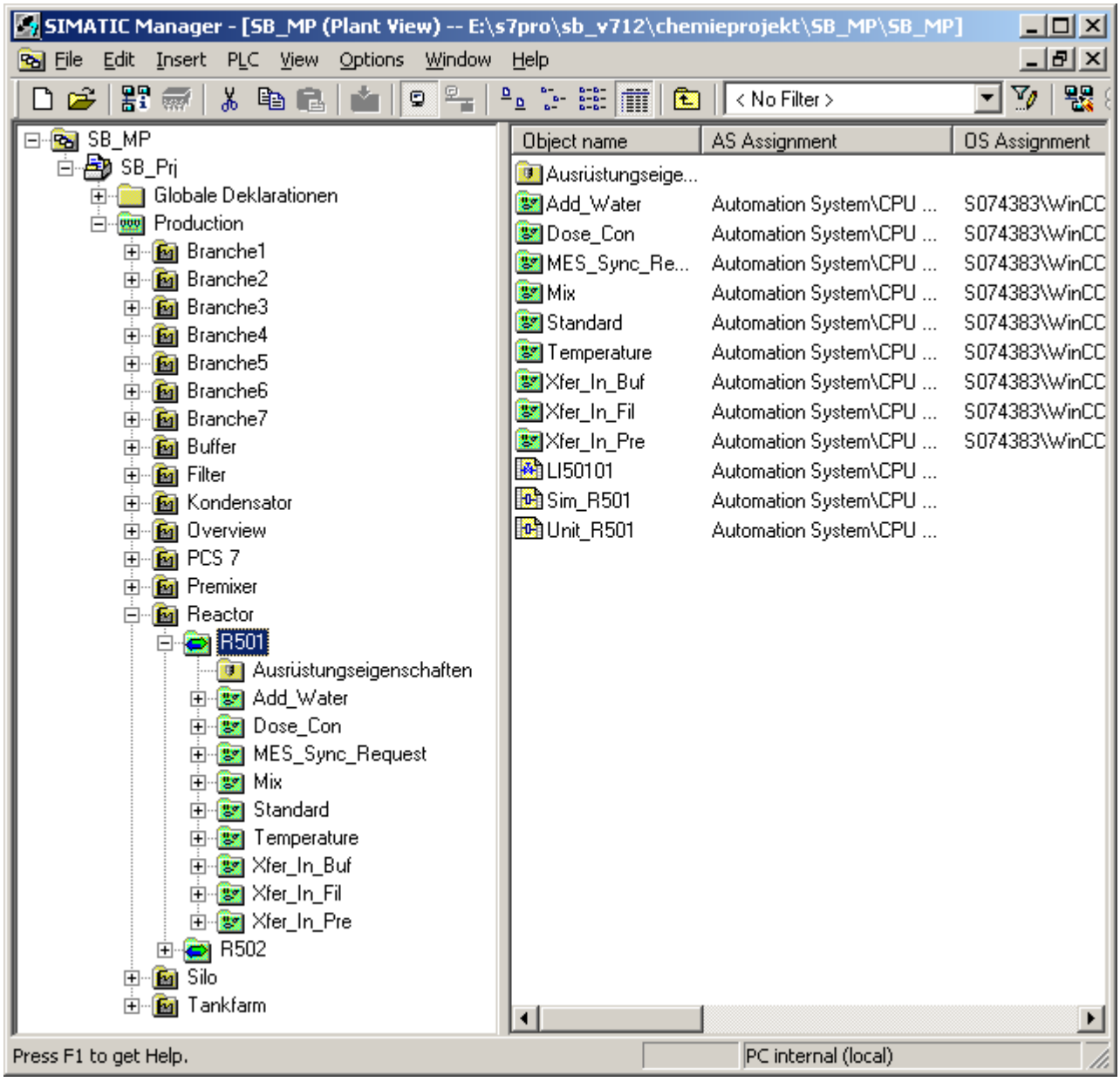
By default, inclusion in the naming scheme is deactivated. This means that no hierarchy folder is included in the name.

Storage of the blocks

The charts with the corresponding SFC type instances (Page 176) or BATCH interface blocks (Page 172) can be stored in the appropriate Batch hierarchy folders according to their technological significance. Only TAG_COLL can be stored in the process cell folder. The UNIT_PLCs along with EOPs, EPHs and TAG_COLL can be stored in folders of the "Unit" object type. EPH blocks and TAG_COLL blocks can be stored in folders of the "Equipment module" object type. The IEPAR blocks should also be saved in the Batch hierarchy folder.

The charts with the function blocks (valves, controllers etc.) and sequential controls (SFC) required for the automation task can also be stored in these BATCH hierarchy folders. You can also extend the structure specified by SIMATIC BATCH for the general function blocks using neutral hierarchy folders so that you produce the ideal plant structure for your requirements.

Example:



7.2.3.2 Procedure for creating the plant hierarchy

Information on creating and setting the plant hierarchy

For detailed information on creating, modifying and setting the properties of the plant hierarchy, refer to the manual *Process Control System PCS 7; Engineering System*.

Only the **additional and special** settings for the batch configuration are described in the following.

Special settings for Batch configuration

The following additional settings must be made or checked for batch configuration:

- Specifying the basic settings for the plant hierarchy (Page 153)
- Assigning the object type "Process cell", "Unit" or "Equipment phase" to hierarchy folders (Page 158)
- Assigning a unit class to a unit (Page 158)
- Executable functions in a single project (Page 237)
- Executable functions in a multiproject (Page 240)
- Inserting CFC charts with EPHs/EOPs (Page 154)

7.2.3.3 Specifying basic settings of the plant hierarchy

Necessary settings

The following basic settings are necessary for the plant hierarchy of the current project:

- Number of hierarchy levels
- Whether or not the hierarchy folder names of an entire level will be included in the tag names (in WinCC) (HID = higher-level designation).

Procedure in the SIMATIC Manager

Once you have created the first hierarchy folder, you can make the basic settings.

1. Select any hierarchy folder in the Plant view.
2. Select the menu command **Options > Plant hierarchy > Settings**.
3. Make the following settings in the "Customize plant hierarchy" dialog box:
   - Enter the maximum number of possible hierarchy levels that can occur in the project. For the BATCH hierarchy, only three hierarchy levels are relevant. If you decide to use neutral folders, up to eight hierarchy levels are possible.
   - Using the "Include in designation" check box, you can decide whether the hierarchy folder name of any particular level will be included in the higher level designation (HID). You can decide whether the name of an individual hierarchy folder will be included in the HID in the operator control and monitoring attributes of each individual hierarchy folder (menu command Edit > Object Properties > Control and Monitoring Attributes").
4. Confirm your settings with OK.

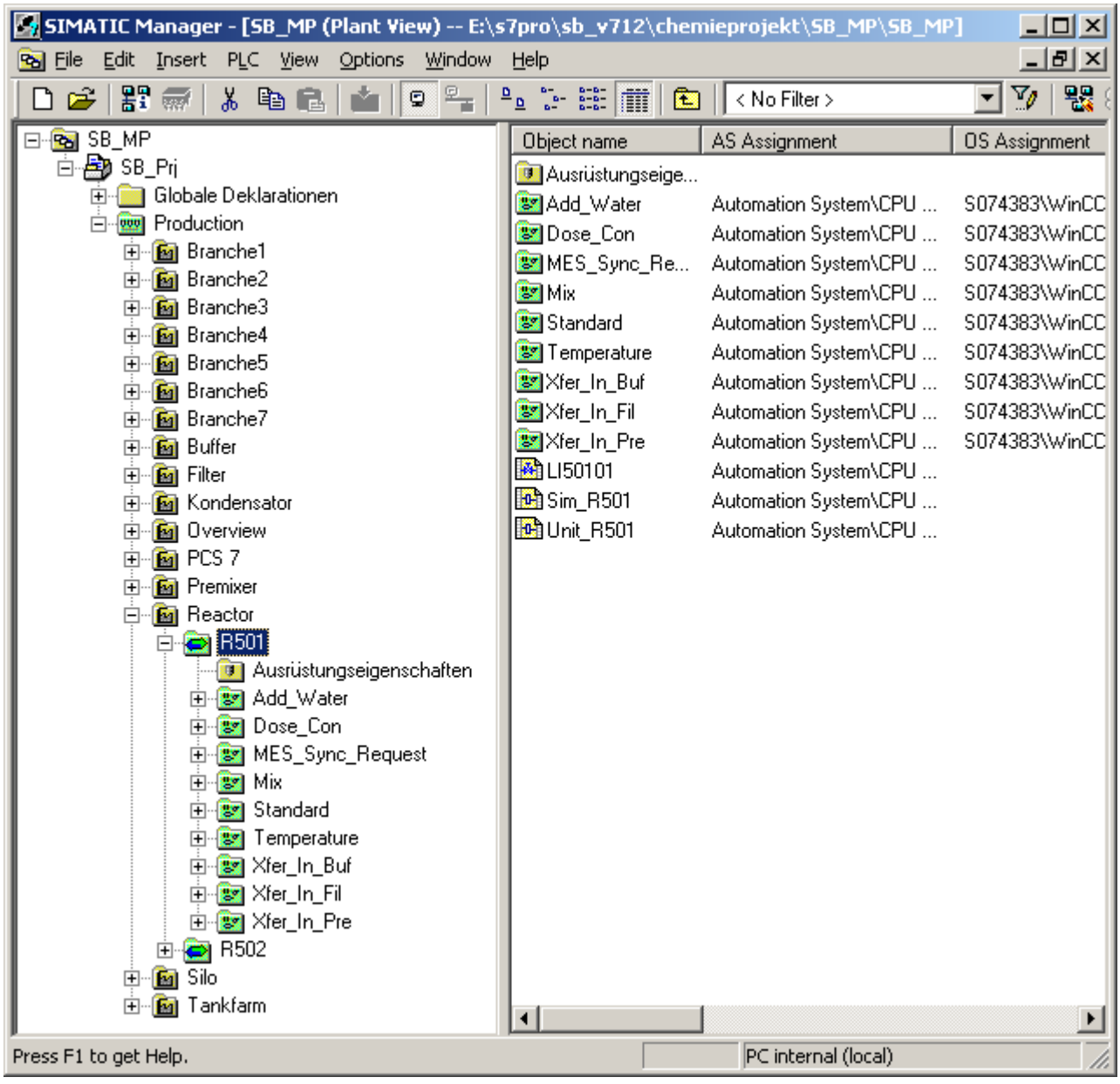
7.2.3.4 Rules for inserting CFC charts

Rules for storing CFC charts in the plant hierarchy

The process cell model is created in the SIMATIC Manager based on the CFC charts and the configured plant hierarchy. When inserting CFC charts in the plant hierarchy, note the following:

- The charts with the corresponding SFC type instances or BATCH interface blocks can be stored in the appropriate Batch hierarchy folders according to their technological significance. Only TAG_COLL can be stored in the process cell folder. You can store the UNIT_PLC along with EOPs, EPHs and TAG_COLL in folders of the "Unit" object type. EPH blocks and TAG_COLL blocks can be stored in folders of the "Equipment module" object type.
- The CFC charts with the function blocks (valves, controllers etc.) and sequential controls (SFC) required for the automation task can also be stored in these BATCH hierarchy folders.
- You can also extend the hierarchy specified by SIMATIC BATCH for the general function blocks using neutral hierarchy folders so that you produce the ideal plant structure for your requirements.

Example


SIMATIC Manager - [SB_MP (Plant View) -- E:\s7pro\sb_v712\chemieprojekt\SB_MP\SB_MP]
File Edit Insert PLC View Options Window Help
< No Filter >
SB_MP
SB_Prj
Globale Deklarationen
Production
Branche1
Branche2
Branche3
Branche4
Branche5
Branche6
Branche7
Buffer
Filter
Kondensator
Overview
PCS 7
Premixer
Reactor
R501
Ausrüstungseigenschaften
Add_Water
Dose_Con
MES_Sync_Request
Mix
Standard
Temperature
Xfer_In_Buf
Xfer_In_Fil
Xfer_In_Pre
R502
Silo
Tankfarm
Object name
AS Assignment
OS Assignment
Ausrüstungseige...
Add_Water Automation System\CPU ... S074383\WinCC
Dose_Con Automation System\CPU ... S074383\WinCC
MES_Sync_Re... Automation System\CPU ... S074383\WinCC
Mix Automation System\CPU ... S074383\WinCC
Standard Automation System\CPU ... S074383\WinCC
Temperature Automation System\CPU ... S074383\WinCC
Xfer_In_Buf Automation System\CPU ... S074383\WinCC
Xfer_In_Fil Automation System\CPU ... S074383\WinCC
Xfer_In_Pre Automation System\CPU ... S074383\WinCC
LI50101 Automation System\CPU ...
Sim_R501 Automation System\CPU ...
Unit_R501 Automation System\CPU ...
Press F1 to get Help.
PC internal (local)

7.2.3.5 "Process cell" hierarchy folder

Introduction

Below the project, you create the SIMATIC BATCH hierarchy folder of the object type "Process cell". You select the object type in the properties of the hierarchy folder in the "S88 type definition" tab. A hierarchy folder that was type defined as process cell has the following icon in the plant view in the SIMATIC Manager:



Definition of a process cell

A process cell is a logical group of facilities/devices (containers, actuators, sensors, etc.) for creating one or more batches. The process cell determines the spectrum of logical control options for a set of process equipment within a plant area.

Rules for the "Process cell" hierarchy folder

- Within a project, only one "Process cell" hierarchy folder can be created. Examples of this might be a polymerization plant, dyehouse, multipurpose plant.
- When creating a master recipe in SIMATIC BATCH, the data of this process cell are made available. This means that all the units and equipment phases required in a master recipe must be created below the process cell folder.

Multiproject

Each project of a multiproject contains the same "Process cell" object. Below this, you can configure different units in the individual projects.

7.2.3.6 "Unit" hierarchy folder

Introduction

Below the process cell, you create the hierarchy folder with the object type "Unit".

- If the unit folder is created directly below the process cell folder, the "Unit" object type is assigned automatically by the system when you create it.
- If the unit folder is not created directly below the process cell folder but is inserted below a neutral folder, the inserted folder is automatically assumed to be a neutral folder. You can then set the "Unit" object type afterwards in the properties of the hierarchy folder in the "S88 type definition" tab.

A hierarchy folder that was type defined as unit has the following icon in the plant view in the SIMATIC Manager:



Hierarchy folder "Unit"

Several units can be defined in one process cell. Several units can be used within a master recipe. Examples at this level could be the division of a process cell into neutralization, extraction, distillation, or preparation.

Predecessor/successor

In the object properties of the "Unit" hierarchy folder, you can select a different unit of the same project, or of a different project as successor for each unit. If this successor is located in another project, it is displayed in the current project as a hierarchy folder with a link.

You can open this dialog from the object properties dialog of the hierarchy folder **Unit > "S88 type definition" tab > Predecessor/successor** button.

Managing unit allocation with UNIT_PLC

To map the unit on the programmable controller, there is exactly one instance of the BATCH interface block UNIT_PLC in one of the charts of the "Unit" hierarchy folder. The batch control enters the batch ID and the batch name in the UNIT_PLC block so that the allocation of units can be managed.

With suitable user configuration on the AS, UNIT_PLC can be used to prevent the use of a unit by batch control (input BA_EN: Batch enable).

7.2.3.7 "Equipment module" hierarchy folder

Introduction

Below the unit, create the hierarchy folder of the "Equipment module" object type:

- If the equipment folder is created directly below the unit folder, the "Equipment module" object type is assigned automatically by the system when it is created.
- If the equipment folder is not created directly below the unit folder but is inserted below a neutral folder, the inserted folder is automatically assumed to be a neutral folder. You can then set the "Equipment module" object type afterwards in the properties of the hierarchy folder in the "S88 type definition" tab.

A hierarchy folder that was type defined as equipment module has the following icon in the plant view in the SIMATIC Manager:



Hierarchy folder "Equipment module"

Several equipment modules such as a dosing or bottling machine can be defined in a unit. Equipment phases such as heating, cooling, ventilating or emptying can be created for the equipment modules.

7.2.3.8 Assigning the "Process cell", "Unit" or "Equipment phase" object type

To identify the BATCH hierarchy, each hierarchy folder is explicitly assigned the object type "Process cell", "Unit", or "Equipment phase". Depending on the object type, other BATCH attributes can then be set.

After creating a new hierarchy folder, one of the object types "process cell", "unit", "equipment phase" or "neutral" is automatically assigned depending on the position. You can change the object type assigned to a hierarchy folder as follows:

Procedure in the SIMATIC Manager

1. Select the hierarchy folder in the Plant view.
2. Select the menu command **Edit > Object properties**.
3. Switch to the "ISA-88 type definition" tab.
4. Set the required type (process cell, unit, or equipment module) of the hierarchy folder for the "Object Type". If you select the "<neutral>" object type, the BATCH hierarchy will be deactivated again for this folder.
5. Confirm with "OK".

Result: The graphic display of the hierarchy folder matches the selected object type.

Neutral folder

The "<neutral>" object type deactivates the BATCH hierarchy for the "process cell" object. The lower-level BATCH hierarchy folders retain their object type but are no longer relevant for the SIMATIC BATCH configuration. In "Object type", the nested hierarchy folders no longer relevant for SIMATIC BATCH are displayed in round brackets, for example: (unit).

7.2.3.9 Specifying predecessors for a unit

Introduction

In the object properties of the "Unit" hierarchy folder, you can select a different unit of the same project, or of a different project as successor for each unit. This prevents units that have no connection in the plant structure from being selected during recipe creation.

You can also enter several units as successors, for example, as a preliminary selection and then select the required successor in a master recipe.

You can also specify the predecessor of a unit defined as a successor as the next successor.

Procedure in the SIMATIC Manager

1. Select a "unit" hierarchy folder in the Plant view.
2. Select the menu command Edit > Object Properties.
3. Change to the "S-88 type definition" tab.
4. Select the "Successor/Predecessor" button. In the dialog shown, all units that you type defined as unit are displayed.
5. Assign the successor for the current unit. To do this, select the desired successor in the "Available Units" window and click the "Arrow right" button. The units are moved to the "Successor" window and has the "Successor" attribute.
6. Confirm your settings with "OK".

Result

A successor is inserted as a hierarchy folder with a link in the current project if it is not already contained in this project or another project in the multiproject.

Removing a successor

You can remove the successor attribute by selecting the unit in the "Successor" window and clicking the "Arrow left" button to move it back to the "Available units" window. If a hierarchy folder with a link was created for this successor, this nevertheless remains in the project and you will need to delete it manually if required.

Predecessor

If this is a successor for the selected unit, the hierarchy folder for the immediate predecessor is shown in the "Predecessor" window. Similar to the successor, there can be several predecessors.

Working in the multiproject

Note

Ensure that the hierarchy folders of the "Process cell" object type have the same name in the individual projects of the multiproject.

7.2.3.10 Extending the plant hierarchy by adding neutral folders

Neutral folders

As already mentioned, the three-stage hierarchy for SIMATIC BATCH can be extended by adding neutral folders to improve the structuring of the project, for example to divide units into groups. The neutral folders can be created at any level. The total number of possible levels (batch hierarchy levels, levels with neutral folders) is limited to eight.

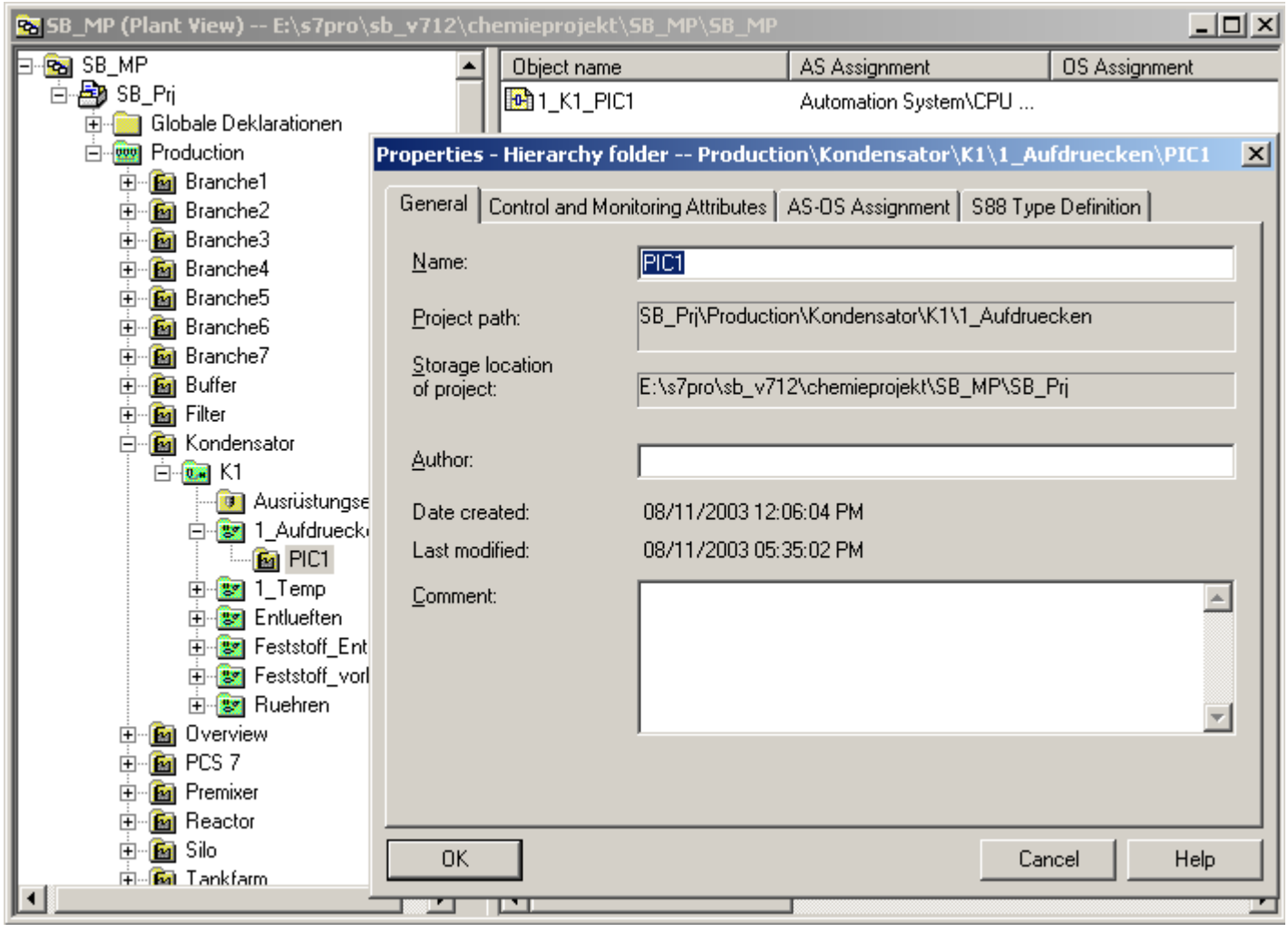
Neutral folders can, for example, be inserted above the "Unit" level. This level can then be used, for example, as the area level. A further level could, for example, be inserted below the "Equipment module" level. This level can then serve as a control module level.

Neutral folders are used as a classification criterion and do not affect the main 3 stages of the technological hierarchy.

Note

No BATCH interface blocks (or EPAR blocks) should be located in the charts of neutral folders.

Example



Levels in the example:

Process cell:	Production
Area:	Branches1 to 7, Buffer, Filter, Capacitor, Overview, PCS 7, Premixer, Reactor, Silo, Tankfarm

Unit:	In the Reactor area: R501, R502
Equipment module:	In the R501 area: Add_Water, Dose_Con, MES_Sync_Request, Mix, Standard, Temperature, Xfer_inBuf, Xfer_In_Fil, Xfer_In_Pre
Single control unit:	M50101, R501_MIX_CFC, R501_MIX_SFC

Batch allocations of the levels in the example:

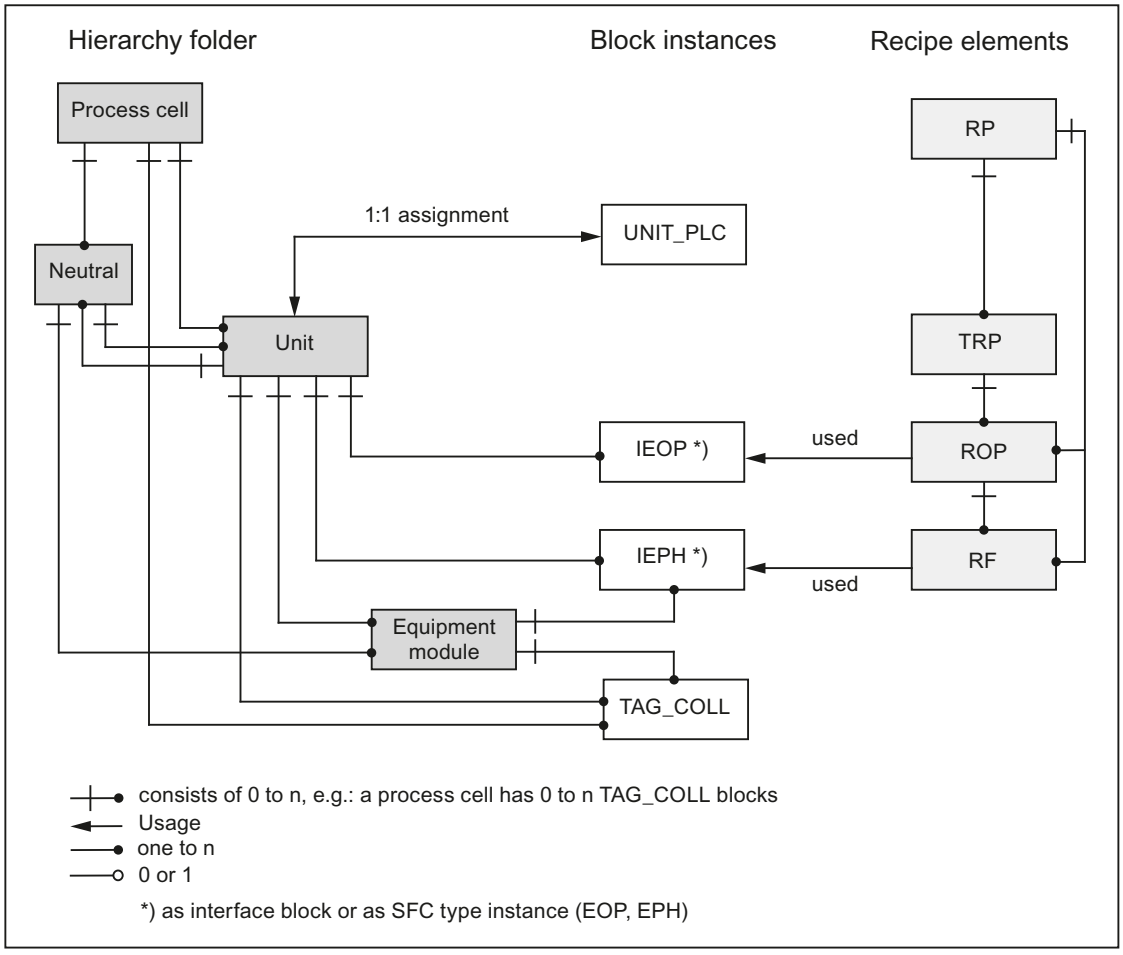
Process cell:	Data types/phase types, unit classes, units of measure
Area:	None (not batch-relevant) Areas are displayed during recipe creation as a filter criterion for unit allocation.
Unit:	Units and possibly equipment phases
Equipment module:	Equipment phases
Single control unit:	None (not batch-relevant)

7.2.3.11 Relationship between plant hierarchy, blocks and recipes

Introduction

For recipe creation and processing, the process cell and unit levels must exist at least once. Whether or not you require the equipment module level depends on how you define the equipment procedural elements.

Relationship between hierarchy folders, block instances and recipe elements for a hierarchical recipe



Legend

Batch hierarchy folder of a process cell:

- Process Cell
- Unit
- Equipment Module
- Neutral folders

Block instances

IEOP	Equipment operation interface
IEPH	Equipment phase interface
UNIT_PLC	Unit status and allocation interface
TAG_COLL	Collection of process values

Recipe elements

Abbreviation	Recipe element
RP (RP)	Recipe Procedure
RUP	Recipe Unit Procedure
ROP (ROP)	Recipe Operation
RP (RPH)	Recipe Phase

7.2.4 Create interfaces for the equipment module

7.2.4.1 Introduction

Interfaces for the equipment module

In Engineering as of V9.0, SIMATIC BATCH provides an additional version of the interface for the equipment module.

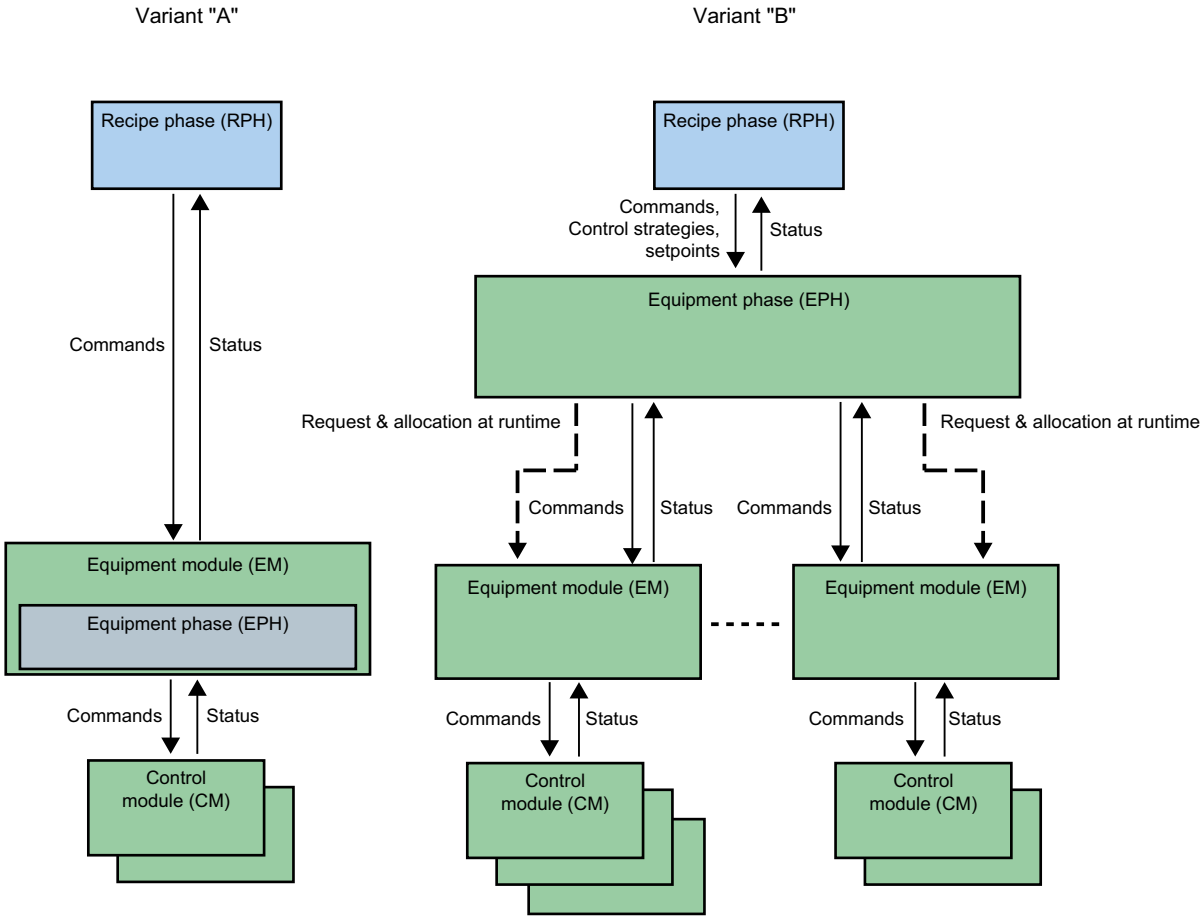
The previous version combines the equipment phase with the equipment module in an object. In this version, the recipes are configured dependent on resources.

With versions as of V9.0, the equipment phase is separated from the equipment module. In this case, an equipment phase can control one or more equipment modules. In this version, the recipes are configured independent of resources.

- Interface for the equipment module
  In this type of configuration, each recipe phase of a control recipe communicates with an equipment module in the automation system during runtime. Both setpoints and process values as well as the current status or control commands are exchanged.
  The equipment module also includes the equipment phase.
  The equipment phase (EPH) or equipment operation (EOP) Batch category can be selected in SFC type of equipment module.
  This version is shown as version "A" in the figure below.
- Versions as V9.0 available: Interface to the equipment phase
  In this configuration example, the equipment phase (EPH) in the engineering system is the assignment partner for the recipe phase (RPH) of SIMATIC BATCH.
  This version is shown as version "B" in the figure below.
  You can find information on this in the manual *Process Control System PCS 7; CFC for SIMATIC S7* in the section "Configuring technology".

As an alternative for reasons of compatibility, SIMATIC BATCH also continues to provide BATCH interface blocks (IEPH/IEOP) as the communications interface to the processing programs on the automation system. These blocks are implemented as CFC blocks and are installed during the SIMATIC BATCH setup.

The following figure shows the different versions:



BATCH interface blocks/unit

A CFC is created for each unit and contains an instance of the UNIT_PLC block with assigned parameter values.

BATCH interface blocks/equipment phase

Communication between SIMATIC BATCH and the equipment phases in the automation system is implemented using own interface blocks (IEPH, IEOP and IEPAR_xxx). An equipment phase is implemented with the IEPH block and an equipment operation using the IEOP block. They are interconnected with the appropriate inputs/outputs of the SFC control block and technological blocks according to the process cell requirements in the CFC charts.

Use of SFC types

To provide better support for the type instance concept, an SFC type (= BATCH type block) with parameters can be created for each equipment phase type. Each BATCH type block is displayed in the "Other blocks" block library or the library of the family assigned to the SFC type (for example Batch) of the CFC and can then be simply inserted in the CFC from there.

Note

Mixed operation possible

Mixed use of both variants (SFC types, BATCH interface blocks) within a project is possible.

Note

Block I/Os

The block I/Os BA_ID_AC for PI/PO (parameters for input materials, parameters, major, minor, intermediate, waste product) at interface modules or "name"_BX (setpoint tracking ID) at SFC types are not used in SIMATIC BATCH.

Note

PC-based mode

In the PC-based mode, SFCs are read on the AS in the 1 s cycle. For this reason, in PC-based mode, the status of the equipment phase may not change faster than once per second. The status may be lost in the BATCH control server if this condition is violated.

Control strategies

Different and (in terms of the same run) mutually exclusive equipment phases/operations of the same equipment module are known as control strategies of this equipment module.

Recipe phases/operations can be implemented with various control strategies (set of setpoints) that can be used in the manual mode or in the automatic mode (recipe mode). To be able to use the control strategies in the automatic mode, the recipe phases/operations must also be capable of the control strategies. The control strategies and their corresponding setpoint parameters are configured in the engineering system in the batch or SFC types. In the Recipe Editor, the control strategies defined in this way are available as a set of setpoints with a control strategy name. During parameter assignment in the recipe, only the parameters belonging to the control strategy are available.

Note

Only one control strategy parameter can be created per operation/phase type.

Placing BATCH blocks in the plant hierarchy

The BATCH interface blocks as well as the BATCH type blocks are stored within the CFC charts according to their function in the appropriate hierarchy folders, in the plant view in the SIMATIC Manager.

Blocks of the BATCH block library

The names of the following BATCH blocks must not be modified:

- UNIT_PLC
- EventSend
- MemIDB64

The BATCH configuration dialog searches the S7 project for the block names listed above in order to be able to make internal project settings. If the names are changed, SIMATIC BATCH cannot be configured correctly.

In CFC charts, only blocks from the "BATCH" block family in the SIMATIC BATCH library may be used and, therefore, imported. If necessary, blocks from the "Runtime" block family in the SIMATIC BATCH library are automatically imported to the "Blocks" folder (offline block folder), but must not be used in the CFC charts.

Note

All SIMATIC BATCH blocks of version BATCHflexible V4 are fully functional in this version but can no longer be changed during engineering. The "IUNIT" and "UNIT_BLOCK" blocks from block library versions before SIMATIC BATCH V7.1 SP2 are also fully functional but can no longer be changed.

See also

Setting up the equipment module with SFC types (Page 176)

7.2.4.2 Optimum installation of the blocks for AS-based mode

Block execution in AS-based mode

The entire recipe control in this mode is controlled by the UNIT_PLC block. To achieve optimum step change times, the following rules must be kept to:

1. The UNIT_PLC block and SFC type, IEPH/SFC, IEOP/SFC must be installed in the same OB. If this is not the case, the recipe unit can nevertheless be executed but the step change cannot be made in the same cycle.
2. Order in which the blocks are called:
   - Block calls for a recipe phase or a recipe operation (SFC type or IEPH/IEOP/SFC)
   - Call for blocks that represent an actuator (for example: VALVE or MOTOR)
   - Call for blocks for controlling the actuators (driver blocks)
   - Call for the blocks for the unit UNIT_PLC

Note

Call from OB 32

Due to the AS cycle time, we recommend you insert all Batch-relevant blocks into OB32 (AS update cycle = 1 sec.). Faster processing does not result in shorter step change times.

If you need the recipe phases to run faster/slower as 1 second due to the process situation, you can also insert the Batch-relevant blocks in a faster/slower OB. Make sure that the UNIT-PLC block does not exceed the OB cycle time when running the recipe unit procedure.

7.2.4.3 Structure of the unit with the UNIT_PLC interface block

The following functions are executed by the BATCH interface block UNIT_PLC:

- Assigning and releasing a unit using a running control recipe.
- Control of the recipe unit procedure in AS-based mode

The UNIT_PLC block manages a unit

Each UNIT_PLC block manages precisely one unit in the automation system. This block is the central block for batch control. The following rules apply when inserting the block:

- To map the unit on the AS, there must be exactly one instance of the UNIT_PLC block in one of the charts of the "Unit" hierarchy folder.
- There are no other settings or interconnections necessary for UNIT_PLC.
- At the "UNIT_NAME" input of UNIT_PLC, the unit name that was defined in the plant hierarchy is always shown. The "UNIT_NAME" input cannot be modified in the block.

Every recipe operation (ROP), equipment phase (EPH) or transition in the assigned unit is checked by this block and the specifications for further processing steps are defined.

The more ROPs, EPHs or transitions included in the recipe, the longer the time needed to process the recipe. To allow the configuration engineer of the process cell to set the optimum allocation of time for running the process (actuators, sensors, process logic etc.) and time for processing recipes, there are two parameters in UNIT_PLC:

- Max_CycleRun IN
  Maximum time per processing cycle that may be used to process batch control The default value is 25 ms and the input of the block is not visibly interconnected.
- QAvgRecProcTime INOUT
  Average time per processing cycle that is currently used to process batch control. Two measured values, the average calculated time of the last cycle + measured value of the current cycle are taken into account for each calculation.

Examples are provided below to show the two parameters. This assumes that only one unit is fitted in the AS.

Example 1: UNIT_PLC installed in OB32 (1000 ms watchdog interrupt), suitable parameter assignment

MaxCyclRun is set to 50 ms		Assessment
approx. 1/20 processing time for batch processing	QAvgRecProTime = 30 to 40 ms	OK
approx. 19/20 processing time for processing processes in the OB 32 and other OBs	QAvgRecProTime = 40 to 50 ms	Still OK
	QAvgRecProTime = 50 to 60 ms*	Not OK

Example 2: UNIT_PLC installed in OB32 (1000 ms watchdog interrupt), suitable parameter assignment

MaxCyclRun parameterized at 100 ms		Assessment
approx. 1/10 processing time for batch processing	QAvgRecProTime = 80 to 90 ms	OK
approx. 9/10 processing time for processing processes in the OB 32 and other OBs	QAvgRecProTime = 90 to 100 ms	Still OK
	QAvgRecProTime = 100 to 110 ms*	Not OK

Example 3: UNIT_PLC installed in OB35 (100 ms watchdog interrupt), acceptable parameter assignment

MaxCyclRun parameterized at 30 ms		Assessment
approx. 1/3 processing time for batch processing	QAvgRecProTime = 10 to 20 ms	OK
approx. 2/3 processing time for processing processes in the OB 35 and other OBs	QAvgRecProTime = 20 to 30 ms	Still OK
	QAvgRecProTime = 30 to 40 ms*	Not OK

Example 4: UNIT_PLC installed in OB35 (100 ms watchdog interrupt), bad parameter assignment

MaxCyclRun is set to 50 ms		Assessment
approx. 1/2 processing time for batch processing	QAvgRecProTime = 30 to 40 ms	OK
approx. 1/2 processing time for processing processes in the OB 35 and other OBs	QAvgRecProTime = 40 to 50 ms	Still OK
	QAvgRecProTime = 50 to 60 ms*	Not OK

* Recipe processing cannot be undertaken in a processing cycle but must instead be split over two processing cycles. The system thereby extends the batch runtime by one processing

cycle (in examples 1 and 2: 1000 ms; in examples 3 and 4: 100 ms) if the time set for the "MaxCyclRun" parameter is exceeded in a processing cycle.

Note

We recommend that you install the UNIT_PLC block in OB32 (1000 ms watchdog interrupt). *Only if equipment phases are installed for example in OB35 does the UNIT_PLC belonging to this EPH also need to be installed in OB35.* The UNIT_PLC should always be processed after the equipment phases.

Installation in OB35 brings no benefits in terms of the speed with which the recipes are processed because batch processing is handled by internal control mechanisms regardless of the OB cycle.

Note

Temporal processes are shown in a schematic representation

To simplify the matter, the above examples show the temporal processes for one unit per AS. However, there are normally several units active at the same time in an AS. To establish the time required of an AS for batch processing, the average processing time ("QAVGTecProTime" parameter) of all units must be added together.

Example 5: 6 UNIT_PLCs are processed at the same time in OB 32

MaxCyclRun is set to 50 ms	
QAvgRecProTime = 20 to 40 ms per UNIT_PLC	
Cycle time required per AS, maximum 240 ms	In practice, an average AS load resulting from the 6 units in the example is approximately 80 ms.

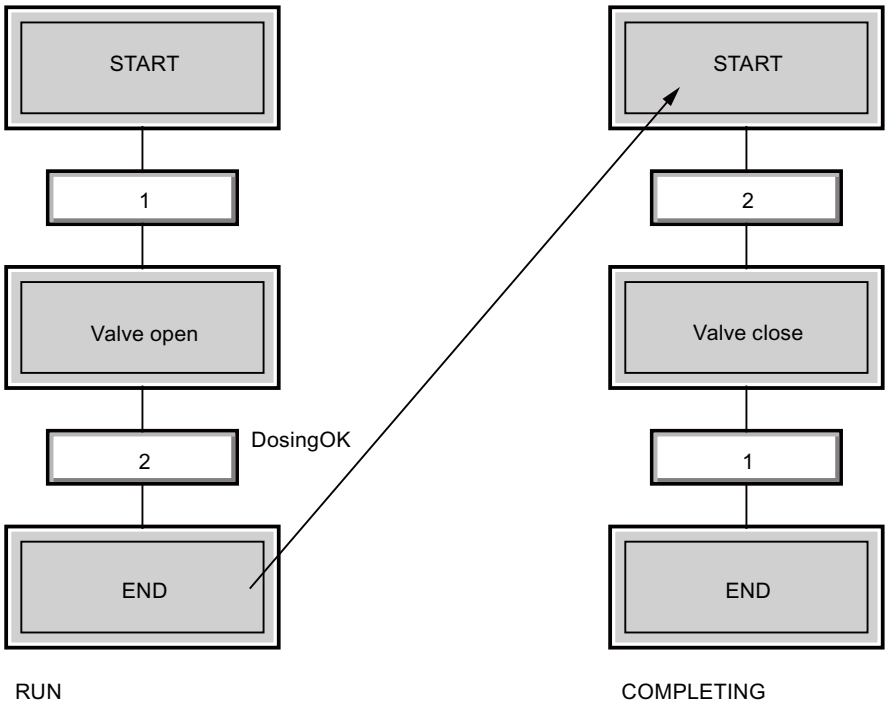
7.2.4.4 Self-terminating equipment phases

Definition

Self-terminating equipment phases are sequences that end with a process condition, in other words, the end of the RUN sequence independently starts the COMPLETING sequence.

Example: Dosing

The RUN sequence of the "Dosing" phase ends when the dosing quantity is achieved and then independently starts the first step of the COMPLETING sequence. The equipment phase is executed after the start command and moves through the sequences STARTING-RUN-COMPLETING-COMPLETED triggered by conditions that depend on the process and not on operator intervention or SIMATIC BATCH.



The property "self-terminating or non-self-terminating equipment phase" can be configure at the SFC type for all instances or at all SFC instance blocks. This involves the block input contact "SELFCOMP".

SELFCOMP=1: Self-terminating equipment phase

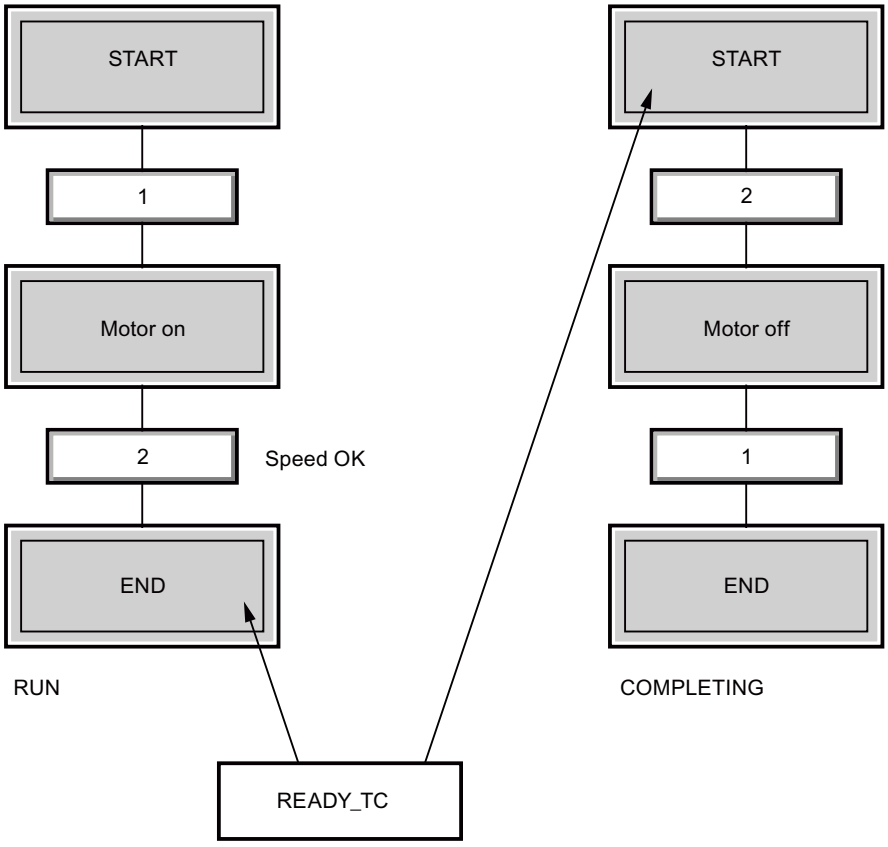
7.2.4.5 Non-self-terminating equipment phase

Definition

Non-self-terminating equipment phases are sequences that are not completed by a process condition. The end of the RUN sequence is only reported (Ready_TC) so that this equipment phase can be completed by an external command. This command can given either by the operator using the "Close" in the SFC faceplate or by SIMATIC BATCH with the "Close" command.

Example: Agitation

The RUN sequence of the "Agitation" equipment phase is started. When the agitator has reached its setpoint speed, the RUN sequence ends and the equipment phase reports that it has completed. The "COMPLETING" step can only be started by external command from the operator or from SIMATIC BATCH.



As long as no external complete command has been issued, the equipment phase remains in the RUN sequence (RUN status), which means that the RUN sequence is started once again. If you only want the RUN sequence to be executed once and not cyclically, you must make the following settings in the sequence properties in the "Start Condition" tab.



The property "self-terminating or non-self-terminating equipment phase" can be configure at the SFC type for all instances or at all SFC instance blocks. This involves the block input contact "SELFCOMP".

SELFCOMP=0: Non-self-terminating equipment phase

7.2.4.6 Setting up the equipment module with interface blocks IEPH and IEOP

SIMATIC BATCH block library

All the necessary BATCH blocks for the two modes are contained in the SIMATIC BATCH block library. The documentation in the form of a PDF file is available under START > SIMATIC > Documentation > English > SIMATIC BATCH. You can obtain direct help for each individual block with the F1 key in the SIMATIC Manager in CFC when the BATCH block is selected in the relevant library. The BATCH interface blocks are inserted in the CFC charts by dragging them from the BATCH block library.

Overview of the BATCH interface blocks

Block	Application
IEPH	Control of simple processes
IEOP	Control of complex processes
UNIT_PLC	Management of unit allocation
TAG_COLL	Collecting of process values for archiving, report creation and forming transitions
IEPAR_DINT	Parameter block for the data type **double integer**
IEPAR_BOOL	Parameter block for the data type **Boolean** (binary)
IEPAR_REAL	Parameter block for the data type **real** (floating point)
IEPAR_STR	Parameter block for the data type **string** (text)
IEPAR_PI	Parameter block for the data type **process input**(input material)
IEPAR_PO	Parameter block for the data type **process output**
IEPAR_ENUM	Parameter block for the data type **enumeration type** (user-defined enumeration type)
IEPAR_SOURCE	Parameter block for the data type **Source**
IEPAR_DEST	Parameter block for the data type **Dest**
IEPAR_VIA	Parameter block for the data type **Via**

Equipment module

Using the BATCH interface blocks along with SIMATIC BATCH, makes the following functions available:

- Controlling the running of the process:
  The IEPH/IEOP blocks are used for this purpose. These provide the commands (for example start or hold) of the recipe steps from the batch control to the processing blocks (for example: SFC external view or user blocks). The processing blocks report their current statuses back to the batch control.
- Transferring setpoints and process values:
  The IEPAR blocks are used for this purpose. The batch control writes the recipe parameters (setpoints) for the processing blocks into these blocks. The processing blocks write the result data (process values) to the IEPAR blocks so that they can be stored as batch data by the batch control. The IEPAR blocks linked to the IEPH/IEOP blocks are also used to form transition conditions.

SFC optimization in conjunction with the IEPH block

The IEPH block forms a BATCH interface in the automation system. An SFC chart is interconnected with the IEPH. You also have the option of developing your own blocks to take over tasks from an SFC.

In terms of timing, optimum processing of step changes can only be achieved in conjunction with an SFC type or an IEPH/SFC pair. SIMATIC BATCH supports the use of a user block with the IEPH, but this can lead to a longer step change time under certain circumstances.

Rules for the interface blocks IEPH/IEOP

- The IEPH, IEOP interface blocks for controlling the process must be inserted in sequences before the processing block in the CFC chart.
- The IEPH block is used with a recipe step of the type equipment phase, the IEOP is used with a recipe step of the type equipment operation.
- The phase/operation type name is derived from the F_TYPE input of the IEPH/IEOP block.

Rules for interconnecting the IEPH/IEOP interface blocks and the SFC chart

- To pass control commands from SIMATIC BATCH to the SFC, the following interconnections between IEPH, IEOP and the SFC external view must be configured:

IEPH/IEOP		SFC external view	
QBA_EN	(OUT)	BA_EN	(IN)
VSTEP_NO	(OUT)	STEP_NO	(IN)
VBA_ID	(OUT)	BA_ID	(IN)
VBA_NAME	(OUT)	BA_NA	(IN)
Q_OCCUPI	(OUT)	OCCUPIED	(IN)
QSTART	(OUT)	START	(IN)
QHOLD	(OUT)	HOLD	(IN)
QSTOP	(OUT)	STOP	(IN)
QABORT	(OUT)	ABORT	(IN)
QRESET	(OUT)	RESET	(IN)
QTERM	(OUT)	COMPLETE	(IN)
QCONT	(OUT)	CONT	(IN)

- The equipment procedural element must return the actual status to SIMATIC BATCH. This requires the following interconnection:

SFC external view		IEPH/IEOP	
BA_STATE	(OUT)	USTAT_L	(IN)

- The IEPH and IEOP blocks map the RESUME command to the START command. The RESUME I/O remains unconnected. The SFC chart interprets START independent of its actual status as START or RESUME respectively.

Note

Rule for automatic mode

To allow the commands of the BATCH control server to be processed in automatic mode, the following inputs ENSTART, ENCOMPLETE, ENHOLD, ENRESUME, ENABORT, ENSTOP, ENRESET must remain unconnected in the interface block and their value set to 1.

Note

Continuous mode

For continuous operation of the equipment procedural element (continue mode), the following inputs ENASTART = 1 and SELFCOMP = 0 must be set in the SFC.

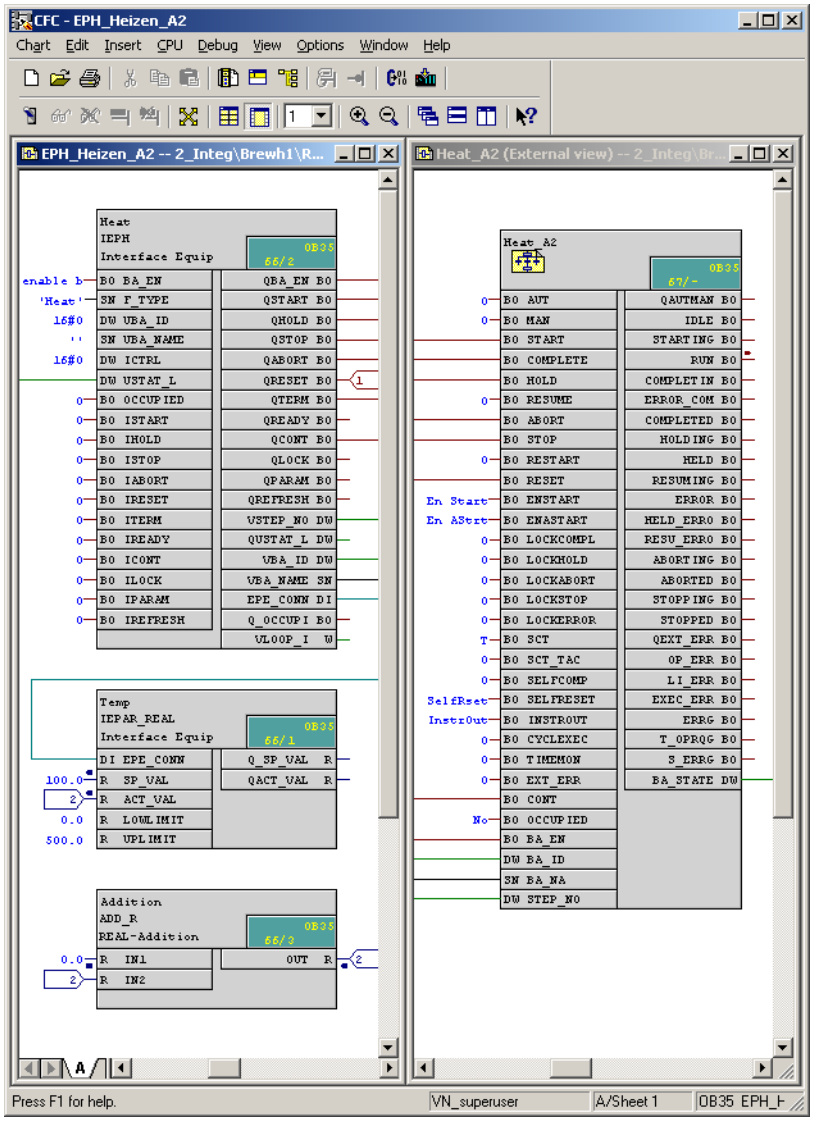
Rules for installing parameter blocks

- The underlying parameter blocks (IEPAR_xxx) must be connected to the EPE_CONN output of the IEPH/IEOP blocks. The following parameter types are possible:

IEPAR_REAL	Floating point
IEPAR_DINT	Integer
IEPAR_BOOL	Binary value
IEPAR_PI	Input material
IEPAR_PO	Output material
IEPAR_STR	String
IEPAR_ENUM	Enumeration
IEPAR_DEST	Target
IEPAR_SOURCE	Source
IEPAR_VIA	Via

- Exactly one IEPAR block for the required data type is necessary for each parameter (setpoint/process value) of an IEOP/IEPH.
- With the IEPAR_ENUM enumeration time, the data type name is specified at the "ENUM" block I/O. In the batch types, the values are assigned to this data type (for example 1 = ON / 2 = OFF etc.).
- In all IEPAR blocks (apart from the BOOL and ENUM type) the high and low limit value and the default setpoint must be specified. The default value must be within the limits.

Example



Configuring enumerations and control strategies with IEPH, IEOP

1. Insert a new enumeration in the Shared declarations > Enumerations folder.
2. Add new values to the enumeration.
3. Open the object properties for the enumeration and activate the check box "Control strategy".
4. In the CFC Editor, connect the IEPAR_ENUM block to the required IEPH/IEOP. Interconnect the "EPE_CONN" output of the IEPH/IEOP block with the input of the same name on the IEPAR block.
5. Open the "SP_VAL" input object properties of the ENUM block I/O and select the enumeration and values.

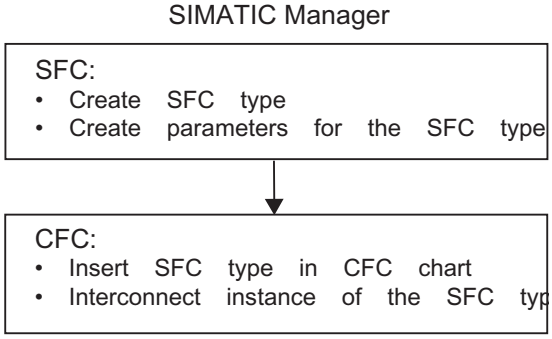
Result: After reading in the type description in the BATCH configuration dialog with the "Generate" button, the control strategies you edited in this way are indicated by a red flag and displayed under data types.

7.2.4.7 Setting up the equipment module with SFC types

You create SFC types and their instances in the CFC charts for SIMATIC BATCH using SFC/CFC standard tools. SIMATIC BATCH does not need to be installed.

Configuring an SFC instance

Below, you will find a recommended order for creating an SFC type (equipment phase) and an instance in the CFC chart.



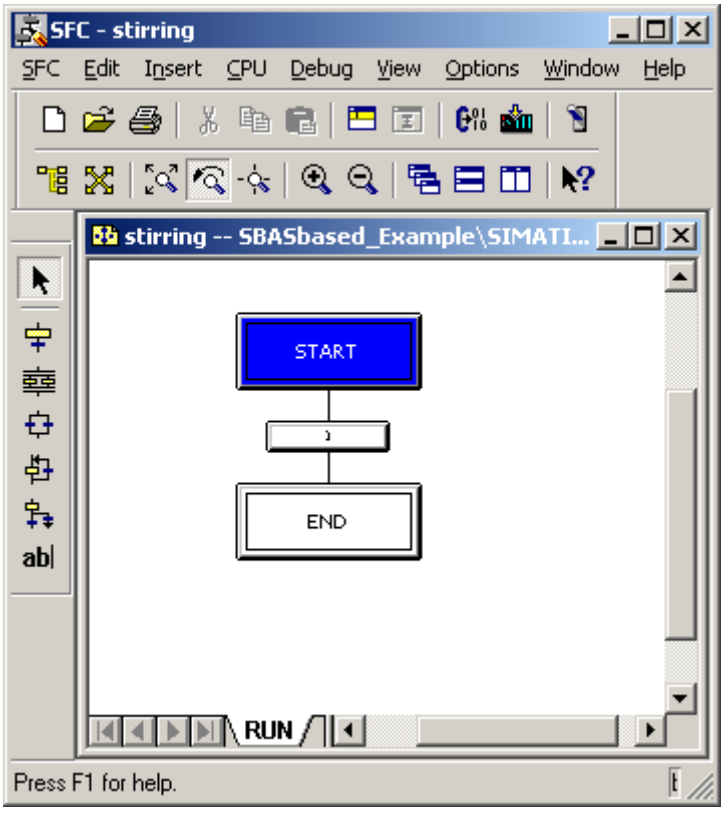
Creating an SFC type in the SIMATIC Manager (component view)

1. Select the "S7 Program" object in the Component view.
2. Select the menu command Insert > Insert new object > SFC type.
3. Select the new object "SFC type".
4. Select the menu command Edit > Object properties.
5. The "Properties SFC Type" dialog box opens.
   - Under Name, change the phase/operation type name (batch type).
   - You can also enter the required number for the FB number and the name of the block library for the family.
   - Change to the "Options" tab.
   - Under Category, set the version "EOP" or "EPH" and whether this operation type/phase type is allowed as an operator instruction.

   Note

   The "EOP" or "EPH" setting is necessary to generate the type description in the BATCH configuration dialog. Only SFC types of one of these two categories are read into the batch process cell in the BATCH configuration dialog using the "Generate batch types" function.

6. Select the menu command Edit > Open object.
   Result: SFC opens with the new SFC type.



7. Here you can use the standard SFC tools to edit the sequential control of the equipment operation/phase.

Overview of the parameters relevant for SIMATIC BATCH

Parameter	Where to edit	Meaning
Setpoint	Under Characteristics > Set-points	Parameters of the equipment operation/phase. You can assign predefined control strategies.
	Under Characteristics > Set-points > Data type	BOOL (binary) data type
		INT data type (integer 16 bits)
		DINT data type (double integer 32 bits)
		REAL data type (floating point)
		STRING data type (text)
		PI data type (process input, input material)
		PO data type (process output, output material)
		SOURCE data type
		DEST data type
		VIA data type
Control strat-egies	Under Characteristics > Control strategies	Control strategy name

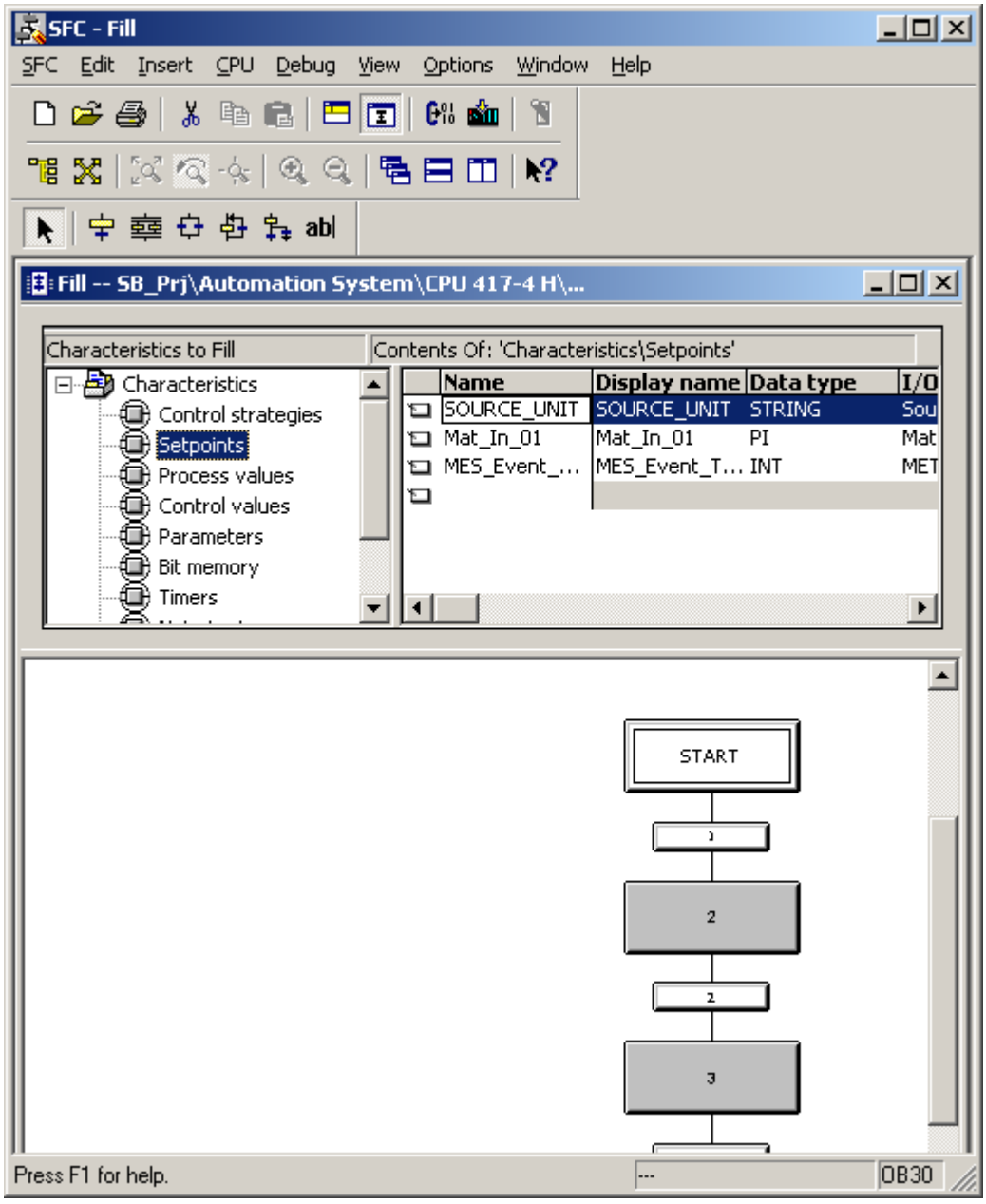
Note

An enumeration data type can be assigned in the "Enumeration" column for the INT and DINT data types. This is stored as the system attribute "S7_enum" on the interface I/Os.

No entries can be made in the "Enumeration" column. The enumerations available for selection are those previously created in the SIMATIC Manager under the "Shared Declarations" object. The enumerations are then available for operator control and monitoring of SFC instances in SIMATIC BATCH.

Creating parameters or setpoints for the SFC type

You create setpoints (parameters) that are relevant for SIMATIC BATCH in the characteristics view in SFC:



1. Select the created object "SFC type" in the chart folder.
2. Select the "Open object" command in the shortcut menu. SFC opens the SFC type.

3. Change to the "Characteristics" view with the menu command of the same name. The "Characteristics" view opens.
4. Here, you edit all the setpoints relevant for SIMATIC BATCH To do this, select "Setpoints" in the left-hand column. On the right, you can now set the setpoint with all the relevant attributes.

Creating control strategies

When you configure the SFC type, you can specify the control strategy type to be valid for this equipment phase/operation using the characteristics function. In addition to this, the amount of parameters can also be put together based on the setpoints for each control strategy.

1. Select the created object "SFC type" in the chart folder.
2. Select the "Open object" command in the shortcut menu. SFC opens the SFC type.
3. Change to the "Characteristics" view with the menu command of the same name. The "Characteristics" view of the selected SFC type opens.
4. Here, you edit all the control strategies relevant for SIMATIC BATCH by clicking on the "Control strategy" characteristic in the left column. Result: All setpoint values of the SFC type are displayed in a separate table column on the right for the newly edited control strategies.
5. Choose the setpoints that are to be assigned to the control strategy by selecting the check boxes.

Note

The control strategy type name must correspond to the SFC type name

If you implement equipment phase types and their instances both from interface blocks and as SFC types, the control strategy type name created in the shared declarations would have the same name as the SFC type name. If this is not the case, this can lead to validation errors in the BATCH configuration dialog. The name of the control strategy type must not be modified later.

Instantiating the SFC type

After creating the SFC type and storing it, the SFC type can now be dragged to the CFC chart from the "Other blocks" library or the family assigned to the SFC type (for example Batch). At the same time, the type FB is copied to the project or if it already exists, it is updated. A DB is created and therefore an instance of the SFC type. Remember the following rules:

- The SFC types in a chart container are displayed in CFC in the catalogs under "Other blocks" or in the family assigned to the SFC type (for example, Batch).
- If you create an instance of the SFC type, the SFC type (including the FB) is copied to the project (chart container).
- After placing the SFC instance in a CFC chart, it can be interconnected.
- The SFC instance is not displayed in the chart container (only the CFC chart).
- The SFC instance is displayed in the CFC chart like a block with an interface.

- If you select an instance of this type, you can open and edit it within the CFC chart using the "Open" shortcut menu command.
- The interconnection is possible with the control module level (CMs), the interlock logic and batch control.
- In the SFC, in addition to the name of the operation/phase type parameter, an I/O name must be specified for the SFC type in the characteristics view for setpoints. One setpoint results in several block I/Os:

I/O name		Meaning
<name>	(IN)	Setpoint from SIMATIC BATCH or PCS 7 OS
<name>_Q	(OUT)	Setpoint (valid value for SFC)
<name>_AI	(IN)	Process value return input for process value
<name>_ AO	(OUT)	Process value for SIMATIC BATCH and PCS 7 OS
<name>_M	(IN)	Material code setpoint from SIMATIC BATCH*
<name>_MQ	(OUT)	Material code (valid MatCode for SFC)*
<name>_MAI	(IN)	Material code process value return input*
<name>_MAO	(OUT)	Material code process value for PCS 7 OS*
<name>_B	(IN)	Reserved for batch ID, currently not used*
<name>_BQ	(OUT)	Reserved for batch ID, currently not used*
<name>_BAI	(IN)	Reserved for batch ID, currently not used*
<name>_BAO	(OUT)	Reserved for batch ID, currently not used*

* Only for PI or PO data types

- The following block I/Os exist for the control strategy:

I/O name		Meaning
CS	(IN)	Control strategy setpoint from SIMATIC BATCH or PCS 7 OS
QCS	(OUT)	Control strategy (valid control strategy for SFC)

- Set Enable bits in SFCs

Rules for supplying the equipment procedural elements with Batch data

Equipment procedural elements controlled by SIMATIC BATCH must be supplied with the Batch data. The faceplates on the PCS 7 OS then indicate whether this equipment procedural element is being used by SIMATIC BATCH and which batch is running. The batch name and the batch ID are included in the messages to the PCS 7 OS.

To allow this, the five following interconnections must be configured:

SFC type	Automation function for example MEAS_MON, MOTOR...
QBA_EN	BA_EN
QOCCUPIED	OCCUPIED
QBA_ID	BA_ID
QBA_NA	BA_NA
QSTEP_NO	STEP_NO

Note

Rule for automatic mode

To allow the commands of the BATCH control server to be processed in automatic mode, the following inputs ENSTART, ENCOMPLETE, ENHOLD, ENRESUME, ENABORT, ENSTOP, ENRESET must remain unconnected in the SFC type and their value set to 1.

Note

Continuous operation

For continuous operation of the equipment procedural element (Continue mode), the following ENASTART = 1 and SELFCOMP = 0 inputs must be set in the SFC.

7.2.4.8 Setting up process tags with the TAG_COLL interface block

The following functions are executed by the BATCH interface blocks TAG_COLL and IEPAR_xxx:

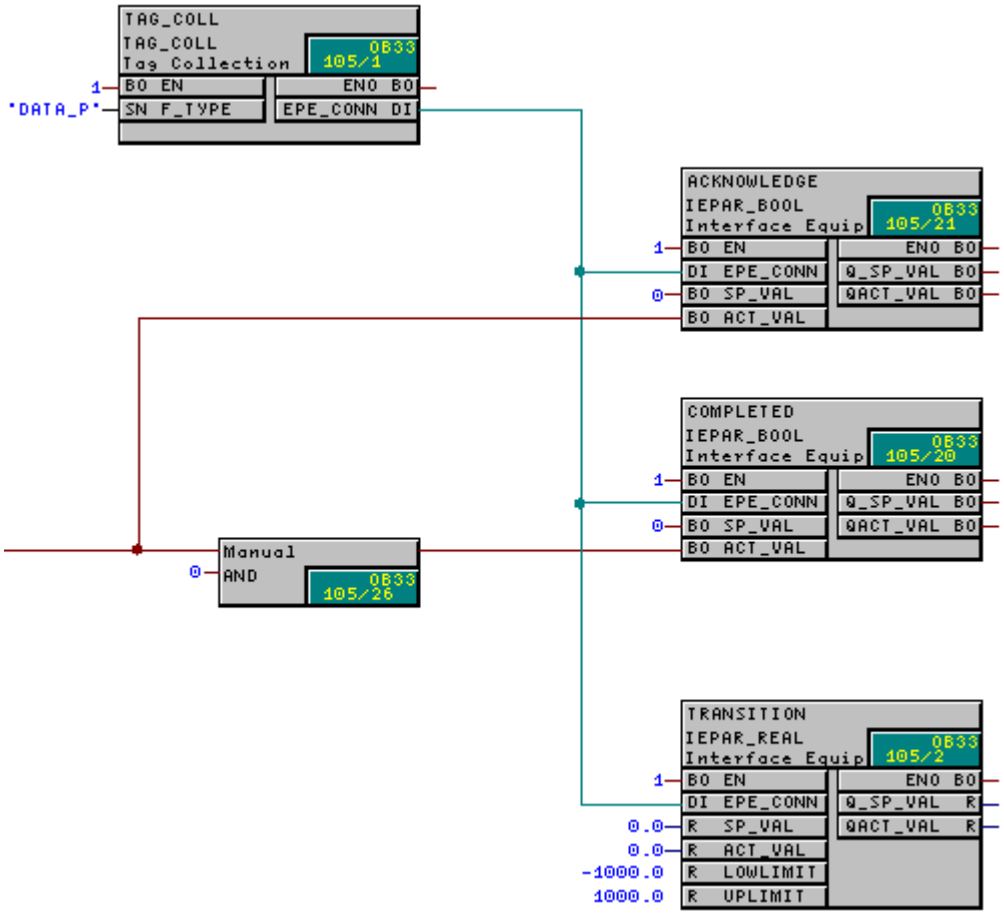
- Collection of process values for forming transition conditions
- Process value archiving and report creation

Rules for interconnecting in the CFC charts

The TAG_COLL and IEPAR_xxx blocks form a process tag for which the following rules apply:

- If process values of IEPAR blocks are queried in transitions and these are not available as IEPAR_xxx in the IEPH or IEOP, a TAG_COLL must be inserted in the CFC chart. This is, for example, the case when values of other units are queried.
- The parameter blocks (IEPAR_xxx) must be connected to the EPE_CONN output of the TAG_COLL block.
- A process tag type name must be specified for each TAG_COLL.
- TAG_COLL blocks must be installed in a PH folder with an S-88 type definition (process cell; unit; equipment module).
- The process tag type name is derived from the F_TYPE input of the TAG_COLL block.
- The process tag parameter name is derived from the IEPAR_xxx block name.

Example



7.2.5 Dynamic unit parameters

Core statement

Dynamic unit parameters allow you to define and evaluate properties of units. They are used as parameter steps and as transitions in basic recipes, and are evaluated or further used during the runtime of a batch. SIMATIC BATCH transfers parameter values to the unit and can react to them during batch execution.

In transitions you define conditions that must be met by the value of a variable. This means you can configure transition conditions in the recipe sequence in which, for example, unit candidates are selected and allocated.

You can use dynamic parameters in two ways in SIMATIC BATCH batch control:

- Units are given properties in form of setpoints during batch control.
- Unit selection during batch control takes place by means of conditions, for example, in which the dynamic unit properties are queried in form of process values.

Engineering technology

In SIMATIC Manager, the central place for configuration is Basic and BATCH engineering.

You create the enumerations and control strategies for your project in the global declarations.

The unit block "UNIT_PLC" was extended by the new inputs "UnitStatus" and "L_UnitStatus". These inputs have "S7_Enum" attributes and can be linked to a set of enumerations. All units must be connected with the same enumeration. The "UnitStatus" input can be modified by a PCS 7 OS or by means of the SIMATIC BATCH batch control. The "L_UnitStatus" input is coupled with the user program in the AS and you can use it with its own logic. The "En_LinkedUnitStatus" input blocks the "UnitStatus" input and activates the "L_UnitStatus" input. The "Q_UnitStatus" block output shows the current status of the corresponding unit.

You use enumerations at the "UNIT_PLC" block "UnitStat" input. You can use them to define a status for a unit with a parameter step of batch control.

You use control strategies at the "IEPAR_ENUM" block, for example, at the "SP_VAL" input. To do so, the "EPE_CONN" output of "UNIT_PLC" must be interconnected with the input of the same name at the "IEPAR_ENUM" block. You use batch control to define and continue to use the control strategy at the "SP_VAL" input.

The control strategies of equipment properties are assigned to the corresponding parameters (IEPAR_XXX) in BATCH engineering. Only the selected control strategy parameters are then taken into consideration during batch control. After generation or propagation of the BATCH types, the compilation or merging of batch instances and the download of the batch process cell, the global declarations are available for recipe engineering in the recipe editor after updating your batch process cell.

User interface

The setpoint and the current process value are displayed in the unit faceplate of a PCS 7 OS. The displayed parameters are filtered according to the selected allocation strategy, if available. Similar to the setpoints of recipe functions (EPH, EOP), you can change the setpoints for dynamic units using the faceplate.

Requirement

You are using the current block types from the SIMATIC BATCH block library in your project. Check to see if the unit block "UNIT_PLC" includes the inputs "UnitStat" and "EPE_CONN". If the unit block does not exhibit these I/Os, you must update your block types or make the corresponding I/Os visible.

Additional information

Assigning control strategies (Page 219)

How do I configure and create dynamic unit parameters? (Page 747)

7.2.6 Creating and inserting user process tag types in CFC charts

7.2.6.1 Creating and inserting user process tag types in CFC charts

Introduction to creating and inserting user process tag types in CFC charts

There are two ways to collect measured values, for example to form transition conditions:

- Using the BATCH interface block TAG_COLL (as in BATCH *flexible* V5.x)
- Using the standard function block TAG_COLL, given the name TAG_COLLECT below to distinguish the two (new in SIMATIC BATCH as of V6.0)

Individual measured values are created in the interface or standard function block. The process tag types are then generated in the BATCH configuration dialog within the context of the batch types ("Generate" button) from the TAG_COLL/TAG_COLLECT blocks.

Using the TAG_COLL BATCH interface block

When using BATCH interface blocks, the TAG_COLL block is used to collect process values to form transition conditions and for archiving and report creation of measured values: For a description, see section Rules for the TAG_COLL interface block (Page 182). The process tag types that are then generated can be further processed and modified in the BATCH configuration dialog.

Using the TAG_COLLECT function block

If you configure with SFC types it is advisable to configure a TAG_COLLECT standard function block to collect process values. The process tag types that are then generated are read-only in the BATCH configuration dialog. Modifications to the process tag type can only be made in the function block. These are then adopted in any existing instances. After modification, the batch types and the process tag types must be generated again.

Note

Points to note:

- To allow a TAG_COLLECT FB/FC type to be read into the BATCH configuration dialog (generated) for the process cell, an instance of the TAG_COLLECT must have been created at least once in the CFC chart.
- FB types are unique only within an S7 program or a CPU. For Batch configuration, however, the uniqueness throughout the entire project or the multiproject must be ensured.

7.2.6.2 First option: Create new function block

There are two ways of creating process tag types:

- Option 1: A new FB is created immediately.
- Option 2: A new CFC chart is created and then compiled as a block.

Option 1: Creating process tag types directly as the FB type TAG_COLLECT

1. In the Component view of the SIMATIC Manager, create a new function block in an S7 program or a block folder by selecting the menu command **Insert > Insert new object > Function Block**.
2. Select the function block and select the menu command **Edit > Open object**.
3. Here, you can edit all the values to be be collected as measured values as input parameters.

   Note

   Use only the data types permitted with SIMATIC BATCH:

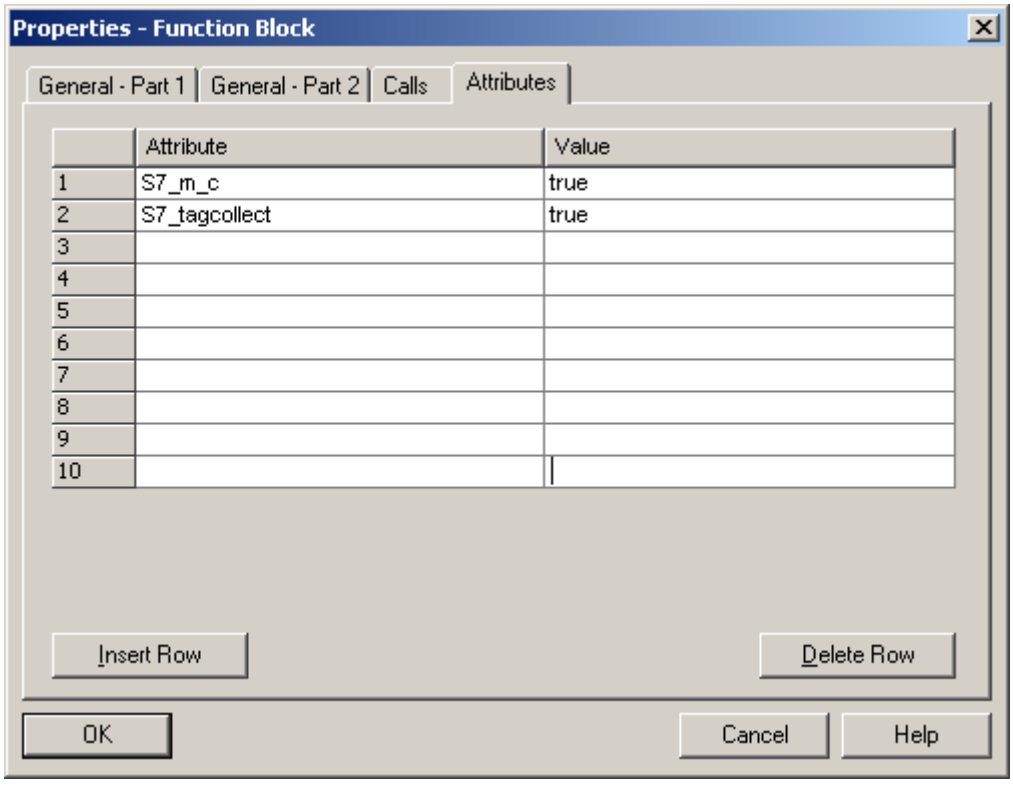
   Bool, Int, Dint, Real and String.

4. Assign the parameters the following attributes:
   - If nec. S7_unit = value "Unit of measure". Unit of measure corresponds the name of the unit of measure.
   - S7_edit = value "para" for display and change in the Process Object view.
   - S7_measval = value "true" for archiving without automatic assignment of an archive tag

   or optionally

   - S7_archive = long-term or short-term for archiving with automatic assignment of an archive tag.
5. Select the function block and select the menu command **Edit > Object properties**.
6. Assign a symbolic name to the FB.
7. Go to the "Attributes" tab in the open properties dialog of the function block.

8. Here, set the attribute "S7_tagcollect" (process tags) to "true" and the attribute "s7_m_c" to "true". Only then will the archiving parameters be sent to the PCS 7 OS and become available for operator control and monitoring.



9. Open the corresponding block and check if the "S7_m_c" attribute is set to "true" for the inputs. Navigate to the appropriate inputs in the tag overview and right-click to open the object properties. The "S7_m_c" attribute must exist in the "Attributes" tab and be set to "true".
10. Apply the attributes with "OK".
11. Open the CFC chart and insert the function block from the "S7 Program" folder into a CFC chart.
    Result: The TAG_COLLECT FB type appears in the "Other blocks" library or in the library of the family assigned to the FB (for example: Batch) and can be immediately used for configuring additional process tag types.

    Note

    The FB type TAG_COLLECT must be stored in the library, for example under "Other Blocks" so that the process tag types created in this way can be generated in the BATCH configuration dialog.

12. Open the BATCH configuration dialog with the menu command **Options > SIMATIC BATCH**.
13. Select the "Batch types" object in the left window.

14. Click the "Generate" button in the area on the right.
    Result: The new process tags that you have defined along with the set values (input parameters) are read in and displayed (read only).
15. Confirm all settings in the dialog with OK.

Result

These process tags are available for use in the transitions during recipe creation. If the "S7_measval" or "S7_archive" attribute is set for the parameters and the interconnection to the WinCC archive is established for the "Process variables" assigned to the units, they can be used in the "Process tags" tab for batch reports during recipe creation.

Note

If the attribute "S7_m_c = true" is not set for the input of the TAG_COLLECT function block, the output of the interconnected block is used if the output has the attribute "S7_m_c = true".

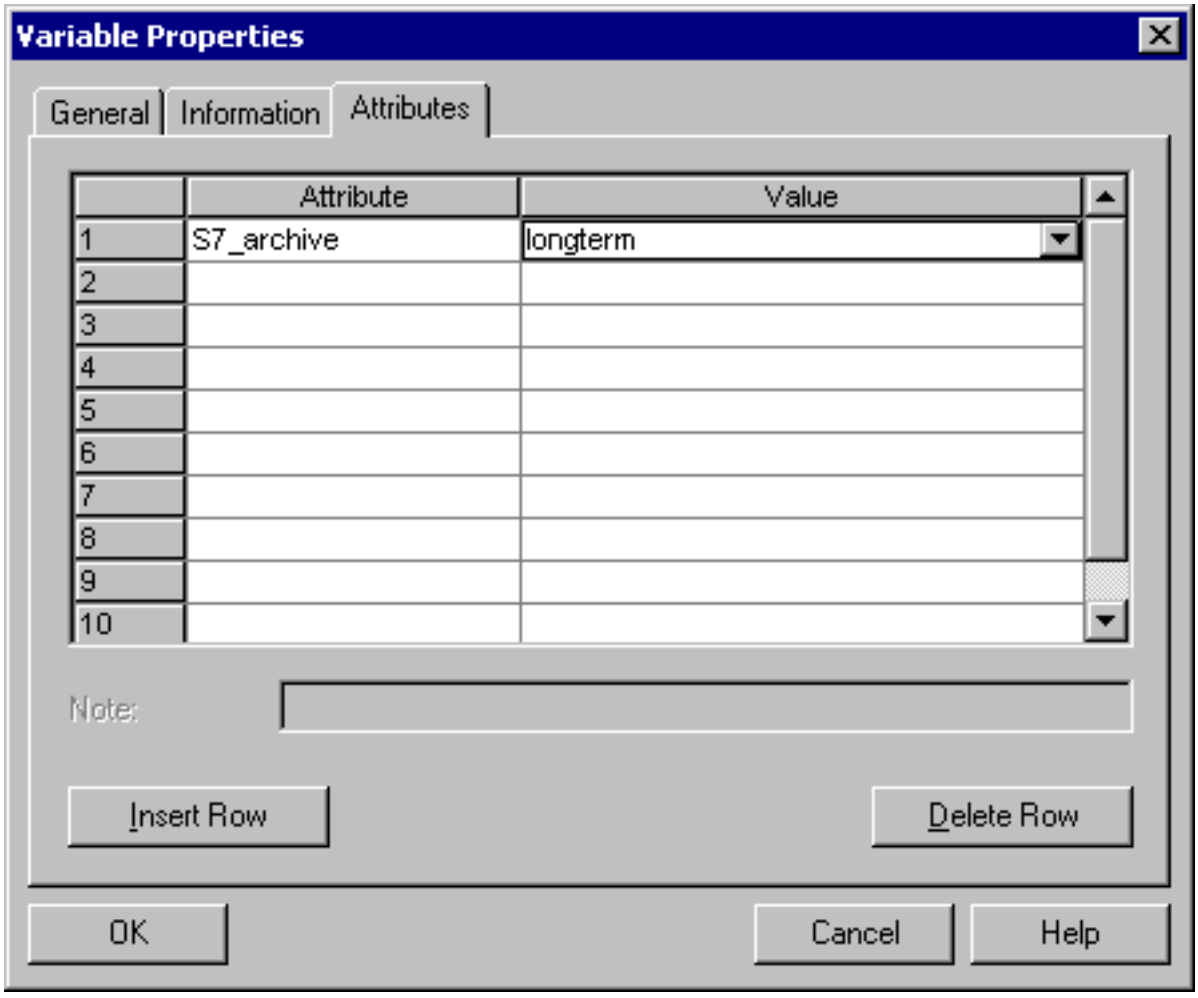
7.2.6.3 Second option: Create CFC chart and compile it as a block type

Procedure

1. In the Component view of the SIMATIC Manager, create a new CFC chart below a chart folder by selecting the menu command **Insert > Insert new object > CFC**.
2. Select the CFC chart and select the menu command **Edit > Open Object**.
3. Open the I/O table with **View > Chart Inputs/Outputs**.
4. Here, you can edit all the values that will be collected as measured values as input parameters under **IN**.

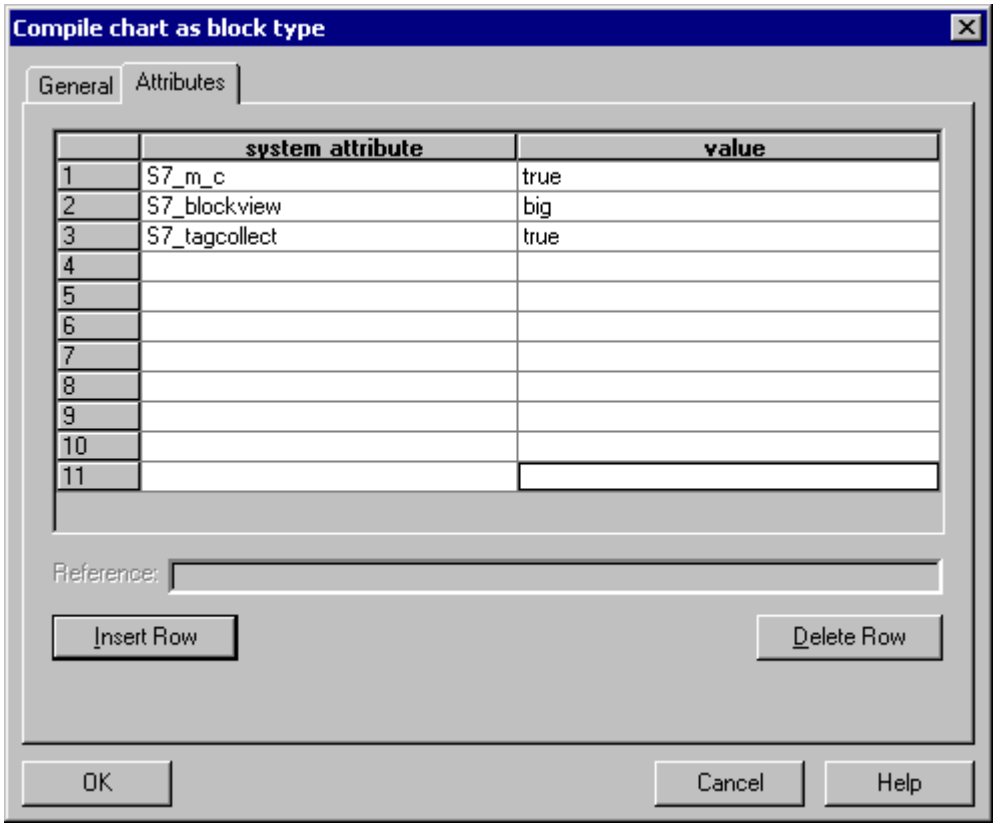
5. Assign the parameters the following attributes (in the dialog box "Properties - Variable" for the parameter: select with a right-click and use the shortcut menu command "**Object Properties**"):
   - S7_check = true for check and "S7_unit = unit* (unit corresponds to the name of the unit).
   - S7_edit = para for the display and change in the process object view.
   - S7_measval = true for archiving without automatic assignment of an archive variable

   or alternatively
   - S7_archive = longterm or shortterm for archiving with automatic assignment of an archive variable.



6. Confirm the settings with OK.
7. Select the menu command **Chart > Compile > Chart as Block Type**.
8. In the "General" tab, specify the following: FB name, symbolic name and the family (for example, BATCH)
9. Change to the "Attribute" tab.

10. Here set the attribute "S7_tagcollect" (process tags) to "true" and in the case of automatic assignment of an archive variable also set the attribute "s7_m_c" to "true". The parameters for archiving will only be transferred into the PCS 7 OS, and only be observable and operable if this has been done.



11. Accept the setting with "OK".

Result

The FB type TAG_COLLECT you have created can be used immediately for configuring other process tag types. The procedure from now on is exactly the same as in Method 1 starting at Step 9.

7.2.7 Equipment properties and their use

7.2.7.1 Introduction

Why are equipment properties defined?

In previous versions, you selected the possible unit candidates statically. This meant that selecting the available units in which a recipe procedure was to be executed in the recipe editor when creating a recipe. You can continue to use this procedure.

You now have the additional option of employing a new strategy, "Unit selection according to conditions". Specific equipment properties are demanded in the conditions, for example, the size of the unit (capacity of a silo) or the material composition of the silo shell.

Equipment properties are assigned to units in the ES configuration and requested as conditions when creating recipes. When the equipment property matches the defined condition in the recipe, the unit is offered for allocation.

See also

Specifying units using conditions (Page 560)

7.2.7.2 Creating equipment properties

Requirement

The "Shared declarations" folder with the subfolder "Equipment properties" already exists in the project in the SIMATIC Manager.

Procedure

1. Select the "Shared declarations" folder. In the shortcut menu, select **Insert new object > Equipment property**.
2. Name the equipment property (name and display name).
3. From the drop-down list, select the desired data type and assign it an enumeration or unit of measure. For the "Location" data type, assign the additional types "Source", "Destination" and "Via". You will find more detailed information about these types in the documentation for Route Control.
4. Complete your specifications in this dialog and confirm your entries with "OK".

Result

You can now assign this equipment property to your units. If you are working in a multiproject, you can adjust your created equipment properties in the MP with the command **Shared Declarations > Update in Multiproject**.

7.2.7.3 Assigning equipment properties to the units

Requirements

- The equipment properties have been created.
- The Plant view is displayed in the SIMATIC Manager.

Procedure

1. Select the hierarchy folder of the unit to which you want to assign equipment properties and select the shortcut menu command Insert new object > Equipment property.
2. Select die equipment property, right-click and select the shortcut menu command Object properties.
3. Select the desired equipment property in the drop-down list of the name box. The instance is then given the same name as the original in the shared declarations.
4. In the "Value" box, enter a value for the instance of the equipment property. If your equipment property contains an enumeration, you also have the option of selecting a value for the enumeration used in a drop-down list in the "Value" box.
5. Complete your specifications in the dialog and confirm your entries with "OK".

Result

The selected units are now assigned with equipment properties and values. Following the generation of the batch types, these are available for allocation conditions when creating recipes in the recipe editor.

7.2.7.4 Configuring unit groups

If you use several units with identical equipment properties, you can assemble them into unit groups. Prior to SIMATIC PCS 7 V6.1, this group was the unit class. When you migrate older projects, these groups are given the equipment property "UnitClass".

Procedure

1. In the Component view of the SIMATIC Manager, create a new "enumeration" object in the "Enumerations" folder under the shared declarations. You then assign a name to the group, for example, process cell groups. Insert several "Value" objects with names such as Group_A, Group_B etc.
2. Create an equipment property with a suitable name, such as process cell group. Assign the data type "INT" or "DINT" to this process cell group and select the enumeration you have just created from the "Enumeration" drop-down list box.
3. Complete your specifications in the dialog and confirm your entries with "OK".
4. Now assign each unit to one of the created unit groups. To do this, select the hierarchy folder of the unit, right-click and select the shortcut menu command **Insert new object > Equipment property**.
5. Select die equipment property, right-click and select the shortcut menu command **Object properties**.
6. In the name box, select the newly created equipment property from the drop-down list, in our example "Pcell Group".
7. Select a process group in the "Value" box.
8. Open the configuration dialog "Configure batch process cell ...".

9. After you run the "Generate batch types" function, the configured data is made available.
10. If you have configure one or more enumerations as an equipment property, you can set one of them as a group criterion for the recipe editor. Select the "Pcell" folder and select the desired process cell group for the "Unit group".

Result

You have assembled several units with identical properties in a unit group. When creating the recipe, you use the unit group as a criterion for the unit allocation.

See also

Specifying units using conditions (Page 560)

7.2.8 Configuring transfer of archive data from WinCC archives

Introduction

The batch data also includes the values of important process variables over time. SIMATIC BATCH does not record these measured value sequences, but fetches the values from the WinCC measured value archives. For each instance parameter to be recorded as a measured value,

- the "Archive measured variable" option must activated and
- a WinCC archive tag must be assigned.

Step 1 - Set the "Archive measured variable" option

Activate the "Archive measured variable" option for each instance parameter to be recorded as a measured value. You have the following options:

- Using BATCH interface blocks:
  - at the IEPAR blocks for the parameter QACT_VAL **or**
  - in the BATCH configuration dialog at the "Batch types" object.

  Note

  These two settings have the same effect. Using the **Generate** function in the BATCH configuration dialog, the changes at the instances are entered in the batch types or by entering changes in the BATCH configuration dialog the changes are transferred to all instances in the CFC.

- When using SFC types: The "Archive" column (S7_archive attribute) of the characteristics for the setpoint is activated for the SFC type.

  Note

  For SFC types, this setting can only be made directly at the SFC type. All batch types of the SFC type are read-only in the BATCH configuration dialog.

Convenient setting in the process object view

The setting for "Archive measured variable" can also be made in the process object view. To do this open the "Parameters" tab. The settings for several parameters can be conveniently made in the "Archive" column.

Possible settings

- No archiving
- Archiving (= short-term)
- Long-term archiving (= long-term)

Inheritance with SFC Types -> SFC Instances

Note

If an instance from the SFC type is created in the CFC chart, the setting of the S7_archive attribute at SFC type is passed to the instance. This means that if the setpoint for the archiving is labeled (Para(i)_AO) at the SFC type, this setting is automatically active in all SFC instances.

You should avoid changing this setting at the SFC instances (in contrast to the SFC type) because synchronization is only made in the BATCH configuration dialog with the SFC types for operation, function and process tag types (not with SFC instances). This may lead to validation errors and therefore errors in the compilation.

Step 2 - Create WinCC archive tags

To be able to assign archive tags later, you must select the "Archive measured value" check box in the Batch configuration dialog for the tag of a phase or operation to be archived. You can also set the tag to "Archive" in the CFC at the output "QACT_VAL" of a block. As a result, the "Archive measured value" check box is automatically selected at the next generation of Batch types. With this option, you can create archive tags automatically as described in option 1.

The creation of the WinCC archive tags depends on the setting of the "Create/update archive tags" option in the "**Object Properties**" of the OS in the SIMATIC Manager.

There are two possibilities:

- The "Create/update archive tags" option is **activated**. In this case, a corresponding archive tag is automatically created in WinCC.
  Requirement: There must be an OS and the OS path that is the basis for the WinCC tag name is displayed under the runtime name.
- The "Create/update archive tags" option is **not activated**. In this case, you have to create the archive tag manually in the WinCC Explorer. You can find additional information about this in the WinCC Information System.

Note

If you deactivate the option "Create/update archive variables", the generated archive tags in WinCC are deleted by "Compile OS". But the assignments are retained in the BATCH configuration dialog. No warning appears to indicate that the archive tags no longer exist in WinCC.

Step 3 - Assign WinCC archive tags

In the BATCH configuration dialog, the additional function "Instances -> Display" can be activated for the selected type parameter. All the instant parameters having a reference to this type parameter are displayed. In the next dialog, you can open the WinCC tag browser for each instance parameter in which the required WinCC archive tag can be assigned.

1. Select the required type parameter in the BATCH configuration dialog.
2. Click the "Display" button in the area on the right.
   Result: The "Instances that use the <Name> type parameter" dialog box opens.
3. Click on the row on the right and then again on the arrow that appears.
   Result: The "WinCC archive tag for <Name>" dialog box opens. This displays all the operator stations and the archive tags.
4. Display the individual hierarchies in the WinCC tag browser.
5. Select the required WinCC archived tag.
6. Click the "Apply" button.

Result: After compiling and downloading the process cell, you can use the archive tags in your recipes.

Procedure in the multiproject

You set the "Archive measured variable" option in the BATCH configuration dialog of the multiproject (not in individual projects) because the batch types can only be edited in the multiproject.

The assignment of the desired WinCC archive tags to the instance parameter is done in the individual projects (not in the multiproject). To do this, first call the "Update" command for the individual project to read the latest batch types from the multiproject into the project. This assigns the WinCC archive tags to the instance parameter as described in the procedure above.

Result: The path to "WinCC archive tag updated" is shown in the project for the properties for the instance parameter. The assignment of the WinCC archive tags in the multiproject can first be viewed after the command "Merge" (batch instances) has been run.

7.2.9 Clearing up blocks in CFC data management

Cleaning up blocks

Blocks that are not used by any CFC in CFC data management can cleaned up in the CFC dialog.

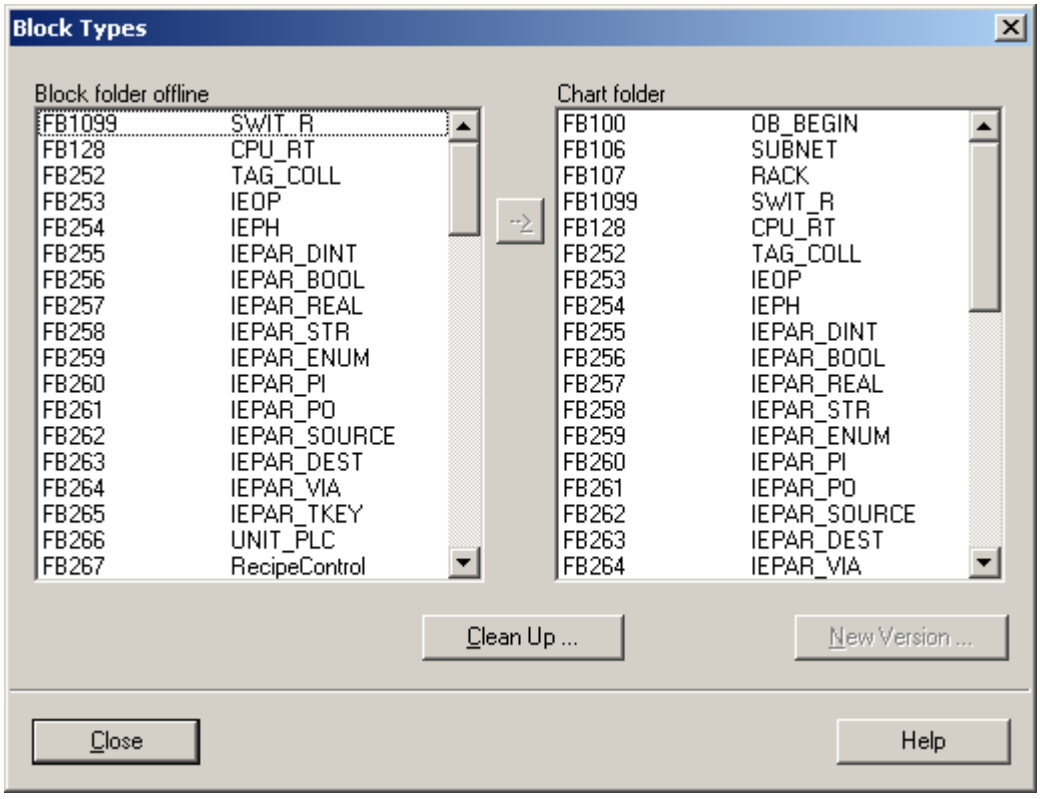
Blocks used in the S7 project

All the blocks used in a S7 project are contained in the project's "Blocks" folder. A subset of these blocks, which is fitted in a CFC chart, is also managed in CFC data management.

Clearing up CFC data management

In the CFC menu "Options" > "Block types" (see figure below), the content of the "Blocks" folder (left-hand window) and CFC data management (right-hand window) are shown. The right-hand window should only contain the blocks of the SIMATIC BATCH library that are also installed in the CFC charts (for example UNIT_PLC, MemIDB64, EventSend, IEOP, IEPH, IPAR…).

All other blocks from the SIMATIC BATCH library that are not used in a CFC chart are removed from the CFC data management using the "Clean up" button in this dialog. The blocks must not, however, be deleted from the block folder of the project.


Block Types
Block folder offline
FB1099 SWIT_R
FB128 CPU_RT
FB252 TAG_COLL
FB253 IEOP
FB254 IEPH
FB255 IEPAR_DINT
FB256 IEPAR_BOOL
FB257 IEPAR_REAL
FB258 IEPAR_STR
FB259 IEPAR_ENUM
FB260 IEPAR_PI
FB261 IEPAR_PO
FB262 IEPAR_SOURCE
FB263 IEPAR_DEST
FB264 IEPAR_VIA
FB265 IEPAR_TKEY
FB266 UNIT_PLC
FB267 RecipeControl
-->
Chart folder
FB100 OB_BEGIN
FB106 SUBNET
FB107 RACK
FB1099 SWIT_R
FB128 CPU_RT
FB252 TAG_COLL
FB253 IEOP
FB254 IEPH
FB255 IEPAR_DINT
FB256 IEPAR_BOOL
FB257 IEPAR_REAL
FB258 IEPAR_STR
FB259 IEPAR_ENUM
FB260 IEPAR_PI
FB261 IEPAR_PO
FB262 IEPAR_SOURCE
FB263 IEPAR_DEST
FB264 IEPAR_VIA
Clean Up ...
New Version ...
Close
Help

7.3 PC station (PCS 7 OS / WinCC Explorer)

7.3.1 Compiling the OS

Introduction

SIMATIC BATCH communicates with the automation system via the defined PCS 7 OS (message OS). As a result, on completion of PCS 7 basic configuration and following every change to the batch process cell data, the PCS 7 OS must be compiled. This downloads all the BATCH objects as WinCC tags to the appropriate PCS 7 OS. Only after compiling the PCS 7 OS is it possible to generate the correct full runtime name when generating the batch process cell data. Before downloading the batch process cell data, the WinCC projects must first be downloaded.

Procedure in the SIMATIC Manager

1. Right-click on your OS within your PC station and select the **OS > Object properties** command from the shortcut menu.
2. Open the "Target OS and Standby OS" tab.
3. Select the "Create/update archive tags" check box if you want to archive with automatic assignment of an archive tag. This setting is effective for all parameters for which the "S7_archive" attribute is set.
4. Confirm with "OK".
5. Select the menu command **Options > Wizard Compile multiple OS > Start**.
6. In the next Wizard dialogs, follow the normal procedures for PCS 7. Select the operator stations, the S7 programs and then the scope of the compilation. There are no specific SIMATIC BATCH settings necessary.

Note

The default compilation mode for PCS 7 is area-oriented compilation (OS area). This setting can be changed by calling the menu command **Options > Wizard Compile multiple OS > Compile mode**.

You cannot change between area-oriented and AS-oriented compilation within a project or multiproject.

See also

How to compile and download the process cell data (Page 214)

7.3.2 PCS 7 OS - change project type

Change WinCC project type

If in WinCC Explorer you change the project type of a PCS 7 OS, for example from a multi-user project to a single user project, then the OS Project Editor must be run in the complete configuration mode. This is the only way for the necessary applications to be entered in the PC's start-up list and to ensure data consistency in process mode.

7.4 BATCH engineering

7.4.1 BATCH configuration dialog

Downloading automation data to the BATCH server

The BATCH configuration dialog is the Control Center for BATCH engineering. The aim of configuration is to make available all necessary data from the PCS 7 basic configuration and the BATCH configuration to the SIMATIC BATCH server for the automation task.

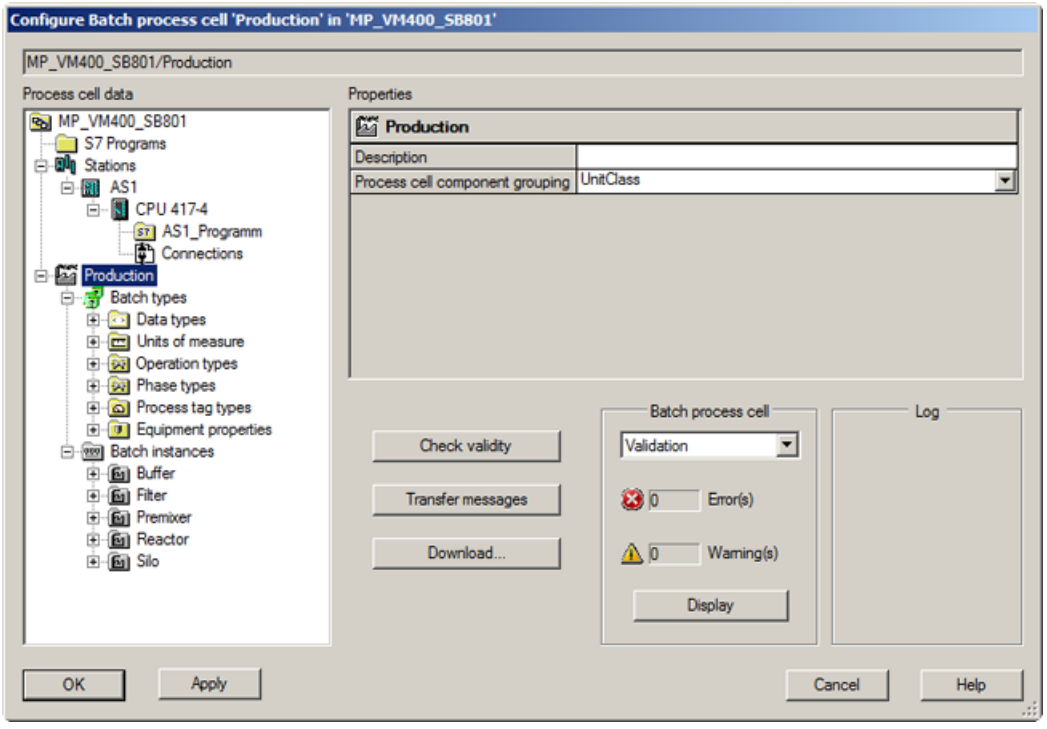


Figure 7-1 BATCH configuration dialog

Project data from the PCS 7 basic engineering is collected in the form of objects in a structure in the navigation area for SIMATIC BATCH. When you select an object in the navigation area, its properties are then displayed and special context-dependent functions are offered.

Note

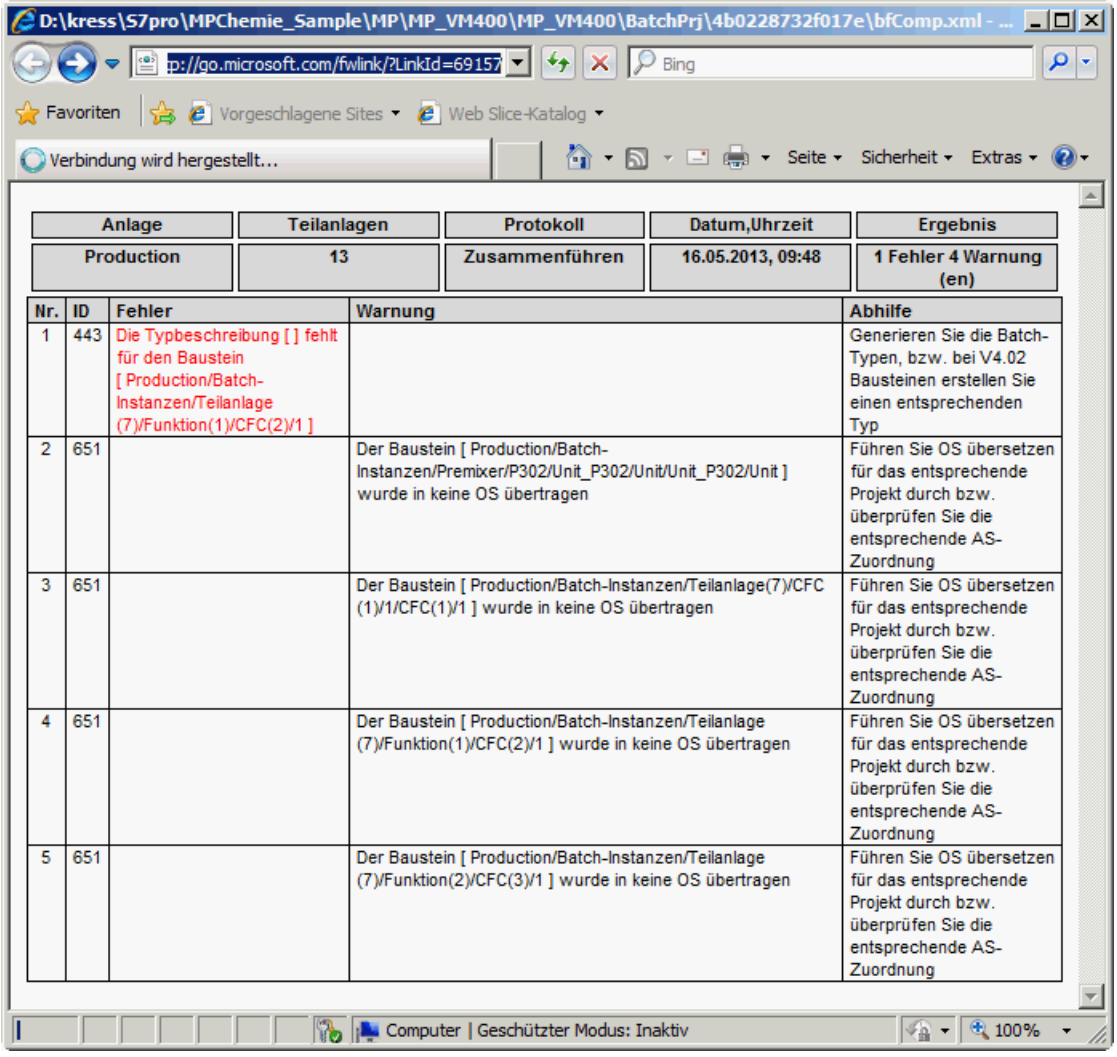
All actions in the BATCH configuration dialog must be made in the same PCS 7 project exclusively from one PC.

Following the creation of Batch objects (units and equipment modules) in basic engineering, the name of your batch process cell must not be changed, neither in SIMATIC Manager within the plant view nor in the BATCH configuration dialog in the process cell settings.

Following the actions "Retrieve", "Save as", "Save as with reorganization" and "Reorganize" in SIMATIC Manager, you must generate the BATCH types and compile/merge the BATCH instances in the BATCH configuration dialog prior to distributing the batch data.

Validation

During configuration, a validation signals possible errors and warnings. The objects concerned are marked immediately by a colored lightning symbol in the navigation area. If you click on a faulty object, you can then display and print out the corresponding report in the log area. The log provides information on errors and warnings in the configuration.



Anlage	Teilanlagen	Protokoll	Datum,Uhrzeit	Ergebnis
Production	13	Zusammenführen	16.05.2013, 09:48	1 Fehler 4 Warnung (en)

Nr.	ID	Fehler	Warnung	Abhilfe
1	443	Die Typbeschreibung [ ] fehlt für den Baustein [Production/Batch-Instanzen/Teilanlage (7)/Funktion(1)/CFC(2)/1]		Generieren Sie die Batch-Typen, bzw. bei V4.02 Bausteinen erstellen Sie einen entsprechenden Typ
2	651		Der Baustein [Production/Batch-Instanzen/Premixer/P302/Unit_P302/Unit/Unit_P302/Unit] wurde in keine OS übertragen	Führen Sie OS übersetzen für das entsprechende Projekt durch bzw. überprüfen Sie die entsprechende AS-Zuordnung
3	651		Der Baustein [Production/Batch-Instanzen/Teilanlage(7)/CFC (1)/1/CFC(1)/1] wurde in keine OS übertragen	Führen Sie OS übersetzen für das entsprechende Projekt durch bzw. überprüfen Sie die entsprechende AS-Zuordnung
4	651		Der Baustein [Production/Batch-Instanzen/Teilanlage (7)/Funktion(1)/CFC(2)/1] wurde in keine OS übertragen	Führen Sie OS übersetzen für das entsprechende Projekt durch bzw. überprüfen Sie die entsprechende AS-Zuordnung
5	651		Der Baustein [Production/Batch-Instanzen/Teilanlage (7)/Funktion(2)/CFC(3)/1] wurde in keine OS übertragen	Führen Sie OS übersetzen für das entsprechende Projekt durch bzw. überprüfen Sie die entsprechende AS-Zuordnung

Figure 7-2 Log

Access protection

Access protection for projects configured for PCS 7 engineering also affects the BATCH configuration dialog. For functions that affect changes in basic engineering, you need to authenticate yourself with SIMATIC Logon.

Overview of the dialog landscape for the BATCH configuration dialog

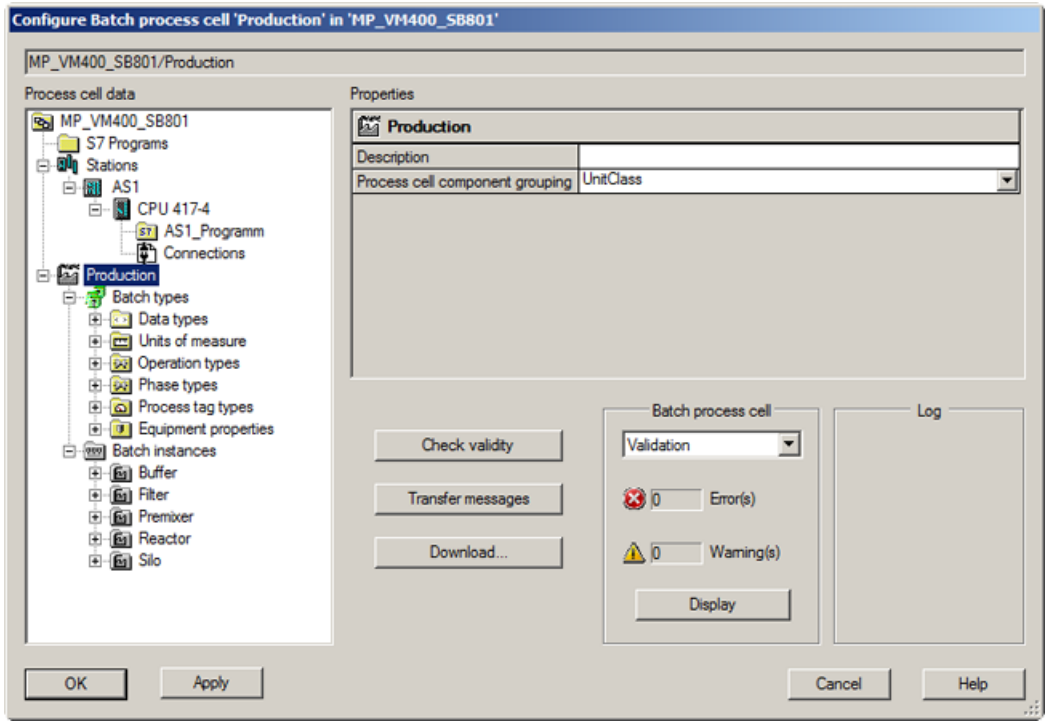


Figure 7-3 BATCH configuration dialog

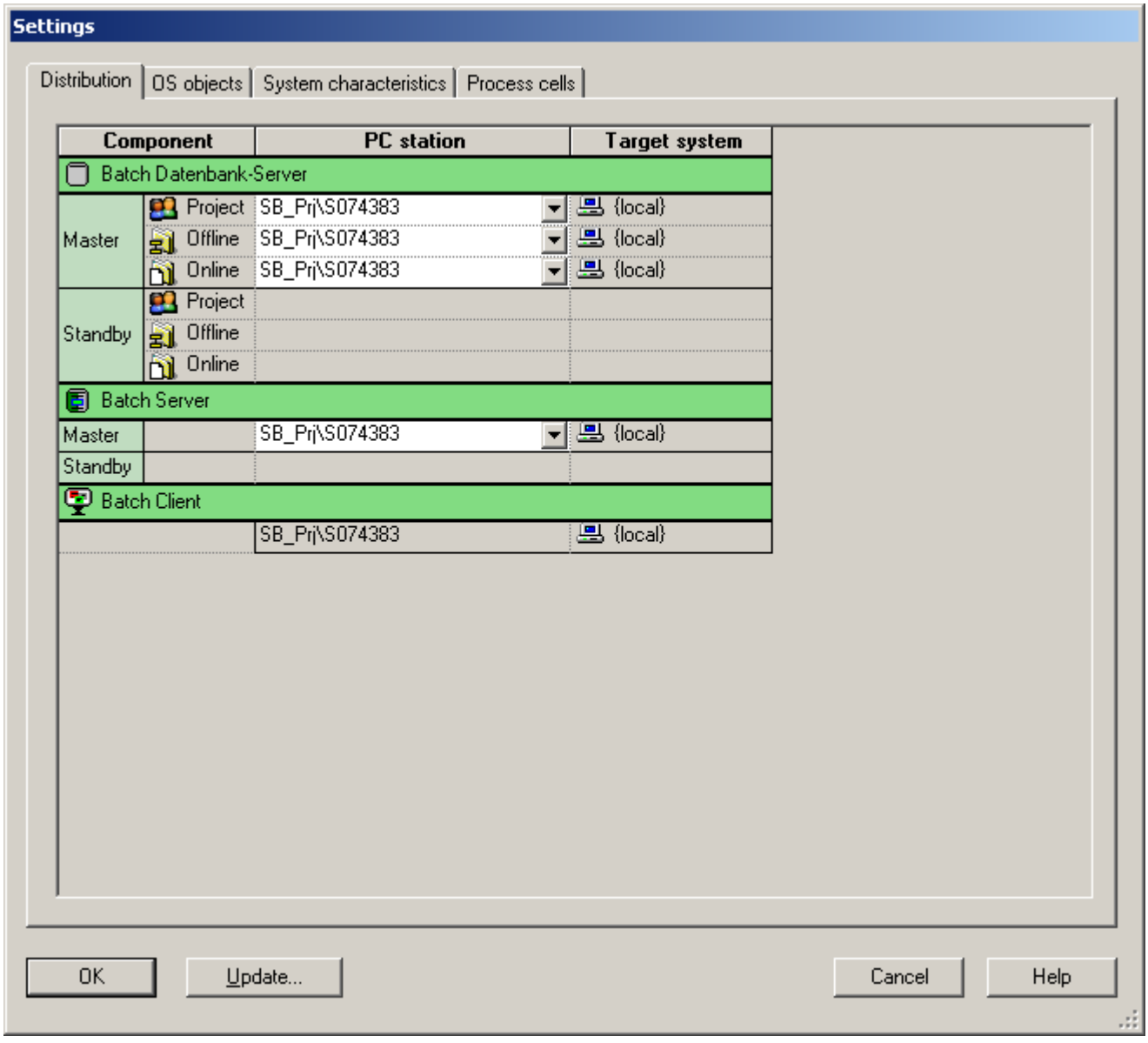


Figure 7-4 Settings in the multiproject or project

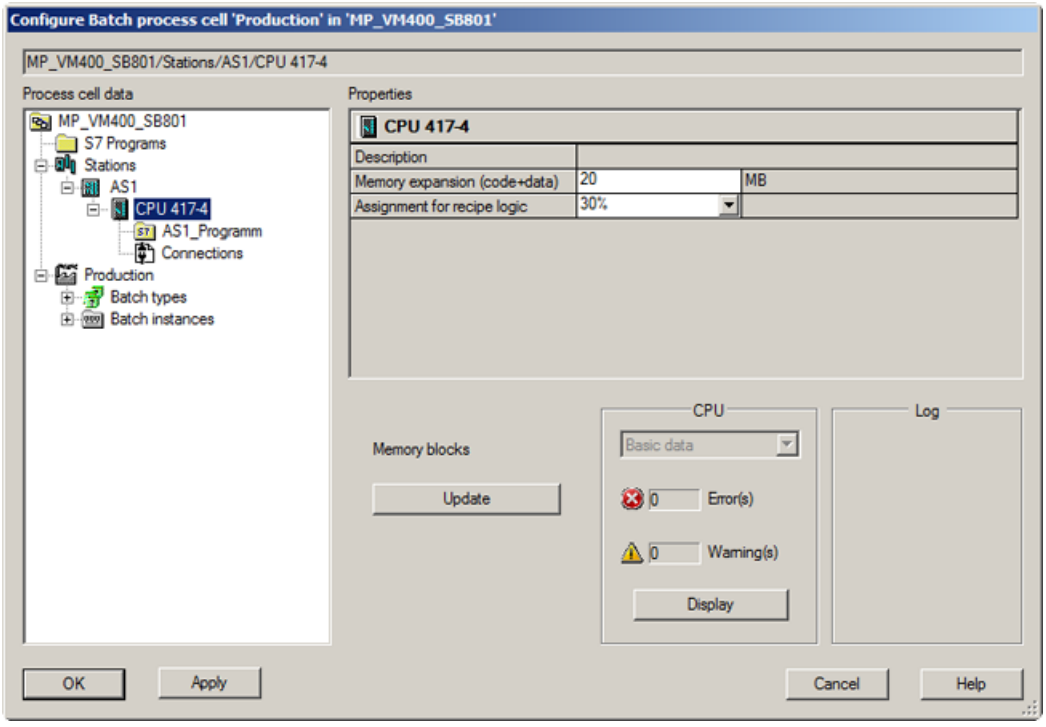


Figure 7-5 Stations, CPU memory configuration

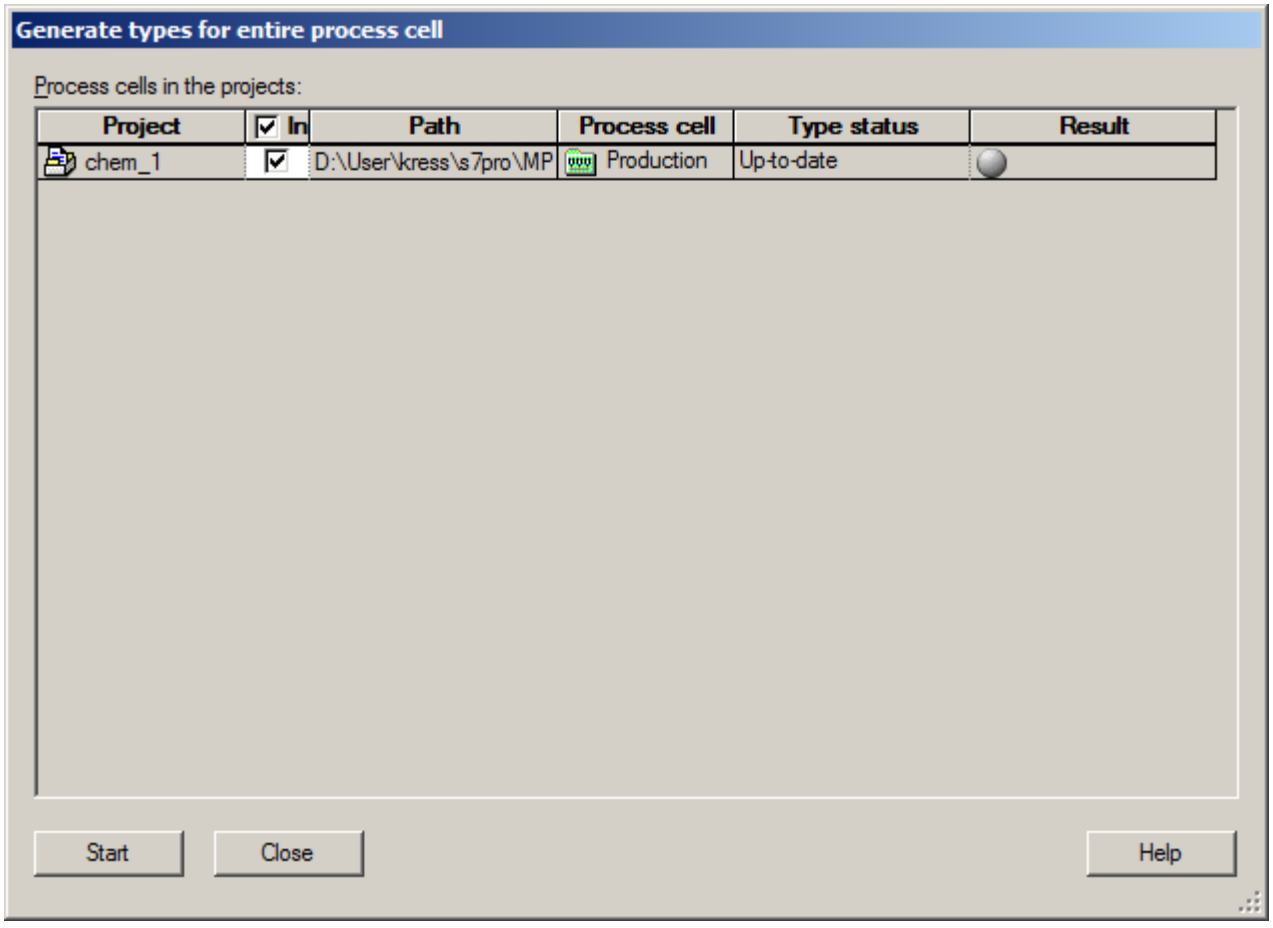


Figure 7-6 Generating batch types

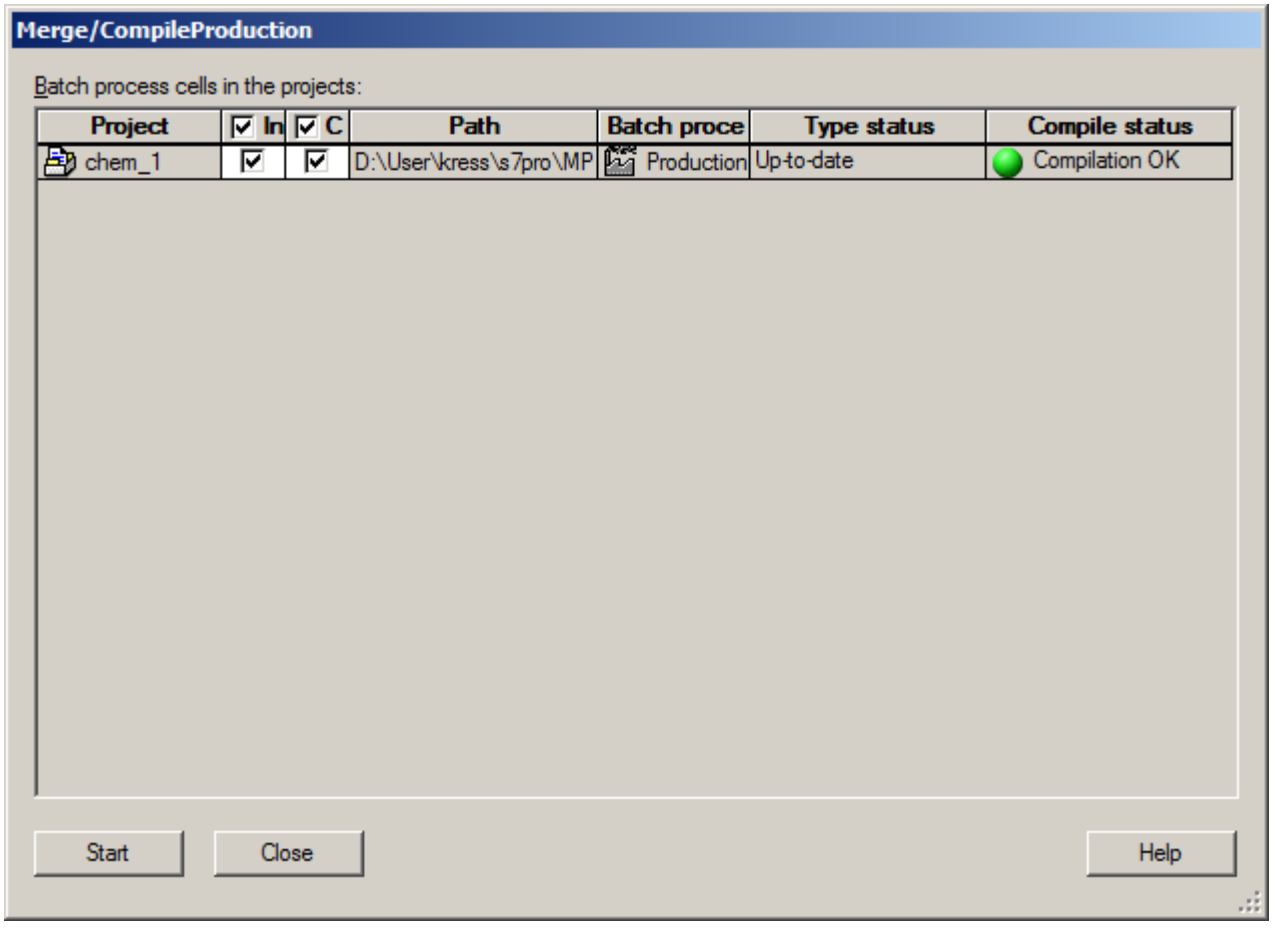


Figure 7-7 Merge batch instances

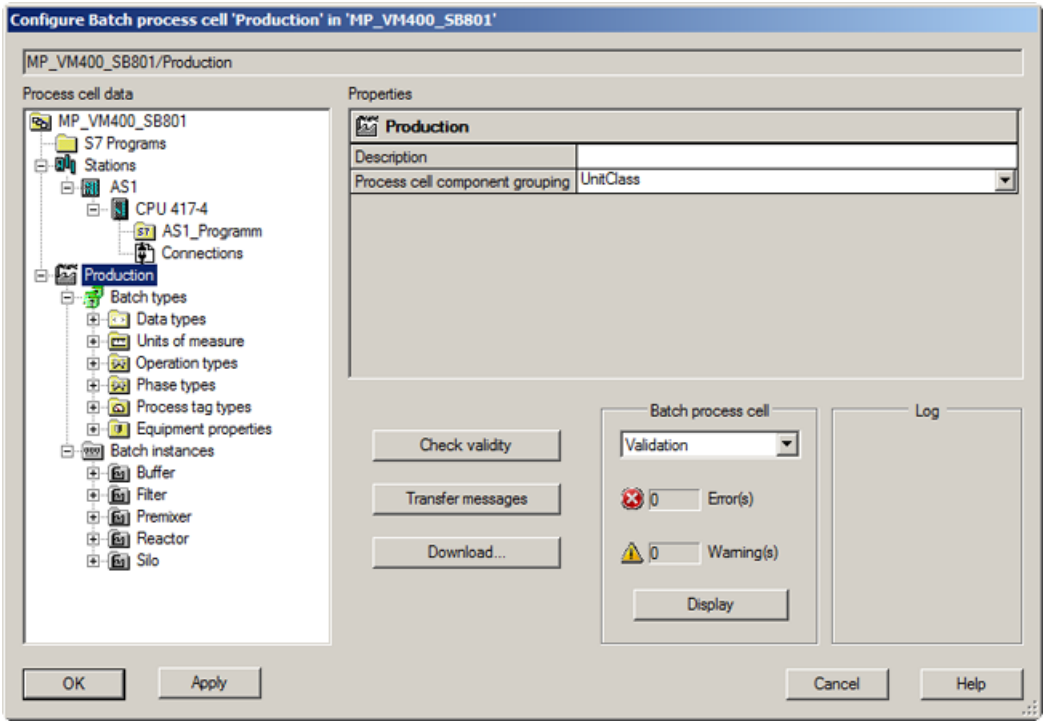


Figure 7-8 Downloading a batch process cell

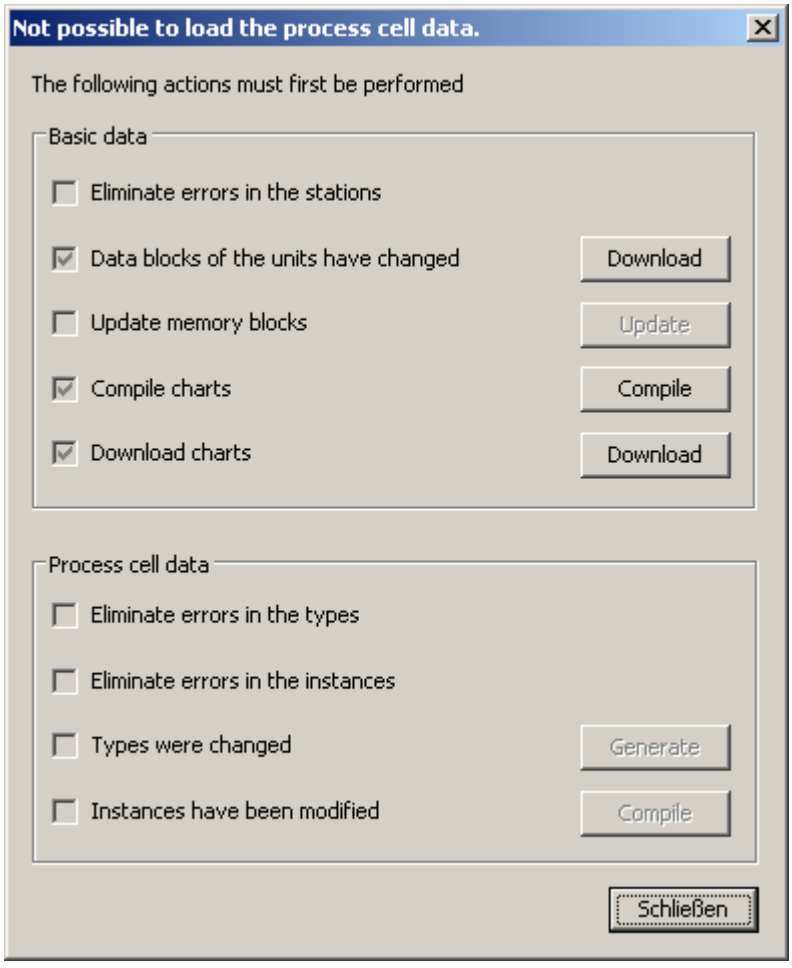


Figure 7-9 Downloading a batch process cell is not possible

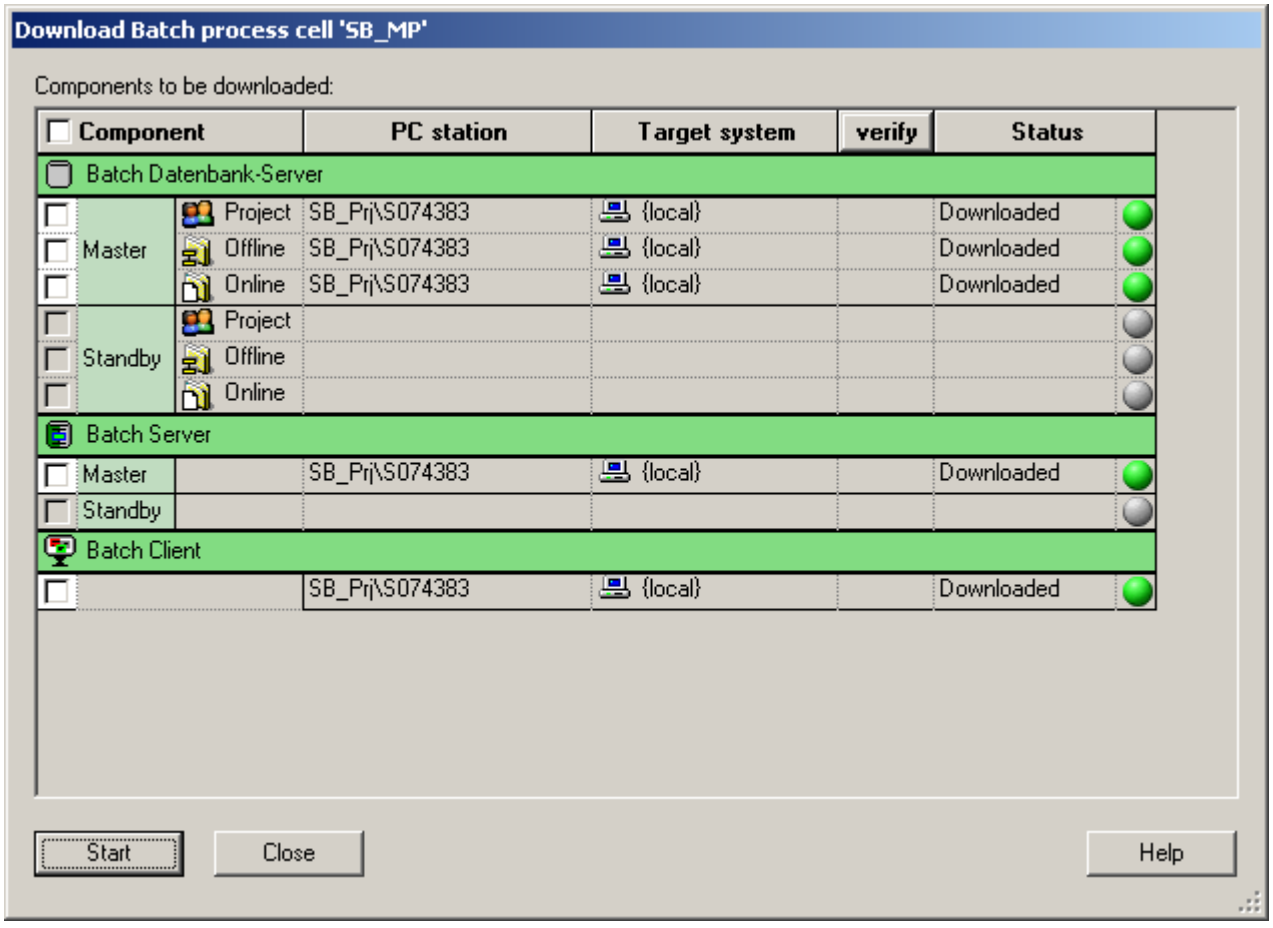


Figure 7-10 Downloading a batch process cell

Additional information

Online help for STEP 7> What you need to know about access protection

7.4.2 BATCH engineering overview

Requirement for the BATCH engineering

All the relevant points from the PCS 7 basic engineering have been performed and the PCS 7 OS was compiled and downloaded.

SIMATIC BATCH engineering

Below, you will find a list of configuration steps that are required for BATCH engineering:

1. Start the BATCH configuration dialog in the SIMATIC Manager using the SIMATIC BATCH > Open configuration dialog command.
2. In the BATCH configuration dialog, select the highest folder in the navigation area and click "Settings" in the shortcut menu. Check the settings in all the tabs are set the system characteristics. Select the OS to which Batch message texts are transferred.
3. If you want to use the "AS-based" mode, you will need to go to the "Stations" folder and enter or select the percentage of total memory you are using for the allocation of recipe logic.
4. Update the stations. The necessary S7 connection in the BATCH application is generated and assigned parameters automatically.
5. Edit the assignment of control strategies.
6. Edit the assignment of parameter groups.
7. Generate the batch types. In a multiproject, you can propagate the batch types to the projects.
8. Compile the batch instances or merge the batch instances in a multiproject.
9. Assign WinCC archive tags to the configured measured values.
10. Select the folder of your batch process cell in the navigation window. Transfer the messages to the assigned PCS 7 OS.
11. Download your batch process cell to the database on the SIMATIC BATCH server.
    If your configurations have repercussions for the PCS 7 basic data or the BATCH process cell data, you will be informed of this in the "Loading the process cell data is not possible" dialog. Configurations that still need to be performed can be started immediately from this dialog. You can then download the batch process cell.

⚠ WARNING

Change to reserved areas in the S7 program

If you change the "Areas reserved for other applications ..." in a S7 program (under Open CFC chart and then select "Options >Settings >Compile/Download" and make changes), new block numbers are assigned to the DBs and FCs in the current S7 program. As a result the DB and/or FC information saved internally for SIMATIC BATCH has to be updated.

Following a change to the reserved areas you will need to run the SIMATIC BATCH engineering again.

Additional information

Memory configuration of the CPU being used (Page 220)

7.4.3 Symbols in the BATCH configuration dialog

Meaning of symbols in the BATCH configuration dialog

Object / symbol	Meaning
	Remote process cells
	STEP 7 multiproject
	STEP 7 project
	S7 programs/stations
	Automation systems
	CPU
	S7 program
	Connections
	Batch process cell
	Neutral folder, structuring element
	Batch instances
	Batch types
	Data types
	Units of measure
	Phase and operation types
	Phase type, operation type based on IEPH/IEOP interface block
	Phase type, operation type based on IEPH/IEOP interface block and SFC type, mixed type
	Phase type, operation type based on SFC type
	Phase type, operation type based on SFC type with control strategy
	Process tag types
	Process tag type
	Equipment properties
	Unit of measure
	Enumeration as control strategy
	Floating point number
	Integer
	String
	Boolean

Object / symbol	Meaning
	Enumeration
	Material
	Input material
	Output material
	Equipment property of LOCATION data type as source
	Equipment property of LOCATION data type as destination
	Equipment property of LOCATION data type as via
	Equipment property of LOCATION data type

7.4.4 Automatic parameter assignment of the BATCH blocks

Conceptual overview

In the BATCH configuration dialog, the BATCH blocks used from the basic engineering (SFC types or BATCH interface blocks) have parameters assigned automatically.

The elements and blocks for both modes (AS-based and PC-based) are briefly listed below and their functions described.

Unit blocks: UNIT_PLC replaces IUNIT

For AS-based mode, you will need to replace the IUNIT block with the UNIT_PLC block. The UNIT_PLC block contains the functionality of the IUNIT interface block including the AS-based runtime system.

Automatic parameter setting of BATCH blocks in the BATCH configuration dialog

The SIMATIC BATCH configuration dialog reads and writes parameters at the blocks during configuration:

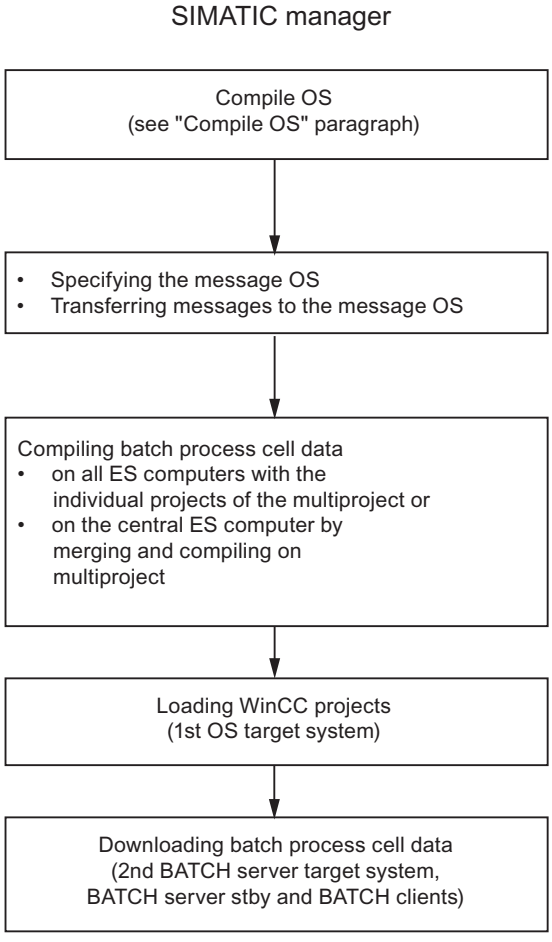
- Determination of all instance data blocks (IDB).
- Writing information to the corresponding inputs of the runtime blocks
- Reading the parameter addresses of the SFC instances
- Creating NetPro S7 connections
- Creating equipment properties DBs (EQM) using the information from the equipment file (EQM)
- Copying the template CFCs
- Parameterizing the blocks in the template CFCs

Messages for batch processing

Messages for batch processing are generated in the AS via the UNIT_PLC block. These messages are downloaded to the PCS 7 OS by the AS-OS engineering. All blocks that are placed in the CFC can create messages with the "Alarm_8P" block.

7.4.5 How to compile and download the process cell data

Basic procedure



Compile OS

See chapter "PC station", paragraph "Compile OS (Page 198)".

Specifying the message OS and for transferring the batch messages

In many Batch process cells, the process automation is not only recipe-controlled. In other words, it is perfectly possible that there is one or more OS servers in the process cell that do not have any batch-relevant data. This means that the batch-relevant operator stations must be specified for SIMATIC BATCH. To achieve an optimum load distribution, you can select a message OS to which SIMATIC BATCH sends its messages.

- **Specifying the message OS**
  You must select a suitable OS to which SIMATIC BATCH sends its messages. The message OS is also the communication OS for the BATCH server.
- **Transferring batch messages**
  The message texts of all BATCH messages are transferred via the function "Transfer messages" in the selected OS.

Compiling Batch process cell data

These must be generated (compiled) for use of the process cell data via SIMATIC BATCH. After complete configuration of all process cell data and also after any change in process cell data these must be recompiled prior to loading.

The compilation of the process cell data (Page 222) is performed by the "Compile" function. During this process, the process cell data are compiled and validated. Any possible errors are displayed and entered in a test log. If the data are not plausible they will not be complied.

Loading WinCC projects

WinCC projects continue to be transferred to PCS 7 operator stations independent of SIMATIC BATCH with the "Download to target system" function. The download procedure for the process cell data to the BATCH server and BATCH clients remains unchanged. You must, however, make sure that the WinCC projects are downloaded before you start the BATCH downloads.

Note

If a PC station with a redundant WinCC application (stby) is loaded on a new PC, SIMATIC BATCH does not automatically recognize the destination path for the standby OS. If this happens, then open the BATCH configuration dialog, select your batch process cell from the process cell data and click on the "Settings" button. Click on the "Update" button in the Settings dialog, "Distribution" tab. The new computer name is registered.

Downloading BATCH process cell data

After compiling the process cell data successfully, it is transferred to the BATCH server, database server and the BATCH clients. The process cell data is downloaded (Page 224) automatically using the "PLC Download" function.

Reading in information about Batch process cell data (not included in the "Basic procedure" graphic)

This is executed explicitly via an operation so that the process cell data can be specifically imported into the batch system. This can be entered at any BATCH client within BatchCC. There is an internal comparison and synchronization of the new with the old process cell data.

For more information about reading in the process cell data (Page 320), refer to the chapter "BATCH Control Center".

7.4.6 Display number of units

If you want to know how many available units (UNIT_PLC instances) are in your project, for example, to be able to order the required licenses for SIMATIC BATCH, open the corresponding log in the BATCH configuration dialog.

Procedure in the SIMATIC Manager

1. Open the BATCH configuration dialog with the **Options > SIMATIC BATCH > Open configuration dialog** menu command.
2. Select the folder of your batch process cell (process cell folder) in the navigation window.
3. Click on "Display" in the "Protocol" area.

Result

The log window is displayed with the data. The number of configured and available units is also displayed.

See also

Delivery type of SIMATIC BATCH (Page 86)

7.4.7 Configuring control strategies

Basic procedure

You can configure control strategies for equipment phases or equipment operations in different ways:

- Configuration of SFC types
  When you configure the SFC type, you can also use the characteristics function to specify the control strategies that are valid for this equipment phase/operation. In addition to this, the amount of parameters can also be put together based on the setpoints for each control strategy.
- Configuration of SFCs (SIMATIC Manager and SFC editor)
  New control strategies are configured using newly created enumerations with their properties and the interconnection of the IEPAR_ENUM block with the required IEPH/IEOP block.
- Configuration in the BATCH configuration dialog
  New control strategies are created using new user data types and the assignment of operation types/phase types as the data type for the control strategy parameter in the BATCH configuration dialog.

Control strategies and control strategy parameters are included in the process cell data when you compile and are therefore available later in the BATCH Recipe Editor.

Result: After reading in the type description in the BATCH configuration dialog with the "Generate" button, the control strategies you edited in this way are indicated by a red flag and shown under phase types.

Note

Setpoints for the current and prepared control strategy are checked regardless of operating mode (automatic, manual). When you prepare a control strategy, you must also prepare limits for the associated setpoints. Otherwise the check will result in an error message.

Procedure for SFC types

Result: in the properties of the SFC type on the "Options" tab, the configured control strategy is displayed in a check box under Control strategy selection. By enabling or disabling this, you can decide which control strategies of the SFC type will be passed on to the SFC instances.

Procedure for SFCs

In the SFC, you create the following SFC types for SIMATIC BATCH with the following characteristics:

- EOP (equipment operation)
- EPH (equipment phase)

The type (EOP or EPH) and the type name are specified for the SFC type. This creates the interface to SIMATIC BATCH.

The following can be created as characteristics of the SFC type:

- The control strategies of the equipment operation/phase
- The setpoints (parameters) of the equipment operation/phase

The process values of the equipment operation/phase are derived from the setpoints.

SFC types created in this way (= BATCH type blocks) are stored in the chart folder.

In CFC, these BATCH type blocks are available in the " Other blocks" library or the family assigned to the SFC type, for example batch and can be inserted and interconnected by dragging them to the CFC chart.

Procedure without a PCS 7 project (BATCH configuration dialog)

1. Open the BATCH configuration dialog with the **Options > SIMATIC BATCH** menu command.
2. For operation/phase type, create a new parameter, for example fw_param an. Select the required "Phase type" under "Phase types" in the left-hand window and then click the "New" button. Result: A new type parameter is created.
3. Select the "Control strategy parameter" check box. Press the "Edit" button to the right of the "Control strategy parameter" check box. Assign the required setpoints (parameter data record) to each control strategy in the open properties dialog for the control strategies "Control strategies of FW_heat".
4. Assign the correct control strategy (for example FW_Heat) on the right in the "Assigned data type" list box. Condition: The corresponding control strategy must be available in the data types.
5. Close the BATCH configuration dialog with "OK".

Result: The new control strategy appears in the BATCH configuration dialog with the corresponding user data type.

Note

Please make sure that the planned configuration of the control strategies in your PCS 7 project matches the one in the BATCH configuration dialog.

Control strategy symbols

The following control strategy symbols are defined in the BATCH configuration dialog:

Symbol	Meaning
	Enumeration as control strategy
	SFC type with control strategy
	CFC with control strategy

Further references

For more detailed information on programming a sequential control and defining the SFC characteristics, refer to the online help of SFC (<F1> or menu command Help > Contents).

7.4.8 Assigning control strategies

BATCH configuration dialog

If you have created an equipment property as control strategy with different control strategy parameters for different units in basic engineering, you can specify in the "Control strategies of" dialog which of these parameters can be displayed and used for the configuration when selecting a unit. It is a filter that you use to determine the selection of parameters unit by unit.

Requirement

- A control strategy with control strategy parameters has been created.
- BATCH parameter blocks "IEPAR_Type" have been interconnected using the "EPE_CONN" I/O at the "UNIT_PLC" unit block.
- The created control strategy and a start value were assigned at all "SP_VAL" I/Os of the "IEPAR_ENUM" BATCH parameter block.
- All data from basic engineering have been compiled and downloaded.
- The batch types have been generated and propagated, if necessary, in the BATCH configuration dialog and the batch instances have been compiled and merged.

Dialog in the BATCH configuration dialog

Select the "Equipment properties" folder within the batch types of your Batch process cell and select the control strategy (enumeration type with control strategy parameters). The "Edit" button is displayed in the properties under control strategy parameters. The "Control strategies of equipment properties" dialog opens when you click this button.

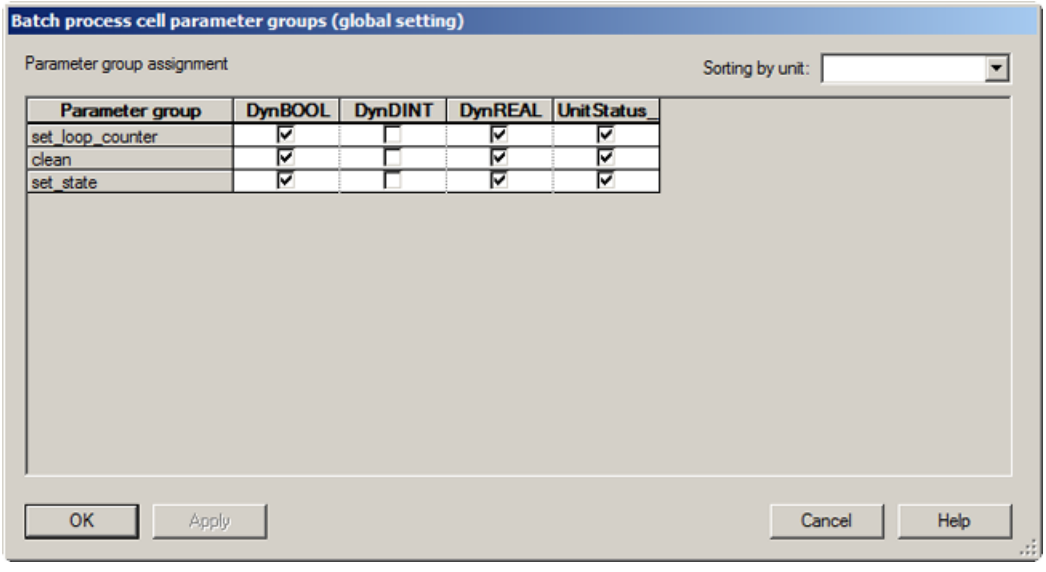


Figure 7-11 Control strategy assignment

First, select a unit in the dialog. Then, select or clear the check boxes to define which parameters of a control strategy are to be available for recipe engineering.

Additional information

Configuring dynamic unit parameters (Page 747)

7.4.9 Obtaining the memory configuration and setting the allocation

Getting the available memory on the AS

The memory available in the AS depends on the type of CPU and with older CPUs also on the number of memory modules used. The work memory is split. Half is in a fixed code area and half in a fixed data area.

Proceed as follows to determine the amount of memory currently available:

1. Right click on the CPU in the SIMATIC Manager and select "PLC -> Module Information"
2. Select the "Memory" tab. In the displayed dialog, you can recognize the current configuration of the data and code memory of the selected CPU.

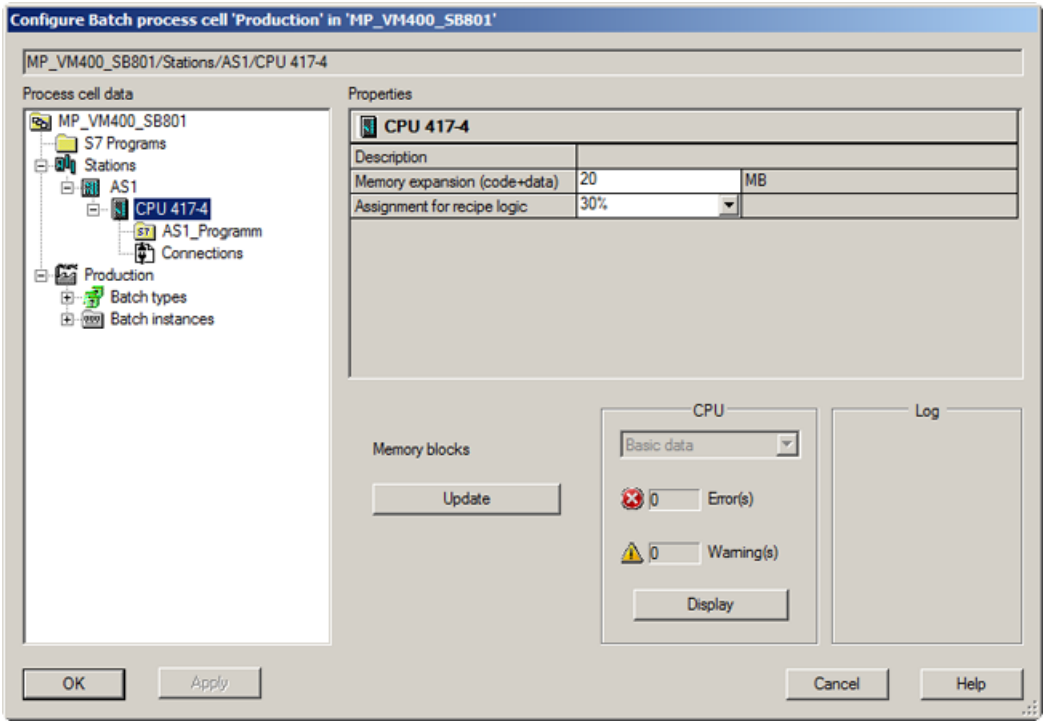
Storage of recipe logic

The recipe logic is stored on the AS in data blocks of the type "MemIDB64" in the data area of the work memory. The data blocks are saved in the CFC chart "@ASB_Mem".

Allocation of work memory

The figure shows the dialog for individually setting the allocation of work memory with data blocks for storing of recipe logic.

Blocks cannot be created and fitted during the AS runtime.



- Memory configuration (code+data)
  In this box, enter the memory configuration of your CPU that you obtained online.
- Allocation for recipe logic
  Select the percentage of the memory configuration to be reserved for the recipe logic. The following selections are available: 0%, 10%, 20%, 30%, 40% and 50%.

Example

The memory setup of a CPU 417 is specified as 30 megabytes. 15 megabytes of this is code memory and 15 megabytes data memory. In our example, 20% of the memory is to be reserved for the recipe logic. This means that: 20% of 15 MB, i.e. 3 MB, are allocated for data blocks. A data block of the type "MemIDB64" has a size of 64 KB. This means that 3 MB = 3072 KB divided by 64 KB corresponds to 48 data blocks contained in the "@ASB_Mem" CFC chart. This calculation and the resulting installation of this number in the CFC chart is handled by the system in the BATCH configuration dialog.

How many data blocks do I need?

The more batches processed simultaneously on a unit in one AS, the greater the number of instance blocks required.

A master recipe executed on the AS requires at least 2 data blocks. Twenty batches running simultaneously with this control recipe require 40 data blocks in the "@ASB_Mem" CFC chart.

Result: The 20% allocation of the data area in work memory is adequate.

7.4.10 Compiling the Batch process cell data in single project engineering

Introduction

The process cell data is compiled by using the "Compile" function in the BATCH configuration dialog. At the same time, the process cell data are checked for plausibility. Possible errors are displayed and stored in a test log. If the data is not valid, it will not be compiled.

Procedure in the SIMATIC Manager

1. Open the BATCH configuration dialog with the menu command **Options > SIMATIC BATCH**.
2. Select the "Batch instances" folder under process cell data in the left window.
3. Click the "Compile" button in the area on the right.
   Result: If the validation is successful, the process cell data is compiled. A log is created that you can display as follows:
   In the BATCH configuration dialog: under **Log >: "Compile" setting > "Display" button**
4. Select the process cell object under process cell data in the left window.
5. Click the "Transfer to OS" button in the area on the right.
   Result: A dialog opens with all operator stations of the project that were defined as Batch-relevant when the settings were made in the "OS objects" tab. In the "Status" column, you will see the current status displayed. Here, you can see whether or not the OS-relevant data has already been transferred.
6. Press the "Start" button.

Result: The messages and the OS-relevant data are transferred. A log will be created that you can display as follows:
In the BATCH configuration dialog: under **Log -> "Transfer to OS" setting -> "Display" button**

7.4.11 Compiling the process cell data in multiproject engineering

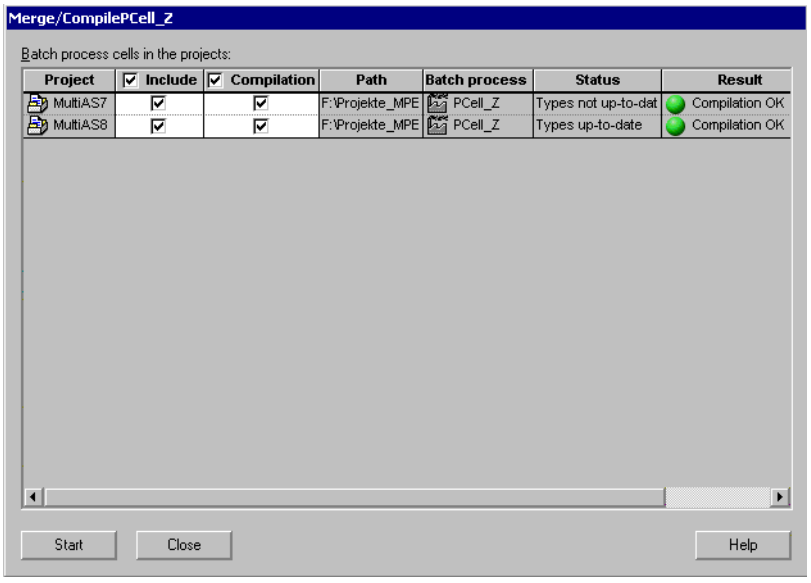
Introduction

The process cell data are compiled with the function "Compile" in the BATCH configuration dialog. This means that the process cell data are checked for plausibility. Possible errors are displayed and stored in a test log. If the data are not plausible they will not be complied.

Procedure in the SIMATIC Manager

1. Open the BATCH configuration dialog with the **Options > SIMATIC BATCH** menu command.
2. In the left window under process cell data select the "Batch instances" folder.

3. Click the "Merge" button in the area on the right.
   Result: A dialog opens display all Batch-relevant projects. In this dialog, you can compile the batch process cell data of all projects and then merge the data.



4. Here, you select the projects whose process cell data will be included:
   With the central "Include" and "Compile" check boxes in the table header, all necessary settings for the individual projects are made automatically depending on the status. If, for example, the status for a project is "Types not up-to-date", the "Compile" check box is automatically selected when the project is included.

   Note

   Compilation is also possible in every individual project of the multiproject.
   If projects are removed for editing, the check boxes are inactive (grayed out). If process cell data compiled earlier for this project already exists, this data is also adopted.

5. Press the "Start" button.
6. Click the "Close" button.
7. Select the process cell object under process cell data in the left window of the BATCH configuration dialog.
8. Click on the "Transfer to OS" button in the right area.
   Result: A dialog opens with all operator stations of all projects of the multiproject that were defined as Batch-relevant when the settings were made in the "OS objects" tab.
9. Press the "Start" button.
   Result: All Batch-relevant data (messages and user data types) is downloaded to the appropriate operator stations.

Results:

- After a successful validation the process cell data will be compiled. A log is created that you can display as follows:
  In the BATCH configuration dialog: under **Log ->: "Merge" setting -> "Display" button**

  Note

  The display of validation events in the "Merge/compile PCell..." dialog and in the BATCH configuration dialog may differ in the following situations:

  - Only warnings (yellow arrow) or 'everything OK' is shown at the individual projects in the "Merge/compile PCell..." dialog. Everything within the project is correct as far as the validation is concerned.
  - Errors (red arrows), are shown in the BATCH configuration dialog, however. These are errors which occur in relation to other projects and are therefore shown in the overall BATCH configuration dialog.

  The concrete cause can be found in the merge log.

- The messages and the OS-relevant data will be transferred. A log is created that you can display as follows:
  In the BATCH configuration dialog: under **Log -> "Transfer to OS" setting -> "Display" button**.

Tip

Do not forget to run the "Compile OS" function **before** compiling and downloading. This avoids the display of errors in the runtime names when you compile the process cell data.

7.4.12 Compiling and Downloading Batch Process Cell Data

Introduction

After configuring for the first time in the BATCH configuration dialog, you have the option of performing the entire BATCH engineering in this dialog using the function SIMATIC BATCH > Compile/Download function in the SIMATIC Manager. The dialog consists of two tabs in which you can make the required settings.

"Merge / Compile" tab

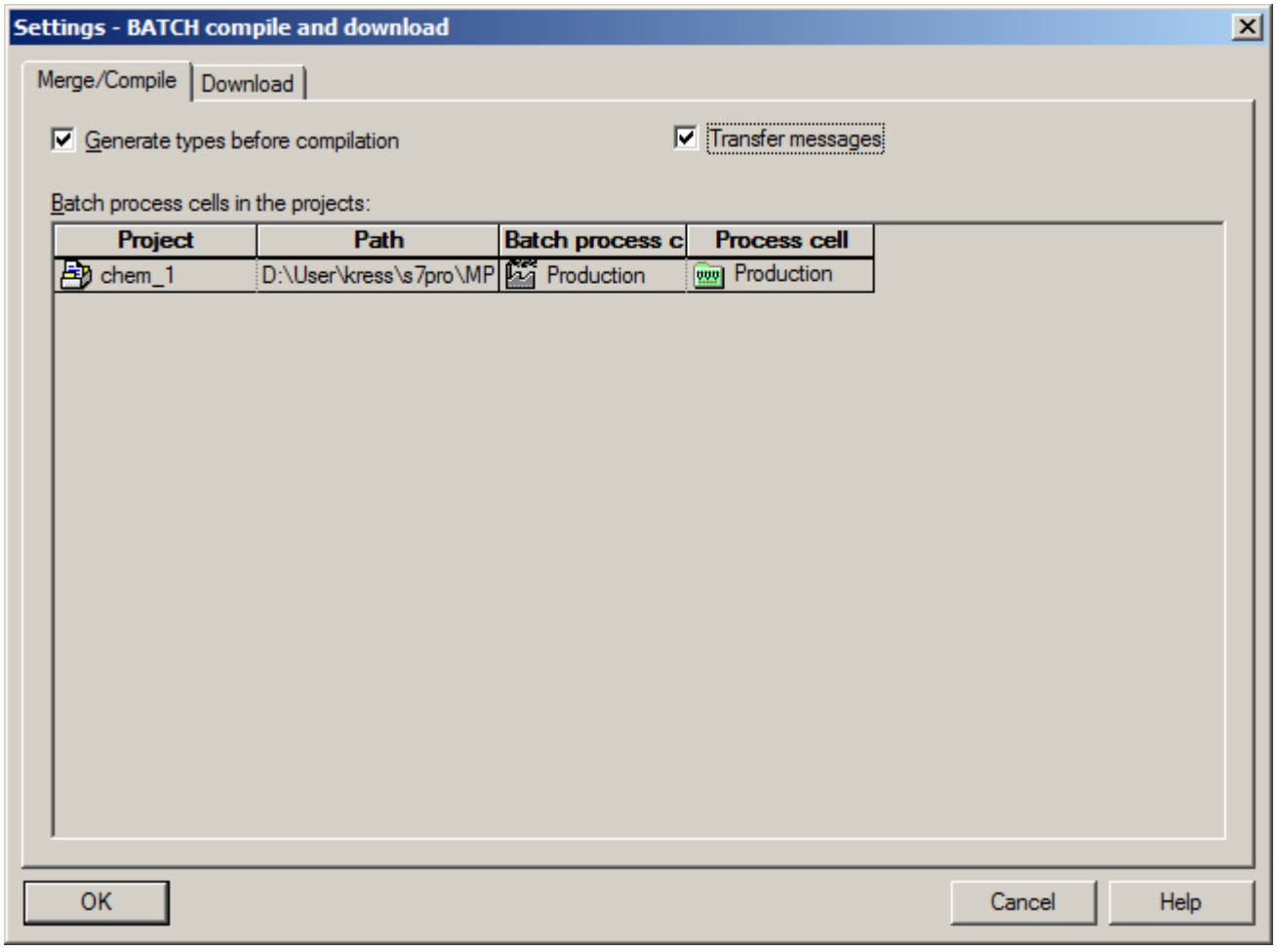


Figure 7-12 Decide whether or not you want to generate the batch types prior to compilation and whether you want to transfer the batch messages to the PCS 7 OS. You can do this by selecting or deselecting the relevant check box.

"Download" tab

The dialog is shown below. Components that need to be downloaded are activated automatically by the system. By selecting the check box in the "Component" table column title, all configured components are downloaded.

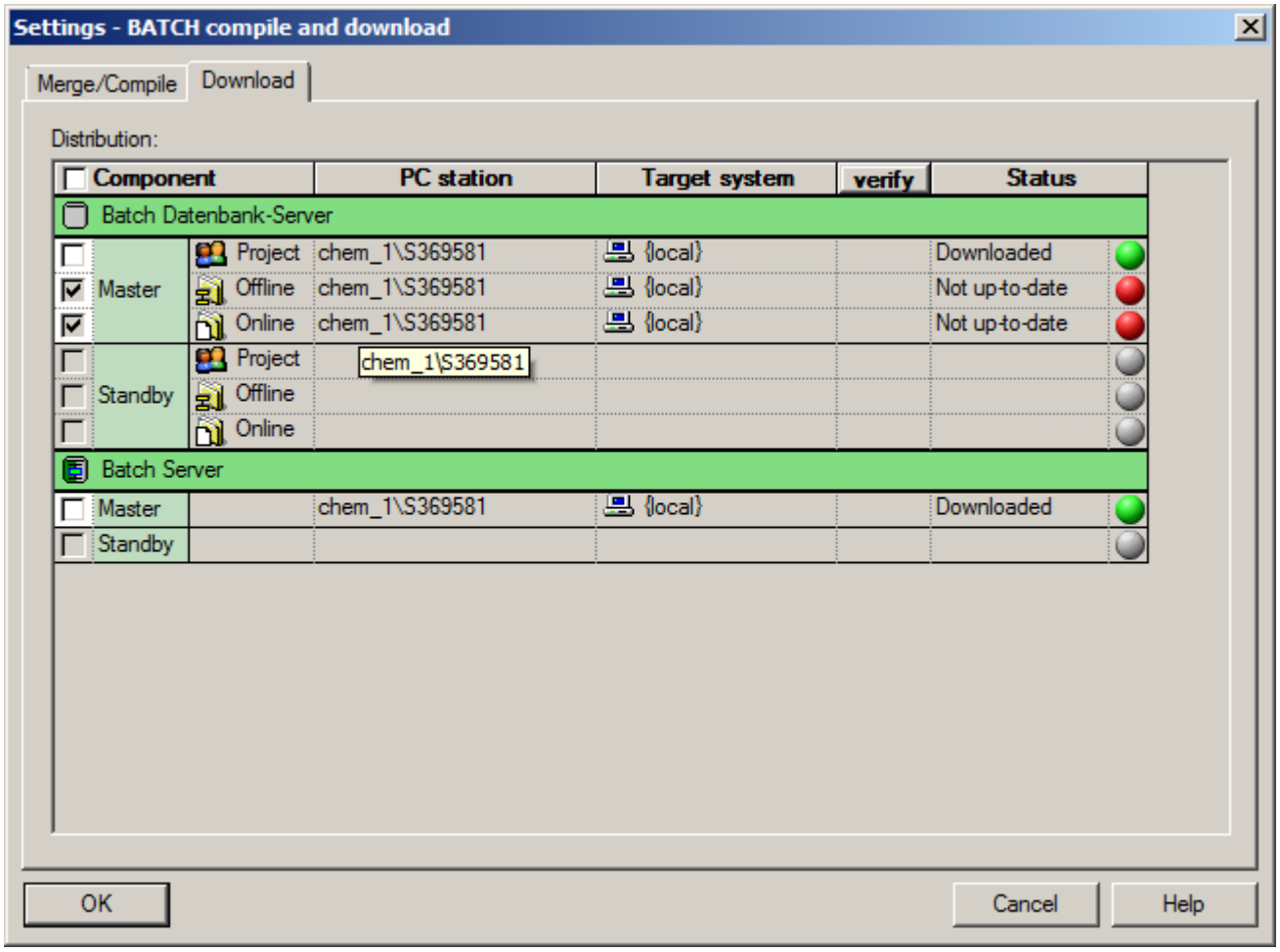
Requirement for downloading the BATCH process cell data

To ensure data consistency, the AS and OS engineering must be completed in the SIMATIC Manager prior to downloading the BATCH process cell data. The following sequence should be followed:

1. Compile and download the automation systems
2. Compile and download the PCS 7 OS server
3. Merge/compile and download the BATCH server and BATCH clients

Procedure in the "Settings" dialog in the SIMATIC Manager

1. In the "Settings" dialog, open the "Download" tab with the menu command **Options > SIMATIC BATCH > Compile/Download.**
2. In the "Merge/Compile" tab, you can decide whether or not the batch types are generated prior to merging/compiling and whether the messages should be transferred to the PCS 7 OS.
3. Go to the "Download" tab.
4. In the "Download" tab, all PC stations for BATCH servers (single, redundant), database servers and BATCH clients are displayed with information about their download status.



5. Press "OK" to start the download processes based on your settings on the components.
6. When successfully completed, the "Downloaded" status is shown for the respective components in the dialog. A log of the individual configuration steps is also displayed.

Changes to basic automation

Note

If the basic automation in the ES is modified, for example, if you make changes to CFC/SFC charts, SFC types, in HW Config, in the plant hierarchy, in AS-OS engineering etc., the BATCH process cell data must be downloaded again.

Download of new process cell data

Note

When you download the data of another BATCH project, make sure that all BATCH servers (redundant servers) have been restarted. This is the only way to ensure that all BATCH servers are connected to the newly loaded project when the new project is selected.

Actions in the SIMATIC Manager

Note

Following the actions "Retrieve", "Save as", "Save as with reorganization" and "Reorganize" in SIMATIC Manager, you must generate the BATCH types and compile/merge the BATCH instances in the BATCH configuration dialog prior to distributing the batch data.

7.4.13 Multiple instantiation of the same block types within a unit

Introduction

As of SIMATIC BATCH version 8.1, multiple instances of the same SFC type can be addressed within a unit.

To distinguish between multiple block instances of an SFC type within a unit, the block instance names must be different.

Up until SB version V8.1, configurations with more than one instance for a function or operation type within one unit were rejected with a plausibility error during compilation or merging of the batch instances.

Principle

The instance mode (more than one instance for a phase/operation type per unit) has been added to the current type mode (a maximum of one instance for a phase/operation type per unit).

The system automatically switches to instance mode as soon as the condition is met in at least one of the units (several instances per type).

Note

Type and instance mode

Before beginning the configuration work, select the mode in which the process cell is to be operated.

Basically, instance mode is only recommended for new process cells.

Converting an existing process cell from the type mode to the instance mode can have serious consequences. The consequences may only become apparent later, and thereby make more work necessary.

Type mode

Only type names are displayed in type mode.

Instance names are not displayed.

The instance names in the units can be freely assigned.

If you want to switch from type mode to instance mode, make sure that the unit switchover possible in type mode is also available in instance mode when assigning the instance names.

You may need to adapt the instance name.

In the example, it would not be possible to switch between the two units for the mentioned types in instance mode.

SFC type	Unit 1	Unit 2	Remark
Dosing	DosiU1	DosiU2	Both units already include one instance each for the Dosing type.
Heat	HeatU1	HeatU2	Both units already include one instance each for the Heat type.
Agitation	AgitU1	AgitU2	Both units already include one instance each for the Agitation type.

Instance mode

Only instance names are displayed in instance mode.

Type names are not displayed.

At least one instance name should be identical in each unit so that you can switch between units.

In the table below, these are the instances "DosiInst", "HeatInst" and "AgitInst".

The instances "AgitInst1", "AgitInst2" und "AgitInst3" can only be used in the corresponding unit.

SFC type	Unit 1	Unit 2	Remark
Dosing	DosiInst	DosiInst	The "DosiInst" instances can be used in both units equally.
Heat	HeatInst	HeatInst	The "HeatInst" instances can be used in both units equally.
	HeatInst1		The instance "HeatInst1" can only be used in unit 1.

SFC type	Unit 1	Unit 2	Remark
Agitation	AgitInst	AgitInst	The "AgitInst" instances can be used in both units equally.
	AgitInst1	AgitInst3	The instances "AgitInst1" and "AgitInst2" can only be used in unit 1 and "AgitInst3" can only be used in unit 2.
	AgitInst2		

Summary of the main requirements

- If there is a maximum of one block instance per phase or operation type per unit in all available units, the entire batch process cell is in type mode.
- If there is more than one block instance per phase or operation type in at least one unit, the entire batch process cell is in instance mode.
- If the corresponding requirement is met, the system switches internally from type mode to instance mode and vice versa.
- You can only configure more than one instance per type in a unit for SFC types. The instance mode is therefore only possible with SFC types. This is also true for a mixed type configuration, which means multiple instances are only possible with SFC types.
- The instance mode is not possible with pure (I)EPH types or even with BATCH flexible V4.02 blocks.
- The type comment is displayed when the instance in the recipe or in the batch is not defined. An instance, for example, is not defined when the strategy "The longest out of use", "Operator selection" or "Process parameters" is selected in the Recipe.
  The instance comment is displayed when the instance in the recipe or in the batch is defined.
- Switching the modes (type mode to instance mode or vice versa) results in a message box in SIMATIC BATCH Engineering.
  The message box must be acknowledged so that download to the BATCH system is possible.
  The note is important because many problems can occur during switching, for example, when naming instances that cannot be corrected automatically.

Selecting a standard instance in the BATCH configuration dialog

When multiple instances of an SFC type exist in a unit, then the instance that is available with the same name in all (or as many as possible) units should be selected as default instance in the BATCH configuration dialog.

For function and operation types, select the block instance name of the standard instance in the drop-down list at the type in the "Standard instance" row.

This standard instance is then the instance that is used when migrating a type mode project to an instance mode project. A corresponding note is displayed if not all units have instances of this type (i.e. an instance with this name).

If the user does not select a standard instance, a random instance is selected as standard instance name when generating the batch types.

If the selection is made manually, this is always retained. The selection can be changed or reset at any time so that the selection is once again made automatically.

If there are multiple instances within a unit, the following is checked in the BATCH configuration dialog:

- Is the instance name unique?
  If the instance name is not unique, a corresponding plausibility error is output.
- Has a common instance name been assigned in all units where this SFC type is used?
  If no common instance name has been assigned, a corresponding note is displayed.

Effects on involved components

Reports

Only the instance name is displayed in the recipe report and in the batch report for instance mode.

SIMATIC BATCH COM API

The associated instance name and not the type name is displayed at the instances for the "GetObjectData" XML functions in instance mode.

SIMATIC BATCH OS controls

Types with multiple instances have no effects on OS controls.

Process tags

Process tags (TAGCOLLs) behave in accordance with the type mode.

Transition conditions

Transition conditions with TAGCOLL tag behave in accordance with the type mode.

7.4.14 Simultaneous compilation and download

PCS 7 also provides a complete function "Compile and Download" for all PC stations (including operator stations) that can also be used for a Batch process cell.

Procedure in the SIMATIC Manager

1. In the Component view or Plant view, select the single project or multiproject and then select **PLC > Compile and download objects** in the context menu.
   The "Compile and download objects" dialog box opens.
2. Select the "Process cell" among the objects and then click the "Edit" button in the section "Settings for compilation/download".

3. Make the following settings in the tabs:
   - In the multiproject in the "Merge/compile" tab: Here, select all projects to be included when generating the batch process cell data.
   - In the "Transfer" tab of the single project / multiproject: Here, select the message OS and the batch-relevant operator stations.
   - In the "Download" tab of the single project / multiproject: Here, select components to be downloaded (BATCH server, BATCH clients, DB server)
4. Confirm with "OK".
   In the "Compile" and "Download" columns of the "Compile and download objects" dialog box, specify the objects to be included in the compilation or download.
5. Click on the "Start" button.

Note

In a multiproject, only the process cell below a project of the multiproject needs to be selected and the options "Compile" and "Download" only need to be specified for this project.

7.4.15 Communication monitoring

Communication monitoring

With SIMATIC BATCH, you have the ability to monitor the communication between BATCH server, PCS 7 OS server and the AS. The communication monitoring is performed by the unit block, UNIT_PLC (FB 266). You define the configuration in the BATCH configuration dialog under the settings in the "System characteristics" tab in the "Monitoring times" area. When configuring communication monitoring in a distributed system, take the following into consideration:

- The times involved in a redundancy failover
- The critical times in the process

UNIT watchdog (sign of life monitoring)

The monitoring of the "UNIT_PLC" unit blocks is controlled by the BATCH Control server. If there is no update or reset of the counter for configured time interval, is disconnect is signaled at the UNIT_PLC block, to which the automation system can respond. Time monitoring is active only when the unit is occupied by a batch. If a unit is allocated manually using the corresponding "UNIT_PLC" faceplate, communication monitoring (UNIT watchdog) is not activated.

Using the UNIT watchdog

Communication monitoring complements the redundancy concept. However, it can also be used without redundant servers, for example, with a single station system. On the other hand, it is also not necessary to activate communication monitoring for a redundancy failover. It should be used in particular to protect a critical automation process.

Setting the UNIT watchdog

Note

Process tolerance

If both mechanisms, redundancy and UNIT watchdog are active, please note the following when setting the time interval:
The time interval should always be selected in accordance with the process tolerance, in such a way that a significant increase in the switchover time can be detected and responded to at any given time. Depending on the backup measures of the process initiated, the synchronization of batches by batch control may take longer following the failover or is no longer possible automatically. In this case, the operator will need to intervene manually to continue the batches.

Additional information

BATCH Configuration dialog > "System characteristics" tab (Page 1007)

7.4.16 Working with several process cell projects

One BATCH server per project

Note

In the scenarios described below, the rule that only one BATCH server can be configured per S7 project/multiproject still applies.

Several process cells of different S7 projects

With SIMATIC BATCH, it is also possible to generate BATCH servers and BATCH clients in multiple S7 projects. For example, you can run three S7 projects each with three PCS 7 operator stations and the same multiclient (with BATCH client). The multiclient (with BATCH client) can communicate with the BATCH server of each S7 project.

The various process cell projects belonging to the S7 projects can be opened simultaneously by the BATCH client. In this case, the batch applications must be opened more than once. The display of several process cell projects within a batch application, for example within a BatchCC is, on the other hand, not possible.

Running different projects on one BATCH server

You can run different process cell projects on one BATCH server **in succession**: Several projects can be loaded on a single BATCH server PC. However, only one process cell project (i.e. one BATCH server) can be active at any one time. This is advantageous, for example, when the "correct" project and a test project need to be run separately without either modifying the data of the other process cell project.

By selecting the OS project (PCS 7 OS changes to runtime), a switchover is made on the BATCH server PC. SIMATIC BATCH recognizes which process cell project belongs to which OS project.

Switching over the BATCH client

The assignment of the BATCH client <-> BATCH server is generally made during configuration in the engineering system. After reading in the process cell data, a BATCH client then operates with the process cell project of the corresponding BATCH server.

If there is information on more than one process cell project on the BATCH server, a selection dialog with all existing process cell projects is displayed on the BATCH client after selecting the menu command **Program > Read in new process cell** . By selecting a process cell project, you establish the connection to the BATCH server (and therefore also to the required process cell project).

7.4.17 Downloading to the target system, changes

Selective download (CFC editor)

The SIMATIC PCS 7 function can be used in conjunction with SIMATIC BATCH.

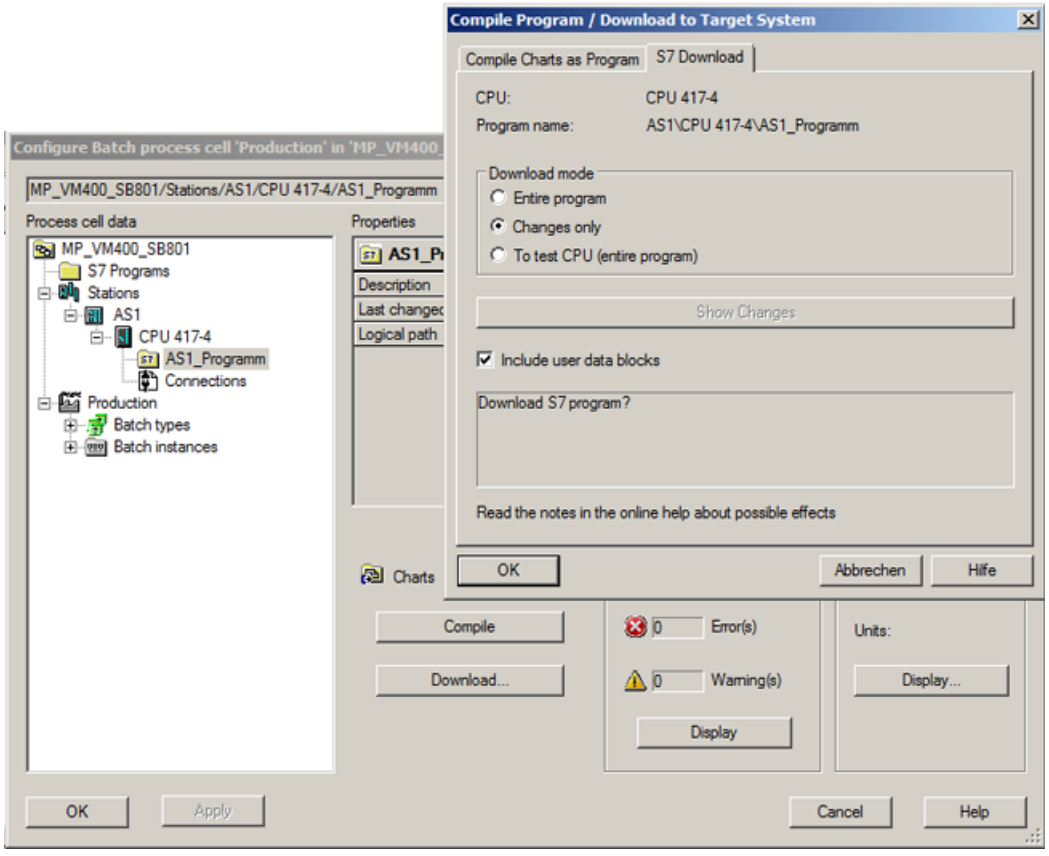
Note

Observe the information in the *Process Control System PCS 7, CFC for SIMATIC S7* manual or in the section "Selective download of individual charts" in the *online help, CFC for SIMATIC S7*.

Global data blocks must be loaded

When delta loading in the CFC, you must ensure that the "Include user data blocks" option button is selected.

You make this setting in the "S7 Download" tab when you load the S7 program in the CFC from the BATCH configuration dialog or from the SIMATIC Manager.



7.4.18 Specifying the type description of the process cell

7.4.18.1 Type description of the process cell

Introduction

As the basis for creating recipes in SIMATIC BATCH, the type description of the process cell must be generated or edited and, where necessary, synchronized with the block instances of the CFC charts. The following types can be defined for creating recipes.

Batch types (type description of a process cell)

Type	Editing options and results
Data types	The system specifies the standard data types floating point number, integer, string, input material, output material, material (V4), and Boolean. You can also create custom data types and edit their properties.
Units of measure	You can create new units of measure and edit their properties.

Type	Editing options and results
Operation types, phase types and process tag types	To allow recipe creation purely on the basis of types, types must be specified without the block instances for them existing. • Operations types: Type information for the equipment operations (EOP) • Phase types: Type information for the equipment phases (EPH) • Process tag types: Type information of the TAG_Coll blocks Operation types and phase types can be assigned control strategy parameters.
Equipment properties	You can create equipment properties for units and change their properties.

Configuring the type description

You generate or edit the batch types in the BATCH configuration dialog. The procedure depends on the answers to the following questions:

- Are you using a single project or multiproject?
- Are you using SFC types or BATCH interface blocks?

Depending on your application, you have various functions available for the batch types. Functions that cannot be used are grayed out in the BATCH configuration dialog.

Batch types that depend on language

Note

Batch types that depend on the language (user data types, for example) are displayed in SIMATIC BATCH in the language with which they were created during the configuration of the type descriptions. Switching the language of the Batch application has no effect in this regard.

7.4.18.2 Type description for the individual project

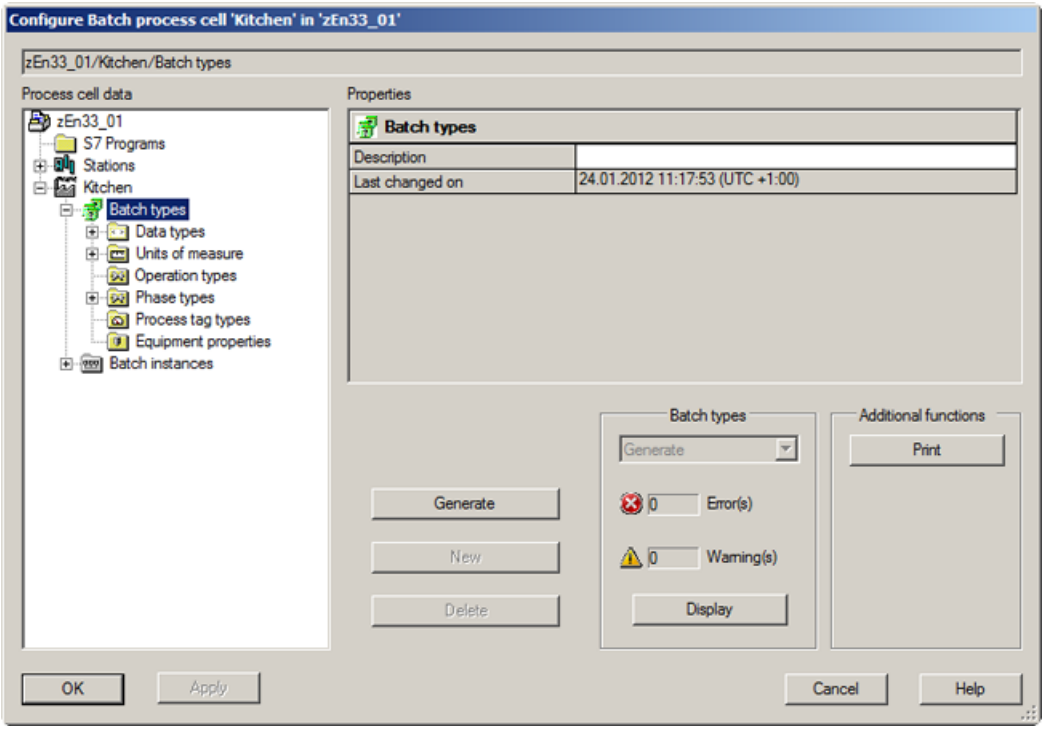
Configuring the type description

You configure the type description in the BATCH configuration dialog. You open this dialog in the Component view and in the Plant view:

- using the **Options > SIMATIC BATCH** menu command
- by selecting any object and then the **SIMATIC BATCH** command in the shortcut menu

BATCH configuration dialog

For the type description, the "Batch types" object must be selected on the left side of the BATCH configuration dialog. Click on expand ("+") to display all possible batch type objects. The attributes of a type object are displayed under "Properties" on the right side of the dialog.



Display of errors

Validation errors and warnings detected by the functions "Validate", "Compile" or "Generate" are displayed in the log field and can be visualized with the "Display" button. All errors/warnings that are subordinate to the selected object will be displayed.

The errors and warnings are also indicated on the object by a red or yellow lightning bolt. By selecting the object involved and selecting the **Display log** command in the shortcut menu, the object-related text for errors and warnings can be displayed:

	Error
	Warning

If errors/warnings cannot be determined, for example, after a migration, a question mark is shown on the object icon.

7.4.18.3 Executable functions in a single project

Executable functions for the BATCH types in the BATCH configuration dialog

Function	Selected object	Description
Generate	Batch types	• SFC types: Operation/phase types are generated from SFC types with EOP/EPH IDs. • BATCH interface blocks: Batch types (units of measure, operation/phase types, process tag types) are generated from the instances of the BATCH interface blocks. **Note:** If Batch instances, SFC types or TAGCOLLECT FBs are modified, the "Generate" function must be run prior to compilation. The same applies to modifications in the PH, for example after moving or copying CFC charts.
New	• Phase types • Operation types • Process tag types	Creation of phase, operation, and process tag types under the selected area and creation of the corresponding type parameters.
Delete	• Data type • User data type (if present) • Units of measure • Phase types • Operation types • Process tag types • Equipment properties	You can delete data types, user data types, units of measure and equipment properties in the selected folder. All non-instanced objects are deleted. However, they remain available in the shared declarations and will appear again during the next generation. With operation types, phase types and process tag types, you can select individual objects and delete them as long as they have not been instanced.
Edit	• Phase types • Operation types • Process tag types	Editing the attributes of the batch types and type parameters. Exception: SFC types You can find a description of how to edit SFC types in the section "Creating a new SFC type (Page 176)".
Additional functions **Print**	Batch types	Printing: Print all batch types of the process cell in tabular form.
Additional function **Display**	• User data type (if present) • Units of measure • Phase types • Operation types • Process tag types • Equipment properties	List of all instances that refer to this type object. Certain attributes can be selected using a filter.
Log	Batch types	Display of the logs of the executed "Generate" function To do this you must select the executed function in a drop-down selection list and then click on the "Display" button.

7.4.18.4 Type description in a multiproject

Configuring the type description

In a multiproject, the type description is configured only in the multiproject itself.

The batch types cannot be modified in any of the projects booked into the multiproject; in other words, no batch types can be edited or added.

If a project is removed for editing of the multiproject, you can specify whether or not the batch types can then be modified in this project. This applies to current batch types and every project of the multiproject (enable editing for the condition). This means that you have the option of adapting (updating) your own batch types in every project to those of the multiproject.

Note

All projects in the multiproject have the same rights and priorities.

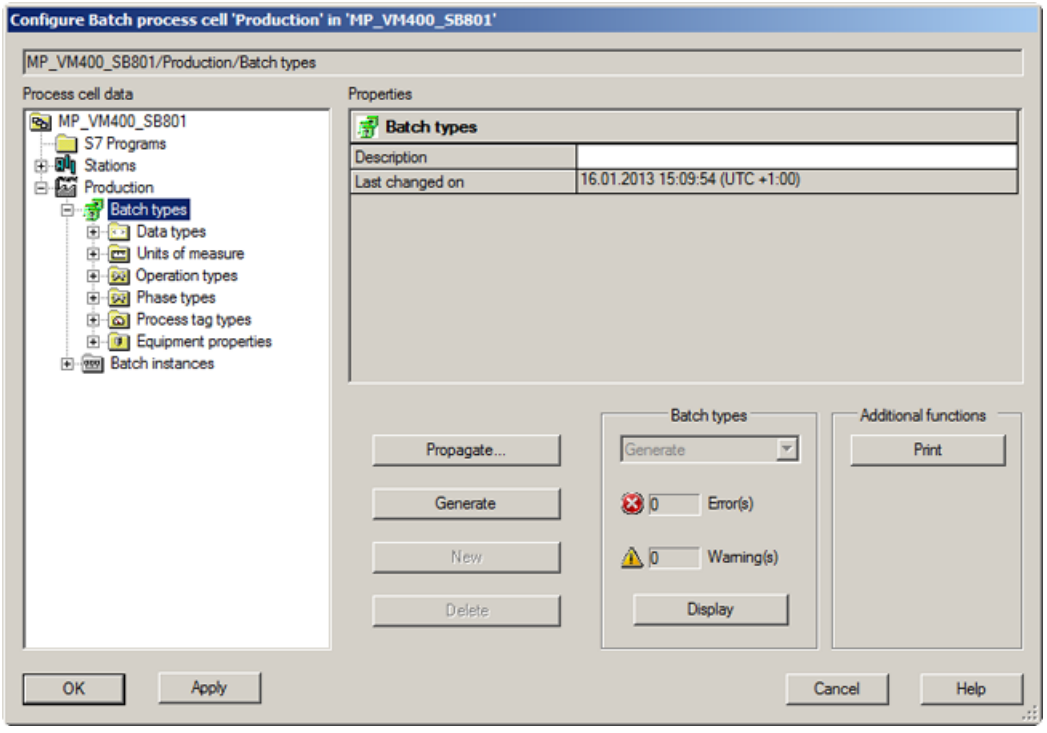
Projects with Batch configurations require the creation of a Batch process cell. The batch types are managed only in the specific projects.

You configure the type description in the BATCH configuration dialog. You open this dialog in the Component view and in the Plant view:

- using the **Options > SIMATIC BATCH** menu command
- by selecting the multiproject and then the **SIMATIC BATCH** command in the shortcut menu

BATCH configuration dialog

For the type description, the "Batch types" object must be selected on the left side of the BATCH configuration dialog. Click on expand ("+") to display all possible batch type objects. The attributes of a type object are displayed under "Properties" on the right side of the dialog.



Display of errors

Validation errors and warnings detected by the functions "Validate", "Compile" or "Generate" are displayed in the log field and can be visualized with the "Display" button. All errors/warnings that are subordinate to the selected object will be displayed.

The errors and warnings are also indicated on the object by a red or yellow lightning bolt. By selecting the object involved and selecting the **Display log** command in the shortcut menu, the object-related text for errors and warnings can be displayed:

	Error
	Warning

If errors/warnings cannot be determined, for example, after a migration, a question mark is shown on the object icon.

7.4.18.5 Executable functions in a multiproject

Executable functions for the BATCH types in the BATCH configuration dialog

Function	Selected object	Description
Generate	Batch types	• SFC types: Operation/phase types are generated from SFC types with EOP/EPH IDs. • BATCH interface blocks: Batch types (units of measure, operation/phase types, process tag types) are generated from the instances of the BATCH interface blocks. • In multiproject engineering, this command generates the batch types from the SFC types or BATCH interface blocks of all projects of the multiproject. **Note:** If Batch instances, SFC types or TAGCOLLECT FBs are modified, the "Generate" function must be run prior to compilation. The same applies to modifications in the PH, for example after moving or copying CFC charts.
Propagate	Batch types	Notification of the complete type description to the individual projects of the multiproject. After executing this function, you can select the projects to be involved in the propagation of the batch types in a dialog box. The type descriptions of all selected projects are then consistent.
New	• Phase types • Operation types • Process tag types	Creation of phase, operation, and process tag types under the selected area and creation of the corresponding type parameters.
Delete	• Data type • User data type (if present) • Units of measure • Phase types • Operation types • Process tag types • Equipment properties	You can delete data types, user data types, units of measure and equipment properties in the selected folder. All non-instanced objects are deleted. However, they remain available in the shared declarations and will appear again during the next generation. With operation types, phase types and process tag types, you can select individual objects and delete them as long as they have not been instanced.
Edit	• Phase types • Operation types • Process tag types	Editing the attributes of the batch types and type parameters. Exception: SFC types You will find a description of editing SFC types in the section "Creating a new SFC type (Page 176)".
Additional functions **Print**	Batch types	Printing: Print all batch types of the process cell in tabular form.

Function	Selected object	Description
Additional function **Instances: Displays**	• User data type (if present) • Units of measure • Phase types • Operation types • Process tag types • Equipment properties	List of all instances that refer to this type object. Certain attributes can be selected using a filter.
Log	Batch types	Display of “Generation“ log.

7.4.18.6 Executable functions in a project of a multiproject

Functions available in the BATCH configuration dialog

Function	Selected object	Description
Additional function: Print	Batch types	Prints all batch types of the process cell in tabulated form.
Additional function: Display	• User data type, if available • Units of measure • Phase types • Operation types • Process tag types • Equipment properties	List of all instances that refer to this type object. You can select certain attributes via a filter.
Log	Batch process cell	Display of the validity log.
	Batch instances	Display of the compile log.
Update	Batch types	Updating the batch types in this project (importing the batch types of the multiproject).
Check validity	Batch process cell	The validity of the project is checked.
Compile	Batch instances	Compiles the batch instances.

7.4.18.7 Executable functions in a removed project

Functions in the removed project with editable batch types

Function	Selected object	Description
Generate	• Batch types	• SFC types: Operation/phase types are generated from SFC types with EOP/EPH IDs. • BATCH interface blocks: Batch types (units of measure, operation/phase types, process tag types) are generated from the instances of the BATCH interface blocks. • This command generates the batch types from the SFC types or BATCH interface blocks of the project removed for editing. **Note:** If Batch instances, SFC types or TAGCOLLECT FBs are modified, the "Generate" function must be run prior to compilation. The same applies to modifications in the PH, for example after moving or copying CFC charts.
New	• Phase types • Operation types • Process tag types	Creation of phase, operation, and process tag types under the selected area and creation of the corresponding type parameters.
Delete	• Data type • User data type (if present) • Units of measure • Phase types • Operation types • Process tag types • Equipment properties	You can delete data types, user data types, units of measure and equipment properties in the selected folder. All non-instanced objects are deleted. However, they remain available in the shared declarations and will appear again during the next generation. With operation types, phase types and process tag types, you can select individual objects and delete them as long as they have not been instanced.
Edit	• Phase types • Operation types • Process tag types	Editing the attributes of the batch types and type parameters. Exception: SFC types You will find a description of editing SFC types in the section "Creating a new SFC type (Page 176)".
Additional functions **Print**	Batch types	Printing: Print all batch types of the process cell in tabular form.
Additional function • **Display**	• User data type (if present) • Units of measure • Phase types • Operation types • Process tag types • Equipment properties	List of all instances that refer to this type object. Certain attributes can be selected using a filter.
Log	Batch types	Display of the logs for the executed functions "Generate" First select the executed function in the drop-down list and then click the "Display" button.

7.4.18.8 Propagating a type description to other projects (multiproject)

To allow batch configuration in the individual projects of the multiproject and to compile unit data with the latest type description, the type description generated centrally in the multiproject can be distributed (propagated) to the individual projects of the multiproject.

Working in the SIMATIC Manager

1. Select the "Batch types" object in the BATCH configuration dialog.
2. Click the "Propagate" button.
   Result: The "Propagate types for entire process cell" dialog box opens.
3. Activate all the projects to be propagated.
4. Click the "Start" button.

Result:

The complete type description is distributed to the projects of the multiproject. After running this function, the batch types are consistent in all selected projects.

Rational engineering 8

8.1 Difference between single project and multiproject engineering

The engineering involved in a batch process cell can be done both on one PC (single project) or on several PCs (multiproject).

Single project engineering

In small Batch process cells and when only one configuration engineer is available, engineering is done in a single project; in other words, on one PC.

Multiproject engineering

In larger Batch process cells, simultaneous configuration is necessary on different PCs and by different configuration engineers. This is made possible by multiproject engineering. Access to the data on the other PCs is possible. The individual projects of the process cell are merged on a central ES PC using the "Multiproject" object.

8.2 Single project engineering

8.2.1 Removing projects for editing and restoring them

You can transfer your projects to other engineering stations in the network with the command "Remove for editing". You can completely configure the project there.

Preciously, you could only edit batch types in a removed project. As of SIMATIC BATCH V7.0, you can now remove any project from a multiproject for editing. The batch types can still be edited in each project.

Procedure

1. Select the project to be removed in the SIMATIC Manager, right-click and select the command **Multiproject > Remove for Editing ...** in the shortcut menu.
2. Then select a local directory or network path for storage. The complete project data is copied to the selected path and removed from your multiproject directory. The removed project is display grayed-out in the multiproject. It can no longer be edited there.
3. Select the grayed-out project, right-click and select the shortcut menu command **Multiproject > Reapply after Editing**. This copies the project data back to the multiproject directory. You can now continue configuration for the multiproject as usual.

8.2.2 Flow chart: Engineering procedure for a single project

Introduction

Below you will see a **recommended** sequence of configuration steps. The order of the steps shown in the schematic is not absolutely necessary. We have selected a method on which the following more detailed description is oriented.

Requirement

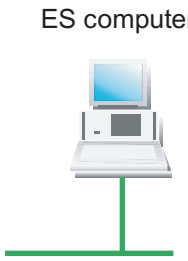
The basic control has been created; in other words, the PLC hardware is configured, the CFC and SFC charts have been created and compiled. The information below relates only to the supplementary ES configuration for creating recipes and batch control with SIMATIC BATCH.

Example of a configuration for single project engineering

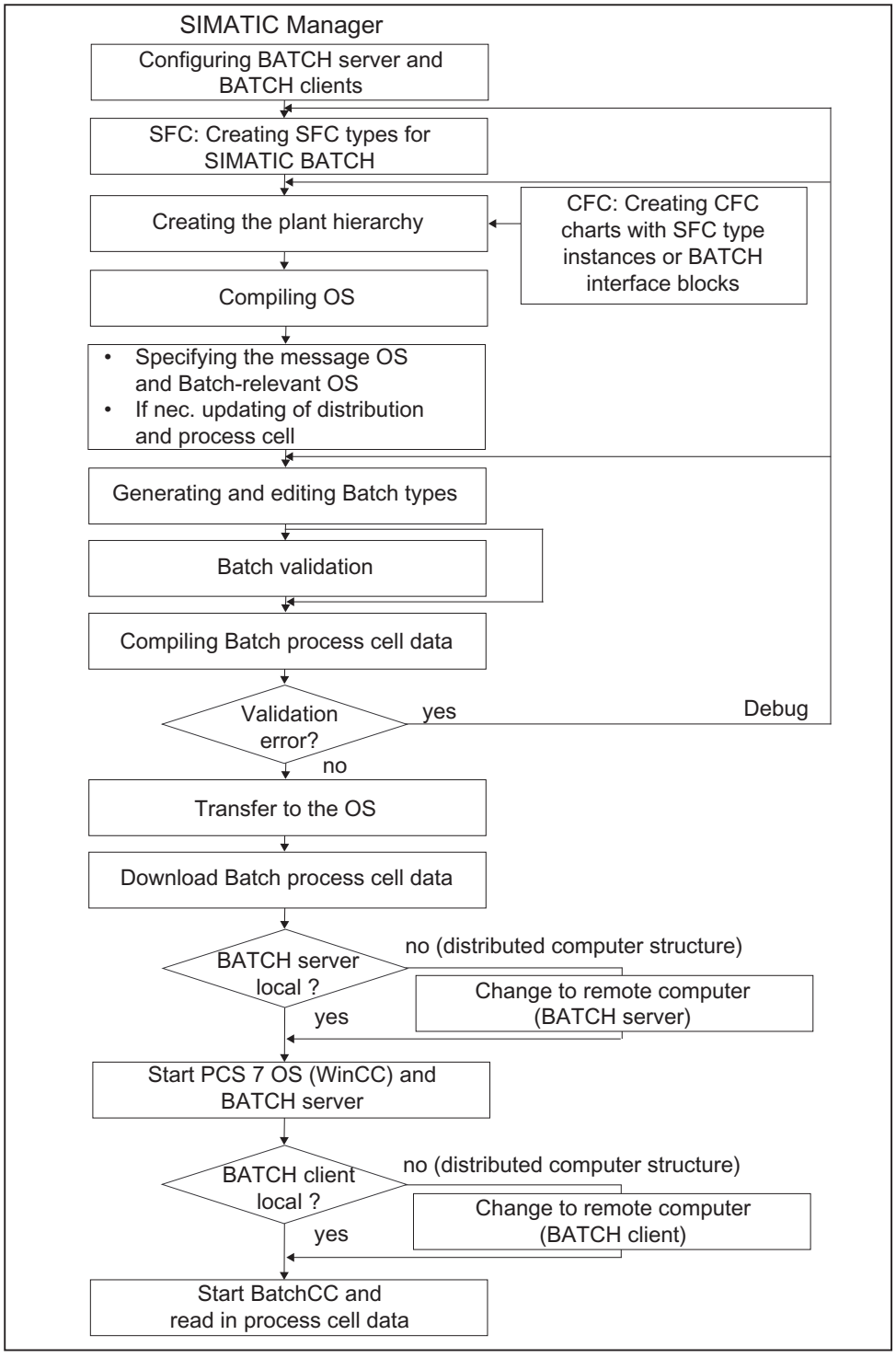
Individual project

Available functions:
• S7 configuration
• Configure BATCH clients
• Configure BATCH server
• Configure SFC types
• Configure TH

Available functions in "Process batch process cell" dialog box:
• on project:
• Settings: Distribution, OS objects
• on the process cell:
• Transfer into OS
• Download
• on the batch types:
• Edit
• Generate
• Synchronize
• on the batch instances
• Compile
• Validation



What is involved in the ES configuration for SIMATIC BATCH?



Updating the process cell data

Note

If you modify the basic control (CFC/SFC charts, hardware configuration, plant hierarchy etc.), the process cell data must be updated again and downloaded to the CPU (BATCH server, BATCH clients) and batch-relevant data must be transferred to the operator stations.

Prior to this, the OS must be compiled and downloaded again.

8.3 Multiproject engineering

8.3.1 General information

General documentation on multiproject engineering

An introduction to multiproject engineering with PCS 7 is provided by the manual *Process Control System PCS 7; Engineering System* This documentation is on the "Electronic Manuals, PCS 7" CD. This is general documentation that describes the configuration of a multiproject and the interaction between individual S7 projects from a neutral perspective.

You will find further information in the online help in PCS 7 in the topic "What you Should Know about Multiprojects".

The following information relates to the additional engineering steps involved in configuring batch processes with the components of SIMATIC BATCH.

Uniqueness of the names

Note

Please note that if you distribute the configuration work on several ES PCs, the project names and the names of the project objects contained must be unique on all ES PCs. The process cell name must be identical in all projects.

The name of the Batch projects (multiprojects and projects) may only occur once in the PCS 7 environment.

You must declare required type information, such as units of measure, equipment properties and enumerations in the shared declarations in the SIMATIC Manager.

Consistency of projects

Note

As the user, you yourself are responsible for the consistency of the projects within a multiproject. This applies especially to the shared declarations and the SFC types.

Project languages

Note

All projects in multiprojects must be configured in the same language. If a project is removed and then configured in another language, SIMATIC BATCH will not be able to compile it correctly when the project is reinserted. The reason for this is the lingually differing display names for the parameters of enumerations.

Multiproject projects

Note

Never use configurations in which several PC stations are set up on the same PC in projects within a multiproject. It is better to configure one PC station with several applications (e.g one OS and one BATCH server).

8.3.2 Importing remote process cells

Introduction

To enable material transport through several process cells with a batch with SIMATIC Route Control, you can import remote process cells into the local S7 project in addition to the local process cells. The required functionality for this step is provided in the SIMATIC Manager.

Imported remote process cells contain the complete plant hierarchy and the information about the types and instances of the locations for the corresponding hierarchy folders.

Requirements

- You can only import remote process cells within a multiproject.
- Locations need to be configured in the S7 project.
- The multiproject must be opened in the SIMATIC Manager.

Procedure

1. Switch to the plant view using the menu command **View > Plant View**.
2. Select the multiproject folder and select the shortcut menu command **Plant Hierarchy > Import process cell**.
3. Follow the instructions in the subsequent dialogs.

Result

You have imported a remote process cell into your S7 multiproject.

Additional information

Preparing ES data for SIMATIC BATCH

8.3.3 Preparing ES data for SIMATIC BATCH

Introduction

All information available in the ES from imported remote process cells is prepared for SIMATIC BATCH in the BATCH configuration dialog.

Functions in the BATCH configuration dialog

- The ES data are written to the EQM file using the "Generate" and "Compile" functions in the BATCH configuration dialog.
- The ES data are copied to the corresponding project directory of Batch with the "Download" function.
- The ES data are transferred to the SIMATIC BATCH database using the "Update process cell" action in the BATCH Control Center (BCC).

Additional information

Selecting types of locations for transfer parameters (Page 612)

8.3.4 PCS 7 - change project type

PCS 7 change project type

If you want to insert a PCS 7 project in a PCS & multiproject, you should work in the SIMATIC Manager with the STEP 7 Master Data Library, to ensure consistency relative to the AS blocks.

A description of how to create a Master Data Library within a multiproject is available in the online help in the SIMATIC Manager in the chapter "Using the Master Data Library".

8.4 Central multiproject engineering

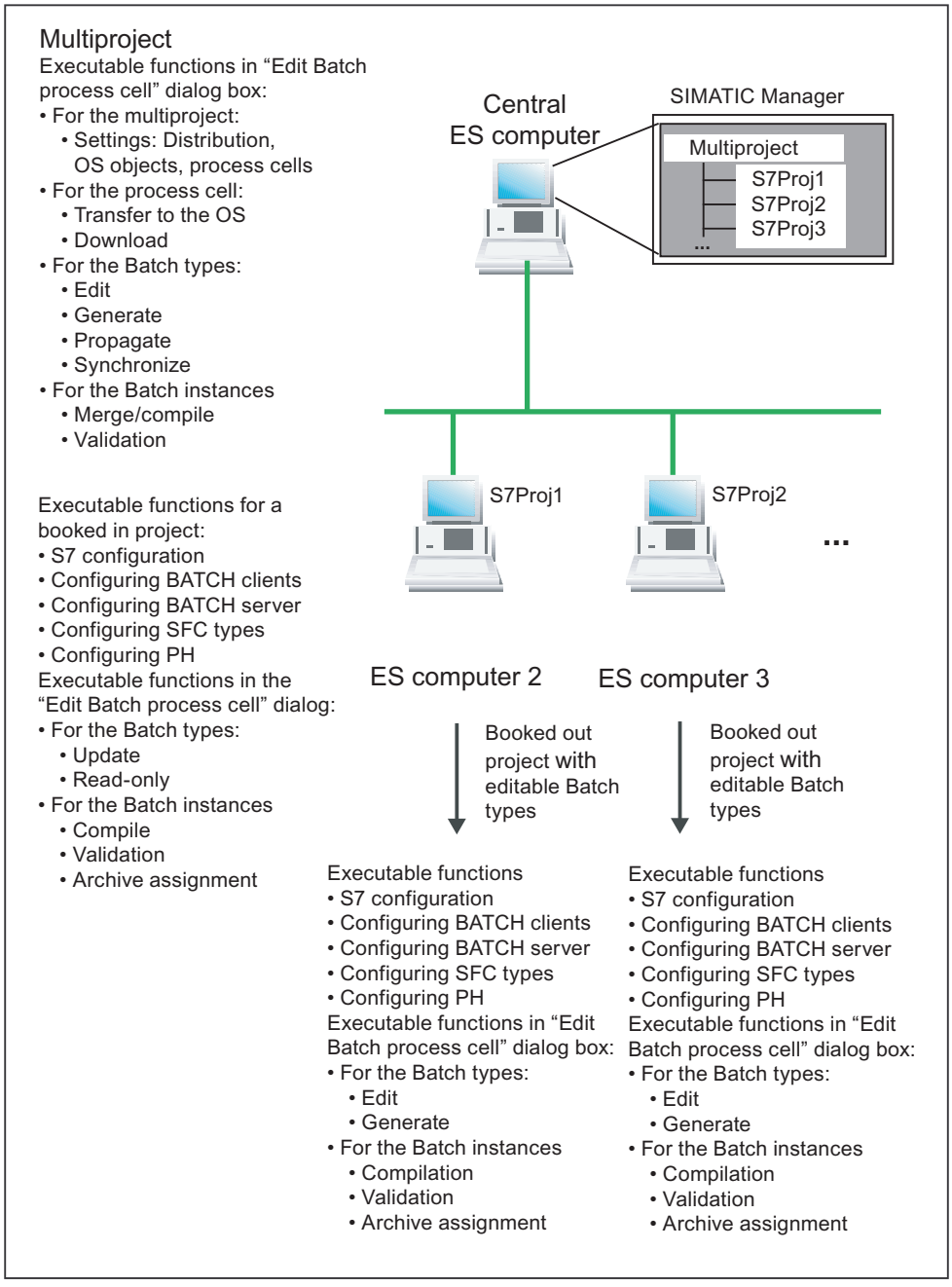
8.4.1 Flow chart: Engineering procedure for a multiproject

Example configuration for centrally managed multiproject for SIMATIC BATCH

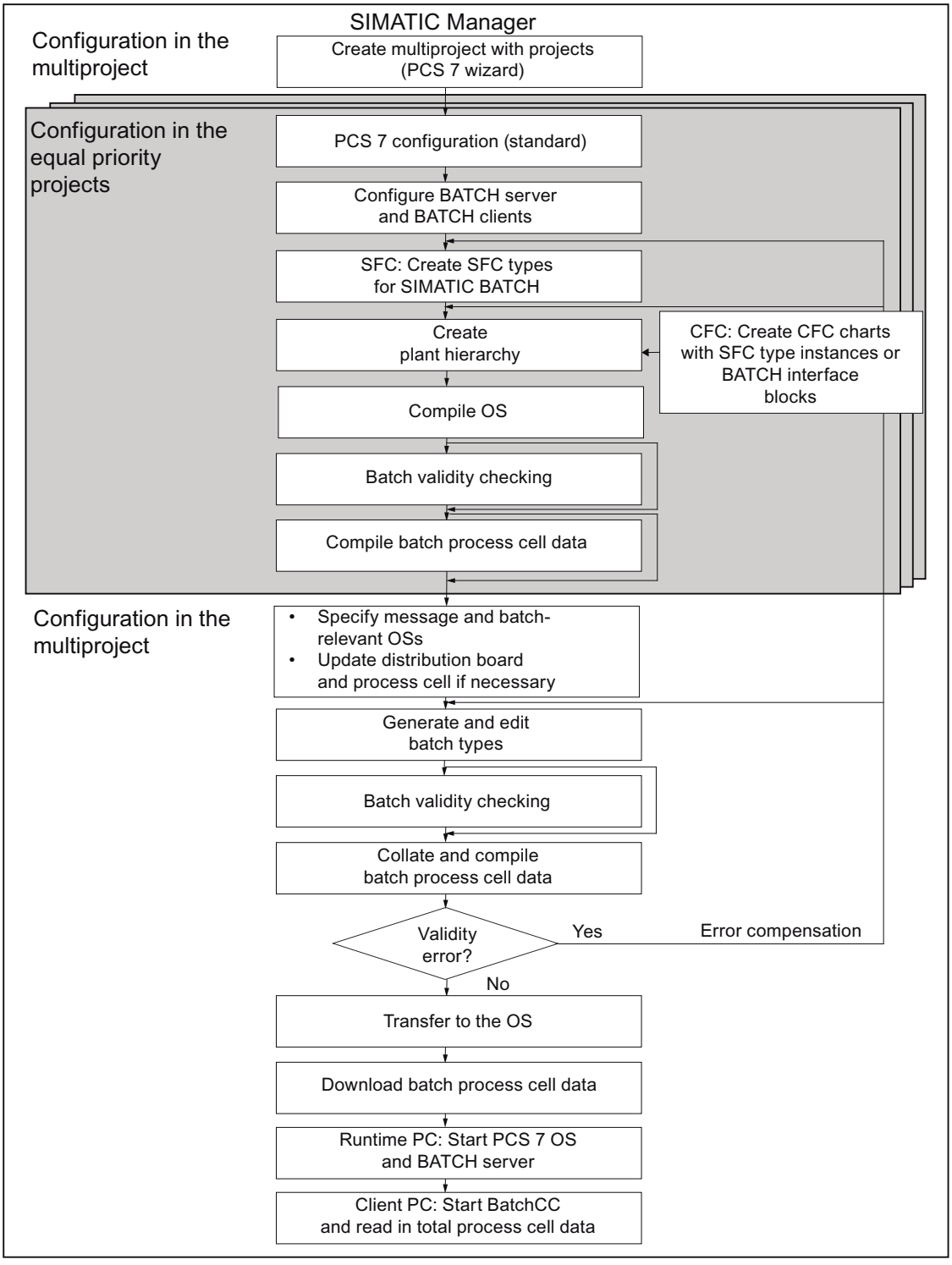
The first step is to create a "Multiproject" object on a central ES PC in the SIMATIC Manager. You set up all the S7 projects along with drive information relating to the ES PCs on which the S7 projects will be configured below the multiproject. The individual S7 projects can then be configured at the same time on the ES PCs (PC 1, PC 2, PC 3, etc.). The data for the BATCH server is configured on one of the ES PCs (PC 1).

Note

It is, of course, also possible to configure one of the projects on the central ES PC, for example the computer with the BATCH server configuration. To keep the picture clear, however, the description that follows is based on the configuration shown in the schematic below.


Multiproject
Executable functions in “Edit Batch process cell” dialog box:
• For the multiproject:
• Settings: Distribution, OS objects, process cells
• For the process cell:
• Transfer to the OS
• Download
• For the Batch types:
• Edit
• Generate
• Propagate
• Synchronize
• For the Batch instances
• Merge/compile
• Validation
Executable functions for a booked in project:
• S7 configuration
• Configuring BATCH clients
• Configuring BATCH server
• Configuring SFC types
• Configuring PH
Executable functions in the “Edit Batch process cell” dialog:
• For the Batch types:
• Update
• Read-only
• For the Batch instances
• Compile
• Validation
• Archive assignment
Central ES computer
SIMATIC Manager
Multiproject
S7Proj1
S7Proj2
S7Proj3
...
S7Proj1
S7Proj2
...
ES computer 2
ES computer 3
Booked out project with editable Batch types
Booked out project with editable Batch types
Executable functions
• S7 configuration
• Configuring BATCH clients
• Configuring BATCH server
• Configuring SFC types
• Configuring PH
Executable functions in “Edit Batch process cell” dialog box:
• For the Batch types:
• Edit
• Generate
• For the Batch instances
• Compilation
• Validation
• Archive assignment
Executable functions
• S7 configuration
• Configuring BATCH clients
• Configuring BATCH server
• Configuring SFC types
• Configuring PH
Executable functions in “Edit Batch process cell” dialog box:
• For the Batch types:
• Edit
• Generate
• For the Batch instances
• Compilation
• Validation
• Archive assignment

What is involved in the ES configuration for SIMATIC BATCH in a multiproject?



Updating process cell data

Note

If you modify the basic control (CFC/SFC charts, hardware configuration, plant hierarchy etc.), the process cell data must be compiled again, batch-relevant data must be transferred to the operator stations and downloaded to the CPU (DB server, BATCH server, BATCH clients).

Before data is transferred to the operator stations, the OS must be recompiled.

8.5 Distributed multiproject engineering

8.5.1 Overview and important initial considerations

Introduction

In this section, we explain distributed multiproject engineering with SIMATIC BATCH. This involves the exchange of projects between central and several distributed multiprojects. These projects can only contain SIMATIC AS stations.

These projects are exchanged by removing them from a central multiproject, inserting them into a distributed multiproject, editing them in the distributed multiproject, removing them from the distributed multiproject and finally inserting them back into the central multiproject.

Since BATCH multiproject configuration was only designed for editing within the context of a single multiproject, a few important rules and restrictions must be taken into consideration for distributed multiproject engineering with SIMATIC BATCH. These rules are described in this section.

Central multiproject engineering: Scope

In contrast to distributed multiproject engineering, central multiproject engineering is used for centralized tasks. Central multiproject engineering is, therefore, not a topic in this **documentation.**

Note

The procedure for multiproject engineering is described in the document "PCS 7 V6.1+SP1 Configuration Guide for Multiproject Engineering" with the article ID 22258951 (http://support.automation.siemens.com/WW/view/en/22258951).

Definition of terms

Term	Meaning	Abbreviation in the text
Transfer project	A transfer project is part of a multiproject and only contains SIMATIC AS components (CPU stations).	
Multiproject	A multiproject is the linkage of several projects and libraries to form a comprehensive automation solution. The project data continues to be stored in the projects.	MP
Multiproject engineering	Project configuration in a multiproject.	MPE
Central multiproject	A multiproject stored on the central ES.	CMP
Central multiproject engineering	A multiproject created on a central ES PC with its individual S7 projects. These are configured in synchronization on different ES PCs in the network.	CMPE
Distributed multiproject	A multiproject in which a project is inserted for further editing and subsequent testing.	DMP

Term	Meaning	Abbreviation in the text
Distributed multiproject engineering	An example for this is when work is contracted to several engineering firms that develop and test the desired function at different locations. They perform the engineering in a distributed engineering environment.	DMPE
Engineering station	PC on which the SIMATIC PCS 7 configuration software is used.	ES

Requirements for distributed multiproject engineering with SIMATIC BATCH

The following requirements must be fulfilled to perform DMPE with SIMATIC BATCH.

- The projects to be exchanged may only contain AS stations.
- The transfer project can be used in any environment regardless of the hardware configuration. Only the connections need to be adapted.
- The same PCS 7 version, including the corresponding hotfixes and IT integration software must be installed on the involved PCs or on all PCs in the project.
- All configurations, such as Save as, Delete, Archive, Retrieve etc., must be performed in the SIMATIC Manager.
- The master data library is located in the CMP and may only be modified here. It is a template for all involved DMPs. The master data library must always be transferred to all involved DMPs.
- To minimize potential problems with the distributed configuration, you should use only SFC types in your CMP and DMPE. Avoid using the BATCH interface blocks EPH, IEPH, EOP, IEOP, EPAR, IEPAR and AF blocks.
- You can perform the following configurations only in the master data library of the CMP:
  - Changes to the SFC types, as well as project-specific blocks.
  - Shared declarations.
- You cannot change names of existing and instanced SFC types.
- You cannot rename projects.
- A unit cannot be distributed over several projects.
- The unit name must be identical in all Batch-relevant projects.

Possible configurations in the central multiproject

All configurations that result in changes or additions to the master data library must be performed in the CMP.

- Shared declarations:
  - Units of measure
  - Equipment properties in the shared declarations
  - Enumerations in the shared declarations
- Create and test SFC types (typicals)
  Typicals are phase types, for example, heating, cooling, dosing, etc. When these phase types are created, they are thoroughly tested so they can be later duplicated as instances. Any subsequent changes implies an enormous amount of work, because the duplicate type instances may already be in use and all instances may have to be inserted again.
- Create models
- Create and test custom blocks
- Create and test models
- Create and test units
- Test individual units

Possible configurations in the distributed multiproject

- CFC charts
- WinCC process pictures
- Import, create, change and export recipes

What can be tested in the DMP?

- Recipes, batch sequences
- Process pictures

Up to which point in time can DMPE be performed?

The point in time at which the commissioning phase for DMPE with SIMATIC BATCH is completed, depends on your own decision for the most part.

Note

You determine the point in time at which any reconfigured data can lead to inconsistencies in the Batch database when you perform the "Update process cell" function. The procedures described here must stop at the latest at the point when data consistency must be guaranteed in the Batch database.

In general, this is the point at which the acceptance test with parameter fine adjustment is closed or, at the latest, the start of production.

Overview of the configuration tasks

Step 1 (Page 260): Archiving and removing project(s) and the master data library in the CMP.

Step 2 (Page 260): Restoring and inserting project(s) and master data library in the DMP, and adapting the project.

Step 3 (Page 262): Editing, testing and archiving project(s) in the DMP.

Step 4 (Page 263): Restoring and inserting project(s) in the CMP.

8.5.2 Step 1: Archive and remove project(s) and master data library in the CMP

The project which you wish to transfer for editing must first be archived and then removed from the multiproject. The master data library is then archived for the transfer.

Requirement

The central multiproject on the central engineering station has been created with all projects of the MP, its AS and OS objects, the plant hierarchy, the batch assignment as well as the master data library.

Procedure

1. Archive your project as a user project.
2. Remove the transfer project from your multiproject if is no longer needed. Select your project folder, right-click and select the command **Multiproject > Remove From Multiproject** in the context menu.
3. Archive your master data library. **File > Archive > Libraries tab > select master data library and click OK >** Select the storage path and save.
   If changes are made in the master data library, it is not necessary to synchronize AS projects directly in CMP but first in DMP to optimize the time.

Result

The transfer project and the master data library are in a ZIP file ready for transfer to the DMP.

8.5.3 Step 2: Restoring and inserting project(s) and master data library in the DMP, and adapting the project

Introduction

The project removed from a central multiproject and the corresponding master data library are transferred to the engineering firm as a ZIP file. There, the project of the CMP is adapted to the local environment to allow further configuration and subsequent testing (AS, OS and BATCH process mode).

Requirement

You have received the project of the CMP and the master data library as archive files.

Procedure

The required tasks you need to performed on the distributed engineering station are presented below in chronological order.

1. If there is an AS project in the destination path with a name identical to the one in your distributed multiproject, archive this project for later use and then delete it in the DMP.
2. Retrieve the project to the destination path of the distributed multiproject.
   File > Retrieve > select file and then Open > select destination directory and then click OK > OK > Do you want to remove the references to the multiproject? Yes > Yes
3. Restore the transfer master data library in the same directory. Open the retrieved project, delete the "Batch process cell" object, remove the ISA-88 type definitions and adapt the AS address (MAC address) as required. The configured S7 connections can remain in the project. You can ignore system warnings relating to this.
   - Select the project and then **select the batch process cell >** in the data window, right-click and select "Delete" in the shortcut menu.
   - In the Plant view, select the folder of the batch process cell, right-click and select the shortcut menu command "Object properties" > In the "ISA-88 type definition" tab, select "<neutral>" from the selection box and then > OK. The BATCH identifiers are remove in all hierarchy subfolders.
4. Include the project and the master data library in the distributed multiproject.
   Select your multiproject folder, open the shortcut menu and select **Multiproject > Insert into Multiproject >** Select the project or the master data library and click OK. Specify the inserted library as the master data library.
5. Merge the subnets or synchronize the subnets with networks in the distributed project.
   Select the multiproject folder, open the shortcut menu and click **Multiproject > Adjust Projects >** In the dialog that opens, select the "Ethernet" subnet in the navigation window and then "Execute". In the dialog that appears, select the corresponding subnet in the multiproject and insert it into the "Merged" window with the right arrow. In the "Merged" window, select the displayed folder to check if the subnet has been merged. Then click **OK > Apply**.
6. To allow testing, configure an S7 connection from the AS to the OS.
   Open **NetPro > Select** the CPU in the AS > Select a free position in the connection table, open the shortcut menu and click "Insert New Connection" >. In the "Insert New Connection" dialog, select the folder "In Multiproject: xxx", select the "WinCC Application" and click "OK" > In the "Properties S7 Connection" dialog, under the connection path, select the local and partner interface from the respective drop-down lists and click "OK" .
7. Insert the Batch process cell object into your project.
   Select the multiproject folder in the plant view and click **Insert New Object > Batch Process Cell** in the shortcut menu.
8. Type-define your batch process cell.
   Select the top hierarchy folder and, in the shortcut menu, click "Object properties" > In the "ISA-88 type definition" tab of the properties dialog, select "Process cell" as the object type and click "OK". The folder of the batch process cell is given a light green background.

9. Is the name of the batch process cell in all projects of the CMP identical to the process cell name on the MP level? Is the correct master data library integrated?
   - Compare the project names within both multiprojects. Compare the project names within the CMP with the project names within the DMP. The names must be identical.
   - Compare the names in the master data library within both multiprojects.
10. Compile and download the AS of your inserted project.
11. Adapt your OS and then compile and download it.
12. Update the batch process cell, generate and propagate the batch types, merge the batch instances, transfer the messages to the OS and download the Batch data.
13. Update the Batch data in the Batch Control Center (BCC).

Note

To make sure that you update the batch data without errors, do not change the names of type objects, phase types etc. If you do, you will need to adapt the object assignment manually in the "Update process cell" dialog in the Batch Control Center.

Result

You have transferred a CMPs from a central ES to a multiproject on a distributed ES. To test the newly configured functions in process mode, you have created a new S7 connection, compiled all ES data and downloaded it to the AS. You have also updated the batch process cell and distributed the Batch data to the respective components. You have created a new batch process cell and recipes to run the batches.

8.5.4 Step 3: Editing, testing and archiving project(s) in the DMP

Introduction

You would like to edit the inserted project and test it in process mode. Then you want to archive the project for transfer to the CMP. Leave the transfer project and the master data library in the DMP for any changes that may be required.

Procedure

Once all tests are completed, archive the project as a user project in a new project path and close all projects.
File > Archive > select project > OK > select archive and path > Save.

Result

You have continued editing of the project(s) and performed testing in process mode. You then archived the project as a user project to reinsert into the CMP.

8.5.5 Step 4: Restoring and inserting project(s) in the CMP

Introduction

In this step, you integrate the project back into the CMP.

Requirements

- You have received the project of the DMP as an archive file.
- No changes were made to the master data library.

Procedure

1. If there is already a project with the same name in the destination path of the CMP, delete it.
   In the SIMATIC Manager > File > Delete > User Projects tab > select project > OK > Yes OK.
2. Retrieve the project in the destination path of the CMP.
   In the SIMATIC Manager > File > Retrieve > select archive > Open > select destination directory > OK > OK > Yes > Yes.

   Note

   Warning dialog "Retrieve". Do you want to remove the references to this multiproject? Yes.

3. Delete the S7 connection for communication between AS and OS you have configured for testing.
   Open NetPro > Select the CPU in the AS > Select the previously inserted S7 connection > Shortcut menu > Delete.

   Note

   If have changed the AS addresses of existing S7 connections, the addresses of the original CMP must be set again.

4. Remove the BATCH process cell identifier (ISA-88 type definition) and delete the "Batch process cell" object.
   - In the Plant view, select the folder of the batch process cell in your project, right-click and select the shortcut menu command "**Object properties > In the "S88 type definition" tab select "<neutral>" > OK**. The light green batch identifier is removed in the folder icon.
   - Select the project in the Plant view > select the batch process cell in the data window > select > **Delete in the shortcut menu > OK**.
5. You should run the following checks.
   Did you remove the project from the CMP earlier?
   Were all the Batch IDs removed first?
   Is the name of the top hierarchy folder the same in all projects?
   Does the MAC address of the AS match the CMP settings?

6. Include the project in the CMP.
   In the SIMATIC Manager > select the multiproject folder > In the shortcut menu > Multiproject > Insert into Multiproject > User Objects tab > select project > OK. Optionally: Browse and navigate to the corresponding path.
7. Merge the Ethernet subnets.
   In the SIMATIC Manager > select the multiproject folder > In the shortcut menu, > Multiproject > Adjust Projects > select Ethernet > Execute > select subnet in the multiproject > Merge with right arrow > OK > Apply.
8. Check if the S7 connection between the AS and the OS, which was deleted in the DMP, is now in the CMP. Save NetPro.
   - Open NetPro, select the CPU in the AS and check the S7 connection in the connection table.
   - Select the WinCC application on the OS and check the S7 connection in the connection table.
9. Add the batch process cell and the ISA-88 type definition.
   - In the Plant view of the **SIMATIC Manager > Select the project > In the shortcut menu > Insert new object > Batch process cell**.
   - Select the process cell folder in the Plant view > In the **shortcut menu > Object properties > "S88 type definition" tab > select object type "Process cell" > OK**. The folder of the batch process cell is given a light green color.
10. Check whether the name of the Batch process cell is identical to the name of the Batch process cell at the MP level in all projects in the CMP.
    In the plant view of the SIMATIC Manager, check the hierarchy names and the Batch process cell names in the entire MP.
11. Compile and download the AS objects (CFC charts) and the OS objects of your multiproject.
12. Update the batch process cell, generate and propagate the batch types, merge the batch instances, transfer the messages to the OS and load the batch data.
13. Update the batch data in the Batch Control Center (BCC).

Result

You have integrated the project back into the original CMP. You have made all the preparations to start process mode in you project.

8.5.6 Errors sources in distributed multiproject engineering with SIMATIC BATCH

Introduction

If the procedures and requirements for individual configurations are not adhered to, the following errors may occur:

- The batch data in the CMP and all projects may become invalid
- The batch data in the Batch database may become invalid
- SFC types may be changed in the master data library with confirmation.

Troubleshooting

How are problems like this avoided?

Procedure on the ES in the SIMATIC Manager

1. Open the multiproject in the SIMATIC Manager.
2. Remove the ISA-88 type definition and delete the Batch process cell in all AS projects of the multiproject. The OS projects are an exception to this.
3. Update the Batch process cell, generate and propagate the batch types, merge the batch instances, and transfer the messages to the OS.
   The batch types now only include the types you generated manually. The batch instances are also empty.
4. Reinsert a Batch process cell and the ISA-88 type definition in all AS projects of the multiproject. The OS projects are an exception to this; they are retained.
5. Update the Batch process cell, generate and propagate the batch types, merge the batch instances, transfer the messages to the OS, and download the batch data.
   The batch types now also include the generated types again. You have merged the batch instances.
6. Check if all function blocks and SFC types are identical in all projects of the CMP and have the same version. The easiest way to ensure this, is to update the function blocks of the master data library in all projects (AS projects). You can also copy the SFC types to all chart folders of the S7 program.
   - Select the block folder within your S7 program in your integrated project. Select **Options > Charts > Update Block Types.** Select the S7 program to be checked and click **Next.**
     If an update is not required, this is indicated by a check mark in the "Status" check box. If an update is required, the "Update" dialog is displayed. Select the block types that are to be updated. Check the log and close the wizard.
   - Copy the SFC types in the chart folder of your integrated project to all chart folders within the CMP.

Procedure on the Batch server

1. Delete the batch database and then download the batch data from the ES to the target station.

   Note

   Before deleting the batch database, you must first back up your batch data (recipes, libraries, and formulas) using an export or backup in the BATCH Control Center.

2. Start the BATCH Launch Coordinator. Open the BATCH Control Center and select **Program > New process cell**. Update the batch process cell data.
3. Import your master recipes, libraries, formulas from a current export file or a restore file.

   Note

   Before performing procedural steps one and three, consult with your Siemens service engineer. Batch data must not be lost.

Procedure on the OS servers

Delete the batch messages on the OS servers involved.

Note

Consult with your Siemens service engineer. Make sure you do not lose any Batch data whatever you do.

Potential problems and solutions, FAQ

1. Central settings of the configured equipment properties are lost when attaching and detaching.
   Recommendation: BATCH configuration without conditions only via class view (selection of units using check box), if other conditions (such as different tank sizes) are not used. Configure the equipment properties at a later time.
2. Permission management and materials in SIMATIC BATCH cannot be separately archived or exported and imported.
   If it becomes necessary to start using a new database, permissions management and materials can no longer be imported without a "Restore". Importing the permission management and materials into an empty database requires an enormous amount of work.
   Recommendation: When the BATCH database is initially created, the permissions should be configured first and saved as a backup to avoid the large amount of work required for reconfiguration of the permissions. If this is done at the outset, you will then have a correct backup file to perform a "restore".
3. When changing existing unit names.
   Recommendation: Assign the changed unit name when updating the process cell in the BatchCC (update dialog). You should assign the new or renamed unit names in the BATCH configuration dialog following the update of the batch process cell. If you do not use this dialog, the recipes will become invalid and you must readapt the allocation of the units for every individual recipe.

4. When changing the names of existing equipment modules (EM).
   Recommendation: Assign the name change of existing equipment modules (EM) when updating the process cell in the BCC (update dialog). You should reassign the new or renamed equipment modules in the dialog following the update of the batch process cell. If you do not use this dialog, the recipes will become invalid and you must readapt the new assignments for every individual recipe.
5. When changing/adding setpoints, control strategies at SFC types.
   Recommendation: Assign the name change of the setpoints of an SFC type when updating process cells in the BatchCC (update dialog). Renamed setpoints should be assigned in the dialog following the update of the batch process cell. If you do not use this dialog, the recipes will become invalid and you must readapt the new assignment for every individual recipe. If you add or delete setpoints or control strategies, you must always select and save the functions in which changes have been made in every recipe. Otherwise, you will not have valid recipes.

8.6 Operation of SIMATIC BATCH with more than one PCS 7 OS

In standard cases, SIMATIC BATCH can be used either as a single station system (SB server with SB clients and OS server with OS client) on one computer or as a distributed system (multiple station system) with multiple OS servers (single or redundant).

Redundancy with more than one PCS 7 OS

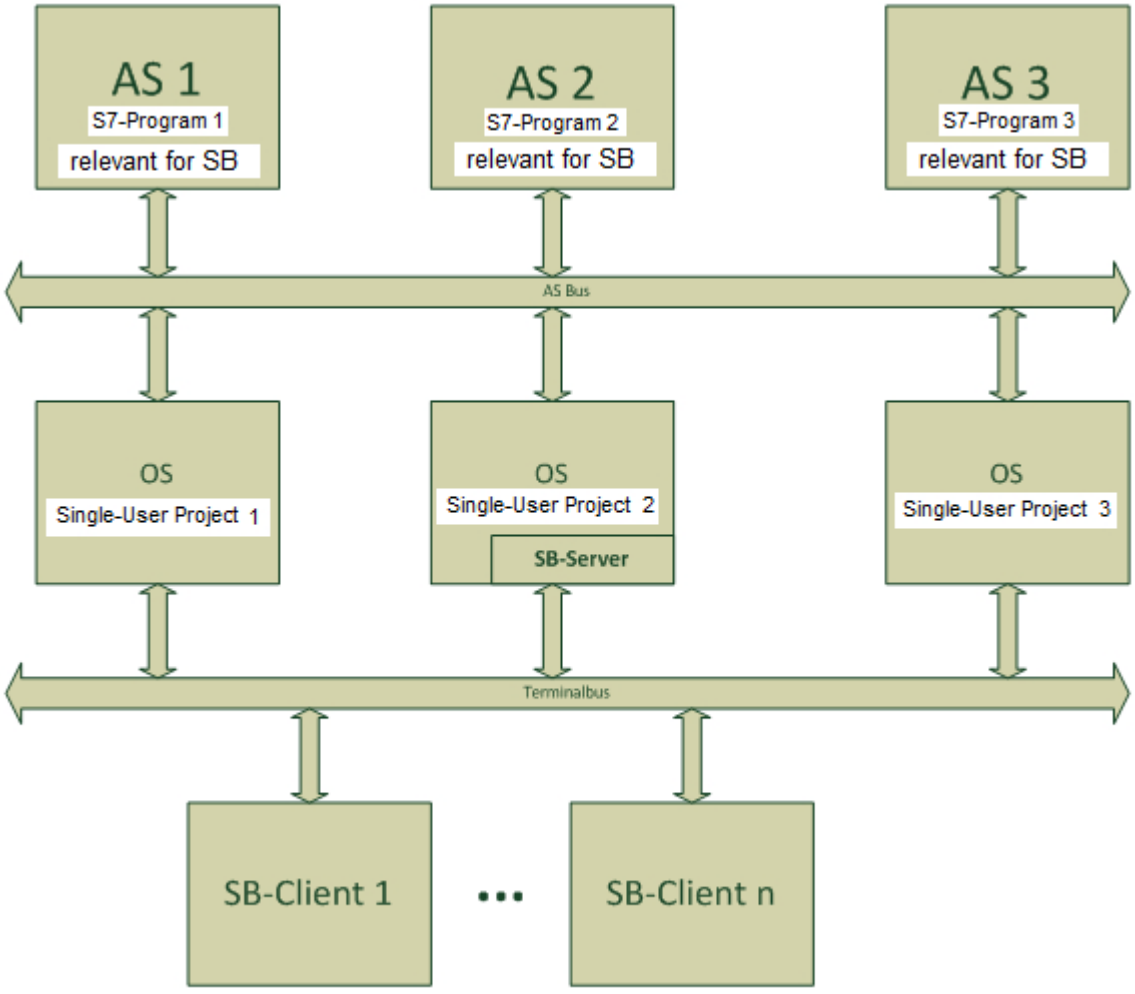
An additional variant is offered for the PCS 7 OS. This variant enables multiple redundancy over multiple PCS 7 OS single station projects with corresponding configuration of the automation systems.

Configuration conditions

The following conditions must be met for SIMATIC BATCH to be operated with multiple PCS 7 OS in the single station project type as multiple redundancy:

1. A SIMATIC BATCH server must be installed on one of the PCS 7 OS.
2. All automation systems relevant for SIMATIC BATCH must be connected with this PCS 7 OS.
3. All S7 programs of the automation systems relevant for SIMATIC BATCH must be compiled and downloaded to this PCS 7 OS in "AS-oriented" compilation mode. The configuration example includes the S7 programs of AS 1, AS 2 and AS 3.
4. This PCS 7 OS must be specified as message OS.

Configuration example



BATCH Control Center 9

9.1 Starting and operating

9.1.1 Information on the BATCH Launch Coordinator

Start mode and startup characteristics

When you set up a PC as the SIMATIC BATCH server, note the following special characteristics of the BATCH server start mode and the status of the BATCH Launch Coordinator service and the BATCH server applications that it initializes:

1. When the BATCH Launch Coordinator service is started up for the first time following PC installation, the start mode "Automatic" is set. In automatic mode, there are two start modes for the BATCH Launch Coordinator, "Automatically after WinCC starts" and "Automatically, independent of WinCC". The installation of SIMATIC WinCC determines which of the two automatic start modes is set for the BATCH server. If WinCC is installed on the BATCH server then the start mode "Automatic start of Simatic Batch after start of WinCC" is set, if WinCC is not installed on the BATCH server, then the start mode "Automatic start of Simatic Batch independently of WinCC" is set.
2. General characteristics: The BATCH Launch coordinator icon appears in the taskbar as soon as a user logs on to the PC. Depending on your BATCH data, the current state is indicated within the icon of the BATCH Launch Coordinator. The various states are listed with their meanings later in this chapter. The icon and thus the user interface of the BATCH Launch Coordinator can be closed without terminating the service or SIMATIC BATCH.
3. If a user logs off the BATCH server PC, the icon or the user interface of the BATCH Launch Coordinator closes. The BATCH Launch Coordinator service and the server applications continue to run, however.
4. The "Change start mode from" > "automatic to manual" function and vice versa is included in the shortcut menu of the BATCH Launch Coordinator. The default setting is "automatic". When changing the start mode, no user rights are checked.

Shortcut menu of the BATCH Launch Coordinator

When you right-click on the BATCH Launch Coordinator icon, its shortcut menu is displayed. The menu contains the following functions:

Function	Subfunction	Meaning
BATCH Runtime	Start	The function is only available if the SIMATIC BATCH is in the "Ready" state. Switches the status from "Ready" to "Running" or "Listening".
	Exit	Status change from "Running" or "Listening" to "Ready".

Function	Subfunction	Meaning
BATCH project	Start	The BATCH project is loaded and the BATCH server applications (services) have not yet started. Then the server applications for the loaded project are started.
	Exit	The BATCH server applications (service) are closed.
	Information	An information dialog opens, showing the BATCH data for the loaded project.
	Waiting for BATCH data	This function is only available if your batch process cell data is not yet loaded on the batch server. It opens a dialog, which automatically closes once your batch process cell data is loaded on the BATCH server.
	Configuration errors	As soon as the system detects a configuration error in your BATCH project, a warning dialog is displayed on the screen. You can exit the dialog by clicking "OK", or press the "More Information" button to obtain details about the error in another dialog. The system provides information on how to make your project configuration consistent. Only then will the project be released for operation.
	Select	This menu command is only enabled on a BATCH client without installation of a BATCH server. You open the "Select BATCH project" dialog with this function. The dialog displays all available BATCH projects in the network with their unique database identifiers (DBIdent) for selection. If you select a project and then click "Select", this project is visualized on the BATCH client. Pressing the "Information" button opens a dialog, which displays important information about the project. Example: Name of the Batch process cell, etc.
Change start mode from	Manual to automatic	Changes the start mode from manual to automatic. You need administrator rights to change the start mode. The change menu is only available when the status is "ready", "running" or "listening". If WinCC server is installed on the BATCH server, then the BATCH Launch Coordinator automatically starts after WinCC Runtime starts. If WinCC Server is not installed then the Launch Coordinator starts automatically after a delay of approximately 15 seconds.
	Automatic to manual	Changes the start mode from automatic to manual. You need administrator rights to change the start mode.
BATCH status	-	Opens a dialog which shows status information for BATCH server, Launch Coordinator, PCS 7 status and the batch server applications.
Change server language	-	Opens a dialog, in which you can change the desired language for the shortcut menu and tooltip text of the BATCH Launch Coordinator.
Exit	-	Closes the icon of the BATCH Launch Coordinator in the taskbar.

Monitoring a BATCH Launch Coordinator from a BATCH client

You can monitor the status of any batch process cell by starting the BATCH Launch Coordinator on a BATCH client, without BATCH server installation. When the Launch Coordinator is started, a dialog opens showing all loaded batch process cells. Once you have selected a batch process cell, the Launch Coordinator icon appears showing the status of its process cells in the status bar of the BATCH client.

Status icons of the BATCH Launch Coordinator

The icon contains a status display for SIMATIC BATCH. The potential states are listed in the table below.

Symbol	Meaning
	No status icon. No connection to the BATCH project. The BATCH project is not loaded and SIMATIC BATCH is waiting for BATCH data. Or the BATCH data is loaded, but the server applications have not yet started.
	SIMATIC BATCH is ready (Ready). The BATCH project is loaded and started.
	Intermediate state. A status change is in process (Processing).
	Intermediate state. Preparing to switch to the "Running" state (Running Prepared).
	SIMATIC BATCH is running (Running) on BATCH master or BATCH single station system. The BATCH project is loaded, started and BATCH Runtime is started.
	SIMATIC BATCH is running (Listening) on BATCH standby. The BATCH project is loaded, started and BATCH Runtime is started.
	Intermediate state. Preparing to switch to the "listening" state (Listening Prepared).
	Intermediate state, switching to BATCH master (Switch up). Switching the state from Listening to Running.
	Intermediate state, switching to BATCH standby (Switch down). Switching the state from Running to Listening.
	Error in SIMATIC BATCH (Fault).

Note

Combined states with Processing, Switch up, Running Prepared, Switch down, Listening Prepared are temporary, for example, during the redundancy switchover of a BATCH server.

Additional information

BATCH Launch Coordinator (Page 37)

9.1.2 Starting BatchCC

Following installation of SIMATIC BATCH, you will find the following components in the Windows start menu under **Siemens Automation > SIMATIC > BATCH**:

- SIMATIC BATCH Control Center: This starts BatchCC.
- SIMATIC BATCH Launch Coordinator. This starts the BATCH Launch Coordinator.
- SIMATIC BATCH Recipe Editor: This starts the BATCH Recipe Editor.

Requirement

To start BatchCC or the BATCH Recipe Editor, the BATCH Launch Coordinator must be started and the "Running" status must be displayed in the information bar. The symbol looks like this:



To start BatchCC:

1. Select the **Start > Siemens Automation > SIMATIC > Batch > BATCH Control Center** menu command in the Windows Start menu.
   Result: If several projects are detected when you start BatchCC or if the connection to the project cannot be established, a selection dialog appears.
2. Select the project you require.

Result

Once you have made a selection, BatchCC is started together with the selected project. If you select a project that does not have a link, the application will close.

Language setting of BatchCC and BATCH Recipe Editor

In both BatchCC and in the BATCH Recipe Editor, you can change languages using the menu command **Options > Settings > User settings > "Languages" tab**. Select the check box for the desired language.

See also

Layout of the main window (BatchCC) (Page 276)

9.1.3 Getting Help

Online help

There are various ways of getting online help:

Call	Type of help
Help menu	Introductory information, description of the user interface, concrete instructions
"Help" button or F1 key in a dialog box	Context-sensitive help in every dialog box
Selecting a menu command and pressing the F1 key	Context-sensitive help for every menu command

Screen tips

To display a brief text explaining the buttons in the toolbar, position the cursor on a button until the screen tip is displayed.

Changing the font size

With the menu command **Options > Font** in the help topic window, you can set the font size to "small", "normal" or "large.

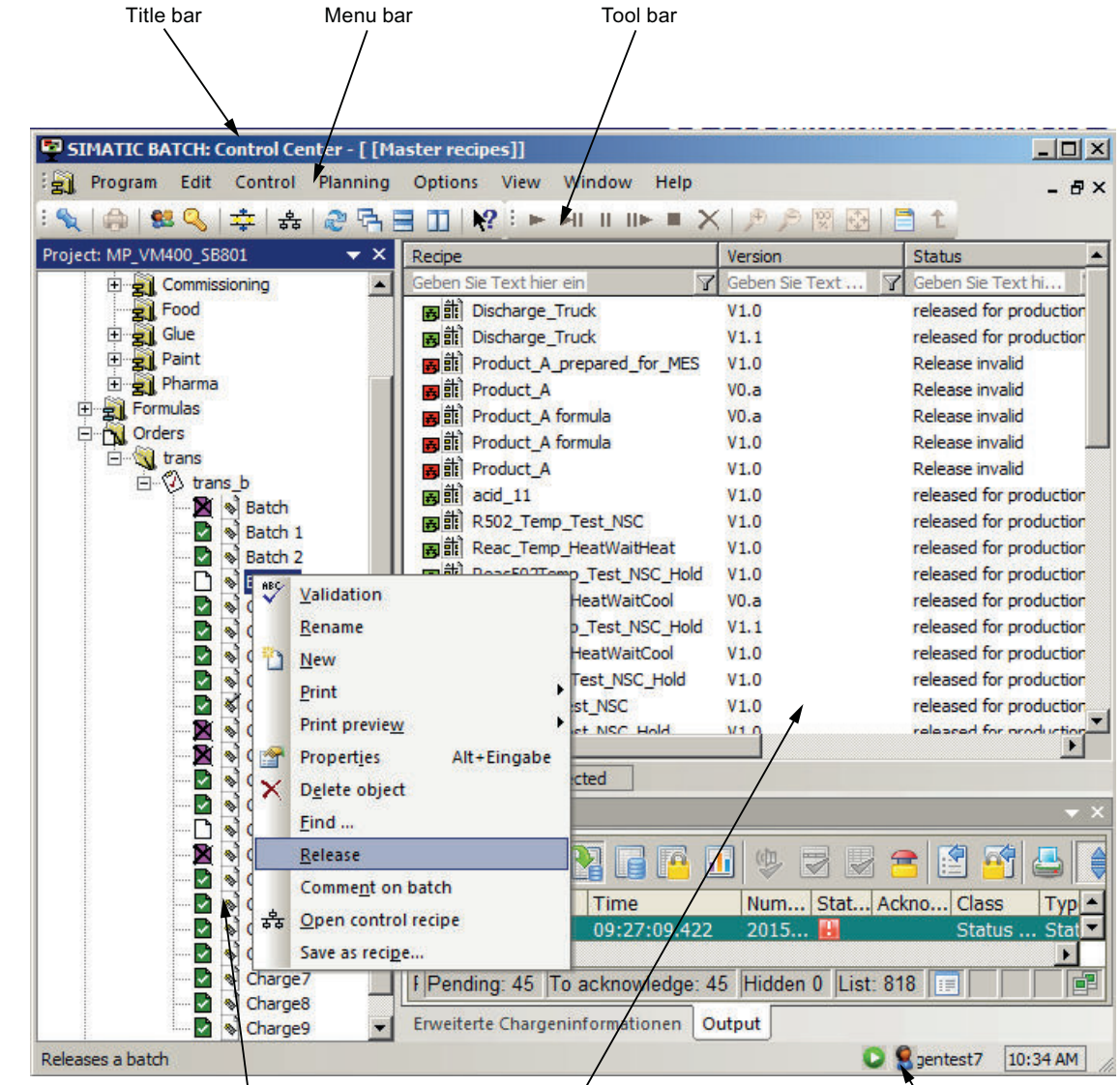
Note

If you start the Batch Control Center or BATCH Recipe Editor from a WinCC screen in process mode, due to reasons of security no online help is available.

9.1.4 User interface and operation

9.1.4.1 Layout of the main window (BatchCC)

The basic layout of the user interface of BatchCC consists of individual windows and is shown in the figure below. In the left section, the batch process cell or the BATCH project output is shown with its objects in a tree structure. The main window shows the BATCH objects, for example, in list form. You can control the view or windows with the "View" menu. There you will find commands for displaying and hiding additional windows.



Editing window with Batch objects:
- Librarys with library operations
- Master recipes
- Formula categories with formulas
- Production orders
- Input and output materials
- Permissions management

Overview lists depending on the context for:
- Library operations
- Master recipes
- Formulas
- Production orders
- Materials

Status bar with context -sensitive information

Arranging the various windows

You can individually arrange windows in BatchCC. The following windows are offered:

- Control recipe. Arranged in the main window.
- Overview of the control recipe. Floating to the right next to the main window.

- Output. Anchored below in the main window.
- Extended batch information. Floating in BatchCC.

Floating windows can be docked by double-clicking on the title bar. Click on the title bar of a window and hold down the left mouse button. The window positioning boxes are displayed. In order to place any window, drag a window box to one of these positions and then release the mouse button. In order to display several windows in an area as a tab, drag a window to the positioning box at the center and release the pressed mouse button.

Note

The output window in BatchCC for WinCC messages is only updated if there is a running WinCC application on the same PC (OS server or OS client). In all other cases, you can open the output window but messages are not output.

Title bar

The title bar of the main window contains the system buttons with which you can:

- exit BatchCC,
- minimize the main window to its icon,
- restore the window to its normal size again, and
- display the main window in full-screen size.

Menu bar

The menu bar is located at the top edge of the main window. Its functions relate to the currently active window. You can only select menu commands that are feasible in the current status of the object. As an example, you can only select the menu command **Edit > Delete** when at least one object is selected. Menu items that cannot be selected are displayed in gray.

Toolbar

The toolbar is located below the menu bar. It contains a series of buttons that trigger the more commonly required functions of the menu bar. You can see which function is triggered by a button in the toolbar by positioning the mouse pointer on the button (without clicking). A box appears with the name of the button. In the status bar, you can see more detailed information about the function. Clicking the button triggers the function. Buttons that cannot be selected are displayed in gray.

Status bar

At the lower edge of the user interface, you will see the status bar that displays important information and statuses. The information displayed changes depending on the particular operation and object status. In some situations, a progress indicator is also displayed in the status bar for processes that require longer.

In the **left** part of the status bar, you will see context-sensitive information, for example explanations of menu commands, operator prompts or error messages.

In the **right** part of the status bar, the currently logged-on user, the current time and the status of the BATCH control server or redundant BATCH control server are displayed.

Redundancy status symbols

The connection to the BATCH control servers can assume the following states.

Symbol in the status bar	Redundant configuration	Non-redundant configuration
	Both master and standby BATCH control servers are available.	The BATCH control server is available.
	Redundant servers are available, data synchronization between the master and standby server enabled.	-
	Redundant servers are available, postponed error. Master server waiting for standby server to take over role. Standby server cannot take over.	-
	Redundant servers are available, postponed error on the master. Master server waiting for standby server to take over role. Standby server cannot take over. Data synchronization between the master and standby server enabled.	-
	Warning. The standby server in a redundant configuration is not available.	-
	Warning. The master server in a redundant configuration is not available. Master server waiting for standby server to become available and take over role.	-
	Warning. The master server in a redundant configuration is not yet available. Master server waiting for standby server to become available and take over role. Data synchronization between the master and standby server enabled.	-
	Neither of the two redundant BATCH control servers is available. The BATCH Control Center is not ready to use.	The BATCH Control Server is not available. The BATCH Control Center is not ready to use.

See also

Objects and object hierarchy (Page 299)

Overview lists (Page 288)

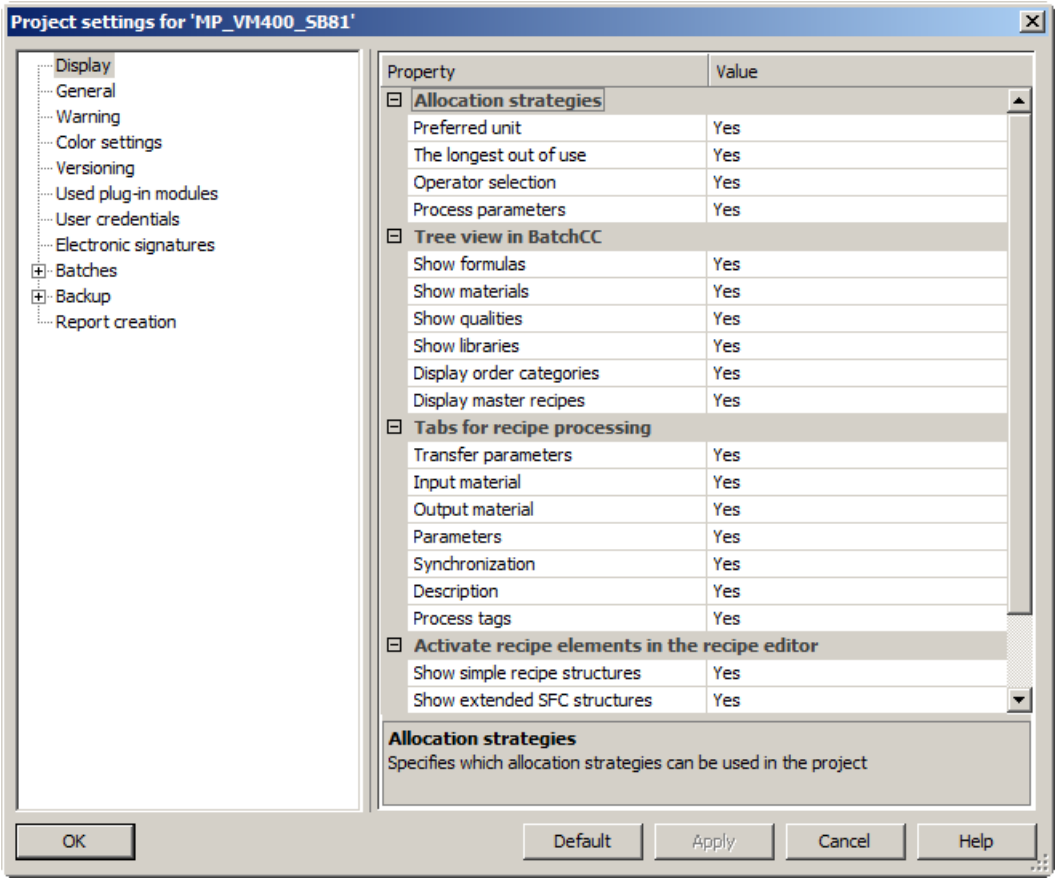
9.1.4.2 Project and user settings

The graphic user interface of SIMATIC BATCH can be configured and customized completely according to your specific needs. You decide on the appearance and range of functions. You can make the required settings centrally in the "Project settings" and "User settings" dialogs in BatchCC and the recipe editor.

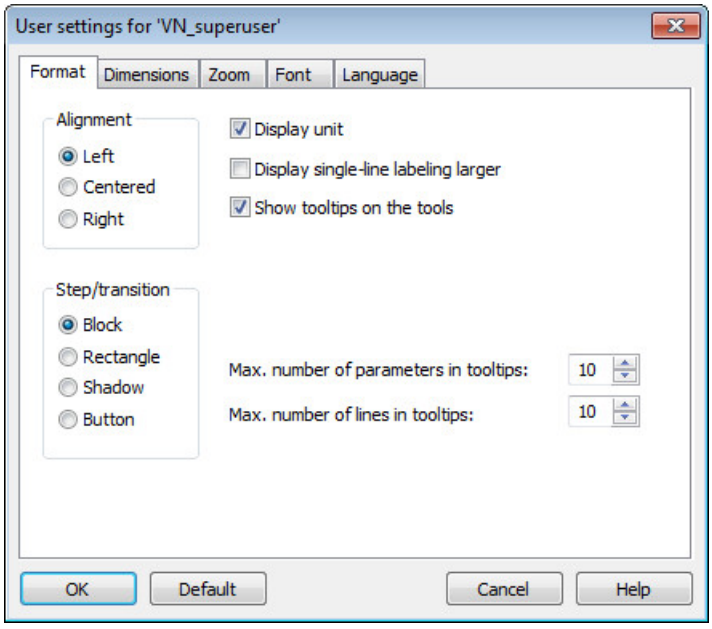
The "Project settings" dialog contains several elements for which you make general settings relating to the appearance and range of functions. In the "User settings" dialog, you can make settings for language, zoom, layout and format of the user interface.

Selecting dialogs

Select the menu command **Options > Settings > Project settings**. This opens the dialog box shown below in which you can make individual Project settings.



Select the menu command **Options > Settings > User settings**. This opens the dialog box shown below in which you can make individual User settings.



Press the "Help" button in the context-sensitive help if you want more information about the various project or User settings.

9.1.4.3 User-specific session information

Introduction

User-specific session information is saved automatically and for a long period when the user logs off, using SIMATIC Logon for example and is made available again when the user logs again on with the same name, even on another PC in the network. This functionality is available in both the BATCH Control Center and the recipe editor.

Restrictions

- Project settings: Project settings are part of the user-specific session information.
- Backup / restore: Session information is not saved in the backup file.

Constraints

The described constraints apply to the two client applications, the BATCH Control Center and the recipe editor:

- If you do not use SIMATIC Logon, the applications use the user logged on in Windows.
- If you use SIMATIC Logon, the applications use the user logged on in SIMATIC Logon.

- If the "Default user" option is activated for SIMATIC Logon, SIMATIC Logon automatically logs on the "Default user" when the user currently logged on logs off. This automation is transparent for SIMATIC BATCH. A session profile is generated and stored in the Batch data base for this user, too.
- If a user is logged on to more than on PC at any one time, the changes in regard to his session information is not immediately (during the current session) displayed on the other PC.

Example:

If the user closes his session on computer "A" and has previously changed session information on computer "B", he will find such session information stored in the database for computer "B" when he logs on again to computer "A".

Time period in which the user-specific data is saved

A session is defined as the time period in which a specific user is logged on to a client application (BCC or BRE). If SIMATIC Logon is installed and the application is already launched, the session begins with the logon. If the application is launched after a logon, the current SIMATIC LOGON user is used automatically. In this case, the session begins with the start of the BATCH Control Center application. The session ends with the logoff, the logon of another user or the closing of the application.

Session information that is saved

The following data is part of a session and is therefore saved as session information in the database:

- Size and position of the main window (BCC and BRE) are only changed after these applications are started, not when the user changes.
- Size and position of dialogs that are scalable.
- Configured language.
- Selected shortcuts.
- If the column widths in a list can be changed or the column display can be toggled on and off: width of the columns, arrangement of columns and visibility of columns.
- Position, size and visibility of the menu bars.
- The last directory set in all SIMATIC BATCH dialogs where this selection is possible.
- Window settings for batches (size and position).
- Window settings SUBs and ROPs (size and position).
- Open control recipe window are saved for each user at the end of the session and reopened at the beginning of the next session. If you wish to avoid this, press the Shift key when logging on or when changing users.

9.1.4.4 Customization of the properties dialogs for RPEs

Which tabs are displayed in the properties dialogs of all recipe procedure elements (RPEs) in the recipe editor is set in the project settings in the "Display" folder in the tabs for recipe editing. The default setting is always to display all tabs in the dialogs. The settings apply only to the dialogs in the recipe editor and for online structural changes. In process mode, all tabs are still displayed in the dialogs.

System response when tabs are hidden

If you hide tabs, please note the following system response:

- If tabs are hidden in the recipe editor although they contain parameters, for example in the Transfer parameters tab, you can still query these parameters in the transition conditions in process mode and they are also listed in the batch log. The system always handles parameters of hidden tabs as being present, for example when importing master recipes and these are always taken into account in during validation. The system does not generate any specific error messages relating to this. The following tabs are affected by this functionality:
  - Transfer parameters
  - Process parameters
  - Input material
  - Output material
- If tabs are hidden in the recipe editor although they contain electronic signatures and/or synchronizations, these are taken into account fully when importing, however their functionality is disabled in process mode. The configured functionality is listed in the batch report. The following tabs are affected by this functionality:
  - Electronic signature
  - Synchronization

9.1.4.5 Properties dialogs in BatchCC, viewer and OS controls

System response in BatchCC and viewer for archived batches

Since there is no specific project setting for the BatchCC and the viewer for displaying or hiding tabs in the properties dialogs, tabs are always displayed if they include configuration settings, for example an electronic signature or transfer parameters. This means that tabs are hidden if they do not contain any configuration settings. This behavior applies to the following tabs:

- Transfer parameters
- Process parameters
- Input material
- Output material
- Electronic signature
- Synchronization

System behavior with the SIMATIC BATCH OS controls

In the properties dialogs for the BATCH OS controls in process mode, you have the option of hiding or showing tabs for the following elements in the OS Master control tab using the "PropertiesTabOrderAndVisibility" attribute:

- Order category
- Order
- Batch
- RPEs
- Transition
- Parameter
- Allocations
- Conditions
- Control recipe
- Chaining
- Favorites
- Shortcuts

Note

Note that hiding tabs that contain configuration settings may result in restrictions and malfunctions during operator control in process mode.

Additional information

"PropertiesTabOrderAndVisibility" attribute (Page 691)

9.1.4.6 Expand or reduce parameter display

Displaying or hiding columns in tabs of the properties dialogs of RPEs

No special system setting exists, nor is one required, for customizing the number of columns in the following tabs of the properties dialogs for RPEs:

- Transfer parameters
- Input material
- Output material
- Parameter

If, for example, there are values in the "Parameters" tab in the properties dialog of an RPE, a button is displayed with which you can show or hide the following table columns. All the listed columns are shown or hidden together.

- Data type
- Source
- Target
- Actual value ID
- Setpoint ID
- Displays
- Modifiable
- Effective immediately
- Formula
- Visible externally
- Data type

System characteristics

This customization is identical for all BATCH client applications such as the BCC, the recipe editor and the viewer for archived batches.

The default setting is to hide all the columns listed above. Modifications to the column display only apply as long as the dialog is open and they are not saved permanently for the specific user.

In the template for the BATCH OS controls, there is a check box in the OS Properties control configured with the aid of WinCC Dynamics; this check box also shows or hides the table columns named above. When using the tooltip display, the check box is called "Expanded parameter display".

Additional information

"Parameters" tab (Page 834)

9.1.4.7 Creating and manipulating objects

Selecting functions

All important functions relating to an object are available in the shortcut menu.

As an alternative, the same functions are also available in the "Edit" menu. Functions that cannot be executed in the current status of an object are grayed out in the "Edit" menu.

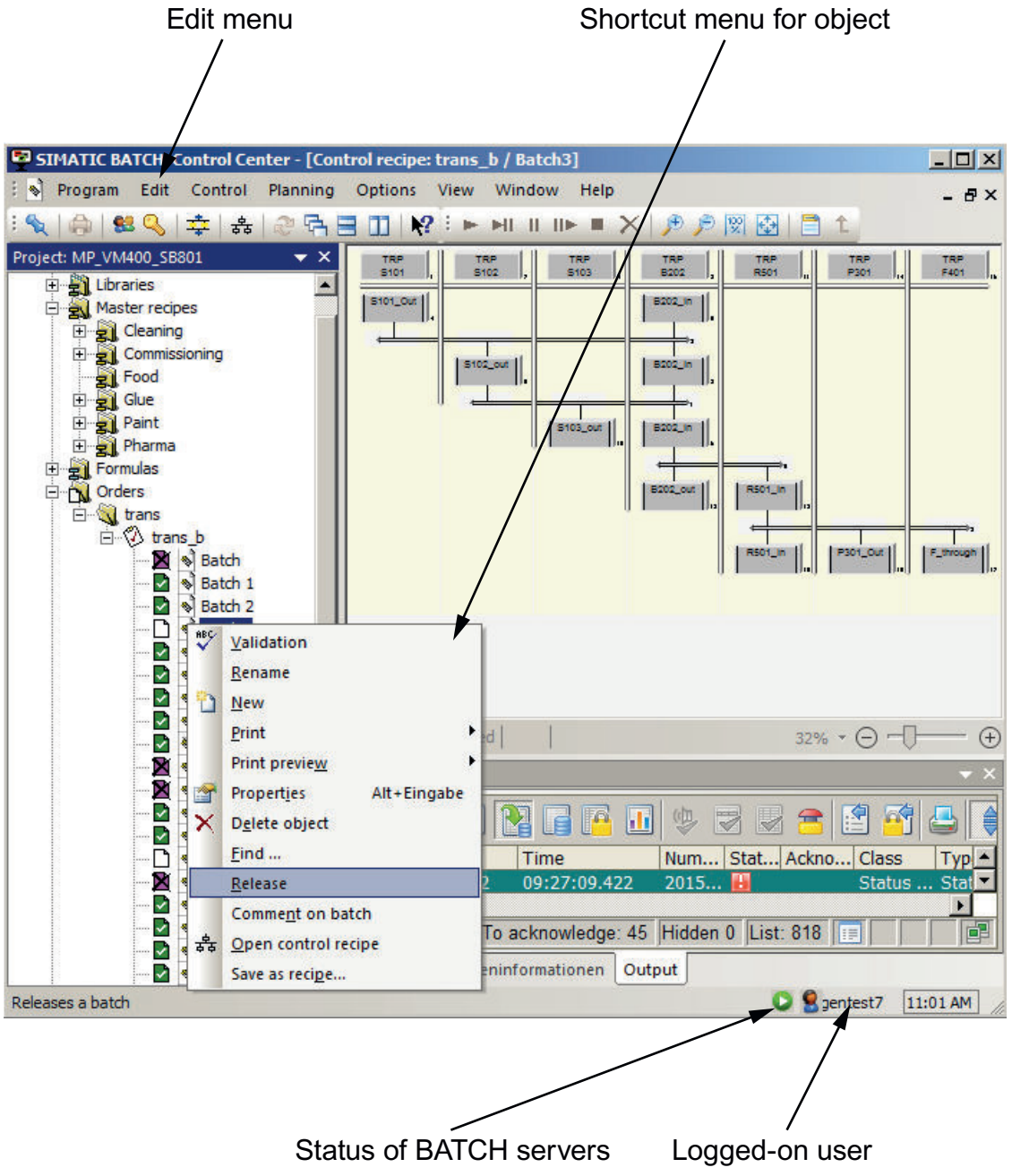


Figure 9-1 Selecting the functions

General functions

Some basic functions are common to all objects. These common functions are listed below. The descriptions of other functions assume that you know how to use these functions.

The normal sequence of activities involving objects is as follows:

- Create the object
- Select the object
- Perform the actions with the object (for example, open, delete)

Creating objects

To create a new object, select the destination of the object in the editing window of the BATCH object window (for example the "Formulas" folder if you want to create a new formula category). To start the function, you then select the menu command **Edit > New**.

Opening objects

There are several ways of opening an object:

- Double or single click on the object icon
- Select the object and then the menu command **Edit > Open**. This functions only with objects that are not folders, for example master recipes.

After opening an object, you can create or modify its content.

Properties of objects

Object properties are data belonging to the object that decide its behavior, for example the properties of a master recipe.

The menu command **Edit > Properties** opens a dialog box in which you can see and set the properties of the selected object.

Renaming objects

The names of batch objects are specified when the objects are created. This name can be changed by selecting the "Rename" command.

The Rename command is not always available. For example with materials, qualities, or folders, it is only possible to rename in the corresponding "Properties" dialog box.

Deleting objects

You can delete both folders and objects. It is only possible to delete most folders when they contain no elements.

Deleting is permanent and cannot be undone. If you are not sure whether or not you still need an object, it is advisable to archive the entire project before deleting.

9.1.4.8 Overview lists

The purpose of overviews

Useful information for select objects from the BatchCC is collected in overview lists. Your batch process cell can be easily managed with the help of overview lists. Operator functions are offered in the shortcut menu for objects included in the lists.

Which overviews are available?

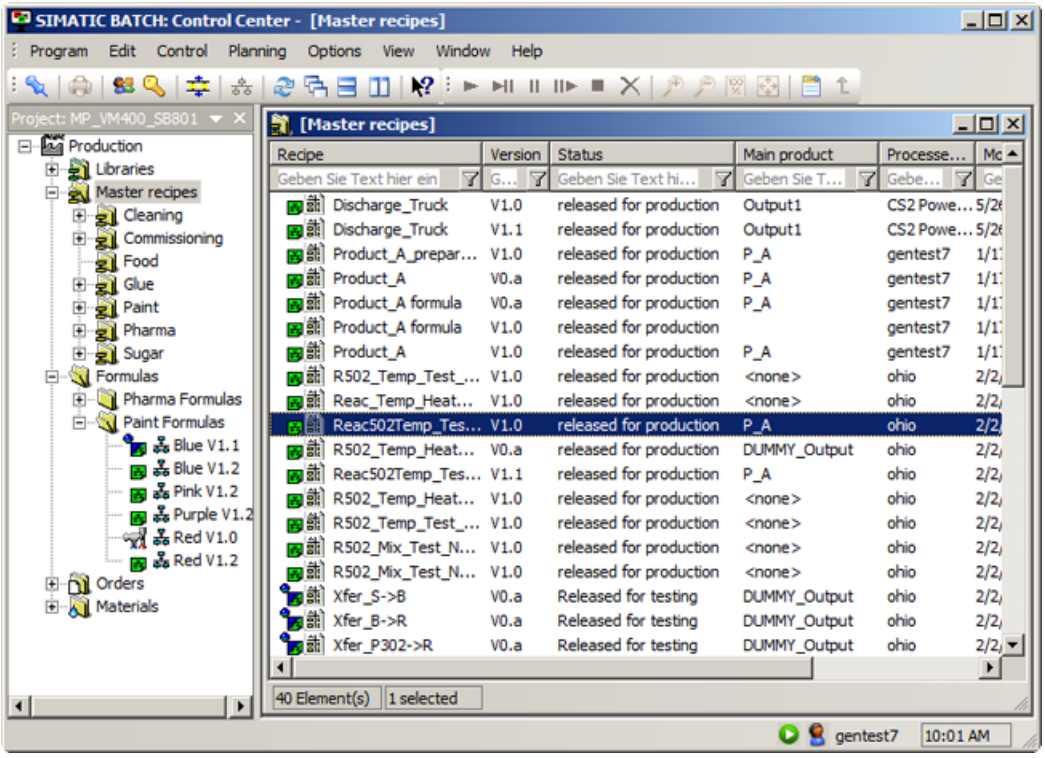
The following lists can be called:

- Library over list
- Master recipe overview
- Formula overview
- Order overview list
- Batch overview list
- Material overview list

To select overviews:

Select a folder in the navigation window, for example, a master recipe folder, and then select the menu command **Edit > Details**.

Example



Lists for batch planning

There are additional lists for orders and batches.

List	Description
Order category list	List with all order categories of the process cell. Prior to the selection, you must select the "Orders" folder in BatchCC.
Production order list	List with production orders: • When the folder of the type “Orders" is selected, all production orders are displayed. • When a folder of the type "Order category" is selected, only the production orders belonging to this category are displayed.
Batch planning list	List with all batches that are planned, released or locked. Batches can be controlled via commands in the shortcut menu for one or multiple selected batches. The status display for each executed batch is dynamically updated. Depending on their status, batches are moved by the system from batch planning - via batch status - to the batch results list. Scenario: If you start a batch from this list, it remains visible in the list and is shown with its new status "Running". At the same time, the batch is moved to the batch status list. As soon as the batch is completed, it is moved to the batch results list. The content of the batch planning list is updated once you open it again, and the batch moved to the batch status list is no longer displayed.

List	Description
Batch status list	List with all batches with the released, running, held, waiting, locked or error status. Batches can be controlled using the shortcut menu for one or multiple selected batches. The status display for each executed batch is dynamically updated. Depending on their status, batches are moved by the system from batch planning - via batch status - to the batch results list. The content of the batch status list is updated once you open it again, and the batch moved to the batch results list is no longer displayed.
Batch result list	List with all batches with the completed, aborted, canceled, archived, stopped and closed status. Batches can be closed, archived and deleted via the shortcut menu for one or multiple batches. Depending on their status, batches are moved by the system from batch planning - via batch status - to the batch results list.

Selection of the batch lists

You can display batch lists for the following folders:

- “Orders” folder
- Folders of the type "Order category"
- Folders of the type "Order"

Select the required folder.

Select the required batch list in the **"Planning"** menu or in the shortcut menu.

Working with lists, filters, and effects

Shortcut menu with possible functions: If you select a list object and right-click, the shortcut menu opens with the available functions for the list object.

Sort table contents: If you left-click a column header, the table will be sorted in ascending and descending order according to the contents of the selected column header.

Filter table column contents: If you enter a filter text in the text box below the column header, the table will be filtered accordingly. You can also filter several columns at the same time. The individual filter conditions are then linked with an AND logic operation. That means that only objects that meet all the entered filter criteria are displayed. If, for example, you enter the text "Wa*" in the text box of the "Main Product" column, only the entries whose main product starts with the letters "Wa" appear in the table.

Arrange table columns: The order of the individual table columns can be changed as needed. Click a column header and hold down the left mouse button. Drag the object to the desired column position and release the mouse button. When columns are arranged, the symbols contained in a column are also moved to the new position. The new arrangement of a list is saved automatically when the list is closed and is retained the next time the list is opened. Columns can also be hidden and displayed. Right-click a column header. In the shortcut menu, click the name of the column you want to remove from or display again in the list. A new arrangement in a list is automatically saved when the list is closed and retained the next time the list is opened.

Interpret type and status symbols: Corresponding symbols are displayed for each object listed (in overview and batch lists). The following object symbols are available:

- Libraries
- Master recipes
- Formulas
- Order category
- Order
- Batch
- Materials

For objects that can assume a status (libraries, master recipes, formulas, orders, and batches), status symbols are also added as a prefix in addition to type symbols. For batches, the type symbol is superimposed with additional symbols.

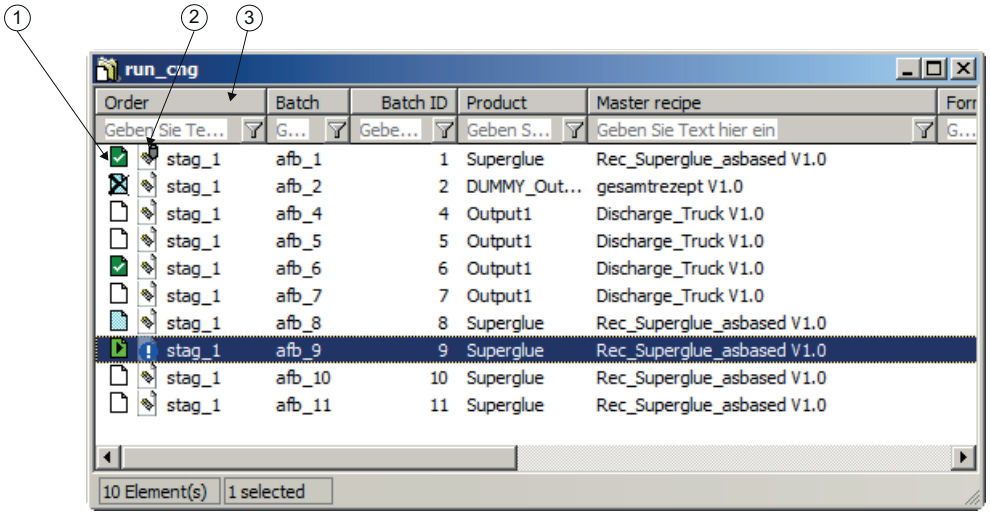


Figure 9-2 Symbols (Status and Type)

① Status symbol of a batch

② Type symbol of batches

③ "Order" table column

Select all

With CRTL+A or the menu command **Edit > Select all**, you can select all the objects of a list, for example, to release all batches using the shortcut menu.

Additional information

Status of the batches (Page 404)

9.1.4.9 Output window for messages

Requirement

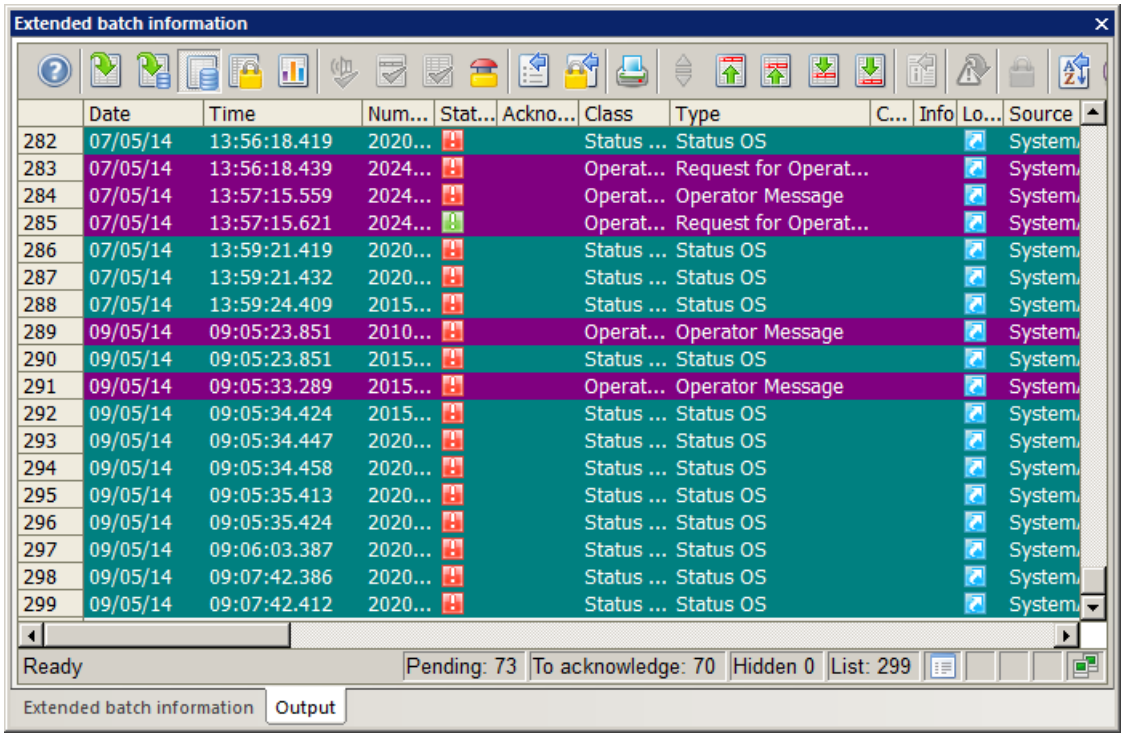
A PCS 7 OS (WinCC) runs on the BATCH client PC in process mode.

Output window

All the messages for batch control (system messages, process messages, error messages) that are managed in the WinCC archives can also be displayed in BatchCC.

To display these messages, you can open the output window of the PCS 7 OS (WinCC Alarm Control) in BatchCC in a separate output window.

You open the output window with the menu command View > Toolbars > Output.



Customizing

- You can customize the properties of the message window (familiar from WinCC), for example the columns displayed and the selection of messages.
- User settings are entered in the global database and restored the next time you start BatchCC. Certain settings that are essential for SIMATIC BATCH are exceptions to this, for example selection of BATCH messages.
- Select a message line and then select "Open control recipe" in the shortcut menu. This opens the control recipe that matches the message.

9.1.4.10 Extended batch information

The "Extended batch information" window display information about the active batch in plain text. It not only provides you with information from the control recipe view using status symbols and tooltips, but also with an independent message window with important batch messages during operation.

You can use the window in BatchCC only if you the "Open control recipe for the batch" permission as a logged-on user.

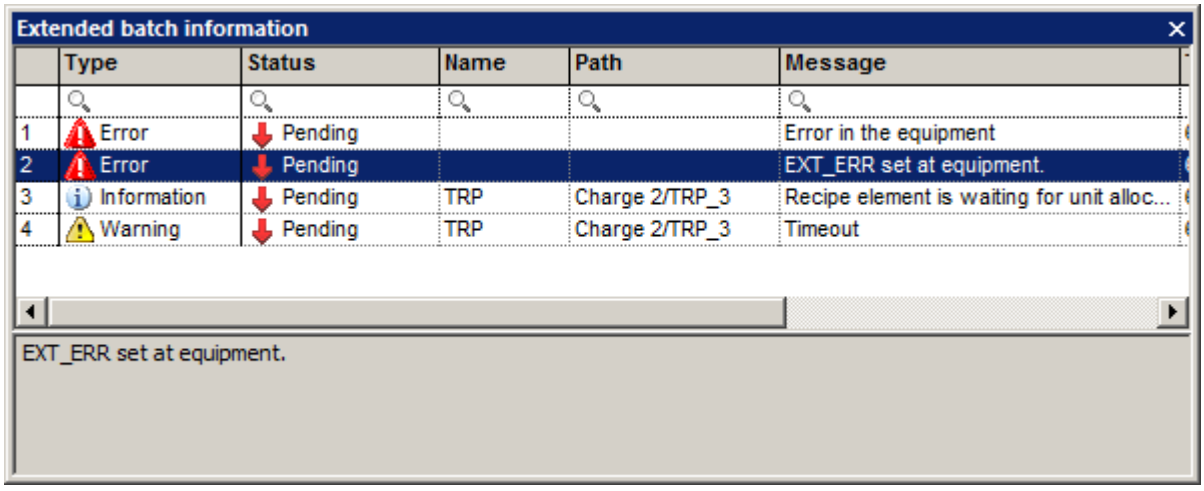


Figure 9-3 Extended batch information

Possible symbols in the dialog

Table 9-1 Symbols for status and type of an error message

Symbol	Meaning
	Error status: Completed
	Error status: Reset
	Error status: Outgoing
	Error status: Outgoing and acknowledged
	Error status: Pending
	Error status: Pending and acknowledged
	Error type: Error
	Error type: Information
	Error type: Warning

Message texts

Messages concerning warning limit violations or errors that have occurred are displayed during batch processing. Some examples are described below:

- Errors in the equipment module such as pending external error, for example.
- Errors due to lack of licenses, for example, to few UNIT licenses, no SIMATIC BATCH Server license
- Errors in the allocation, for example, recipe element awaiting unit allocation.
- Errors in connections, for example no connection to the automation system.
- Errors in transition conditions
- Timeout for batch and step commands

Table layout

Each message is listed in a table row. The type, status, name, path, message text and time stamp is provided for all messages. When you select a message in the table, the message text appears below in a description field.

Navigation from the message line to the error

By double-clicking a message row, you can jump to a recipe element causing an error within the control recipe view recipe in BatchCC. In addition, the messages contained in the table can be sorted and filtered according to your own criteria. Filter settings in the message window are only saved if the control recipe window was open in BatchCC at the same time.

Arranging the batch information window

You can show or hide the batch information window using the **View > Toolbars** menu. The window can be moved to any position and can also be combined with other windows as a tab.

To reposition the window, click with the left mouse button on the title bar and hold down the mouse button. Position symbols for the arrangement of the window are displayed when moving the window. Move the window onto one of the symbols.

If you move the window to the inner position symbol within a displayed window, the window will be displayed as an additional tab. Double-click the title bar to remove the window again.

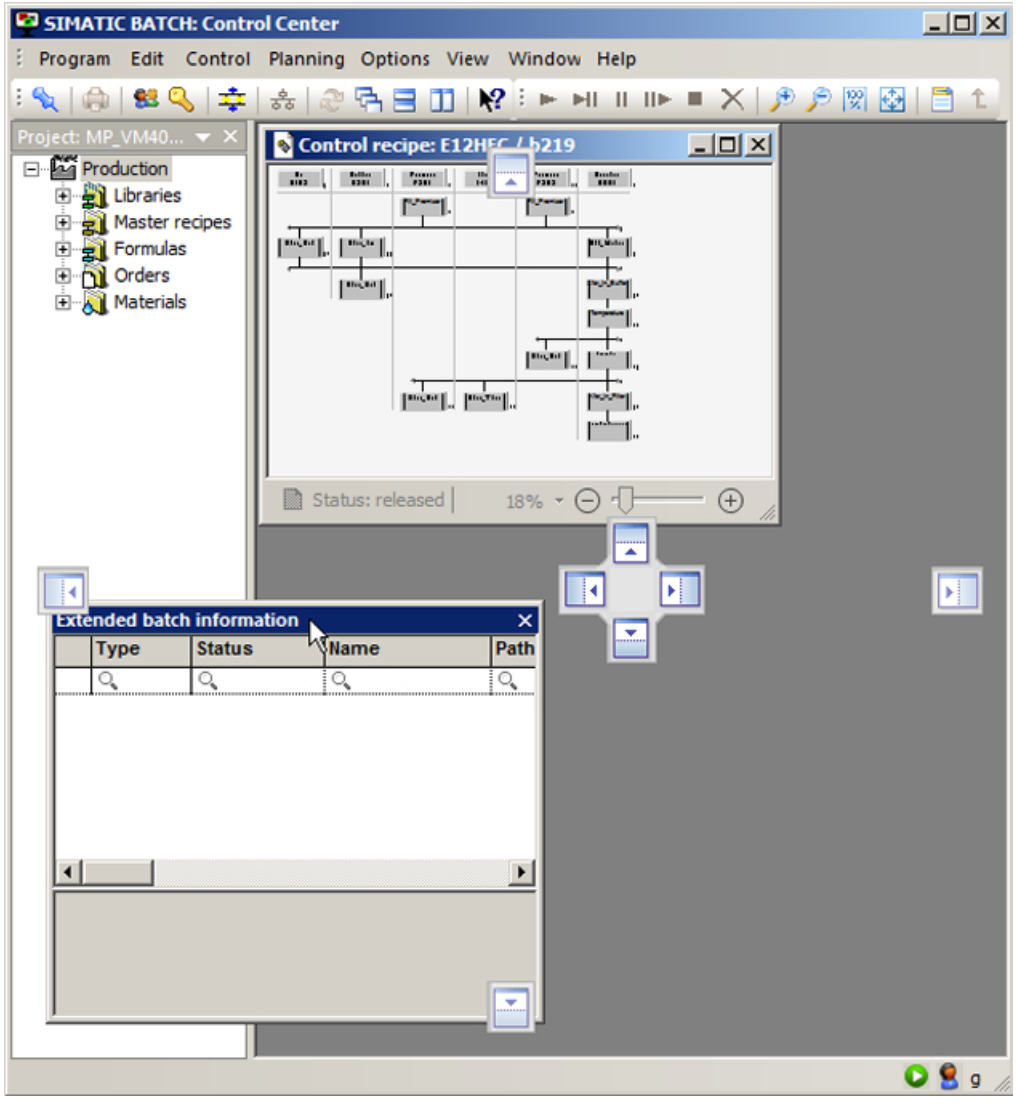


Figure 9-4 Position symbols

9.1.4.11 Shortcut window

In the "Shortcuts" window, you can create batches, master recipes and materials from the navigation window of the BatchCC using drag-and-drop. By right-clicking on a shortcut symbol in the shortcut window, available commands are displayed for selection in the shortcut menu. These are identical to those offered in the navigation window.

Fast access

The shortcut window displays a type of fast access for frequently used objects. This eliminates the need to navigate through folder structures in the BatchCC navigation window. You can show or hide the shortcut window.

Deleting all objects in the shortcut window

Right-click anywhere in the shortcut window to show the command "Delete all shortcuts". Left-click on the command to delete all objects in the window.

Example

For example, when you save a master recipe there, you can open it using the "Open" command from the shortcut menu and edit it immediately in the Recipe Editor.

9.1.4.12 Log

User actions that you have performed in BatchCC are recorded in the log. User actions are assigned to various types. The following types are available.

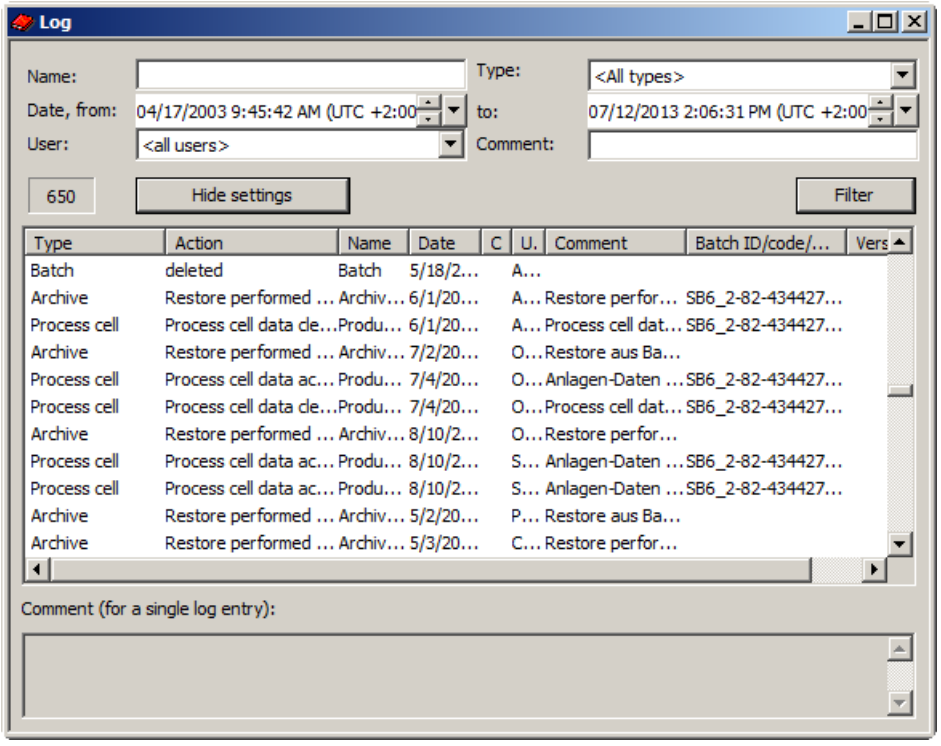


Figure 9-5 Log

Types	User actions
Project	Process Historian was activated / deactivated
Process cell	Process cell data activated by server. Process cell data cleaned up
Library element	Library element deleted
Master recipe	Master recipe deleted
Formula category	Formula category
Formula	Formula deleted
Order category	Order category deleted

Types	User actions
Order	Order deleted
Batch	Batch deleted
Materials	Materials deleted
Role	Role in the user management deleted
Archives	Restore performed from a backup file. Log was not imported during restore

Each user action is listed as a line with special attributes within a table. The attributes of user actions are sorted in columns.

The following attributes are represented as table columns.

Column name	Meaning
Type	Type of user action. Types from above table.
Action	User action from above table.
Name	The text displayed in the "Name" column refers to the user action type. Example: When a batch is deleted, its batch name is displayed.
Date	Time and date of the user action including time zone information.
Computer	The "Computer" column contains the computer name of the PC on which the user action was performed.
User	Identification of the user who is logged on to the PC.
Comment	Displays a comment text that was predefined or entered by the system or by the user for the action. Comments are displayed in the language in which they were created.
BatchID/Code/etc.	The BatchID is specified for batches. DB indent (SB8_) is specified for a restore. The material name is displayed for materials.
Version	For user actions on objects (materials, library elements, master recipes, and formulas), the version of the object is specified.

Note

- Events in the log are updated by reopening the log.
- For a restore it is possible to disable the restoration of the permanent log. The check box "Without log" is used. This will create an empty log in BatchCC.
- Batch data that results when process parameters are changed is output in the batch report and not in the log.

Filtering by events in the log

You use a filter to search for the required user actions. Enter your search criteria in the "Name", "Type", "Date from" "to", "User", and "Comment" fields or select them from the drop-down list. Then click the "Filter" button. Wildcards are allowed for filter entries. The characters "*" or "?" are permitted as variables. For example, you use "A*" to search for all objects beginning with A. With "?" in a name, you search for all objects with this name and a variable at the location of the "?" character.

If the search result is displayed as a table, further filtering in the columns is possible by clicking the desired column header. This sorts the list entries accordingly.

"Hide settings" button

With the "Hide settings" button, the filter settings and the comment display are hidden in the "Log" window. To exit this window view again, click the "Show settings" button.

9.1.4.13 Editing window with BATCH objects

Object hierarchy

The object hierarchy can be structured in BatchCC in much the same way as the folder structure of the Windows Explorer with folders and files.

The top folder is the batch process cell with the permission management. Below the Batch process folder are the subfolders for "Libraries", "Master recipes", "Formulas", "Orders" and "Material". You can create other folders within these to store a variety of objects (libraries, recipes, formulas, etc.).

When you double-click on the permission management, the "Permission management" dialog opens.

9.1.4.14 Window for displaying active applications

In this dialog, you can see information about BATCH applications that have started, for example BCC and RE and elements within them that have been opened, for example recipes. These elements are then being processed by a specified user on a specified PC.

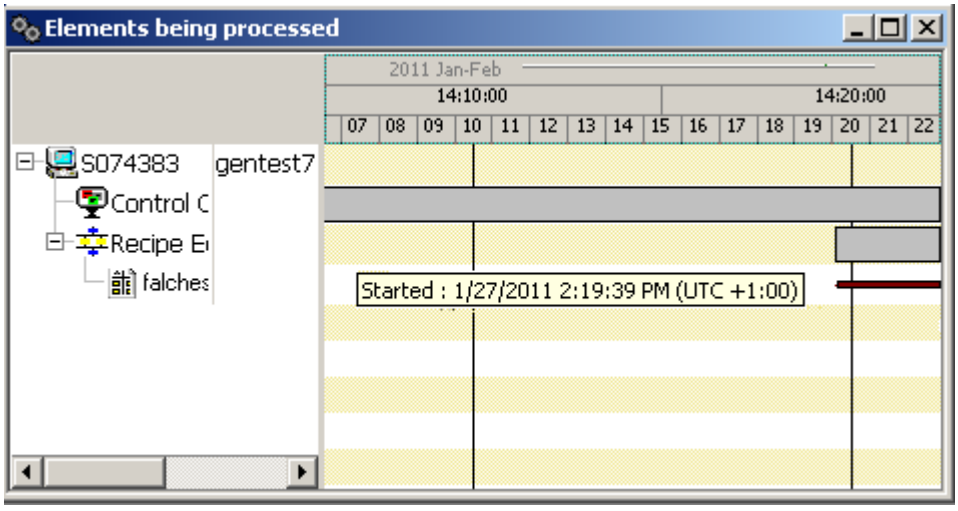
Working in the dialog or reading out the allocation information

BATCH applications are displayed in the form of a grey bar and elements opened for editing in the form of a brown bar in the time wrindow. If you hold the mouse pointer over a bar, you will see the start time for the application or editing of the element in the tooltip.

The bars appear only as time progresses after processing starts (application or element). If the window it is displayed in a reduced size, you can navigate to the current point in time, in other words the right-hand margin of the time scale, by clicking on the time scale, holding down the right mouse button and moving the mouse pointer to the left.

Opening the dialog

To open the display window with the current applications, select the Options > Active applications menu command in the BatchCC. This function opens a window with the currently active applications.

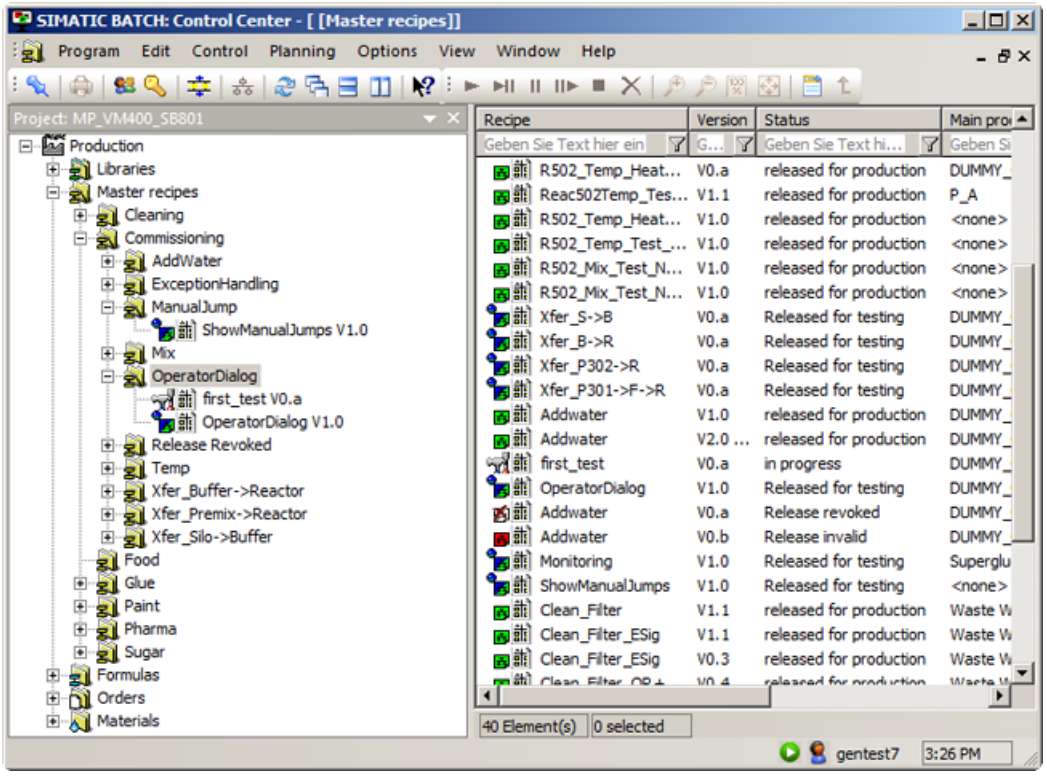


9.1.5 Objects and object hierarchy

9.1.5.1 Objects and object hierarchy

The object hierarchy for library operations, master recipes, formulas and production orders can be structured in BatchCC in much the same way as the folder structure of the Windows Explorer with folders and files.

The following figure shows a possible structure in the project window within the BatchCC.



User-defined structure of objects and folders

You can create self-defined folder structures below the libraries, master recipes, formulas, production orders and materials folders.

Note

User-defined hierarchy structure

To allow you to better structure your process cell, you can also create a different, user-defined hierarchy structure made up of BATCH objects and folders. The highest folder level cannot be changed or freely defined. This applies to the folders "process cell", "libraries", "master recipes", "formulas", "orders", "materials" and "permission management".

Showing dependent elements, references between BATCH objects

The "Dependencies" tab of the "Properties" dialog displays the assigned references to other BATCH objects for the objects selected in the BatchCC (library operations and master recipes) and the configured unit allocations.

Additional information

- Libraries with library operations (Page 301)
- Master recipes (Page 302)

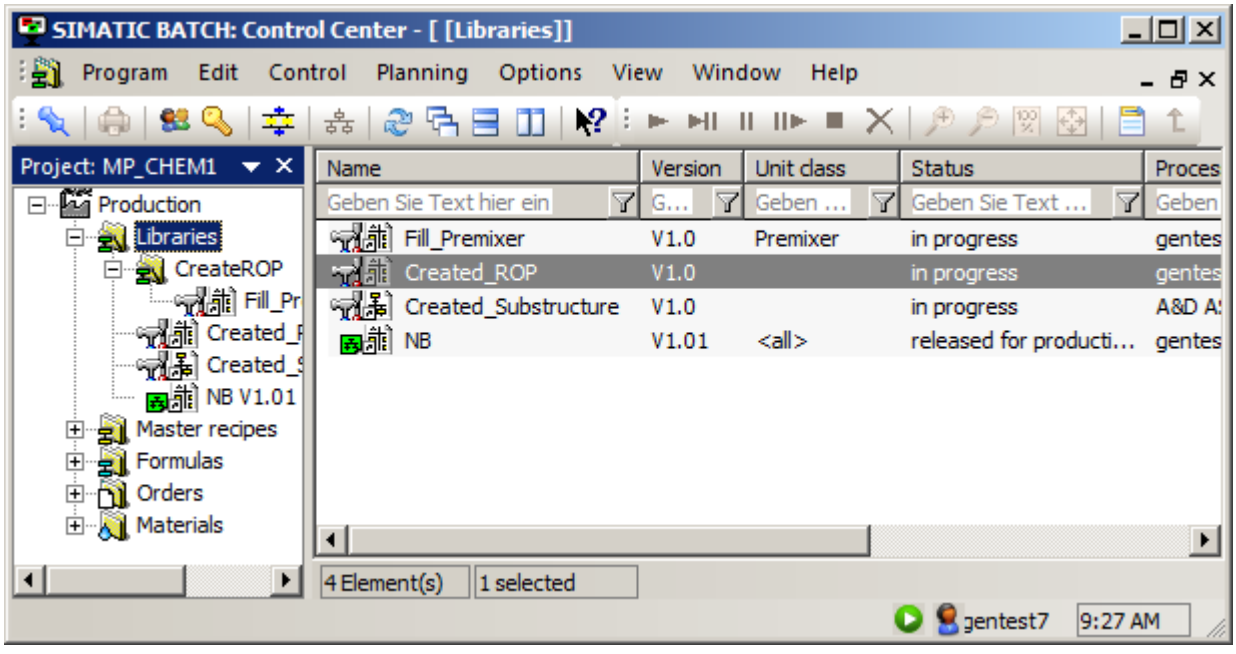
- Formulas (Page 303)
- Production orders (Page 304)
- Materials (Page 306)
- Permission management (Page 306)
- Creating and manipulating objects (Page 285)

9.1.5.2 Libraries with library operations

Reusing recipe elements

You can use libraries to store recipe elements created with the BATCH Recipe Editor that you require often in the master recipes. You can store and manage recipe operations (for hierarchical recipes) and substructures (for flat recipes) in libraries. In the following descriptions, recipe operations or substructures from libraries are called library operations or library substructures.

Position of the objects



Available functions

- Opening and editing recipes (Page 334)
- Specifying the properties of library operations (Page 612)
- Validating recipes (Page 347)
- Releasing recipes for testing (Page 348)

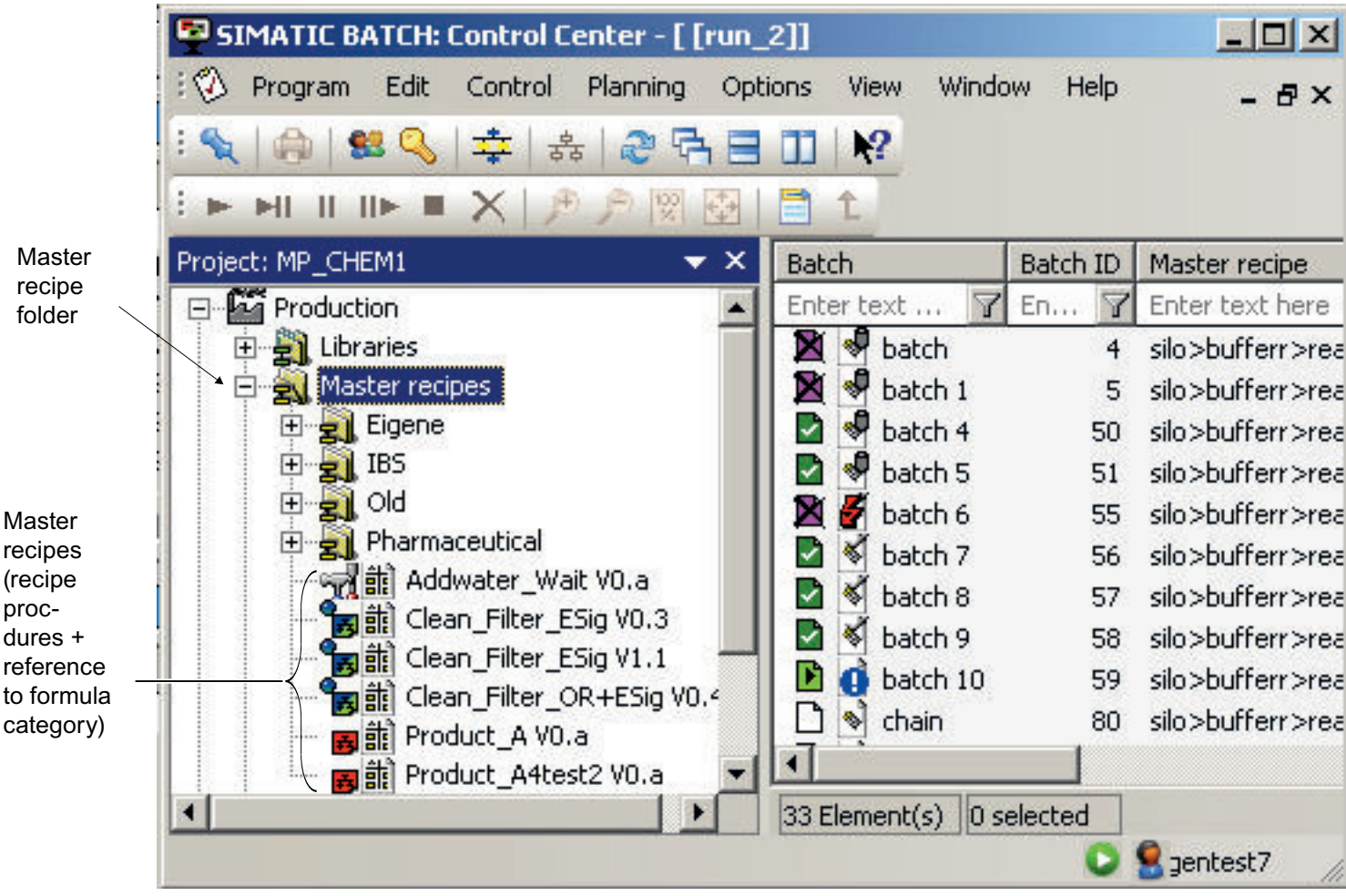
- Releasing recipes for production (Page 349)
- Status of the recipes and status changes (Page 350)

9.1.5.3 Master recipes

Storing recipe procedures

In this area, you can store the recipe procedures created with the BATCH Recipe Editor according to the technological structure of your process cell. With the reference (can be set in a dialog box) to a formula category and ultimately to a concrete formula, you have a complete master recipe. There are both flat and hierarchical master recipes. If you have large numbers of master recipes, these can be stored in different folders (without semantics) to achieve a better structure.

Position of the objects



Available functions

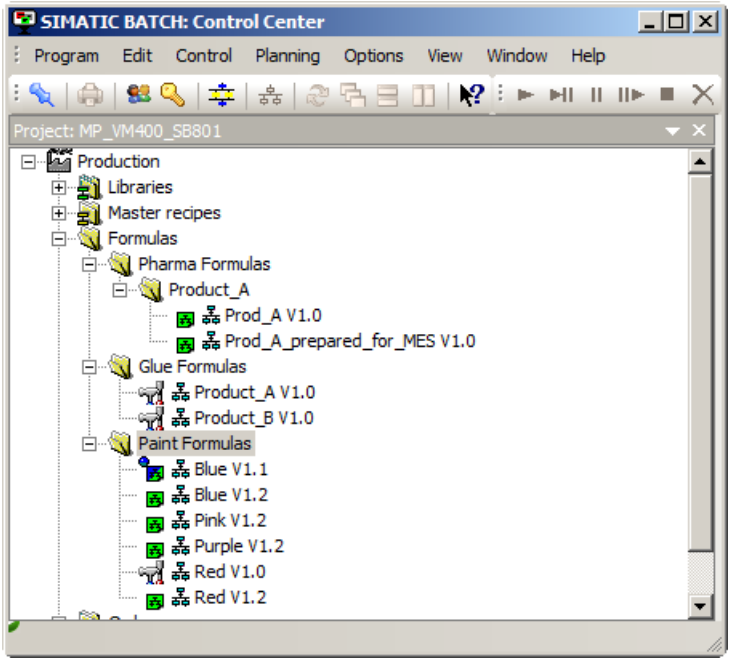
- Creating a new master recipe (Page 333)
- Opening and editing recipes (Page 334)
- Specifying the properties of master recipes (Page 334)
- Interconnecting master recipe header parameters with an external formula (Page 339)
- Working with the recipe overview (Page 341)
- Validating recipes (Page 347)
- Releasing recipes for testing (Page 348)
- Releasing recipes for production (Page 349)
- Status of the recipes and status changes (Page 350)

9.1.5.4 Formulas

Creating formula categories

In this area, you create the formula categories with the formulas belonging to them according to the technological needs of your plant. If you have large numbers of formulas of a category, these can be stored in different folders (without semantics) to achieve a better structure.

Position of the objects



Available functions

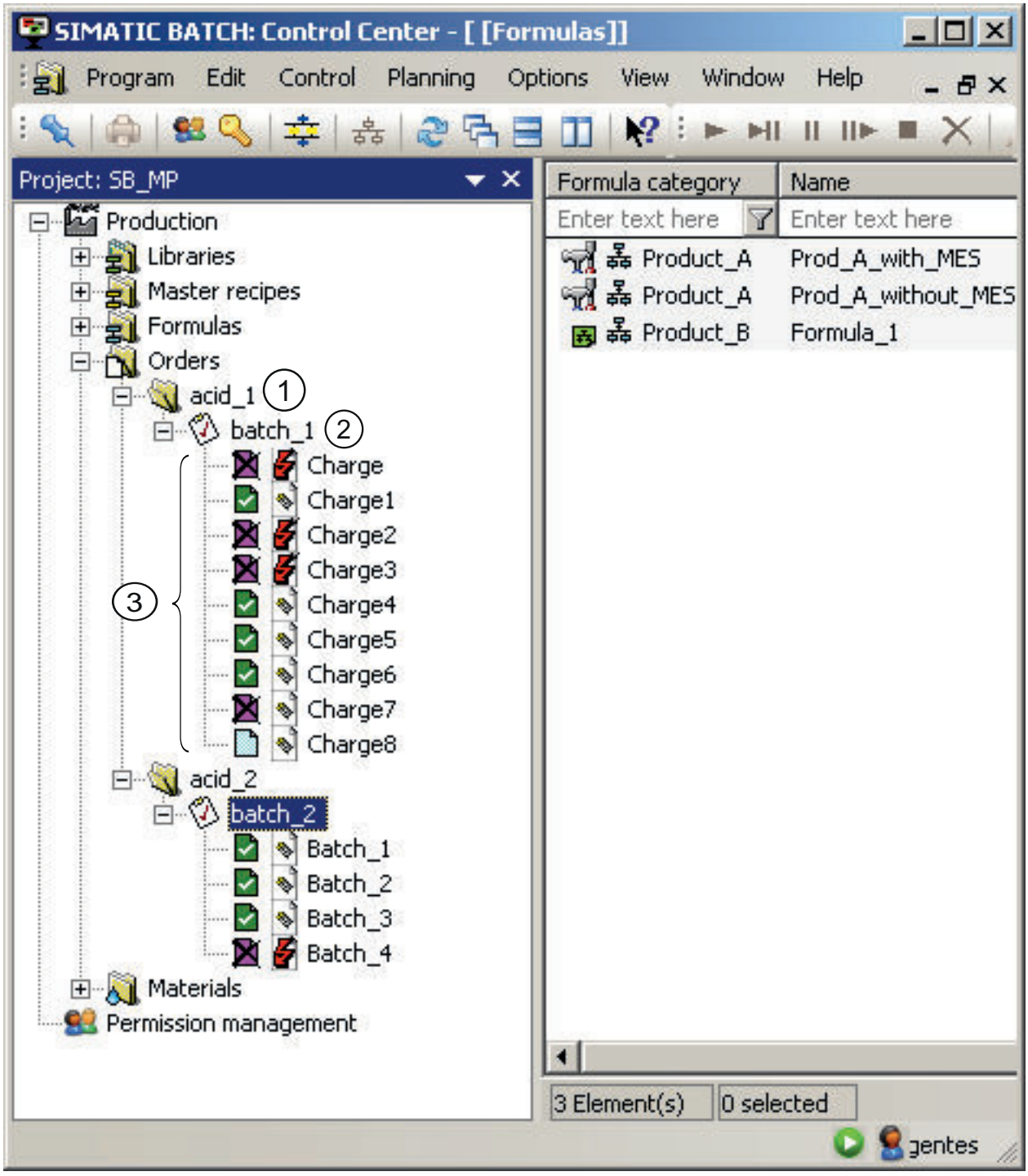
- Creating a new formula category (Page 336)
- Specifying the properties of the formula category (Page 336)
- Creating a new external formula (Page 337)
- Specifying the properties of formulas (Page 338)
- Interconnecting master recipe header parameters with an external formula (Page 339)
- Working with the formula overview (Page 342)
- Validating formulas (Page 349)

9.1.5.5 Production orders

Creating production order categories

In this area, you create the production order categories with the lower level production orders. You can create batches for a production order. You also make the settings for batch processing, for example the Start mode.

Position of the objects



Legend for figure:

① Order category

② Production orders with batches

③ Status display of batches

Available functions

- Creating a new production order (Page 382)
- Specifying the properties of a production order (Page 385)
- Adding batches to the production order (Page 386)
- Specifying the properties of a batch (e.g. quantity) (Page 387)
- Setting the Start mode for batch processing (Page 389)
- Displaying and modifying unit allocation if required (Page 390)
- Chaining batches (Page 391)
- Displaying the run time of a batch (Page 394)
- Working with overviews (Page 288)
- Status of the batches (Page 404)

9.1.5.6 Materials

Creating materials

To be able to use input and output materials in recipes and formulas, these must first be entered in BatchCC.

Available functions

- Defining materials (Page 325)
- Changing the quality (Page 326)

9.1.5.7 Permission management

Setting up permission management

The permission management is set up by the system administrator. Here, you can specify the user permissions of the user roles for specific computers and for specific units for all the functions of BatchCC and the BATCH Recipe Editor. This is only possible if the PCS 7 SIMATIC Logon software is installed. Without this additional product, every user in SIMATIC BATCH has all permissions comparable with the "Super user" role.

Available functions

- Specifying user permissions (Page 310)
- Changing user permissions (Page 315)
- Displaying user permissions (Page 316)

9.2 Specifying user permissions

9.2.1 Introduction to permission management

SIMATIC BATCH supports the central user management SIMATIC Logon of SIMATIC PCS 7, which in turn is based on the mechanisms of the user management in Windows.

Basic procedure

- You define users and user groups (available on the particular Windows server) and define passwords centrally in Windows.
- You can define user roles for SIMATIC BATCH and assign them to Windows user groups using the Software SIMATIC Logon software.
- Within SIMATIC BATCH (BatchCC), you can make the following extra specifications:
  - User permissions for one user role (global)
  - Permitted user roles per computer (computer-specific)
  - Permitted user roles per unit (unit-specific)
- The components of SIMATIC BATCH contained in SIMATIC PCS 7 are provided with the data of users as they log in from a central logon service and are informed of possible logon changes.

User roles for SIMATIC BATCH

The following user roles and associated user permissions are set as default for SIMATIC BATCH. You can add additional user roles in the SIMATIC Logon roles management. Additional information is contained in the online help for SIMATIC Logon.

Note

User groups and roles

When a user is a member of several Windows user groups that have been assigned a variety of roles in SIMATIC BATCH, this user has a union set of the individual permissions from all assigned roles.

Preconfigured roles and assignment types (user groups / function)	Preconfigured user rights
Super user	Unrestricted full access to all functions of SIMATIC BATCH.
Automation engineer	Reading and updating process cell data
Factory manager	Editing, modifying or releasing recipes Creating batches.
Emergency operator	Has no permissions by default. You have to configure accordingly.
Operator	Starting, releasing, holding, resuming, locking, closing and archiving batches.

Preconfigured roles and assignment types (user groups / function)	Preconfigured user rights
Shift manager	Creating and processing batches and formulas.
Process engineer	Creating and modifying recipes

Super user

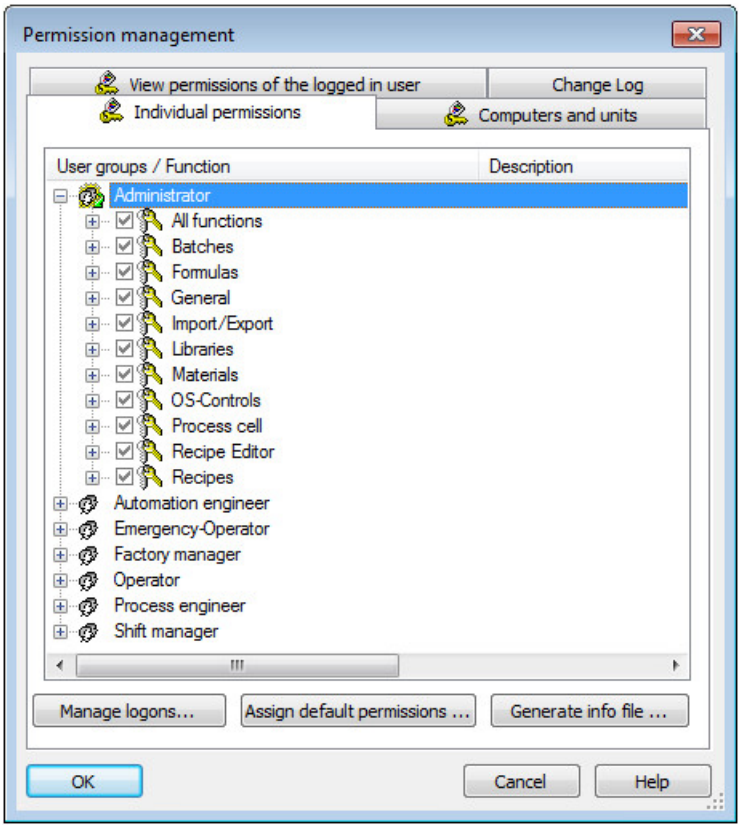
The administrator of SIMATIC BATCH takes on the role of "Super user". A user with the super user role has all user permissions in SIMATIC BATCH and only this user can make changes in the permission management. The following icon identifies a super user:



Rules for super users

- There is at least one role whose users have the "super user" status.
- In the roles management under **Options > Roles management** in the BatchCC, you can change the name of this and all other roles. This means it is no longer simple to recognize whether or not a role has super user status.
- SIMATIC BATCH creates the "Super user" role by default when the database is generated.

- To find out which roles have super user status, you can open permission management with **Options > Permission management, "Individual permissions"** tab in the BatchCC. There all icons for roles with super user status have a yellow outline.



- A role that is assigned all permissions in Permission management (all entries have a check mark) is **not** equivalent to a role with super user status.
- As well as always having all permissions by definition, roles with super user status also have additional permissions that cannot be assigned to other users. For this reason, the permissions of these roles cannot be edited: all check marks are always set in the permission management.

9.2.2 Specifying user permissions

Requirements

SIMATIC Logon must be installed on every PC running BATCH applications. SIMATIC Logon consists of two components:

- SIMATIC Logon Role Management (integrated in the BatchCC)
- SIMATIC Logon Service (logon dialogs)

Basic requirements for working with SIMATIC Logon:

- To configure SIMATIC Logon for use in SIMATIC BATCH, there must be a Windows user who is a member of the "Logon_Administrator" group. You can log on with this membership (Start > SIMATIC > SIMATIC Logon > Configure SIMATIC Logon) and open the "Configure SIMATIC Logon" dialog. There, you decide, for example, the language setting for the logon dialog in the BatchCC. By being a member of this group, you can log on in the BatchCC and open and configure roles management. However, you have no operator input rights whatsoever in SIMATIC BATCH.
- Users intended to use SIMATIC BATCH must be added to the members of the "SIMATIC BATCH" and "SIMATIC HMI" Windows groups. Only then can you assign the relevant roles for SIMATIC BATCH to these users in the SIMATIC Logon roles management (**Options > Roles management** in the BatchCC).
- Certain individual rights are defined for each role. This allows precise rights to be defined for every operator of the batch process cell. To adapt the individual permissions and the permissions for computers and units in the "Permission management" dialog, you require a user that has been assigned the role of super user in the role management.

Note

Permission management on the BATCH server

If permissions are managed on the BATCH server, it is not enough to simply install SIMATIC Logon on the BATCH server PC. A BATCH client must also be installed on the BATCH server PC.

Defining Windows users and user groups

1. Select the menu item **Start > Settings > Control Panel > Administrative Tools > Dialog "Computer Management" > System > Local Users and Groups > Users/Groups**.
2. With **Action > New User/New Group**, create all users (with passwords) and user groups in the Windows network (Windows server).

Defining user roles for SIMATIC BATCH

1. Open the BCC.
   The logon dialog for SIMATIC Logon Service is displayed.
2. Enter the user name, password, and domain of a Windows user who is a member of the "Logon_Administrator" group here, and confirm your entry with "OK".
3. Launch the Roles management dialog in BatchCC with the menu command **Options > Roles management**.
   The "SIMATIC Logon roles management" dialog is displayed:
   - You can create user roles for SIMATIC BATCH in the upper half of the dialog box and then assign Windows user groups/Windows users to these user roles. As a result, Windows users in SIMATIC BATCH have the assigned permissions of the BATCH user roles.
   - In the lower half of the dialog box, you can navigate through the Windows user groups/ Windows users of the available computers and domains.

4. Create user roles for SIMATIC BATCH and connect the user roles to a Windows user group or a Windows user.
   The user roles listed here can be used as a template for creating new roles. Each user role predefined by the system has special user permissions within SIMATIC BATCH. The user permissions are passed on to the new user role.
5. Double click on the required role in the dialog above and then right-click on the "Groups and users" object. Click the "Edit" command in the shortcut menu. The "Edit groups and users" dialog opens. There, select the Windows group or the Windows user you want to add to the role and move the group or user to the "Configured groups and users" box with the red arrow button.

   Note

   Detailed information

   You will find detailed information about the procedure in the SIMATIC Logon online help and manual. You will find the manual in the Windows start menu using the menu command **Start > SIMATIC > Documentation > Language > SIMATIC Logon**.

6. Confirm your settings by clicking the "Save" button.

   Note

   Assignment after restore

   Following a restore of BATCH backup data in BatchCC, the assignment of user roles and permission management performed previously in SIMATIC Logon may need to be checked and, if necessary, adapted.

Defining user permissions for SIMATIC BATCH

1. Log in with your logon for the "Super user" role in the BatchCC.

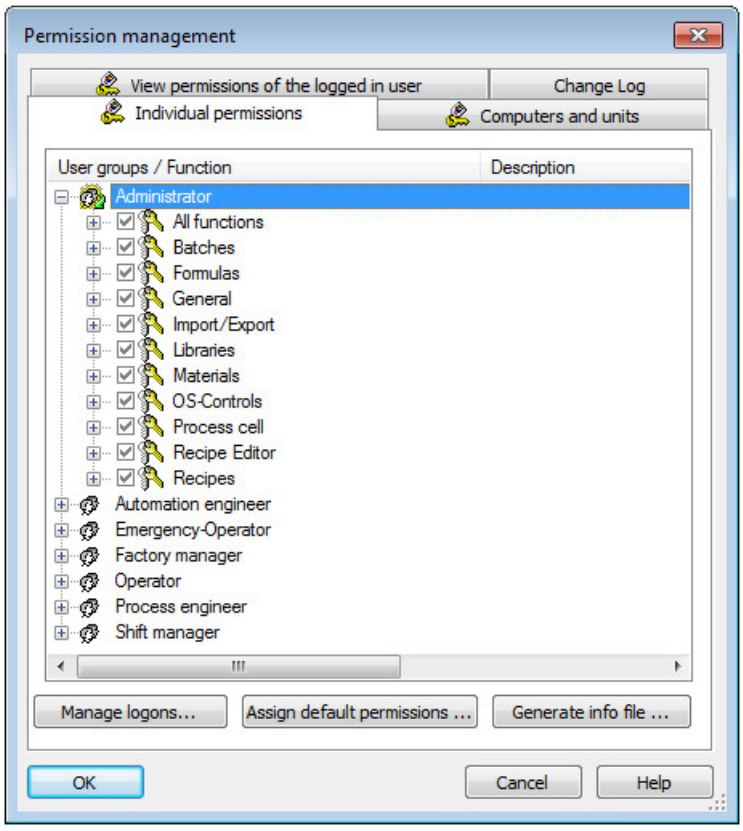
   Note

   Super user status

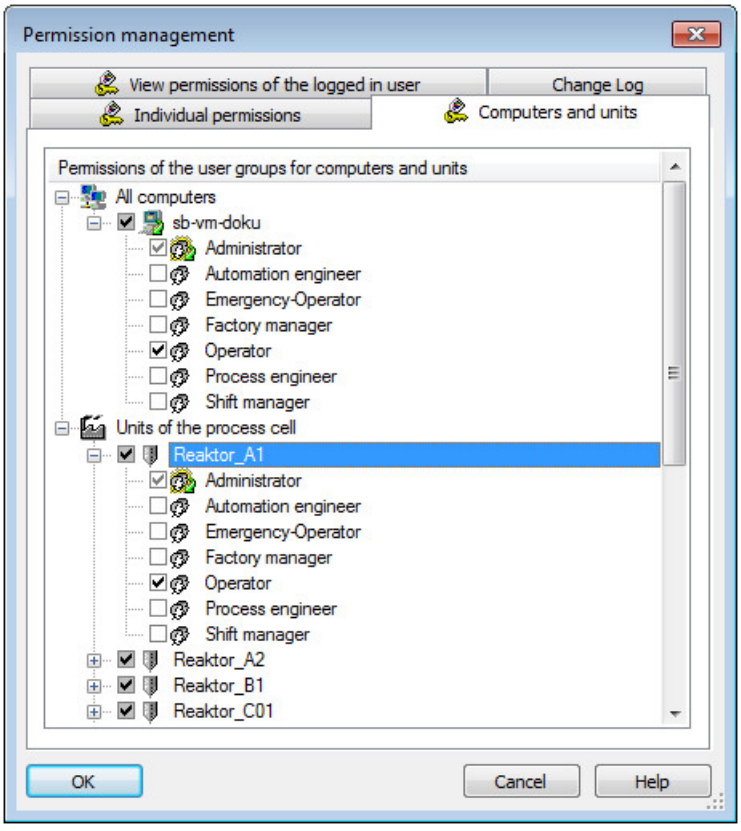
   Only members of the super user role can edit user rights, in other words, define and change user rights. It is not possible to assign this permission to another group. The super user role can be renamed in the SIMATIC Logon roles management and the "Super user" status is transferred to the renamed role. In the figure below, for example, the administrator role.

2. Click the menu command **Options > Permission management** or select the corresponding command from the toolbar. The "Permission management" dialog is displayed.

3. In the "Individual permissions" tab, specify the user permissions for each user role:



4. On the "Computers and units" tab, specify which user roles are possible on which computer or unit.
   - In the "All computers" folder, the computer names are displayed and the user roles below them.
   - In the "Units of the process cell" folder, the units are displayed with the user roles below them.



5. Save your newly created user permissions with "OK".

Change user

To change the current user logged on in a BATCH application (BATCH Recipe Editor, BatchCC), double-click on the logon display on the bottom right of the status line of the BATCH application. Alternatively, you can click the key symbol or use the "Log off" command in the "Options" menu.

Result

The SIMATIC PCS 7 Logon Service is triggered and a new logon dialog opens.

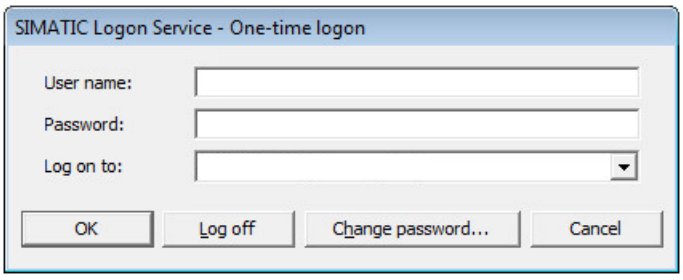


Figure 9-6 SIMATIC Logon Service - one-time logon

You set the language for this dialog in SIMATIC Logon, "General" tab. You open this dialog from the Windows Start menu **Start > SIMATIC > SIMATIC Logon > Configure SIMATIC Logon**. Members of the "Logon_Administrator" group created in the Windows user management as a result of installation of SIMATIC Logon can log on. Use user name "logon" and password "logon" for the logon.

9.2.3 Changing user permissions

General

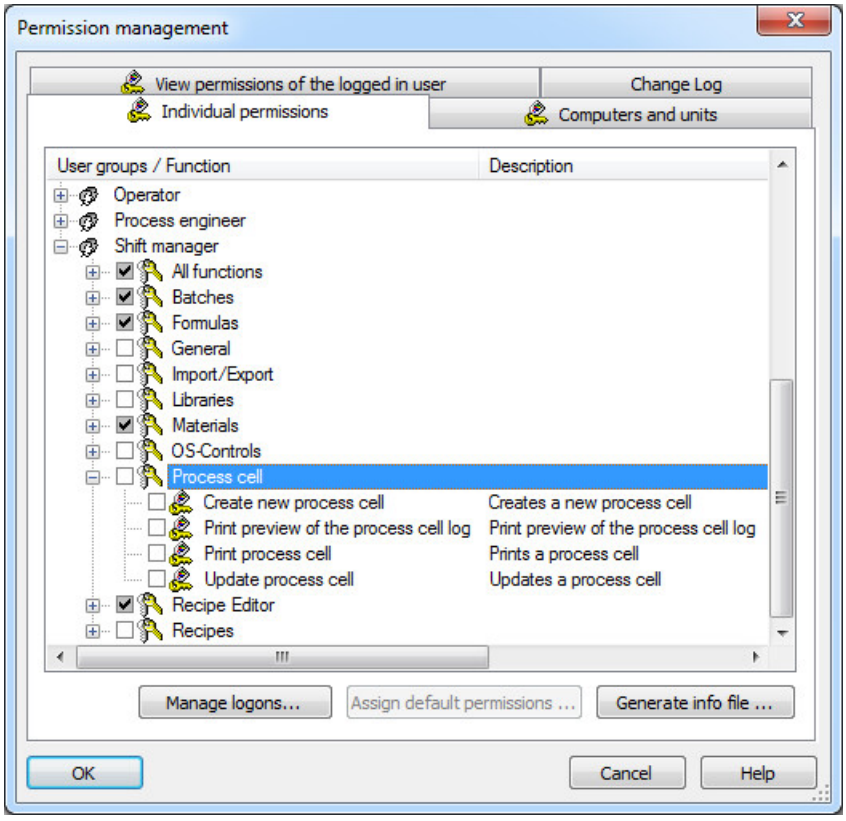
The user permissions can be modified during runtime, in other words, while you are creating a recipe or editing something. User rights can only be changed by one person at any one time. You cannot edit individual permissions of the "super user" role.

Requirement

To change or adapt the user permissions of the various roles, you need to be logged on as a user with the super user role in the BatchCC.

Procedure:

1. Select the menu item **Options > Permission management** in the BatchCC. The "Individual permissions" tab of the "Permission management" dialog is displayed.
2. Navigate through the relevant user groups/functions and change individual permissions by selecting or deselecting check boxes.



3. Save the modified individual permissions of the roles or user groups with "OK".

9.2.4 Display of user permissions

Procedure:

1. Select the menu command **Options > Permission management** in the BatchCC. The Individual permissions tab of the "Permission management" dialog is opened.
2. You can display information about the permissions of all user roles in the "Individual permissions" tab. To do this, navigate through the tree structure of the user roles or user groups / functions.
3. In the "Computers and units" tab, you can see which user roles are possible on which computer or on which unit.

Additional information

Tab "Computers and units" (Page 877)

9.2.5 Generating and displaying an info file with individual permissions

Info file with individual permissions for user roles

In the "Permission management" dialog you can click the "Generate info file" button to generate a complete overview of the individual permissions you have configured for your user roles. This overview can then be displayed in Windows Internet Explorer and printed.

Note

Logical dependencies between individual permissions

There are dependencies between the individual functions (and also, therefore, the permissions) which are not supported by the software. You have the individual permission "Edit master recipe", for example, but not the permission "Start recipe editor". Because you do not have the permission "Start recipe editor", you cannot execute the permission "Edit master recipe". In other words, you need both permissions to edit a master recipe.

Note

Software update, project migration with new individual permissions

Please note that when updating software and during project migration, the software does not tell you that new roles are being added to the user management. Please check your configured roles and make sure that you have the necessary permissions for operation in the user management. You might need to assign a new individual permission to the corresponding role to ensure that you retain the configured functional scope.

Structure of the info file

The SIMATIC BATCH version, the generation date of the html file, and a note about ID numbers used which do not reference SIMATIC BATCH appear in the header.

The chapters listed in the contents are linked. You can navigate to the required chapter from here.

All available individual permissions are displayed in the first chapter in the form of a table. All individual permissions correspond to those listed for each role under "All functions" on the "Individual permissions" tab in the Permission management dialog. A brief description and a detailed description of each individual permission is provided. Please note that there may be new individual permissions in new software versions for SIMATIC BATCH. This means that only this generated html file always contains up-to-date individual permissions.

What do I need to remember about individual permissions with regard to the roles configured in the project?

All individual permissions are assigned to function groups in the second chapter, "Function groups". There are currently 10 function groups. The function groups contain the individual

permissions necessary for their tasks. This should help you to assign your various user roles with the appropriate individual permissions for their function. Please note that individual permissions can be assigned to multiple function groups. Each individual permission in a function group is linked to the Individual permissions chapter.

In the third chapter, "Roles", all individual permissions are assigned to various roles. These roles correspond to the roles specified on the "Individual permissions" tab in the "Permission management" dialog. It is possible to assign an individual permission to multiple roles in this view also. Similarly, you have the option to link each individual permission to its description.

The fourth chapter, "All computers", presents information from the Permission management dialog, "Computers and units" tab, in the BCC. You are shown which role is logged in on which PC. The computer name is displayed. Every role shown is listed as a link, referencing the corresponding role and the individual permissions.

The fifth chapter, "Units", presents information from the "Computers and units" tab in the Permission management dialog. You are shown which role is logged in on which unit. Every role shown is listed as a link, referencing the corresponding role and the individual permissions.

9.2.6 Setting up the emergency operator

Automatic logon of standard user or emergency operator

You can set up an emergency operator in SIMATIC BATCH using SIMATIC Logon. When a logged-on user logs off in BatchCC, the specified user is automatically logged on as an emergency operator in BatchCC. This ensures that the system can be operated at all times.

You create a new role named "Emergency_Operator" in BatchCC for this function and administer the rights of this user group. The user logged on as an emergency operator cannot log off in BatchCC.

Requirements

- You are using SIMATIC Logon.
- You have the necessary permissions in BatchCC and for SIMATIC Logon to make the configuration.

Procedure

1. Open the "Configure SIMATIC Logon" dialog by selecting Start > SIMATIC > SIMATIC Logon > Configure SIMATIC Logon.
2. Select the check box "Use the following data if the user is not explicitly logged on" in the "Configure SIMATIC Logon" dialog, "General" tab.
3. Enter a name in the "Group" text box. For "User", enter the name of an emergency operator. The name of the emergency operator specified here appears in BatchCC as a user who is logged on.
4. Close the dialog with "OK".

5. Open the role management in BatchCC. Create a new role called "Emergency_Operator". You do not have to assign a user to the role. Save the role management.
6. Open the permission management in BatchCC. In the "Computer and units" tab, you assign the newly created "Emergency_Operator" group the permissions for the PC and the units. To do this, select the check box for this user group.
7. Go to the "Individual permissions" tab and set the necessary permissions or functions for the "Emergency_Operator" group. Close the dialog with "OK".

Result

Now if you log off from BatchCC, the emergency operator is automatically logged on with the assigned permissions in BatchCC.

9.3 Reading in the ES data

9.3.1 Reading process cell data into SIMATIC BATCH

Importing the process cell data for the first time

The first time you open the BATCH Control Center, no BATCH objects are displayed in the left-hand editing window because they do not yet exist. To be able to use the batch-relevant process cell data created in the engineering system (ES), this data must first be read into SIMATIC BATCH. To do this, create a new process cell in the BATCH Control Center.

Requirement

The batch process cell data created in the engineering system (ES) has been downloaded from the engineering station to the PCS 7 OS (runtime PC) of the BATCH server.

Procedure

1. Select the menu command **Program > New process cell**.
2. In the dialog, select the row for the process cell you want to read and confirm with OK.

Result

The process cell data is read in and is available in the BATCH Control Center and in the BATCH recipe editor. You can now start to configure the recipes and plan the batches.

Additional information

Update the process cell data if there is change in the engineering system (Page 321)

Updating a BATCH process cell (Page 323)

"Assignment" tab in the "Updating the process cell" dialog (Page 862)

"Preview" tab in the "Updating the process cell" dialog (Page 865)

9.3.2 Updating process cell data after changes in the engineering system

Updating process cell data

If you have made changes to the BATCH-relevant process cell data in the engineering system (ES) or have entered new data, for example a new unit, you must also make such changes known in SIMATIC BATCH by reading the process cell data into the BATCH Control Center again. When you do this, all the BATCH data is updated.

Note

Updating the process cell on the BATCH client

The updating of the process cell data takes place only on the BATCH client on which this phase has just been started. All other BATCH clients continue to have access to the BATCH server and batch process.

Changes in master recipes, library operations, formulas and formula categories are not, however, possible at this point. If you attempt this, a dialog indicates that it is not possible.

Requirement

The batch plant data created in the Engineering System (ES) has been downloaded from the engineering station to the runtime computer of the BATCH server.

What has been changed or added in the basic engineering?

Before you decide on an update, in the "Preview" tab you can display all changes made between the current process cell data currently loaded in Batch and the new process cell data.

If you want to update the data later, click the "Cancel" button in the dialog.

The preview shows which objects have been deleted, changed or added in color.

The time when the process cell data was updated in the BCC is also displayed and when the process cell data was loaded from the ES the last time.

If the two time stamps differ, SB is not working with the current process cell data, which can lead to problems.

Since the preparation of the data is implemented in an HTML file, this results in some IE specific system responses:

- The shortcut menu of the IE is also displayed unchanged in the preview.
- Everything derived from the IE such as the shortcut menu, print options etc are displayed in the language of the operating system or the installed IE version.
- The print settings from the BCC are not used for printing and the print preview. For printing and the print preview, the print settings of the IE apply.
- The print settings apply to all IE instances regardless of whether the print settings are made in the shortcut menu of the IE in the preview or directly via the shortcut menu of the IEE.

The following also applies:

- You perform the action of printing both directly in the dialog and via the shortcut menu.
- In contrast, you run the print preview only via the shortcut menu.
- If the BCC is started from WinCC the "Preview" tab is not displayed in the "Updating the process cell" dialog.

Effects on the status of the recipes and formulas

After updating the process cell, all the recipes (master recipes, library operations) of this process cell that were "released for production" and "released for testing" are changed to the "Testing release" status. Objects in the "Testing release" status are checked automatically. If the check is successful, the objects are returned to their original status. If the check is unsuccessful, the objects are changed to the "Release invalid" status. Depending on the project settings, they can now be edited and they can be released again.

In the overview lists (Page 288) you can, for example, release the recipes with one action by selecting several rows and the command "Release for production" (shortcut menu).

Batch status changes with "Updating the process cell"

Batches with the status "blocked" and "released" are automatically checked when the process cell is updated. They are set to the status "Testing release" for this.

During a process cell update, first the batch status is checked. The result of the check distinguishes between incorrect and correct batches.

Batch status before the check	Result of the check	Batch status after the check
Released	Batch is OK	Released
Blocked	Batch is OK	Blocked
Released	Batch is defective	Release invalid
Blocked	Batch is defective	Release invalid

If a batch has "Release invalid" status following the check, you can no longer use this batch. You can only delete it.

Additional information

"Assignment" tab in the "Updating the process cell" dialog (Page 862)

"Preview" tab in the "Updating the process cell" dialog (Page 865)

Updating a BATCH process cell (Page 323)

9.3.3 Updating a BATCH process cell

Updating process cell data

Below, you will find a description of how to update a process cell. It is always necessary to update your process cell if you make changes in the basic engineering that you also need to make known to SIMATIC BATCH.

Requirement

The batch plant data created in the Engineering System (ES) has been downloaded from the engineering station to the runtime computer of the BATCH server.

Procedure

1. Select the menu command **Edit > Updating the process cell**.
2. In the dialog, select the row with the modified process cell project and confirm with OK. Result: The "Update process cell" dialog box appears. After confirming this dialog, the process cell data is updated. Changed object data is overwritten. New objects are added. The assignments are displayed based on the following symbols:

☐	Object not assigned
☑	Object assigned but at least on lower-level object is not
☑	Object and all lower-level objects assigned

3. If there are any assignments missing between the objects of the old and new process cell configuration, make the necessary assignments, as follows: Select the object with a missing assignment in the left-hand window. In the upper right-hand window, select the value that is not assigned and double-click on the object.
4. Repeat step 3 for all objects that are not assigned and then confirm your changes by clicking the "OK" button in the dialog.

Result

The process cell data is updated. During this time, the process cell is locked for editing. The process cell update includes a validation routine during which all the objects used in SIMATIC BATCH are checked. If incorrect assignments are found, objects used in SIMATIC BATCH can fail validation. In this case, you must adapt and re-release BATCH objects such as master recipes, library operations, or formulas that have the "Release invalid" status following the validation. Batches that are running are not affected by a process cell update. Batches that have already been released and that have the status "Release invalid" following the validation can no longer be used. Delete such batches and create a new batch with the modified master recipe.

Additional information

"Assignment" tab in the "Updating the process cell" dialog (Page 862)

"Preview" tab in the "Updating the process cell" dialog (Page 865)

Updating process cell data after changes in the engineering system (Page 321)

9.4 Specifying the materials

9.4.1 Editing materials

Purpose

At the start of batch planning, you must define the following in SIMATIC BATCH for materials (products, by-products, waste products):

- The materials for input materials and output materials
- The quality of the main product

You define the materials in the list boxes displayed in the subsequent dialogs for recipe creation and batch planning.

Materials and qualities must be assigned a unique alphanumeric code (for example an internal company code) in the form of a string. This code can, for example, be used to specify a setpoint and process value input at the interface blocks or SFC types to identify the material or product.

Note

Central material management

If you have a central material management department in your company, you can also write the materials to the Batch data management (Batch CDV) using the user interface (API) of SIMATIC BATCH.

Rules

- The material or quality can have a maximum of 255 characters.
- The material code is alphanumeric and can have a maximum of 16 characters.
- The quality code is numeric and be set in the range from 0 to 2147483647.
- Both the material name and the material code must be unique.
- The quality and the quality code must be unique within a material.
- When you delete a material, the system checks which recipes, libraries and formulas contain use it. If this material is used there, it cannot be deleted.

How to create a new material

1. Select the "Materials" folder in BatchCC.
2. Select the menu item **Edit > New**.
   Result: The dialog box "Properties of <materials>" opens.

3. In the "Materials" tab, specify the following:
   – Name of the material
   – Unique alphanumeric code (string) for the material
   – Whether it is an input and/or output material
4. Select the "Qualities" tab.
5. Add new qualities with the "New" button. Several qualities are possible for a material.

Note

Qualities for a material

The definition of qualities for a material is optional.

6. Confirm the new materials you have made with "OK".

Note

Shortcut menu for the "Materials" folder

As an alternative, you can also make these settings with the commands "**New**" and "**Properties**" in the shortcut menu for the "Materials" folder in the tree.

Modifying and deleting

Using the shortcut menu commands "**Properties**" and "**Delete**" you can modify or delete existing materials.

9.4.2 Changing the quality

Proceed as follows:

1. Select the quality BatchCC (in the "Materials" folder).
2. Select the menu command **Edit > Properties**.
3. Change the settings for the quality in the "Quality" dialog.
4. Save you new entries with "OK".

Note

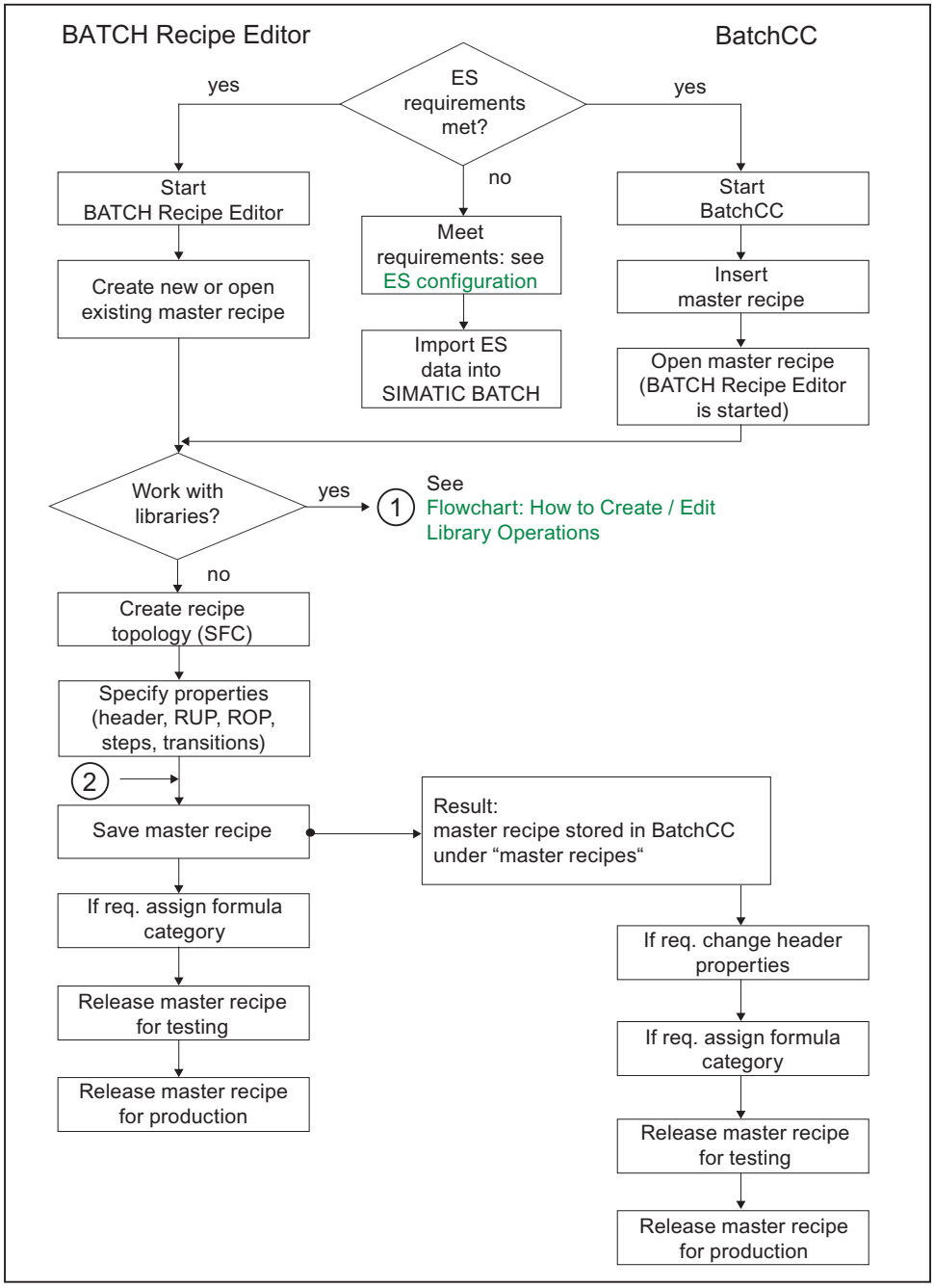
Context menu for the "Quality" object

As an alternative, you can also perform this settings in the tree using the command **Properties** in the context menu of the object Quality .

9.5 Recipes

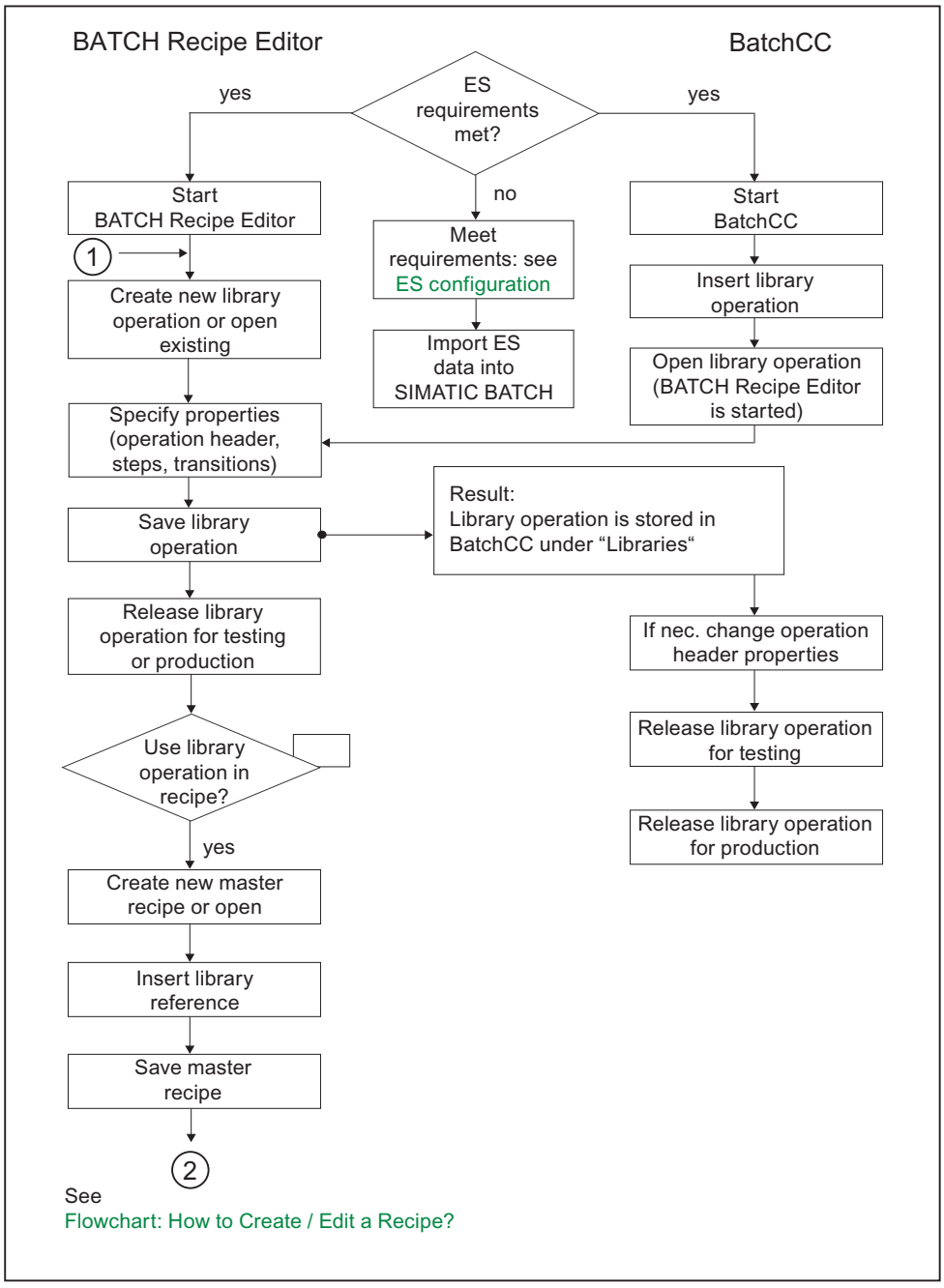
9.5.1 Flow chart: How to create and edit a master recipe

How to create and edit a master recipe



9.5.2 Flowchart: How to create/edit a library operation

How to create / edit library operations and insert them in master recipes



9.5.3 Basics of recipe creation

9.5.3.1 Relationship between header parameters, formula category and external formula

Header parameters (internal formula)

If you want to keep your material and production data directly in the master recipe, you can do this in the recipe header. This is then known as an internal formula. The material and production data can be set there during the creation of the master recipe and modified during batch planning and/or also while a batch is executing. These parameters can be passed on from the recipe header to individual recipe steps or from the recipe steps to the recipe header.

Interaction between header parameters, formula category and external formula

If you want to manage several material and production data lists for a master recipe, you must do this outside the master recipe in "external" formulas belonging to a formula category.

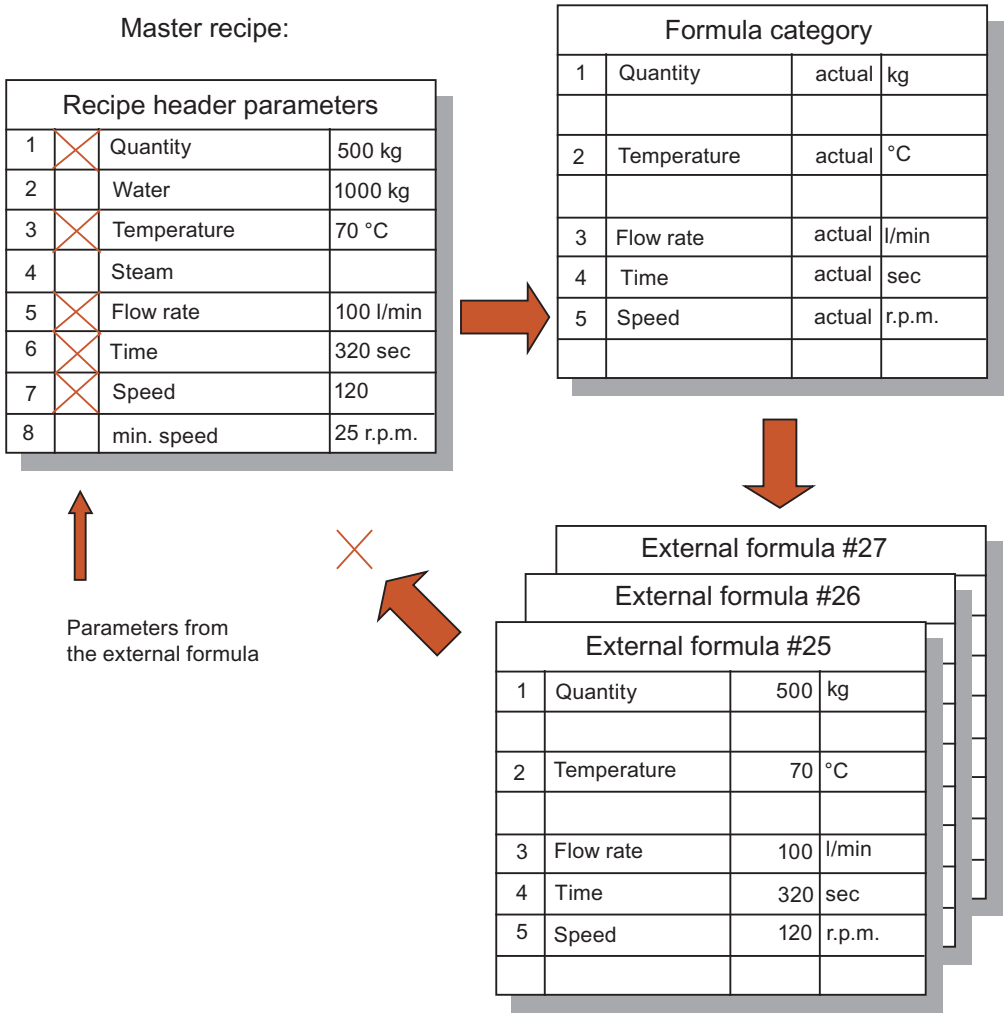
In this case, a formula category is assigned to a master recipe. The parameters of the master recipe are then interconnected with those of the formula category, the parameters that can be manipulated by an operator using a formula during batch planning are marked. In the formula category, the parameters are listed with the data type and physical unit. Concrete parameter values, a high and low limit and a references to the procedure (master recipe), are in the formula.

The parameters of external formulas can also be modified during batch planning and/or while a batch is executing.

Note

Internal and external formula must not be congruent, this means, all recipe header parameters must not be interconnected to an external formula. and not all the parameters of an external formula need to be used in a master recipe.

Example of interaction

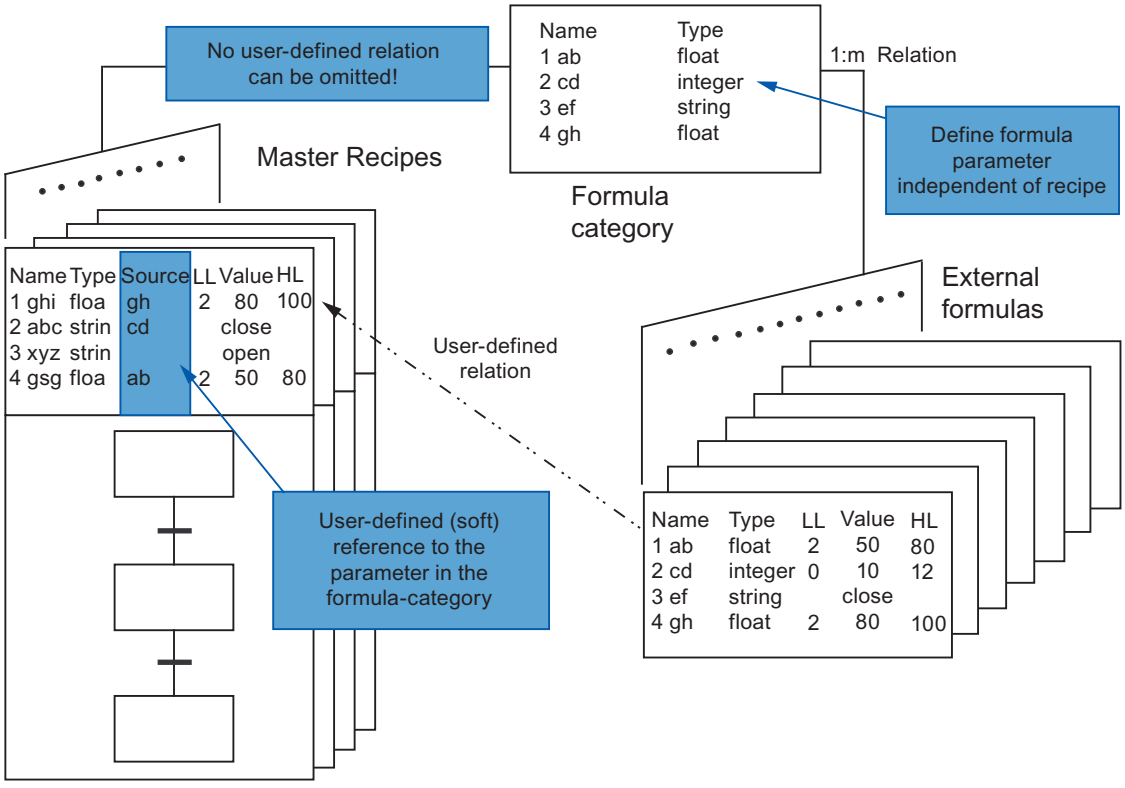


9.5.3.2 Interconnecting parameters

Interconnecting parameters between the master recipe and external formula

After assigning the master recipe and formula category, the parameters for the input materials, output materials and process parameters still need to be interconnected.

The advantage of this is that you can use independent parameter names in the formula category of a master recipe. After assigning a formula category to a master recipe, you specify the reference to the parameters in the formula category in the properties dialog. Parameters of the same data type and same physical unit are made available from the formula category.



9.5.4 Editing master recipes

9.5.4.1 How to configure a master recipe

Note

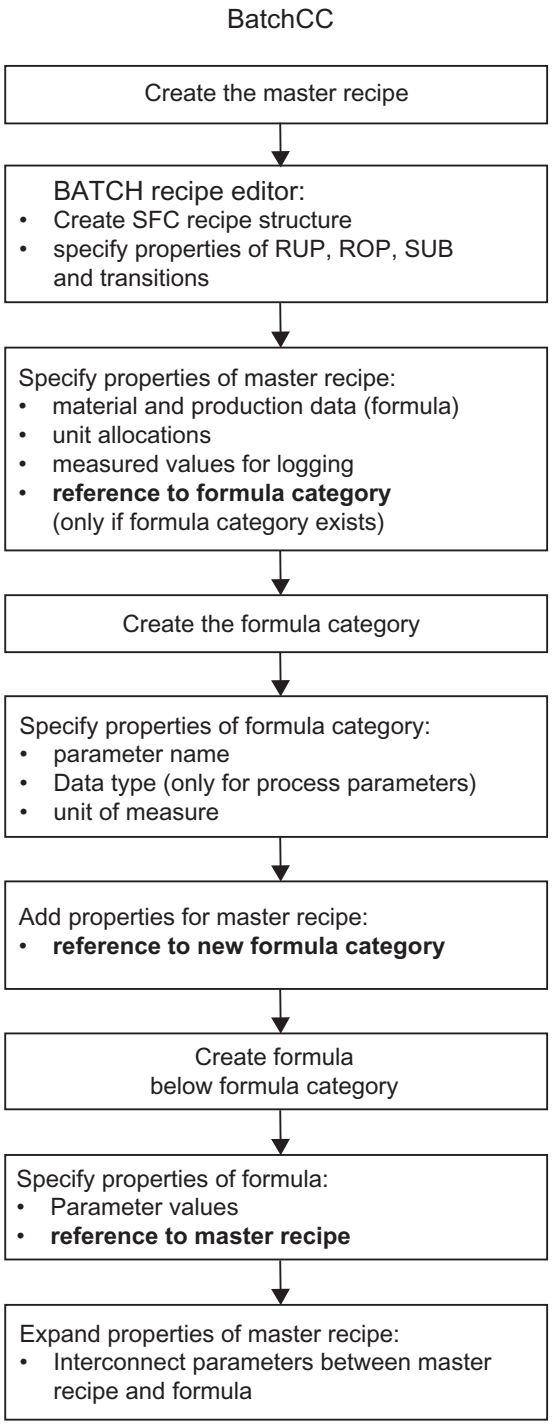
The order of the steps shown is not absolutely necessary. We have selected a method on which the more detailed description of the actions is oriented.

You can also use master recipes without using the "formula category" and "formulas" objects. In this case, the material and production data (formula) are set in the properties of the master recipe.

Configuring a master recipe

The schematic below shows a **recommended sequence** for configuring a master recipe **in BatchCC**. It illustrates clearly how to configure the assignments between the master recipe, formula category and formula.

You create the actual recipe structure and set the properties of the recipe elements (Step 2) in the BATCH Recipe Editor. All the other steps can be made in BatchCC.


BatchCC
Create the master recipe
BATCH recipe editor:
• Create SFC recipe structure
• specify properties of RUP, ROP, SUB and transitions
Specify properties of master recipe:
• material and production data (formula)
• unit allocations
• measured values for logging
• reference to formula category (only if formula category exists)
Create the formula category
Specify properties of formula category:
• parameter name
• Data type (only for process parameters)
• unit of measure
Add properties for master recipe:
• reference to new formula category
Create formula below formula category
Specify properties of formula:
• Parameter values
• reference to master recipe
Expand properties of master recipe:
• Interconnect parameters between master recipe and formula

Basic procedure

You create the master recipes in the BATCH Recipe Editor:

- For hierarchical recipes: as a structure of recipe unit procedures (RUPs), recipe operations (ROPs) and recipe phases (RPHs)
- For flat recipes: as a structure in substructures (SUBs)

In BatchCC, you can specify the reference to a formula category in the properties of the master recipe (header parameters). In the properties of the formula, you specify the reference to the procedure (master recipe). After these steps, you have a complete master recipe for batch planning.

9.5.4.2 Creating a new master recipe

There are two ways of creating a new master recipe:

- In the BATCH Recipe Editor: see section "BATCH Recipe Editor"
- In BatchCC: described below

Follow these steps in BatchCC:

1. Select the "Master recipes" folder.
2. Select the menu item **Edit > New > Hierarchical/Flat**.
3. Enter the name and version of the new master recipe in the dialog displayed and confirm with OK.

Result: The new master recipe is inserted as a  object. The master recipe is in the initial status "In Progress" and can now be edited.

Additional editing

You can now continue to edit the master recipe either using the shortcut menu for the object  or alternatively via "Edit" in the menu bar:

- Creating the recipe topology (Page 556)
  To edit the master recipe, open the object with the "Open" menu command. The BATCH Recipe Editor is then opened. In the BATCH Recipe Editor, you create the topology of the master recipe with steps and transitions and define the properties of the recipe elements (RUPs, ROPs, RPHs, SUBs and transitions).
- Specifying the master recipe properties (Page 334)
  To specify the properties of the recipe header parameters, select the "Properties" menu command.
- Working with the recipe overview list (Page 341)
  As an alternative to the tree, the "master recipe" objects can also be edited in the recipe overview. You can open the recipe overview with the menu command "Details". First, select the folder with the desired master recipes in the tree.
- Validating recipes (Page 347).

- Releasing recipes for testing (Page 348)
- Releasing recipes for production (Page 349)

9.5.4.3 Opening and editing recipes

Editing recipes

The recipe procedures of the master recipes and the library operations are created with the BATCH Recipe Editor.

With the exception of deleting, that is only possible with the BatchCC, you can make any modifications to recipe procedures and library operations with the BATCH Recipe Editor.

Proceed as follows in the BatchCC

To edit master recipes and library operations, the objects must first be **opened**:

1. Select the master recipe or library operation in the BatchCC
2. Select the menu command **Edit > Open**.

Result: The BATCH Recipe Editor opens displaying the graphic structure of the highest hierarchical level of the recipe object.

9.5.4.4 Specifying the master recipes

Open tab dialog box

There are two ways in which you can open the "Properties of <Recipe name>" tab:

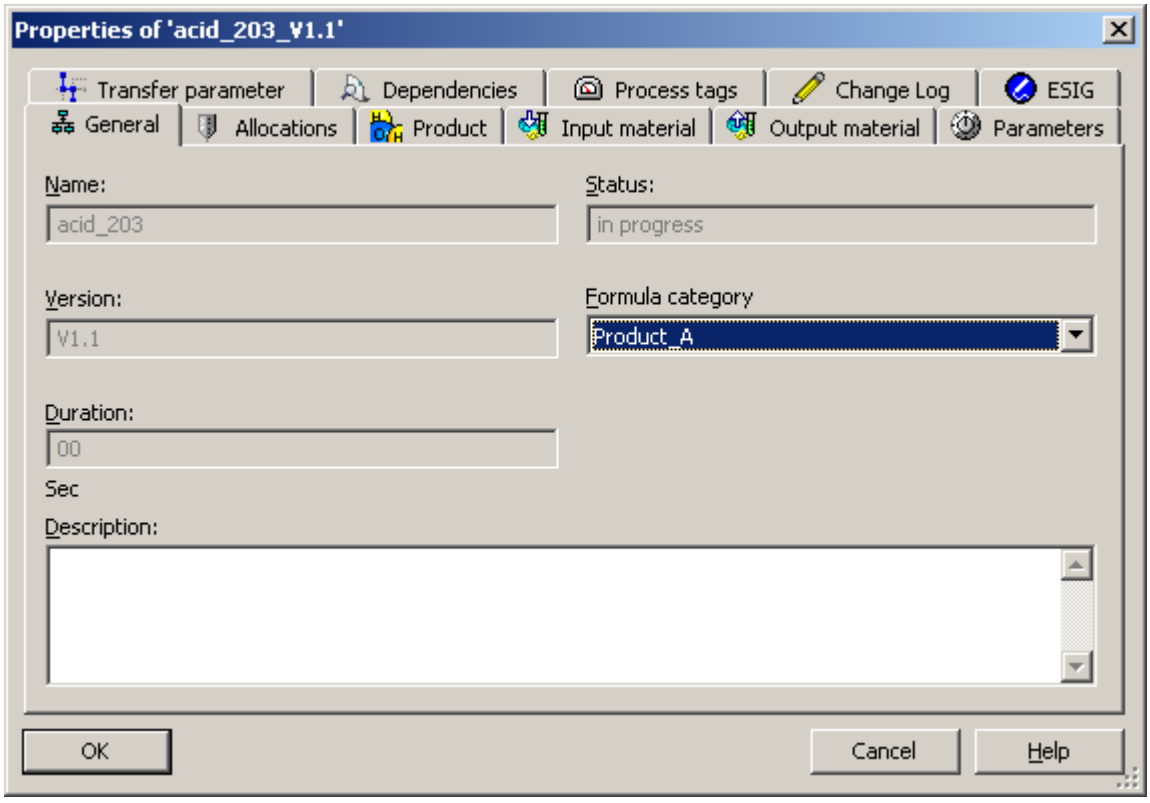
- In the BATCH Recipe Editor: See section "BATCH Recipe Editor"
- In BatchCC: described below

Follow these steps in BatchCC

1. Select the master recipe in the "Master recipes" or in one of its subfolders in the BatchCC.
2. Select the menu item **Edit > Properties**.
   Result: The "Properties of the <recipe name>" dialog is displayed with the header parameters. In the dialog tabs, all the Properties of the master recipe (Page 613) are available, which must/can be specified in addition to the master recipe structure.
   Some of the properties (parameters) already have a fixed value due to the detailed configuration of the individual recipe elements (RUPs, ROPs, RPHs, SUBs transitions) based on the process cell configuration in the engineering system. You can recognize parameters or settings that can still be modified by the white editing fields.
3. Make the settings you require in the tabs and confirm with "OK".

Entering properties

You enter the properties of the master recipes in the following tab dialog box. Click the "Help" button for context-sensitive help on each individual input or output box in the tab.



Reference to formula category

With the "Formula category" input box in the "General" tab, you assign the formula category with the required structure for material and production data (formula) to the master recipe. It is assumed that the formula category has already been created.

See also section: Relationship between header parameters, formula category and formula (Page 329)

Interconnecting parameters

After assigning the master recipe and formula category, the parameters still need to be interconnected. After assigning a formula category to a master recipe you specify the reference to the parameters in the formula category in the properties dialog ("input materials", "output materials" and "parameters" tabs).

See also section: Interconnecting parameters between the master recipe and formula (Page 339)

Electronic signatures

Operator actions relating to recipes and recipe elements can be signed. You configure electronic signatures in the "ESIG" tab.

See also section: Specifying electronic signatures (Page 408)

Additional information

Overview of the properties of master recipes (Page 613)

9.5.4.5 Creating a new formula category

Follow these steps in BatchCC

1. Select the "Formulas" folder.
2. Select the menu item **Edit > New**.
3. Enter the name of the new formula category in the dialog displayed and confirm with OK.

Result: The new formula category is inserted as the following object.



With the formula category, you can now create a class of formulas with the same raw material and production data structure.

Additional editing

You can now continue to edit the formulas as follows:

- Specifying the properties of the formula category (Page 336)
- Creating a new external formula (Page 337)

9.5.4.6 Specifying the formula category properties

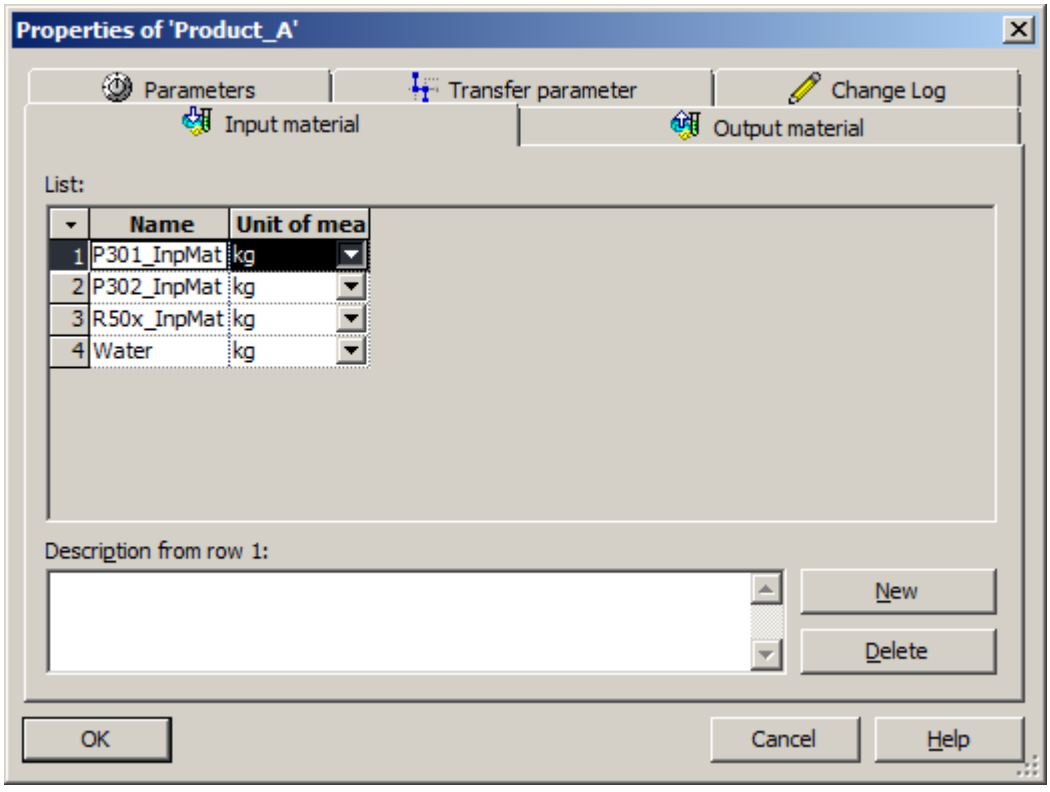
Proceed as follows in the BatchCC

1. Select the formula category in the "Formulas" folder or in one of its subfolders.
2. Select the menu command **Edit > Properties**.
   Result: The dialog box "Properties of <category name>" is displayed. In the tab dialogs, the structure of the "Material and production data (formula) (Page 122)" can be specially created for this formula category (external formula).
3. Enter the structure of the formula category consisting of the parameter names, data type (only for process parameters) and physical unit and confirm with OK.

Result: With the formula category, you can now create formulas with the same raw material and production data structure by creating new formulas under this formula category in the tree.

Entering properties

You enter the properties of the formula category in the following tab dialog box. Use the "Help" button to get context-sensitive instructions for each specific input/output field on the tab.



9.5.4.7 Creating a new external formula

Proceed as follows in the BatchCC

1. Select the required formula category in the "Formula" folder. If the formula does not match any formula category, you have to create the corresponding formula category (Page 336) first.
2. Select the menu command **Edit > New**.
3. Enter the name and version of the new formula in the dialog that follows.

Result: The new formula is inserted as a object. In the properties dialog for the formula, you can now enter the required information for the materials, quantities and quality. |The parameters of the higher level formula category are displayed in each case. If parameters are missing, the formula category needs to be adapted.

Additional editing

The following actions are possible for additional editing of the formula:

- Specifying the properties of a formula (Page 338)
- Interconnecting master recipe header parameters with an external formula (Page 339)

9.5.4.8 Specifying the properties of the formula

Proceed as follows in the BatchCC

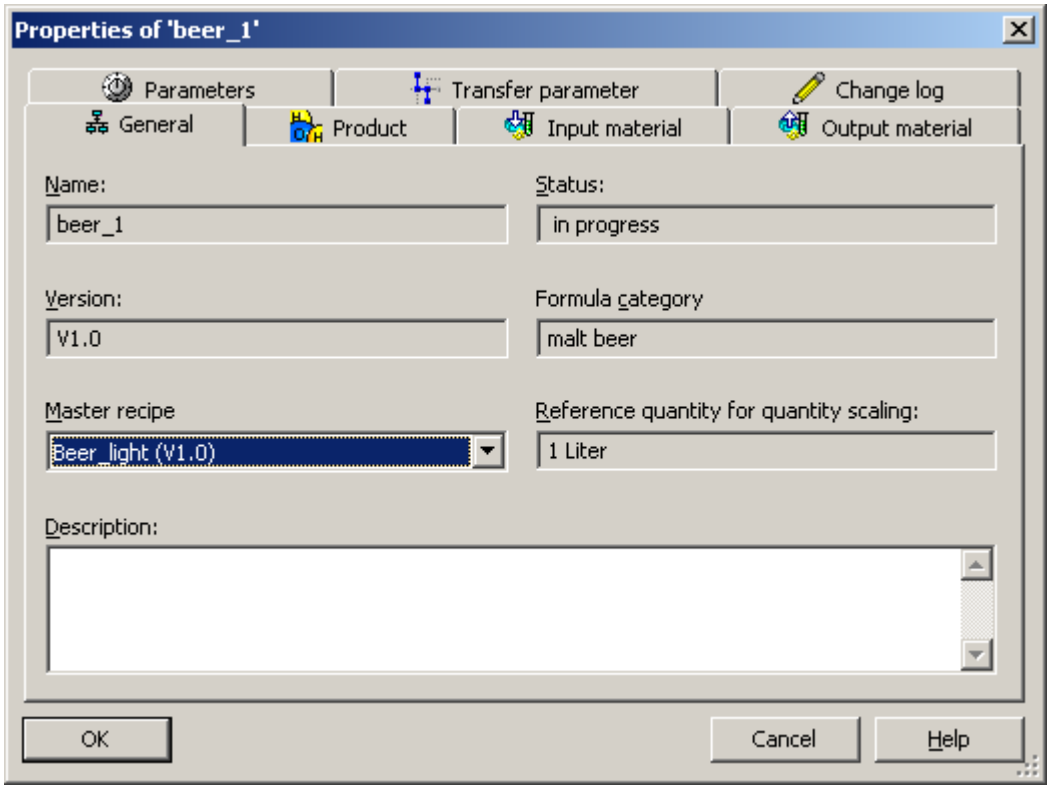
1. Select the formula under the formula category.
2. Select the menu command **Edit > Properties**.
   Result: The dialog box "Properties of <formula name>" is displayed. The possible range of values for the parameters of the formula are displayed as the upper and lower limits.
3. Enter the required parameter values and select the corresponding master recipe.

Note

In the "Master recipe" input field you can select those master recipes to which the formula category of the present formula has already been assigned. If the required master recipe is not listed, change to the properties dialog of the master recipe and enter the reference to the formula category there.

Entering the properties

You enter the properties of the formula in the following tab. Use the "Help" button to get context-sensitive instructions for each specific input/output field on the tab.



Reference to the master recipe

In the "Master recipe" input box in the "General" tab, you assign a specific master recipe to the formula. Thus a complete master recipe is present for batch planning.

See also section: Relationship between recipe header parameters, formula category, and formula (Page 329)

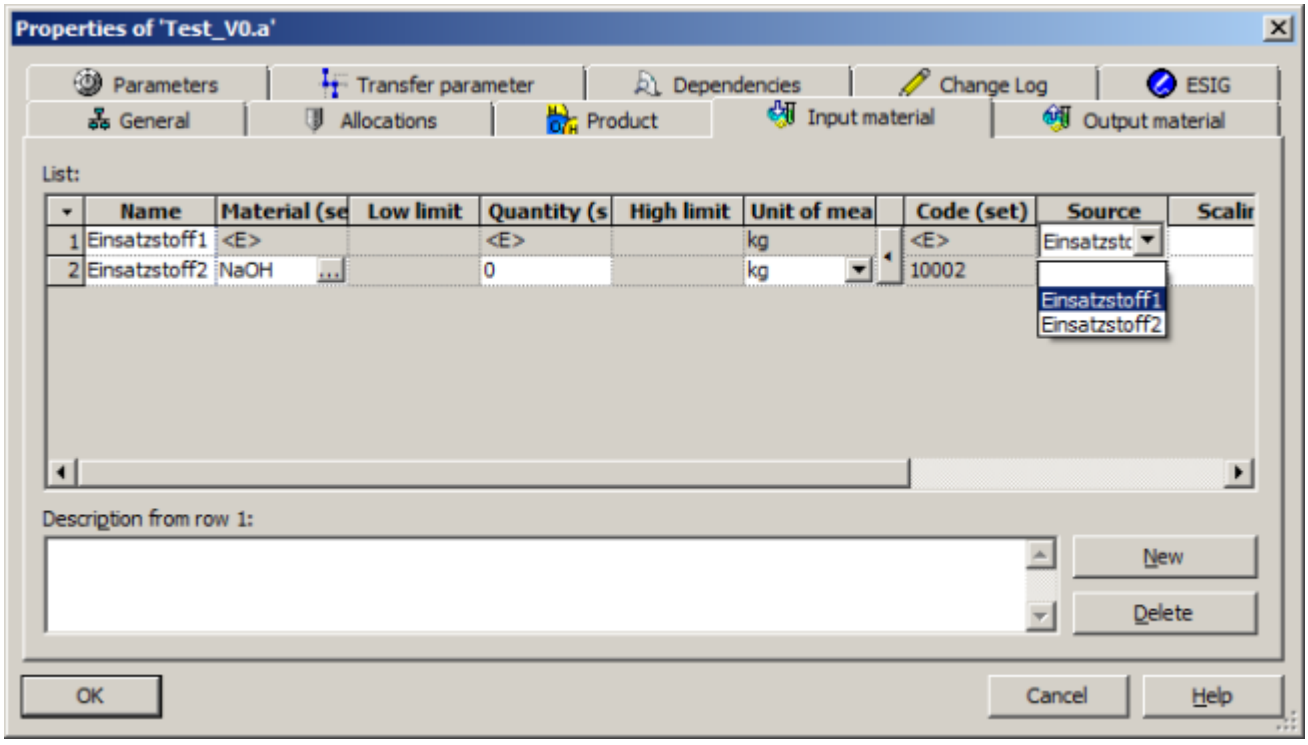
9.5.4.9 Interconnecting master recipe header parameters with external formula

Interconnecting parameters

After assigning the master recipe and formula category, the parameters of the input materials and process parameters must still be interconnected. Perform the parameter interconnection for the master recipe in the properties dialog, provided the formula category was assigned there (see also section Specifying the properties of the master recipe (Page 334)).

Follow the steps outlined below:

1. Select the master recipe in the "Master recipes" or in one of its subfolders in the BatchCC.
2. Select the menu command **Edit > Properties**.
   Result: The dialog box "Properties of <recipe name>" is displayed.
3. Change to the tabs for input materials, output materials, or parameters.
4. Create the reference to a parameter in the formula category in the "Source" column.
   - Left-click: The list box contains all the formula parameters of the same data type and same physical unit for selection. It may be necessary to assign the unit first in the "Phys. unit" column. "<E>" is shown under Value indicating external (see figure).
   - Right-click: Another dialog box opens. When creating new parameters, you can use this to check whether a parameter of the same name at a different level will be overwritten and if this is the case, you can see the level at which the parameter exists.



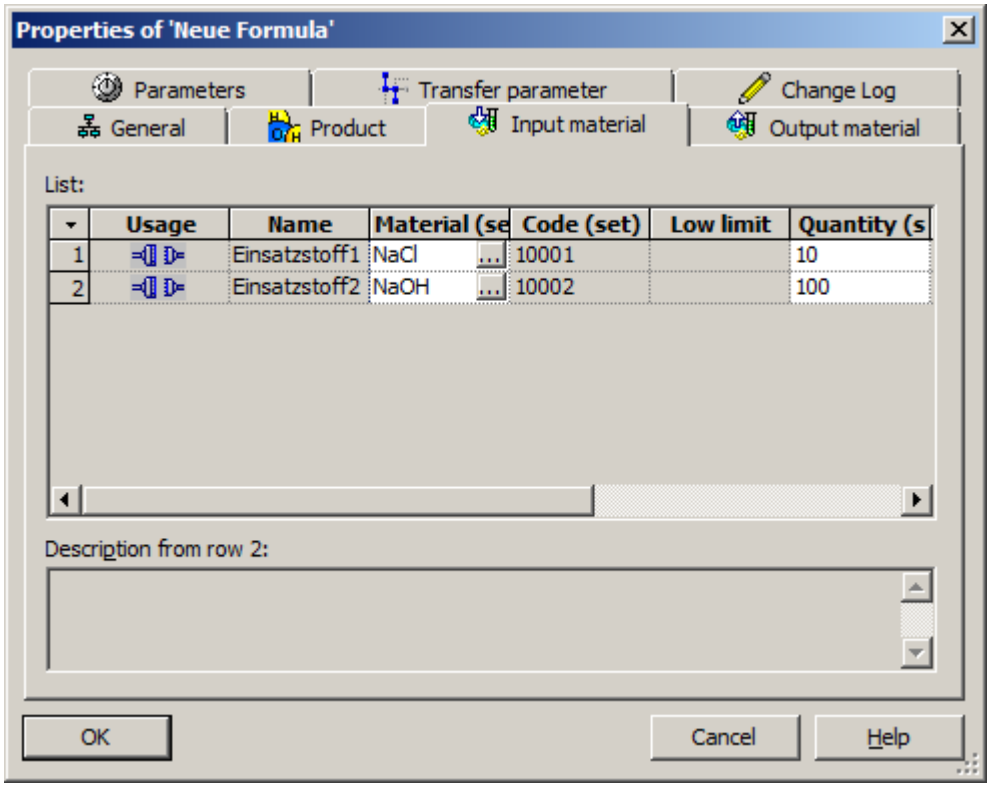
5. Confirm the references with "OK".
   The header parameter is connected to the parameter of the external formula using the parameter of the formula category provided this master recipe was already assigned to a formula (see also section Specifying the Properties of the Formula (Page 338)). The values of the formula are used in the parameters of the master recipe.

Display of parameter interconnection

The interconnection is displayed in the properties dialog of the formula with a connection icon in the "Usage" column:

: interconnected

: not interconnected (or no longer interconnected)



Additional information

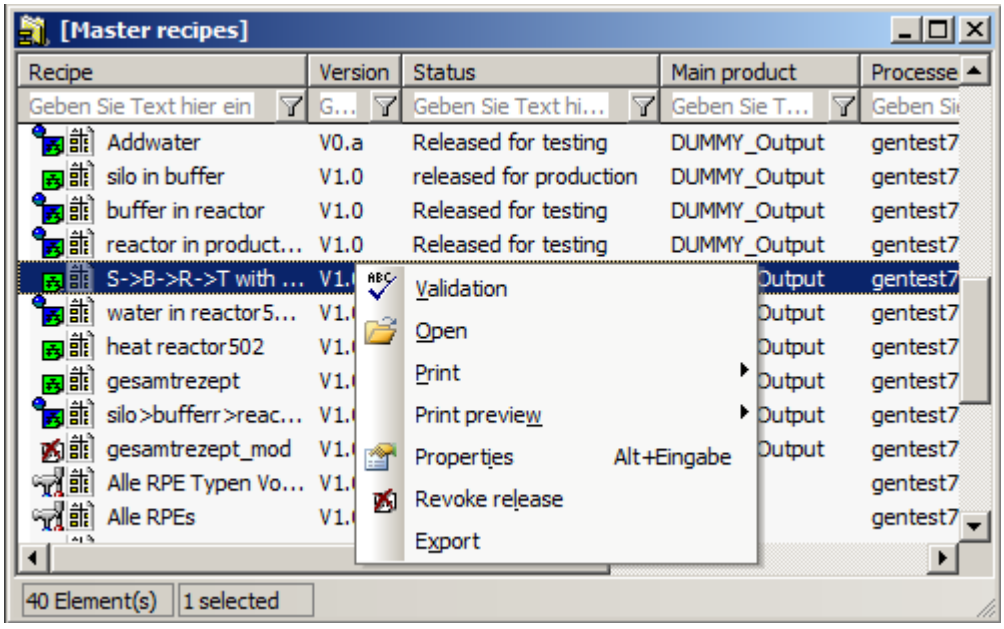
Interconnecting parameters (Page 330)

9.5.4.10 Working with the recipe overview list

Recipe overview

The recipe overview provides you with a list of the master recipes of a selected area. Apart from the properties from the tree, this list also shows the author and date of the last modification.

Using the shortcut menu for the list object, you can select the available functions in the same way as in the tree structure (alternative editing method).



Selecting the recipe overview

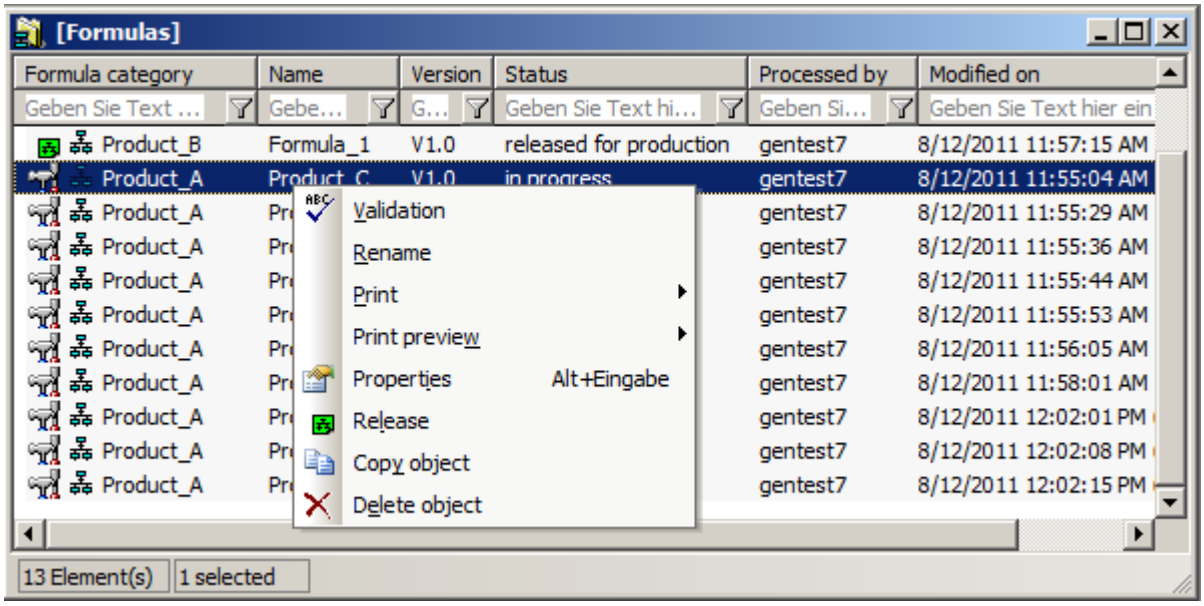
Select the required area by first selecting a master recipe folder in the tree structure and then selecting the menu command **Edit > Details**.

9.5.4.11 Working with the formula overview

Formula overview

The formula overview provides you with a list of all the formulas of a selected area. Apart from the properties from the tree, this list also shows the author and date of the last modification.

Using the context menu for the list object, you can select the available functions in the same way as in the tree structure (alternative editing method).



Selecting the formula overview

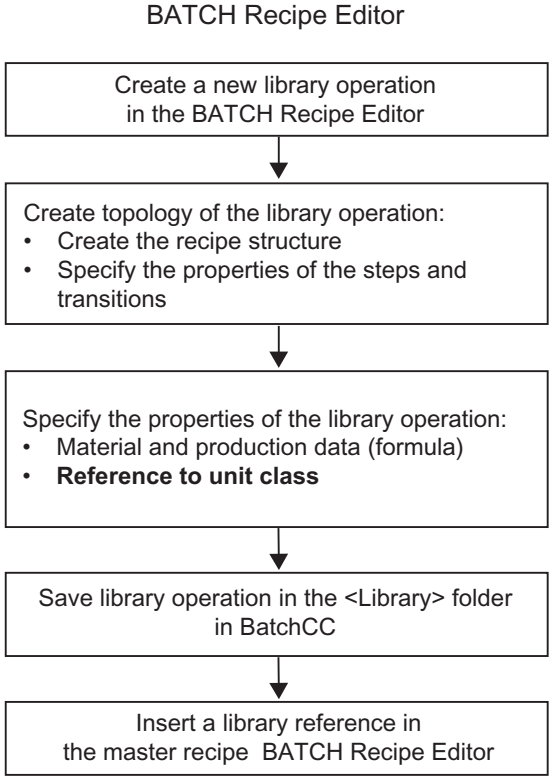
Select the required area by first selecting a formula folder in the tree and then selecting the menu command **Edit > Details**.

9.5.5 Working with libraries

9.5.5.1 How to configure library operations

Configuring library operations

The schematic below is a **recommended sequence** for configuring a library operation in the BATCH Recipe Editor. You manage library operations in BatchCC. All the other steps can be made in the BATCH Recipe Manager.



Principle of the procedure

You create reusable library operations in the BATCH Recipe Editor

- For hierarchical recipes: as a structure of recipe phases (RPHs)
- For flat recipes: as a structure in substructures, recipe operations ROPs and recipe phases (RPHs)

A library operation for hierarchical recipes is created for each specific unit class. The unit class is referenced in the header of the library operation. When the unit is to be selected by conditions, specify the conditions for the future unit in the library operation.

In the BATCH Recipe Editor, you store the library operations created in this way in the "Libraries" folder in BatchCC using a menu command.

When you create the recipe structure in the BATCH Recipe Editor you insert the required library operation using a library reference. The library operation is **not** copied but a link to the library operation within the library is created.

Any modifications required must always be made to the library operation stored in the library. Any changes made to the library operation always affect all links (library references) in the master recipes of the process cell.

Multiple use

A library operation can be used in the following ways:

- More than once in a process cell
- More than once in a recipe procedure (RP)
- More than once within a recipe unit procedure (RUP) – only with hierarchical recipes
- More than once within a substructure (SUB) – only with flat recipes

See also

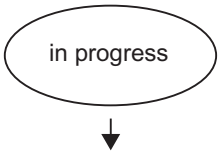
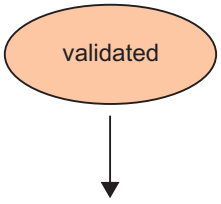
Specifying the properties of the library objects (Page 612)

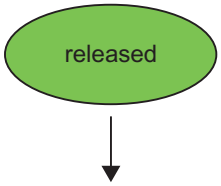
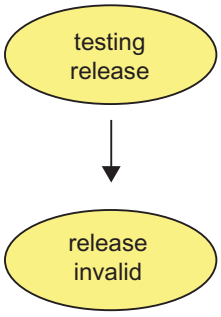
9.5.6 Status and validity of recipes

9.5.6.1 Status changes and validation

Status changes and validation of master recipes and library operations

The initial status of a newly created master recipe or library operation is always "In progress". You can bring about status changes using the appropriate commands. For batch planning, the master recipe must be valid.

Status	Triggered by	Meaning
	New menu command	A master recipe or a library operation always has the status In progress after it has been created.
	Validation (Page 347) menu command	The plausibility (validity) of the parameters in the process cell data is checked. A results list or error list is displayed that indicates, for example, which parameter settings are missing. Requirement: The master recipe or library operation has header parameters and a recipe structure.

Status	Triggered by	Meaning
	Release for testing (Page 348) menu command Release for production (Page 349)	The two releases differ only in that different permissions and different user routines can be used. Both releases can be started without first running the validation check. In this case, a validation test is run automatically in the background.
	Revoke release menu command	If a master recipe or library operation had already been released for production, the release can be revoked (for example to make modifications).
	When updating the process cell data	After updating, all the recipes (master recipes, library operations) of this process cell that were "released for production" and "released for testing" are changed to the "Testing release" status. After updating the process cell data, the recipes and library operations in the "Testing release" status are checked automatically. If the check is successful, the master recipes and library operations are returned to their original status. If the testing is unsuccessful the elements will be transferred to the status "Release invalid". They can now be edited and depending on the project settings they can be released again.

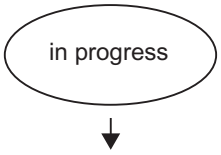
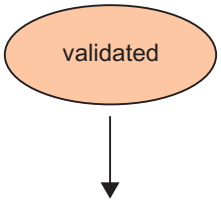
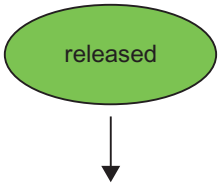
Difference between releasing for testing and releasing for production

In the validation for release of a recipe, you can include you own test routines. Due to the distinction between release for testing and Release for production, separate test routines can be processed. You could, for example, only allow water as the product for recipes released for testing. Different user permissions can also be defined.

Recipes released for testing can also be edited directly after revoking the release. If recipes are released for production, editing is possible only with certain settings in BatchCC (Options > Settings > Project settings).

Validity of the formula

For batch planning, the formula (with assigned master recipe) must be validated.

Status	Triggered by	Meaning
	New menu command	A formula always has the In progress status after it has been created.
	Menu command Validation (Page 347)	The assignment of a master recipe and the validity of the formula parameters are checked. A result or error list is displayed that indicates which parameters are not interconnected. Requirements: • A master recipe released for testing or production is assigned to the formula. • The formula parameters were interconnected successfully • The formula parameters are within the upper and lower limit values
	Release menu command	The release can be started without first running the validation check. In this case, a validation test is run automatically in the background.
	Revoke release menu command	If a formula had already been released, the release can be revoked (for example to make modifications). This is also the status if you make modifications in the properties dialogs.

Requirements for batch control

Note

Only validated formulas with master recipes released for production can be used for batch control.

Only test batches (for example, test mode with water) can be created with the master recipes and library operations released for testing .

9.5.6.2 Validation of recipes

Definition

The validation covers the consistency of the library operations and process cell data used in the created recipe.

Requirement

This is only possible when the recipe is edited with the elements step, transition and structure elements along with the corresponding configuration of the recipe data (header).

Follow these steps in BATCH Control Center:

1. Select the recipe you want to validate (master recipe or library operation) in the tree.
2. Select the menu item **Edit > Validation**.

Result

A result display or error list is displayed that indicates whether or not the recipe header is completed, whether materials exist, whether steps and transitions in the recipe are configured and whether the normalized batch quantity is correct. Validation is also possible in the BATCH Recipe Editor.

Note

If the recipe is open in the BATCH Recipe Editor, you can also jump to the part of the recipe that caused the problem by double-clicking the entry in the error list. You can use the validation control at any time. Validation does not change the recipe status.

External validation

Validation is possible based on modules that can be created and modified externally (plug-in modules).

The *SIMATIC BATCH; Plugin Concept* documentation describes how to program these modules. How to register these modules and activate their functions in SIMATIC BATCH is explained in the section "Working with externally created modules for validation (Page 351)".

9.5.6.3 Releasing recipes for testing

Requirement:

The requirement for this function is the validation of the recipe. The validity of the recipe is first checked automatically when you start this command.

Follow these steps in BatchCC

1. Select the recipe (master recipe or library operation) in the tree.
2. Select the menu item **Edit > Release for Testing**.

Result: After it has been released, the recipe has the "Released for testing" status. This is indicated by the following icon.



If errors occur in the validation, the problems are displayed and the recipe status remains "In Progress...". Release is also possible in the BATCH Recipe Editor.

Note

If the recipe is open in the BATCH Recipe Editor, you can also jump to the part of the recipe that caused the problem by double-clicking the entry in the error list.

9.5.6.4 Releasing recipes for production

Requirement:

The prerequisite in this regard is the validity of the recipe. The validity is first checked automatically with this command.

Proceed as follows in the BatchCC

1. Select the recipe (master recipe or library operation) in the tree structure.
2. Select the menu command **Edit > Release for production**.

Result: After it has been released, the recipe has the "released for production"  status. If errors occur in the validation then these deficiencies are displayed and the recipe status remains in "in progress". The release can also be executed in the BATCH Recipe Editor.

Note

If the recipe is open in the BATCH Recipe Editor you can go from the error list to the part of the recipe causing the error by double clicking on the list entry.

9.5.6.5 Validating formulas

Definition

During validation, the formula is checked to make sure that a released master recipe is assigned. The consistency of the formula parameters and their interconnections with the parameters of the master recipe are also checked.

Requirements:

- A master recipe released for testing or production is assigned.
- The formula parameters were interconnected successfully
- The formula parameters are within the upper and lower limit values

Proceed as follows in the BatchCC

1. Select the formula you want to check in the tree.
2. Select the menu command **Edit > Validation**.

Result: A result or error list is displayed that indicates, for example, whether or not the assigned master recipe is released.

Note

Validation can be executed at any time. The validation does not change the status of the assigned master recipe.

9.5.6.6 Status of the recipes and status changes

The initial status of a new recipe is always "In progress". You can bring about status changes using the appropriate commands. You must first open the context menu and select the appropriate commands to change the recipe.

Meaning of the icon: On the left is the status icon (for example, released/release revoked/ etc.), on the right is the type icon (for example hierarchical / flat).

Status displays of the recipes and their meaning

Symbol	Status	Meaning
	In progress	Initial status of a newly created and status after modifying a recipe.
	Released for testing	Recipes that have been released for testing can be used for creating a batch for test purposes. If the function is given graded permissions, a distinction can be made between testing the functionality (for example a test mode with water...) and production.
	Released for production	This status indicates that the recipe has been tested for normal production. Following the command Revoke release, or Configure process cell, the recipe changes to the "Release revoked" status.
	Release revoked	If a recipe has already been released for production or testing, it can be changed to this status using "Revoke release", for example to correct errors.
	Testing release	After updating the process cell data, all the recipes (master recipes, library operations) and formulas of this process cell that were "released for production" and "released for testing" are changed to the "Testing release" status.
	Release invalid	After updating the process cell data, the recipes and library operations in the "Testing release" status are checked automatically. If the testing is unsuccessful the elements will be transferred to the status "Release invalid".

A recipe that is already open and being edited is locked to prevent access by other operators. This is indicated as locked by the additional symbol  .

Released recipes are displayed in BatchCC when you create batches.

9.5.6.7 Status of the formula and status changes

The initial status of a new formula is always "In progress". You can bring about status changes using the appropriate commands. You must first open the context menu and select the appropriate commands to change the formula.

Meaning of the icon: On the left is the status icon (for example, released/release revoked/ etc.), on the right is the type icon.

Status displays of the formula and their meaning

Icon	Status	Meaning
	In progress	Initial status of a newly created formula.
	Released for production	This status indicates that the formula is intended for normal production. Following the command Revoke release, or Configure process cell, the recipe changes to the "Release revoked" status.
	Release revoked	If a formula has already been released for production, it can be changed to this status using "Revoke release", for example to correct errors.
	Testing release	After updating the process cell data, all released formula of this process cell change to the "testing release" status.
	Release invalid	After updating the process cell data, the formula in the "Testing release" status are checked automatically. If the testing is unsuccessful the elements will be transferred to the status "Release invalid".

A formula that is already open and being edited is locked to prevent access by other operators. This is indicated as locked by the additional symbol  .

9.5.6.8 Working with externally created modules for validation

The validation can also be executed on the basis of modules (plugin modules) that can be created and modified externally.

How you program these modules is described in the documentation *SIMATIC BATCH; Plugin Concept*. Below, you will learn how these modules are registered in SIMATIC BATCH and how to activate their functions.

Follow the steps outlined below:

1. Install the plug-in modules on the BATCH clients.
2. Select the menu command Options > Settings in SIMATIC BATCH.
3. Change to the "Used plug-in modules" tab.
4. If necessary, add new modules not yet known in SIMATIC BATCH and whose files are located on the computer using the "Add" button.

5. Select the module you want to use in the "Used plug-in modules" tab and confirm with "OK".
6. Result: The "Plug-in details" dialog box opens.
7. Here, you configure the functionality of the module and confirm with "OK".
8. Result: If no functionality is selected, a message is displayed telling you that no functionality has been selected.

   Note

   At least one of the supported functions must be selected. Only then will the module become active during the next validation.

9. Confirm with "OK".
10. Run the validation as described in the section "Validating recipes (Page 347)".

Result

If recipe elements are not run through due to the functionality of the modules, they are indicated by being crossed through in the open control recipe.

9.5.7 Creating reports

9.5.7.1 Printing recipes

Definition of a recipe report

The pre-configured recipe report contains all the data required for production. This includes the recipe header data, the recipe topology, the input materials, the output materials, the parameter list and the procedural rules.

Principle

The recipe data for a report is provided centrally from the Batch database. In BatchCC, you can print out the report for a master recipe for documentation purposes or view it in the print preview.

Procedure in BatchCC

1. Select the **Edit > Print preview > 1 Standard** menu command for the master recipe previously selected in the tree structure. As an alternative, you can also select a print preview with the right mouse button when the master recipe is selected.
   Result: The recipe report is displayed in the print preview window.
2. To navigate within the report, click the corresponding functions in the control bar located at the top.
3. You can print out the displayed report data for documentation purposes with the **Edit > Print > 1 Standard** menu command.

Printing a recipe directly

The complete report data for a recipe can also be printed out directly without the print preview in BatchCC.

Additional information

Print preview (Page 1083)

9.5.8 Exporting/importing

9.5.8.1 Information on exporting/importing

Usage

The Export/Import Assistant in SIMATIC BATCH enables the transfer of batch objects (master recipes and libraries) from one PCS 7 project to another PCS 7 project. You not need recreate the batch objects step-by-step.

The assistant offers **support** but does not serve as a backup mechanism (for example, in case of loss of data). Use the Backup/Restore function for this purpose.

Application example: Export batch objects from a test process cell, and import these batch objects into a productive process cell.

Data format

The data format created during the export is always "machine-readable" only, not documented and may not be "*reverse engineered*" (interpreted) by the user.

A change or creation using external tools or manual intervention are not permitted.

How it works and limits

Batch objects are closely linked to the associated process cell data. The Export/Import Assistant only offers **support** and does not create an exact copy.

The import process is considered to be "automatic recreation".

The automatically created batch object is created exactly as it is created in the recipe editor. The structure of the batch object is identical to the structure of the original batch object. The internal display is not an exact copy of the internal representation of the original batch object. The data of the batch objects can differ due to the different PCS 7 projects from which they originate.

This means you have to check the imported batch objects. You are the only one who can determine if an adaptation made by the import is correct.

A BATCH object is always set to "In progress" after the import.

You can customize the batch objects with the assistant during the import. The assistant makes a recommendation for all assignments that can be changed. You must check this recommendation and change it, if necessary. A summary is displayed at the end of the import dialog.

You exit the import dialog by pressing the "Finish" button. The recipe data is adapted according to the assignment you have selected. A recipe that matches the actual process cell is being created.

The batch object is not shown as identical in the recipe comparator. The exact steps involved in processing play a role when comparing recipes. The existing recipe comparison is **not** a similarity comparison. To calculate its result, the recipe comparator also takes into account the processing history.

Note

The transfer of a batch object from one project to another can never be checked for correctness by the SIMATIC BATCH system.

Small differences between the projects and the adaptations of the batch objects during import can result in an unexpected result that no longer matches the original.

In this case. it is irrelevant if the changes were made automatically or by the user.

9.5.8.2 Exporting/importing batch objects

Export/import assistant

A convenient assistant is available to guide you through the export and import of BATCH objects.

Batch objects that can be exported/imported

- Libraries
- Master recipes
- Formula categories

Export

The exported data are saved to a file with the "*.sbx" file extension.

Import

The format used for SIMATIC BATCH with the "*.sbx" file extension is not available for external applications.

If files with the "*.sbx" file extension were not created by SIMATIC BATCH, error-free functioning cannot be ensured.

To ensure error-free operation, only the format "BatchML" should be used for the import of externally generated master recipes, formulas, or libraries.

The file extension can be "*.sbml" or "*.xml".

The "BatchML" document describes how to create external recipe data in BatchML format for batch processes in SIMATIC BATCH.

The document and examples are available on the Internet in English and are intended for BatchML/XML experts. Basic knowledge of BatchML and XML is mandatory.

You can find the document and the examples available for download on the Internet under Entry ID 109747147:

Internet link (https://support.industry.siemens.com/cs/ww/en/view/109747147)

You can find information on the standard "BatchML" on the Internet:

Internet link (www.mesa.org/en/BatchML.asp)

Compatibility

You can export beginning with version V6.1. Export data from the current or an older SIMATIC BATCH version are supported for importing.

Performance

When exporting/importing large recipes, you should only export one large recipe at a time into a file or import one large recipe at a time out of file otherwise performance will be affected.

Start the Import/Export Assistant

- The Export Assistant can be started with the menu command **Options > Export**
- The Import Assistant can be started with the menu command **Options > Import**
- Alternatives for starting the export process without the assistant:
  - Shortcut menu (libraries, master recipe, formula categories) for each element
  - Overviews (libraries, master recipes) for one or more elements

Note

All referenced objects, such as materials, libraries, formula categories, are included in the export.

All formulas in a formula category are always included in the export.

9.5.8.3 Exporting using assistants

Procedure

1. Select the **Options > Export** menu command in BatchCC.
   Result: The Assistant opens.
2. Select what you wish to export, libraries and/or master recipes and/or formula categories.

   Note

   All referenced objects (such as materials, libraries, formula categories) are included in the export. All formulas in a formula category are always included in the export.

3. Press the "Export selected elements" button.
   Result: The "Save as" dialog then appears.
4. Select the storage location and file name for the export file here.

9.5.8.4 Importing with the wizard

Principle of importing

The Import wizard is used to import exported process cell data (*.sbx file extension) or process cell data from an externally created file in BatchML format (*.xml or *.sbml file format).

The recipe data on a source process cell that has been exported (see previous section), can be imported again into the source process cell or another target process cell.

The import wizard supports you with interactive dialogs for importing.

After selecting the desired import file and specifying the type (master recipes, libraries, formula categories), the corresponding content of the import file appears on the first page of the wizard. You can specify which elements of the import file should be imported. If there is a saved object with the same name in the currently open Batch process cell, this is displayed. When this happens, enter a new name or exclude the object from the import.

In the subsequent dialogs, the import wizard compares the process cell data of the file to be imported with the process cell data of the batch process cell open in BatchCC (target process cell). The status of the assignments is display graphically. Missing assignments can be manually removed by selecting check boxes. Assignments can only be made when the name and data type match.

If an assignment cannot be made or if an element is to be excluded, leave the relevant check box empty.

Note

If you deactivate the import of individual elements, the validation is no longer guaranteed. The resulting errors in the validation check are shown in the validation log. You can correct these errors in the Recipe Editor of the affected recipe.

Additional parameter assignments must be made for formula categories and libraries. If a formula category is replaced, for example, the import wizard must be informed which parameter

from the new formula category corresponds to which parameter from the old formula category. This is especially important to provide the interconnected parameters in the recipe header a reference in the new formula category. The import wizard preassigns the parameters where possible. These assignments should be checked and corrected if required. Parameters can only be assigned when the target data type and unit of measure of the original parameter match the data type and unit of measure of the assigned parameter.

Procedure

1. Select the menu command **Options > Import** in BatchCC.
2. Select the file to be imported.
   The types (master recipes, libraries, formula categories) and number of objects associated with the type are displayed depending on the content of the file.
3. Select the types that you want to import.
4. Click on the "Open" button.
   - If you are importing a file with the extension *.sbx, continue with step 5.
   - If you are importing a file with the extension *.xml or *.sbml, a dialog box opens.
     If discrepancies have been found, they are displayed in the dialog box.
     After eliminating the discrepancies, click the "Next" button.
5. Select the check box for the items that you want to import.
6. Following the instructions provided by the interactive dialog. Once you have completed the settings for a dialog, click the "Next" button.
   The entries are always checked for discrepancies before a dialog is closed. The system checks if all elements with a check mark have an assignment. If not, correct this now. Then click again on the "Next" button.
7. Once you have completed all dialog boxes, click the "Finish" button.
   All selected elements are imported and displayed in the tree.

Note

All referenced objects (such as material, libraries, formula categories) are imported according to your settings.

All formulas in a formula category are always included in the import.

Additional information

You can find additional information in the section "Options > Import... menu (Page 1058)".

9.5.8.5 Tooltips and shortcut menu of the import wizard

Tooltips in the dialog boxes of the wizard

Tooltips are shown when you hold the mouse pointer over the list elements: Tooltips contain information such as name, object ID and/or unit.

Shortcut menu in the dialog boxes of the wizard

A shortcut menu can be opened for dialog boxes with assignment lists by right-clicking in the dialog box. Depending on the status of the list lines, the following commands are available in the shortcut menus:

Shortcut menu command	Description
Import	The check box is selected with this command. If the check box for the list row is not selected, this command is the only one in the shortcut menu.
Exclude from import	This command is only in the shortcut menu if the check box for the list row is selected. This command clears the check box and removes any assignment or renaming that you have made.
Rename	This command is only in the shortcut menu if the check box is selected and renaming is permitted. Using this command, you can give the element a new name under which the element will be imported.
Reject new name	This command is only in the shortcut menu if the check box has been selected and the element has been renamed. If you have inadvertently changed an element name, you can restore the original name using this command. The entry in the corresponding column is deleted.
Release assignment	This command is only available in the shortcut menu if the check box is selected and an assignment has already been made. This command removes an assignment that has been made. The command corresponds to the following button in the import wizard. 

9.5.9 Comparing recipe objects

9.5.9.1 Window with comparison overview

The "Comparison of recipe objects" functionality is provided in BatchCC. You can compare different versions of master recipes, libraries, and formulas with one another to identify differences.

Selection of comparison objects

A comparison can be started in one of the following ways:

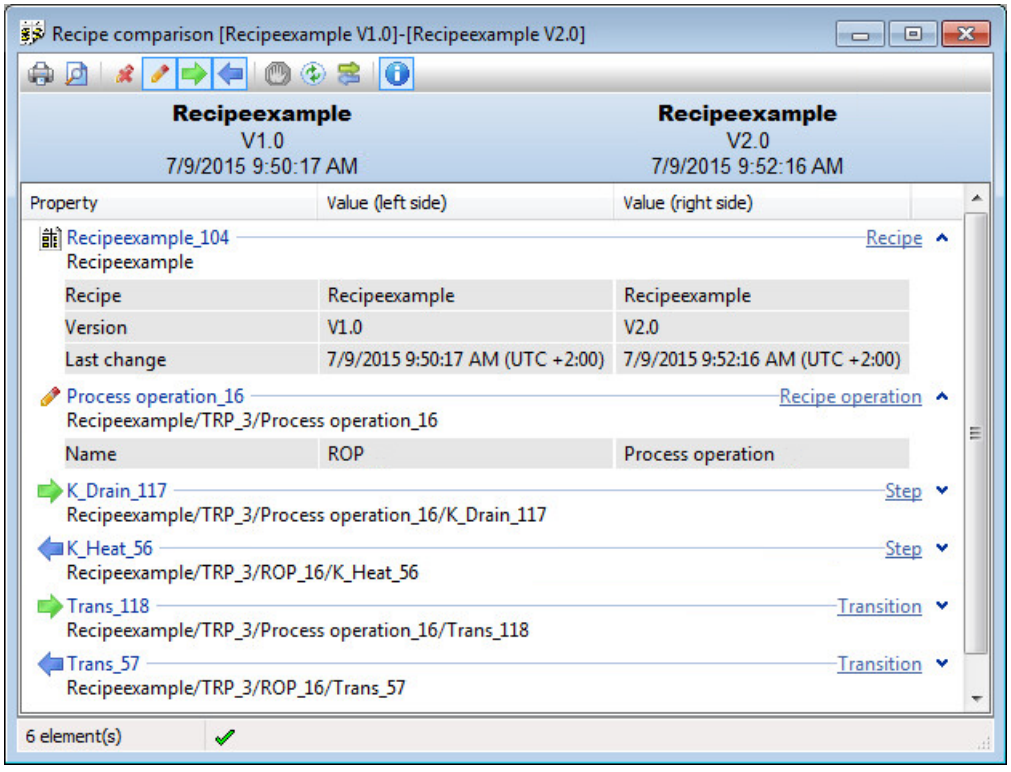
- Select an object in the tree view of BatchCC and select the "Compare with" command in the shortcut menu under "Advanced"
  The "Compare with ..." is opened. You select the object you want to compare in the dialog.
- Open the detail window of a hierarchy folder in BatchCC and select two comparison objects. Then select the "Compare" command in the shortcut menu under "Advanced"

Display of the comparison results

Once the two comparison objects have been selected and the comparison was started with the corresponding shortcut menu command, the result window with the comparison results is opened.

The following elements are displayed in the result window with the default setting for the filter:

- Changed
- Inserted
- Deleted



Depending on the size and complexity of the comparison objects, it takes a certain amount of time until all results are available. The number of different attributes/elements is displayed at the bottom left of the window and the progress of the comparison at the bottom right of the window of the status bar. A toolbar at the top of the window is provided for executing actions and filtering result objects.

The expandable result blocks and their context-dependent data are listed in the display area of the result window. At the right edge above each result block are the element type and a means of expanding and collapsing the result block. At the left edge are the element name and the full path within the overall object (recipe, library or formula). Three column headers "Property", "Value (left side)" and "Value (right side)" are displayed vertically.

Meaning of the commands in the toolbar:

Icon	Command/action
	Prepares a print preview of the filtered comparison results corresponding to the display on the screen but with expanded result blocks.
	Prints out the filtered comparison results corresponding to the display on the screen but with expanded result blocks.
	A comparison that has been started but is not yet complete, is aborted.
	Restarts the comparison
	Changes the comparison direction. As a result, the comparison object of the left column is swapped with that of the right column in the display and the "Show only elements present on the right/left" symbols are also swapped.

Note

Saving the comparison results

You can save the comparison results as PDF/XPS files using a corresponding printer.

Meaning of the filters in the toolbar:

Icon	Command/action
	All unchanged elements are shown/hidden here. The values are displayed in both the "Value (right side)" column and the "Value (left side)" column.
	All changed elements are shown/hidden here. The values are displayed in both the "Value (right side)" column and the "Value (left side)" column.
	The elements that exist **only** in the comparison object (recipe, library or formula) in the "Value (right side)" column are shown/hidden in the "Value (right side) column.
	The elements that exist **only** in the comparison object (recipe, library or formula) in the "Value (left side)" column are shown/hidden in the "Value (left side) column.

Additional information

Basic principles of the display and interpretation (Page 360)

Special displays and interpretations (Page 364)

Formula comparison (Page 377)

9.5.9.2 Basic principles of the display and interpretation

The basic principle of the comparison of recipe objects in terms of display and interpretation of results is explained using the following recipes:

- Recipe named Recipe example - V1.0
- Recipe named Recipe example - V2.0

Comparison of recipe named Recipe example - V1.0 with recipe named Recipe example - V2.0

The master recipe named Recipe example - V1.0 is structured as follows and contains the following elements.

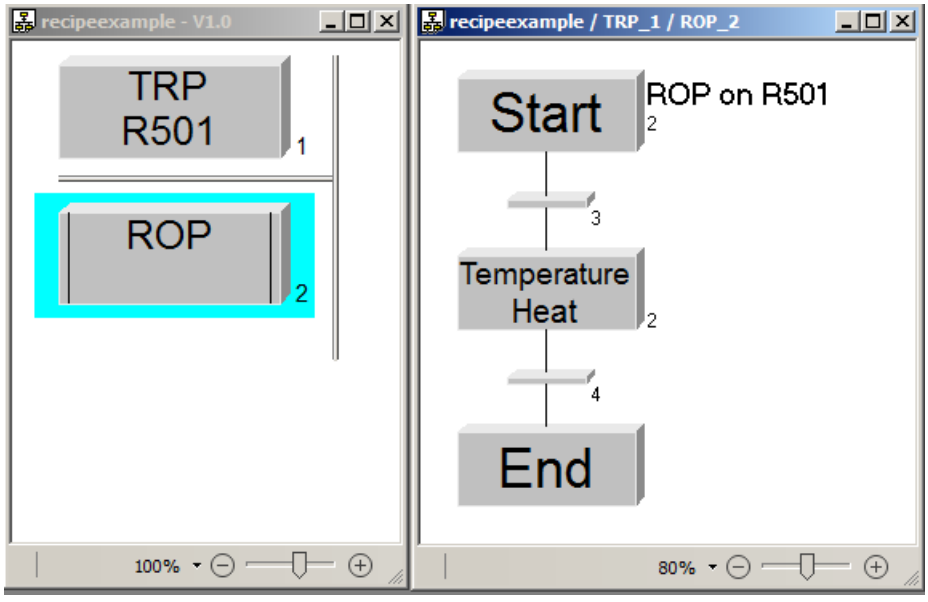


Figure 9-7 Master recipe V1.0

In the master recipe named Recipe example - V2.0 to be compared, changes have been made as follows.

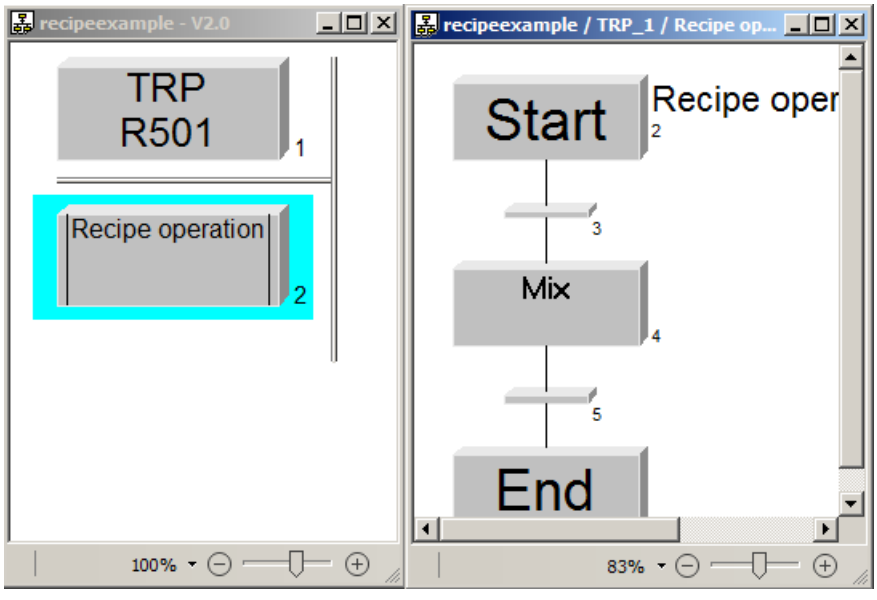


Figure 9-8 Master recipe V2.0

Changes:

1. The name of the "ROP" has been changed to "Recipe operation".
2. The "Heat_1" recipe step has been deleted.
3. The "Trans_2" transition has been deleted.
4. The "Agitate_4" recipe step has been added.
5. The "Trans_5" transition has been added.

Conditions for comparison of the two master recipes V1.0 and V2.0

- For the following comparison result, master recipe V1.0 was selected first and then master recipe V2.0. For this reason, the values of recipe V1.0 are located in the left column of the result and the values of recipe V2.0 are located in the right column.
- Only data needed to explain the principle, and not the entire data, is shown.
- In addition, the result elements are shown in expanded state, like in the printout.

Result of the comparison, display and interpretation

The individual attributes are shown in the following result blocks. The display is influenced by your filter selection from the toolbar. The result window contains:

- All elements in the right and left columns that have not changed and/or
- All elements in the right and left columns that have changed and/or
- The elements in the right column that are only present in the comparison object of the right column
- The elements in the left column that are only present in the comparison object of the left column

	Property	Value (left side)	Value (right side)		
	Recipe_example_1 **<absolute path>**			**Recipe**	⊟
	Name	Recipe example	Recipe example		
	Version	V1.0	V2.0		
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)		
	<Additional attributes>	…	…		
	RUP_1 **<Absolute path>**			**Recipe unit procedure**	⊟
	Name	RUP	RUP		
	<Additional attributes>	…	…		
	Recipe_operation_2 **<Absolute path>**			**Recipe operation**	⊟
	Name	ROP	Recipe operation		
	<Additional attributes>	…	…		

	Property	Value (left side)	Value (right side)		
	Heat_1 <Absolute path>			**Step**	
	Name	Heat			
	<Additional attributes>	…			
	Trans_2 <Absolute path>			**Transition**	
	Name	Trans			
	<Additional attributes>	…			
	Agitate_4 <Absolute path>			**Step**	
	Name		Agitate		
	<Additional attributes>		…		
	Trans_5 <Absolute path>			**Transition**	
	Name		Trans		
	<Additional attributes>		…		

Each row in the table represents one result line. The first result block always shows the header data of the two master recipes. This comprises the name, version and last change date of the comparison objects. Each result line is preceded by an informative filter symbol. This is followed by the name of the elements and the absolute path. The element type is given on the right side, followed by a plus sign. Each result line can be expanded or collapsed to show or hide additional comparison data for the selected element using the plus sign on the right side. The expanded table rows for the comparison element are displayed with a gray background to improve readability. The expanded display is referred to as the result block.

Individual examination of the comparison result

Result block 1: "Recipe header" element

The "Recipe example - V1.0" recipe has been compared with the "Recipe example - V2.0" recipe.

Result block 2: Element "RUP_1"

The displayed symbol indicates that nothing has changed in this element. The values are identical in the left and right columns.

Result block 3: "Recipe_operation_2" element

The displayed symbol indicates that something has changed in this element. Only the values that have changed are displayed. The value before the change is located in the left column, and the value after the change is located in the right column (here, left column: "ROP"; right column: "Recipe operation").

Result block 4: "Heat_1" element



The displayed symbol indicates that the "Heat" element exists only in the "Recipe example - V1.0" recipe. The values of all attributes available in this type context are displayed in the left column.

Result block 5: "Trans_2" element



The displayed symbol indicates that the "Trans_2" element exists only in the "Recipe example - V1.0" recipe. The values of all attributes available in the type context are displayed in the left column. The system-internal name is used for transitions.

Result block 6: "Agitate_4" element



The displayed symbol indicates that the "Agitate" element exists only in the "Recipe example - V2.0" recipe. The values of all attributes available in the type context are displayed in the right column.

Result block 7 -> "Trans_5" element



The displayed symbol indicates that the "Trans_5" element exists only in the "Recipe example - V2.0" recipe. The values of all attributes available in the type context are displayed in the right column. The system-internal name is used for transitions.

9.5.9.3 Special displays and interpretations

Because the explanations in the "Basic principles of the display and interpretation" section are not sufficient for the following SIMATIC Batch constructs, the particularities for these are described in this section:

- Simultaneous branch
- Alternative branch
- Synchronization line
- Monitoring container
- Recipe loop
- Transition condition
- ESIG (electronic signature)
- Control strategy
- Substructure/library reference

Interpretation rules

1. If recipe elements (RUP, ROP, simultaneous branch, alternative branch, synchronization line, monitoring container, recipe loop, substructure) are newly added or deleted, the recipe elements contained therein are not shown in the comparison.
2. If there are changes, additions or deletions in existing recipe elements (RUP, ROP, simultaneous branch, alternative branch, synchronization line, monitoring container, recipe loop, substructure, subelements), these recipe elements are shown accordingly as changed, added or deleted in the comparison.
3. Moved recipe elements are shown as deleted in the original recipe and are shown as added in the modified recipe.
4. High and low recipe limits are shown as follows:
   - With unchanged recipe limits, the following character is suffixed to the displayed recipe limits "*".
     The character means that the recipe limits correspond to the engineering limits and have never been changed.
   - When recipe limits have been changed, only the limits are shown.

   High and low recipe limits from basic engineering are not shown in the recipe comparison, because these recipe limits cannot be changed in the recipe editor.

The display of the recipe elements corresponds to the explanations in the "Basic principles of the display and interpretation" section and is not further explained here.

Simultaneous branch

A simultaneous branch has been added.

The simultaneous branch was added. The new simultaneous branch contains three elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	**Recipe_example_1** **<absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	**AND_3** **<Absolute path>**			**Simultaneous branch**
	Comment		Parallel	
	Number of subelements		3	

The number of elements in the simultaneous branch has been changed.

The simultaneous branch named "AND_3" has been changed. The simultaneous branch contains three elements in the "Recipe example - V1.0" recipe and four elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	**Recipe_example_1** **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	**AND_3** **<absolute path>**			**Simultaneous branch**
	Number of subelements	3	4	
	Elements that were added			

Alternative branch

An alternative branch has been added.

The alternative branch was added. The alternative branch contains three elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	**Recipe_example_1** **<absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	**OR_4** **<absolute path>**			**Alternative branch**
	Comment		Alternative	
	Number of subelements		3	
	Elements by which the alternative branch was added			

The number of elements in the alternative branch has been changed.

The alternative branch named "OR_11" has been changed. The alternative branch contains three elements in the "Recipe example - V1.0" recipe and four elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 <absolute path>			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	OR_11 <absolute path>			**Alternative branch**
	Number of subelements	3	4	
	Elements that were added			

Synchronization line

A synchronization line has been added.

The synchronization line was added. Three elements are connected to the synchronization line in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 <Absolute path>			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Sync_13 <Absolute path>			**Synchronization line**
	Comment			
	Number of connections		3	
	Synchronization point (node ID1)		ROP_2 - ROP_5	
	Comment (node ID1)			
	Blocking (node ID1)		Yes	
	Synchronization point (node ID2)		ROP_4 - ROP_6	
	Comment (node ID2)			
	Blocking (node ID2)		Yes	
	Synchronization point (node ID3)		ROP_8 - ROP_9	
	Comment (node ID3)			
	Blocking (node ID3)		Yes	

The number of connections to the synchronization line has been changed.

The synchronization line was changed. Two elements are connected to the synchronization line in the "Recipe example - V1.0" recipe and three elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	**Recipe_example_1** **<absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	**Sync_14** **<absolute path>**			**Synchronization line**
	Number of connections	2	3	
	Synchronization point (node ID)		ROP_8 - ROP_9	
	Comment (node ID)			
	Blocking (node ID)		Yes	

A synchronization line with attributes has been added.

The added synchronization line is connected to two elements in the recipe and the following attributes were allocated:

- Comment or description via "Properties" dialog of the synchronization line (SyncLine comment)
- Comment or description specified via "Add comment" dialog for each of the two connection points (SyncNode 2.1 Comment and SyncNode-2.2 Comment)
- The "Blocking" property was set to "No" at the connection point (NodeID2)

	Property	Value (left side)	Value (right side)	
	**Recipe_example_1** **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	

	Property	Value (left side)	Value (right side)	
	Sync_15 **<Absolute path>**			**Synchronization line**
	Comment		SyncLine comment	
	Number of connections		2	
	Synchronization point (node ID1)		ROP_2 - ROP_5	
	Comment (node ID1)		SyncNode-2.1 Comment	
	Blocking (node ID1)		Yes	
	Synchronization point (node ID2)		ROP_4 - ROP_6	
	Comment (node ID2)		SyncNode-2.2 Comment	
	Blocking (node ID2)		No	

Monitoring container

A monitoring container has been added.

The monitoring container named "Monitoring" has been added. The monitoring container contains two elements in the "Recipe example - V2.0" recipe and three elements will be monitored.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Monitoring_8 **<absolute path>**			**Monitor**
	Name		Monitoring	
	Number of elements in the monitoring container		2	
	Comment on monitored elements			
	Number of monitored elements		3	
	Comment on monitoring container			
	Description			
	Planned runtime		00 S	
	Monitoring time		00 S	
	Overwrite runtime		No	
	Scaling the runtime			
	ESIG activated		No	

The number of elements in the monitoring container has been changed.

The monitoring container named "Monitoring" has been changed. The monitoring container contains two elements in the "Recipe example - V1.0" recipe and three elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Monitoring_8 **<Absolute path>**			**Monitor**
	Number of elements in the monitoring container	2	3	
	Elements that were added			

The number of monitored elements has been changed.

The monitoring container named "Monitoring" has been changed. Three elements will be monitored with the monitoring container in the "Recipe example - V1.0" recipe and four elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Monitoring_8 **<Absolute path>**			**Monitor**
	Number of monitored elements	3	4	
	Elements that were added in the monitored area			

Recipe loop

A recipe loop has been added.

The recipe loop was added. The recipe loop contains two elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Loop_11 **<Absolute path>**			**Loop**
	Comment		Loop	
	Number of subelements		2	
	Elements that were integrated in the loop			

The number of elements in the recipe loop has been changed.

The recipe loop was changed. The recipe loop contains two elements in the "Recipe example - V1.0" recipe and three elements in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	Recipe example **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Loop **<Absolute path>**			**Loop**
	Number of subelements	2	3	
	Elements that were added in the loop			

Transition conditions

Condition 3 of a transition has been added.

A 3rd condition has been added to the transition "Trans_4. The name of the transition is located in the absolute path. The condition itself is represented by the attributes.

The example corresponds to the condition:

U3_String value from RUP_2 unit must not have the value "ERROR"

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Trans_4 **<absolute path>**			**Transition**
	Number of conditions	2	3	
	Logic	(C1 OR C2)	(C1 OR C2 OR C3)	
	Condition_12 **<Absolute path>**			**Condition**
	Description			
	Operator		<>	
	Right value		ERROR	
	Left value		U3_String (RUP_2:UnitParameter)	
	Effective immediately (left)		Yes	

Condition of a transition has been changed.

The operator and the right value have been changed in the 3rd condition of a transition "Trans_4". The name of the transition is located in the absolute path.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Condition **<Absolute path>**			**Condition**
	Operator	<>	=	
	Left value	ERROR	NULL	

ESIG (electronic signature)

Set check mark at global attribute "Activate".

An ESIG is displayed as inserted if the check mark is set at the global attribute "Activate" in the property dialog of the corresponding object (recipe, recipe function, etc.) in the ESIG tab. In addition, at least one ESIG must be configured.

Here is an example for a newly inserted ESIG for a recipe with all available recipe-specific actions for which ESIGs are possible:

- Abort batch
- Resume batch
- Release batch
- …
- Unlock

	Property	Value (left side)	Value (right side)	
	**Recipe_example_1** **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	ESIG activated	No	Yes	
	<Additional attributes>	…	…	
	ESIG that are available for this recipe			**ESIG**

Remove check mark at global attribute "Activate"

Check mark at global attribute "Activate" has been removed.

	Property	Value (left side)	Value (right side)	
	**Recipe_example_1** **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	ESIG activated	Yes	No	
	<Additional attributes>	…	…	

The check mark at the global attribute "Activate" has been removed and the attribute "Sequence" was changed for the "Abort batch" action.

	Property	Value (left side)	Value (right side)	
	**Recipe example** **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	ESIG activated	Yes	No	
	<Additional attributes>	...	...	

	Property	Value (left side)	Value (right side)	
	ESIG **Electronic signature/Abort batch**			**ESIG**
	Specified signature sequence	No	Yes	

Action for which an ESIG is possible has been changed

The role "Superuser" has been added for the ESIG for the "Abort batch" action.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	...	...	
	ESIG **Electronic signature/Abort batch**			**ESIG**
	Number of configured roles	1	2	
	Configured roles	Operator	Operator; Superuser	

Control strategy

The control strategy has been changed.

The control strategy has been changed for the "Heat_10" recipe element. The control strategy contains control strategy 1 in the "Recipe example - V1.0" recipe and control strategy 2 in the "Recipe example - V2.0" recipe.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Name	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Heat_10 **<Absolute path>**			**Step**
	Control strategy	Control strategy 1	Control strategy 2	

Substructure and library reference

A library reference in the hierarchical recipe has been resolved.

Since substructures are not possible in hierarchical recipes, the "Resolve substructure" command applies here to library references. The library reference is displayed as deleted.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<Absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
	Lib_reference_Test_27 **<Absolute path>**			**Recipe operation**
	Comment			
	Name		LibReferenceTest	
	Description			
	Planned runtime		00 S	
	Monitoring time		00 S	
	Overwrite runtime		No	
	Scaling the runtime			
	ESIG activated		No	
	Lib_reference_Test_25 **<Absolute path>**			**Library reference**
	Comment			
	Library reference	LibReferenceTest		
	Description			
	Planned runtime	00 S		
	Monitoring time	00 S		
	Scaling the runtime			
	Overwrite runtime	No		
	ESIG activated	No		

A library reference in the flat recipe has been resolved.

The "Resolve substructure" command also applies to library references in flat recipes. The library reference is shown as deleted, and a substructure with the name of the previous library reference is shown as added.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	

	Property	Value (left side)	Value (right side)	
	Lib_reference_Test_6 <absolute path>			**Library element**
	Comment			
	Name		LibReferenceTest	
	Description			
	Planned runtime		00 S	
	Monitoring time		00 S	
	Overwrite runtime		No	
	Scaling the runtime			
	ESIG activated		No	
	LibReferenceTest <Absolute path>			**Library reference**
	Comment			
	Library reference	LibReferenceTest1		
	Description			
	Planned runtime	00 S		
	Monitoring time	00 S		
	Scaling runtime			
	Overwrite runtime	No		
	ESIG activated	No		

A substructure has been resolved in the flat recipe.

The substructure is shown as deleted, and all elements from the substructure are shown as added.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 <absolute path>			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	

	Property	Value (left side)	Value (right side)	
←	**Sub_6** **<Absolute path>**			**Library element**
	Comment			
	Name	Sub		
	Description			
	Planned runtime	00 S		
	Monitoring time	00 S		
	Overwrite runtime	No		
	Scaling the runtime			
	ESIG activated	No		
→	Recipe phases included in the resolved substructure			

Elements in the flat recipe in a substructure have been hidden.

All elements that are hidden in the substructure are shown as deleted, and the substructure is shown as added.

	Property	Value (left side)	Value (right side)	
	Recipe_example_1 **<absolute path>**			**Recipe**
	Recipe	Recipe example	Recipe example	
	Version	V1.0	V2.0	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	<Additional attributes>	…	…	
→	**Sub_17** **<absolute path>**			**Library element**
	Comment			
	Name		Sub	
	<Additional attributes>		...	
←	Elements hidden in the substructure			

9.5.9.4 Formula comparison

With a formula comparison, you can compare two formulas within a formula category.

The formula attributes are displayed on both sides in the comparison header, corresponding to the selected filter. This is followed by the recipe parameters, transfer parameters and parameters for output materials and input materials, corresponding to the selected filter. The attributes are displayed on both sides here as well. The reason for the display on both sides is that it is not possible to add or delete something in one formula and not in the other formula within a formula category. Thus, only attributes can be changed.

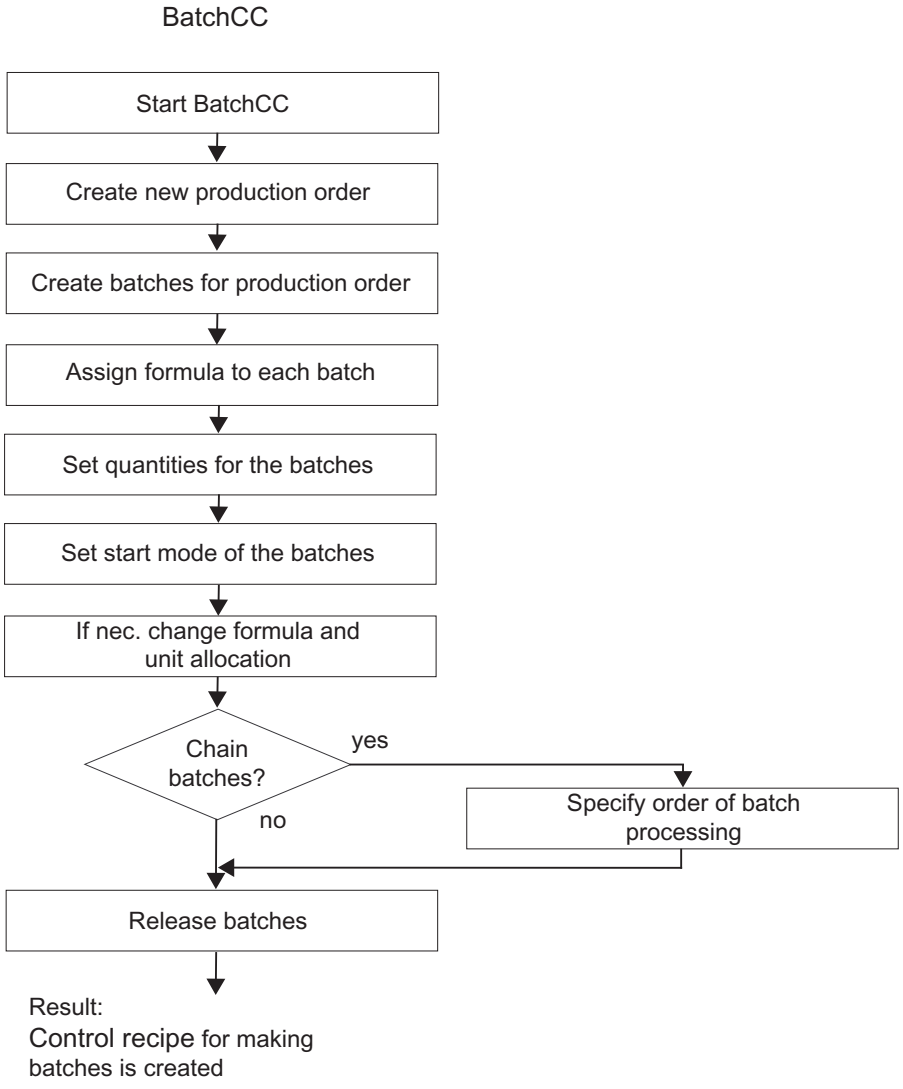
Comparing formulas

	Property	Value (left side)	Value (right side)	
	FormP1 **<absolute path>**			**Formula**
	Name	FormP1	FormP1	
	Version	V1.0	V2.0	
	Recipe	Recipe example	Recipe example	
	Last change	08.06.2015 14:36:58 (UTC +2:00)	01.06.2015 11:06:05 (UTC +2:00)	
	Input material 1 **<Absolute path>**			**Input material**
	Setpoint	11	21	
	Material name	Input material 001	Input material 002	
	Material code	E001	E002	
	Output material 1 **<Absolute path>**			**Output material**
	Setpoint	15	25	
	Material name	Product 001	Product 002	
	Material code	P001	P002	
	Parameter1 **<Absolute path>**			**Recipe parameters**
	Setpoint	20	40	

9.6 Batch Planning

9.6.1 Flow chart: How to create/edit a batch

Flow chart



What can be planned?

A production order specifies which product will be manufactured. Batches can be assigned to a the production order manually or automatically.

The recipe on which the batch is based specifies the production process and the duration of the unit allocation.

The following can also be selected for a specific batch:

- Batch quantity
- Formula/master recipe
- Units used
- Start mode and start time

The sequence in which batches are executed can be selected by chaining the batches.

9.6.2 Planning batches

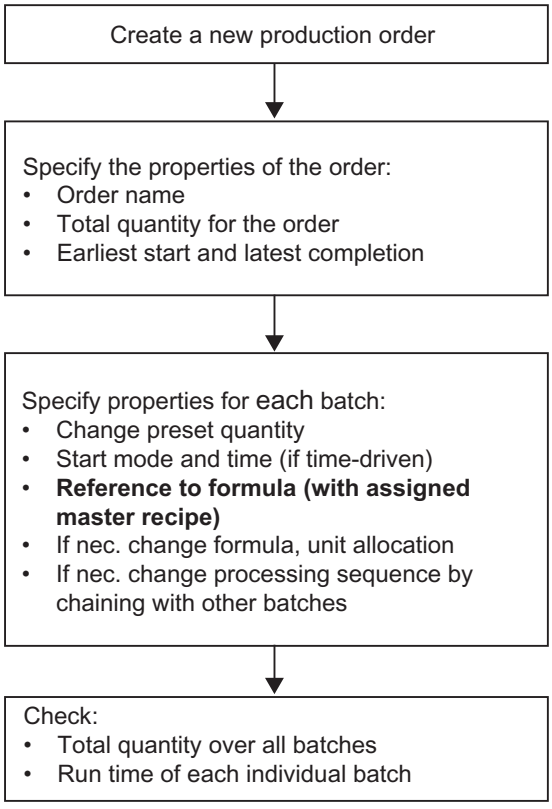
9.6.2.1 How to configure batches

You can create batches by using master recipes or formulas (with assigned master recipes). The procedure is identical in both cases. The procedure for working with formulas is described below.

Configuring batches

With SIMATIC BATCH, you can schedule batches and specify the chronological order of several batches without having to release the batches immediately for production. Batches can be derived from production orders.

The sequence shown below is the recommended order for configuring production orders with batches in BatchCC. The diagram shows which settings must be made for batches.



Basic procedure

You create the batches for the production orders in BatchCC. By defining and selecting a master batch, numerous batches with similar properties can be created quickly. In the properties of each batch, you specify the reference to a released formula with assigned master recipe or to a released master recipe without a formula category assignment. You can specify the batch quantity and Start mode for every batch. By chaining the batches, you can define the order in which they are processed.

Note

Excluding blocking effects with batches

Depending on the current status of the batches, the batch structure, the number of released batches and their start mode, it is possible that batches block each other when they are running. This effect can occur in particular when there is a failover of redundant BATCH servers or when exiting and restarting a BATCH server.

To make sure that batches do not block each other while they are running, configure start allocations or work with chains in the "End" mode. This is particularly important when using synchronization functions.

Additional information

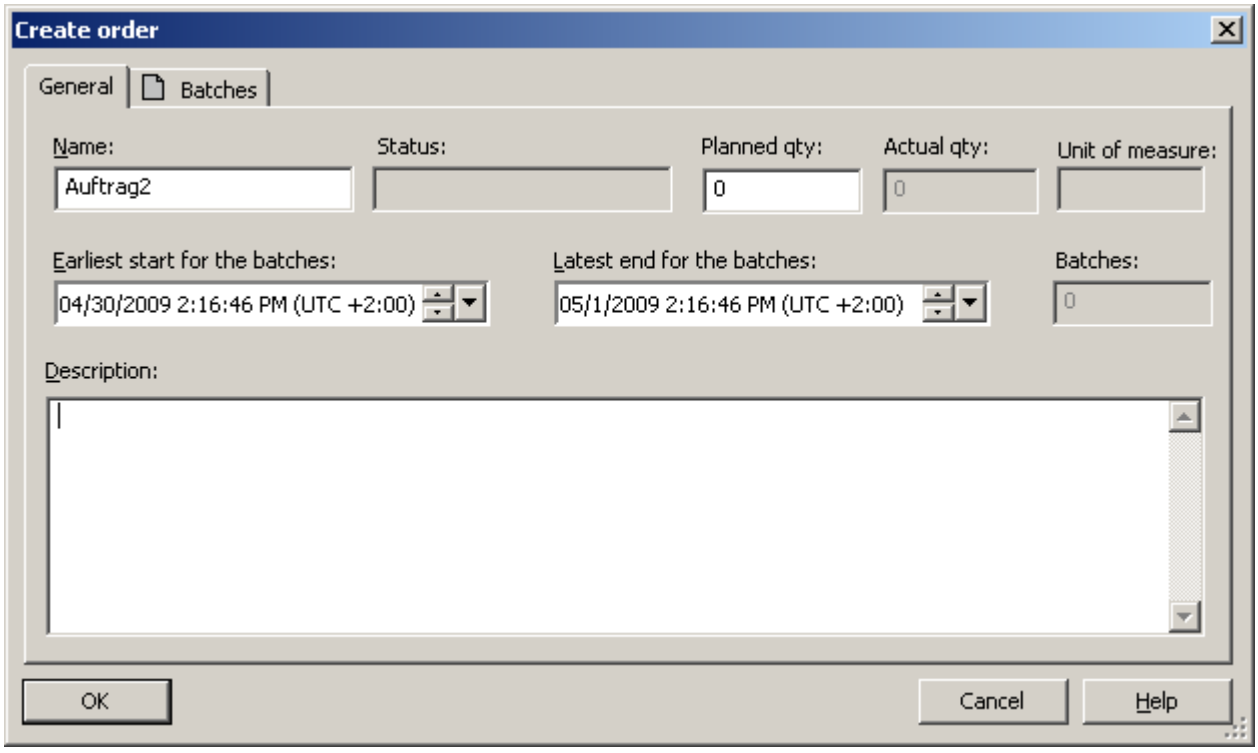
"Allocation" tab (Page 817)

Order of batch processing (Page 415)

9.6.2.2 Creating a new production order

Procedure in BatchCC:

1. Select an order category folder below the "Orders" folder.
2. Select the menu item **Edit > New**.
   A dialog with two tabs, "General" and "Batches", opens.



3. Make the following settings for the production order in the "General" tab:
   - Name of the production order
   - Planned total batch quantity for the order
   - Earliest start and latest end of the batches
4. You then have two options as to how you continue the configuration.
   1st option
   You do not want to create specific batches yet. Simply confirm the settings made up to now with "OK" at this point.
   Result: The production order is inserted as an object in BatchCC. Later, you can add batches to this order and set the actual properties for each batch.
   See also section: Adding batches to a production order (Page 386)
   2nd option
   You move on immediately to the "Batches" tab.
   For further settings:
   See section: Assigning batches to a production order (Page 383)

See also

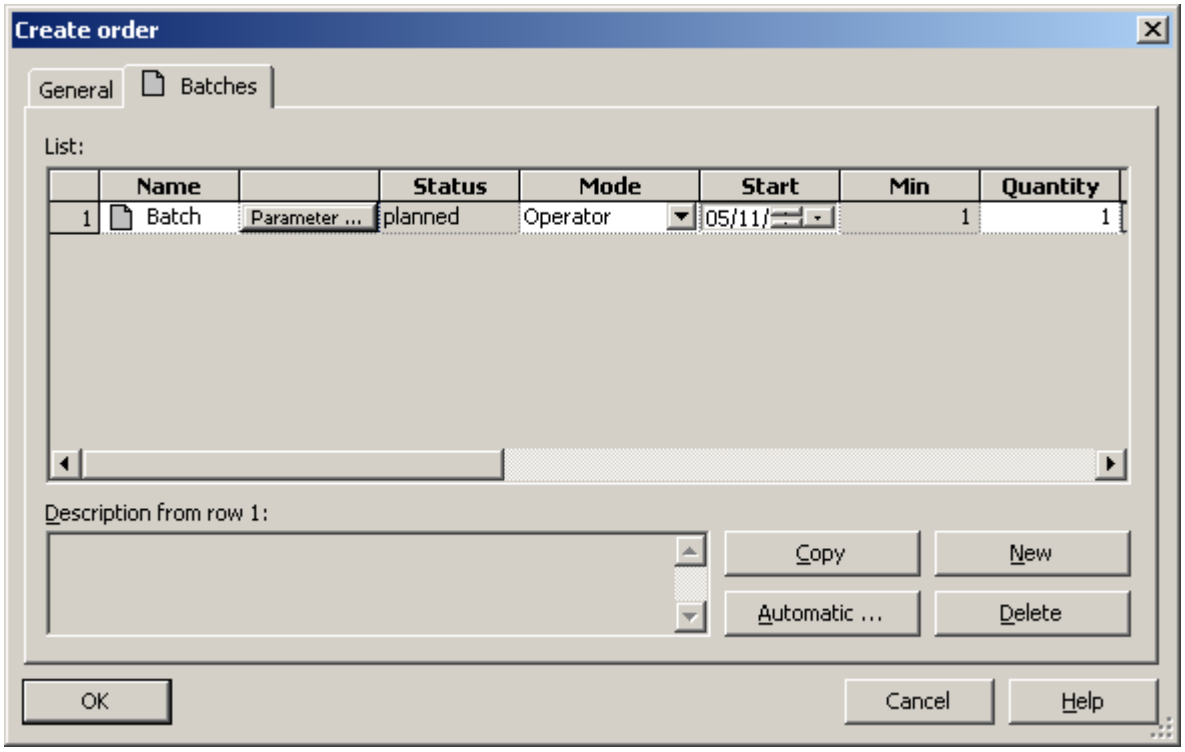
Displaying the properties of a production order (Page 385)

Overview lists (Page 288)

9.6.2.3 Assigning batches to a production order

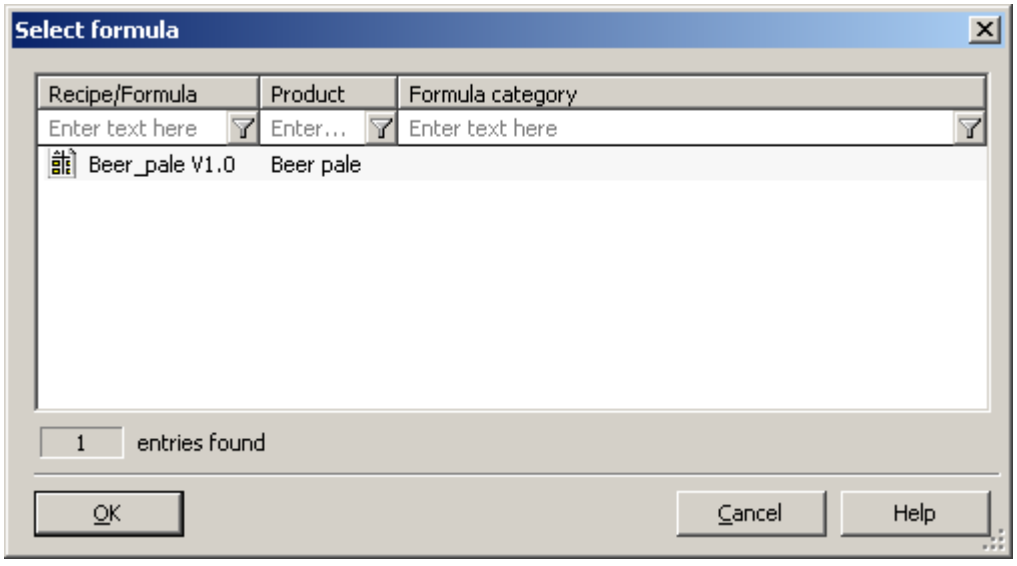
Procedure in BatchCC:

1. While creating a new order, change to the "Batches" tab (properties dialog for the order).



2. Create the batches for the production order as follows:
   - You can create new batches with the "New" button. You then make the settings for the batch quantity, Start mode, formula etc.
   - Working with the master batch: Select a batch in the table and then press "Copy", the selected batch then gets the status of a master batch and all subsequently created batches have the property of a master batch.
   - Automatic: Using the "Automatic" button is a convenient method of calculating batches for a specific amount of material.

3. If necessary, change the allocation to a unit or to a master recipe or formula by clicking on one of the table cells "Allocations", "Product" or "Recipe/Formula".
   Result:



4. In this dialog, you enter the product, the formula or the formula category. As a result, all the assignments with a released master recipe and/or validated formula are listed.
5. Select the row with the correct assignment and confirm with "OK".
   Result: The new formula or master recipe is assigned to the batch in the "Batches" tab.
   Tip: First set all the properties (batch quantity, Start mode, formula) of the master batch in the "Batches" tab or make any batch the master batch by selecting it and then creating further batches with the "Copy" button.
6. Set the batch quantity in the "Quantity" cell. The reference scale standard of the quantity has been previously configured. If you set a value outside the limits set by the minimum and maximum scale, the value is corrected to the limit value.
7. If necessary, change the Start mode and start time in the "Mode" and "Start" table cells.
8. Confirm all your entries with "OK".

Result: The information about the number of batches and the total batch quantity of the production order is updated in the "General" tab. The batches are created as objects underneath the production order. The batches have the status "Planned".

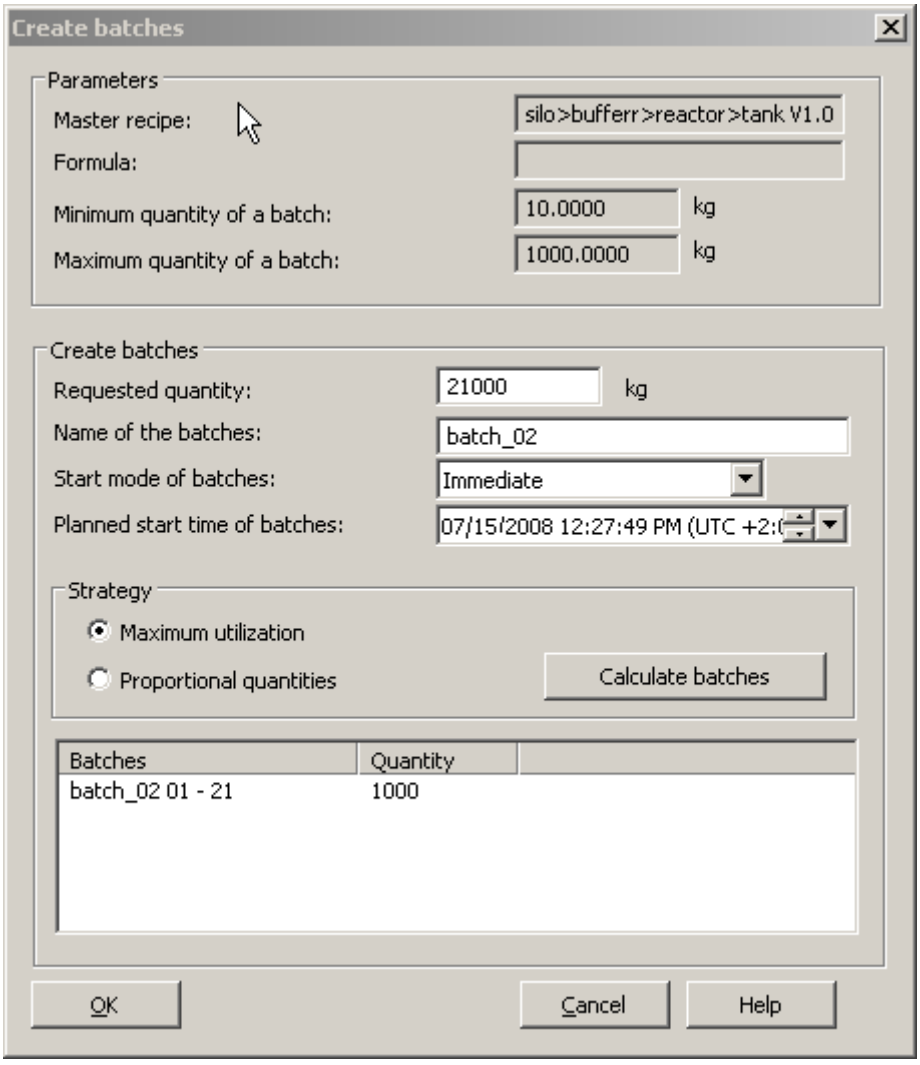
Creating batches automatically

In the "Batches" tab, you can also create batches automatically using the "Automatic" button.

How to create batches automatically:

1. Select a batch as the master batch.
2. Click the "Automatic" button.
   Result: The dialog for selecting the formula/master recipe is displayed.

3. This is where you select the formula/master recipe and confirm with "OK".
   Result: The "Generate batches" dialog box appears.



4. Make all the required entries and confirm with "OK".

Result

The number of batches and the amount of each batch is calculated automatically and created so that the total amount is produced.

9.6.2.4 Displaying the properties of a production order

Procedure in BatchCC:

1. Select the production order in the "Orders" folder in BatchCC.
2. Select the menu command **Edit > Properties**.

Result: You can see the current status of the production order in the dialog. All the batches created for the order are listed with their properties in the "Batches" tab. The "General" tab contains the following properties of the order.

Properties of the production order

Property	Meaning	Modifiable
Name	Name of the order.	Can be modified using "Rename" on the shortcut menu provided the order is not yet released.
Status	Processing status of the order.	Updated by BatchCC.
Planned quantity	Batch quantity: Planned total batch quantity of the order.	Cannot be modified*
Actual quantity	Batch quantity: Here, the total quantity of all batches in the order is displayed.	Updated by BatchCC.
Unit of measure	Unit of measure for the amounts**	Updated by BatchCC.
Earliest start and latest end for the batches	Time window for processing the batches.	Cannot be modified*
Batches	Number of batches for this order.	Updated by BatchCC.

Legend:

* Changes can only be made with the creation of a new production order.

** If batches have different units or different materials, "***" is displayed.

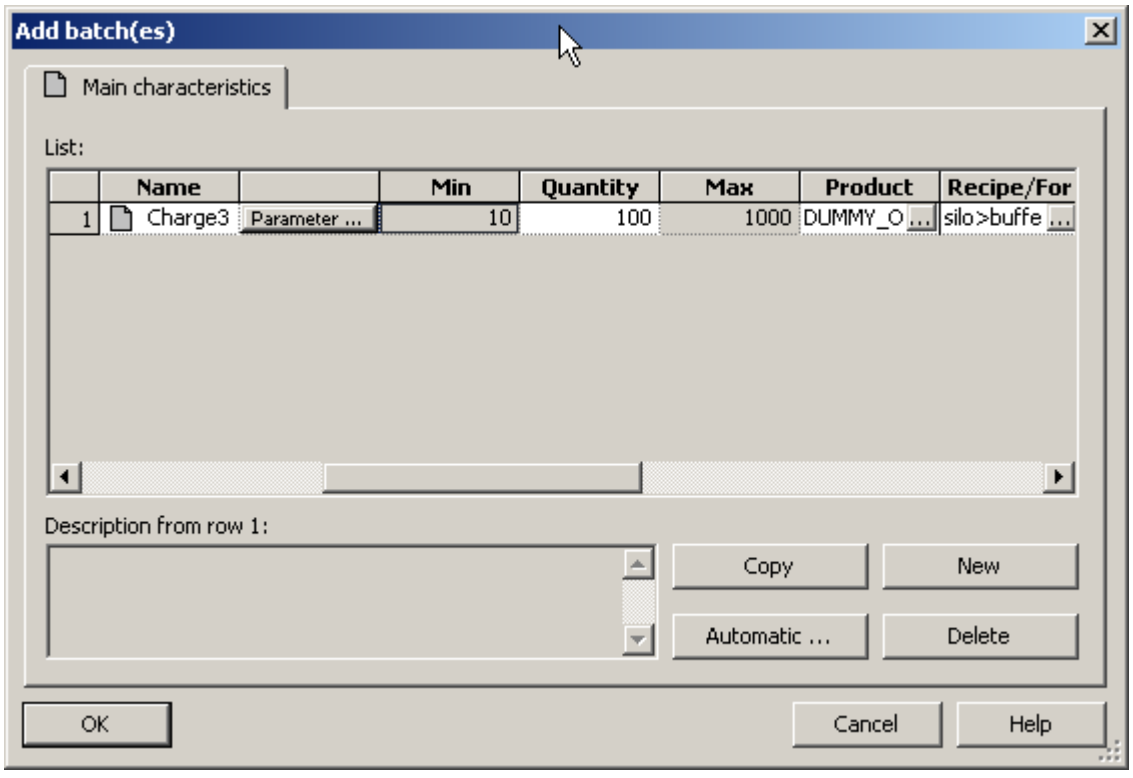
9.6.2.5 Adding batches to a production order

There are several ways you can add batches to the production order:

- When creating a new production order: see section: "Assigning batches to a production order". (Page 383)
- By adding batches to an existing production order: described below.

Procedure in BatchCC

1. Select the production order in the "Orders" folder.
2. Select the menu item **Edit > New**.
   Result: The "Batches" properties dialog for the production order appears.



3. Follow the same procedure as described in the section "Assigning batches to a production order" (Page 383).

See also

Overview lists (Page 288)

Releasing batches (Page 406)

Opening the control recipe for the batch (Page 403)

9.6.2.6 Specifying the properties of the batch

There are three ways in which you can specify the properties of batches:

- When creating a new production order: see section: Assigning batches to a production order (Page 383).
- When supplementing a batch for the production order: see section Adding batches to a production order (Page 386).
- Later for an existing batch. This option is described below.

Requirement

The batch is in the "Planned" status and the control recipe is not open.

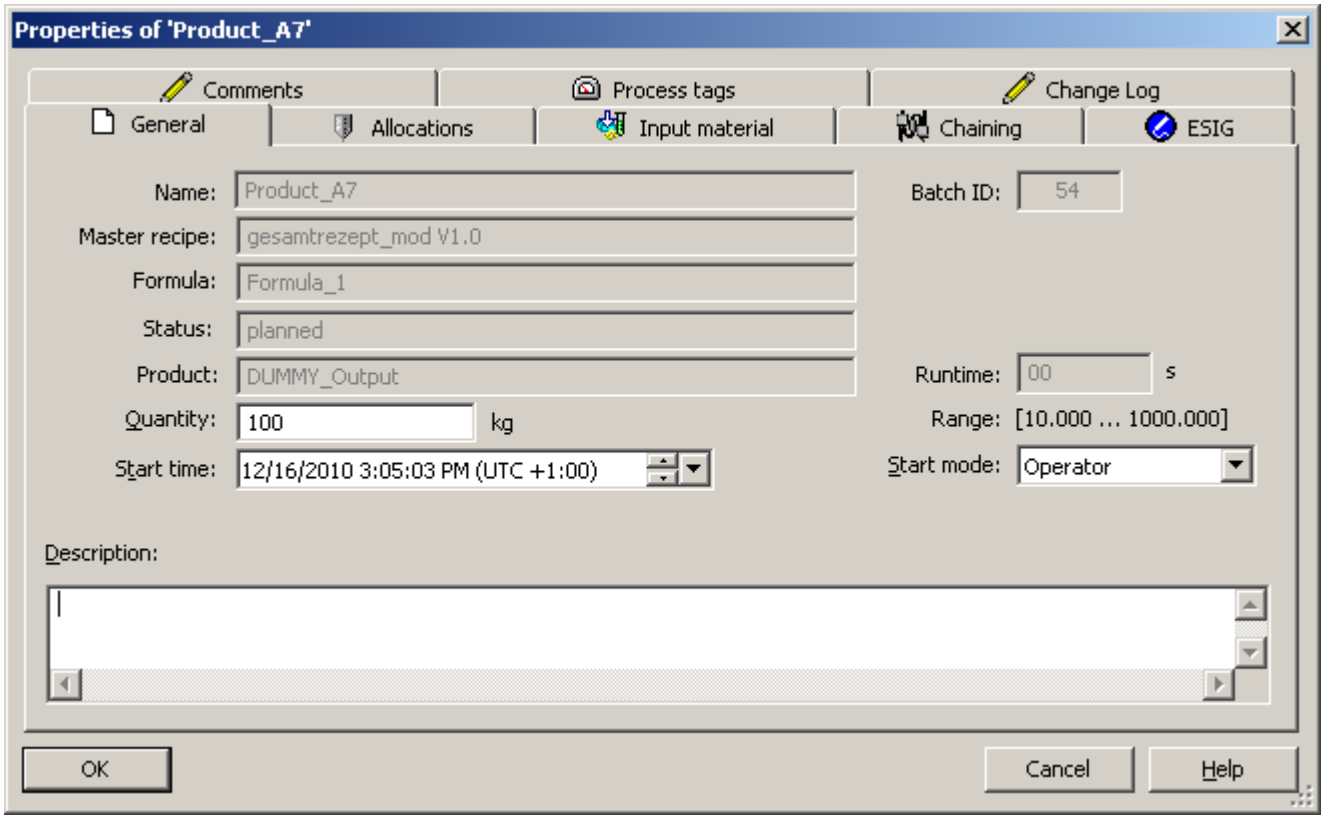
Procedure in BatchCC

1. In the "Orders" folder in BatchCC, select the object "Batch" below the production order.
2. Select the menu command **Edit > Properties**.
   Result: The dialog box "Properties of <batch name>" is displayed. In this dialog, you can do the following:
   - Display and, if required, modify the batch quantity
   - Setting the Start mode for batch processing (Page 389)
   - Displaying and modifying unit allocation (Page 389)
   - Displaying and modifying formula parameters (Page 391)
   - Displaying the chaining of the batch and changing if necessary (Page 391)
   - Displaying the run time of a batch (Page 394)
3. Make all the settings you require for the batch and confirm with "OK".

Result: After it is enabled, the batch can be processed depending on the selected Start mode and the unit allocation.

Entering properties

You enter the properties of the batches in the following dialog. Use the "Help" button to get context-sensitive instructions for each specific input/output field on the tab.



9.6.2.7 Setting the start mode of the batch processing

Procedure in BatchCC:

1. In the "Orders" folder in BatchCC select the object "Batch" below the production order.
2. Select the menu item **Edit > Properties**.
   Result: The dialog "Properties of <batch name>" is displayed.
3. In the "Start mode" input field, select **"Operator", "Immediate" or "Time-driven"**.
4. You must also set a start time and date.
5. Confirm with "OK".

Possible start modes

Start mode	Meaning
Operator	You can start the released Batch with the menu command **Control > Start** .
Immediate	When released, the batch is started as soon as the units required at the start of the control recipe are free.
Time-driven	The batch is started on a particular day, at a particular time. The start time and date must be specified.

Note

Batches with the start mode "Immediate" are started **before** batches with the start mode "Time-driven" (start mode "Immediate" takes priority) if the same units are involved.

9.6.2.8 Displaying unit allocation and changing it if necessary

Unit allocation and run time

A unit can only be involved in the production of one batch at any one time. The unit allocation is displayed along with the duration of the allocation and is not related to any particular recipe. The length of time required by units involved in a batch is set when the recipe is created. The times are relative to the start of the batch and take into account the actual quantity of the batch.

If necessary, you can adapt the unit allocation in the properties dialog of the batch.

Note

The allocation times of the units are planning values used to optimize the use of facilities. Please remember that these allocation times are not exactly the same as the actual times required for batch control.

Procedure in the BatchCC:

1. In the "Orders" folder in the BatchCC select the object "Batch" below the production order.
2. Select the menu item **Edit > Properties**.
   Result: The dialog "Properties of <batch name>" is displayed.
3. Select the "Allocation" tab.
   Result: The units reserved for the recipes are displayed in the table.
4. If required, modify the unit allocation. The "Unit" list box shows only the units that also have the recipe phases being used.
5. Confirm your changes with "OK".

Overview of the unit allocations

You can also open an overview (read only) of the unit allocations with the menu command **Planning > Unit allocation**.

9.6.2.9 Displaying formula parameters and modifying them if necessary

Changing a formula

In the properties dialog for the batch, you can make the final modifications to the formula parameters.

Note

Formula parameters modified at this point apply only to this batch. The parameter values are not changed in the formula used or in the master recipe used in the tree of BatchCC.

Procedure in the BatchCC:

1. In the "Orders" folder in the BatchCC select the object "Batch" below the production order.
2. Select the menu item **Edit > Properties**.
   Result: The dialog "Properties of <batch name>" is displayed.
3. Change to the "Input material", "Output material", or "Parameters" tab.
   Result: Tables are opened displaying all the header parameters of the master recipe with the current values of the formula parameters.
4. If required, change the values of the formula parameters. The possible range of values are displayed as the upper and lower limits.
5. Confirm changes with "OK".

9.6.2.10 Displaying the chaining of a batch

In the properties dialog of a charge, you can display any chaining of the batch and set and change the start mode.

Procedure in the BatchCC:

1. In the "Orders" folder in the BatchCC select the object "Batch" below the production order.
2. Select the menu item **Edit > Properties**.
   Result: The dialog "Properties of <batch name>" is displayed.
3. Select the "Chaining" tab.
   Result: The defined predecessor/successors are displayed in the table.
4. If necessary, modify the chaining.
5. Confirm changes with "OK".

9.6.2.11 Setting batch order; chaining batches

If you want to make sure that a batch is only started after a previous batch has been completed, you can also chain planned and not yet released batches. You can specify a predecessor batch and then specify whether the predecessor batch is to be started or already completed.

Rule 1: Times in the tooltip, Gantt symbol, properties dialog and tree view

- In the case of non-chained batches, the displayed times are identical everywhere.
- If, in the case of chained batches, the planned starting time of a successor batch lies after the end time of its predecessor batch, the displayed times are identical everywhere.
- If, in the case of chained batches, the planned starting time of a successor batch lies before the end time of its predecessor batch, the planned start time is displayed in the properties dialog. All other dialogs display the actual start time.

Rule 2: Start mode

- A batch in "Immediate" start mode is positioned in a chaining directly at the end time of the predecessor batch and is started immediately after completion of the predecessor batch.
- If the planned starting time lies after the end time of the predecessor batch, a batch in "Time-driven" start mode is started. If the planned starting time lies before the end time of the predecessor batch, the chaining algorithm is used as the basis for positioning and starting.
- All batches in "Manual" start mode must always be started via an operator action, even if they are chained. Therefore, the use of this start mode is recommended at most for the first batch of a chain. All subsequent batches should have the "Immediate" or "Time-driven" start mode.

Rule 3: Minimum intervals for chaining batches (GAP time)

- The GAP time guarantees a minimum interval between two chained batches.
- In the start mode "time-driven", a time-based offset t to the predecessor batch results, depending on the planned starting time of the successor batch. At a configured GAP time ≥ t, the actual time offset corresponds to the GAP time; at a GAP time < t, the time offset is equal to t, meaning that the successor batch starts at the planned starting time.
- In the start mode "immediately", the planned starting time does not play any role; the time-based offset corresponds to the GAP time.
- At a manual start of a batch (chained or not), a configured GAP time is never considered.

Rule 4: Shifting in the Gantt chart

- Batches of a batch chain with the start mode "time-driven" or "manual" can be shifted in the Gantt chart in both directions (menu Planning > Set batch order).
- A shift to the left is possible at the most up to the end time of the predecessor batch. In this action, the planned starting time is always adapted.
- Shifting to the right is possible as far as you like. When the planned starting time of its successor batch is reached, it and correspondingly all further ones are shifted to the right. The planned starting time is updated for all the batches that are shifted to the right by this action.
- In the start mode "immediately", only the first batch of a batch chain can be shifted to the left or right.

Rule 5: Changing the planned starting time in the properties dialog

- If the planned starting time in the properties dialog is set greater than the end time of its predecessor batch, the position and thus the real start in the Gantt chart shifts to the right.
- If the planned starting time in the properties dialog is set smaller than the end time of its predecessor batch, the position and thus the real start in the Gantt chart shifts to the end of its predecessor batch.

Rule 6:

- In the case of a manual start of a chained batch, the start is always carried out immediately, irrespective of the start mode, position in the Gantt chart, completed predecessor batch, planned starting time or GAP time.

Note

Please note that the rules described here refer principally to end chaining. However, they also apply analogously for start chainings in the case of correct interpretation.

Procedure in BatchCC:

1. Select the menu command Planning > Set batch order.
   Result: The "Set batch order" dialog box opens. All batches and their start and end times are displayed on the left.
2. Select the correct time range on the right.
3. Select a planned batch in the time window that you want to chain with another batch.
4. Select the "Chain with predecessor" or "Chain with successor" command in the shortcut menu.
5. Then select the predecessor or the successor batch.

Chaining mode

- You can also specify the following modes for the batch via "Properties" (shortcut menu) in the "Chaining" tab:
- Start chain: This batch starts running as soon as the predecessor batch starts.
- End chain: This batch starts running only after the predecessor batch is completed. If the batch is aborted or stopped, a query is displayed asking whether the next batch should be started.

Result

Chained batches are displayed with a connecting line in the time window. By selecting the batches and then the shortcut menu command "Cancel connection to predecessor", the chaining is broken again.

Note

- Deleting chained batches can result in the interruption of batch chain.

Tips:

- You zoom the time scale by pressing the CTRL key and the right mouse button at the same time.
- If you select a batch and the "Display" command in the shortcut menu, the time segment associated with the batch is displayed in the time window. Information about shortcut menu command: If the batch to be chained is displayed in the time segment by the "Display" command, the chaining mode is lost. Instead, shift the time window until the batch to be chained is visible in the time segment.
- If you select the batch and use the "Go to Predecessor" command in the shortcut menu, you will jump to the predecessor in the time window.

9.6.2.12 Displaying the run time of a batch

Procedure in the BatchCC:

1. In the "Orders" folder in the BatchCC select the object "Batch" below the production order.
2. Select **Edit > Properties** from the menu.
   The "Properties of <batchname>" dialog opens.
   The run time calculated in the Recipe Editor for the control recipe based on the individual steps is displayed in the "Run time" box.

   Note

   These batch run times can be used to optimize planning. Please remember that these times are not exactly the same as the actual times required for batch control.

9.6.2.13 Planning the unit allocation

Unit allocation

A dialog provides you with a complete overview of all batches and their unit allocation. Symbols indicate whether or not there is a conflict or double allocation of the units by pending batches or in the future. Both in processing mode and during the planning, the dialog provides information about the allocation of batches and units.

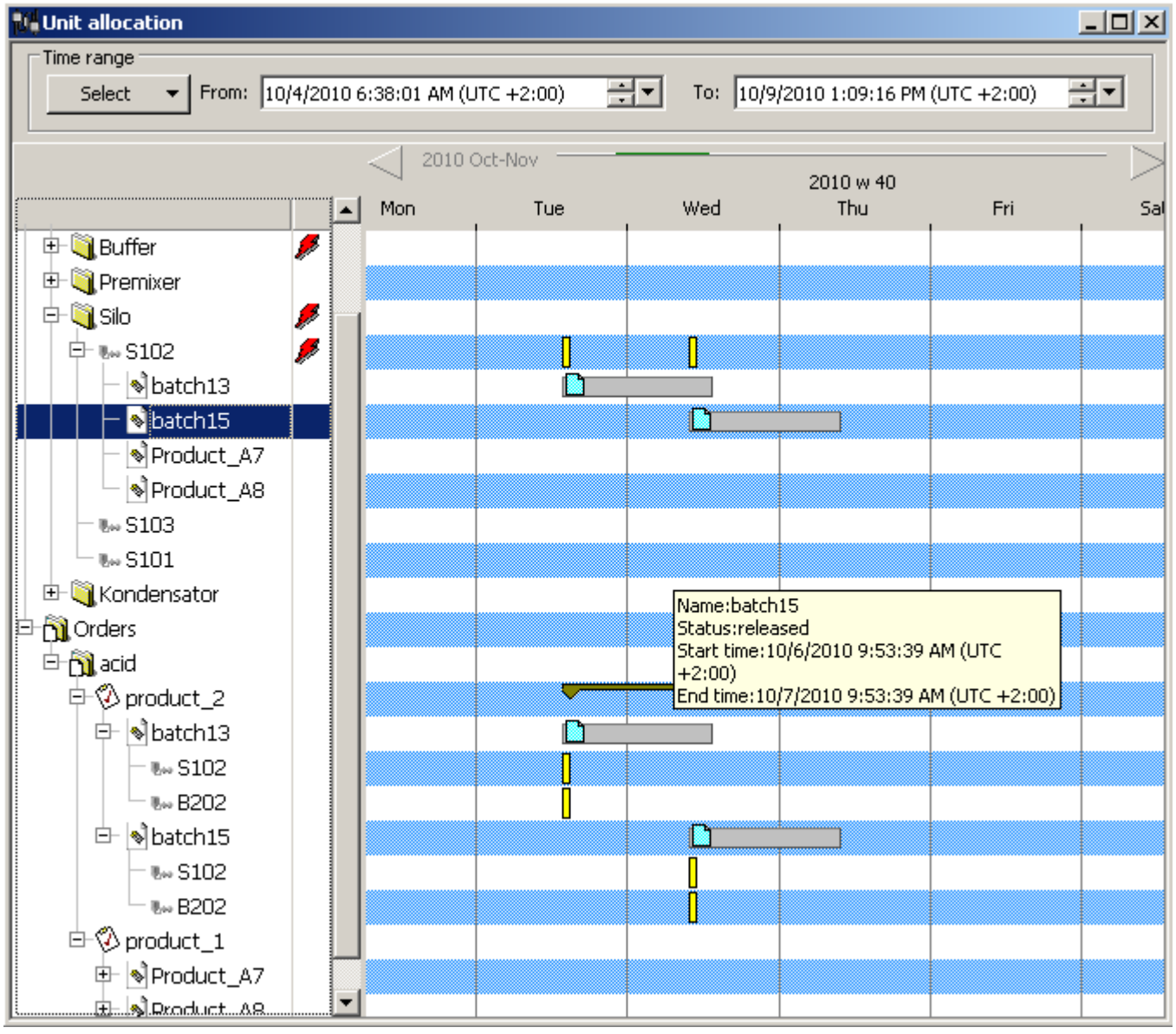
Note

If units are selected using "The longest out of use", "Operator selection" or "Process parameters" allocation strategies, they are not shown in the upper "Units" section. An allocation conflict can only be clearly indicated when the "Preferred unit" allocation strategy is exclusively used.

To select the unit allocation overview:

Select the menu command Planning > Unit allocation.

In the upper left area, you can display the units and corresponding batches. In the lower left area, the batches are displayed at the first level and then the required units. This allows you to optimize the unit allocation with various options. The time conflict is indicated by a red lightning icon. Time conflicts can be eliminated in this overview dialog by simply moving the batches in the right-hand time window.



Meaning of the symbols

- Yellow bar: Unit without conflict
- Gray bar: Batches with a run time longer than six hours. The icon to the left of the bar indicates the current status of the batch.

- Blue bar: Batches with a run time shorter than six hours. These batches are always displayed the same size. In other words, zooming does not magnify nor reduce the time elements of these batches.
- Red bar: Units with conflict. The same unit is planned to be used by more than one batch at the same time.

Note

As long as a batch is in the "planned" status, it can be dragged and dropped in a horizontal direction (time scale) in this view.

Below a unit, all the batches that have not yet completed and for which the unit is used are displayed. A batch can therefore occur more than once under "Units".

Moving the time scale

The time range can be moved using the arrow symbols at the left and right ends of the scale:

- Left arrow: Moves the time scale towards the past.
- Right arrow: Moves the time scale towards the past.

As an alternative, the time range can also be moved by clicking on the area between the two arrows.

Continuous expansion and reduction of the time scale

The visible time range (for example one week) can be reduced (for example, two hours) or expanded (for example, ten days).

By clicking on the area between the two arrows while holding down the "Ctrl" button, you can zoom the time scale.

- Move the mouse to the left: the times scale is reduced.
- Move the mouse to the right: the times scale is increased.

9.6.2.14 Possible limit violations when adjusting the volume

Recommendations to avoid possible limit violations when creating a basic recipe and control recipes based thereon (batches)

The following explanations demonstrate how limit violations can be avoided when releasing a batch. Such limit violations are generally caused by adjusting the volume of the setpoint parameters when creating a control recipe from a basic recipe.

Definitions

Recipe

A recipe is comprised of the recipe header, recipe steps and transitions.

Recipe header

Besides other data, the recipe header contains the standard mix as well as an high and low limit of the recipe All set parameter values set within the basic recipe are related to this standard mix. The standard mix is normally set within the stipulated recipe limits. for flexibility, a standard mix is also possible outside of the recipe limits for smaller and larger volumes although this limits the intended support of the recipe manufacturer by the system. Such master recipes can always be released.

Recipe step

All recipe steps (RUP, ROP, SUB, RPH) contain set values such as the process parameters, materials used and raw materials. The following takes into consideration only those recipe steps that accord to an EPH or EOP function block. within the automation system The set values of these recipe steps have an high and a low limit (also referred to as parameter limits) that are configured within the engineering system and can no longer be changed within the basic recipe. For each set value, an individual configuration can be made as an option when creating the basic recipes of whether the volume of this value is to be adjusted when releasing the control recipe (possible volume adjustments: linear and quadratic).

Unit

A unit recipe contains a candidate list of used units. The candidates result either by manual selection of the unit in the candidate list (candidate mode) or by evaluation of configured conditions (constraints mode).

Adjusting the recipe parameters

If an adjustment has been selected at a recipe parameter then set values can be optimally entered when creating the recipe by dynamically calculated limit values in the displayed tooltip. These limits calculated dynamically by the system are based on the candidate list and the assignment strategy of the respective RUP (hierarchical recipe) or of the respective RPH (flat recipe). If the set nominal value is within the recipe limits calculated by the system then no parameter limits are violated when releasing the control recipe (batch release). However, this presupposes that the mix is within the set recipe limits! If the standard mix is outside of the recipe limits then a limit violation can not be excluded even if the set value is within the tooltip limits.

With linear adjustment selected, the parameter limits are adjusted in the recipe editor according to the following formula and then displayed in the tooltip:

- Adjusted parameter low limit = (standard mix / recipe low limit) * Parameter low limit
- Adjusted parameter upper limit = (standard mix / recipe upper limit) * Parameter upper limit

Visualization / Tooltip highlighted in green

When adjusted nominal values are used, a check is made on the release of a control recipe (batch release) whether the adjusted nominal values are within the limits defined by the engineering system. Candidates that are no longer permitted are thereby removed from the candidate list. It may also occur that no valid candidate exists any longer for this control recipe. However, to ensure that such problems are not noticed for the first time at a later time, i.e. as plausibility errors (limit value violations) on release of the batch, the creator of the recipe is already supported by the system when working within the recipe editor and possible conflicts are shown for prepared amounts within the set recipe limits.

If there are several candidates for an RUP (hierarchical recipe) or an RPH (flat recipe) then the high and low limits of the parameter are displayed in green. These limits are adjusted according to the respective parameters of all possible units, i.e. the lowest limit for the low limit and the highest limit for the high limit. The values displayed in tooltip are calculated acc. to the above-mentioned formula for linear adjustments.

Batch

When creating a control recipe (batch), the actual amount prepared may deviate from the standard preset mix (the standard mix is always preset). The control recipe must be released for production. The nominal values set in the basic recipe are only adjusted on release, i.e. the actual volume adjustment is made here. The nominal values are re-calculated according to the set adjustment (linear and quadratic) but only when the prepared amount is different to the standard mix. If the prepared amount is not changed at the control recipe then there is also no adjustment of the volume.

After the nominal values have been adjusted, they are checked against the limits of all possible units. If the result of this check is that no unit fulfills the limits then release of the control recipe is refused with a corresponding message.

When checking the adjusted nominal values, the limits from engineering are always used and never the dynamically calculated limits of the recipe. The dynamically calculated limits are only an aid for the creator of the recipe to avoid limit violations that are only noticed when the batch is released.

Note

There are also batch releases that may lead to limit violations during the runtime of the batch, particularly in case of executed loops; refer also to Example 2. The system cannot always support you here in all cases! The user must accept responsibility here and make test runs of the recipe such as, e.g. a water run.

Example 1

A recipe has the following requirements:

Recipe header				
Reference quantity	①	REF_{Recipe}	1000 liter	
Minimum quantity	②	LL_{Recipe}	100 liter	
Maximum quantity	③	HL_{Recipe}	5000 liter	

Unit			Unit A	Unit B
Lower limit of nominal value		LL_{SP}	100	0
Upper limit of nominal value		HL_{SP}	1500	100
Setpoint		SP	250	50

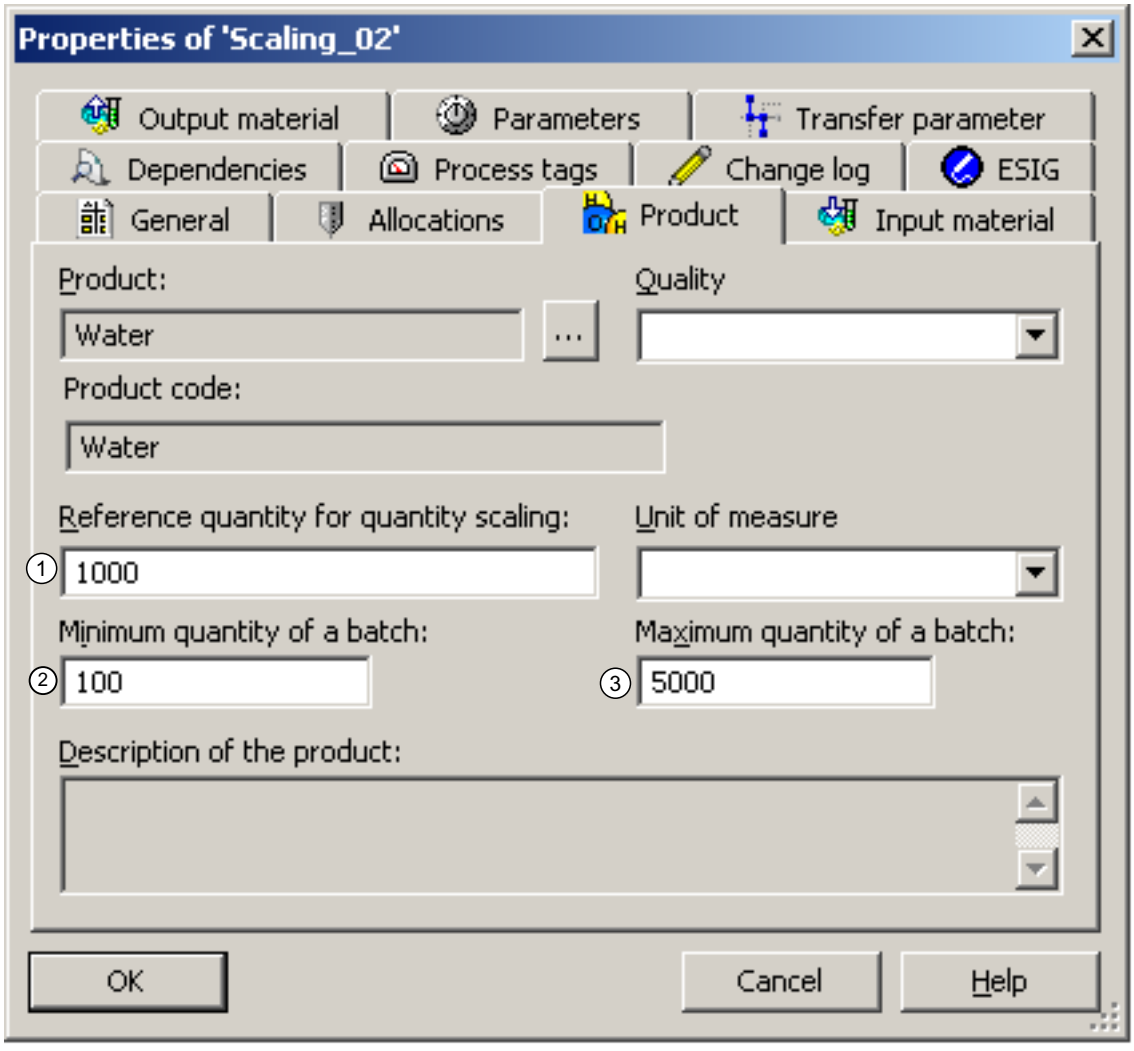


Figure 9-9 Fig 1: Recipe parameters

If, e.g. several units are possible in candidate mode for a partial recipe but no preferred unit has been entered then the lowest low limit (0, 100) 0 or the highest high limit (100, 1500) 1500 of all candidates is entered for the nominal value to be adjusted. To present this clearly, the nominal values are displayed in green (see Figure 2).

To make recipe design easier for the recipe creator, the limit values within which the nominal value can be without violating the nominal value limits for mix quantities between the lowest

and highest amount are shown as a tooltip. For linear adjustment, these values are calculated as follows:

- Adjusted parameter of low limit = (1000 / 100) * 0 = 0
- Adjusted parameter of upper limit = (1000 / 5000) * 1500 = 300

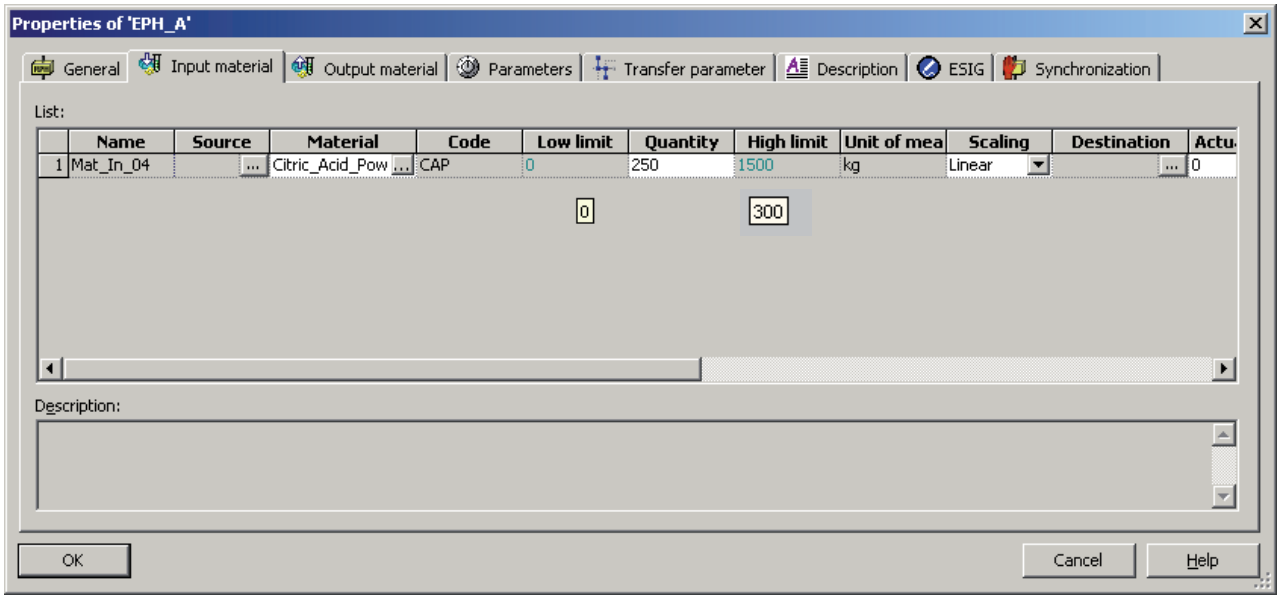


Figure 9-10 Fig 2: Display of the nominal limits of several candidates without preferred unit

If UNIT_B is specified as the preferred unit, the values from the corresponding function/ operation (here, low limit = 0 and high limit = 100) are displayed as the low/high limit in black (see Figure 3). The tooltip limits are then as follows:

- Adjusted parameter of low limit = (1000 / 100) * 0 = 0
- Adjusted parameter of upper limit = (1000 / 5000) * 100 = 20

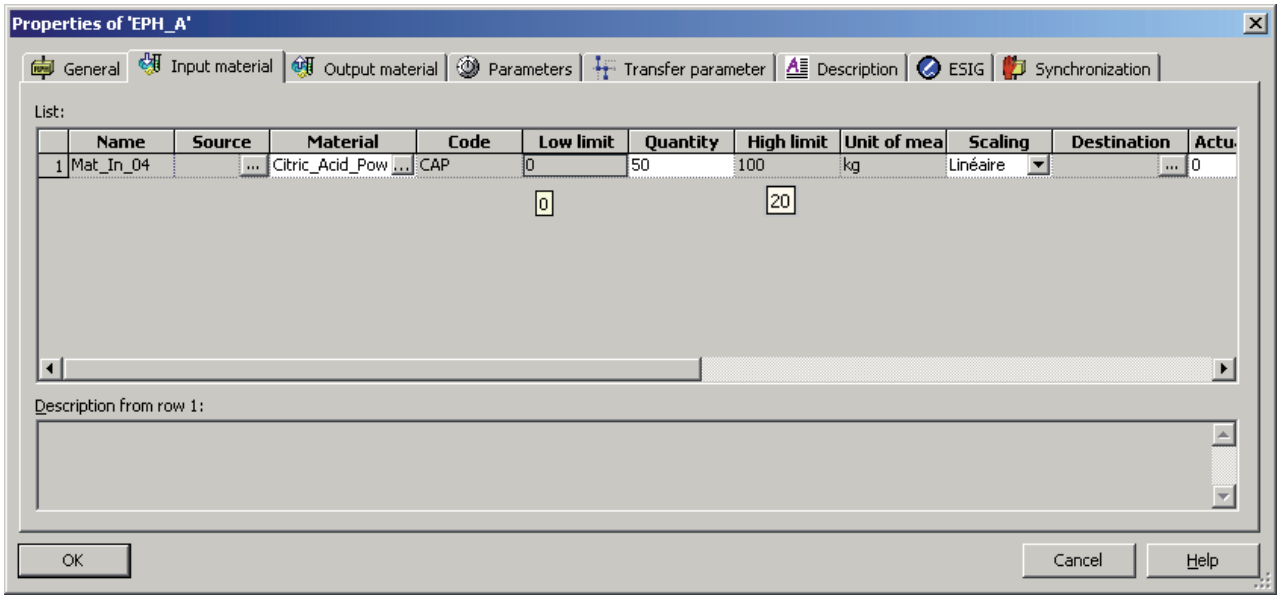


Figure 9-11 Fig 3: Display of nominal limits in candidate mode with preferred unit "UNIT_B"

If the nominal value is outside of the values of the limits calculated in tooltip then a warning is issued on release of the recipe even although it is within the nominal value limits.

Example 2

Recipe header		
Reference quantity	REF_{Recipe}	1000 liter
Minimum quantity	LL_{Recipe}	100 liter
Maximum quantity	HL_{Recipe}	5000 liter

Unit		Unit_A
Lower limit of nominal value	LL_{SP}	100 liter
Upper limit of nominal value	HL_{SP}	1500 liter
Setpoint	SP	250 liter

Amount of mix = 1000kg

As the amount of the mix is identical to the standard mix then no adjustment is made. A single dosage has a total volume of 250 Kg in the container. The batch is plausible and is released.

Amount of mix = 5,000kg

As the mixed volume is 5 times greater than the standard mix, the nominal value is adjusted in case of linear adjustment from 250kg to 1250kg. here, the upper limit of 1500 Kg for single dosages is not exceeded - the batch is released.

Amount of mix = 6,000kg

As the mixed volume is 6 times greater than the standard mix, the nominal value is adjusted in case of linear adjustment from 250kg to 1,500kg. Here, there are 4 single dosages of 1500kg resulting in a total volume of 6000kg in the container. There is an overdosage of 1000kg in the container although the single dosage volumes are within the limits of the single steps. However, as the system only checks the limits of the single dosages, but does not permit the standard mix to be exceeded or fallen below, the batch is plausible and is released.

Remedy

The incorrect behavior of this batch can be prevented by making a change to the configuration at the upper limit of the single step from 1500 Kg to 1250 kg. Engineering and the creator(s) of the recipe must work together on this. Please carry out the test runs.

9.6.3 Opening the control recipe for the batch

9.6.3.1 Opening the control recipe for the batch

Even during the batch planning, you can open the graphic recipe structure of the control recipe to check it. In this case (batch is still planned), a validation is performed when it is opened! If the batch is released, there is no validation.

Procedure in the BatchCC:

1. In the "Orders" folder in the BatchCC select the object "Batch" below the production order.
2. Select the menu command **Control > Open control recipe**.

9.6.3.2 Icons in the control recipe view

What do the icons in the control recipe view represent?

For batches that have been started, the following icons can be displayed in the corresponding recipe elements in the control recipe window.

Icon	Description
	Electronic signature necessary
	Operator dialog exists
	Recipe element locked (being processed)
	Recipe element running
	Breakpoint set
	Error
Element	Path of the recipe element
Text	Comment on the property

9.6.3.3 Overview of the control recipes

In BatchCC, in addition to the open control recipe window, you can also open a structural overview of the control recipe with the menu command **View > Toolbars > Overview for control recipe**.

The complete control recipe is always shown in the overview window. The overview window is used for more complex control recipes that you display enlarged in the control recipe window. You use this function to visualize details in large recipes.

Using the overview window

The enlarged area is shaded in the overview window.

Note

The shaded area is released for moving only when objects are enlarged so much in the control recipe view that they are cut off in the window.

If you click the shaded area, the area can be shifted to the point in the control recipe that you are interested in. In so doing, the content is updated immediately in the control recipe window. In this way you navigate easily to the required place, without changing the zoom factor again. The shifted area is simultaneously displayed in the control recipe view.

9.6.4 Processing status of the batches

9.6.4.1 Status of the batches

Status of the batches

The status of a batch provides you with information about the batch processing. Example: Is the batch completed or has it been aborted? The status symbols are updated dynamically.

The symbols indicating the batch status are shown in the order folder of the tree structure and in the batch lists (Planning, Status and Result) in the BATCH Control Center. The table below shows you which status symbols can be displayed in which batch lists.

Symbol	Status	Meaning	Planning list	Status list	Results list
	Planned	The batch was created as a new batch in batch planning	X		
	Release prepared	While releasing the batch, an error occurred in communication between BatchCC and the BATCH server (Batch control server).	X		
	Released	The batch has been created and released. A control recipe exists.	X	X	
	Locked	The batch has been created and released but was locked by batch control to prevent it being started.	X	X	
	Canceled	The batch was canceled. Further processing is no longer possible.			X
	Waiting	The batch was started and is now waiting for the unit or units required at the start of the recipe to become free.		X	
	Running	The batch was started or resumed and is being processed.		X	

Symbol	Status	Meaning	Planning list	Status list	Results list
	Pausing after step	The batch was paused, the steps currently being executed are completed.		X	
	paused after step	The batch was paused, the steps currently being executed are completed.		X	
	Held	The batch was held.		X	
	Aborted	The batch was aborted by operator intervention. Processing can no longer be resumed.			X
	Stopped	The Batch was stopped due to an operation. Resumption is no longer possible			X
	Completed	The batch was completed correctly.			X
	Testing release	After updating the process cell data, released batches change to the "testing release" status. After the update, the batches in the "testing release" status are checked automatically. If the check is successful, the batches are returned to their original status. If the testing is unsuccessful the elements will be transferred to the status "Release invalid". Such batches must no longer be used and can only be deleted!	X	X	
	Release invalid		X	X	

Additional status

The following symbols indicate other batch statuses in addition to those listed above. These symbols are superimposed on the type symbol for orders.

Symbol	Status	Meaning	Planning list	Batch status list	Results list
	Chained	The batch is chained with a predecessor.		X	X
	Closed	The batch is closed and can be archived.		X	X
	Archived	The batch is archived. The batch can now be deleted.		X	X
	Error	At least one recipe phase in the control recipe of the batch has reported an error or the batch control itself is in an exceptional state.		X	X

Symbol	Status	Meaning	Planning list	Batch status list	Results list
	Operator prompt	Pending operator prompts in the control recipe • Operator instruction / dialog or • Electronic signatures (ESIG) or • Breakpoints or • Individual steps stop the batch sequence.		X	X
	Online structure change	An online structure change was started.		X	X

9.6.4.2 Releasing batches

You release a planned batch as follows.

Procedure

1. Select the batch you want to release either in your order folder or in the navigation window in BatchCC or in the planning list.
2. Select the Control > Release menu command.

Result

The batch is released for production. If errors occur in the validation, the problems are displayed and the recipe status remains "planned". If no errors occur, the control recipe is created. Processing of the batch is started depending on the Start mode. This assumes that the units required for the start of the control recipe are free. If errors occur in communication between BatchCC and the BATCH server (Batch control server), the batch only changes to the "Release prepared" status. After communication between BatchCC and BATCH server (Batch control server) is functioning again, the release can be completed by executing "Release" again.

9.6.4.3 Locking a batch

To prevent a released batch from being started (by operator command or automatically), you can lock it.

Procedure

1. Select the batch in the tree structure in the BatchCC or in the planning list.
2. Select the Control > Lock menu command.

Result:

The batch changes to the "locked" status.

To change a locked batch back to the "released" status, use the Control > Unlock menu command.

9.6.4.4 Canceling a batch

Batches can also be canceled. After it has been canceled, a batch can no longer be used; in other words the batch can no longer be released or started.

Procedure

1. Select the batch in the planning list or in the navigation window of the BatchCC.
2. Select the Control > Cancel menu command.

Result

The batch changes to the "canceled" status. You can only delete a canceled batch.

9.7 Electronic signature

9.7.1 Specifying electronic signatures

SIMATIC BATCH supports the function "Electronic signature" according to the requirements as regards FDA or 21 CFR Part 11.

The "electronic signatures" function allows you to enter one or more electronic signatures in the form of dialogs similar to the logon prompts normal in Windows when defined actions are taken with BATCH objects such as batches, recipes, recipe elements etc.

If an electronic signature is not entered, this prevents the corresponding operator action being taken.

The entered signature data is saved in the batch history or in the relevant object being manipulated and is available for subsequent evaluation (logging).

The actions taken with BATCH objects for which the "Electronic signatures" function is activated can be defined for specific roles (permissions) in the "ESIG" dialog box. The acronym "ESIG" stands for "Electronic signature".

Requirement

The SIMATIC Logon software verifies the logon data. This means that SIMATIC Logon must be installed on the BATCH clients.

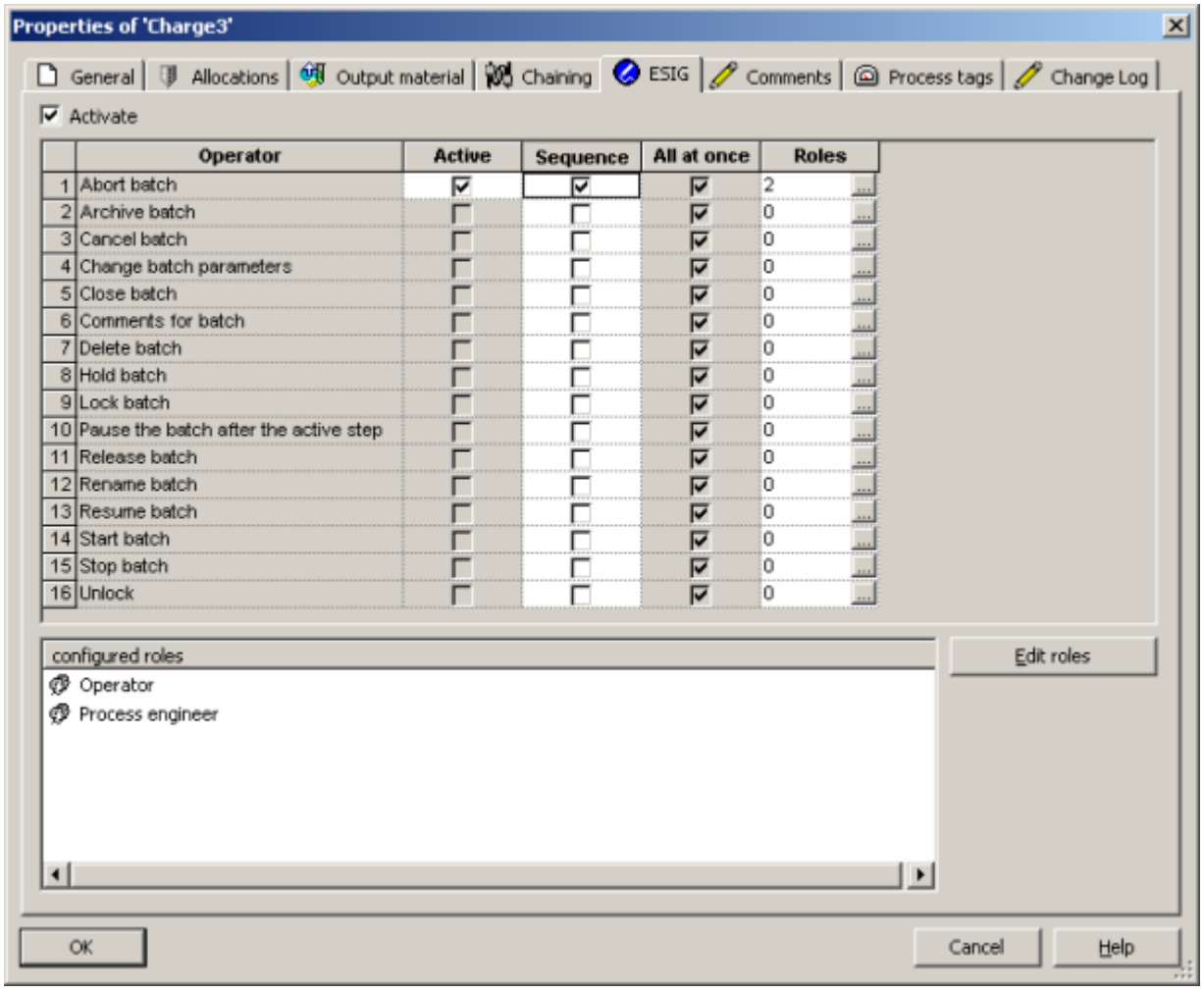
What can be signed?

Operator action relating to BATCH objects such as batches, control recipes, unit recipes, recipe operations, recipe phases and transitions

All the possible operator actions for the selected object are shown in the "ESIG" dialog box. And you can only configure electronic signatures for the operator actions listed in the dialog. The number and type of operator actions depend on the selected BATCH object.

Procedure

1. In the BatchCC, select the batch, the master recipe, or the library operation and then select the **Edit > Properties** menu command or select the recipe procedure, the recipe unit procedure, the recipe operation, the recipe phase, or the transition in the BATCH Recipe Editor and then select the **Edit > Object properties** menu command.
   Result: The "Properties of <objectname>" dialog box opens.
2. Change to the "ESIG" tab (in the figure below, this is for a batch) and select the "Activate" check box. Result: A table with possible operator actions for the object is displayed.



3. Click the "..." button in the "Roles" column of the required operator action. Result: The "Configure roles" dialog opens.
4. Here, select the user roles required to provide an electronic signature for the selected operator action:

	Use this icon to move the "available roles" for operator input in the "Configured roles" direction or back again to cancel already configured user roles.
	Use these icons to specify the sequence in which signatures must be entered if multiple signatures need to be obtained. First select the user role you want to arrange in order in the "Configured roles" list.

1. Confirm the settings with "OK". Result: All the signatures required and the necessary sequence of signatures are displayed in the "Configured roles" table in the "ESIG" dialog box. The check box in the "Active" column is only enabled and available for selection after user roles have been assigned to an operator action. You can then enable or disable the actions requiring signatures in the "Active" column.
2. In the "Sequence" column, select the actions for which the signatures must be entered in a specific order per action if more than one signature is required.
3. The "All at once" check box is always selected for all operator actions; this represents the default and cannot be modified. When more than one signature is required per operator action, all signatures must be entered at the same time; in other words, all electronic signatures of all required roles must be entered in an open signature dialog box.
4. When completed, confirm the configuration with the "OK" button.

Result

At runtime of the object (batch, RPH, ROP, RUP, transition), after the action is complete, the dialog box "SIMATIC BATCH: Sign" opens. For information on entering electronic signatures, refer to section "Signing operator actions (Page 410)".

Note

Once electronic signatures have been created, they can be deactivated but not deleted.

Project settings > Electronic signatures

In the "Electronic signatures" tab in the project settings, you can enable or disable other operator actions related to an action centrally for the entire project. You will find more detailed information in the section Electronic signatures tab (Page 799).

9.7.2 Signing operator actions

At runtime of the object (batch, RPH, ROP, RUP, transition), after the action is complete, the dialog box "SIMATIC BATCH: Sign" dialog box opens automatically.

The signature request for the corresponding object is also visualized in the control recipe and in the tree view of the BatchCC with the following icons.

Icon	Description
	Highlighting in the control recipe.
	Highlighting in the BatchCC.

With a right-mouse click on the object to be signed and the shortcut menu command "Sign", this dialog box can also be opened here.

With the "Sign" button of the dialog box "SIMATIC BATCH: Sign", the entry of the signatures can be started. assuming that you have configured electronic signatures for the object.

Requirement

The SIMATIC Logon software verifies the logon data. This means that SIMATIC Logon must be installed on the BATCH clients.

Initial situation:

After an operator action, the "SIMATIC BATCH: Sign" dialog box opens automatically. As the representative of a user role, you are prompted to sign the action.

Procedure

Your user role appears in the dialog box "SIMATIC BATCH: Sign" in the "Signatures" table:

1. Click the "Sign" button.
   Result: The "SIMATIC Logon Service - Signature" dialog box opens.
2. Enter your user name and your password and then select the correct domain or correct computer.
3. Confirm with "OK".
   Result: The information for the signature is displayed in the "Signatures" table.
   - If several signatures are required and the "All" option is active, all the signatures must be entered at the same time in one open "SIMATIC Logon Service - Signature" dialog box before clicking "OK".
   - If several signatures are required and the "Individually" option is active, the open "SIMATIC Logon Service - Signature" dialog box can be closed again with "OK" after entering a signature.

   In both cases, the signature is complete, only when all signatures have been entered.
4. Confirm the "SIMATIC Logon Service - Signature" dialog box with "OK".

Note

Remember that it may be necessary to complete the signatures within a specified time. The time available and the expiration of the time is displayed in the "Times" group in the "SIMATIC Logon Service - Signature" dialog box.

9.7.3 Forcing comment entry

Comment field in the "Sign" dialog

To sign operator actions, or the editing of recipes, you can now also force entry of a comment. This means that the operator or the person who is required to sign electronically per user role, is forced to enter a comment in the comment field of the "Sign" dialog, in addition to signing electronically. Only then can he close the dialog with the "OK" button.

Requirement

To configure in the BATCH Control Center, enable the "Force comment when signing" check box in the "Electronic signatures" tab of the "Project settings" dialog in the Options > Settings menu.

Signing and comment entry

If an electronic signature with forced comment is configured for an action, the batch remains at the step at which the signature is required, and a WinCC process control message is generated. An icon indicating a signature request is displayed at the step and an icon indicating an operator prompt is displayed at the batch.

Icon	Description
	Signature request at the recipe step.
	Operator prompt on the batch in the BCC

Procedure

1. Open the control recipe in the BCC.
2. Right-click on the recipe step with the ESIG symbol and open the "Sign" shortcut menu.
3. Enter the required electronic signature and a comment.
4. Close the dialog with "OK".

Result

After signing with a forced comment entry, the held step is resumed.

9.8 Batch control

9.8.1 Requirements for batch processing

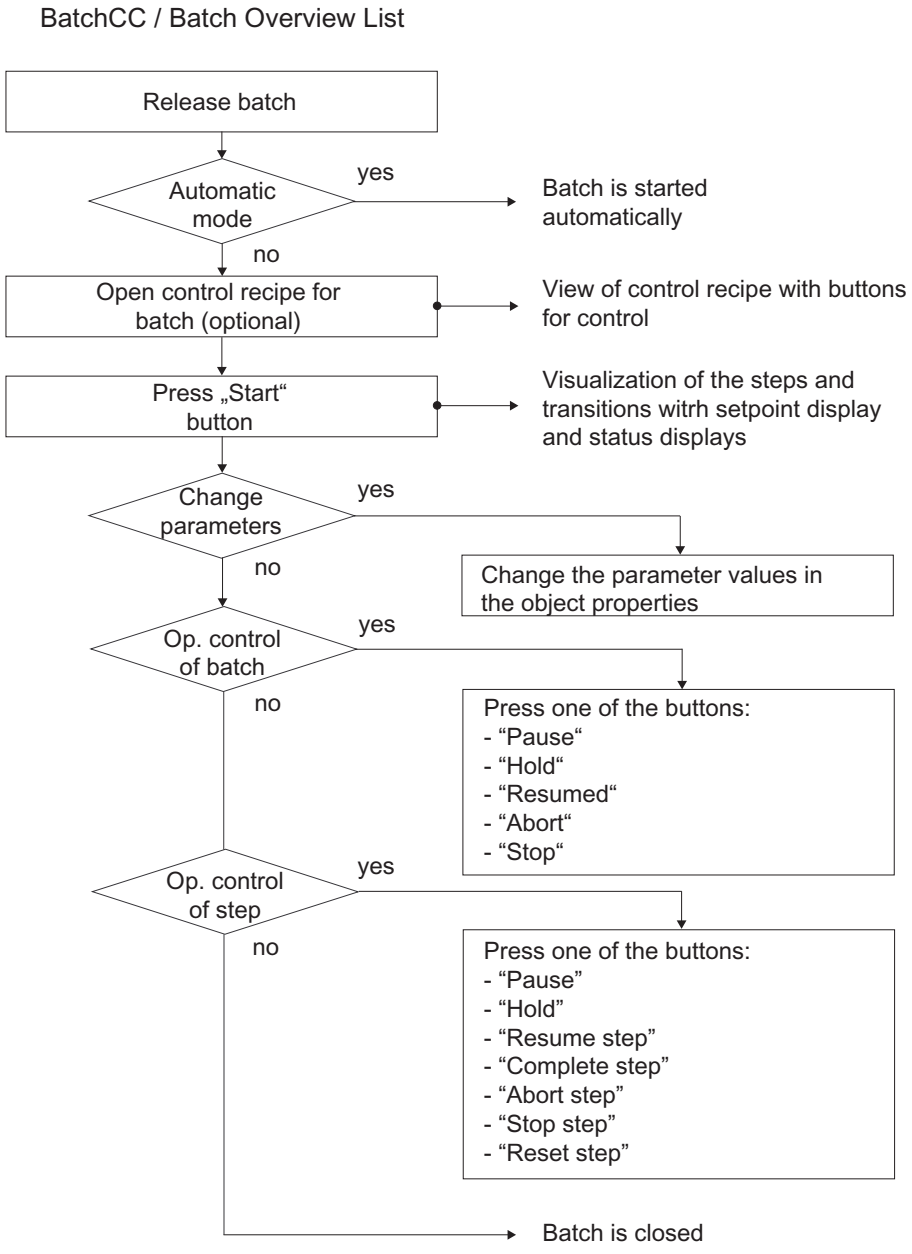
Requirements

Batch control with SIMATIC BATCH requires the PCS 7 OS (WinCC) system. Before a batch can be processed, the following requirements must be met:

- The PCS 7 OS system must be operating in runtime mode (online).
- The SFC type instances or BATCH interface blocks must be known to the PCS 7 OS data manager.
- The bus connection between the PCS 7 operator stations (OS) and the automation systems (AS) must be active.
- The batches for the control recipes must have been generated already; in other words, the batches have the "Released" status.
- The operator has the necessary permissions for batch control in the user management of SIMATIC BATCH.

9.8.2 Flow chart: How is a batch started and controlled?

How do I start and control a batch?



The activities involved in batch control are as follows:

Opening the control recipe (Page 442)

Starting production of a batch (Page 445)

Changing setpoints (Page 482)
Commands for controlling batches (Page 447)
Commands for recipe steps (Page 449)
Locking a batch (Page 406)
Canceling a batch (Page 407)

9.8.3 Basics of batch control

9.8.3.1 Principle of Batch Control

Definition

By batch control, we mean the following:

- Batch execution
- Visualization and control of the batches on the PCS 7 OS

Batch execution

The program checks which units are required to start each released batch. Based on the UNIT_PLC blocks, a check is made to find out whether the units have been released for use by SIMATIC BATCH and are not allocated to other batches. If the units are free and released, the batch can be started, otherwise the relevant parameters are reported for monitoring.

Batch control is always ready to receive OS messages about parameter changes. If a monitored parameter changes, batch control is informed and takes the required action.

Visualization and operator control of the batches

In BatchCC, the control recipe for a batch can be opened. The presentation of the control recipe corresponds to that of the BATCH Recipe Editor. While a batch is being made, the states of steps and transitions are displayed color-coded. The dynamic display of events on the monitor also allows an operator to intervene.

9.8.3.2 Order of batch processing

Order of processing

In SIMATIC BATCH the execution sequence of created batches (status: planned) is determined by the order of their release. All released batches are included in batch control in the order of their release. Batches that do not use the same units and equipment modules can also be processed at the same time.

When the required units at the start of the control recipe are free, the batches are started "immediately", "time-driven" or by the "operator", depending on the selected start mode. If

"time-driven" is set, the batches are started according to the set time. Once the time has elapsed, the batch whose start time is furthest in the past is started first.

Note

The processing order of batches is guaranteed as long as the BATCH server is not shut down and no redundancy failover takes place.

With a redundant BATCH server, the execution order becomes invalid when the server is switched.

The processing order always becomes invalid when the BATCH server is restarted. It makes no difference here whether the restart was caused by a problem or an operation.

Chain the batches if you want the processing order to be valid after a server restart.

Example scenario

- If a "Start allocation" for unit A was selected, the batch starts only when it can occupy unit A. If the unit is allocated to another batch, the batch does not change to the "in progress" or "waiting" status.
- There is another reaction if "Start allocation" is not selected: The batch changes to the "waiting" state. In other words, the batch starts and waits until unit A is released.

Chaining batches

If you want the batches to be processed in a specific order (regardless of the order in which they were released), you can also chain batches. For each planned batch, you can specify which batch must be started and which batch must be completed before the planned batch is started.

Additional information

Chaining of batches (Page 391)

9.8.3.3 Executing a batch

Execution of a recipe in SIMATIC BATCH AS based

The following recipe is intended to illustrate execution of a recipe in As-based SIMATIC BATCH:

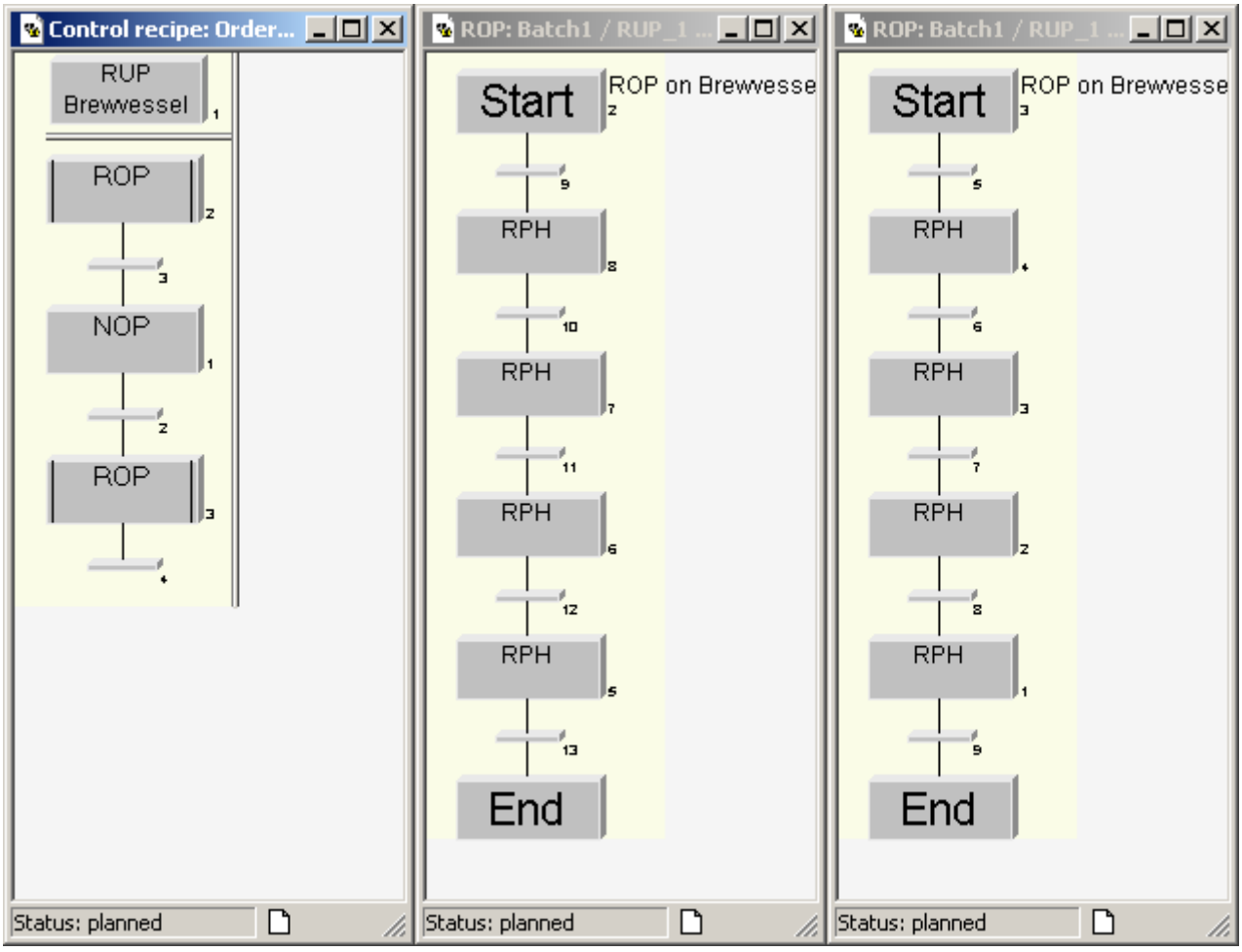


Figure 9-12 Online view of the control recipe in the BCC, status planned

Placeholder (No Operation = NOP) without runtime

The individual recipe phases (RPHs) in the recipe shown only contain NOPs configured without a runtime. Since this recipe manages without feedback from the process or runtimes of the recipe phases, it is good for demonstrating how SIMATIC BATCH AS-based works. In the example, we are assuming that the UNIT_PLC block is installed in OB 32.

The batch runtime fits in the cycle

The batch needs a runtime of approx. 34 ms. If the "MaxCyclRun" parameter is set to a value greater than or equal to 34 ms, the entire batch can be processed within one OB32 call. The result can be seen in the following diagram. The status of all recipe elements is sent to the BATCH control server within 34 ms via the direct communication channel of the BATCH control server (BCS) and the AS.

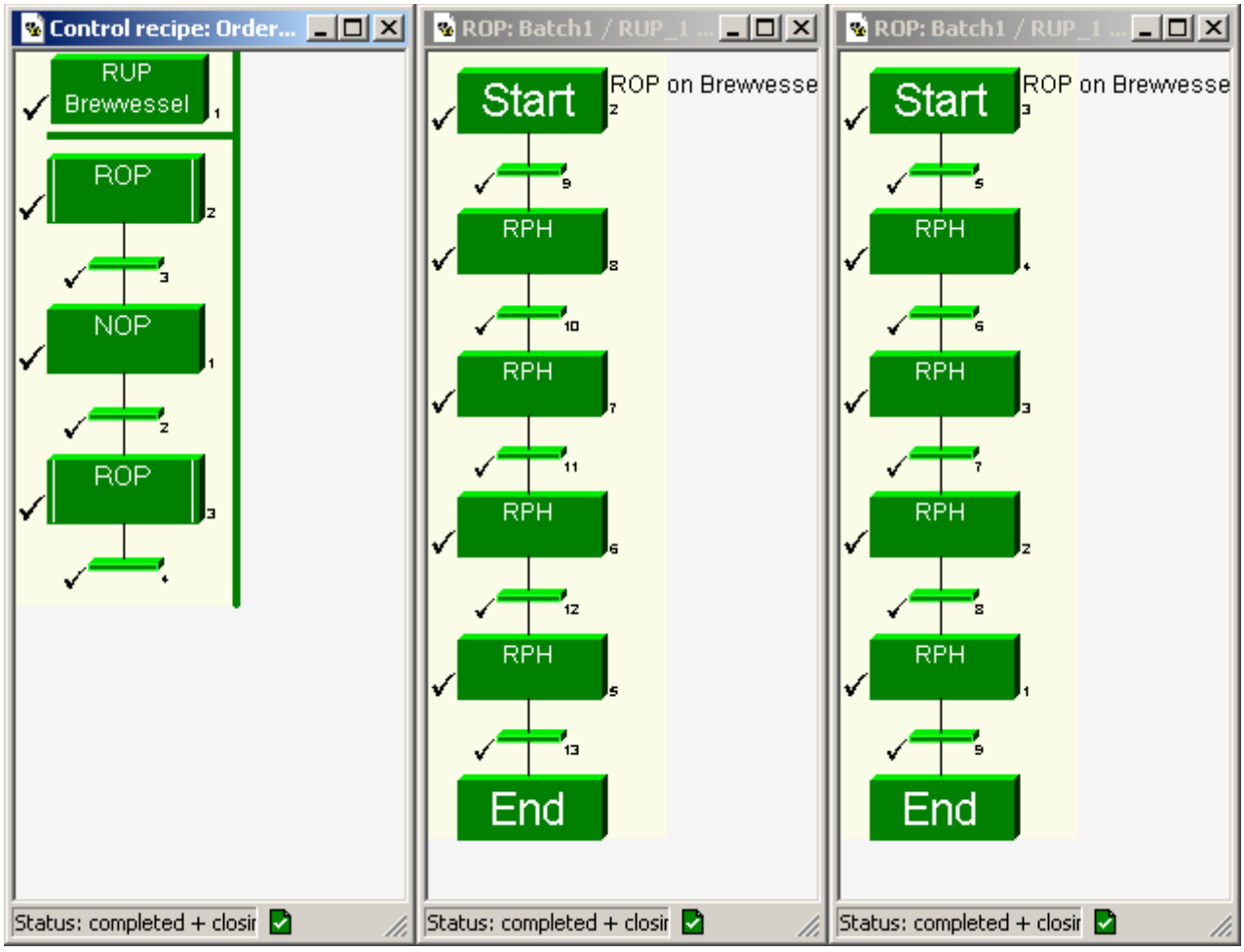


Figure 9-13 Online view of the control recipe in the BCC, status completed and completing

The batch runtime does not fit in the cycle

If the "MaxCyclRun" parameter is now set to a value of less than 34 ms, the batch is not fully processed within one OB 32 call, instead processing is split over several OB 32 calls (see following diagram). In such cases it takes several seconds for the batch to be processed.

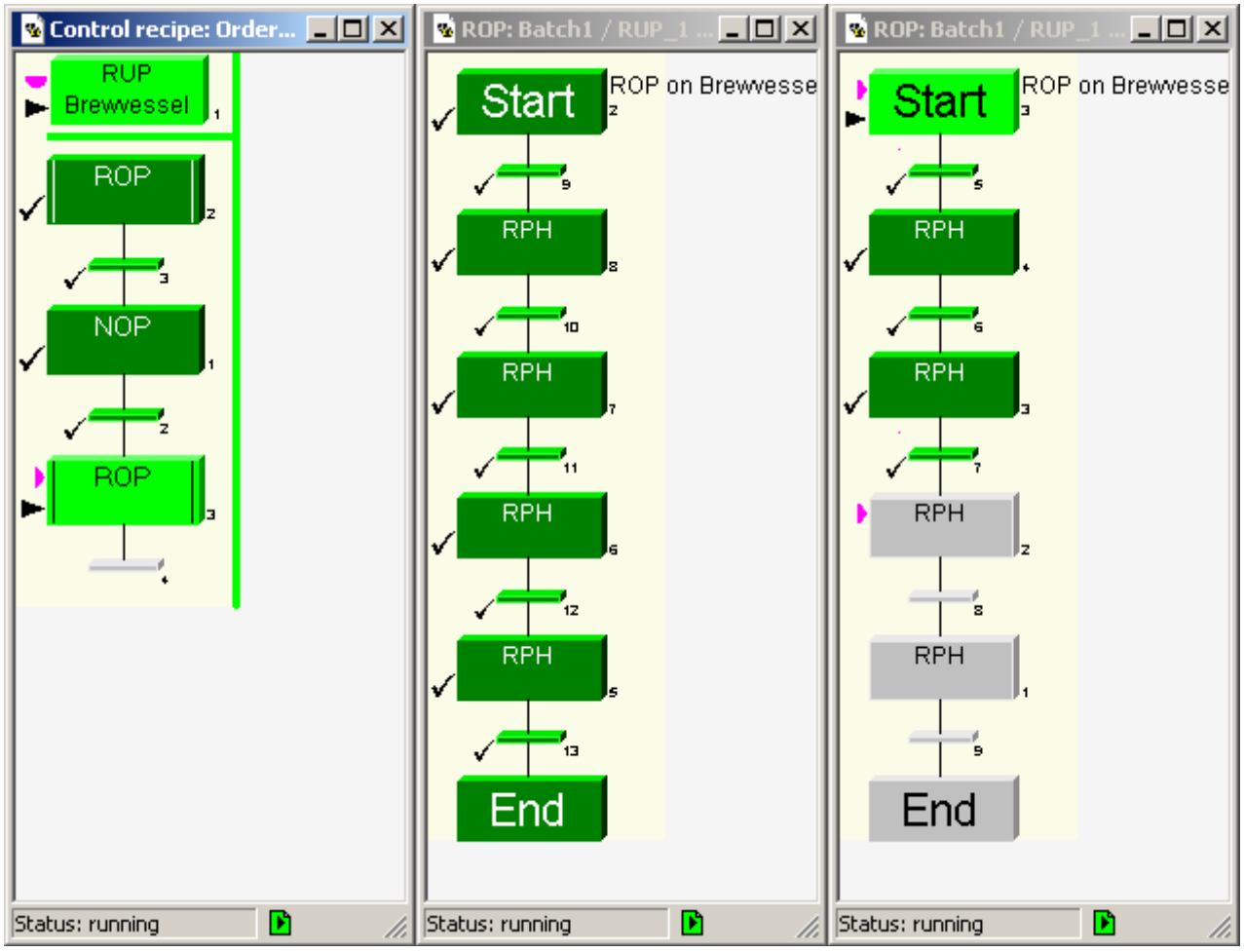


Figure 9-14 Online view of the control recipe in the BCC, status running

Note

Control recipe is run through once

Once a batch has been started, the entire control recipe is run through once without consideration of the time set in the "MaxCyclRun" parameter.

9.8.3.4 Processing the recipe structure

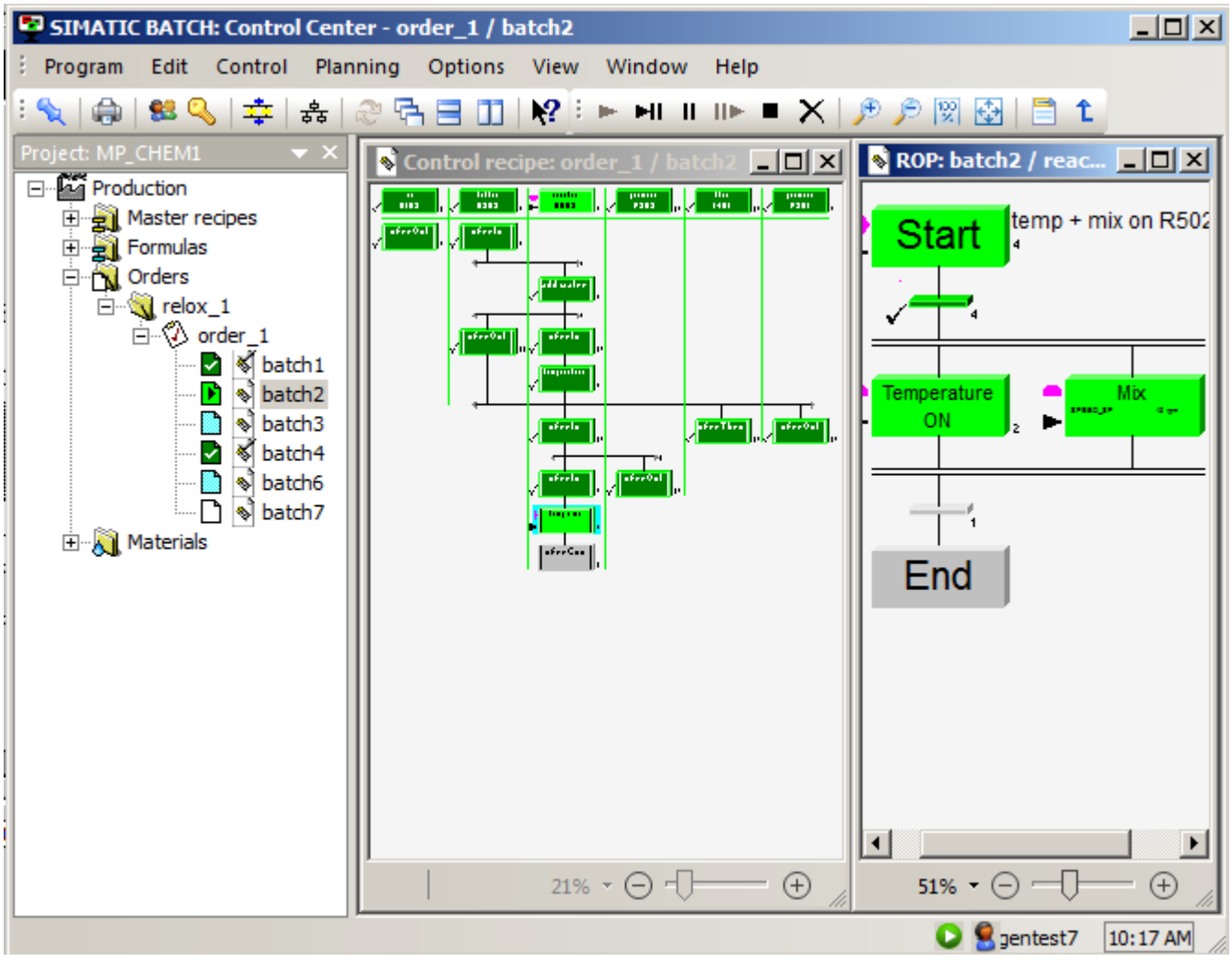
Principle

The recipe structure of a control recipe is processed according to the predecessor-successor principle at all hierarchy levels. In other words, when processing of a recipe element is completed, the processing of the next step in the sequence is activated.

Hierarchical recipe: Within a recipe unit procedure (RUP), the individual recipe operations (ROPs) are executed in sequence accordingly. If the ROPs of different RUPs of a recipe procedure are synchronized, several recipe operations (in different RUPs) can be started at the same time. Within a recipe operation, the individual steps (recipe phases -> EPHs) and transitions (step enabling conditions) are also executed sequentially.

Example of a hierarchical recipe

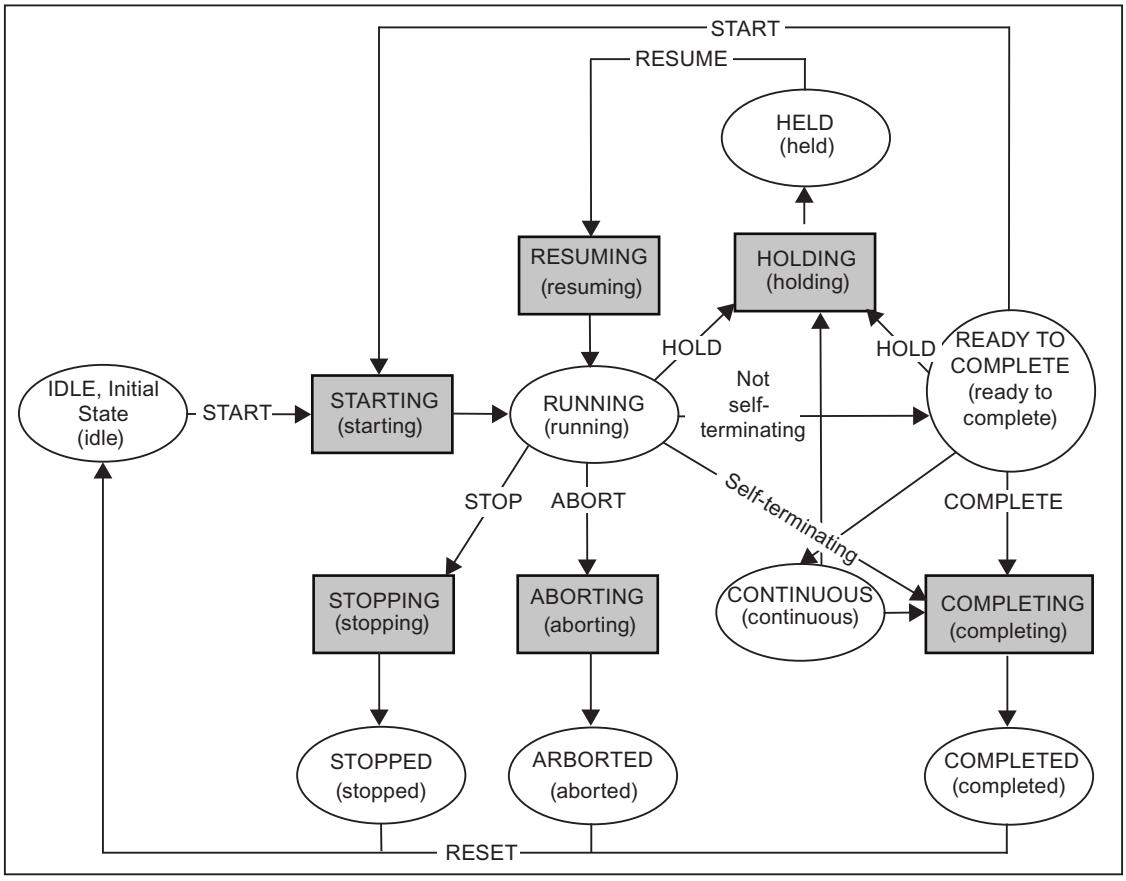
The following figure uses a color visualization to show the execution of a control recipe with a typical hierarchical recipe structure. The entire control recipe is shown in the central window and the right-hand window shows the execution of a recipe operation. This recipe operation is only given the status "completed" when the synchronization is complete.



9.8.3.5 Status changes of equipment phases

SIMATIC BATCH uses so-called equipment phases (EPE, Equipment Procedural Elements) for the recipe sequence. This can be of the type EPH or EOP.

To ensure problem-free cooperation with the overlying control, the equipment phase must provide the following main states (final states), the transitional states are optional and not absolutely necessary:



Legend

Final status

Transitional status

Commands are possible for:

- STOP: In all statuses except IDLE, ABORTED, ABORTING, STOPPED and COMPLETED.
- ABORT: In all statuses except IDLE, ABORTED and COMPLETED.

READY TO COMPLETE and COMPLETED

The following must be differentiated relative to an equipment phase:

- A self-terminating equipment phase. After it has run, such a phase changes to the COMPLETED status.
- A non-self-terminating equipment phase. Once it has run, such a phase changes to the READY TO COMPLETE status. In the READY TO COMPLETE status, an EPE signals that it must be completed actively by the control.

Control in manual mode (batch "Operation" start mode)

With commands for recipe steps, you can execute these status changes manually, for example, during commissioning.

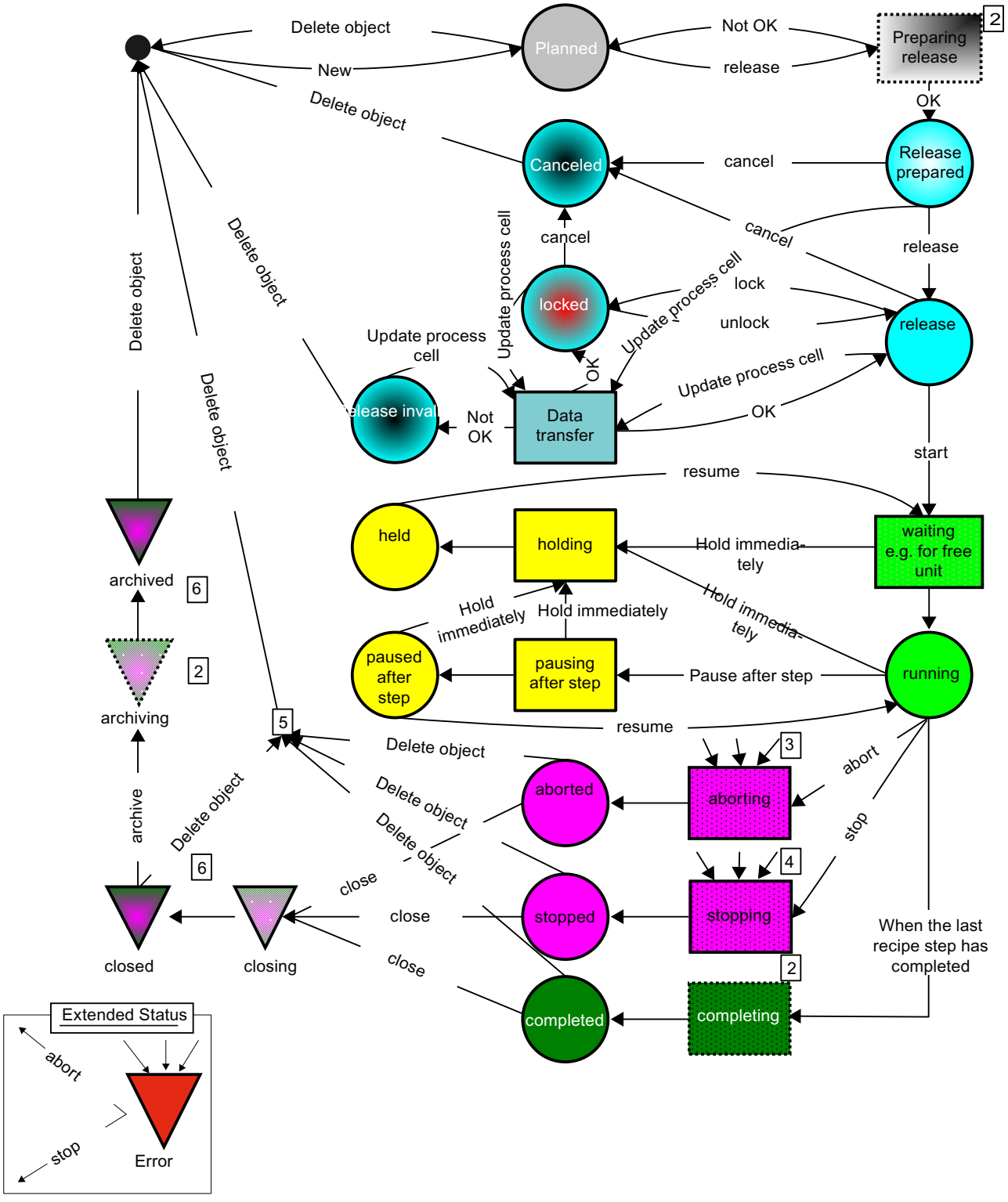
Additional information

Operator commands for recipe steps (Page 449)

9.8.3.6 Status changes with batches

Statuses of a batch

The schematic below shows the possible statuses and status changes of a batch depending on the existing status.


Delete object
New
Planned
Not OK
release
Preparing release
2
OK
Delete object
Canceled
cancel
Release prepared
cancel
cancel
release
Update process cell
locked
lock
unlock
release
Update process cell
Update process cell
Update process cell
OK
Release inval
Not OK
Data transfer
Update process cell
OK
Delete object
Delete object
Delete object
start
resume
held
holding
Hold immedia-tely
waiting e.g. for free unit
Hold immediately
Hold immediately
Hold immedia-tely
archived
6
2
archiving
paused after step
pausing after step
Pause after step
running
5
resume
Delete object
3
aborted
aborting
abort
archive
Delete object
Delete object
Delete object
stop
6
4
close
close
stopped
stopping
When the last recipe step has completed
close
2
closed
closing
completed
completing
Extended Status
abort
stop
Error

Legend

1. The error status of a batch depends on the recipe procedure elements (RPEs).
2. For later use.
3. After "Release", can be reached from all statuses except "abort" and "completed", not using additional ID.
4. After "Release" can be reached from all statuses except "abort", "aborting", "stopped" and "completed", not using additional ID.
5. Depending on the project settings in the "Batches" tab, "Allow deleting of completed, unarchived batches".
6. In addition: "archived", "archiving", "completed" and "completing", only additional ID.

Note

Status changes of a batch

1. ERROR" is an additional label that can appear in any status from "WAITING" onwards. Once the cause of the problem has been resolved, the batch can be resumed using "RESUME", aborted using "ABORT", or stopped using "STOP".
2. A batch is only in the "WAITING" status when it is waiting for its first unit to be allocated.
3. CLOSED" and "ARCHIVED" are additional labels, which continue to show whether the batch was completed or aborted.
4. "Batch valid" is an interim status in normal conditions and a status in an error case, assuming a validity check was successfully performed before the error occurred.
5. The additional label "archiving" is used only in connection with the "Prompt archiving" technology.

Additional information

Status of the batches (Page 404)

States of the batch steps (Page 460)

States of a transition (Page 459)

PH Archive server - Prompt archiving (Page 504)

9.8.3.7 Status changes with recipe steps

Statuses of a recipe step

The figure below shows the possible statuses and status changes of a recipe step depending on its existing status.

Note

All external clients, such as API clients, must comply with this diagram to ensure compatibility with future versions.

All clients that receive recipe results, must be prepared for the optional statuses for future software versions.

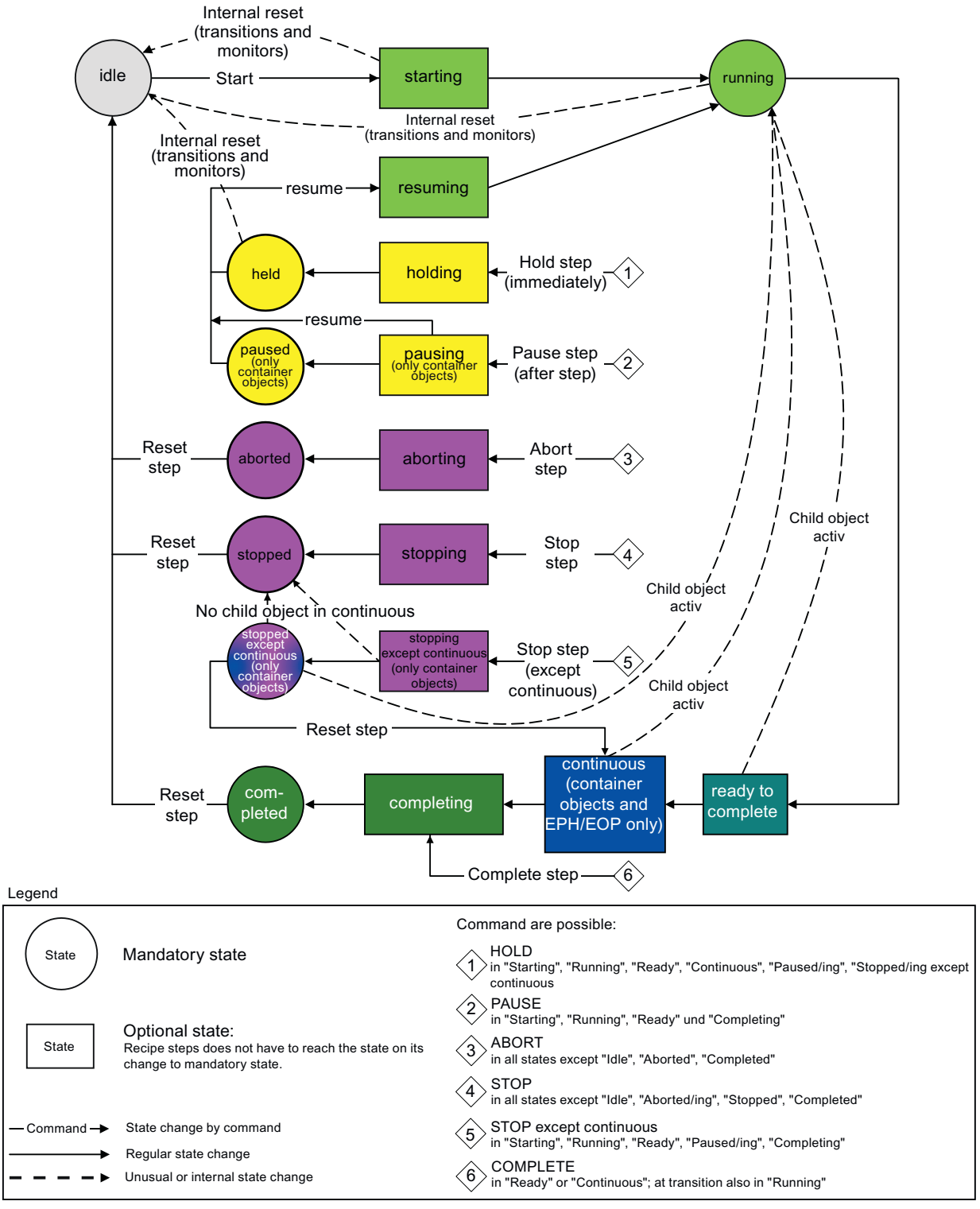


Figure 9-15 Status changes with recipe steps

Abbreviations and information on the diagram

EPH = equipment phase, e.g. heating

EOP = equipment operation

Container object = an object that can contain a lower-level object. For example in hierarchical master recipes, a recipe unit procedure (RUP) and a recipe operation (ROP). In a flat master recipe, for example a substructure (sub).

Continuous = continuous mode (continue)

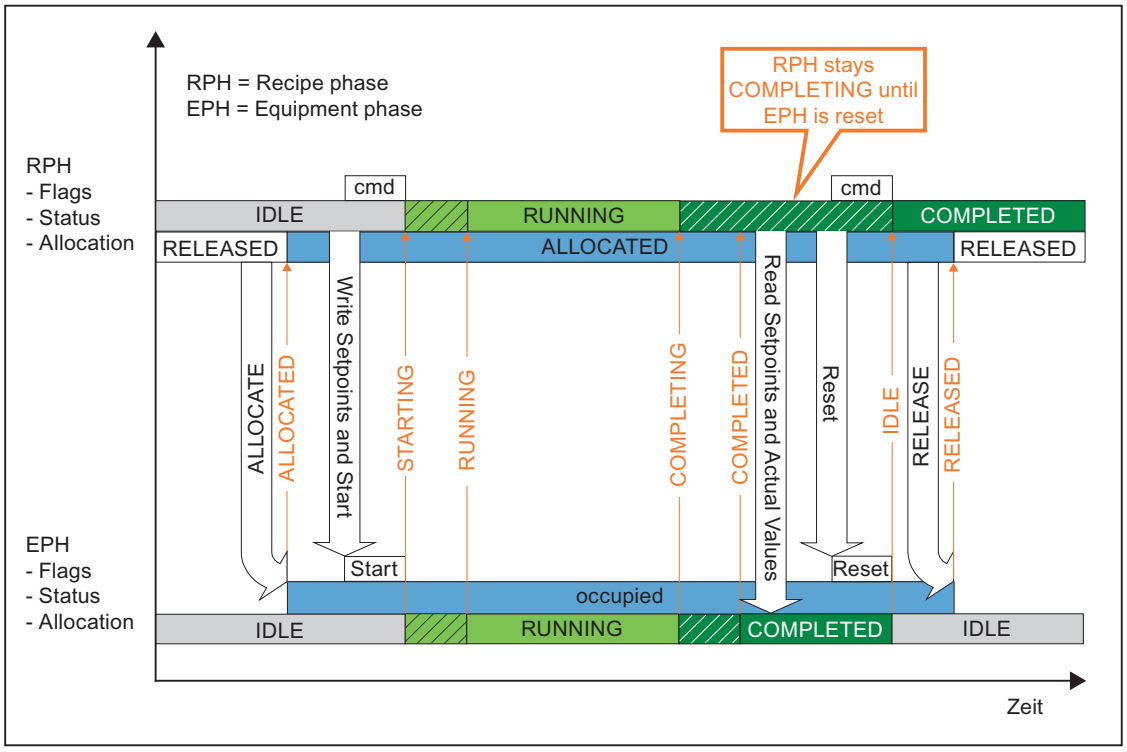
Note

When a recipe step takes on the additional status "manual operation" and is occupied by SIMATIC BATCH, the status can be changed from inactive to any other status. This means that the recipe phase takes on the status of the SFC, for example.

9.8.3.8 Self-terminating and non self-terminating recipe phase

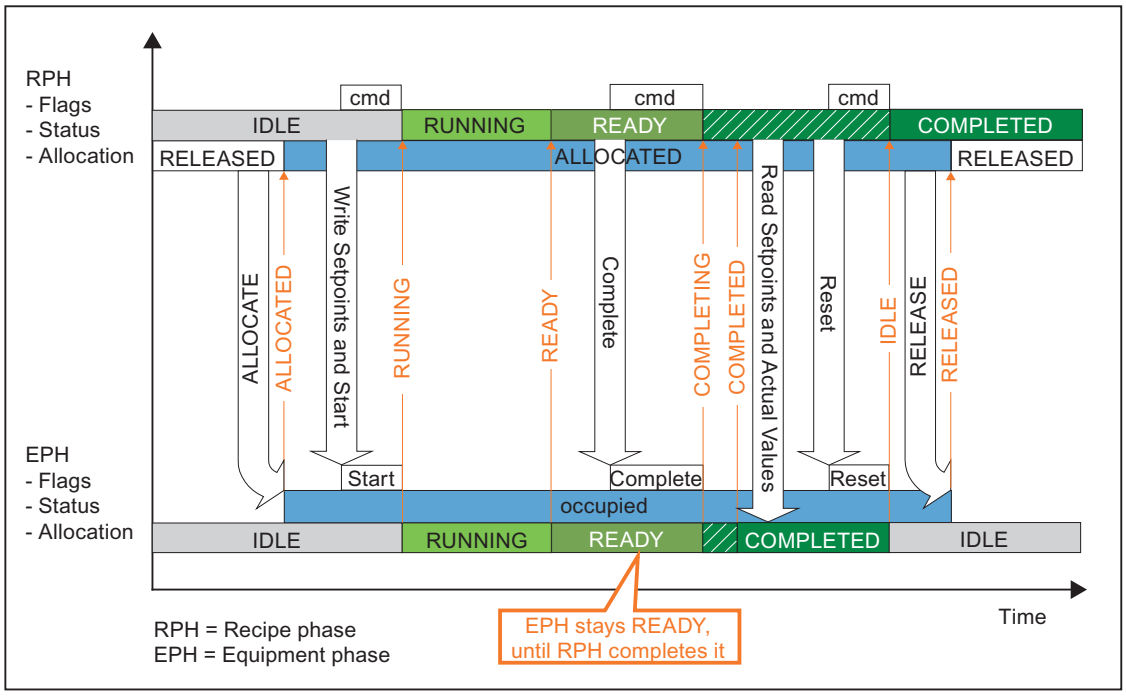
Self-terminating recipe phase and and non self-terminating recipe phase

For a self-terminating recipe phase the normal transition is from IDLE to RUNNING to COMPLETED. The flowchart of a self-terminating recipe phase is shown below.



Non self-terminating recipe phase

A non self-terminating recipe phase goes from IDLE to RUNNING to READY TO COMPLETE, and waits for the COMPLETE/TERMINATE command of the higher level controller. With the READY TO COMPLETE status, the recipe phase signals that it needs to be completed actively by the control (non-self-terminating recipe phase). The flowchart of a non self-terminating recipe phase is shown below.

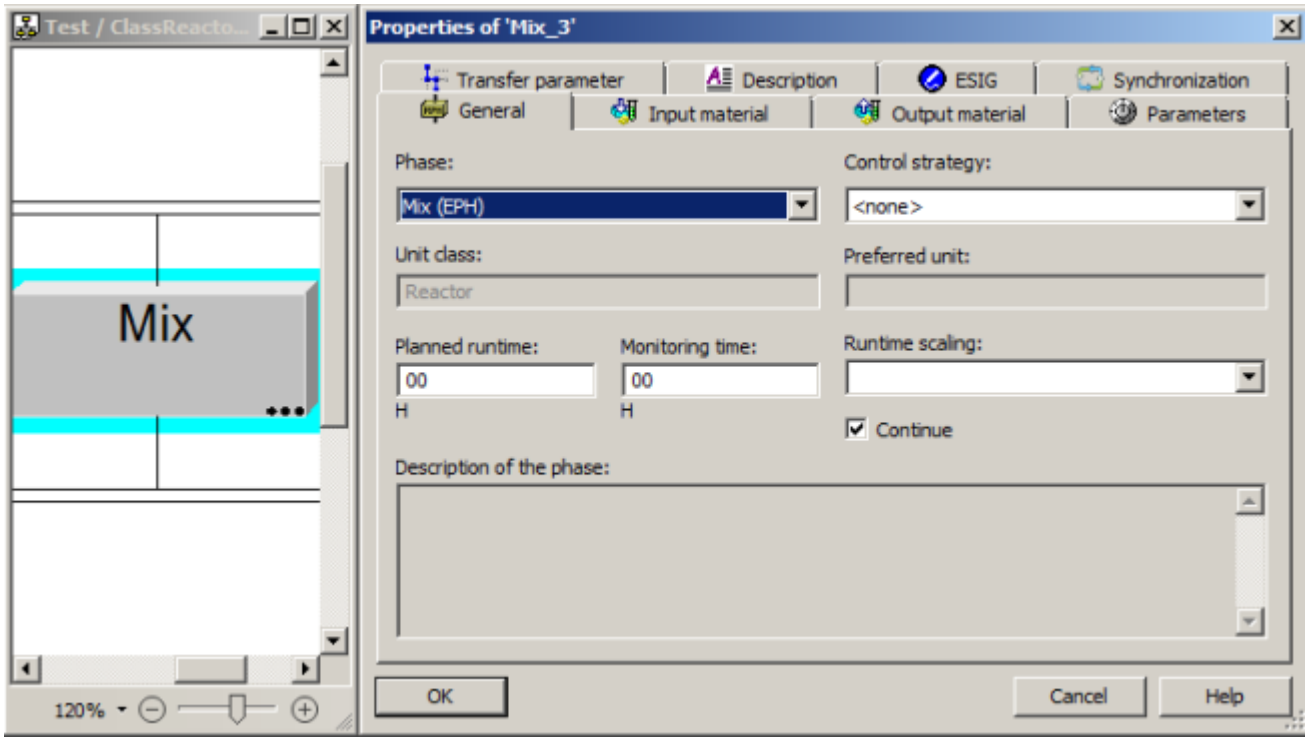


Example of a self-terminating and a non self-terminating recipe function

"Dosing, is a self-terminating process i.e. the function runs autonomously until it reaches the "Completed" status. The "Dosing" process is reset by the recipe control and the subsequent "Heating" phase is started.

"Agitate" is a non self-terminating process, i.e. the function reports "Ready_TC" (ready to complete) as soon as the agitator is running at the target speed. The recipe control then decides with the "Complete" command when the agitator should be switched off.

As soon "Transfer" phase that follows "Agitation" is set by the control, the agitator is switched off with the "Complete" command. The "Transfer" function can start once the agitation reports the status "completed".



9.8.3.9 Parameter trigger and start lock

Checking setpoints with parameter triggers

By setting the IPARAM input, the recipe phase informs the equipment phase that there are new setpoints. This is the case prior to starting, when there is a change of control strategy or after parameter changes when a phase is active. This gives the equipment phase the opportunity of checking the setpoints and preventing the start with the start lock.

Start lock with IEPH and IEOP interface blocks

With the IEPH and IEOP interface blocks, the recipe phase takes into account the start lock according to the following diagram:

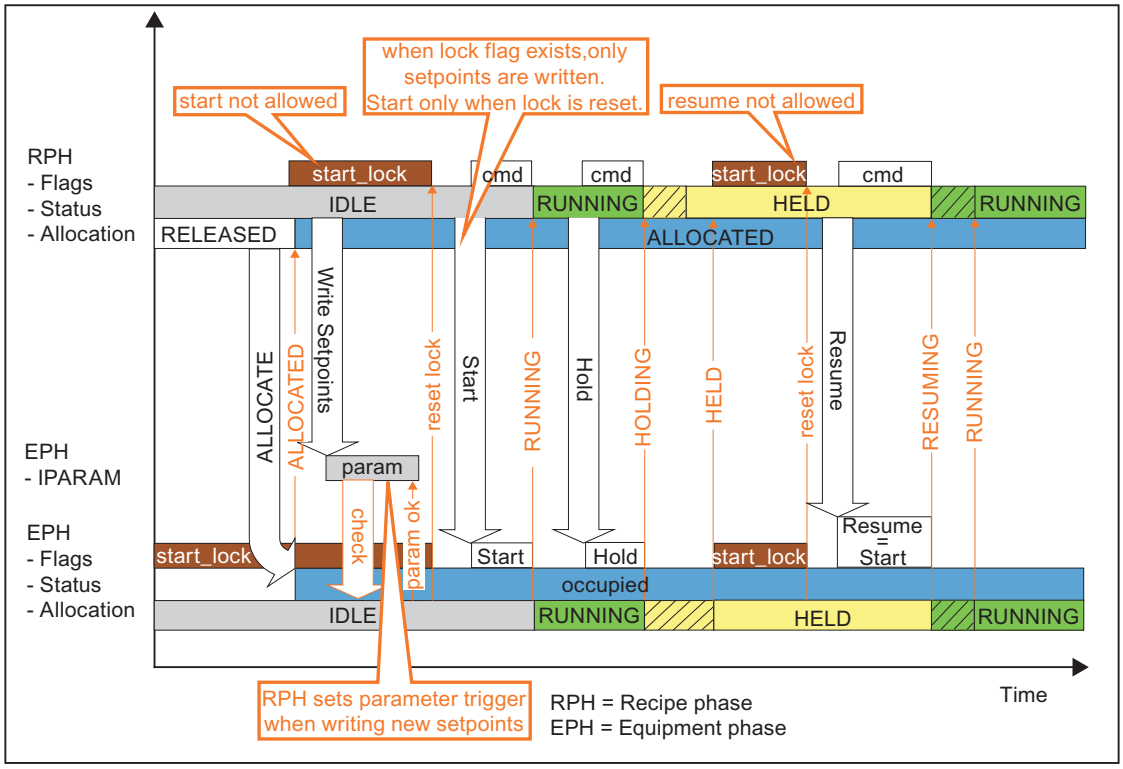


Figure 9-16 Start lock with interface blocks

- If the start lock is already set after the equipment phase is allocated, the recipe phase only writes the setpoints without the ISTART input. Instead, the recipe phase writes the IPARAM input to inform the equipment phase that there are new setpoints. The equipment phase then checks the setpoints and resets the IPARAM input and the start lock.
- Even when the equipment phase reaches the HELD status, it can still set the start lock to prevent a RESUME. No parameter trigger is necessary because the recipe phase does not permit a parameter change while a step is active.

Startup characteristics for SFC types

To achieve faster step change times, the startup characteristics of the SFC types have been optimized as of SIMATIC BATCH V6.1.

Regardless of any start lock, SIMATIC BATCH always writes the allocations, the setpoints, the IPARAM and the start command in a write job to the block. The SFC type checks the setpoint values for useability and executes the start/rejects the start.

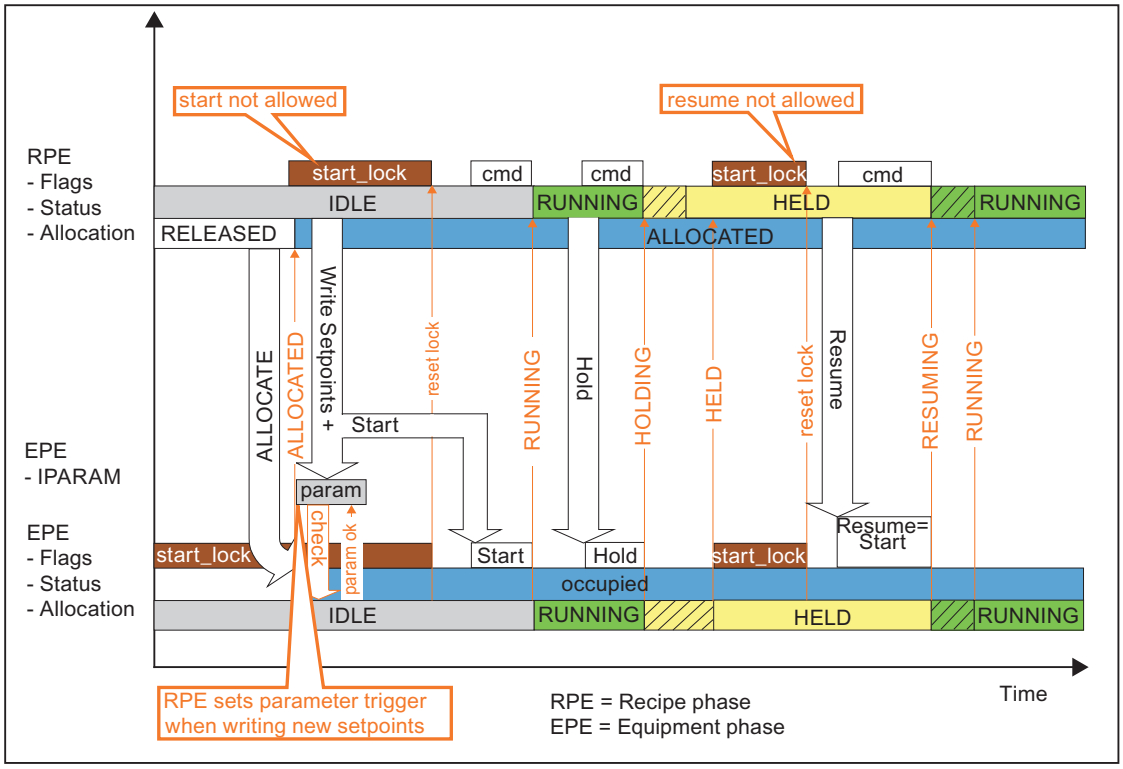


Figure 9-17 Startup characteristics for SFC types

9.8.3.10 Continuous operation of equipment phases

With SIMATIC BATCH it is possible to

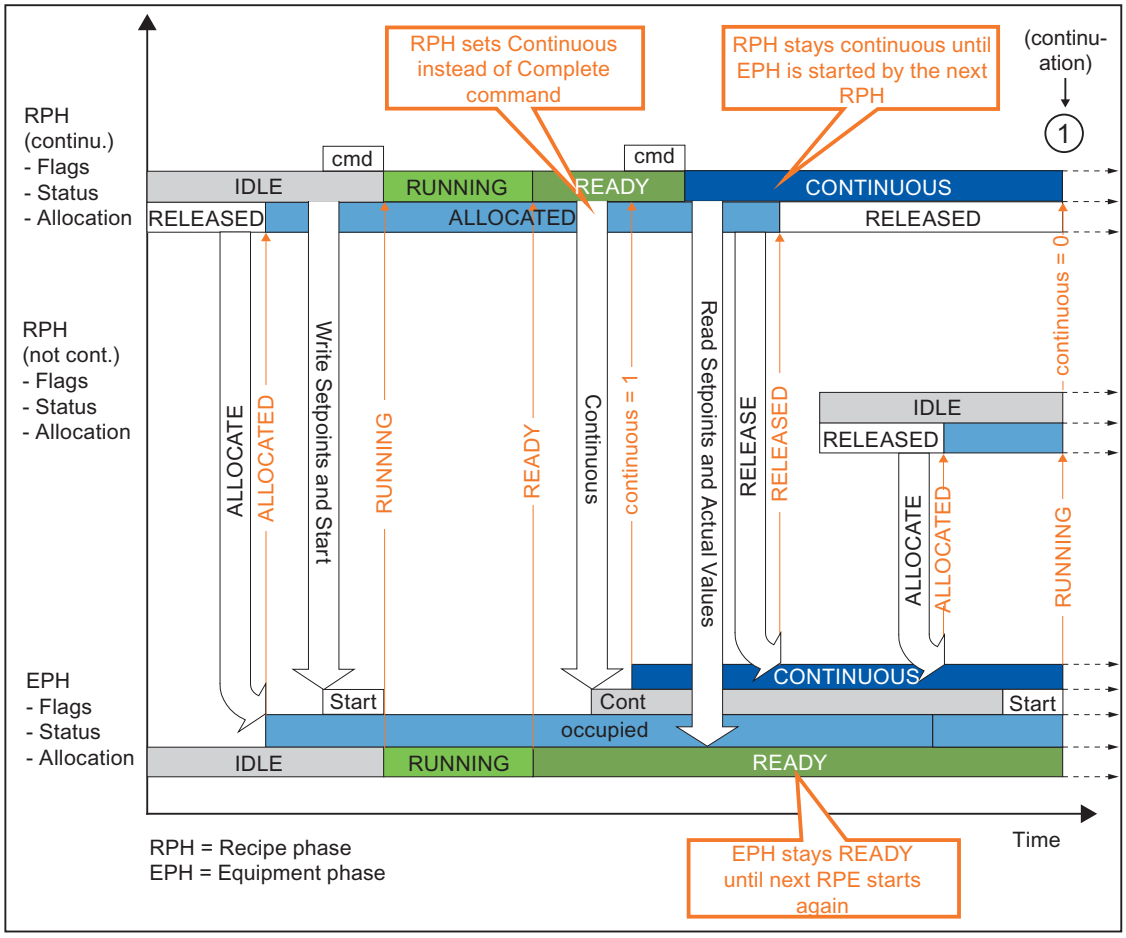
set different parameters for an equipment phase within a recipe without having to deactivate the equipment phase and reactivate it again afterwards. Concurrencies, such as agitating, temperature adjustment, pressure are also maintained beyond recipe operations. This means for example that at the end of an ROP an agitator is not switched off, and at the beginning of the subsequent ROP, it does not need to be switched on again.

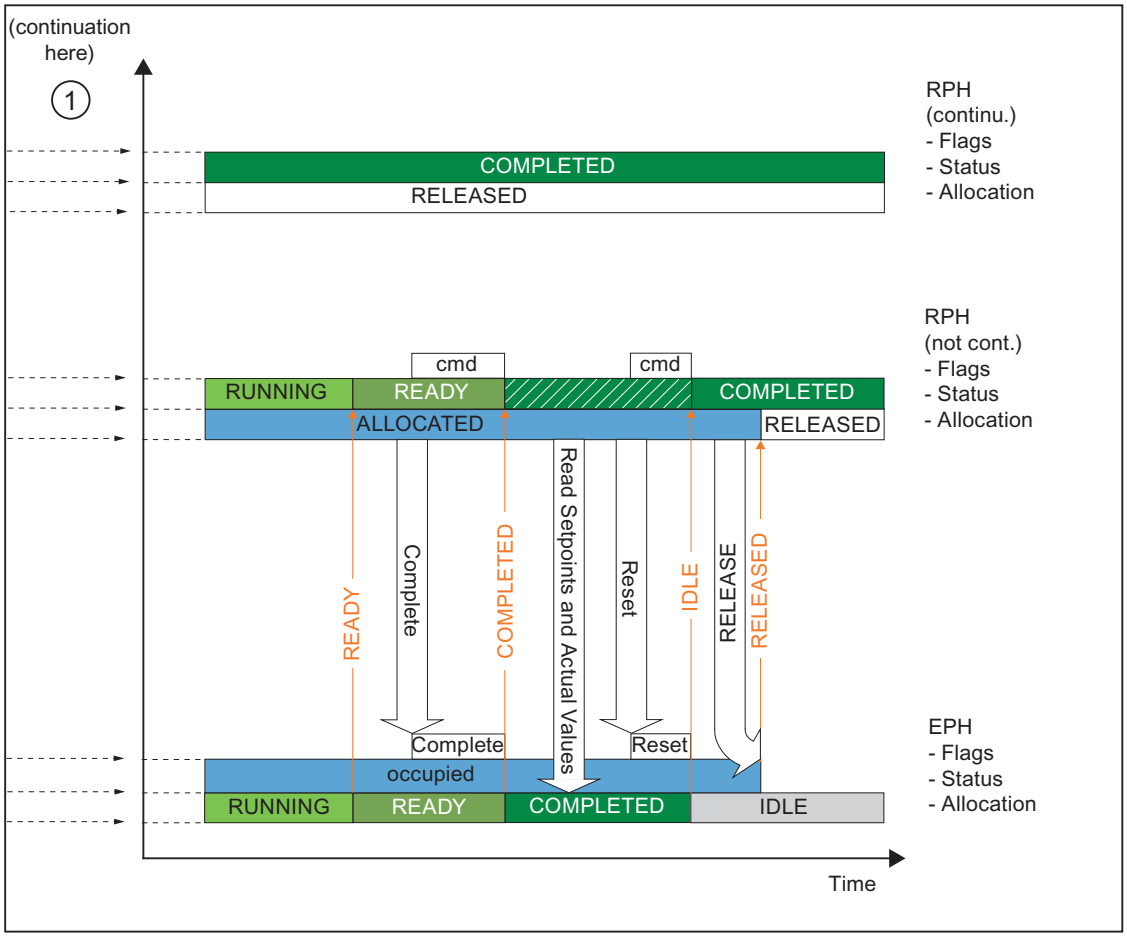
Flowchart

Below, you can see the flow chart of a non-self-terminating equipment phase set to continuous operation:

During the changeover, the equipment phase remains in the "READY TO COMPLETE" status. Instead of terminating the equipment phase, the first recipe phase simply sets the CONTINUOUS ID via the ICONT input **in addition to the basic status**. The setpoints/actual values are read prior to this. The sequence logic handles "CONTINUOUS" and "READY TO COMPLETE" in the same way as "COMPLETED", in other words the recipe continues.

Because the CONTINUOUS ID is set, the second recipe phase can occupy the equipment phase although its status is not IDLE. Once it is occupied, the CONTINUOUS ID is reset. To allow the second recipe phase to start the equipment phase, it is possible to START from "READY TO COMPLETE" in the status transition diagram.


RPH sets Continuous instead of Complete command
RPH stays continuous until EPH is started by the next RPH
(continu-ation)
1
RPH (continu.) - Flags - Status - Allocation
RPH (not cont.) - Flags - Status - Allocation
EPH - Flags - Status - Allocation
cmd
cmd
IDLE
RUNNING
READY
CONTINUOUS
RELEASED
ALLOCATED
RELEASED
IDLE
RELEASED
ALLOCATE
ALLOCATED
Write Setpoints and Start
RUNNING
READY
Continuous
continuous = 1
Read Setpoints and Actual Values
RELEASE
RELEASED
continuous = 0
ALLOCATE
ALLOCATED
RUNNING
CONTINUOUS
Start
Cont
Start
occupied
IDLE
RUNNING
READY
Time
RPH = Recipe phase
EPH = Equipment phase
EPH stays READY until next RPE starts again



Example of continuous operation

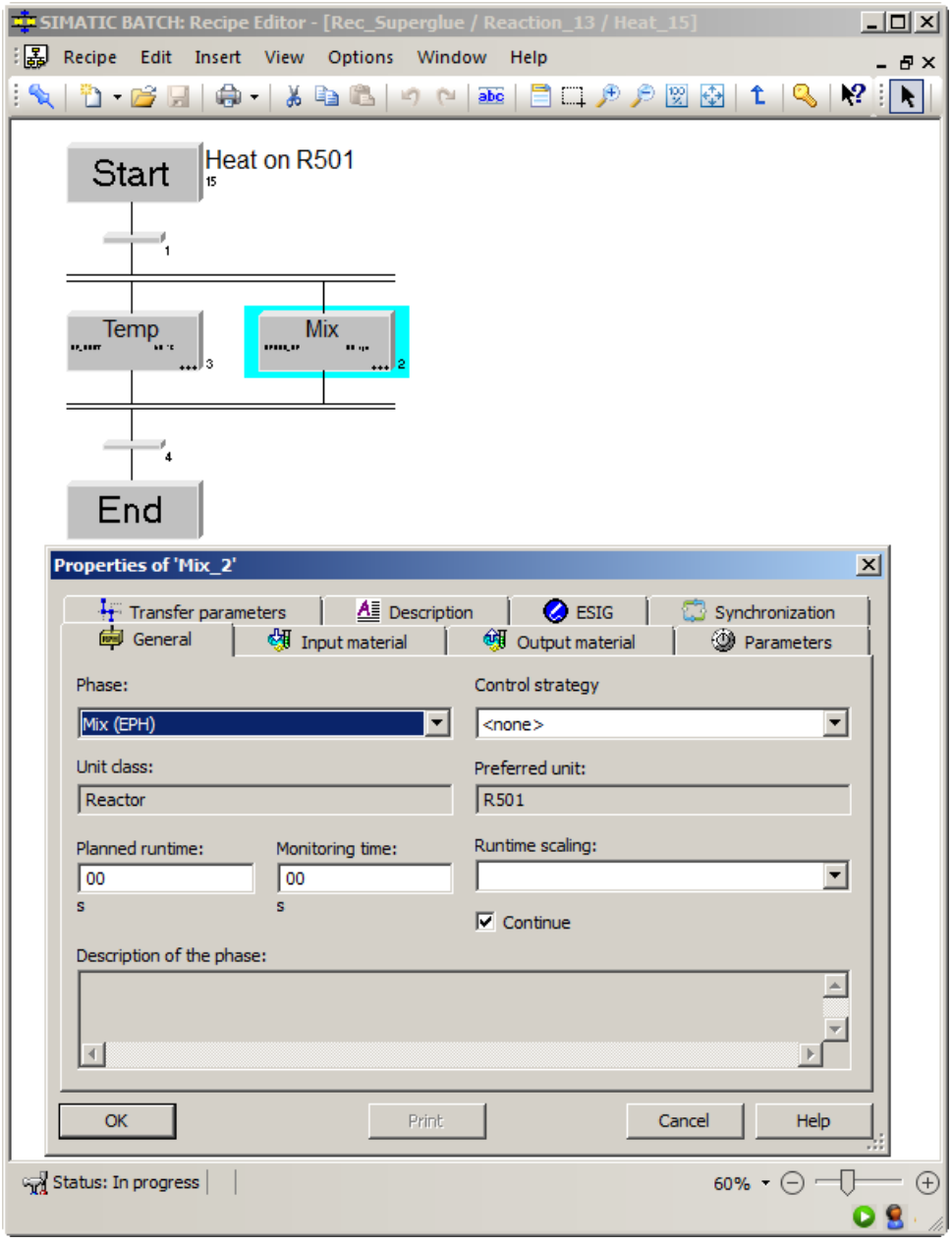
The filling of a condenser should be performed through valve Z in two steps. Agitation is performed with speed 1 during the first filling with quantity X. There should be a pause of ten seconds between the two fillings and the agitator should continue to run at the same speed. Agitation is performed at speed 2 during the second step of the filling with quantity Y.

The block I/Os of the SFC must be supplied for all instances of "Agitate" in the ES configuration.

- ENASTART=1 allows restarting even if the SFC is still running
- SELFCOMP=0 SFC does not complete autonomously

In the Recipe Editor, the "Continue" check box must be activated in the "General" tab of the "Properties" dialog box for the "Agitation" recipe phase that should continue to run. Once the agitator is running, it reports "Ready_TC" (ready to complete) and, instead of the completing the phase "CONTINUOUS" is set and the recipe execution continues with the next phase.

The same phase can be supplied with new setpoints later in the recipe and thereby be restarted.


SIMATIC BATCH: Recipe Editor - [Rec_Superglue / Reaction_13 / Heat_15]
Recipe Edit Insert View Options Window Help
Start
Heat on R501
15
1
Temp
3
Mix
2
4
End
Properties of 'Mix_2'
Transfer parameters
Description
ESIG
Synchronization
General
Input material
Output material
Parameters
Phase:
Mix (EPH)
Control strategy
<none>
Unit class:
Reactor
Preferred unit:
R501
Planned runtime:
00
s
Monitoring time:
00
s
Runtime scaling:
Continue
Description of the phase:
OK
Print
Cancel
Help
Status: In progress
60%

9.8.3.11 Extended continuous mode of equipment phases

You decide in the project settings which behavior the equipment phases are to have in continuous mode. You have the two following options:

- Equipment phase in continuous mode is to be completed when the recipe unit procedure is completed or at the end of the batch (unit has been released).
- Equipment phase in continuous mode is to continue running when the recipe unit procedure is completed or at the end of the batch (unit has been released) (Ready_TC) and it can be allocated again.

Note

You have the option to explicitly prevent extended continuous mode.

You can find additional information in the section "Automatic complete obsolete".

Project setting

The project setting in the group "Batches" is read when the batch is created and is valid for the entire runtime of the batch.

The information about which project setting the batch ran with is also stored in the batch archive.

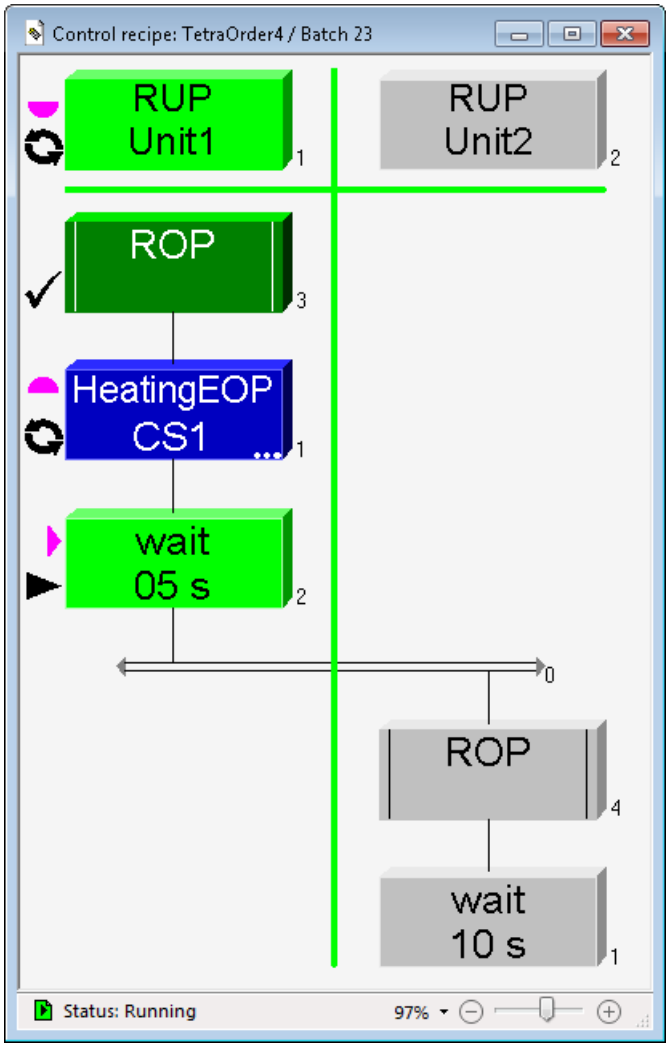
You can change the project setting at any time. Batches that have already been created are no longer influenced by this change.

Representation of the extended continuous mode

The status "Continue" is displayed in allocated equipment phases in extended continuous mode in the same way as in continuous mode.

The status "Continue" is represented by the color blue.

The figure below shows, for example, the status "Continue" for the RUP Unit 1 and for HeatingEOP CS1:



Before the recipe unit procedure is released, the extended equipment phase is released but not completed.

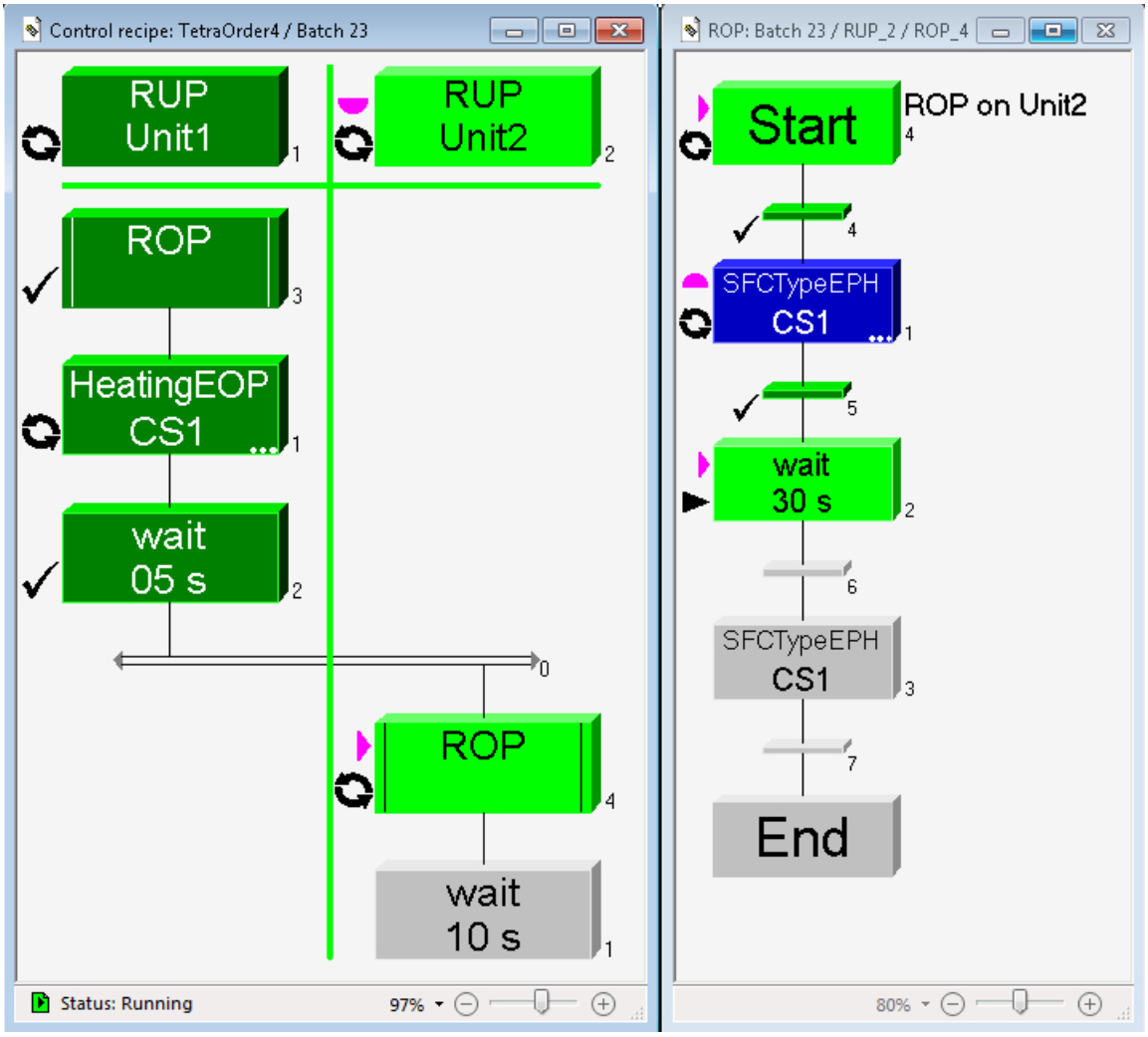
To ensure that these steps are no longer controlled by the completed batch, the steps are identified as follows:

- "Completed" status with dark green
- "Continue" status with two arrows as circle

If a recipe operation contains a recipe phase with the "Continue" label, the "Continue" symbol is also displayed in the active ROP.

The figure below, for example, shows the following:

- The released extended equipment phase "HeatingEOP CS1" in the status "Completed" and "Continue"
- Inheritance of the "Continue" symbol of the step SFCTypEPH CS1 to the ROP of the RUP Unit 2



Automatic complete obsolete

If you have selected the setting "Yes" for "Extended continuous mode" under batches in the project settings, automatic complete by means of SIMATIC BATCH in hierarchical recipes at the end of an RUP or with flat recipes at the end of the batch becomes obsolete.

If you still want automatic complete to continue, integrate a non-continuous recipe phase (continue not activated) within the existing master recipe:

- For hierarchical recipes at the end of an RUP
- For flat recipes at the end of a batch

Stopping or aborting in extended continuous mode

If the associated unit has not been released yet, a equipment phase can be stopped or aborted in extended continuous mode.

Note

Recipe steps in continuous operation that are to continue running on released units, are outside the area of influence of SIMATIC BATCH. This means they cannot be influenced by batch commands.

In the figure shown above, two steps are running in continuous operation:

- HeatingEOP CS1
- SFCTypeEPH CS1

Of these two steps, only the step "SFCTypeEPH CS1" can be influenced by batch commands.

Additional information

Batches > Settings (Page 801)

Abort (Control menu) (Page 1042)

Stop (Control menu) (Page 1045)

Stop step (Page 1098)

Abort step (Page 1099)

9.8.4 Starting batch control

9.8.4.1 Working with lists for Batch Control

Selecting lists for batch control

Select an object in the "Orders" folder in the editing window and then select the required list in the **Planning >** menu.

- **Batch planning list**
- **Batch status list**
- **Batch result list**

Batch planning list

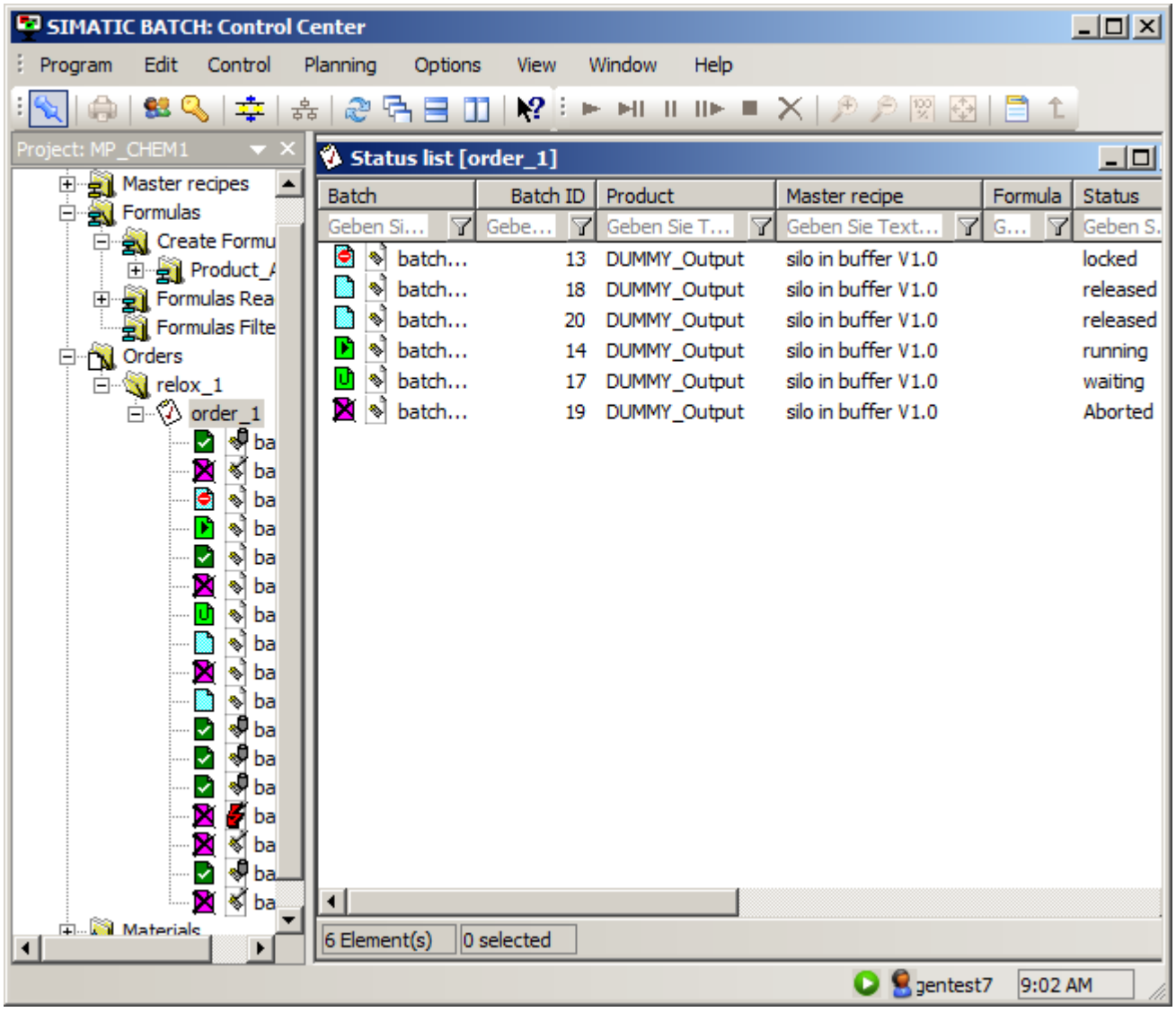
The Batch planning list shows all planned, released or locked batches. You can also start the batches with the shortcut menu for the Batch planning list. When a batch is started, this batch remains visible in the batch planning list and gets the new status (e.g. running). However, when you reopen the Batch planning list, this batch will no longer be displayed.

If you want to display all batches during batch control, work with the batch status list.

Batch status list

The batch status list shows the status of each released, running, held, waiting and locked batch as well as batches with errors and allows the batches to be controlled conveniently using the shortcut menu for the listed object (right-click) or using the "**Control**" menu.

As an alternative, you can, of course, select all the functions relating to batches in the tree (once again using the shortcut menu for the object). Working in the tree can, for example, be an advantage if a control recipe window is open at the same time.



Batch result list

The **Batch result list** shows all the completed, aborted, stopped and canceled batches. The display is updated dynamically. Using the shortcut menu for the batch result list, you can archive closed batches and then delete them.

9.8.4.2 Opening the control recipe

You can see detailed information about the processing of the batch in the control recipe window. The control recipe of the batch is displayed as it was created in the BATCH Recipe Editor.

Follow these steps:

1. Select the batch in the batch status list or in the tree.
2. Select the command "**Open control recipe**" in the shortcut menu for the batch (right-click) or in the "**Control**" menu.
   Result: The corresponding control recipe is opened and displayed graphically (analogous to the view in the BATCH Recipe Editor). The toolbar of BatchCC displays buttons for controlling the processing of the batch. When planned batches are opened, a validation check is run.

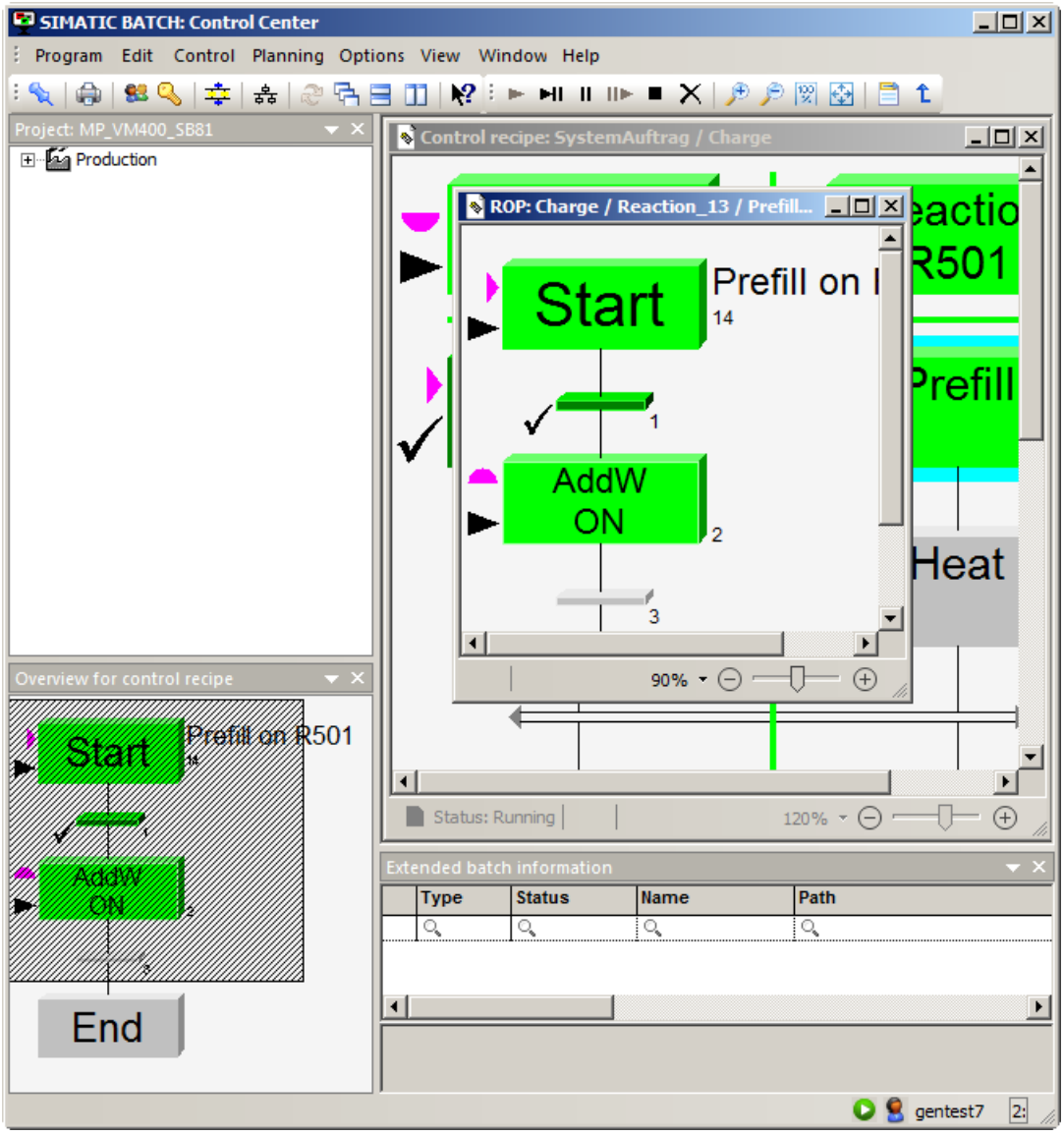
Overview of the control recipe

In BatchCC, you can open the control recipe and also a structural overview of the control recipe. With more complex control recipes, you can go to the relevant point in the control recipe window by clicking on a recipe element in the overview.

Select the menu item **View > Overview of control recipe**.

Result: The overview belonging to the active control recipe window is opened (in the figure below: bottom left). If no control recipe is open, the overview remains empty (gray).

Example



Adapting PCS 7 OS (WinCC) so that BatchCC opens with the current unit recipe

Using WinCC scripts, you can have the current unit recipe displayed in the application window each time BatchCC is called. The current unit recipe is taken from the current operator picture (unit) on the OS client.

Automatically opening a control recipe in BatchCC

The command line can be used to pass BatchCC a parameter specifying the control recipe to be opened.

The parameter or opening the control recipe is: /B="*X*;0", X specifies the batch ID.

Examples:

- Open the control recipe with the ID 157: sbbatchcc32ux.exe /B="157;0"
- Open the control recipe with the ID 12: sbbatchcc32ux.exe /B="12;0"
- Open the control recipe with the ID 8: sbbatchcc32ux.exe /B="8;0"
- Open the control recipe with the ID 1012: sbbatchcc32ux.exe /B="1012;0"

Selecting an element (RUP/ROP/RPH/TRANS) within the control recipe

When a control recipe is opened with the '/B' parameter, an element (RUP/ROP/RPH/TRANS) can be selected within this control recipe. If this element is in a substructure (such as ROP), this substructure is automatically opened and the element is selected. The addressed element is moved together with the selection into the visible area of the control recipe view (if necessary).

To select a special element within the control recipe, the second part of the '/B' parameter needs to be filled out.

Parameter for opening the control recipe and selecting an element within the control recipe: /B="X;*Y*", Y specifies the element within the batch with the batch ID "X". The element is addressed by specifying the step number. The step number is also shown in every WinCC picture in the SIMATIC BATCH faceplates. The step number consists of a part specified by the container element (C-ID) and a part specified by the terminal element within the container (T-ID). These two values are merged to a single value by a formula.

The formula is: <<C-ID>>*10000 + <<T-ID>>

Container elements are all elements that are used to hold other elements, e.g. RUP/ROP.

Terminal elements are all elements that do not have a "container" function and therefore do not contain other elements, e.g. RPH/TRANS.

Examples:

- Open the control recipe with the ID 157, the ROP with the ID 2 and the RPH with the ID 4: sbbatchcc32ux.exe /B="157;20004"
- Open the control recipe with the ID 12, the ROP with the ID 78 and the RPH with the ID 203: sbbatchcc32ux.exe /B="12;780203"
- Open the control recipe with the ID 8, the ROP with the ID 12 and the RPH with the ID 24: sbbatchcc32ux.exe /B="8;12024"

9.8.4.3 Releasing a batch

Quantity scaling to the batch quantity

When a batch is released, it is passed to the BATCH batch control (BATCH control server). At this point in time, a scaling function is applied.

During scaling, the values from the recipe, which apply to the reference quantity, are calculated for the actual batch quantity. Since the batch quantity can still be modified after it is created, the scaling for the final batch quantity must take place when the batch is released. After successful scaling, the "linear or quadratic scaling" identifier is removed. In the "Properties" dialog of a batch, the non-scaled values are displayed before the release, the scaled values are displayed in the control recipe.

9.8.4.4 Starting batch processing

Starting a batch

Only released batches can be started. Batches in the "immediate" and "time-driven" Start modes are started automatically (a manual start is also possible in these situations and has the same effect as a batch with the "operator" Start mode). Batches with the "operator" Start mode must be started explicitly in BatchCC. Below, you will find the options available for the "operator" Start mode.

Note

You cannot start a batch if it is chained to another batch and this predecessor batch has not yet started or been completed (depending on the chaining mode)!

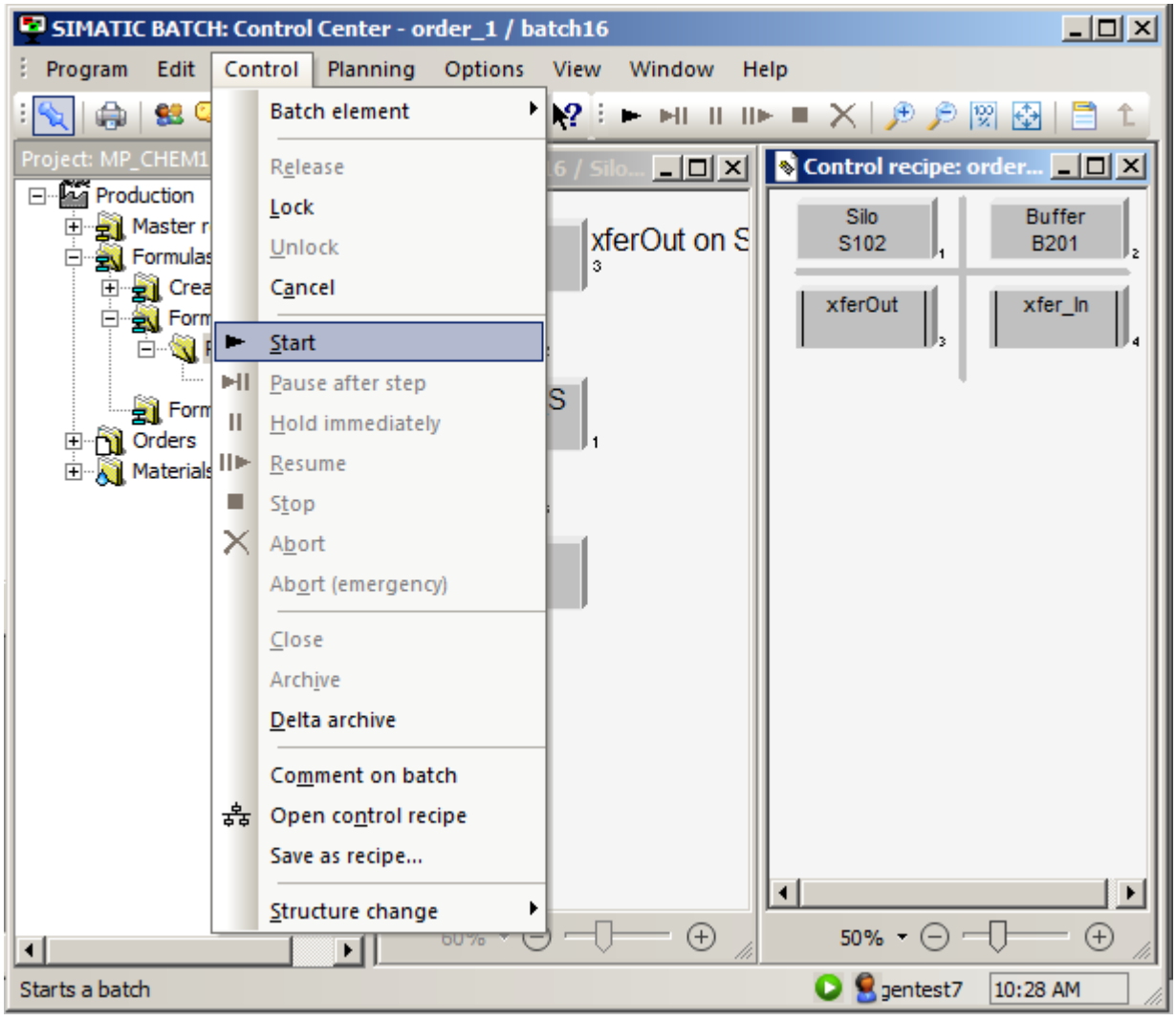
Starting the entire control recipe (batch)

1. Open the control recipe.
2. Click the following button.



Alternatively use the menu command **Control > Start** .

Result: The batch starts. The execution of the control recipe is visualized by the color coding of the individual steps and transitions.



Starting individual recipe elements

Select the recipe element in the control recipe, right-click and then select "**Start Step**" in the shortcut menu.

Rules

A recipe element within a control recipe can only be started when the recipe element in the next higher hierarchy level has already been started. For example, a ROP at the next level down from a RUP can only be started when the RUP has already been started.

It is always possible to abort or halt a lower level recipe element.

Only one recipe element can be processed within a sequence. This means, for example, that if a recipe operation (ROP) is active, no other ROP can be started at the same time in the same sequence or within the same RUP. An attempt to start another ROP would be rejected with an error message.

9.8.4.5 Locking a batch

To prevent a released batch from starting (per operation or automatically) you can lock it.

Proceed as follows:

1. Select the batch in the batch overview list or in the tree structure (BatchCC).
2. Select the menu command **Control > Lock**.

Result: The batch changes to the "locked" status.

With the menu command **Control > Cancel lock**, you can return a locked batch to the "Released" status again.

9.8.4.6 Canceling a batch

Batches can also be cancelled. After canceling, the batch can no longer be released or started.

Proceed as follows:

1. Select the batch in the batch overview list or in the tree structure (BatchCC).
2. Select the menu command **Control > Cancel**.

Result

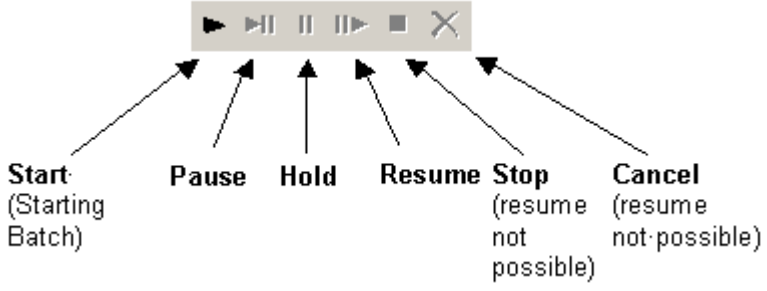
The batch changes to the "canceled" status.

9.8.5 Operator control during batch control

9.8.5.1 Commands for controlling batches

With the commands for controlling batches, you can start (only in the "operator" Start mode), hold, resume or abort (only in the "operator" Start mode) the selected batch.

Buttons for controlling a batch (also available in the context menu of the batch)



Controlling a batch

The following table describes the functions of the control buttons and the reaction of the batches.

Button	Meaning	Reaction
Start	Starts execution of the control recipe	With this command, you start a released batch in the start mode "Operation". Batches with the Start mode "immediately" and "time-driven" are started automatically. You cannot start a batch if the batch is chained to another batch and the preceding batch has not yet been started!
Pause after step	Control recipe processing is held, the steps in progress will be completed	You can pause active batches using the "Pause after step" command. In contrast to the "Hold" command, this command simply prevents the control recipe from passing control to the next step. Active recipe phases are not affected and continue until they are complete. Batch control waits with the processing of the next transition or the start of the next recipe step until the Resume command is received.
Hold immediately	Control recipe processing is held, the steps in progress will **not** be completed.	You can stop batches immediately with the "Hold immediately" command. In contrast to the "Pause after step" command, not only the batch itself but also all the recipe phases currently active in the control recipe are held.
Resume	Execution of the control recipe is resumed at the point at which it was stopped.	This command resumes batches that have been held in the batch control. If recipe phases have also been stopped then these phases return to the status "Running".
Stop	The processing of the control recipe is stopped at this step.	You will find further information in the section "Stop (Control menu) (Page 1045)".
Abort	The processing of the control recipe is aborted at this step	You will find further information in the section "Abort (Control menu) (Page 1042)".

Completing a batch

A batch is completed:

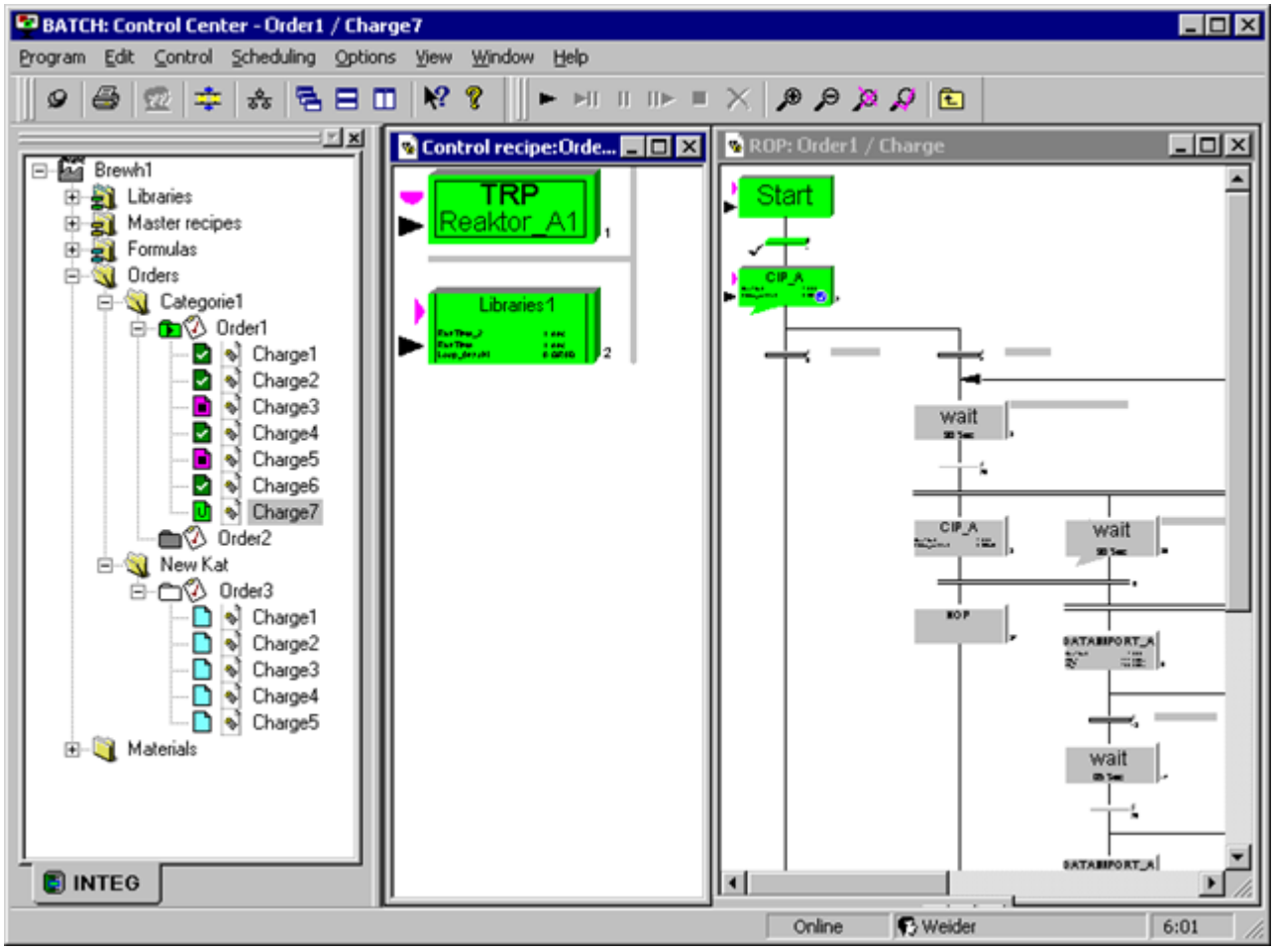
Automatically when all the recipe steps of the batch were executed successfully or

With the operator command "Abort" or "Stop"

Aborting a batch when no AS connection is available

See section, "Aborting a batch when no AS connection is available (Page 474)".

Example of controlling batch processing

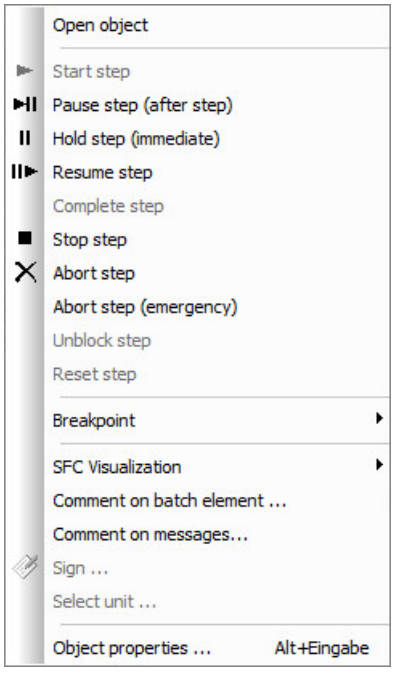


9.8.5.2 Operator commands for recipe steps

During the commissioning phase, for example, you can also hold, resume or abort all the recipe procedural elements (RUP, SUB, ROP, NOP, RPH) within the hierarchical control recipe. The commands "Complete step" and "Reset step" are also available. With these commands, you can also force transitions to enable the next step.

Menu commands for controlling individual recipe elements

Select any recipe procedural element (RUP, ROP, RPH, transition) within the control recipe and select the required command in the context menu. Commands that are not possible in the current status of the element are gray and cannot be activated.



Controlling steps

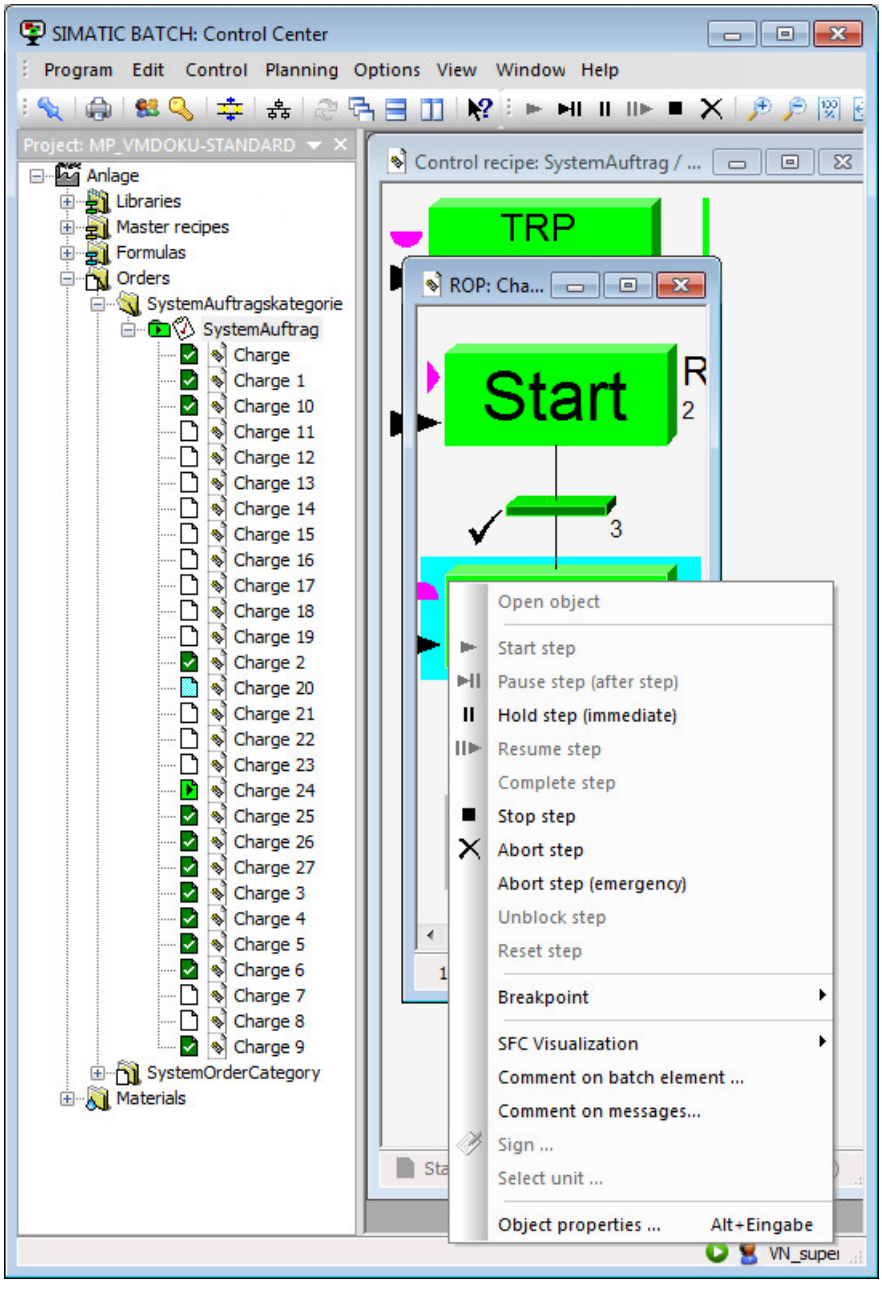
The following table describes the functions of the buttons and the reaction of the recipe steps. Online help for all context menu commands can be accessed by pressing F1.

Command in the context menu	Meaning	Reaction
Start step	Start execution of the control recipe at this step.	Inactive, completed or aborted steps (RUP, SUB, ROP, RPH, transition) can be restarted with this command.
Pause step (after step)	Execution of the control recipe is held at this step, the currently active step is executed until it is completed.	You can stop active steps (RUP, SUB, ROP) with the "Pause after step" command. In contrast to the "Hold immediately" command, this command simply prevents the control recipe from passing control to the next step. Active recipe phases of the step are not stopped but continue until they are finished. Batch control, before evaluating the next transition or starting the next recipe step in the same level (RUP, SUB, ROP), waits until the "Resume step" command is received.
Hold step (immediately)	Execution of the control recipe is held at this step, the currently active step is **not** completed.	You can stop active steps (RUP, SUB, ROP, RPH, transition) immediately with the "Hold" command. All the active recipe phases in the step are held.

Command in the context menu	Meaning	Reaction
Resume step	Execution of the control recipe is resumed at the held step.	The "Resume step" command resumes steps on hold (RUP, SUB, ROP). If recipe phases have also been stopped then these phases return to the status "Running". **Note:** Steps in the error state can be reactivated with "Resume step".
Complete step	Execution of the step is completed.	This command terminates the recipe phase of a step (RUP, SUB, ROP, RPH) that is non-self-terminating (requirement: Ready status).
Stop step	The processing of the control recipe is stopped at this step.	You will find additional information in the section "Stop step (Page 1098)".
Abort step	The processing of the control recipe is aborted at this step	You will find additional information in the section "Abort step (Page 1099)".
Reset step	Execution of the step is reset	Following an abort, the unit or the equipment modules of the step are normally still allocated. "Reset step" cancels the allocation IDs of all the recipe phases in the step (RUP, SUB, ROP, RPH).
Set/remove breakpoint	The breakpoint is displayed as a red dot next to the control recipe element.	You can find additional information in the section "Setting breakpoints (Page 458)".
SFC visualization > Open overview	This function opens the overview window of the SFC visualization. Double-click in the window to display the content.	Requirements: • The corresponding recipe phase must be configured as an SFC type in PCS 7 Engineering. • The PCS 7 OS Client add-on must also be installed on the PC in addition to an installation of the BATCH Client.
SFC visualization > Open pane	This function opens a detail window of the SFC visualization.	Requirements: • The corresponding recipe phase must be configured as an SFC type in PCS 7 Engineering. • The PCS 7 OS Client add-on must also be installed on the PC in addition to an installation of the BATCH Client.
Comment batch element ...	Add comments for the individual batch elements. This can be done before, during and after the runtime of a batch.	-

Command in the context menu	Meaning	Reaction
Comment on messages ...	Opens a dialog for the entry of comments on the existing messages of batch control (system messages, process messages, error messages).	Requirement: If no Process Historian is configured in a multiproject, the shortcut menu command can be executed.
Sign ...	This function opens the dialog "SIMATIC BATCH: Sign" for entering the electronic signature.	-
Select unit ...	Opens a dialog in which you can select an available unit. This function can only be used for recipe elements that has been configured with an allocation strategy.	-
Object properties	Opens the "Object properties" dialog from which you can obtain information about the selected object and edit it.	-

Example of controlling recipe steps



9.8.5.3 Manual jump

Introduction

A manual recipe jump describes the ability of the operator to interrupt a recipe and resume it at a different point.

Interrupting a recipe

To resume a recipe at a different point, no other steps may be active within a step sequencer. These steps can be deactivated in SIMATIC BATCH as follows:

- Abort step or stop step
  A step is aborted or stopped with the menu command of the same name.
  In the "Abort step" dialog, the following buttons are available:
  - Abort step
  - Abort step (except conti.)

  In the "Stop step" dialog, the following buttons are available:
  - Stop step
  - Stop step (except conti.)
- Allow step to run to end
  To do this, set a breakpoint at the successor step and wait for the step to run to the end. You can use the corresponding menu command to complete steps in the "ready to complete" state.

Resuming a recipe at a different point

Select the "Start step" menu command to skip (forward jump) or repeat (backward jump) sections of recipes based on the selected step. In the case of a backward jump, steps that have already been run through are automatically reset (and, therefore, enabled) after the start command. In the case of a forward jump, however, you must set preceding steps to this state yourself. Before starting a step you must ensure that no more steps will be allocated or active in the RUP concerned, nor will any more breakpoints be active. Please note:

- Releasing allocated steps
  After steps are stopped or aborted, they usually remain allocated and, therefore, must be reset. With the new project setting "Release recipe element after stop/abort", the release occurs automatically directly after aborting or stopping.
  In this case, however, it should be noted that the aborted or stopped recipe elements retain the status "aborted" or "stopped" in the control recipe although the corresponding recipe phases were released in the background and thus in the automation system and therefore have the "inactive" status as can be seen in the corresponding faceplates in OS Runtime.
- Deactivating breakpoints
  To deactivate an active breakpoint, you only need to reset the step concerned. Caution: Removing an active breakpoint starts the step.

You can use the "Start step" menu command not only for inactive steps but also for completed, stopped or aborted steps. This means that it is possible, for example, to abort and restart a unit recipe without the unit being released in between.

As a precautionary measure, when the start command is selected, SIMATIC BATCH checks whether there are active recipe elements before and after the start step and lists any it finds in a note box.

Limitations for manual jump

- You can only start recipe elements which are located in an active ROP or in an active recipe unit procedure. Recipe elements cannot be started manually in an ROP/recipe unit procedure which is not active.
- The commands apply only to selected objects and not for all recipe steps in a batch:
  - Abort step (except conti.)
  - Stop step (except conti.)
- If a recipe contains several instances of the same recipe phase and one of these instances is active in a simultaneous branch, one of the instances of this recipe phase started manually by the user will remain in "waiting" until the active recipe phase is complete. This means that the batch may be suspended at this recipe step.
- Partner objects are not started when starting recipe steps in simultaneous branches or after synchronization lines.
- If a monitoring structure contains recipe phases in continuous mode, these phases remain in this state in the event of a "manual jump" after the monitored area.

Additional information

You will find information on project settings the section General (Page 788).

You will find information on the commands "Abort batch" and "Stop batch" in the sections:

- Abort (Control menu) (Page 1042)
- Stop (Control menu) (Page 1045)

9.8.5.4 Time out when transmitting operator commands

Time out time window

A positive acknowledgment has to be issued from the AS to the BATCH control server (BCS) within a set time window. Otherwise there is an error message that the operator command was not executed correctly.

Note

In exceptional cases, the control command may be successfully performed despite the error message.
This happens, for example, when, during prolonged state transitions of a recipe function, the target state is reached only after the acknowledgment time, for example, a long "Aborting" transition state to the "Aborted" target state.

9.8.5.5 Entering comments on a running batch

During or after batch control, the operator can enter comments for each control recipe element (RUP, SUB, ROP, RPH) or for the entire batch (control recipe header) **without** having to put the batch on hold (for example entry of laboratory values or comments on important events).

Rules

Comments made on a current batch do not change or delete the original recipe comments.

Multiple comments can be entered for the control recipe elements or the entire Batch, for example, to correct errors or to add new information.

The previous recipe comment appears "Read only" beside the input field for new texts.

You can enter comments on running batches until the batch is closed.

Follow the steps outlined below:

1. Open the control recipe for the running batches (if not already open).
2. Select a control recipe element or the entire control recipe (appears on a light blue background).
3. Select the command **Comment Batch** or **Comment Batch Element** in the context menu.
4. Enter any text you require in the dialog box and close the dialog box with "OK".

9.8.5.6 Displaying operator dialogs during runtime

Using the "Operator instruction" recipe structure element, you can display instructions for the operator while batches are running or configure the information for manual intervention (for example manual dosing).

Requirements

The Operator instruction was configured during creation of the master recipe as described in the section Operator instruction (Insert menu) (Page 569).

The control recipe is open.

Principle

An operator instruction during runtime is displayed on all active BatchCCs on which the control recipe is open. On all other BatchCCs, there is simply a display in the message window. An operator confirms responsibility for the operator instruction by clicking the "Apply" button (input is then locked in the dialogs on the other BatchCCs).

All operators not affected by the operator instruction, click Minimize or Close: This ensures that the operator dialog disappears but is still available for the process.

After the operator has executed the operator instruction and for example, entered the required process values, the operator confirms with "OK" in the operator dialog to indicate that the instruction has been executed. Once the operator dialog is acknowledged in this way, it disappears automatically from all the message windows. A process value can be entered in the "Input material", "Output material" and "Parameters" tabs of the operator dialog (refer to the figure below).

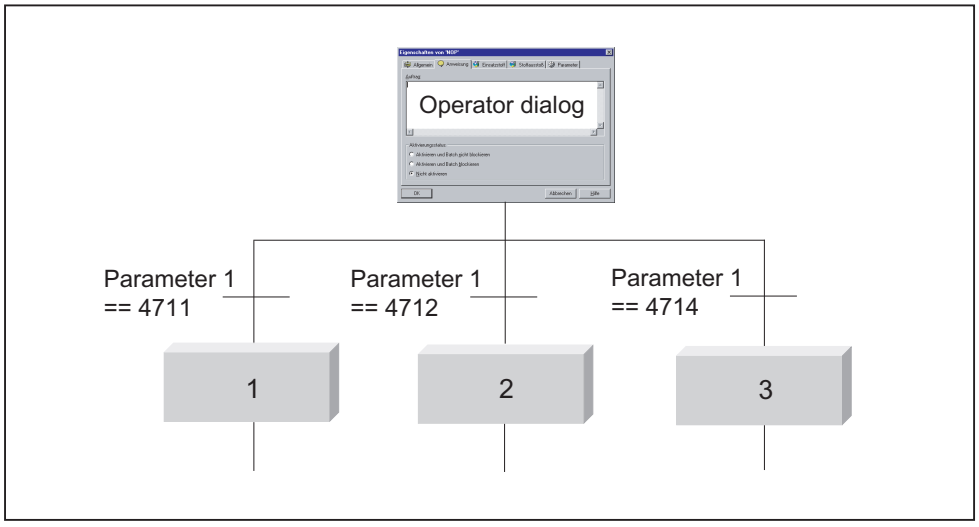
As an option, acknowledgment by the operator can be configured as a condition for continuing the batch. Actual values that have been entered can be used in steps and transitions during the remaining execution of the recipe.

Display in WinCC

In WinCC, an operator prompt appears indicating that operator intervention is required. The operator is therefore informed of operator prompts even when the control recipe is closed.

Branching after the operator dialog

After the operator has entered the actual values, it is possible to branch in the control recipe after the operator dialog.



9.8.5.7 Operator prompts via group display in WinCC

Requests to the operator regarding processing of the batch are displayed in WinCC using the group display. The operator can then open BatchCC and execute the action.

A group display is triggered for the following operator prompts:

- Acknowledge operator dialog
- Enter the Electronic signature (ESIG)
- Acknowledge breakpoint

How it works

1. The BATCH Control Server determines that an operator dialog or a breakpoint needs to be acknowledged or that an electronic signature is required.
2. The BATCH Control Server detects the unit involved from the unit recipe and sets an input to trigger a WinCC message (entering state) of the type "Operator Prompt".
3. A group display is interconnected to the "Unitname.EventState" variable in the WinCC picture so that the operator prompt becomes visible.

4. Using the corresponding unit faceplate, the operator can open BatchCC and take the action required.
5. The BATCH Control Server then resets the input in the unit block which in turn triggers an operator prompt (exiting state).

Note

Unit recipe or unit allocation

The area-specific group display can only indicate SIMATIC BATCH operator prompts that occur within a unit recipe.

With flat recipes, the group display appears only with operator instructions when these were configured with unit allocation.

Breakpoints

Breakpoints cause a group display when they are **within a unit recipe** in hierarchical recipes. With flat recipes, this is unfortunately not possible because the unit allocation is linked to the individual steps.

Configuring pictures

Group displays are installed within the area displays that are interconnected with the individual unit blocks (Unitname.EventState variable). It makes sense to have a button to display the unit faceplate with a unit group display.

9.8.5.8 Setting breakpoints

During batch control, the operator can set breakpoints for each control recipe element in the open control recipe. The breakpoint is displayed as a red dot next to the control recipe element. If execution of the control recipe reaches a recipe element with a breakpoint, the recipe element is not activated. Only the run marker is set and the breakpoint is changed to the following control button.



The recipe element can be started with this button and the control recipe continued. It is also possible to activate the element with the start command for the recipe step.

Follow these steps:

1. Open the control recipe for the running batches (if not already open).
2. Select a control recipe element.
3. Select the command **Breakpoint > Set** in the context menu.

Result:

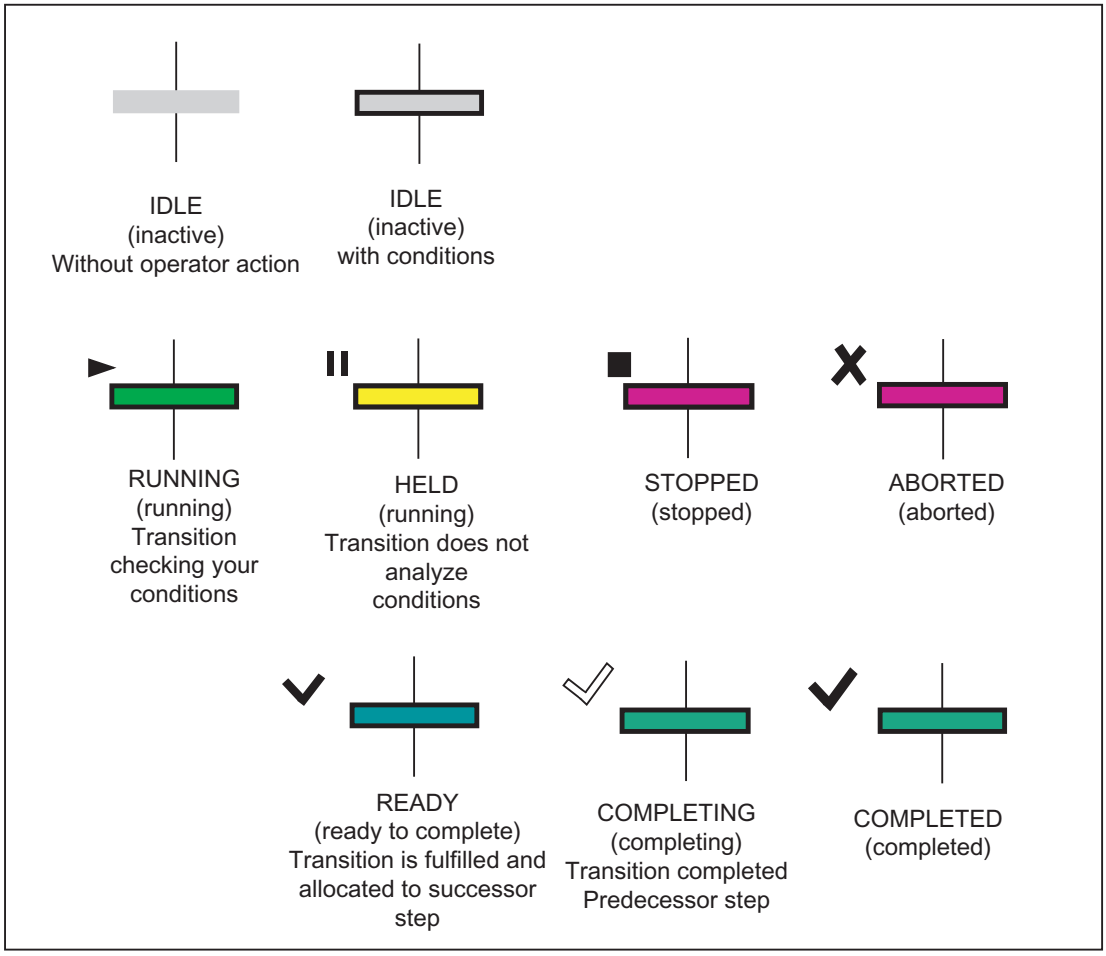
The breakpoint is displayed as a red dot next to the control recipe element. With the **Breakpoint > Remove** menu command, you can clear the breakpoint again.

Note: When an active breakpoint is removed (the control button is displayed), the corresponding recipe element is started automatically.

9.8.5.9 States of a transition

Overview

A transition can adopt the following states:



Note

You can change the colors with the menu command **Options> Settings**.

9.8.5.10 States of a transition condition

Overview

A transition condition can have the following 4 states:

Result	Description	Symbol	
TRUE	Condition is fulfilled	Green check mark	
FALSE	Condition is not fulfilled	(no symbol)	
INVALID	Condition value not yet determined	Question mark	
ERROR	Error in evaluating or determining the condition	White cross in red dot	

Note

If an OR operation for several conditions is used and one condition is fulfilled, the values of the other conditions no longer need to be determined. This means that the transition is fulfilled, although individual conditions may be INVALID.

9.8.5.11 Overview of batch step statuses

The state of a batch step contains information about:

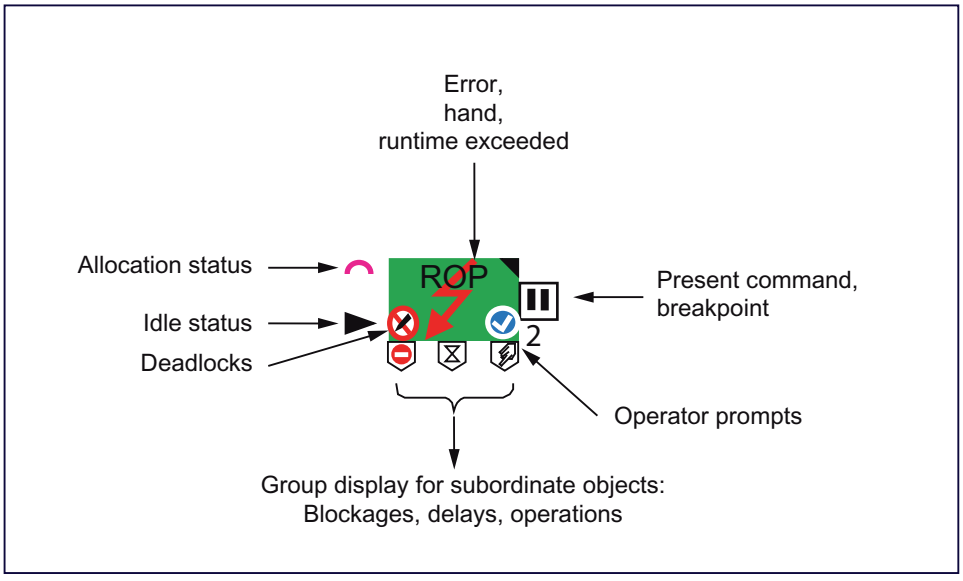
- The allocation of a unit or an equipment phase, for example, waiting for a unit or equipment phase
- The basic status of an equipment phase, for example, inactive, running, held, completed
- Additional characteristics such as error, pending command, locked, operator prompts

The status display of a batch step is formed accordingly.

Form of the status display of a batch step

There are two states and additional status identifiers:

- Allocation status
- Idle status
- Additional status identifiers



Additional information

Allocation statuses of batch steps (Page 465)

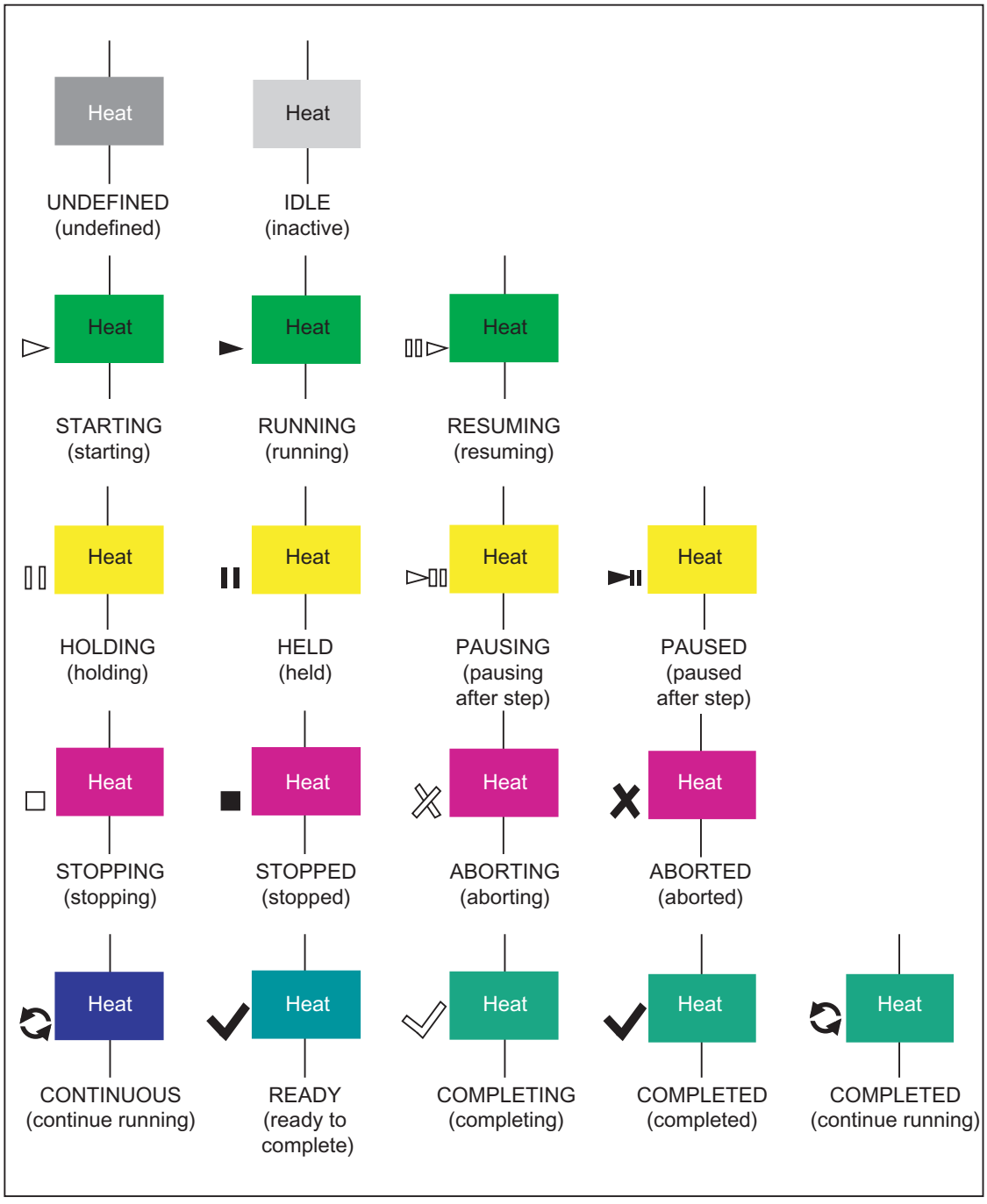
Basis statuses of batch steps (Page 462)

Additional status identifiers (Page 467)

9.8.5.12 Idle statuses of batch steps

Display of the basic status

The basic status of a batch step is indicated by the color of the step and a color-neutral symbol at the bottom left. If a symbol is unfilled this indicates a transition state.



Possible status (basic status) of recipe procedure elements (RPEs)

Status	Value, decimal	Description
RPE_STATE_UNDEFINED	0	Undefined
RPE_STATE_EDITED	1	Edited
RPE_STATE_IDLE	2	Idle
RPE_STATE_STARTING	3	Starting
RPE_STATE_RUNNING	4	Running
RPE_STATE_READY	5	Ready to complete
RPE_STATE_COMPLETING	6	Completing
RPE_STATE_COMPLETED	7	Completed
RPE_STATE_CONTINUOUS	8	Continuous
RPE_STATE_ABORTED	9	Aborted
RPE_STATE_ABORTING	10	Aborting
RPE_STATE_STOPPED	11	Stopped
RPE_STATE_STOPPING	12	Stopping
RPE_STATE_HELD	13	Held
RPE_STATE_HOLDING	14	Holding
RPE_STATE_RESUMING	15	Resuming
RPE_STATE_PAUSED	16	Paused after step
RPE_STATE_PAUSING	17	Pausing after step
RPE_STATE_SOFT_STOPPED	18	Stopped except for continuous
RPE_STATE_SOFT_STOPPING	19	Stopping except for continuous

Note

If a unit recipe contains ROP steps or substructure steps in "continuous operation" state, the Continuous symbol is always displayed in the control recipe view, regardless of the respective basic status. The Continuous symbol is not displayed if a recipe phase was configured for continuous operation but has not yet reached this status.

Possible expanded status of recipe procedure elements (RPEs)

Status	Value, hexadecimal	Value, decimal	Description
RPE_EXSTATE_0	0x0	0	Initial value
RPE_EXSTATE_ERROR	0x1	1	Error
RPE_EXSTATE_FOCUS	0x2	2	Edit flag set
RPE_EXSTATE_CMD_PROCESSING	0x4	4	Command processing active
RPE_EXSTATE_BREAKPOINT	0x8	8	Breakpoint
RPE_EXSTATE_UNIT_ALLOCATING	0x10	16	Waiting for allocation of the unit
RPE_EXSTATE_UNIT_ALLOCATED	0x20	32	Unit allocated

Status	Value, hexadecimal	Value, decimal	Description
RPE_EXSTATE_EPE_ALLOCATING	0x40	64	Waiting for allocation of the equipment phase or operation
RPE_EXSTATE_EPE_ALLOCATED	0x80	128	Equipment phase or operation allocated
RPE_EXSTATE_SIGNATURE	0x100	256	Input of an electronic signature required
RPE_EXSTATE_DIALOG	0x200	512	Operator dialog open
RPE_EXSTATE_WRITE_LOCK	0x400	1024	Write protection set
RPE_EXSTATE_START_LOCK	0x80	2048	Start lock set
RPE_EXSTATE_CONTINUOUS	0x1000	4096	Continuing
RPE_EXSTATE_HOOKED	0x2000	8192	Automatic run sequence interrupted. Recipe element is waiting for trigger (e.g. Mes_Sync_Request)
RPE_EXSTATE_MANUAL	0x4000	16384	Manual service
RPE_EXSTATE_TIME_EXPIRED	0x8000	32768	Runtime exceeded
RPE_EXSTATE_CHILD_BLOCKING	0x0001000	65536	Lower-level object blocked (held, aborted or stopped)
RPE_EXSTATE_CHILD_WAITING	0x0002000	131072	Lower-level object waiting
RPE_EXSTATE_CHILD_OPERATING	0x0004000	262144	Lower-level object waiting for operator intervention
RPE_EXSTATE_CHILD_ERROR	0x0008000	524288	Lower-level object in Error status
RPE_EXSTATE_EQUIPMENT_ERROR	0x0010000	1048576	Error in the equipment properties
RPE_EXSTATE_ALLOCATION_ERROR	0x0020000	2097152	Connection error during allocation
RPE_EXSTATE_PAUSE	0x0040000	4194304	Held
BF_API_RPE_EXSTATE2_VIRTUALALLOC	0x0080000	8388608	Virtual allocation - the unit is still allocated (flat recipe)
RPE_EXSTATE_UNIT_DIALOG	0x0100000	16777216	RUP dialog open
RPE_EXSTATE_CONNECTION_ERROR	0x0200000	33554432	Connection error
RPE_EXSTATE_WAITING	0x0400000	67108864	Object waiting
RPE_EXSTATE_WARNING	0x0800000	134217728	Warning, such as setpoint deviation
RPE_EXSTATE_DEACTIVATED	0x2000000	536870912	Deactivated
RPE_EXSTATE_DELETED	0x4000000	1073741824	Object that was deleted during an online structure change

9.8.5.13 Allocation statuses of batch steps

Independent display of allocation status

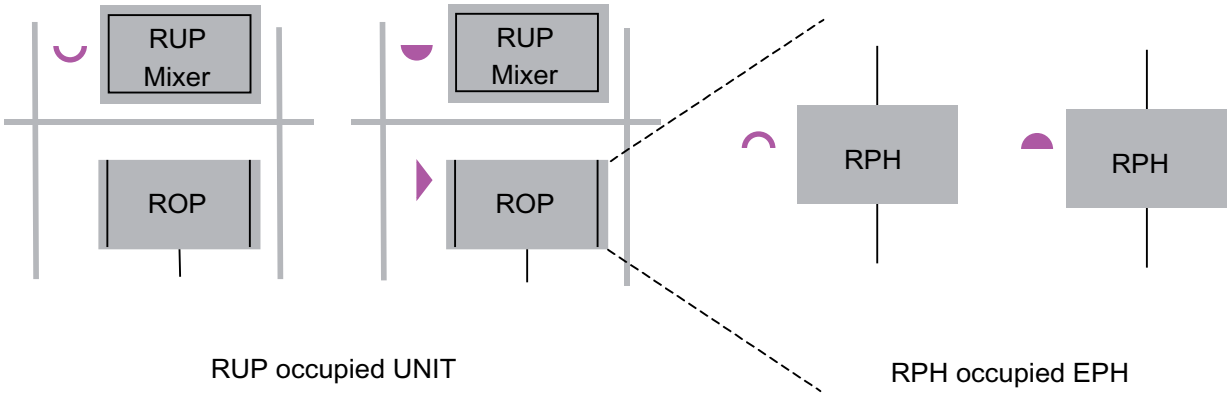
The allocation status is displayed independently of the idle status together with the sequence marker:

Display								
Sequence marker	0	1	1	1	1	1	1	1
Unit allocation	x	0	1	0	0	0	0	0
Unit allocated	x	0	0	1	0	0	1	1
EPE allocation	x	0	0	0	1	0	1	0
EPE allocated	x	0	0	0	0	1	0	1
Hierarchical recipe	All	All	RUP	RUP	RPH	RPH	-	-
Flat recipe	All	All	RPH	RPH	-	-	RPH	RPH

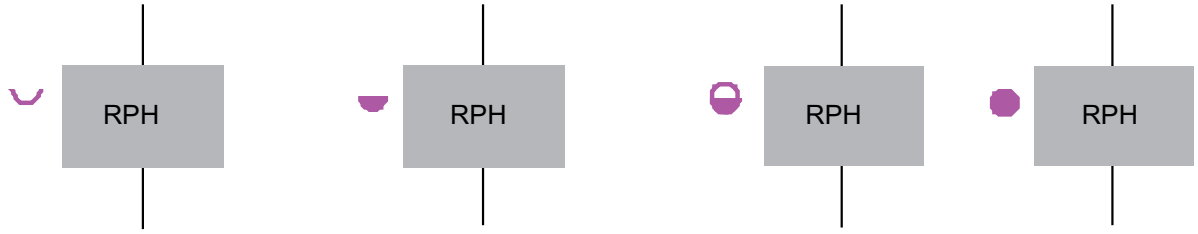
Different marking when allocating units or equipment procedure element (EPE)

It is important that the marking be different when allocating a unit or EPE. In the hierarchical recipe, RUP controls the allocation of units and the equipment phase controls the allocation of EPEs. In the flat recipe both are allocated by the equipment phase.

Allocation with a hierarchical recipe

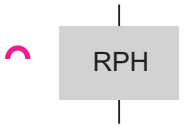
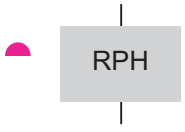
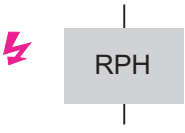
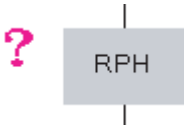


Allocation with a flat recipe

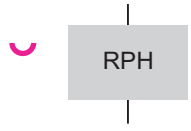
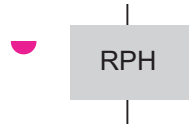
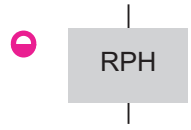
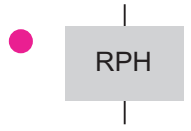
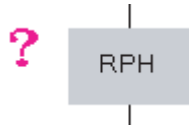


RPH occupied UNIT and RPH occupied EPH

Display of the allocation status – hierarchical recipe

Display	Name	Meaning
	Waiting for unit	The control wants to allocate the unit required by the RUP Either allocated by another RUP, or there are not enough memory blocks. The unit can only be allocated when the PCS 7 OS server is completely in process mode.
	Unit allocated	The control has allocated the unit to the RUP
	ROP running	The control has allocated the ROP
	Waiting for equipment phase	The control wants to allocate the equipment phase required by the RPH
	Equipment phase allocated	The control has allocated the RPH
	Allocation error	Allocation error or connection failure
	Missing AS-OS connection	OS has no connection to the AS

Display of the allocation status – flat recipe

Display	Name	Meaning
	Waiting for unit	The control wants to allocate the unit required by the RPH Either allocated by another RPH, or there are not enough memory blocks.
	Unit allocated	The control has allocated the unit required by the RPH
	Unit allocated and waiting of equipment phase	The control wants to allocate the equipment phase required by the RPH
	Unit and equipment phase allocated	The control has allocated the RPH
	Allocation error	Allocation error or connection failure
	Missing AS-OS connection	OS has no connection to the AS

Additional information

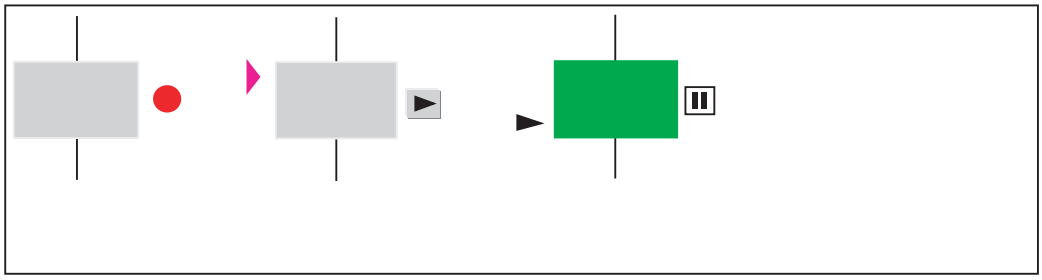
BATCH configuration dialog > "Chart folder" tab (Page 1010)

9.8.5.14 Additional status identifier

Additional status IDs - breakpoint and command

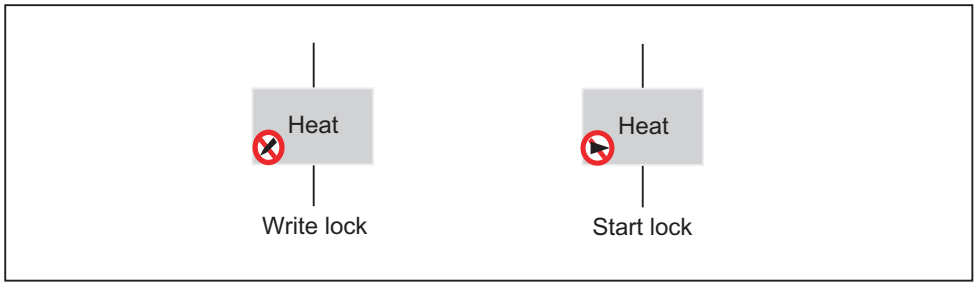
The breakpoint is indicated by a red circle. The circle is replaced by the breakpoint operator button when the step is activated. The symbol for the breakpoint operator button corresponds to the start icon on the toolbar.

The pending command is indicated by a symbol corresponding to the operator button.



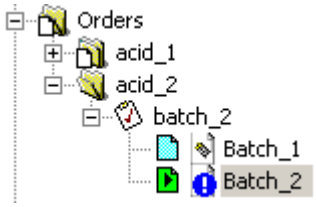
Additional status identifiers - locks

The write lock is set when a BATCH client is currently making online parameter changes or inputting information in operator dialogs. The start lock is set when the PLC block signals the LOCK flag. If both locks are set, the write lock is displayed (priority: write lock before start lock).

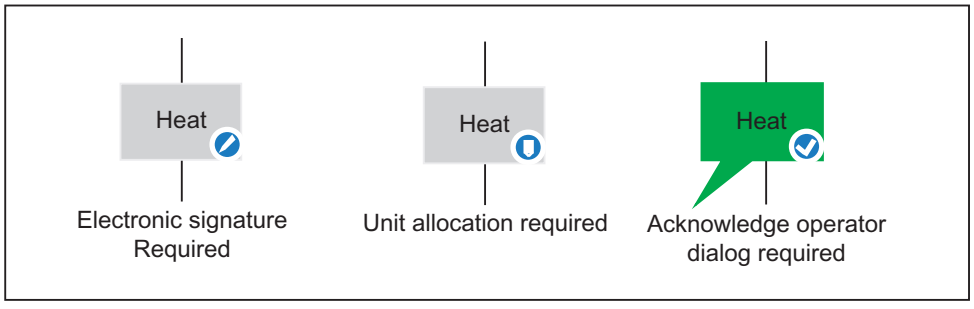


Additional status identifiers - operator prompts

A white exclamation mark on a round blue background is shown for all operator prompts in the current batch in the BCC.



Double-click on the icon or open the control recipe. The following three operator prompts can be shown in a control recipe element:



If one of the above icons for an operator prompt is displayed within a control recipe element, the batch execution is interrupted and an operator action is required from you to resume the batch. Right-click on the corresponding control recipe element and select the appropriate command in the shortcut menu:

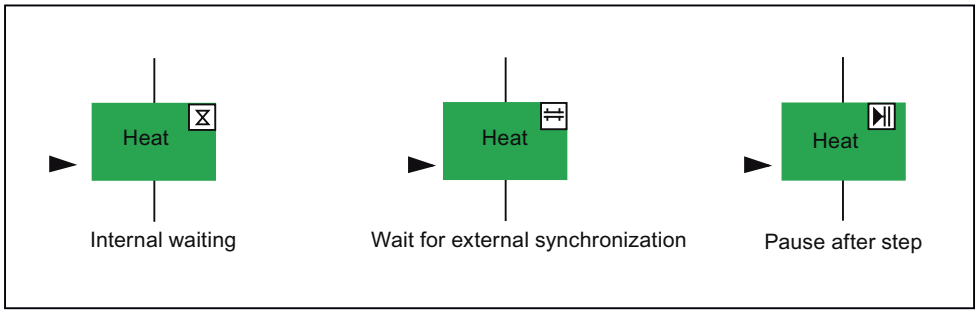
- Electronic signature required > Sign ...
- Acknowledge operator dialog > Open the "Object properties" dialog to apply or change
- Unit allocation required > Select unit ...

Additional status identifier - internal waiting, waiting for external synchronization and pause after step

A step that is waiting for an internal event is is indicated with an hour glass. Example: Step waiting for free data blocks for SIMATIC BATCH AS based.

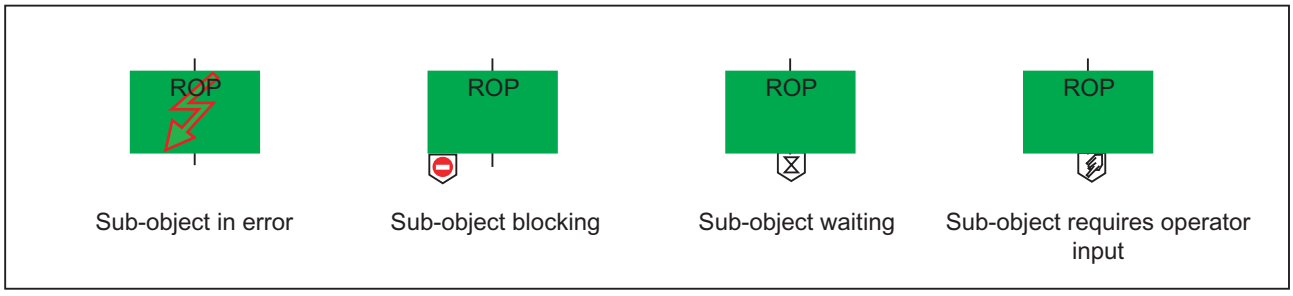
The Synchronization line shows that the step is waiting for external synchronization (from MES via API, for example).

Steps that have performed a pause after step are indicated with the command symbol for "Pause after step".



Additional status identifiers - group display for container objects

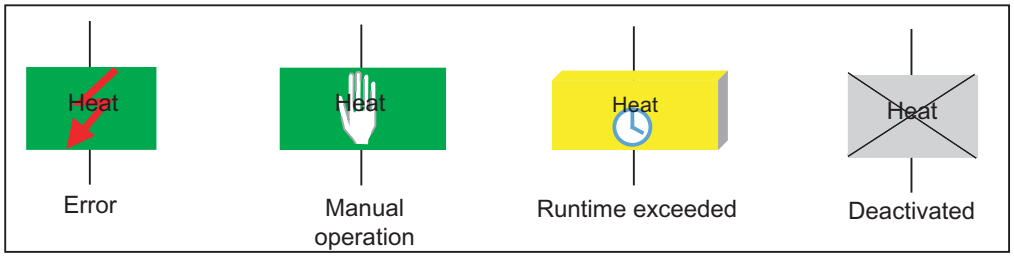
A batch step consisting of lower-level batch steps (recipe unit, recipe operation or substructure), is referred to as a container step. The status of such container steps is determined by the status of its lower-level steps. To indicate that individual sub-objects have interrupted the execution, there are group displays for container steps:



A sub-object blocks the execution when it is stopped, aborted, held or paused after a step. A sub-object waits for external synchronization. A sub-object demands operator input in manual mode for an operator dialog, unit selection, electronic signature or when a breakpoint is set.

Additional status identifiers - error, manual, run time exceeded, deactivated

These symbols can be displayed superimposed on to one another (for example, error + manual).



Note

Note the following points about status visualization:

- If at least one recipe element in a level has the "running" status, the recipe elements of the higher levels are also indicated as "running".
- If no recipe element is in the "running" status, the highest priority state is reported to the higher levels. The only higher priority state reported is "Hold immediately".
- If a recipe element changes to the "Error" status, this state is reported to the higher levels immediately. If the entire batch is to be discontinued, this must be aborted at the batch level.

You can change the colors with the menu command **Options > Settings**.

Additional status identifiers - warning, e.g. setpoint deviation

The additional status identifier "RPE_EXSTATE_WARNING" indicates a warning on a recipe procedural element. This status identifier indicates setpoint deviations between the equipment phase and the equipment module. An exclamation mark appears on the step box as a warning symbol. The setpoint deviation is shown in the tooltip.

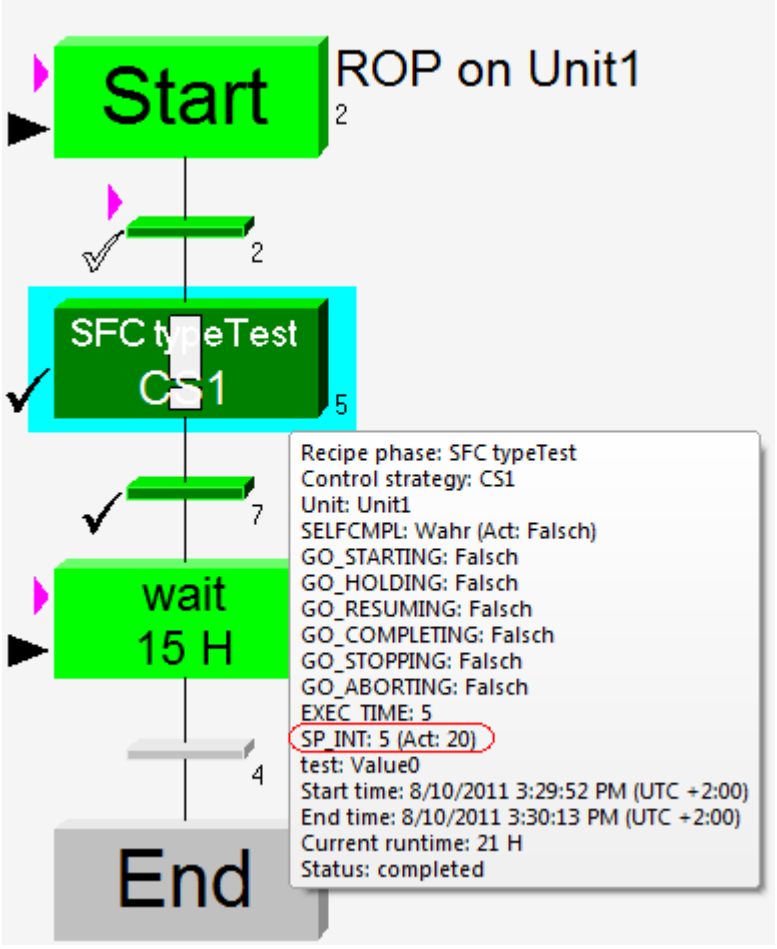


Figure 9-18 Setpoint deviation

In contrast to the additional status identifier "Error" (red lightning bolt), the warning is not highly propagated to the batch via ROP and RUP. The setpoint deviation check takes place when the following actions are carried out:

- Switch from manual to automatic mode
- Allocation of an equipment phase
- Project setting "Transfer setpoints when switching from manual to automatic" is set to "No"
- Current batch status is "Completed" or "Continue"
- Equipment phase is in automatic mode

The setpoint deviation indication applies to the recipe view in BatchCC as well as in BATCH OS Control "Properties". The new status creates as event, which is contained in the xml archive file and in the viewer for archived batches.

See also

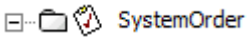
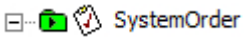
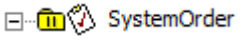
Configuring synchronization with SIMATIC IT (Page 617)

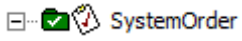
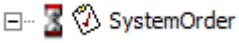
Unlock step (Page 1100)

9.8.5.15 Status display at the order folder

In addition to the symbol for the batch order folder, a symbol shows the combined status of all batches contained in the order folder. Extended batch information is shown dynamically overlaying this symbol.

Possible displays

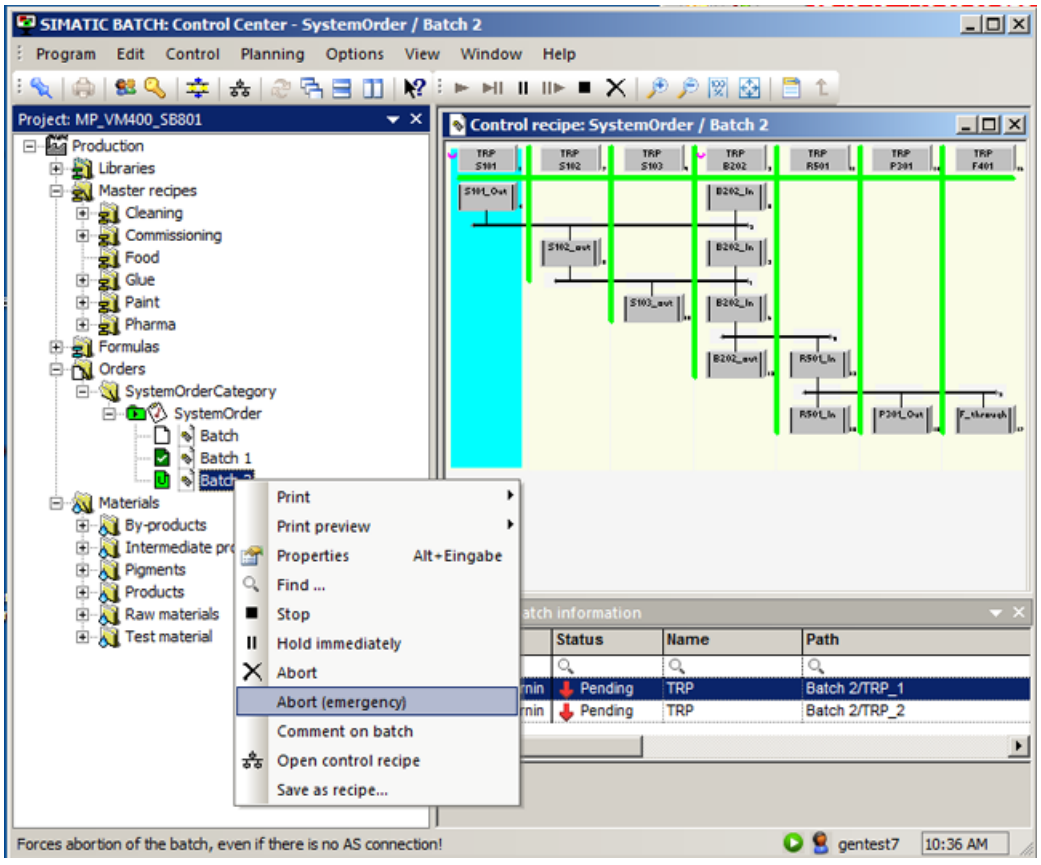
Symbol	Combined batch status
 "Inactive" status	At least one batch has one of the following statuses: • Planned • Release prepared • Released • Release invalid • Locked No batch has one of the following statuses: • Running • Held
 "Active" status	At least one batch of the order has the "Waiting" or "Running" status.
 "Held" status	At least one batch of the order has the “Holding (after step/ immediately)” or “Held (after step/immediately)" status. All other batches are inactive or Completed/Aborted/Stopped.

Symbol	Combined batch status
 "Completed" status	The symbol indicates that all batches included in the order folder have one of the following statuses: • Completed • Aborted • Stopped • Canceled Because all these batch statuses are to be interpreted as completed production, the displayed symbol indicates the end of production. As soon as new batches are created in the folder, the symbol changes accordingly.
 "Unknown" status	The symbol indicates that a time period is required to determine the status information of all order folders. This is a transitional status which results in one of the three statuses above.

Symbol overlaying the order folder	Extended combined batch status
 Operation	Manual input by an operator is required for at least one batch of the order.
 Error	There is an error in at least one batch of the order.

9.8.5.16 Aborting a batch when no AS connection is available

The **Abort (Emergency)** command can be used to abort a batch when no AS connection is available.



The "Abort (Emergency)" command can be used when the following rules are observed:

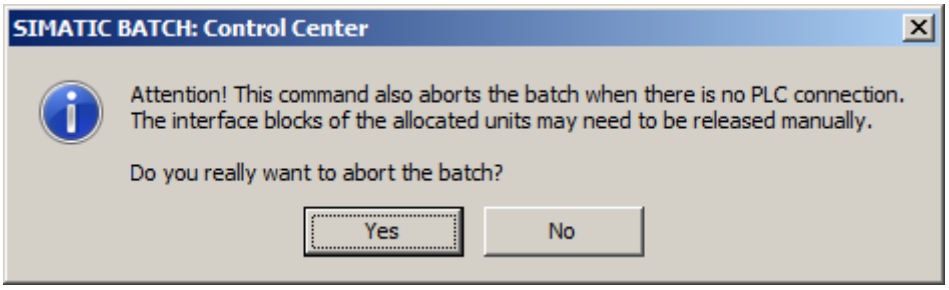
Rules for using Abort (Emergency)

- This command is only active and visible when the user currently logged on has a role with super user status. Note: The "super user" status has nothing to do with the name of the role. The role must have super user status, which is indicated by a yellow outline around the symbol.

- If the "**Abort (Emergency)**" command is used when a **connection to the AS is available**, the command has the same effect as the normal "Abort" command. In other words, the batch is only in the actual "aborted" state when the block states of the AS have been reported as such.
  There is no guarantee, therefore, that executing this command will result in a quicker abortion (when an AS connection is available).

- If the "**Abort (Emergency)**" command is used when **no connection to the AS is available**, the status of the batch and the active elements are aborted regardless of the block states. The user is responsible for manually bringing the blocks in the AS to a non-critical state. Even if the connection to the AS has been re-established, these SIMATIC BATCH blocks must be reset before they can be used again.
- For safety, a prompt appears asking the user if he really wants to abort the batch with the note that no AS connection is available and that the interface blocks of the allocated unit may need to be released manually.



- The "**Abort (Emergency)**" command is not provided by the SIMATIC BATCH API.
- BatchCC has no information as to whether or not there is a connection between the BATCH client and AS. This command is therefore always available, even when the connection between the BATCH client and AS is intact.

9.8.5.17 Operation of batches after restart of CPU, SFC types

Batch operation after CPU restart using SFC types

A CPU stop and subsequent restart generates an error with a running batch which interrupts this batch. To continue, cancel or stop, the batch must be manually operated.

In SIMATIC BATCH, there are two configuration possibilities. The following describes the procedure when using SFC types

Behavior when using SFC types

After a batch error is displayed in the BCC, manual operation must always be initiated. The question mark (refer to Fig, "batch errors") shows the lost connection to the CPU. In BATCH status "BA_STATE", BIT31 (=group error) is set. Manual continuation or cancellation of the batch is only possible if the SFC has been manually started after considering all process requirements (manual operation) and BATCH status "BA-STATE" i.e. bit 31) has been thereby reset.

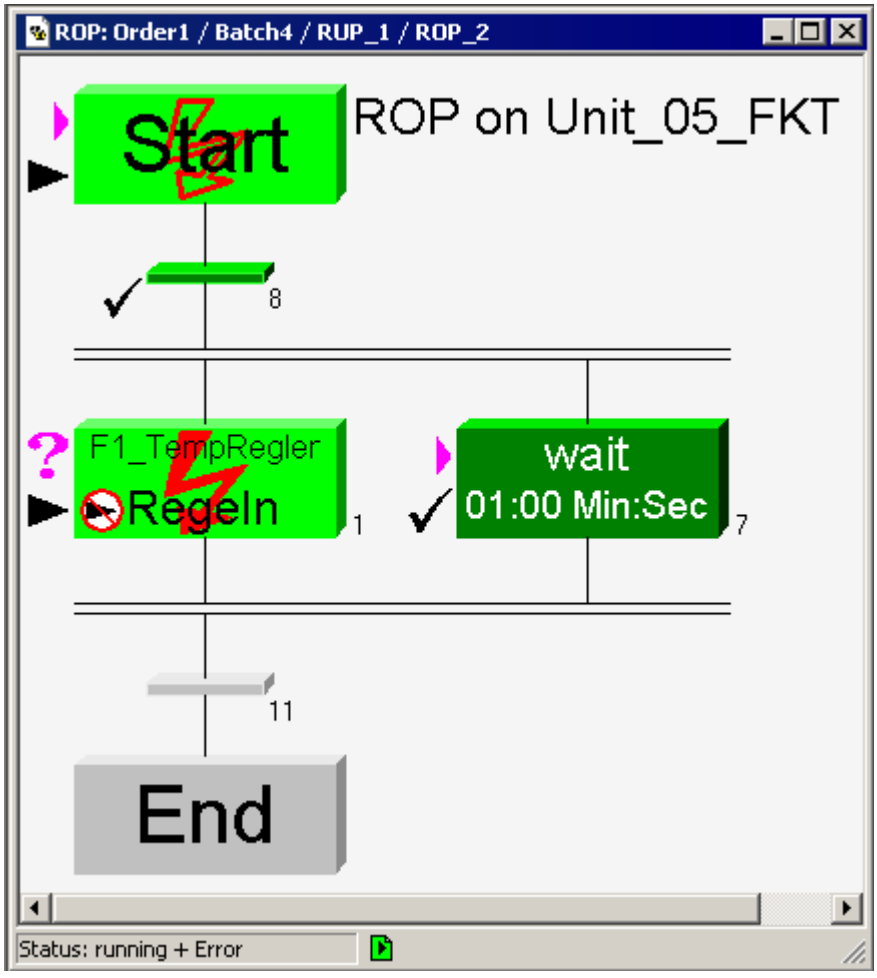


Figure 9-19 Batch errors

The start-up behavior after a CPU restart is determined by the two system settings at the SFC instance:

- Initialise SFC
- Maintain SFC state

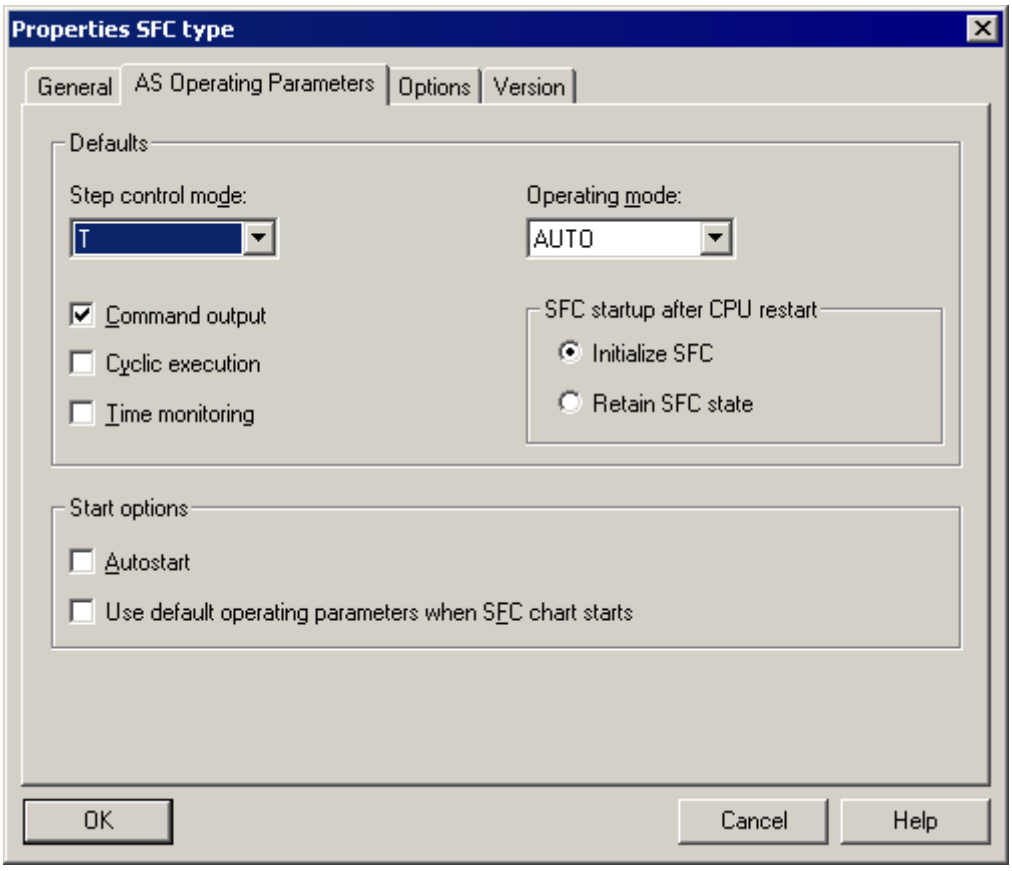


Figure 9-20 Initialise SFC selected as setting

Properties of the SFC startup after a CPU restart: "Initialise SFC"

Scenario: There has been a CPU stop and the start-up behavior of the SFC is set to "Initialise SFC". The SFC stops at the currently active step

Result: After a CPU restart, the SFC is initialised, i.e. the operating state is "Ready" (IDLE) and all steps are initialised. The operating mode remains unchanged - AUTO or MANUAL.

In the "Ready" mode, only a start command can be issued; in the MANUAL mode, the "Start" command or in the AUTO mode the start command from BATCH.

Operating SFC visualisation in the OS: A switch-over from AUTO mode to MANUAL mode is required for manual operation. Only the "Start" function is possible. The SFC is once more run.

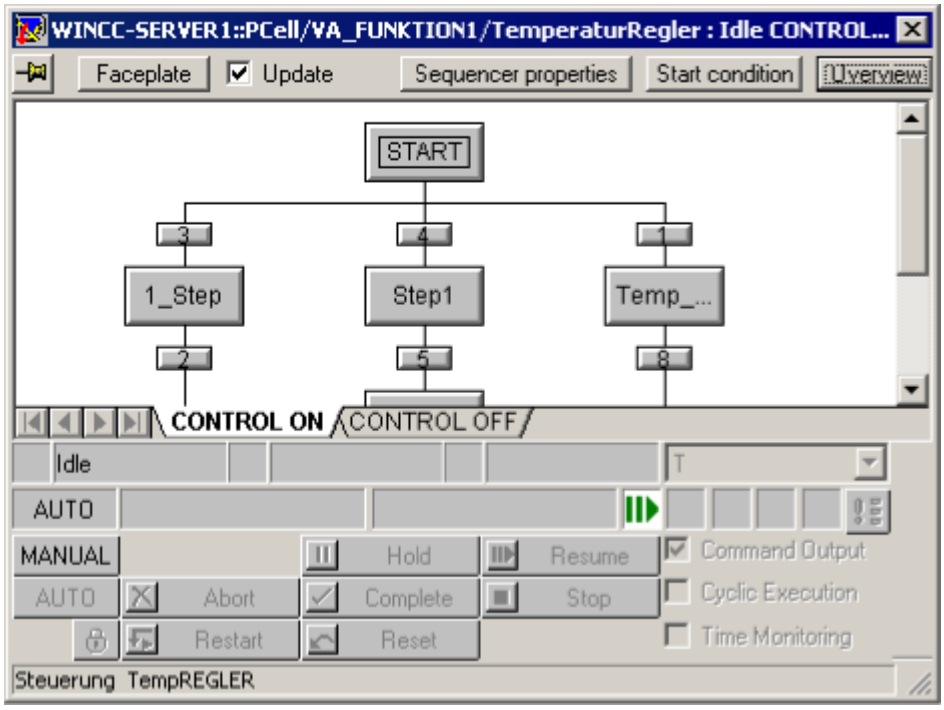
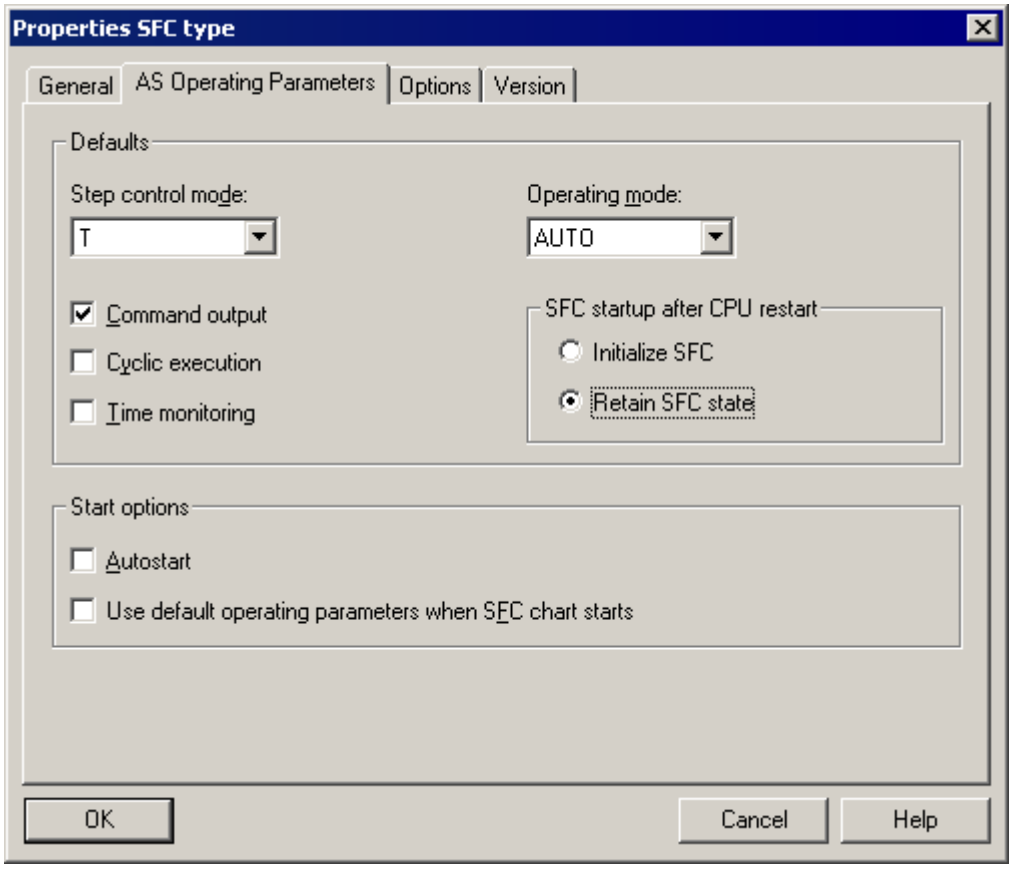


Figure 9-21 Start SFC

Operating the BATCH batch: It is your responsibility as the user to decide when to continue, cancel or stop an interrupted batch after manual operation. Continuation of the batch can also be made at a later step.

Properties of the SFC startup after a CPU restart: "Maintain SFC state"



Scenario: There has been a CPU stop and the start-up behavior of the SFC is set to "Maintain SFC state". The SFC stops at the currently active step

Operation of SFC visualization in the OS: After a CPU restart, the SFC is visualized in its actual state. The step that was active before the CPU stop is marked. The SFC waits for manual operation by the user. You do not have to switch over from AUTO to MANUAL. The step to be continued can be selected. The functions **Continue**, **Cancel** or **Stop** are possible; refer to the figure. You decide as the user on how to continue, depending on the process.

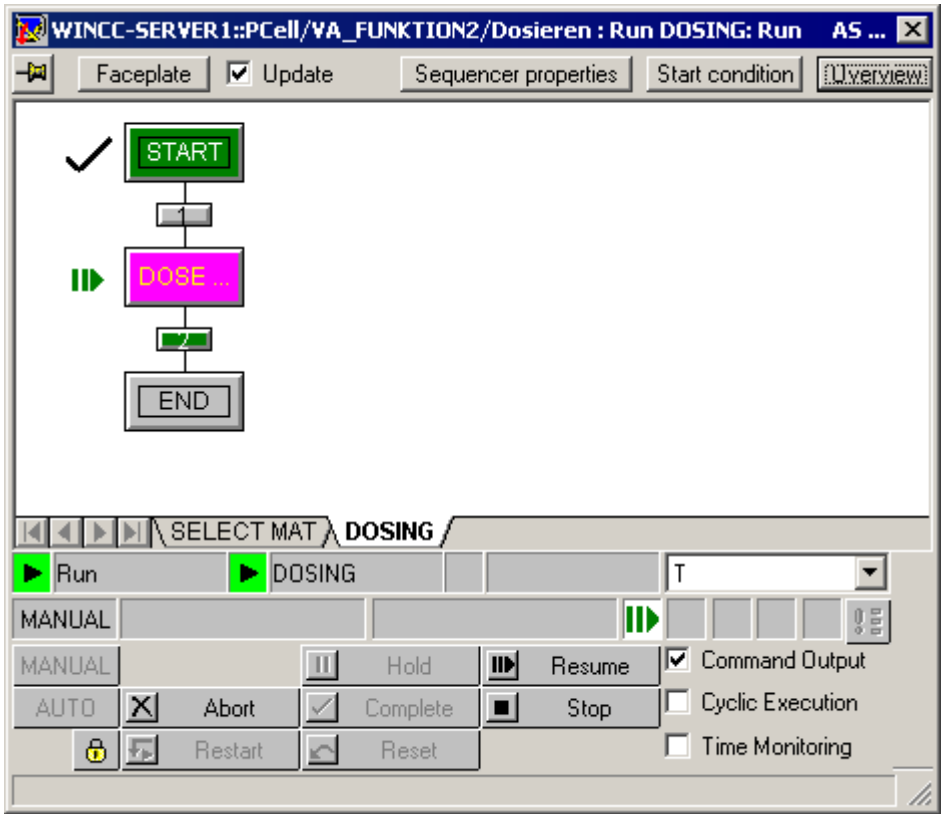


Figure 9-22 Continue, cancel, stop SFC

Operating the BATCH batch: It is your responsibility as the user to decide when to continue, cancel or stop an interrupted batch after manual operation. Continuation of the batch can also be made at a later step.

Online Help: SFC :for SIMATIC S7

Additional information is contained in the online help: SFC :for SIMATIC S7, topic: Processing an SFC after a CPU stop and restart

9.8.5.18 Operation of batches after restart of CPU, SFC and batch interface blocks

Batch operation after CPU restart using SFC plan and BATCH interface block

A CPU stop and subsequent restart generates an error with a running batch which interrupts this batch. To continue, cancel or stop, the batch must be manually operated.

In SIMATIC BATCH, there are two configuration possibilities. The following describes the procedure when using SFC plan and BATCH interface block

SFC plan and BATCH interface block

BATCH blocks (IEPH, IEOP) receive the status of SFC plan. The behavior of batches after a CPU restart is determined according to the settings made for the SFC plan. A difference is made between the settings "Initialise SFC" and "Maintain SFC state".

Initialize SFC: After a CPU restart, the SFC is initialised, i.e. the operating state is "Ready" (IDLE) and all chains are initialised. The operating mode remains unchanged - AUTO or MANUAL. The BATCH blocks also have the status "Ready" (IDLE). Batches are in error and the status "BA_State" or Bit 31 is set. Further operation is as described in chapter "batch operation after CPU restart when using SFC types".

Maintain SFC state: After a CPU restart, the SFC is visualized in its actual state. The step that was active before the CPU stop is marked. The SFC waits for manual operation by the user. You do not have to switch over from AUTO to MANUAL. The step to be continued can be selected. The continue, cancel or stop functions are possible.

The BATCH blocks assume the status as in the SFC plan. The "Running" status is displayed in the following figures.

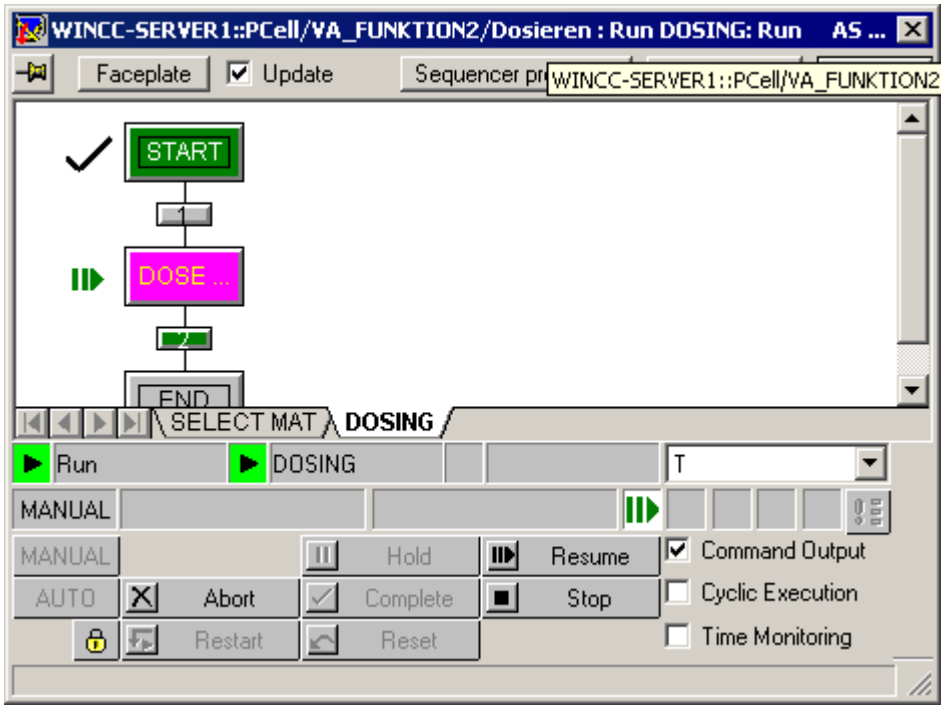


Figure 9-23 Run chain, SFC visualization on the OS

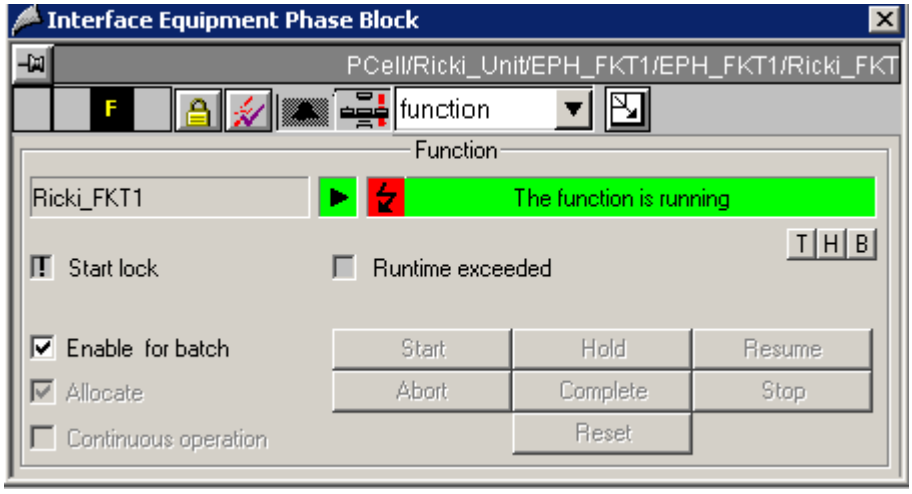


Figure 9-24 IEPH, visualization on the OS

Operating the batch: It is your responsibility as the user to decide when to continue, cancel or stop an interrupted batch after manual operation. Continuation of the batch can also be made at a later step.

Online Help: SFC :for SIMATIC S7

Additional information is contained in the online help: SFC :for SIMATIC S7, topic: Processing an SFC after a CPU stop and restart

9.8.6 Changes control during batch processing

9.8.6.1 Changing setpoints

Introduction

During batch control, it is possible for the operator to change parameters (setpoints) of a control recipe. Use this function if you want to change the speed of an agitator without stopping it. The following parameter values can be changed online:

- Input materials
- Output material
- Process parameters

This requires that "Allow online changes" was specified for the corresponding parameter during recipe creation.

Additional information can be found in section "Setting the online modification of setpoints (Page 605)".

How modification affects RPHs and the operator dialog

The new values are immediately available for all not yet active recipe phases (EPH, EOP) and operator dialogs.

For active recipe phases (EPH, EOP) and operator dialogs, the following behaviors are exhibited:

- Parameter is "Modifiable":
  If recipe steps are currently being processed, parameter changes by the operator are not applied immediately. Modified parameter values only take effect the next time the recipe step is run through.
- Parameter is "Effective immediately":
  If the recipe step is currently being processed, parameter values changed by the operator are applied immediately. Parameter values for the active recipe step in the control recipe are transferred directly to the automation system. You influence the active block in this way.

How modification affects ROPs and the RUPs

The new values are available immediately for all not yet active recipe elements (ROP, RUP) and operator dialogs.

Parameter is "Modifiable":
If recipe elements are currently being processed, parameter changes by the operator are not applied immediately. Modified parameter values only take effect the next time the element is executed (for example positioning within a loop).

Note

If a user has opened a recipe element for editing, other users cannot make changes to this object.

Changing setpoints

You make the setpoint changes during batch control in the properties dialog of the recipe element. The figure below is an example of the dialog for modifying the parameters of a recipe step.

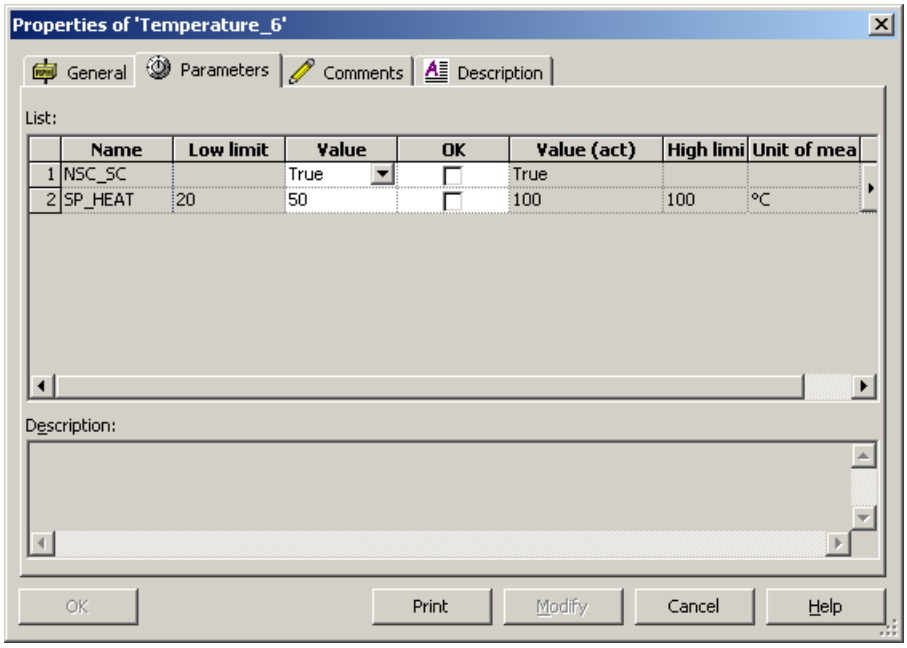
You open the properties dialog by selecting the recipe element and the "**Properties**" command in the corresponding shortcut menu.

The "Input materials", "Output material" and "Parameters" tabs are only displayed if parameters are also available for them.

If you press the "Modify" button, the parameter fields with the option "Modifiable" become editable (white background). Modify the setpoints and then press the "OK" button.

Next to the parameter fields, there is a check box. If the setpoints are changed, this check box is selected. Only setpoints with a selected check box are transferred to the batch control with a changed value. If changes are not to take effect immediately, clear the check box for the time being.

Result: The modified setpoint values are applied. Depending on the parameter assignment, the setpoints take effect immediately or only the next time the recipe element is run through.



Effects of parameter references

The following behavior applies in the case of parameter references (source or target interconnections):

- If parameters are designated as "Modifiable", the operator is permitted to enter new values.
- If parameters are designated as "Not modifiable", the operator is not permitted to enter new values.
- If parameters are designated as "Not modifiable" and are interconnected with a source, parameters nevertheless assume modified values of the source.

Note

If the operator enters a new value on a parameter interconnected with a source, the parameter reference is resolved. Resolved parameter references remain resolved in the subsequent course of the recipe.

9.8.6.2 Changing the unit allocation

Introduction

The allocation of the unit including the batch strategy can be manually changed during batch control.

For example, if a control recipe is stopped due to a fault in the unit that was started with this control recipe, the batch process can be resumed by allocating another unit.

Note

This change can only be made in the properties of the entire batch.

Changing a unit

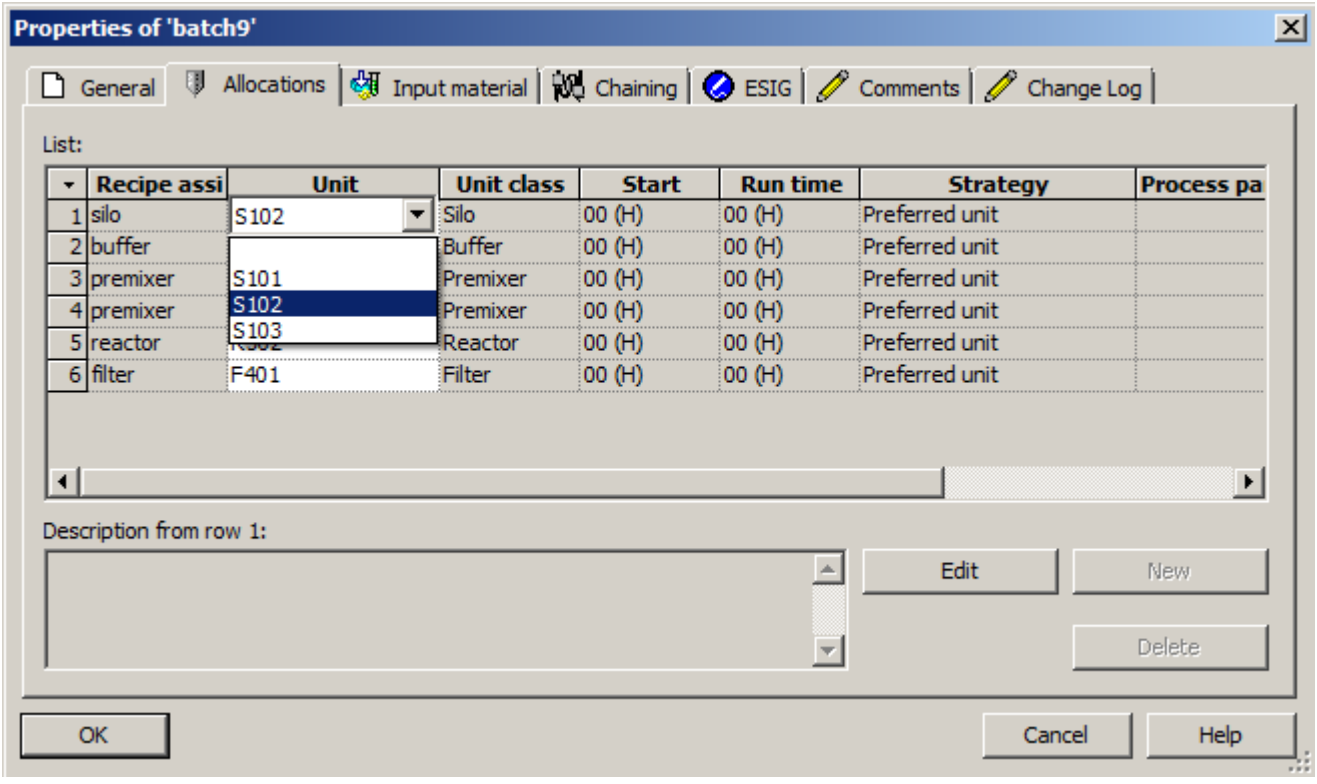
You make the unit changes during batch control in the properties dialog of the recipe procedure.

You open the properties dialog by selecting the recipe element and the **Properties** command in the context menu.

The currently selected units are displayed in the "Allocations" tab.

If you click the "Modify" button, the "Unit", "Strategy" and "Process parameter" fields become editable (white background). If applicable, modify the units and then press the "OK" button. The available settings can be selected from the drop-down list.

When the allocation of the unit is active, no changes can be made to the unit.

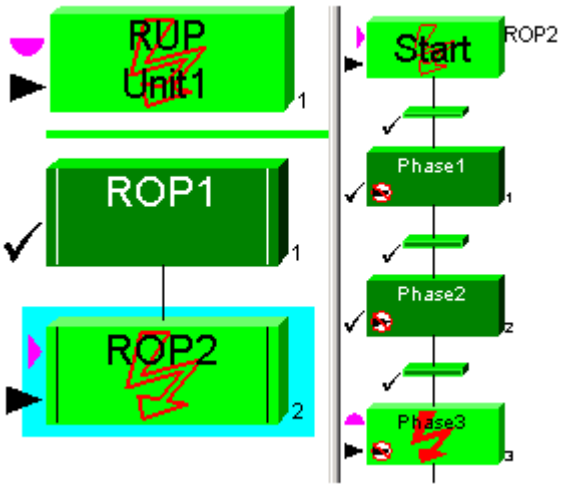


9.8.6.3 Resuming a batch at the old position after changing a unit

The following describes how to resume a batch at the old position after changing a unit when a batch process has been interrupted.

The basic sequence of tasks are shown in an example.

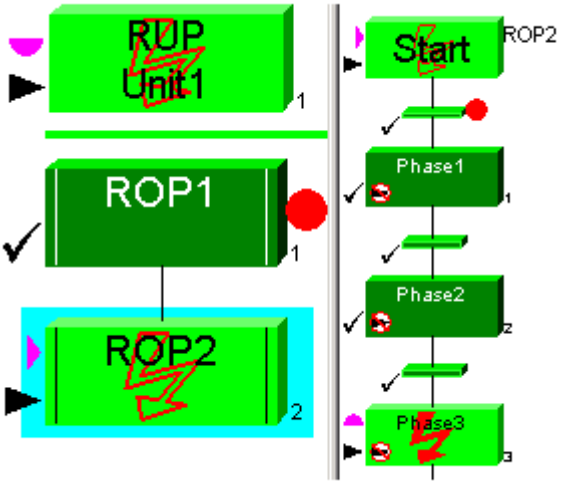
Step 1



"Phase3" within ROP2 has been disrupted in the example. Before the batch can be continued in a new unit, the product first needs to be conveyed to an "intermediate container".

Step 2

To block the execution of steps that have already been completed, the first element of each task sequence (ROP1 within recipe unit procedure and the first transition within ROP2) are marked with a breakpoint (command: **Breakpoint" > "Set"**).

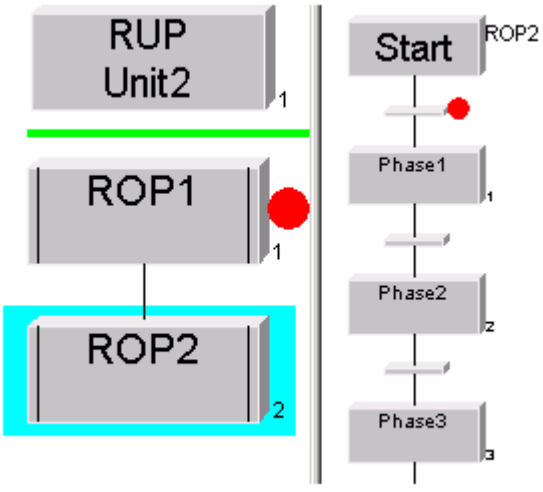


Step 3

The interrupted recipe unit procedure can now be aborted and reset (commands: "Abort step" and "Reset step").

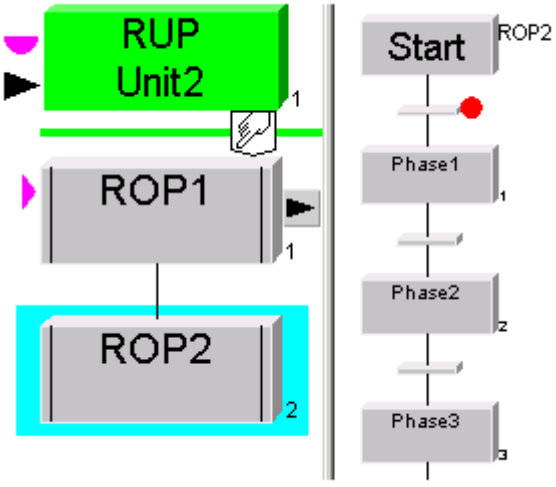
Step 4

Right click on the recipe procedure in the control recipe and select "Object properties" from the context menu. Open the "Allocation" tab in the "Object properties" dialog. Reallocate the process cell.



Step 5

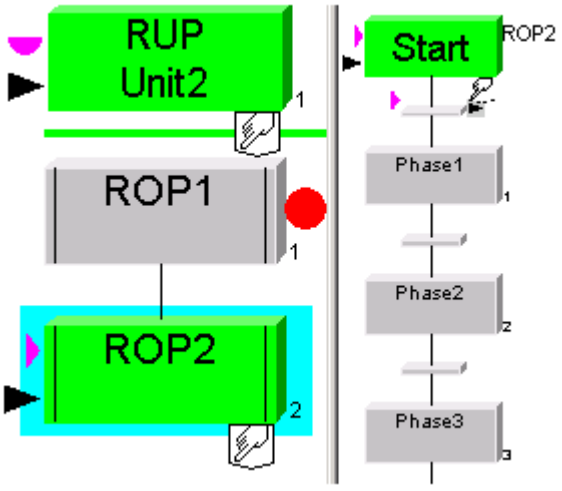
The new unit is allocated by starting the RUP. The breakpoint at the ROP1 blocks any additional call.



Once the unit is allocated, the product is conveyed out of the "intermediate container" into the new unit.

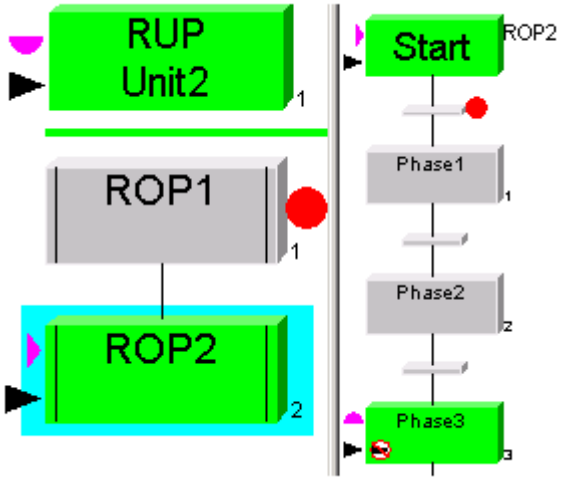
Step 6

Since the process should continue to ROP2, ROP1 must first be reset. ROP2 can then be restarted.



Step 7

Once the transition has been reset, the batch can continue at the interrupted position by starting Phase3.



9.8.7 Display of operator and status messages

9.8.7.1 Displaying messages

Requirement

A PCS 7 OS (WinCC) is operating in run time on the BATCH client computer. In other words, either an OS client application and/or an OS server application is running on the BATCH client computer.

Principle

All the messages for batch control (system messages, process messages, error messages) that are managed in the WinCC archives can also be displayed in BatchCC.

To display these messages, you can open the message window of the PCS 7 OS (WinCC Alarm Control) in BatchCC in a separate display window.

Displaying messages

You can open the message window of the PCS 7 OS (WinCC Alarm Control) with the menu command **View > Output window**.

Setting the WinCC Alarm Control

To allow messages to be displayed, the PCS 7 OS must still be assigned. Proceed as follows:

1. Right-click in the message window and select the shortcut menu command "**Properties**".
   Result: The "Properties of WinCC Alarm Control" dialog box opens.
2. Select the "Selection" button under "Server Selection".
   Result: The "Select Server" dialog box opens.
3. Here, select the PCS 7 OS (message OS).
4. Confirm the selection with "OK".

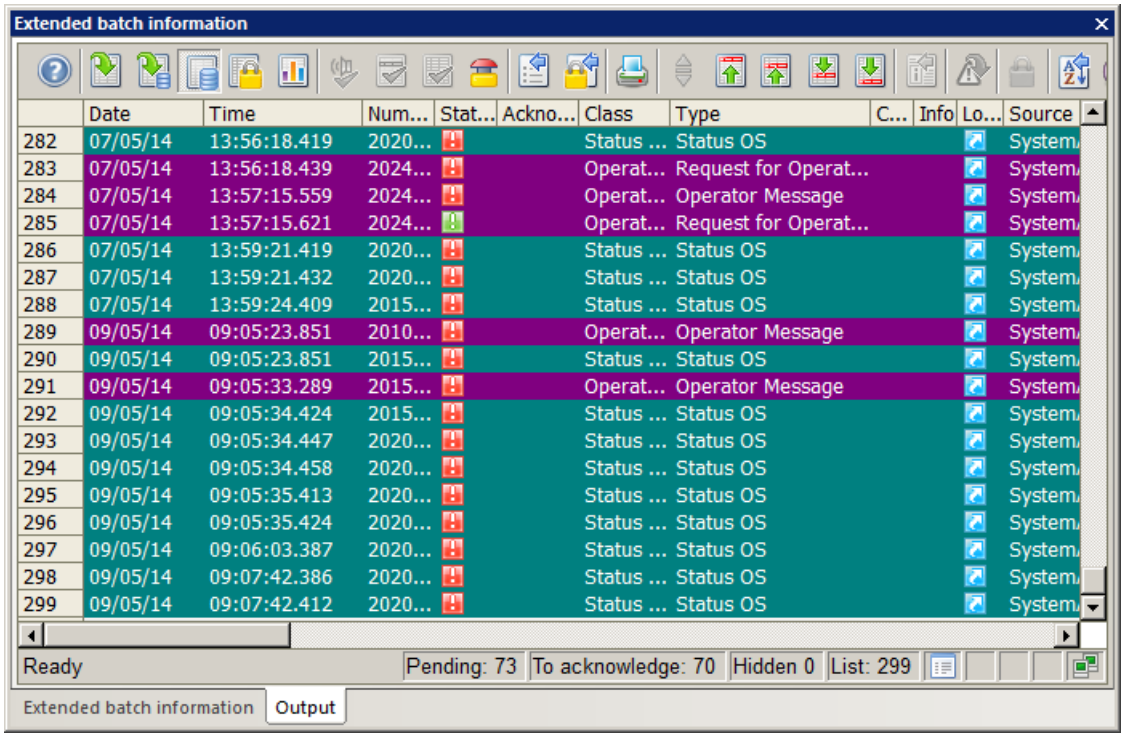
Customizing

You can customize the properties of the message window (similar to WinCC), for example the columns displayed and the selection of messages.

User settings are entered in the global database and restored the next time you start BatchCC. Certain settings that are essential for SIMATIC BATCH are exceptions to this, for example selection of BATCH messages.

Using the **Open control recipe** menu command, the control recipe that matches the message can be opened. This function corresponds to the "LoopInAlarm" function in the WinCC message window.

Example



Additional information

Localizing message causes in the control recipe (Page 490)

9.8.7.2 Localizing causes of messages in the control recipe

Requirement

The message relates to an error that occurred when processing the control recipe.

Follow the steps outlined below:

Select the message line and then select the menu command "Open control recipe" in the context menu.

Result

The control recipe window is opened at the point at which an error occurred.

9.8.8 Online structure changes (OSC)

9.8.8.1 What does the online structure change offer?

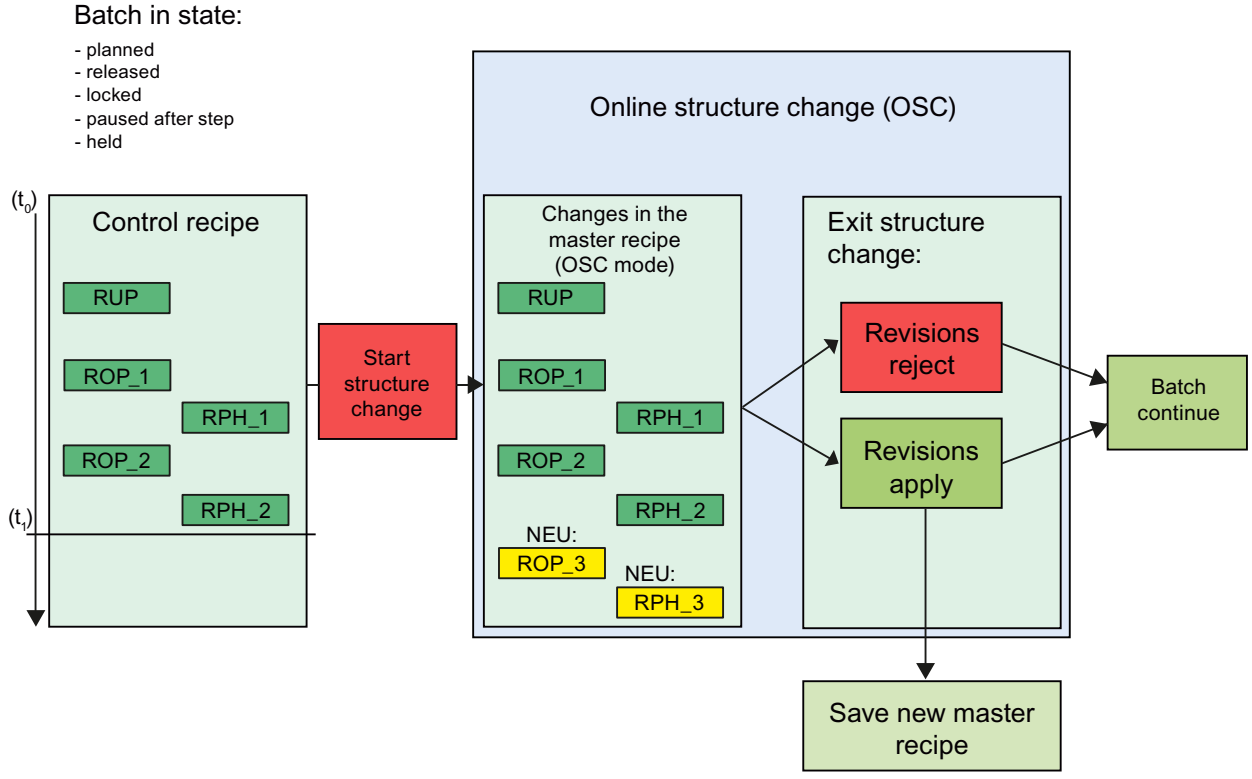
Introduction

In SIMATIC BATCH, you can use the "OSC" function (Online Structure Changes).

Online structure changes (OSC)

This enables you to alter recipe structures in planned, released and started batches. The altered or changed recipe structure in the control recipe (batch) can be saved for further use as a new master recipe. With this new function, you are able to refine your master recipes in test mode and adjust them perfectly to your processes.

The following function graphic provides an overview:



WARNING
Operator responsibility As the operator you are responsible for leaving an active batch in a secure state before transferring the batch to OSC processing mode.

9.8.8.2 Scope of services and features

Scope of services

- Online changes to the recipe structure are available for both flat and hierarchical recipes.
- The master recipes used in batches must have the status "Release for testing".
- The control recipe must be open in the window of BatchCC and the window must be active.
- Online structure changes are adopted independent of the block version.
- All commands available for the online structure change can be found in BatchCC in the "Control" menu. The commands for inserting new recipe elements (RUP, ROP, RPH, loop, synchronization, etc.) are set via the BatchCC toolbar activated when starting OSC mode.
- In the "Batches" folder of the project settings, you can select or clear the "Active batches have to be held" option. Selecting the option means that the batch must be paused for the online structure change. When the option is deselected, the batch and thus the process continue running in AS.
- The right "start structure changes" was introduced for the online structure change.

Features

- Other clients are not permitted access to a batch in OSC mode and the BatchCC prevents the process editing of this batch.
- All the usual editing functions are available.
- You can exit the "OSC processing mode" in two ways:
  - Accepting changes: By selecting the command "Accept changes", the altered control recipe is validated. If no errors occur during the check, changes are transferred to the current batch and OSC processing mode is stopped.
  - Rejecting changes: All changes made are rejected.
- As soon as changes have been saved to a batch or rejected, the batch can be resumed either at the point at which it was paused or at any other point in the control recipe.

- The visualization of the batch affected by the change in BatchCC is not updated for all connected clients during the online structure change. After completing OSC editing, the visualization of the batch is updated.
- You can use the "Save as recipe" function to save the control recipe of any batch to the folder "Master recipes" as a new master recipe with a new name (suggested name is name of the batch), regardless of whether it has been changed in OSC processing mode or not. To do this, you will need the "Save as new recipe" right.

9.8.8.3 Restrictions

The following limitations apply to online structure changes:

- If you want to change existing transitions and steps in OSC mode, carry out the following steps:
  - Cut the transitions and steps.
  - Paste the transitions and steps at the same location.
- Active recipe steps cannot be deleted. An object in the control recipe can only be deleted in the following states:
  - Completed
  - Aborted
  - Stopped
  - Inactive, idle
- It is not possible to update process cells in BatchCC during an online structure change, nor is an online structure change possible during a process cell update.
- A complete batch report cannot be guaranteed if the process continues to run in OSC mode.
- The selected phase type of an existing recipe step cannot be changed. For example 'stir' cannot be changed to 'heat'. Alternatively, you can delete the existing recipe phase and create a new recipe phase with the appropriate equipment phase. The phase type can of course be changed in new recipe phases.
- The following recipe objects cannot be changed or deleted during an online structure change:
  - Existing parameters and their data types
  - Unit candidates
  - Process tags
- Online structure changes are not supported by the SIMATIC BATCH API and SIMATIC BATCH server interfaces.
- A special electronic signature is not required for the online structure change.
- Online structure changes are not recommended when using SIMATIC BATCH in conjunction with SIMATIC IT. You can therefore deactivate the options for OSC in Project settings > "Batches" folder under Deactivate structure change.

- When changing user, which may also be required by other applications (e.g. Recipe Editor, PCS 7 OS), all open dialogs in BatchCC are closed and changes to a control recipe carried out in OSC mode and that have not yet been applied are discarded.
- For batches that use AS-based mode, online structure changes are not possible. Use online structure changes for batches that are created exclusively for PC-based mode. The control recipe used for the batch must not contain any recipe unit procedures that are executed in the AS.
- The commands "Resolve substructure" and "Hide in substructure" are not available for flat recipes during an online structure change.

9.8.8.4 API and SBS behavior

Behavior in OSC mode

- At the start of the online structure change, the affected batch is locked for processing.
- The batch can no longer be changed or operated by other users.
- An error message is output in case of access, for example, to a deleted recipe element via an existing reference in the control recipe.

9.8.8.5 Batch behavior

Batch behavior

If an active batch is placed into OSC editing mode, the BATCH Control Server (BCS) switches the batch to "Suspend mode". The batch can no longer be monitored and controlled via the BatchCC in this mode. The visualization of the batch in the BatchCC is no longer updated because no process values are being read in from the process cell.

9.8.8.6 Requirements

The following requirements are to be fulfilled for processing batches (control recipes) in OSC mode.

Requirements

- Every user with the "Start structure change" right can start a batch in OSC processing mode.
- The "Allow online structure changes" option can be activated in the BatchCC menu under Options > Settings > Project settings > Batches.
- No recipe unit procedure of the master recipe used may be executed on the AS.
- The master recipe has to be released for testing.

- The control recipe used must be open in the window of BatchCC and the window must be active. Click on the window, for example, to do this.
- The start of the OSC execution mode also depends on the status of the object used and the batch status. The states of the objects (master recipes/formulas) and batches are listed in the following tables.

Status of the object	OSC processing mode
Release for testing	Allowed
Release for production	Not allowed

Status of the batch	OSC processing mode:
Planned	Allowed
Released	Allowed
Locked	Allowed
Pausing after step	Allowed
Held	Allowed
Canceled	Not allowed
Waiting	Not allowed
Aborted	Not allowed
Stopped	Not allowed
Closed	Not allowed
Testing release	Not allowed
Release prepared	Not allowed
Release invalid	Not allowed

9.8.8.7 Display of recipe elements

Different types of display

The changes made to recipe elements in OSC mode are displayed differently at different points inside and outside BatchCC. An ROP (recipe operation) and an RPH (recipe phase) will be deleted as an example.

Display modes:

- Display of the control recipe window in BatchCC before the change (starting point)
- Display of the control recipe window in BatchCC after the change
- Display of the print preview window in BatchCC after the change (report)
- Displays the XML archive file e.g. in Internet Explorer

Criteria

The display of changed recipe elements is also dependent on the following time-related criteria:

- Is this a completed recipe element in the control recipe window?
- Is this a recipe element that is still active in the control recipe window?

Representation

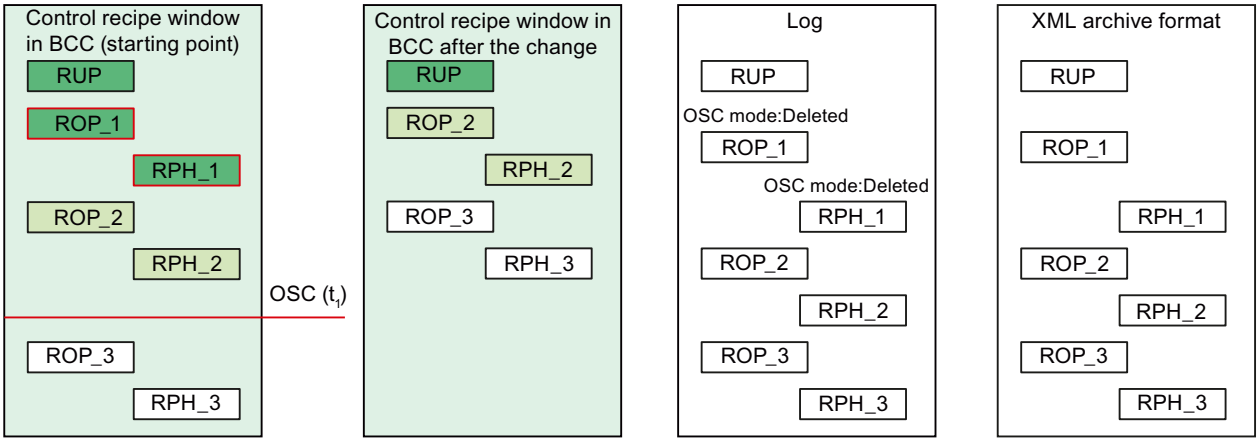
Legend:

Green: Completed recipe element

Light green: Active recipe element Cannot be deleted in OSC mode.

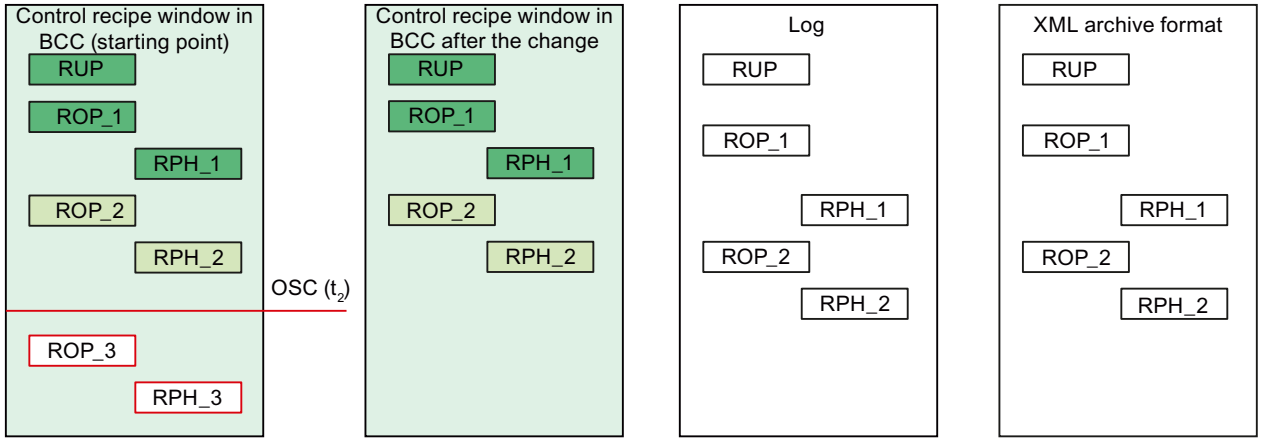
White: Recipe element that is not yet active

Scenario 1: An object already running is deleted at the point in time t_1 in OSC mode. Here: ROP_1 and RPH_1



The two recipe elements (ROP_1 and RPH_1) that have already run and been deleted are not displayed in the control recipe window of BatchCC; in the report they have an information text "OSC mode: deleted" and they are still displayed in XML archive format.

Scenario 2: An object not yet running is deleted at the point in time t_2 in OSC mode. Here: ROP_3 and RPH_3



The two recipe elements (ROP_3 and RPH_3) that have not yet run and been deleted are neither displayed in the control recipe window of BatchCC nor in the report or in XML archive format.

9.8.8.8 How do I perform an online structure change?

Introduction

The following example shows you how to perform an online structure change and provides you with background information on the system behavior.

Requirements

- SIMATIC Logon is installed.
- You have the individual permission "Begin structure change" in permission management.
- The value of the "Allow online structure changes" project setting under Options > Settings > Project setting > Batches is activated.
- The master recipe or formula used for a batch has been released for testing.
- No recipe unit procedure of the master recipe used may be executed on the AS.

Procedure

1. Create a new batch with the released master recipe.
2. Open the control recipe of the created batch and ensure that the opened control recipe window is in the foreground. If the title bar of the dialog is shown in color, then the window is activated.
3. Start the procedure via the command sequence Control > Structure change > Start. Confirm the start of OSC processing mode with the "Yes" button.
   - In the tree view in BatchCC, the affected batch is highlighted with a blue pen (editing) and a lock (interlocking).
   - In the status bar, the warning dialog "Structure change" is shown to you and all other associated BATCH clients. You can skip the warning dialog.
   - A flashing editing symbol and the text "Batch editing" are also displayed in the status bar for your information. If you move the cursor to the editing symbol, the warning dialog is displayed again.
   - In a BatchCC window, an advanced toolbar is displayed for editing the batch.
4. Make a change to your control recipe (batch). Insert, for example, an operator instruction into your control recipe.
   - The symbols "Apply structure change" and "Reject all changes" are activated for use in the toolbar.
   - In the menu bar under Control > Structure change, the commands "Accept change" and "Reject change" are activated for use.
5. If you want to reject your structure change made under point 4:
   - In the menu bar, select the command Control > Structure change > Reject change.
   - In the menu bar, select the command "Reject all changes".
6. If you want to accept your structure changes made under point 4:
   - In the menu bar, select the command Control > Structure change > Accept changes.
   - In the toolbar, select the command "Accept all changes".
7. The toolbar is closed after completing the online structure change via point 5 or 6.
   - A batch that was paused before the online structure change can be resumed after editing.
   - A batch that was released before the online structure change can be started.
   - A batch that was planned before the online structure change can be released and started.

Result

You have executed the new commands and procedure for an online structure change.

In the "Change Log" tab of the "Properties" dialog of a batch in the BatchCC, you can display information that indicates that a structure change has been made to this batch.

9.8.8.9 Save batch as master recipe

Properties of the new master recipe

You can save and continue using a batch as a new master recipe at any time using the command "Save as recipe". The only exception applies when the OSC mode is started. The command "Save as recipe" is not available during OSC processing. To do this, you will need the "Save as new recipe" right.

Note

Scaling functions, such as linear or quadratic scaling, are not performed again for the changed parameters, for which the master recipe was configured, if OSC editing mode is exited. As the user, you are responsible for the correct values of the recipe parameters for continuing the batch.

In the dialog "Save recipe as", enter a name and version. The standard name used by the system is the batch name. You must enter or specify the version, depending on the version concept. The new master recipe is saved in the "Master recipes" folder. The new master recipe has the following properties:

- Altered parameters and used units are automatically transferred to the new master recipe.
- The occupation strategy is replaced by the “Preferred unit" strategy and the unit used in the batch is entered as the preferred unit.
- The new master recipe is in processing mode and starts with a new change log.

Note

Please note that you need to adjust all quantity-dependent parameters and times. Dependencies, e.g. for dosing quantities or times, must be re-entered and parameters must be adjusted to the process. The new master recipe must be re-validated.

9.9 Report creation and archiving of batch data

9.9.1 Preparations and settings

9.9.1.1 Basic principles

Introduction

In BatchCC, you can also archive batches in long-term archives if validation is mandatory. The settings for selecting the desired archiving method and printing batch reports are made in the project settings. The viewer for archived batches is available for displaying control recipes of archived batches. Only closed batches can be archived.

Archiving individual batches

With the shortcut menu, you can archive each closed batch individually. by selecting the batch in the tree and then selecting the command "Archive" in the shortcut menu (right-click).

Archiving multiple batches

Multiple closed batches can be archived by a single action. To do so, open a batch overview list and select the batches to be archived. Then select the menu command "Archive" in the shortcut menu (right-click).

Defaults in BatchCC

The following methods for archiving completed batches are offered in the "Batches" > "Archiving method" folder:

- "Directory" method.
  The archive files are saved as XML files in the specified path in a shared folder on the network or locally. Authentication takes place via Windows security mechanisms.
- "SQL Server" method.
  The archive files are saved in an SQL database. Authentication takes place via Windows security mechanisms.
- "FTP Server" method.
  The archive files are saved on an FTP server. This method always requires a login and password. The domain only has to specified if the login is assigned to a domain (e.g., in the case of an IIS-FTP server).

Additional information

You will find further information on the security aspects and the archiving method "SQL Server" in the sections:

- Security aspects (Page 82)
- Create SQL Server database (Page 501)
- Setting up an SQL server (Page 503)
- User credentials (Page 918)
- Batches > Archiving > Archiving method (Page 805)

9.9.1.2 Create SQL Server database

The "Create SQL Server database" dialog offers several possibilities for creating a new SQL server database.

Principle

- **Area: SQL script:**
  An SQL script is a file containing simple text with SQL statements. The statements in the text can be executed on an SQL server computer by an SQL administrator. This is necessary when the SQL server is not installed on the local computer and SIMATIC BATCH is not installed on this SQL server computer. The SIMATIC BATCH Administrator (super user) can transfer this SQL script to the SQL server administrator so that they can create a suitable SQL database.
  - "Script in file" button: The SQL script is saved as a file.
  - "Script in clipboard" button: The SQL script is copied to the clipboard and can then be inserted into other applications (e.g. Notepad) using the key combination "Ctrl + V".

Note

The path for storing the database file must be adapted or specified in the script. After the script has been executed, the database is stored with a file name under the path you have specified, for example, "SB6_2_25269528_55_Archive_dat.mdf".

- **Area: Creating a database with local SQL server**:
  If the SQL server is running on the local computer and you as the user have the necessary rights to create an SQL server database, you can use the "Create Database" button to create a database.

Requirements

1. Make sure that a dedicated SQL server instance is available for archiving.
   Obtain support from your system database administrator.
2. The SQL server instance must have read and write rights for the "SIMATIC BATCH" user group.
   Obtain support from your system database administrator.
3. The user currently logged into the operating system must have administrator rights for the SQL server instance.

Note

The use of already existing SQL server instances (e.g. from WinCC or PH) is not permitted.

Procedure

1. Start the local SQL server.
2. In BCC, select the menu command [Options] > [Settings] > [Project settings]
3. Select the "Archive" tab
4. Activate the "SQL Server:" check box.
5. Click on the "Create..." button.
6. The "Create SQL Server Database" dialog box opens.
7. Click on the "Create database" button.
8. The "Select directory" dialog box opens.
9. Select a directory for the database.
10. Click on the "OK" button.
11. The "SQL Server Login" dialog box opens.
    - Select the SQL server from the drop-down list.
    - Enable the "Use trusted connection" check box.
12. Click on the "OK" button.

Result

The local database of the SQL server is set up.

With the steps described above obtain support from your system database administrator.

Additional information

You will find information on the security aspects and the archiving method "SQL Server" in the sections:

- Security aspects (Page 82)
- Basic principles (Page 500)
- Setting up an SQL server (Page 503)
- Batches > Archiving > Archiving method (Page 805)
- User credentials (Page 918)

9.9.1.3 Setting up an SQL server

In order to access an SQL database, a login with access rights must be set up in the SQL Server Management Studio.

Note

Please note that you must not use a WinCC/PH/IS SQL server instance for the archiving. Install/ use you own SQL server instance.

Procedure

1. Open the SQL Server Management Studio with the command **Start > Program Files > MS SQL Server "version" > SQL Server Management Studio** and log in.
2. Log into the relevant SQL server.
3. Open the setting **Security > Logins > shortcut menu > New Login**.
4. In the "Login Name" input box, select the Windows user group "SIMATIC BATCH".
5. Under "Default database", select the created Batch database, for example, SB8_2_25269528_55_Archive.
6. In the navigation window, open "User Mapping" and select your Batch database.
7. In the lower window, "Database role membership for ..." enable the access rights "db_datareader" and "db_datawriter".
8. Save your settings with "OK".
9. In the BATCH Control Center, enter both the used SQL server instance (for example, computer name\SBArchive).
10. In the BATCH Control Center enter any user from the Windows user group "SIMATIC BATCH in the project settings under user information.

Result

The entered logon and password are used in the BATCH Control Center for the archive connection to the SQL server.

Storage of the archives

During archiving, the BATCH Control Center saves the individual batch logs (XML archives and depending on the project setting also the PDF logs) in the new database.

Additional information

You will find information on the security aspects and the archiving method "SQL Server" in the sections:

- Security aspects (Page 82)
- Basic principles (Page 500)
- Create SQL Server database (Page 501)
- Batches > Archiving > Archiving method (Page 805)
- User credentials (Page 918)

9.9.1.4 PH archive server

Prompt archiving

To be able to use the "prompt archiving" functionality in the "PH" archiving method in SIMATIC BATCH, the PH needs to be configured singly or redundantly as a PC station in the SIMATIC Manager. After downloading with the SIMATIC BATCH configuration dialog and selecting the function "Update process cell" in the BatchCC, the setting options in the "Project settings" dialog change for the "Archiving method" folder.

As a general rule, only one PH object (Process Historian Appl./Process Historian Appl. (Stby)) can be configured in projects of the multiproject. Since not all configuration options for this basic rule are blocked by SIMATIC PCS 7, several PH objects within a multiproject can cause errors in the operation of SIMATIC BATCH.

Note

Print preview and printing batches

As of SIMATIC BATCH V 8.1 SP1, measured values and messages are transferred by the PCS 7 OS to the PH archive server. There may be situations in which, although the batch data of SIMATIC BATCH is complete on the PH archive server, associated measured values and messages are missing. In this case, the measured values and messages are also incomplete in the print preview and in the printout of batches.

Note

Disabling the PH

Regardless of the "Transfer to external archive server" option in the properties dialog of the PCS 7 OS in the SIMATIC Manager, the process values of SIMATIC BATCH are archived promptly on the PH if the specific requirements in the SIMATIC BATCH are met in the configuration.

You will find detailed information about a PH archive server and a SIMATIC Information Server, their requirements for installation and their setup in the relevant product documentation.

"Archiving method" folder in the project settings

If no PH was configured in SIMATIC PCS 7, the dialog appears as shown below:

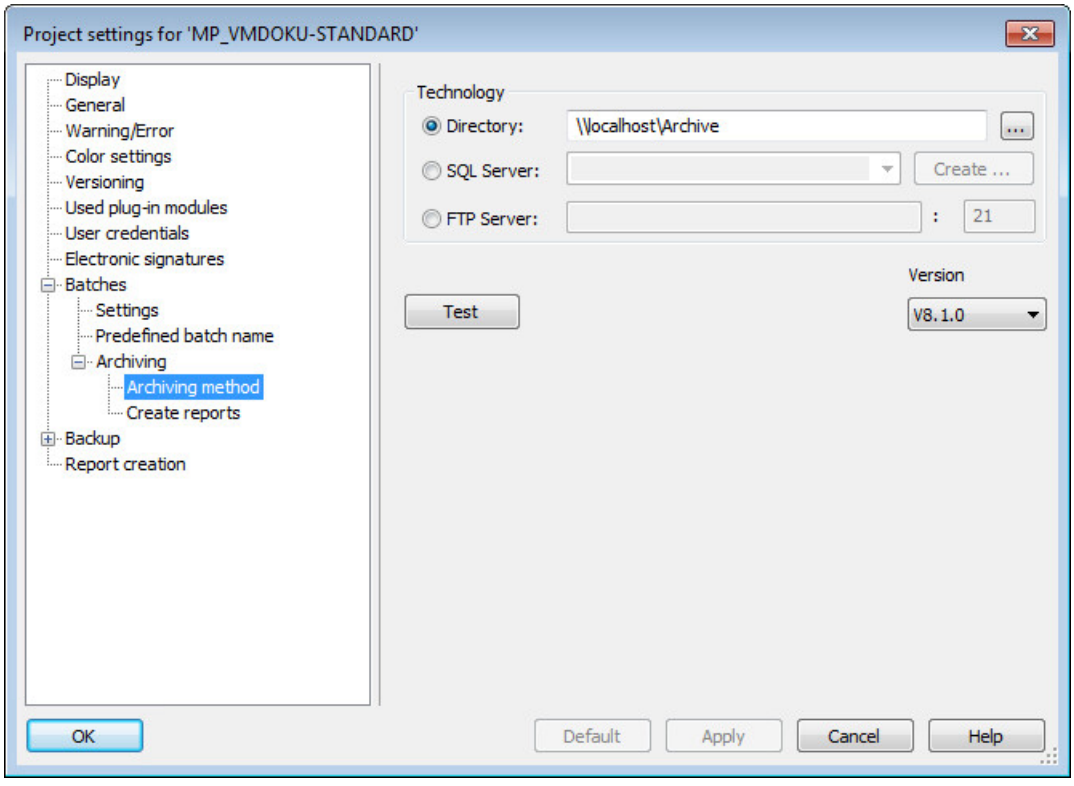


Figure 9-25 "Archiving method" folder without PH

The "Test" button is used to check the connection.

If a PH was configured in SIMATIC PCS 7, the dialog appears as shown below:

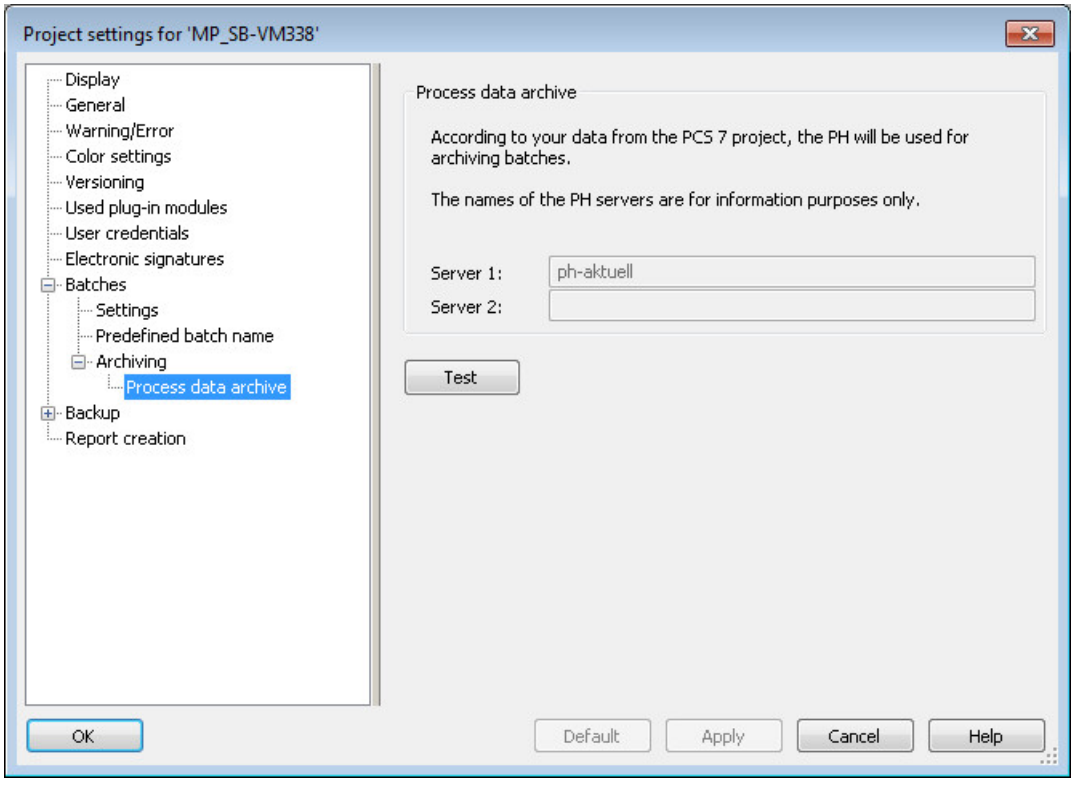


Figure 9-26 "Archiving method" folder with PH

The names of the PH servers in the project settings dialog for SIMATIC BATCH correspond to the computer names that were entered in the "Properties - SIMATIC PC station" dialog in SIMATIC PCS 7.

The "Test" button is used to check the connection.

Project settings for the "PH" archiving method

To be able to start a batch report and the batch print preview in the BatchCC, the URL address of the Process Historian (PH) or of the Information Server (IS) must be entered in the "Information Server" area in the "Report creation" folder.

If a "PH" is selected due to the configuration in the SIMATIC Manager, no other archiving method is possible.

The connection data for "Reporting Services" are determined and entered by the system.

The figure below shows, for example, the URL address in SIMATIC BATCH V9.0.

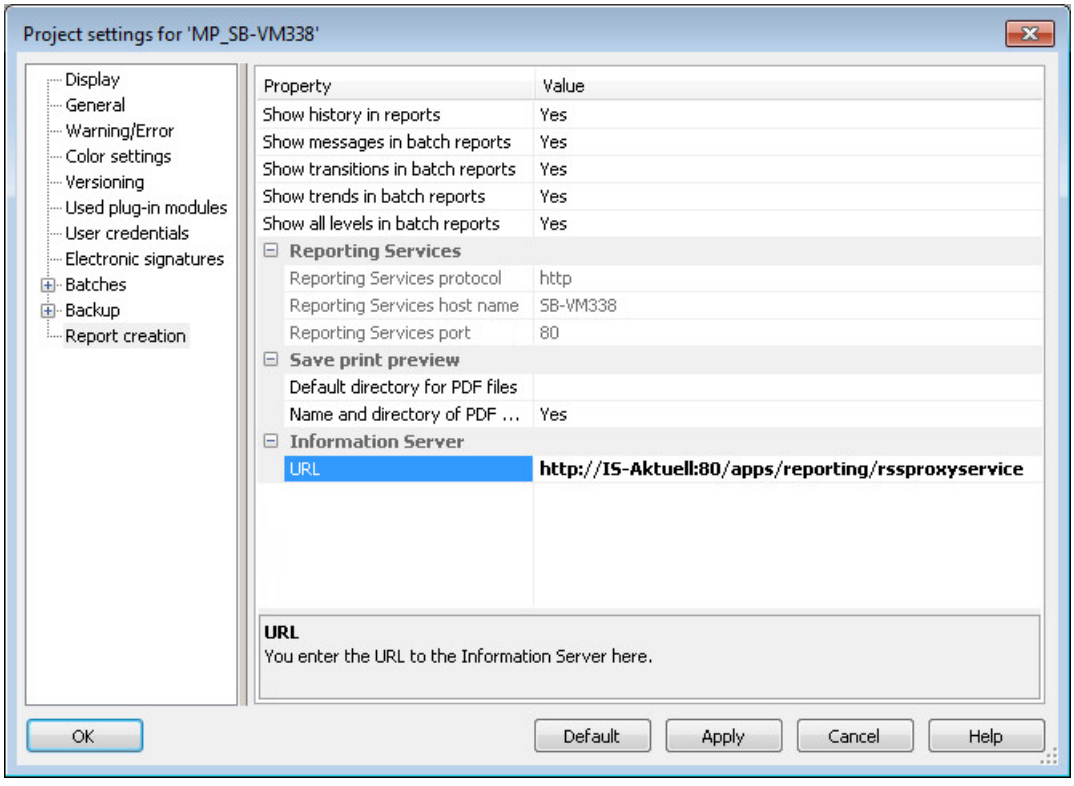


Figure 9-27 "Report creation" folder

The URL address to be entered depends on the SIMATIC BATCH version and on which PC station the PH and IS applications are installed.

The tables below provide an overview.

- URL address up to SIMATIC BATCH V8.2x

URL address	PH and IS applications on one PC station	PH and IS applications on different PC stations
General structure of the address	http://<PH computer name>:<Port>/ReportServer_HISTORIAN	Not permitted
Default address	http://<PH computer name>:80/ReportServer_HISTORIAN	
Example	http://ph-current:80/ReportServer_HISTORIAN	

- URL address as of SIMATIC BATCH V9.0

URL address	PH and IS applications on one PC station	PH and IS applications on different PC stations
General structure of the address	http://<PH computer name>:<Port>/apps/reporting/rssproxyservice	http://<IS computer name>:<Port>/apps/reporting/rssproxyservice
Default address	http://<PH computer name>:80/apps/reporting/rssproxyservice	**Change the default address:** http://<IS computer name>:80/apps/reporting/rssproxyservice
Example	http://PH current:80//apps/reporting/rssproxyservice	http://IS current:80/apps/reporting/rssproxyservice

- Variable parts of the URL address

Variable part	Contents
PH computer name	Name of the PC station on which the PH application is installed
IS computer name	Name of the PC station on which the IS application is installed
<Port>	TCP/IP port used by the Microsoft Reporting Services You can check the TCP/IP port used by the Microsoft Reporting Services in the "Reporting Services Configuration Manager" (Microsoft).

Backup and restore

If the configuration was created successfully and the "PH archiving" method is adopted in SIMATIC BATCH, even after a backup followed by a restore, nothing changes. If, however, a backup file was used that was created at a time when the "PH" archiving method was not active, the "Update process cell" function is absolutely mandatory in the BatchCC following a "Restore". In addition to this, the relevant URL in the project settings must be adapted in the "Report creation" folder.

Note

In this case, the same restrictions relating to completeness of the data apply as described in the section "Changing the archiving method".

Information on batch commands

- "Close" command
  The "Close" command is no longer available since a batch implicitly adopts the status "completed and closed" when all the batch data has been transferred to the PH archive.
- "Archive" command
  The "Archive" command changes the batch to the "Archiving" status. As soon as the batch data is transferred to the PH, the batch status changes to "Archived". As of this version, it is also possible to comment on the batch or batch elements up to the "Archived" status.

Batch reports

Once the "PH" archiving method is enabled, all batch reports are no longer based on data from the SIMATIC BATCH database, but only on the data from the PH archive present at the time the report is created.

Batch reports are created both on the SIMATIC BATCH clients and on the SIMATIC Information Server. In contrast to the SIMATIC BATCH clients, on the SIMATIC Information Server, you can not only create batch reports of a project (and therefore of a process cell), but also batch reports of batches from other projects if they have been archived. Only the report templates of the relevant SIMATIC BATCH versions are necessary to be able to create reports of batches from other SIMATIC BATCH versions.

Note

No storage of PDF or XML

With the "PH archiving" method, no information is stored in XML or PDF format either in the PH archive or externally, for example as a file. This behavior has not been changed compared with previous versions.

When the following requirements are met, batch reports are displayed or printed as of SIMATIC BATCH V8.2 when the "PH" archiving method is used:

- The user of SIMATIC BATCH must be a member of the "SIMATIC Report Services" group on the IS computer.
- The user of SIMATIC BATCH must have read permission for the PH database.

The user permissions can only be configured by an administrator.

Changing the archiving method

Following a software update, when changing to the "PH" archiving method, the batch status plays a decisive role in the completeness of the data in the archive and in the report. The following special characteristics also apply if you change from the "PH" archiving method to another archiving method.

Scenario 1: A batch was started after changing to the "PH" archiving method. In this scenario, no restrictions whatsoever can be expected, the batch data is complete both in the PH archive and in the batch report.

Scenario 2: A batch was archived before changing to the "PH" archiving method. Batches that were archived prior to the changeover cannot be archived again. Depending on whether it was archived previously in the PH or another archiving method was used, the data may or may not

be available in the PH. If it was archived earlier in the PH, the batch data is complete in the PH archive and a report can be created on an Information Server client with the appropriate report template.

Scenario 3: Before changing to the "PH" archiving method, a batch was completed but not archived and a batch is active during the changeover to the "PH" archiving method. It is certain that the process values will be complete in the PH archive and in the batch report. This guarantee does not apply to messages and measured values since this depends on whether this data was transferred by the PCS 7 OS to the PH over the entire duration of the batch (in other words, also during the time prior to the changeover to the "PH" archiving method).

Note

Recommendation

To make sure that the batch data is complete both in the PH archive and in the batch report, before changing to the "PH" archiving method, all batches should have the status "completed + closed + archived".

In the project settings, the "Archive automatically" setting should be disabled so that the archiving of completed batches is not suddenly activated during the changeover. Implementing this recommendation is the responsibility of the user and is not checked by the system. If the recommendation is not followed, the restrictions listed above apply.

Failure of the PH

If the connection is disrupted or if the PH fails, it is no longer possible to create batch reports on the SIMATIC BATCH clients or on the Information Server. If the connection between a SIMATIC BATCH client and the IS is disrupted, the restriction only applies to this SIMATIC BATCH client. If, on the other hand, the connection between the SIMATIC BATCH server and PH PC or the PH PC itself is faulty, no more data will be archived.

If a PH fails, an OS message is always generated and displayed.

Note

The duration of the subsequent data synchronization depends on the length of time of the failure and the performance of the PC. Depending on these factors, it will take a corresponding time before current batch data is again available "promptly" in the PH archive.

Viewer for archived batches

As of version SIMATIC BATCH V8.1 SP1, only archives that were archived with the same version can be displayed.

9.9.2 Object reports

9.9.2.1 Using and operating reports

Standard report templates

You can trigger printing or a print preview from the shortcut menu of BATCH objects. After a short period, the requested report data is displayed. One standard report template is published in the report server database for each of the objects listed below. The standard report templates cannot be renamed or modified. The name of the standard report template is not language-dependent and therefore is not translated into other languages. The report templates are copied to the BATCH server and loaded into the database during the installation of SIMATIC BATCH. They are then available to all BATCH clients.

Objects	Data contents	Name part ID	Complete name of the standard report templates in the database
Batch process cell	The process cell report contains data from the PCS 7 engineering or from BATCH engineering. The following process cell data is listed in the process cell report: • Data types • Units • Equipment modules • Equipment phases • Process tag types • Operation types • Phase types • Units of measure	_pcell	standard_pcell.rdl
Libraries	The library report has the same structure as the master recipe report.	_library	standard_library.rdl
Formulas	The formula report includes data such as: • General properties of the formula • Change history • Input material, output material and parameters	_formula	standard_formula.rdl

Objects	Data contents	Name part ID	Complete name of the standard report templates in the database
Recipes	The master recipe report contains all the data required for the production of your product. These include: • Recipe header data • Input material and output material lists • Procedural rules • Visual representation of the master recipe with processing history and all recipe elements used	_recipe	standard_recipe.rdl
Batches	The batch report contains all the information required for the reproducibility of the batch process, quality assurance and the fulfillment of legal requirements. These include: • Identification data • Control recipe data • Effective production data • Timeline of recipe steps • Error and alarm messages • Operator interventions	_batch	standard_batch.rdl

Toolbar in the report window

There is a toolbar in the top left corner of the print preview window where the batch report is displayed. The function symbols displayed in the toolbar help you to navigate in the preview and to export the report to a PDF file.

You can use your mouse and keyboard for additional navigation options within the report:

- With the mouse scroll wheel: Scroll up and down within a page of the report
- Press and hold SHIFT while using the mouse scroll wheel: Scroll page by page (shifting of screen contents)
- Press and hold Ctrl while using the mouse scroll wheel: Zoom function

Export

You export the displayed report with the "Export" function in the print preview window.

The settings for exporting the report are made in the BatchCC by selecting **Options > Settings > Project Settings > "Report creation" folder** under **"Default directory for PDF files"**. If you check the "Name and directory of PDF file can be changed" box, you have to enter a name and

storage location for the export. When this check box is not selected, a file name is created and the PDF file is saved in the specified folder.

Note

To have the reports for closed batches available at any time, export the batch reports from the print preview to PDF files. You can then archive and delete these batches in the BATCH Control Center.

Special features during report creation

- **Additional load for report generation**
  If your configuration limits are significantly greater than the typical values used for performance calculation, an even higher load will be placed on the BATCH server during report generation. Through the use of a PH, you achieve a significant load distribution.
- **Display reports on PH or PCS 7 Web Option**
  Report files in PDF format are only displayed on a PH or a PC with PCS 7 Web Option for OS if Adobe Reader is installed there.
- **Representation of unswitched transitions in the batch report**
  In PC-based operating mode, process values of unswitched transitions in alternative branches are represented with the "-" character. By contrast, in AS-based operating mode, these process values are also displayed in the batch report.
- **Non-printable characters in the print preview, printout and PDF generation**
  A European SIMATIC BATCH installation uses the Arial font as a default. This means that only European, Arabic and Hebrew characters are used for the print preview, printout and PDF generation from BatchCC. Some characters will not be printed if other fonts are used in BatchCC.
- **Control strategies**
  The process value and setpoint are output for control strategies. If the process value and setpoint are different, both values are marked in red in the report to make them more easily identifiable. Process values and setpoints are displayed with an accuracy of a maximum of two places after the decimal point.
- **Report creation with automatic completion of recipe phases**
  Recipe phases with the "Continue" option are either completed with a recipe phase of the same type without a set "Continue" option, or the recipe phase is automatically completed at the end of the unit recipe. With automatic completion, the recipe operation that contains this recipe phase and the recipe unit procedure are activated once again. This reaction is documented during report creation.
- **Delay in closing batches**
  Messages are collected cyclically from the PCS 7 OS archives for batch reports. This means that message data from running batches may not be up-to-date until the next cycle. All current data is collected after the "Close batch" command. It may take some time for the batch status to change from "closing" to "closed" in the report.

- **Equation values in reports**
  In reports of the master recipes, equation values are displayed only with their configured values. The equations are only calculated and displayed with the current values when the batch runs.
- **Batches running over several days**
  If batches run in loops over several days, for example, in rare situations errors may occur in a print preview or printout when batch reports are generated.

Custom report templates

With Visual Studio, for example, or a similar SQL database application that can operate with the MS Reporting Services, you can create custom report templates (Templates) and use them for printing or for print preview. Observe the naming conventions described below for this.

Note

Redundant BATCH server

Note that custom report templates on a redundant BATCH server are not synchronized automatically. You must manually copy these report templates onto the redundant BATCH server as files and publish them in the report server database.

Conventions for the report template names

The file names for the various reports must comply with the following rules. Example: "TemplateFamily_ReportObjectType_*.RDL"; "MyReport_batch_*.RDL".

Name part in file name	Meaning
TemplateFamily	You can freely choose this part of the file name. The name that you specify here is the display name for the object commands, "Print" and "Print Preview". The "standard" name is reserved for the SIMATIC BATCH product.
_ReportObjectType	Report object types: • Object type for the report on the Batch process cell: _pcell • Object type for reports on libraries: _library • Object type for reports on master recipes: _recipe • Object type for reports on formulas: _formula • Object type for reports on batches: _batch
_*	The name part can be used individually and is optional.

Additional information

You can find the manual *"SIMATIC BATCH - Report views"* in the Windows start menu by selecting **Start > SIMATIC > Documentation > Language Selection**. This manual provides you with more information and a description of the views for the report data.

9.9.2.2 Report creation of batches

Definition of a batch report

The batch report contains all the information required for the reproducibility of the batch process, quality assurance and the fulfillment of legal requirements. These include the identification data, control recipe data, effective production data, chronological sequence of the steps, status, error and disturbance messages as well as operator intervention.

Principle

The batch report can be viewed or printed out at any time between the planning of a batch and its completion. The report always includes the data up to the latest completed control recipe phase including the corresponding messages and measured values. The batch report lists the minimum and maximum values of the process tags in a table for the period during which the level (procedure, RUP, ROP) was active; this is then followed by the trend diagrams.

The batch report can be opened and printed in BatchCC. This is done by selecting the batch and opening the shortcut menu:

- Print > Select report template: The batch report is printed immediately without preview on the screen.
- Print preview > Select report template: The batch report is displayed in the print preview window.

Note

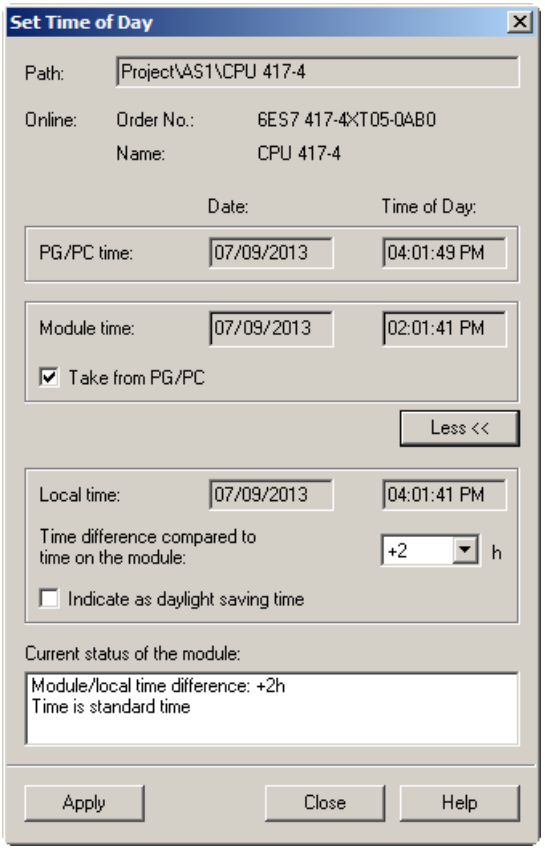
System characteristics

There is a delay when collecting the data for messages and measured values. The delay time depends on the batch size.

Monitoring is canceled when the recipe is completed or runs out of the monitored area. The status "Aborted" is therefore always listed in the batch report.

Time-of-day synchronization

If an incorrect time of day is shown in batch reports or in tooltips in the control recipe, check the settings for time-of-day synchronization. You can set the time of the CPU of your AS to UTC time in the "Set Time of Day" dialog. You can open this dialog in the SIMATIC Manager. Select the CPU in your AS and then select the shortcut menu command **PLC > Set Time of Day**. To change the module time, clear the "Take from PG/PC" check box.



Note

The batch management collects all messages from the start of the batch until the message "Batch closed". The start and close messages include the time of day of the PC on which the batch data management is running. To ensure that all messages during this time window are acquired, the time of day of all network devices must be synchronized. UTC time is always set as the module time on the AS.

The time zone CET/MEZ (Central European Time/Mitteleuropäische Zeit) is ahead of the "world time", meaning UTC, by one hour. This means: Standard difference to UTC = +1. Daylight saving time is UTC+2 and standard time UTC+1.
Time-of-day synchronization: Manual *PCS 7 - PC Configuration*

Time-of-day and date

Note

The time and date are displayed in the batch reports as defined and activated in the country settings.

This is independent of the language of the operating system and the language selected in the PCS 7 setup.

No more than two characters should be used for the day, no more than three characters for the month and no more than four characters for the year. If you select larger formats, the display of the date may be truncated due to the restricted output window.

9.9.3 Displaying archived batches

9.9.3.1 Viewer for archived batches

Overview

Batches you have archived can be visualized again as control recipes. The viewer for archived batches contains functions for opening archives from a PH (Process Historian) as well as from archive files. The basic requirement for connecting to the PH database is the specification of a user name and password in the project settings under "User credentials".

To display control recipes of archived batches, open the viewer by selecting the "Options > Start viewer for archived batches" menu command in the BATCH Control Center. Use one of the following commands in this dialog:

- Open batch from file
- Open batch from PH

Depending on your selection, the "Open" selection dialog opens or the "Find batch" filter dialog opens for archives from a PH.

Restrictions when viewing archive files (XML format)

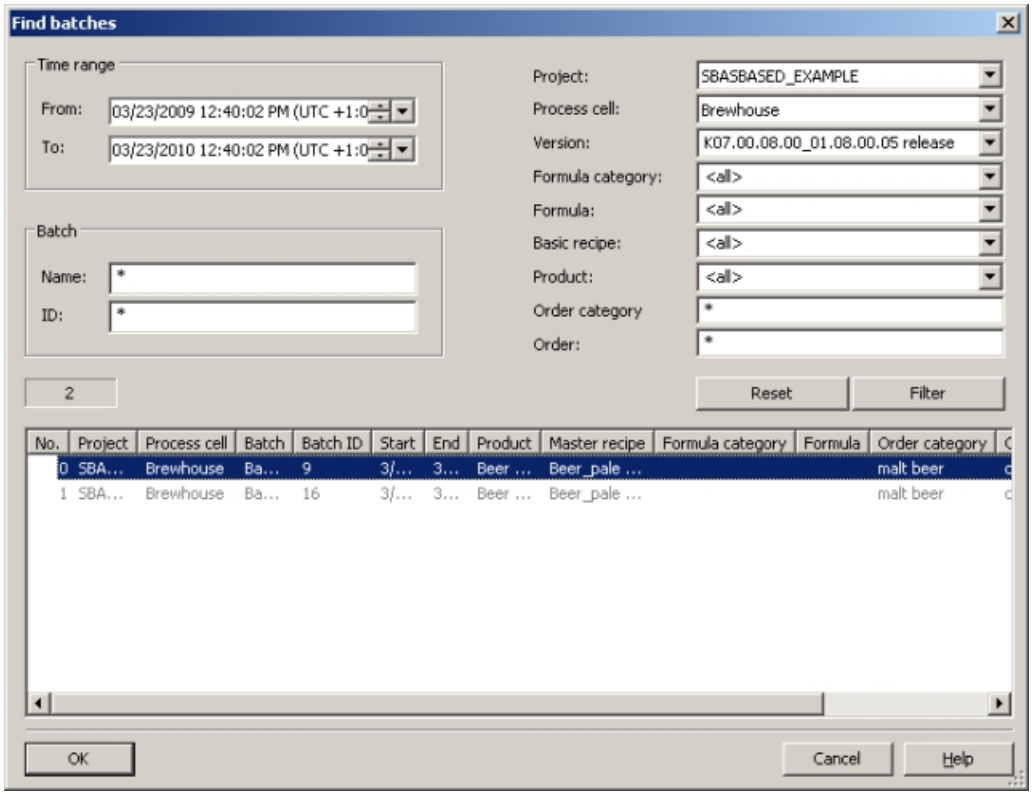
The following limitations apply to the Directory, SQL server, and FTP server archiving methods:

- Archived batches in V7.0 format cannot be imported to any SIMATIC BATCH version.
- Archived batches in the V7.0 SP1 format have the following viewing restrictions:
  - XML archive was generated in versions SB V7.0.1 to SB V7.0.1.14 or in versions SB V7.1.1 to SB V7.1.1.5. Condition mode is not displayed; conditions of transitions are not displayed; descriptions of conditions in transitions are not displayed; properties such as "Continue" and synchronization actions with SIMATIC IT (MES_SYNC_REQUEST) are not displayed and the "Start allocation" property is not displayed.
  - XML archive was generated in version SB V7.0.1.15 or higher or in version SB V7.1.1.6 or higher. Descriptions of conditions in transitions are not displayed.
  - XML archive was generated in version SB V7.1.2. Descriptions of conditions in transitions are not displayed; monitoring time and process value for material and material code are not displayed; new constructs from SB V7.1.2 such as jumps and command steps are not displayed.
- Archived batches in the SB V7.0.8 format have the following when viewing restriction:
  - XML archive was generated in version SB V7.1.2. Descriptions of conditions in transitions are not displayed.
- For archived batches in V7.1.2 format and higher, there are no limitations for the viewer for archived batches.
- In the viewer for archived batches, filters for command steps are displayed only in the archive format V7.1.2.
- To display archived batches again in the viewer for archived batches, the archiving must be in XML format V7.0.1.

For the "PH" archiving method, there are no limitations with regard to the XML format.

Filter dialog "Find batch"

In the filter dialog, you search for archived batches from a PH and then select the required batch.

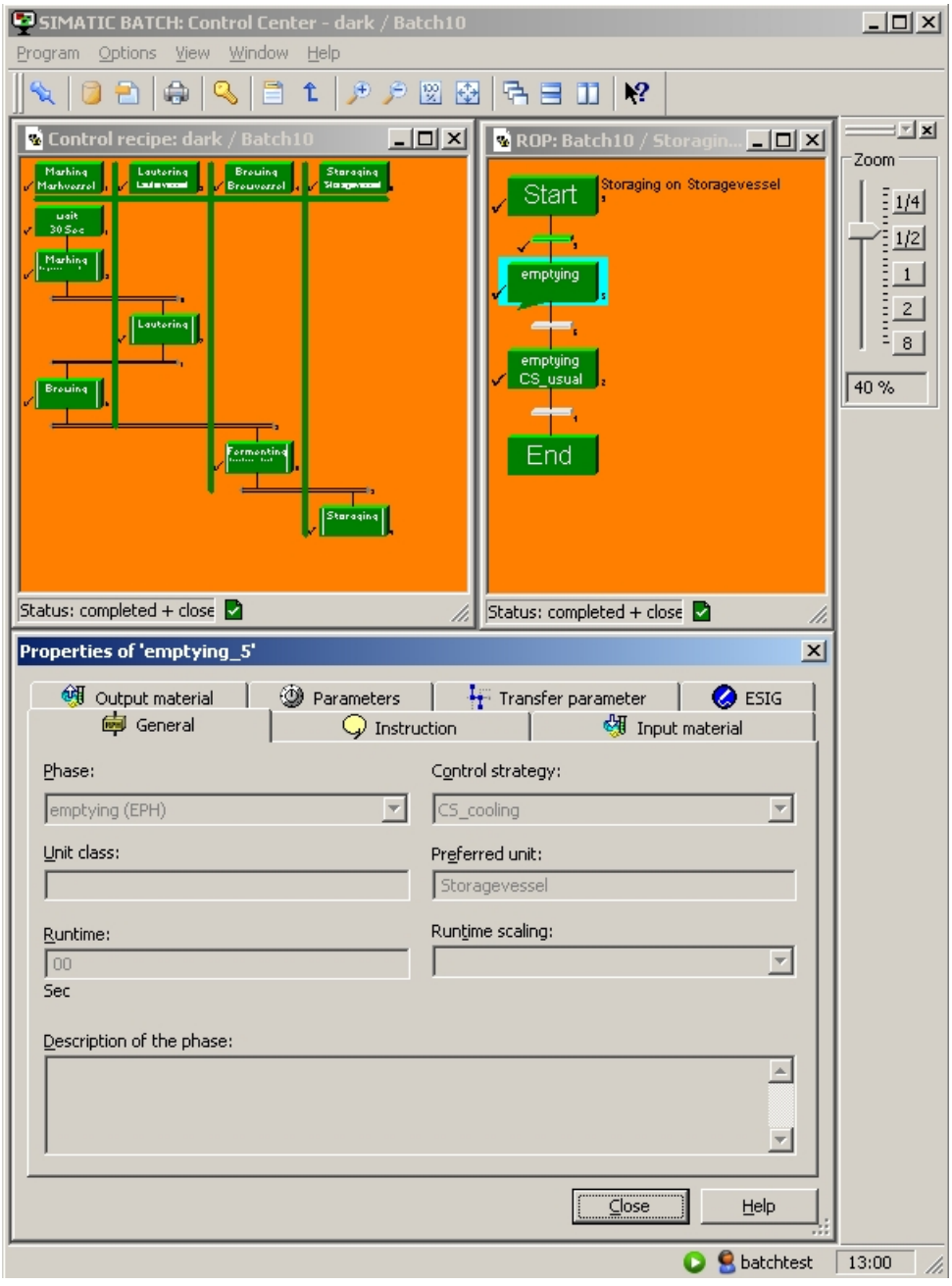


Properties of the "Find batch" filter dialog:

- When the dialog opens, a connection to the specified PH database is established automatically.
- For some filter objects (project, process cell, SB version, etc.), drop-down lists containing existing data on the PH are provided for selection. Other filters can be edited and customized with placeholders.
- The search can only be started by clicking the "Filter" button.
- The result set is managed dynamically so as to enable scrolling forward and backward in large result sets.
- Clicking the "Reset" button deletes the search result and enters <All> in the selection dialog of each object. Exceptions are the order category and order objects; here, the "*" placeholder character is entered. If another search is started, all batches saved in the PH database are listed.

Control recipe view in the viewer

If you double-click a line in the result window, the control recipe for the relevant batch is displayed in the viewer.



Properties of the control recipe view:

- In the BatchCC, you read and view the control recipe for the selected batch.
- Only one control recipe can be viewed in the dialog. Selecting another batch automatically closes a control recipe opened previously.

- The background color of the control recipe window can be customized. You set the background color on the "Colors" tab of the project settings. Double-click the "Background (batch archive)" entry under "Color" and click the desired color. Then confirm your selection with "OK".
- You can expand recipe elements and display their object properties in the control recipe graphic.
- In the object properties the last available process values for input material, output material, parameters, transfer parameters, and transition conditions are displayed. A process value history is not offered.

Restrictions affecting the control recipe view

- Batch data that you saved in V7.0 archive formats are not displayed as control recipes in the viewer.
- The BATCH OS control does not support the viewer for archived batches functionality.
- Reports and batch logs are not available for visualized control recipes.
- Batch messages are not displayed.
- Visualization is not supported for batches archived via the ODBC interface.

Additional information

"Archive" folder (Page 805)

"Versioning" folder (Page 795)

Dialog "Find batch" (Page 1068)

9.9.3.2 Displaying archived batches from the SQL Server

The archived batches are queried through the Microsoft SQL Server Management Studio.

Procedure

1. Open the SQL Server Management Studio with the menu command **Start > Program Files > MS SQL Server "version" > SQL Server Management Studio**.
2. Log on.
3. In the "Databases" navigation window, select the Batch database name, for example, "2_25269528_55_Archive", and the "dbo.tblBatches" table there, and select "Open Table" in the shortcut menu.

Result

The archived batches are displayed.

BATCH Recipe Editor 10

10.1 Introduction

Distinction

The BATCH Recipe Editor allows the graphic creation and modification of recipes.

When editing recipes, a distinction is made between the following:

- Flat recipes
- Hierarchical recipes
- Library object Recipe operations
- Library object: Substructure

Flat recipe

A flat recipe is made up of substructures. The substructure is used to make large recipes clearer to read.

The recipe steps of a substructure can be as follows:

- A further substructure
- A reference to a library object: Substructure
- ROP (recipe operation) with direct access to a recipe phase of the type EOP (equipment operation)
- RPH (recipe phase) with direct access to a recipe phase of the type EPH (equipment phase)
- Operator instruction: Recipe phases of the type EOP and EPH configured for the operator instruction and NOP for a simple operator instruction

Hierarchical recipe

A hierarchical recipe consists of recipe unit procedures (RUP) that are assigned to a unit. The recipe unit procedures are processed parallel to each other in a recipe. The execution of the recipe unit procedures can be coordinated using graphic synchronization lines.

The recipe steps of a RUP can be as follows:

- ROP (recipe operation) with direct access to a type EOP (Equipment Operation) recipe phase
- ROP with an underlying sequence of recipe steps of the type RPH (recipe phase).
  - RPH with direct access to a recipe phase of the type EPH (equipment phase) or
  - Operator instruction with or without direct access to a recipe phases of the type EPH

- Operator instruction: EOP and EPH type recipe phases that are configured for operator instruction and NOP for simple operator instruction
- Library reference

Library object: Recipe operations

A library of library operations can be created for **hierarchical recipes**. A library operation is an ROP consisting of steps of the type RF. When creating the library step sequence, this is assigned to a unit class so that the recipe steps access the equipment phases (EPH) of this unit class. The unit allocation is made when you bind in the recipe step sequence of a recipe unit procedure (RUP).

Library object: Substructure

A library consisting of substructures, in turn consisting of operator instructions, recipe operations of the type EOP or recipe phases of the type EPH can be created for **flat recipes** . Different unit classes/units can be assigned to the recipe steps of the substructure.

10.2 Starting and operating

10.2.1 Starting the BATCH Recipe Editor

Various options

There are three different ways in which you can start the BATCH Recipe Editor:

- From the Start menu of Windows
- Using the menu command in BatchCC
- Automatically by opening a recipe in BatchCC

Starting in the Start Menu of Windows

- Go to the Start menu of Windows and select the menu command **Start > Siemens Automation > SIMATIC > BATCH Recipe Editor**.

Starting in BatchCC

- In the BatchCC, click the relevant button in the appropriate toolbar or select the menu command **Options > Start Recipe Editor** to open the BATCH Recipe Editor.
- If you select a master recipe or a library object in BatchCC and then select the "Open" command (right mouse button) or double-click, the BATCH Recipe Editor is automatically started with the recipe.

Note

With the exception of deleting and renaming recipes, which is only possible in the BatchCC, you can make all other possible modifications to recipes using the BATCH Recipe Editor.

See also

Layout of the main window (Recipe Editor) (Page 526)

10.2.2 Requirements for working with the BATCH Recipe Editor

Before you can work with the BATCH Recipe Editor, the following requirements must be met:

- A recipe operates on the basis of the block instances of the SFC types or the BATCH interface blocks IUNIT_PLC, IEOP, IEPH, IEPAR_xxx and TAG_COLL created in the CFC charts and the additional data in the BATCH hierarchy folders (SIMATIC Manager).
  The Process cell data created this way has to be downloaded to the Batch Server and read in BatchCC via the menu command **Program > New process cell** or with the menu command **Edit > Updating the process cell** after modifying the Process cell data.

  Note

  It is possible to create recipes **before** configuration of the block instances is completed. To allow this, you can edit the type description (batch types) the first time manually (without a CFC synchronization) in the SIMATIC manager and download it as part of the process cell data to the BATCH server.

  At a later point in time when the CFC charts have been finalized, you must then repeat the menu command **Program > Update process cell** in BatchCC.

- You must have the relevant permissions with an entry in the user list (user rights) allowing you to use recipe creation functions.

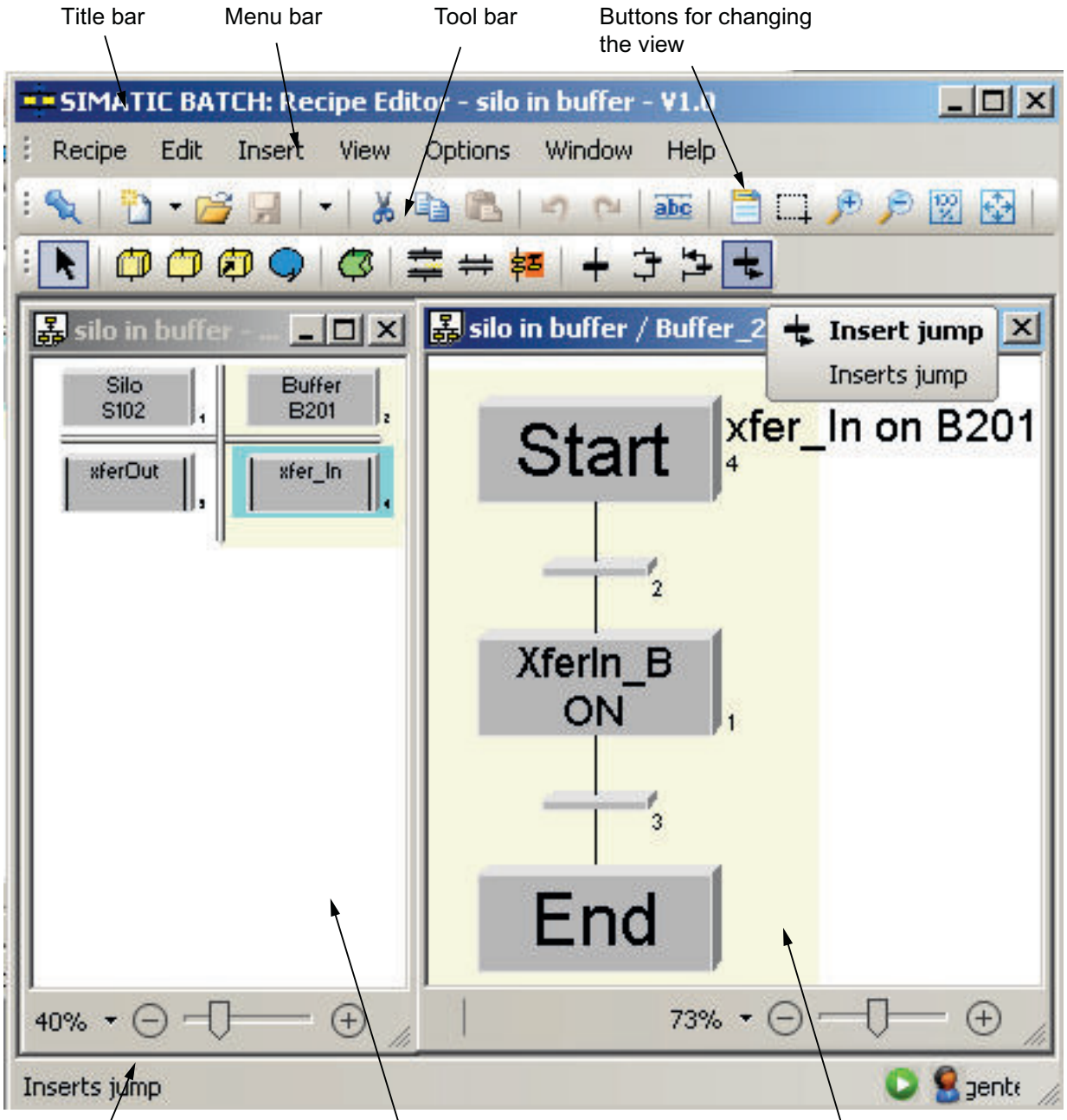
10.2.3 User interface and operation

10.2.3.1 Layout of the main window (Recipe Editor)

Overview

The basic layout of the user interface of the BATCH Recipe Editor is shown in the figure below which illustrates an example of a hierarchical recipe. You can create or modify recipes in the editing windows. using the structure elements of the **Insert** menu.

The first editing window displays either the structure of a recipe or a library object (editing level 1). In the other editing windows, you can edit the lower-level ROP sequences (in hierarchical recipes this is editing level 2) or substructures (in flat recipes this is editing layer 2 to 10).


Title bar
Menu bar
Tool bar
Buttons for changing the view
SIMATIC BATCH: Recipe Editor - silo in buffer - V1.0
Recipe
Edit
Insert
View
Options
Window
Help
silo in buffer - ...
Silo S102
Buffer B201
xferOut
xfer_In
silo in buffer / Buffer_2
Insert jump
Inserts jump
Start
xfer_In on B201
XferIn_B ON
End
40%
73%
Inserts jump
Status bar with context-sensitive information
Editing window with recipe structure of a hierachical master recipe with ROPs (editing-level 1)
Editing window with a ROP sequence (editing-level 2)

Note

Recipe editor without opened object (library/master recipe)

If no object is open in the recipe editor, only menu items and functions that are available are displayed in the relevant bars.

Title bar

The title bar of the main window displays the name of the master recipe, the recipe operation (ROP) or the library object. Here, you will also find system buttons with which you can do the following:

- Close the BATCH Recipe Editor,
- minimize the main window to its icon,
- restore the window to its normal size again, and
- maximize the display of the main window.

Menu bar

The menu bar is located at the top edge of the main window. Its functions relate to the current window opened for editing. You can only select menu commands that are feasible in the current status of the object. As an example, you can only select the menu command **Edit > Delete** when at least one object is selected. Menu items that cannot be selected are displayed in gray.

Toolbar

The toolbar is located below the menu bar. It contains a number of icons with frequently required menu bar functions. You can see which function is triggered by a button in the toolbar by positioning the mouse pointer on the button (without clicking). A small box will then be displayed with the designation. Detailed information about this is displayed in the status bar. Click on the icon to trigger the function. Icons that cannot be selected are displayed in gray.

Status bar

At the lower edge of the user interface, you will see the status bar that displays important information and statuses. The information displayed changes depending on the particular operation and object status.

In the left part of the status bar you will see context-sensitive information, for example explanations of menu commands, operator prompts or error messages.

In the right part of the status bar, you can see the current user and the current time. In some situations, a progress bar is also displayed for processes that require longer.

Shortcut menu

With the right mouse button, you can display the shortcut menu containing functions from the menu bar frequently required in the current situation. Only the functions that are feasible for the recipe element can be selected, all others are displayed in gray.

Assigning names to recipe elements

Numbers are shown next to the recipe elements. Together with the name of the recipe element, which can be chosen freely by the user, these form the unique system name. This unique system name assures that elements that are named the same will always have a unique system name.

See also

Possibilities for adapting the edit window (Page 529)

Selecting objects (Page 533)

Implementation of the hierarchy in the BATCH Recipe Editor (Page 538)

10.2.3.2 Possibilities for adapting the edit window

Commands in the recipe editor

The following commands are available for adapting the editing window in the recipe editor:



Figure 10-1 Assignment of the symbols to the command is carried out from left to right.

Command	Meaning
Pin recipe/batch headers	Keeps the RUP visible as a higher-level object
Selecting the zoom area	-
Zoom in	-
Zoom out	-
Resetting the zoom factor	-
Optimal zoom factor	-
Closing the substructure	Higher level is displayed
Context help	Activate callup of the direct help

In addition to the functions shown above, you can also use the **View > Fit automatically** menu command to activate automatic window adaptation. If you increase the size of the recipe structure or the editing window, the content is automatically increased or reduced in size.

Zoom function

Rapid size adjustment through the zoom function in all the editing windows.

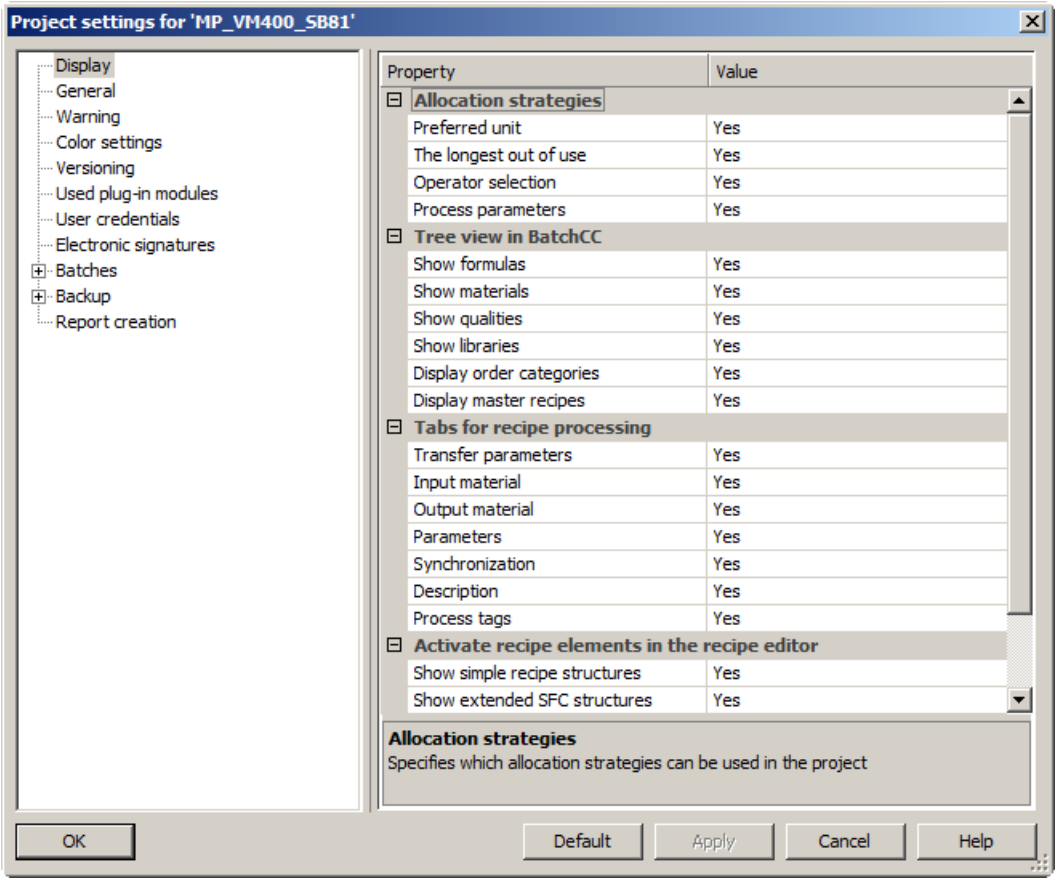
10.2.3.3 Project and user settings

The graphic user interface of SIMATIC BATCH can be configured and customized completely according to your specific needs. You decide on the appearance and range of functions. You can make the required settings centrally in the "Project settings" and "User settings" dialogs in BatchCC and the recipe editor.

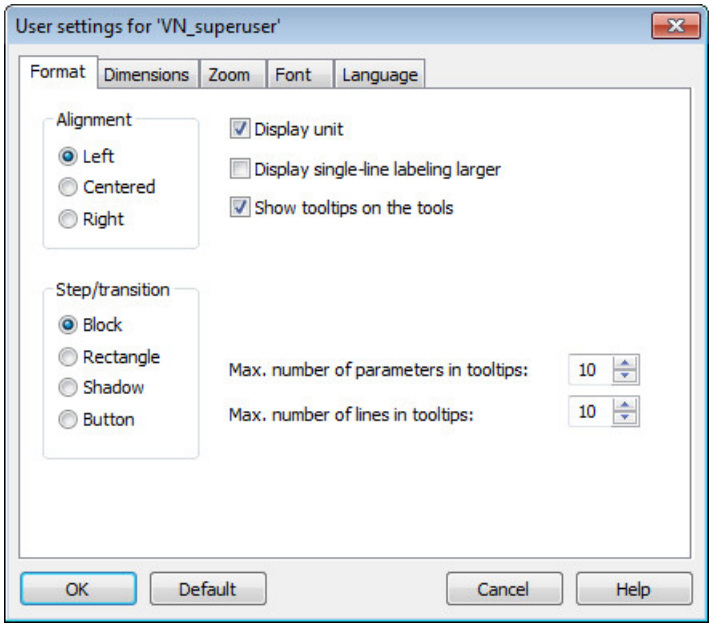
The "Project settings" dialog contains several elements for which you make general settings relating to the appearance and range of functions. In the "User settings" dialog, you can make settings for language, zoom, layout and format of the user interface.

Selecting dialogs

Select the menu command **Options > Settings > Project settings**. This opens the dialog box shown below in which you can make individual Project settings.



Select the menu command **Options > Settings > User settings**. This opens the dialog box shown below in which you can make individual User settings.



Press the "Help" button in the context-sensitive help if you want more information about the various project or User settings.

10.2.3.4 Creating and manipulating objects

Selecting functions

All important functions relating to an object are available in the shortcut menu.

As an alternative, the same functions are also available in the "**Edit**" menu. Functions that cannot be executed in the current status of an object are grayed out in the "**Edit**" menu.

General functions

Some basic functions are common to all objects. These common functions are listed below. The descriptions of other functions assume that you know how to use these functions.

The normal sequence of activities involving objects is as follows:

1. Creating the object
2. Selecting the object
3. Performing actions with the object (for example, opening, deleting).

Creating objects

All objects of the master recipe are created with the "**Insert**" menu.

As an alternative, you can also use the corresponding object icons in the toolbar. You display the toolbar with **View > Toolbars > Insert**.

Opening objects

There are several ways of opening an object:

- Double-click on the object icon.
- Select the object and then the menu command **Edit > Open object**.

After opening an object, you can create or modify its content.

Properties of objects

Object properties are data belonging to the object that decide its behavior, for example the properties of a recipe operation.

The menu command **Edit > Properties** opens a dialog box in which you can see and set the properties of the selected object.

Cut, Paste or Copy

As is usual under Windows, you can: cut, paste or copy most objects. You will find the respective menu commands in the "**Edit**" menu.

You can also copy objects using (Drag-and-drop). If you point to an illegal target, the cursor changes to a forbidden sign.

When you copy an object, the entire hierarchy below it is also copied. As a result you have wide options open to you if you want to use your developed components more than once.

Note

When you insert, the target position must be specified by mouse click.

Renaming objects

You can change the name of an object at a later point in time in the object properties.

Deleting objects

You can delete all objects. Deleting can be undone. A master recipe or a library operation can only be deleted in BatchCC.

Undoing/redoing actions

With the Undo/Redo menu commands, you can reverse modifications step-by-step.

After undoing "n" actions, you can also redo "n" actions.

10.2.3.5 Selecting objects

Selecting by clicking

After activating the selection mode, you have the following options:

- if you single click, all objects (structure elements) that were selected up to now are deselected.
- You can select RUPs, ROPs, RPHs, SUBs, library references and transitions by simply clicking on them with the left mouse button.
- Select sequences, branches and loops not by clicking a step or a transition but on the line between the step and transition (to select a sequence), on the upper or lower horizontal line (to select a simultaneous or alternative branch) or on the upper or lower horizontal line of the return path (to select a loop).
- Select an open ROP by selecting the initial step, the final step or the sequence containing the initial or final step.
- When you make a selection, other selected objects are deselected.

Selecting with a lasso

To open a lasso, drag the mouse while holding down the left mouse button. All the elements completely enclosed in the lasso frame are selected when you release the mouse button. Previously selected elements are deselected if they are outside the lasso frame.

Selecting further objects

If you want to select multiple objects then press the control key at the same time you click the mouse. The element you have clicked is selected without deselecting previously selected elements.

Deselecting

If you have selected an object by mistake then keep the control key depressed and click again to undo the selection.

10.3 Recipe topology

10.3.1 Flat recipes

10.3.1.1 Structure of flat recipes

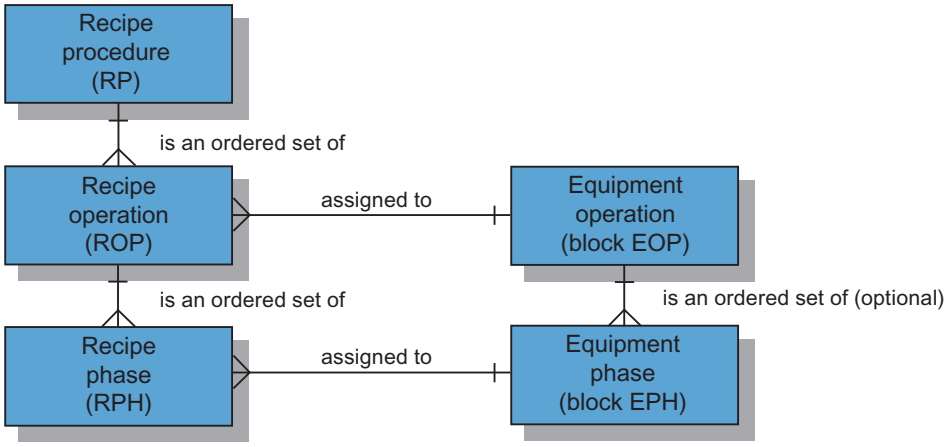
With the BATCH Recipe Editor, you can create flat recipes. To make the structure clearer, you can move existing sequences of recipe elements into a substructure.

Note

The runtime properties of the recipe are not influenced by the substructures.

Basic structure

The following figure illustrates the basic structure of a flat recipe that can contain both recipe operations (ROPs) that use EOPs, as well as recipe operations made up of recipe phases (RPHs) and that use EPHs. These EOPs and EPHs are created during engineering of the basic automation (refer to the section: Engineering > Basic Engineering for PCS 7.



Properties

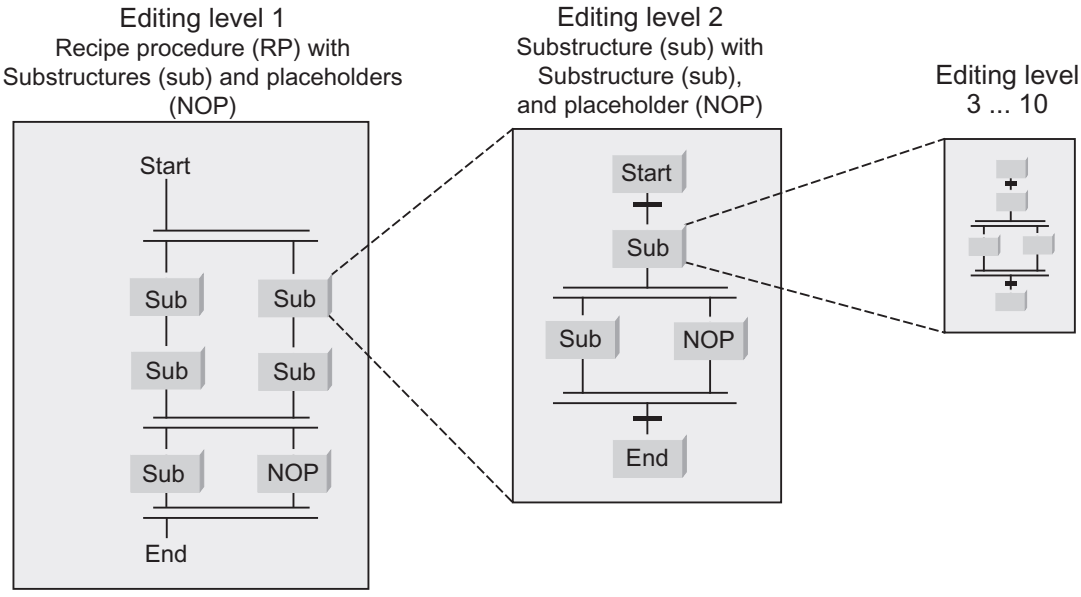
Flat recipes cannot be executed on the AS and cannot be operated or monitored in the BATCH OS controls. If you use flat recipes, you will need to operate the batches in the BatchCC.

10.3.1.2 Use of substructures in the BATCH Recipe Editor

Principle

The figure below shows the basic use of substructures when editing flat recipes with the BATCH Recipe Editor. A substructure itself can be made up of other substructures.

The structure of a flat recipe can be edited into approximately twenty levels by using substructures.



Synchronization



Using the synchronization functions, you coordinate the execution of recipe chains. In flat recipes, synchronization in sequences of the same simultaneous branch are possible.

At each synchronization point, you decide whether or not the chain is halted. If you select "Blocking", the chain waits until the other chains involved have reached the synchronization line or had already reached it (may have already continued). If "Blocking" is not selected, the chain does not wait for the other chains. The fact that the synchronization point was reached is still recorded.

10.3.2 Hierarchical recipes

10.3.2.1 Hierarchical recipes

Hierarchical recipes

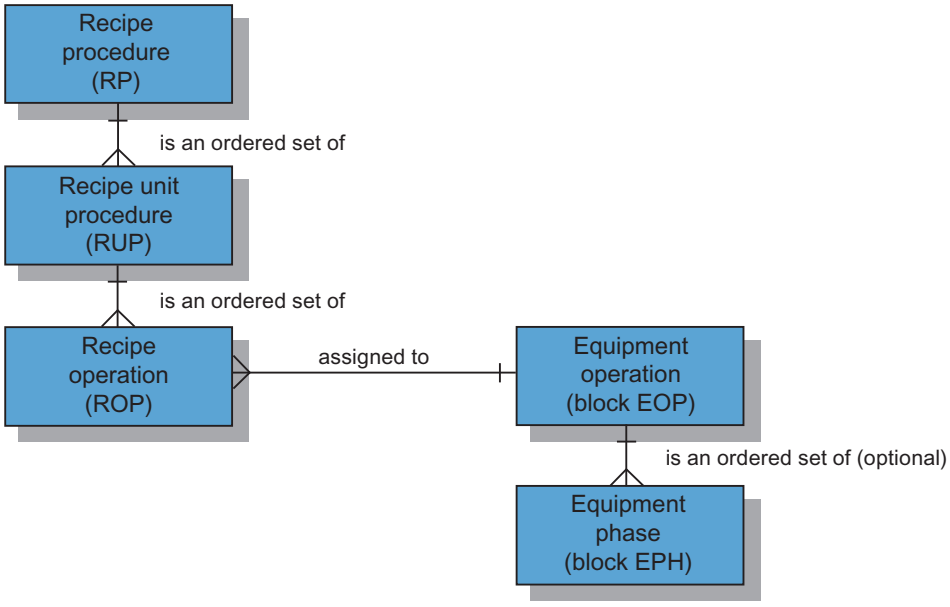
With the BATCH Recipe Editor, you create hierarchical recipes. The following recipes are possible:

- Hierarchical recipes with ROPs (Page 536)
- Hierarchical recipes with RPHs (Page 537)
- Hierarchical recipes with ROPs and RPHs (Page 538)

10.3.2.2 Hierarchical recipes with ROPs

Configuration

The following figure shows the basic structure of a hierarchical recipe with ROPs. Below the recipe unit procedure (RUP), there may be several recipe operations (ROPs). The recipe operations use the EOP blocks directly. These EOPs are created during engineering of the basic control (refer to the section on configuration in the ES).



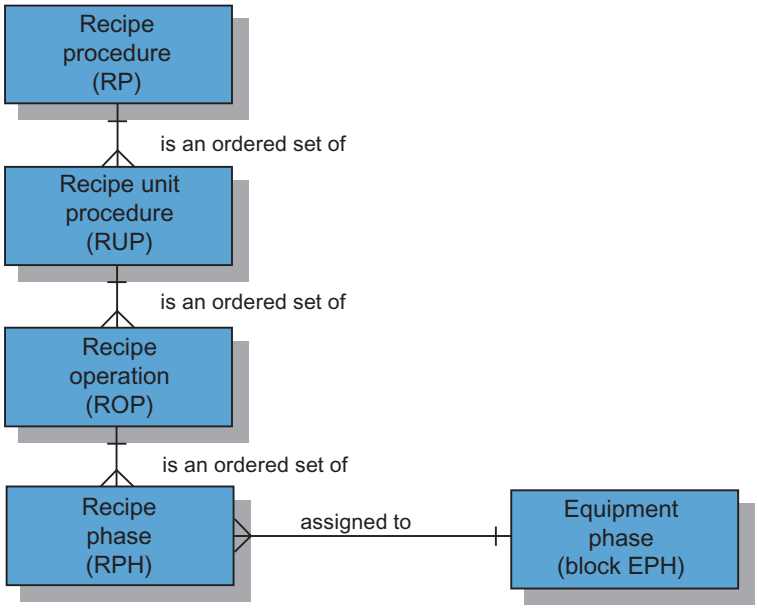
Editing parallel recipe operations (ROPs)

You can only edit parallel branches in hierarchical recipes if you activate the "Allow parallel ROPs" option in the BATCH control center under Options > Settings > Project settings > "General" tab.

10.3.2.3 Hierarchical recipes with RPHs

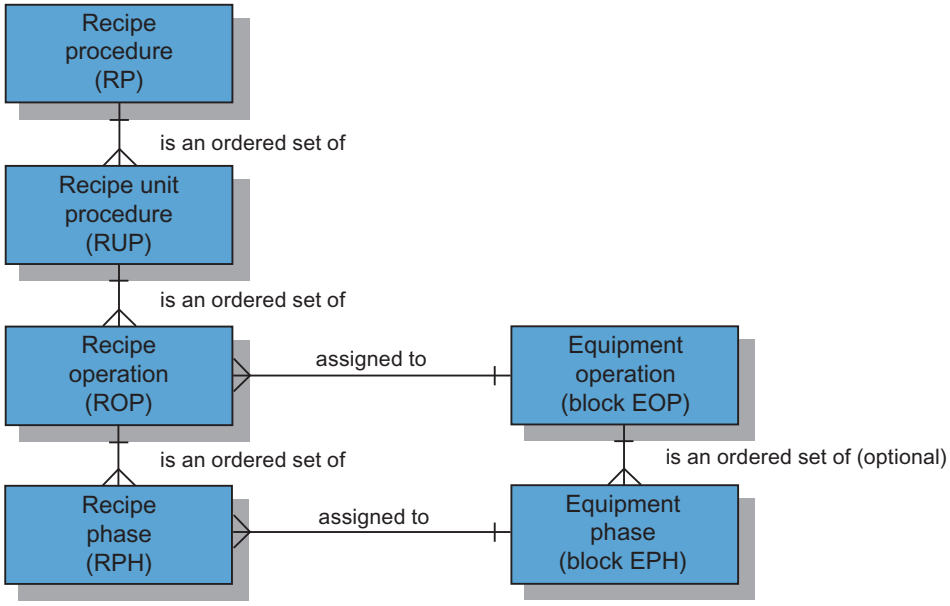
The schematic below shows the basic structure of a hierarchical recipe with recipe phases RPHs. In this model, the process cell is structured in greater detail during engineering with the ES. A unit has several equipment modules that can contain several EPHs.

No recipe phases are possible directly below a recipe unit procedure (RUP). Recipe phases can, however, be used in the underlying ROP. EPHs are assigned to these recipe phases.



10.3.2.4 Hierarchical recipes with ROPs and RPHs

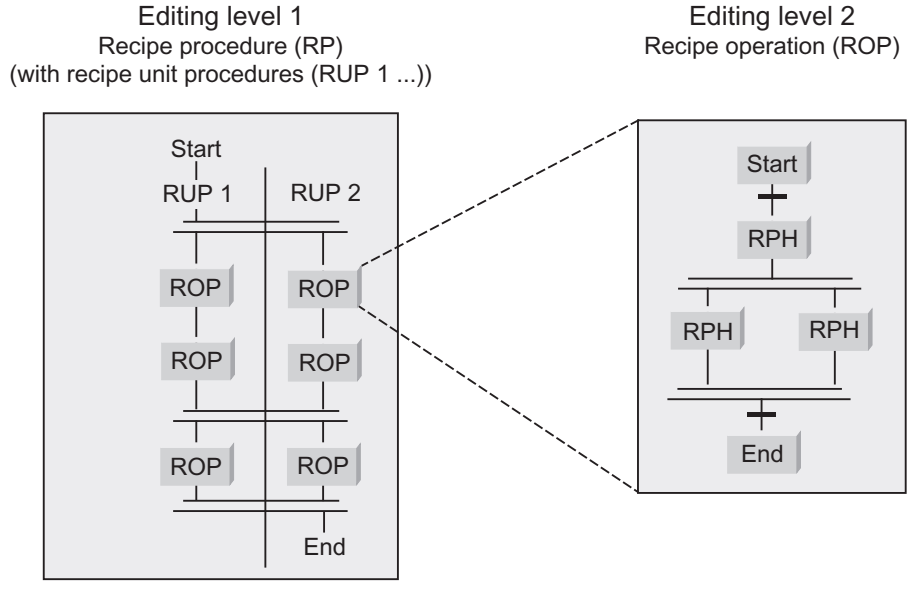
With SIMATIC BATCH, you can also create recipes that contain both recipe operations (ROPs) that use EOPs as well as recipe operations that are made up of recipe phases (RPHs).



10.3.2.5 Implementation of the hierarchy in the BATCH Recipe Editor

Principle

The schematic below shows the basic implementation of the hierarchical structure when editing with the BATCH Recipe Editor. The structure of a hierarchical recipe is edited at two levels (editing level 1 and 2).



Editing level 1

Editing level 1 is intended for the Plant view in which the processes of several cells can be synchronized. A recipe unit procedure (RUP) is made up of recipe operations (ROPs). To structure the process, you can use double lines to synchronize. This allows you to synchronize the timing of ROPs in different units.

Note

Free editing mode:

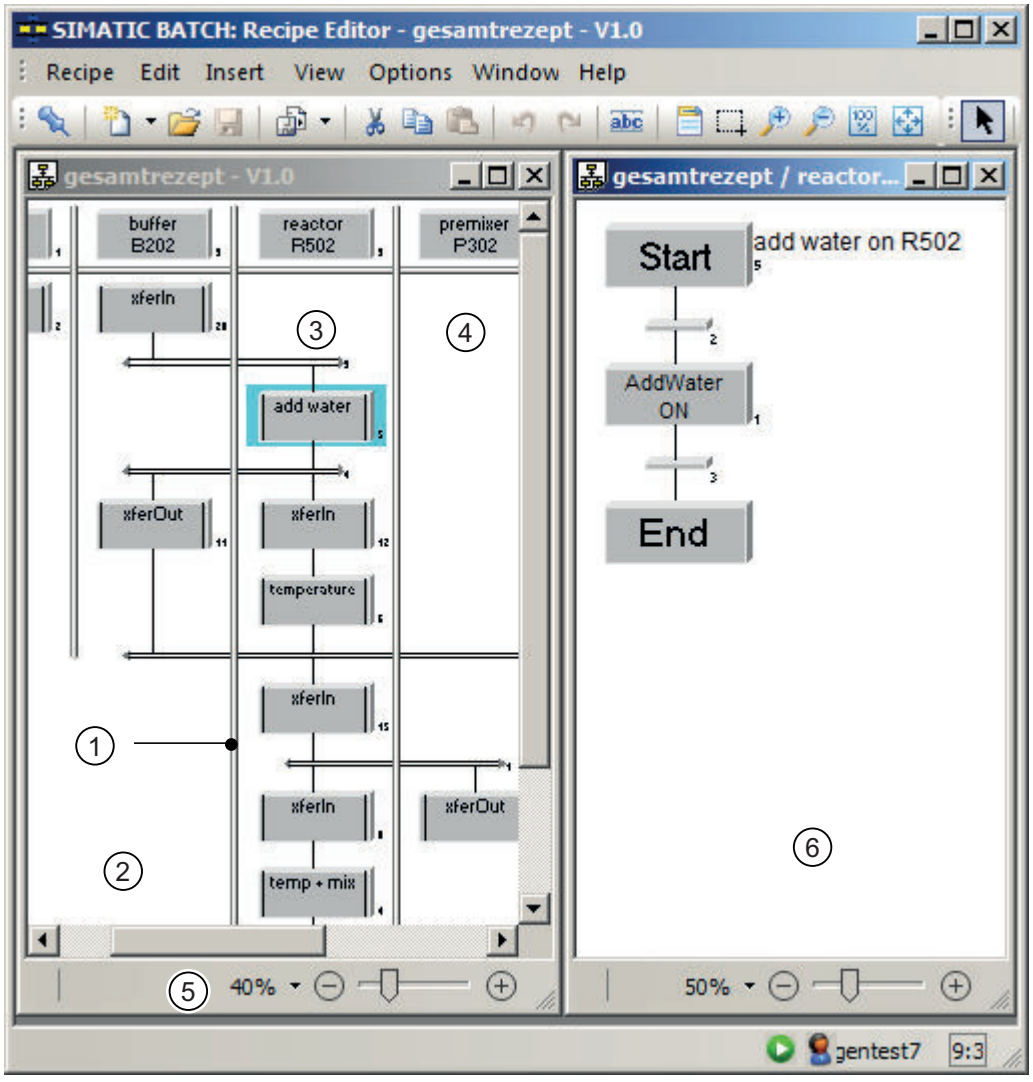
In this mode, you can use all the structure elements of editing level 2 at editing level 1 (parallel ROPs, loops, transitions,...).

Since this mode does not correspond to the standard, this mode will not be described in any greater detail. The way in which the structure elements function is the same at both editing levels.

Editing level 2

Editing level 2 is used to create ROP sequences. An ROP sequence begins with a Start step. The Start step is followed by a transition that defines the start conditions. Every ROP sequence ends with an End step. A transition that defines the end condition precedes every end step.

Implementation in the BATCH Recipe Editor



Legend for figure

1) **Synchronization line** between the recipe unit procedures (RUPs). In the figure, for example buffer B202 and reactor R502.

2) First recipe unit procedure buffer B202 with the recipe operations xferIn and xferOut as transfer operations.

3) Second recipe unit procedure reactor R502 with the recipe operations add water, xferIn, temperature etc.

4) Third recipe unit procedure premixer P302 with the recipe operation xferOut.

5) **Editing level 1**: A recipe unit procedure is always shown within one column; in other words the recipe operations are displayed vertically within a column. The content displayed in the left-hand window corresponds to editing level 1.

6) **Editing level 2**: Sequence of the recipe operation with the recipe structure elements, transition, step, transition. Other elements include, for example, alternative branch, loop, simultaneous branch, monitoring, command step.

10.3.2.6 Synchronization between recipe unit procedures

Principle

Using synchronization, you can synchronize the ROPs of several recipe unit procedures (RUPs) with each other at editing level 1. Each position where a synchronization line connects a recipe unit procedure can have a blocking or non-blocking effect. If blocking is required, the recipe unit procedure continues only when all recipe unit procedures involved in the synchronization have reached the synchronization point.

Example of synchronization (blocking)

In the screenshot shown below, the synchronization lines (blocking) between the two recipe unit procedures (RUPs) shown cause the following reactions:

- Line 1: ROP 10 and ROP 6 start steps 20, 5, 13
- Line 0: ROP 5 and ROP 14 start steps 11, 16

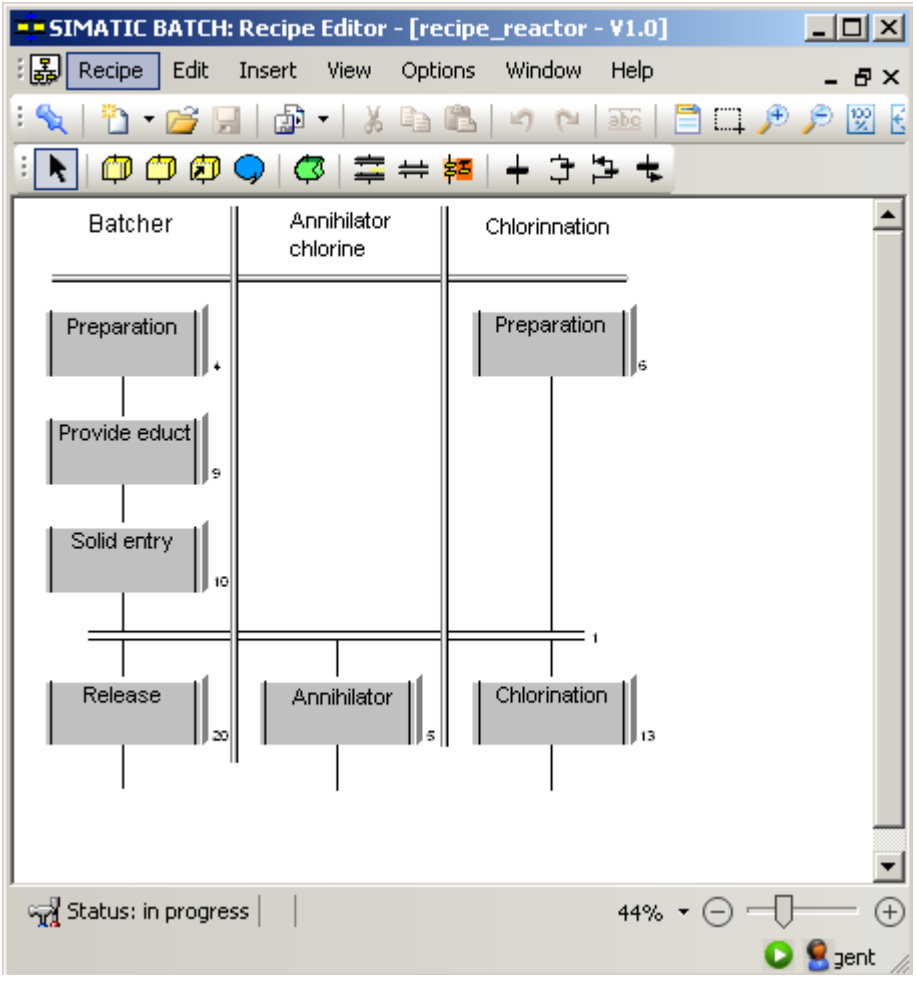


Figure 10-2 Blocking synchronization point

Changing over between blocking and non-blocking

You can change the blocking or non-blocking effect of each synchronization point. Follow the steps outlined below:

1. Select the synchronization point.
2. Select the command "Properties" in the shortcut menu of the synchronization point.
3. Select/clear the "Blocking" check box.
4. Confirm with "OK".

Result: The synchronization point is displayed as a **single line**. ROPs/NOPs in the sequence following this are started immediately (without waiting for synchronization).

Example of synchronization (non-blocking)

The non-blocking position below "Material entry 10" means

- that ROP 20 is processed further by RUP "Dosing setpoint" Immediately when ROP 10 is completed.
- that ROP 5 and ROP 13 are only started when ROP 10 and ROP 6 are completed.

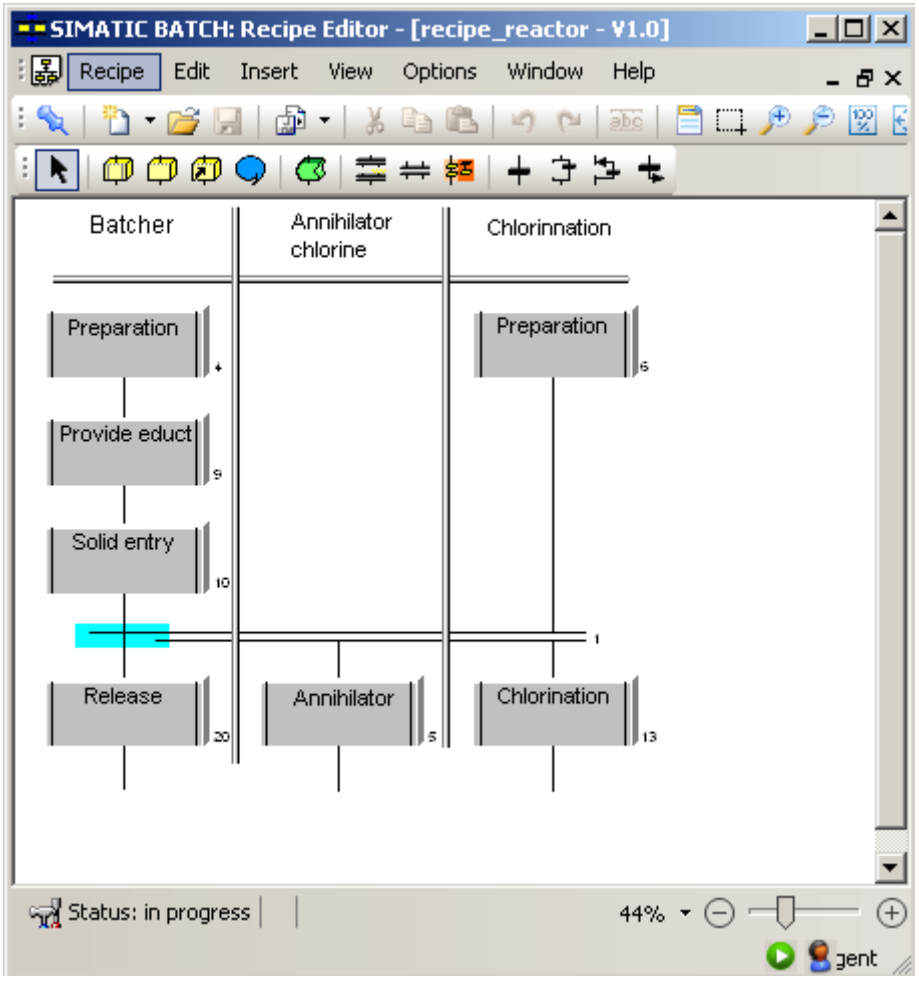


Figure 10-3 Non-blocking synchronization point

10.3.3 Necessary and possible structure elements of the recipe

10.3.3.1 Structure elements of recipes

Overview

The following structure elements can be inserted into the recipes operations:

Structure element	Symbol	Inserted with button/menu command ...
Recipe procedure (RP) (Page 545)		**Recipe > New**
Recipe unit procedure (RUP) (Page 546)		Recipe procedural element (Insert menu) (Page 567)
Recipe operation (ROP) (Page 546)	 	Recipe procedural element (Insert menu) (Page 567)
Recipe phase (RPH) (Page 546)		Recipe procedural element (Insert menu) (Page 567) Recipe phase (Insert menu) (Page 568)
Substructure (Page 546) (only for flat recipes)		Recipe procedural element (Insert menu) (Page 567)
Library reference (Page 547)		Library reference (Insert menu) (Page 569)
Parameter step (Page 548)		Configuring parameter step (Page 747)
Operator instruction (Page 547)		Operator instruction (Insert menu) (Page 569)
Step placeholder (Page 547)		inserted automatically
Transition placeholder (Page 548)		inserted automatically
Command step (Page 570)		Command step (Insert menu) (Page 570)
Simultaneous branch (Page 548)		Simultaneous branch (Insert menu) (Page 574)
Synchronization line (Page 549)		Synchronization (Insert menu) (Page 575)
Synchronization point (Page 549)		Synchronization (Insert menu) (Page 575)
Monitoring (Page 576)		Monitoring (Insert menu) (Page 576)
Transition (Page 549)		Transition (Insert menu) (Page 581)
Alternative branch (Page 549)		Alternative branch (Insert menu) (Page 581)

Structure element	Symbol	Inserted with button/menu command ...
Loop (Page 549)		Loop (Insert menu) (Page 582)
Jump (Page 583)		Jump (Insert menu) (Page 583)

Representation of the recipe elements

- Container elements for ROP, libraries and substructures are indicated by two vertical border lines in the graphic symbol (box).
- Graphic symbols (boxes) without two vertical border lines are objects with nested operations and phases (EOP, EPH)
- Graphic symbols (boxes) with bold, complete border line characterizes parameter steps.

Working with sequences

The structure elements are inserted in sequences. A sequence is a vertical series of structure elements. The elements in the sequence are separated by a vertical line.

Meaning

Actions to be executed one after the other must be arranged vertically in a sequence. A transition is evaluated only when the recipe phase above is completed (ready to complete, or similar). The next recipe step is only triggered when the transition above it evaluates to true.

10.3.3.2 Recipe procedure (RP)

Overview

The recipe procedure includes the procedural elements required for the process engineering in a process cell. When creating a recipe procedure, the equipment-related procedural elements are used that are provided by the basic control.

Recipe procedure window

The recipe procedure window displays the required units in columns. The structure elements, steps, transitions, loops etc. that determine the process sequence can be included in the columns. The processes in the unit are coordinated by the "synchronization line" structure element.

Properties

The properties of the recipe procedure reflect the header parameters of a recipe. This includes specifications such as the product, parameters, reference scale, input and output materials, etc.

10.3.3.3 Recipe unit procedure (RUP)

Overview

The recipe unit procedure includes the procedural elements required for the process engineering in a unit.

The recipe unit procedures are the columns in the recipe procedure window. The recipe operations of the unit are the steps in the recipe procedure window. The name and selected unit are displayed in the column title. By double-clicking the column title, the properties dialog of the recipe unit procedure opens.

The steps in a recipe unit procedure can have the following functions:

- Steps with access to a recipe phase of the type EOP
- Substitute for a step sequence for this unit integrated in the recipe
- Library reference for a library operation
- Operator instruction

10.3.3.4 Recipe operation (ROP)

Overview

The recipe operation includes the procedural elements required for the process engineering of a recipe operation. The equipment based procedural elements that are available through the basic automation are referenced for creation.

Steps can take the following forms:

- Operator instruction
- Steps with access to a recipe phase of the type EPH

10.3.3.5 Recipe steps in a recipe operation (RPH)

At this level, recipe phases are entered in the form of operator instructions or recipe phases of the type EPH.

10.3.3.6 Substructure

A flat recipe is made up of substructures. The substructure is used to make large recipes clearer to read. Units of the recipe that belong together can be moved to their own section and abstracted using the substructure box SUB.

A substructure can consist of recipe steps in the form of operator instructions, recipe operations of the type EOP or recipe phases of the type EPH. A different unit can be assigned to every recipe step.

Note

The runtime properties of the recipe are not influenced by the substructures.

10.3.3.7 Library reference

A library operation is not linked directly into a recipe unit procedure (RUP) but uses a library reference. The library operation cannot be modified within the master recipe; the library operation must always be opened explicitly in the BATCH Recipe Editor.

10.3.3.8 Operator instruction

The operator instruction allows instructions for the operator to be displayed during the processing of a recipe. There is a distinction in this regard between the output

- Pure instructions (NOP step):
  - without acknowledgement, which means the recipe sequence will not be halted.
    Example: Please put on the protective goggles!
  - Without acknowledgment; the recipe is stopped until the operator acknowledges.
    Example: Please close valve V127.
- An instruction with input option (operator dialog)
  - without acknowledgment
    Example: Entry of analysis process values.
  - with acknowledgment
    Example "Manual dosing": The operator is instructed which material to use and how much to add. The operator then enters the process values that have been added and confirms the input (acknowledgment).

Entered values (process values) can serve as setpoints for subsequent recipe functions/ operations. The process values can also be evaluated in transitions: Example: Sample OK? yes/no. In this case parameters must be assigned with acknowledgement.

10.3.3.9 Step placeholder

Incomplete structures must be completed dynamically so that they are always syntactically correct and complete. To make sure this is done, the BATCH Recipe Editor automatically inserts placeholders for recipe phases and transitions.

A recipe phase placeholder appears as an empty recipe phase. By double-clicking or inserting a recipe phase using the menu or the toolbar, the placeholder becomes a recipe phase.

These dynamically generated placeholders are removed again when they are no longer required or they become NOP (no operation) recipe phases when the recipe is saved.

NOP elements can also be used, for example to specify a defined runtime.

10.3.3.10 Transition placeholder

Incomplete structures must be supplemented dynamically in order to be syntactic and complete at any time. The recipe editor therefore automatically inserts placeholders recipe phases and transitions.

A transition placeholder has the appearance of an empty transition.

To convert a transition placeholder to a transition, simply double-click on symbol, or insert a transition into the placeholder via the "Insert" menu or the toolbar.

10.3.3.11 Command step

A command step transfers a command (S88 command) in the recipe operation to one or more target recipe elements (RPEs). It is also possible to specify the status that the target object needs to have before it can receive the command. This status filter applies to the entire list of target recipe elements. A setpoint runtime you have determined for the equipment phase can also be specified. This means that the equipment phase will end only when the setpoint runtime has expired.

10.3.3.12 Parameter step

A parameter step is a recipe element in which parameter values are transferred to a unit. Unit parameters are queried in transitions within a recipe and corresponding units are allocated as a result.

10.3.3.13 Simultaneous branch

A simultaneous branch consists of at least two horizontally arranged sequences joined at top and bottom by double lines.

How it works

A simultaneous branch leads to simultaneous processing of several sequences. This allows processes to be executed at the same time.

With simultaneous branches, the branches are processed only if the first equipment phase can use all branches. Once it is released for Batch, the equipment phase can then be allocated, regardless of whether it is in automatic or manual mode. An equipment phase can only be started by Batch if it is the automatic mode.

The behavior of a simultaneous branch depends on the status of the predecessor:

- The predecessor of a simultaneous branch has the status "Ready to complete"
  Simultaneous branches are activated if all transitions at the beginning of the neighboring branches in the simultaneous branch have been fulfilled.
- The predecessor of a simultaneous branch has the status "Completed"
  Simultaneous branches are activated regardless of the status of all transitions at the beginning of the neighboring branches in the simultaneous branch.

Synchronization lines

Another method of coordinating sequences is to create synchronization lines (Page 549) between the recipe steps.

10.3.3.14 Alternative branch

An alternative branch consists of at least two vertically arranged sequences joined at top and bottom by a single horizontal line.

How it works

With alternative branches, you can adapt the execution of the recipe to states in the process. The conditions in the top transitions of the sequences decide which sequence is executed.

10.3.3.15 Synchronization line

The synchronization lines coordinate the execution of recipe sequences in the units or of the recipe operations (ROPs) between the units.

10.3.3.16 Synchronization point

In each synchronization point, you can decide whether execution is continued or halted.

10.3.3.17 Monitoring

Process events can be monitored as well as a defined area of a recipe (monitoring area).

A transition condition at the start monitors process values, states and events. When the transition condition is fulfilled, the monitoring runs concurrently. Monitoring is configured similar to all recipe structures and can contain all the topological elements (loops, AND, OR, synchronization lines, etc.).

10.3.3.18 Transition

Along with the step, a transition is a second element type used in structuring a recipe. It contains the step enabling conditions between the steps.

10.3.3.19 Loop

A loop consists of a sequence with at least one recipe step and a return path with a transition.

Meaning

The loop allows multiple iterations of a sequence structure.

The transitions following the loop and in the return path decide how often the sequence is repeated. If the condition in the transition following the loop is satisfied, control exits the loop.

The conditions of the two transitions should be mutually exclusive so that it is not the order in which the transitions are evaluated that is relevant but rather the logic itself.

10.3.3.20 Jump

A jump is a recipe transition with or without a jump destination.

A recipe jump in a recipe level (RUP) skips a step in the sequential processing and resumes at a defined recipe step. The currently running RUP/ROP/SUB ends at a location where no jump destination is configured for a jump. The recipe jump is only executed if the configured step enabling condition (transition) is fulfilled.

10.4 Creating recipes

10.4.1 Notes on creating recipes

Expansion in the "Properties of ..." dialog

For each recipe unit procedure (RUP), you can decide whether this will execute AS-based or PC-based. You make this decision during recipe creation in the properties dialog of each recipe unit procedure. Mixed operation within a recipe is permitted.

Mixed operation and blocks

Mixed operation means the option of using both modes, PC-based and AS-based, in one recipe. This could, for example, mean that the recipe logic for a RUP is processed in the automation system and for another RUP on the SIMATIC BATCH server.

This is only possible if you use the "UNIT_PLC" block from the supplied SIMATIC BATCH block library in your PCS 7 project. With this block, both modes are possible. The "IUNIT_BLOCK" block from previous versions of SIMATIC BATCH is only permitted for the PC-based mode and it is interlocked against use in AS-based mode.

During batch control, the two blocks coordinate the allocation of individual units to the running batches. One instance of one or other of these two blocks is required in one of the hierarchy folder charts for each unit.

Options in mixed operation

You have the following options for mixed operation in a master recipe:

- Recipe in AS-based mode with the "UNIT_PLC" block
- Recipe in PC-based mode with the "UNIT_PLC" block
- Recipe in PC-based mode with the "IUNIT_BLOCK" block; only possible with a migrated PCS 7 project since this block is not supplied in the SIMATIC BATCH block library.
- Recipe in mixed operation with the "UNIT_PLC" block
- Recipe in mixed operation with the "UNIT_PLC" and "IUNIT_BLOCK"; only possible with a migrated PCS 7 project since this block is not supplied in the SIMATIC BATCH block library.

In the BATCH configuration dialog, prior to downloading, the validation function checks whether or not the same "UNIT" block type is used within a unit class. Within a unit class, you can work with either only "IUNIT_BLOCK" or only "UNIT_PLC". A mixture of the blocks within a unit class is not permitted and is rejected during validation with an error.

Recipes with references to other units

General property of AS-based mode.

A reference is always executed within this AS in a unit. In this case, the BATCH server is not involved. This means that no problems occur in the recipe execution and therefore your batch

process if the BCS fails or the network connection between the AS and BATCH server breaks down. The recipe control continues to run unaffected on the AS.

If a reference in a recipe is executed beyond unit boundaries, the recipe phase containing the target parameter does not wait to start until the recipe phase from which the source parameter originates is completed. The two recipe phases are executed separately. If you want the target recipe phase for the parameter not to start until the parameter source recipe phase is completed, you must set a synchronization at the appropriate place in the recipe.

Synchronization between units and references beyond the boundary of the unit are controlled by the BATCH server.

Recipe engineering

Based on the following graphics from the BATCH recipe editor, you can see the differences in the configuration of the two modes.

If you use the "UNIT_PLC" block, when you create a new hierarchical master recipe, AS-based mode will always be used automatically as default and you have the option of selecting the mode for every RUP. For recipes configured based on the "IUNIT_BLOCK" block, PC-based mode is used automatically and AS-based mode cannot be used.

Note

A mode selected in the recipe can no longer be modified in the batch if this is planned or released.

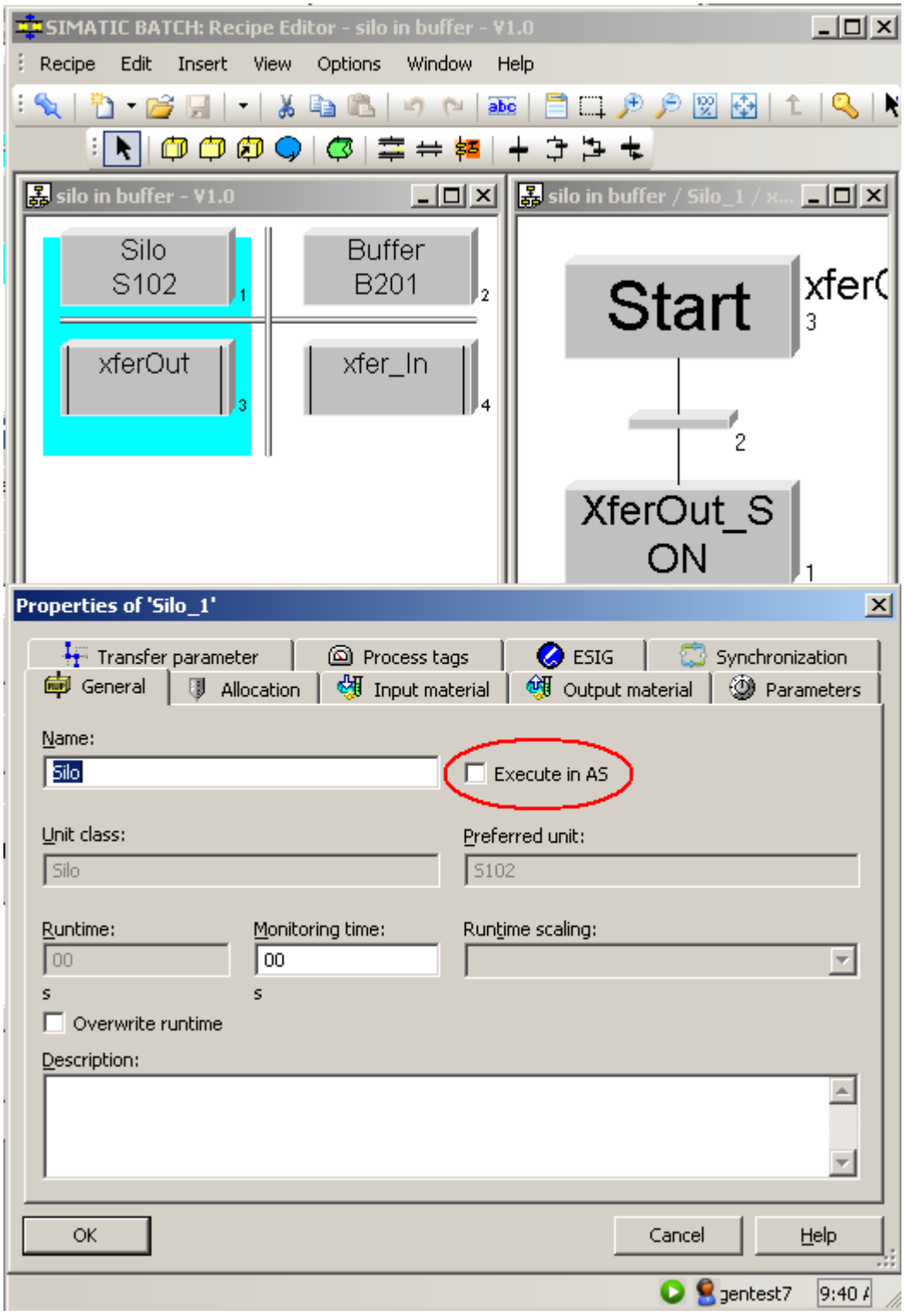


Figure 10-4 Properties dialog of a RUP, do not execute in AS

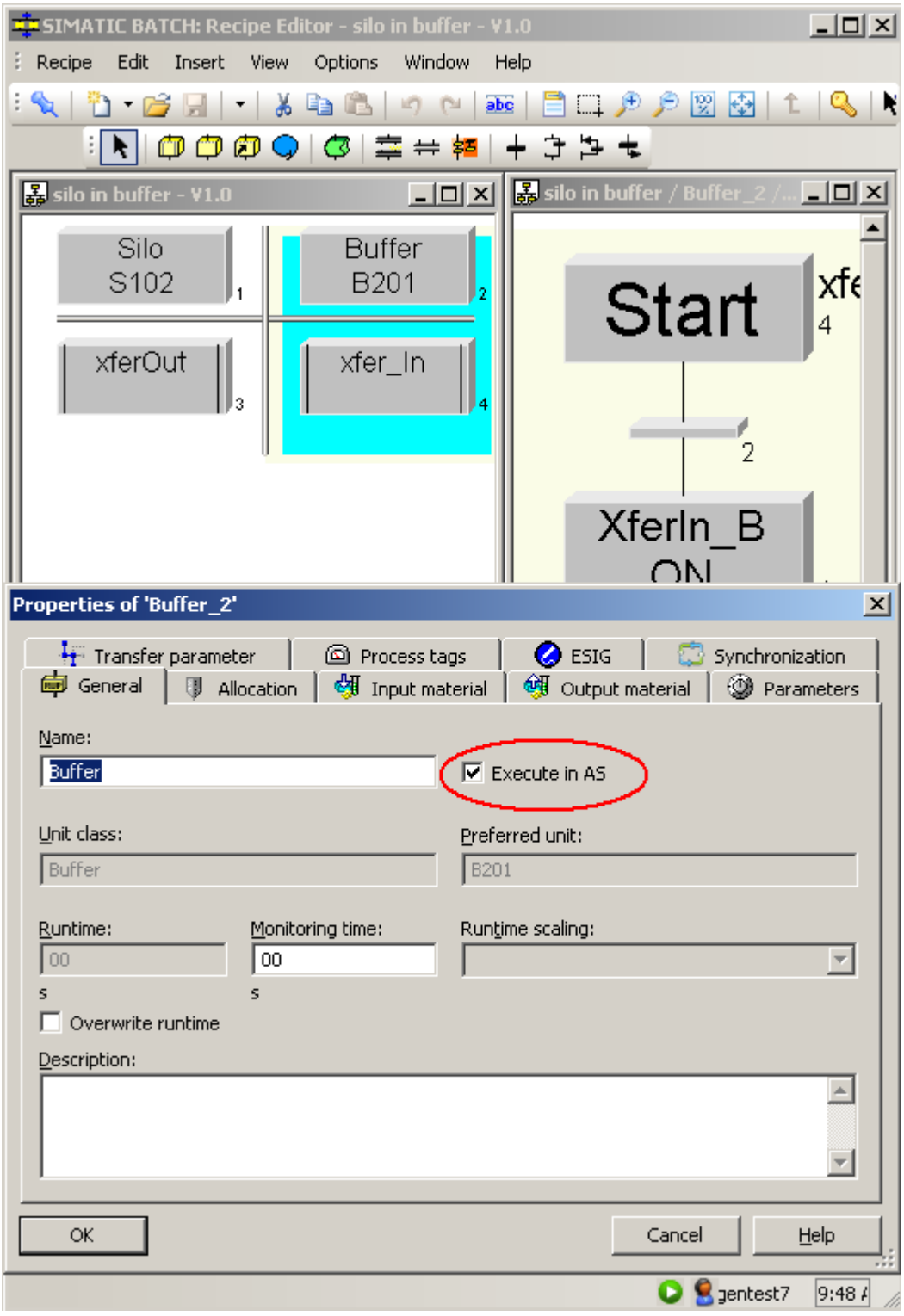


Figure 10-5 Properties dialog of a RUP, execute in AS

Recipe operations executed on the AS are automatically stored with a bright yellow background in the recipe editor.

10.4.2 How to edit a flat recipe

Procedure in the BATCH Recipe Editor:

1. Select the menu item Recipe > New > Flat recipe for a master recipe or Library element: Recipe operation/substructure.
   Result: A new editing window is displayed for editing level 1.
2. Enter the topological structure of the recipe in editing window 1 and any nested editing windows (substructures).
   Required substructures (= SUB) can be created with the "recipe procedural element". By double-clicking on a "SUB", opens the editing window for the substructure.
   - To create a new recipe element, select one of the following buttons in the toolbar:

     Result: The element attaches to the mouse pointer.
   - Move the mouse to the required position in the editing window and click.
     Result: The element is inserted. The symbol for the recipe element is still attached to the mouse pointer. The function of the mouse pointer changes only when you select a different element.
   - Click the selection arrow or the ESC button to change from the editing back to the selecting mode.
3. Assign the unit in the properties dialog for each recipe step. Use the "Properties" command in the shortcut menu for the recipe step.
4. Select the recipe elements in sequence and make the other required settings in the corresponding properties dialog. To do this, select the "Properties" command in the corresponding shortcut menu (select with right-click).
5. Check the validity of recipes. To do this, Select the menu item Recipe > Check validity.
6. Save the recipe at the desired location in the tree structure of BatchCC. To do this, Select the menu item Recipe > Save as.

Result

After creating/inserting the recipe, its status is "in progress". In this status, you can modify it at any time or released it for testing or production.

Help

Make use of the integrated online help when editing recipes:

- Each properties dialog has a "Help" button
- Direct help for each structure element: Mark the recipe element in the editing window and press F1 or the "Context help" button in the toolbar.

See also

Assignment of the unit with a flat recipe (Page 558)

Structure elements of recipes (Page 544)

Setting the properties of the recipe header parameters (Page 597)

Setting the properties of steps (Page 599)

Setting the properties for transitions (Page 605)

Validating recipes (Page 618)

Releasing a recipe for testing or production (Page 619)

Revoking a release (Page 619)

10.4.3 How to edit a hierarchical recipe

Procedure in the BATCH Recipe Editor:

1. Select the menu item Recipe > New > Hierarchical recipe (for a master recipe) or Library element: Recipe operation.
   Result: When you create a hierarchical recipe, a new editing window for an RUP is displayed (editing level 1). When you create a recipe operation, a window is displayed with a basic ROP structure (with start and end) (editing level 2).
2. In the case of a hierarchical recipe, first insert a recipe procedural element (Insert > Recipe procedural element).
   The first RUP is displayed.
3. Assign the unit in the properties dialog for the recipe unit procedure (RUP). Use the command "Properties" in the shortcut menu for RUP or the library operation ("Allocation" tab).

Note

Always make the assignment of the unit before configuring the individual recipe steps. As a result, only the phases actually available in the unit or that correspond to the unit conditions are displayed for selection in the properties dialogs of the phases.

4. Enter the remaining topological structure of the recipe in the editing windows.
   - Select one of the following buttons in the toolbar:

     Result: The element attaches to the mouse pointer.
   - Move the mouse to the required position in the editing window and click to deposit the element at the desired location.
     Result: The element is inserted. The icon for the recipe element is still attached to the mouse pointer. The function of the mouse pointer changes only when you select a different element.
   - Click the selection arrow or the ESC button to change from the editing back to the selecting mode.
5. Select the recipe elements one after the other and make the settings you require in the corresponding properties dialog. To do this, select the Properties command in the corresponding shortcut menu (select with a right-click).
6. Check the validity of recipes. To do this, Select the menu item Recipe > Check validity.
7. Save the recipe at the desired location in the tree structure of BatchCC. To do this, Select the menu item Recipe > Save as.

Result: After creating/inserting the recipe, its status is "in progress". In this status, you can modify it at any time or released it for testing or production.

Help

Make use of the integrated online help when editing recipes:

- Each properties dialog has a "Help" button
- Direct help for each structure element: Mark the recipe element in the editing window and press F1 or the "Context help" button in the toolbar.

See also

Assignment of the unit with a hierarchical recipe (Page 559)

Structure elements of recipes (Page 544)

Setting the properties of the recipe header parameters (Page 597)

Setting the properties of steps (Page 599)

Setting the properties for transitions (Page 605)

Validating recipes (Page 618)

Releasing a recipe for testing or production (Page 619)

Revoking a release (Page 619)

10.4.4 Unit allocation

10.4.4.1 Assignment of the unit with a flat recipe

The units are specified individually in the object properties for each recipe step. The unit assignment is made according to the structure of the plant hierarchy in the engineering system. This means that when additional levels were added to the three-level batch hierarchy, for example an area level between process cell and unit, these are also available as selection criteria in the unit assignment to help make the hierarchy clearer.

If you do not use the "Process cell optimization with online assignment of a unit (Page 564)", follow the steps outlined below.

Assignment of the unit with/without conditions?

- If you want to select the units without conditions, follow the procedure described in this section.
- If you want to select the units with conditions, follow the steps outlined in the section "Unit selection via conditions for a flat recipe (Page 561)".

Procedure in the BATCH Recipe Editor

1. Open the recipe.
2. Select a recipe step.
3. Select the "**Properties**" command in the shortcut menu (selected with a right-click).
   Select the "New assignment" button.
   The "Allocations" tab appears.
4. First, select the representation of the tree structure:
   - Class view: All unit classes without area structure will be listed in the "Unit selection" field.
   - Process cell complex view: All areas with the subordinate units are listed in the "Unit selection" field.
5. Select the unit class in the "Device selection" field and deselect those units (unit candidates) that are not suitable for this recipe unit procedure.
   The unit classes and units from the basic engineering are available for selection. By selecting a unit class and then deselecting the unit candidates, you limit the phases that can be used in the execution of this unit recipe (displayed in the "Available phases" field).
6. If necessary, select a preferred unit in the "Preferred unit" field.
   If no other assignment is made before creating a batch, the unit specified as preferred is used for the batch execution.
7. Confirm the selection with "OK".

Result

This assignment is displayed in the properties dialog of the recipe element. When assigning phases to the recipe element only the phases that can be executed by all the units selected are available.

10.4.4.2 Assignment of the unit with a hierarchical recipe

A recipe unit procedure (RUP) is designed for a specific selection of applicable units (fixed number) or a set of conditions for determining the unit selection (variable number depending on changes in the engineering system).

The units (and the conditions when applicable) are specified in the object properties for the RUP. In so doing, the unit assignment is made according to the structure of the plant hierarchy in the engineering system. This means that when additional levels were added to the three-level batch hierarchy, for example, an area level between process cell and unit, these are also available as selection criteria in the unit assignment to help make the hierarchy clearer.

If you do not use the online assignment of a unit (Page 564), follow the steps outlined below.

Assignment of the unit with/without conditions?

- If you want to select the units without conditions, follow the procedure described in this section.
- If you want to select the units with conditions, follow the steps outlined in the section "Unit selection using conditions for a hierarchical recipe (Page 562)".

Procedure in the BATCH Recipe Editor

1. Open the recipe.
2. Select a RUP (the column is shown on a light blue background).
3. Select the "**Properties**" command in the shortcut menu (selected with a right-click).
4. Select the "Allocation" tab.
5. First, select the representation of the tree structure:
   - Class view: All unit classes without area structure will be listed in the "Unit selection" field.
   - Area view: All areas with the subordinate units are listed in the "Unit selection" field.
6. Select the unit class in the "Device selection" field and deselect those units (unit candidates) that are not suitable for this recipe unit procedure.
   The unit classes and units from the basic engineering are available for selection. By selecting a unit class and then deselecting the unit candidates, you limit the phases that can be used in the execution of this recipe unit (displayed in the "Available phases" field).
7. If necessary, select a preferred unit in the "Preferred unit" field.
   If no other assignment is made before creating a batch, the unit specified as preferred is used for the batch execution.
8. Confirm the selection with "OK".

Result: This assignment is displayed in the properties dialog of the recipe elements shown (where it cannot be changed). When assigning phases, only the phases that can be executed by the units still selected are available.

10.4.4.3 Specifying units using conditions

In the Recipe Editor, you can use conditions to specify units that match the required equipment properties. When a process cell is expanded or a change is made, the list of available units is adapted automatically without change to the recipe.

Requirement

The BatchCC is open.

Procedure

1. Select the menu command Options > Settings > Project settings and select the "Unit selection according to conditions" check box on the "General" tab to "Yes". You have now set this strategy as the default for new recipes or expanded recipe procedures.
2. Open a new recipe in the Recipe Editor. Open the "Properties of ..." dialog with the menu command Recipe > Header parameter ... and open the "Allocations" tab.
3. Select the desired recipe assignment from the list and click "Edit". If there is no recipe assignment, first click "New".
4. Click "New" in the dialog that opens. This creates a new, empty condition. Click the "Change" button to make the following additional settings in the wizard:
   - In the first step, select the required equipment property and click "Next".
   - In the second step, select the operator ("Available" indicates that only the presence but not the value of the equipment property is evaluated).
   - In a third step, select or enter the required value of the equipment property.
   - In the final step, click "Finish".

   Using logical operators, you can logically combine multiple conditions with queries of equipment properties.
5. Close the dialog with "OK".

Result

The possible units on which the recipe unit can run are displayed on the "Allocation" tab. The unit allocation is determined by SIMATIC BATCH from the recipe phases and conditions used and cannot be edited.

10.4.4.4 Unit selection via conditions for a flat recipe

To improve efficiency of selecting suitable units, you can define conditions on the unit. When selecting units, all units that satisfy these conditions (union set) will then be available. It is thus possible, for example for process cell extensions after an update of the process cell in the Batch Control Center, to also include additional units in the batch process (for batches that have not yet been released).

Requirement

To be able to enter the conditions for the unit, the "Condition" option in the properties of the recipe procedure must be activated for the unit in the "Allocation" tab.

Use the option "Unit selection through conditions" in the system settings in the Batch Control Center to activate this option as default for all new recipes.

Possible specifications of conditions

The conditions can be created on the same recipe levels where they can be assigned to units.

When a library structure is included in a master recipe, it brings its conditions with it.

Procedure at the recipe unit procedure level

1. Open the recipe.
2. With a flat recipe: select the recipe step.
3. Select the "**Properties"** command in the shortcut menu (selected with a right-click).
4. Click the "New assignment" button in the "General" tab.
   Result: The "Properties of New Allocation" dialog box is displayed.
5. Click the "New" button in the "Condition" tab.
   Result: A new row is created in the table for entry of another condition.
6. Click the "Change" button.
   Result: The "Operand 1" dialog box opens.
7. From the list, select that attribute of the unit that that needs to satisfy a condition.
8. Click the "Next" button.
   Result: The "Operator" dialog box is displayed.
9. In the middle field select the operator that specifies the logic operation condition of the two operands and therefore defines the condition.
10. Click the "Next" button.
    Result: The "Operand 2" dialog box opens.
11. From the list, select the value of the unit attribute needed to meet the required condition.
    Some values may have to be edited in a subsequent dialog. Use the context-sensitive help if you want more information in this regard ("Help" button).
12. Click the "Next" button.
    Result: The "Operator" dialog box opens again. All elements of the condition are displayed and cannot be changed.

13. Select the "Finish" button.
    Result: The complete condition is entered in the "Condition" tab. Enter additional conditions as needed in the same way.
    Result: The following is displayed in the "Allocation" tab:
    - Left: All units are displayed as unchangeable under "Equipment selection". The required units have already been selected automatically.
    - Right: The union set of all selected units is displayed under "Available phases".
14. First, select the representation of the tree structure:
    - Class view: All unit classes without area structure will be listed in the "Unit selection" field.
    - Process cell complex view: All areas with the subordinate units are listed in the "Unit selection" field.
15. Select the required allocation strategy and exit the dialog using the "OK" button.
16. Confirm the selection with "OK".
17. You can change these settings as needed by pressing the Edit assignment button in the "Properties of <recipe phase>" dialog box.

See also

Process cell optimization with online assignment of a unit (Page 564)

10.4.4.5 Unit selection via conditions for a hierarchical recipe

To improve efficiency of selecting suitable units, you can define conditions on the unit. When selecting units, all units that satisfy these conditions (union set) will then be available. Thus it is possible, for example for process cell extensions after an update of the process cell in the BatchCC, to also include additional units in the batch process (for batches that have not yet been released).

Requirement

To be able to enter the conditions for the unit, the "Condition" option in the properties of the recipe procedure must be activated for each unit recipe procedure (line). The properties dialog in this case is expanded by a "Condition" tab.

Use the option "Unit selection through conditions" in the system settings in the Batch Control Center to activate this option as default for all new recipes.

Possible specifications of conditions

These conditions can be created on the same recipe levels where they can be assigned to units. When a library operation is included in a master recipe, it brings its conditions with it. The properties dialog in this case is expanded with another "Subcondition" tab.

Procedure at the recipe unit procedure level

1. Open the recipe.
2. With a hierarchical recipe: select the RUP (column is shown with a light blue background).
3. Select the "**Properties**" command in the shortcut menu (select with right mouse button).
4. Change to the "Condition" tab.
5. Click the "New" button.
   Result: A new row is created in the table for entry of another condition.
6. Click the "Change" button.
   Result: The "Operand 1" dialog box opens.
7. From the list, select that attribute of the unit that that needs to satisfy a condition.
8. Click the "Next" button.
   Result: The "Operator" dialog box is displayed.
9. In the middle field select the operator that specifies the logic operation condition of the two operands and therefore defines the condition.
10. Click the "Next" button.
    Result: The "Operand 2" dialog box opens.
11. From the list, select the value of the unit attribute needed to meet the required condition. Some values may have to be edited in a subsequent dialog. Use the context-sensitive online help if you want more information in this regard ("Help" button).
12. Click the "Next" button.
    Result: The "Operator" dialog box opens again. All elements of the condition are displayed and cannot be changed.
13. Select the "Finish" button.
    Result: The complete condition is entered in the "Condition" tab. Enter additional conditions as needed in the same way.
14. Confirm with "OK".
    Result: The following is displayed in the "Allocation" tab:
    - Left: All units are displayed as unchangeable under "Equipment selection". The units that it should be are already selected automatically.
    - Right: The union set of all selected units is displayed under "Available phases".
15. First select the view of the tree structure:
    - Class view: All unit classes without an area structure are listed in the "Unit selection" field.
    - Process cell complex view: All areas with the units they contain are listed in the "Unit selection" field.
16. Select the required allocation strategy and exit the dialog using the "OK" button.

10.4.4.6 Process cell optimization with online assignment of a unit

Introduction

When optimizing a process cell with online assignment, the unit recipe is assigned to the unit at the last possible moment. If the unit is not assigned when the batch is running, the "online assignment" function becomes active.

"Online assignment" provides the following four options (strategies) for optimizing the utilization of units:

- Preferred unit: If no other assignment is made before creating a batch, the unit specified as preferred is used for the batch execution.
- The longest out of use: The unit that has not been used for the longest time is selected.
- Operator selection: The allocation of the unit can be performed manually in an operator dialog.
- Process parameter: The variable selected in the process parameter field decides the unit to be used.

Procedure in the BATCH Recipe Editor

1. Open the recipe.
2. Select
   - With a flat recipe: the recipe step.
   - With a hierarchical recipe: select the RUP (column is shown with a light blue background).
3. Select the "**Properties**" command in the shortcut menu (select with right mouse button).
4. Select the "Allocations" tab (using the "Edit assignment" button for flat recipes).
5. In the "Strategy" box, enter one of the options described above for online assignment.
6. If you select the process parameter option, select the relevant formula parameter.
   You can select the parameter with the "Unit" data type from a list box that will decide which unit is selected when the batch is made.
7. Confirm the selection with "OK".

"Operator Selection" strategy

If the "Operator selection" strategy is configured, a status symbol is set at the recipe step (visible in the open control recipe) as soon as SIMATIC BATCH wants to use a unit.

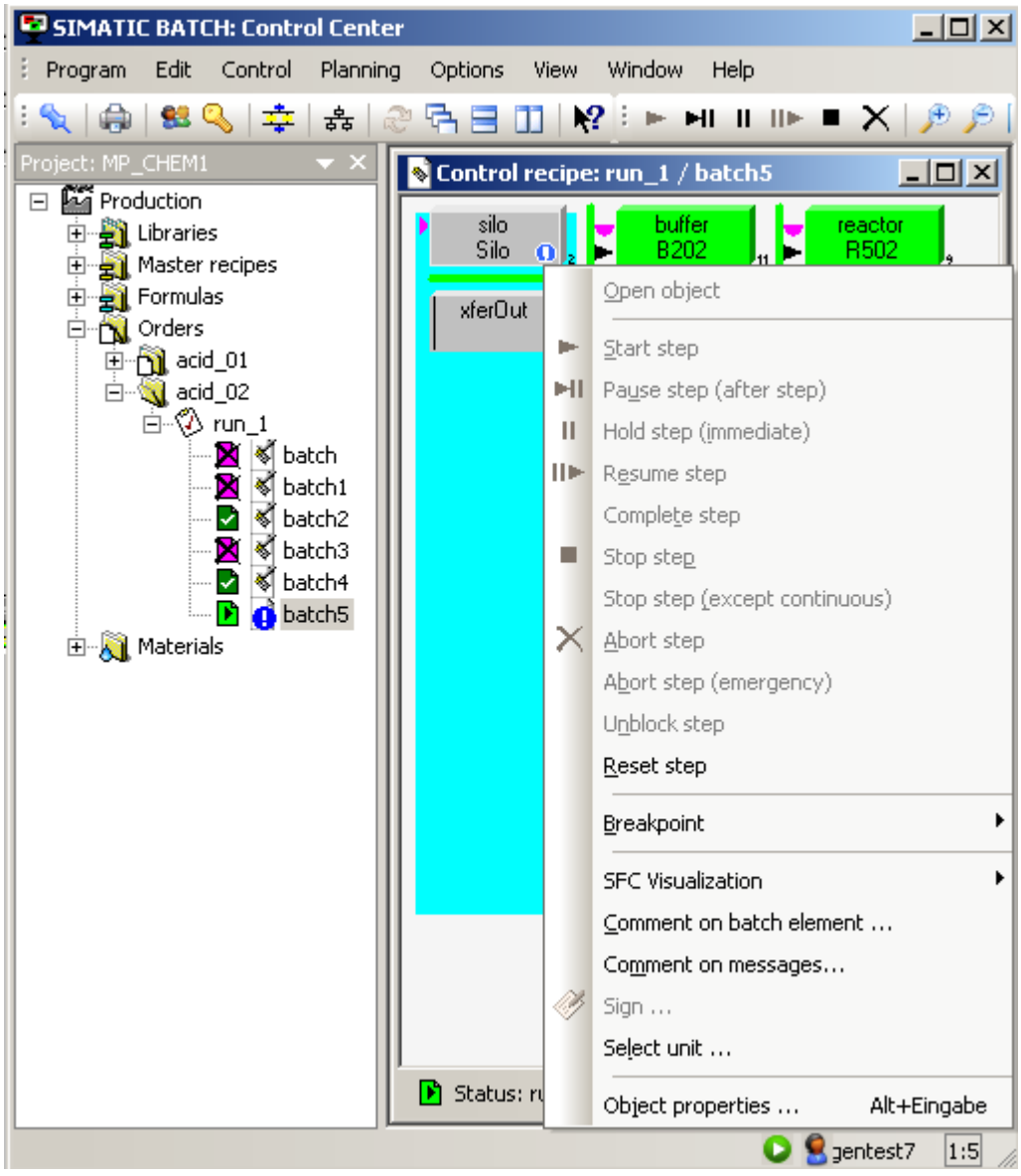


Figure 10-6 Strategy operator selection of the unit



Figure 10-7 Allocation of the unit by operator selection

After selecting the recipe unit procedure (with a hierarchical recipe) or the recipe phase (with a flat recipe) with the status symbol, you can select the required unit with the "Select unit" shortcut menu command.

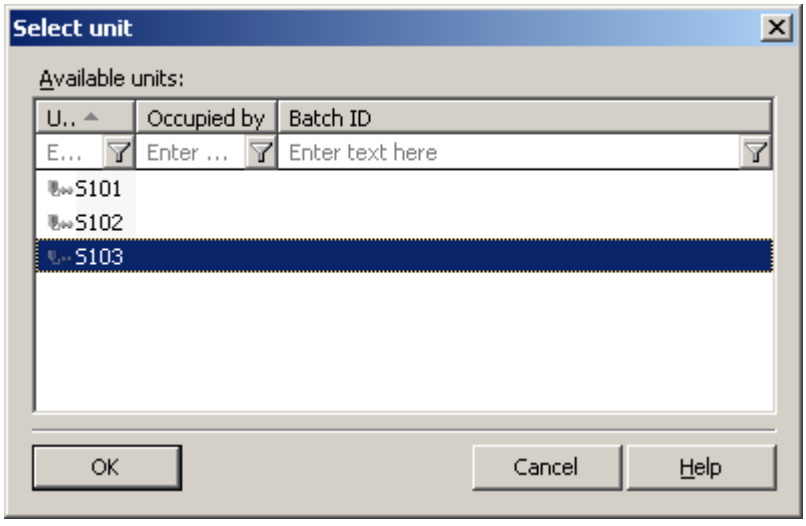


Figure 10-8 Select unit

If this unit is already in use, the recipe unit procedure waits until the selected unit is available again. If the conditions for allocation of the unit are not met, the recipe unit procedure waits until the conditions are met and the unit is available. If more than one user attempts to make a selection at the same time, the allocation goes to the first user. All other selected units are ignored.

"Process parameter" strategy

As soon as the recipe step occupies a unit, the unit remains displayed and in use even if the process parameter is subsequently changed to another unit.

The other unit is not displayed until after this unit has been released; that is, when the recipe step has come to an end or has been aborted and reset.

Note

In a hierarchical recipe, make sure that no further changes are made to the process parameter after the respective recipe unit has started. Otherwise, a unit that was not even used will be displayed when the recipe unit is finished.

If, after the start of a batch, you want to subsequently change the unit, for example, change a process parameter or restart the batch and also switch the allocated unit, then the most recently allocated unit will be shown in neither the archive file (*.xml) nor in the batch report.

Additional information

"Select unit" dialog (Page 905)

10.4.4.7 Supplemental information about online assignment of a unit for flat recipes

Online assignment of several recipe phases with the same unit assignment

If several recipe phases are in a flat recipe with the same unit assignment, the online assignment is only performed for the first recipe phase.

For safety reasons the assigned unit is retained for all subsequent recipe phases, even when the unit is released upon completion of a phase.

Repeated online assignment

To repeat an online assignment, a completed or aborted recipe phase needs to be reset. None of the other recipe phases with the same unit assignment can be active in this case.

Recommendation

To be able to repeat an online assignment in a flat recipe, recipe phases should be distributed over many different unit assignments when the recipe is originally created.

10.4.5 Inserting and labeling recipe elements

10.4.5.1 Recipe procedural element (Insert menu)

Overview

With this function, you insert recipe steps of the type recipe procedure element within a recipe. This step element is a substitute object for the steps and step sequences stored within the nested hierarchy level.

- Hierarchical recipe: RUP, ROP, RPH
- Flat recipe Substructure

Open or double-click

The window for editing the recipe steps or step sequences in the nested hierarchy level opens for the selected object.

Properties

The properties of the step elements and the underlying step sequence are identical. The data in the "General", "Input material", "Output material", "Parameters" (process parameters) and "Process tags" tabs can be edited.

- Hierarchical recipe:
  The unit class and, if selected, a preferred unit for creating a batch are specified by inserting them in the corresponding unit column.
- Flat recipe:
  The unit class/unit can be assigned individually (and differently) for each recipe step on the "General" tab.

Exiting the insertion function

The insertion function for the object is exited by clicking the selection arrow or a different insertion object (menu or toolbar) or with ESC.

10.4.5.2 Recipe phase/operation (Insert menu)

Overview

This function inserts recipe steps of the recipe phase type (RPH). In the properties dialog in the sequence window for the recipe unit procedure, you can link a step with a recipe phase of the type EOP or EPH. In the sequence window for the recipe operation or a single level recipe, you can link a step with a recipe phase of the type EPH.

Properties

Through insertion in the appropriate unit column of a hierarchical recipe, the unit class, (and if preselected) a unit that is preferred for creating a batch is/are specified. The data in the "General", "Input material", "Output material", "Parameters" (process parameters) and "Process tags" tabs can be edited.

To link the recipe steps with the data of the basic control, the configuration data of the corresponding process cell must be read in or updated with the BATCH object manager.

End the insert function

The insert function is closed for this object by clicking the selection arrow or a different object to be inserted (menu or toolbar) or with ESC.

10.4.5.3 Library reference (Insert menu)

Open

The window displaying the recipe step sequence that is stored in the library opens for the selected object. To change the step chain in the library, you have to open it using Open library object... (Recipe menu) (Page 1071).

Properties

The properties of the step elements and the subordinate sequential function block are identical. By installing it in the corresponding unit column of a hierarchical recipe, the unit class and, if selected, a preferred unit for creating a batch are specified. The data under the tabs "General", "Input material", "Output material", "Parameters" (process parameters), "Process tags", can be edited.

End the insert function

The insert function is closed for this object by clicking the selection arrow or a different object to be inserted (menu or toolbar) or with ESC.

10.4.5.4 Operator instruction (Insert menu)

Overview

This function inserts recipe steps of the operator instruction type. The operator instruction allows instructions to be displayed to operators during the processing of a recipe. A distinction is made between the following operator instructions:

- Instruction within an NOP step
  - Without acknowledgment: The recipe is not stopped. Example: Please put on the protective goggles!
  - With acknowledgment: The recipe is stopped until an acknowledgment is entered. Example: Please close valve V127.
- Instruction with input option (operator dialog) A recipe phase/operation is selected for the function. Only the parameter set is applied. No function is started in the AS.
  - Without acknowledgment, example: Entry of analysis process values.
  - With acknowledgment, example "Manual dosing": The operator is instructed which material to use and how much to add. The operator enters the process values of the material added and confirms (acknowledges).

Without acknowledgment: Activation status "Activate and do not block batch" is selected.

With acknowledgment: Activation status "Activate and block batch" is selected.

Note

Batches

Batches that include instructions without acknowledgement are processed as far as the "Completed" status. The instruction is active only as long as the batch is running. If a more restrictive response is required, use the option with acknowledgement.

Entered values (process values) can serve as setpoints for subsequent recipe functions/ operations. You can also pass default values or diagnostic values to subsequent recipe steps. An process value entered by the operator is passed to a higher recipe level in this case. The transfer value is queried in subsequent recipe step as the source. The process values can also be evaluated in transitions, example: Is the sample good? yes/no. In this case parameters must be assigned with acknowledgement.

Properties

Regardless of the unit, only those phases are available that were released for operator instructions in the engineering system. It is advisable to configure special manual operations with the engineering system that are available for all units.

The data in the "Instruction", "General", "Input materials", "Output materials", and "Parameters" (process parameters) and tabs can be edited.

Depending on the phase selected in the "General" tab, it is possible for the operator to enter parameter values (= instruction with input option). The parameter values set in the "Input material", "Output material", "Parameters" (process parameter) tabs are then the setpoints for the operator.

The system supports a maximum of fifty operator instructions active at the same time.

End the insert function

The insert function is ended for this object by clicking the selection arrow or a different object to be inserted (menu or toolbar) or with ESC.

See also

Parameter interconnections (Page 596)

10.4.5.5 Command step (Insert menu)

Overview

You can use this function to insert a command step into your master recipe in the BATCH Recipe Editor.

A command step is used to pass a command (S88 command) in the recipe operation to one or more target recipe elements (RPEs). It is also possible to specify the status that the target object needs to have before it can receive the command. This status filter applies to the entire

list of target recipe elements. A setpoint runtime you have determined for the equipment phase can also be specified. This means that the equipment phase will end only when the setpoint runtime has expired.

How it works

A command step can be inserted in your recipe at any position where a NOP object (No Operation = placeholder, empty step) can be inserted.

When the command step starts, it sends the configured command to all the recipe steps that have appropriate status as determined by the configured filter. The recipe step receiving the command is documented in the batch data.

If a runtime is specified for the command step, the step remains in the RUNNING status for this time. If no runtime was specified, the step ends immediately after sending the command.

If a command step transfers a command to the target recipe element, an operator message is generated and displayed in the command list in the message system. In the Operator column, instead of the logged-on user, the name of the command step is shown followed by the step number. Example: Hold immediately_4:Transition Breakpoint set.

Restrictions

- The command step is processed sequentially and does not wait until the controlled recipe steps have executed the transferred command.

  Note

  If it is important for the ongoing recipe operation that the target object first executes the transferred command, a transition for querying the target object status needs to be inserted after the command step.

- The system cannot fully prevent the recipe from stopping because no steps or too many steps are active if a command step is used incorrectly.
- Note the following recipe constructions in which automatic execution may be disrupted:
  - Due to the command step, not all objects in simultaneous branches are started.
  - Due to the command step, an object is started before a synchronization that has already finished.
  - The command step completes all active recipe steps.
- The "Restart" command at a recipe element only takes effect when the target object has the status "Aborted" or "Stopped".

Consistency check

When the command step starts or restarts, the BATCH Control server checks if a recipe step is already running in the step sequence before and after the target steps. If this is true, the start command is not performed and the command step goes to error status.

Special system characteristics for monitoring

If you use the "Start" or "Restart" command in a command step at a recipe element that is monitored, the monitoring is started as well.

Inserting a command step

To insert command steps in the diagram in the recipe editor, follow the steps below:

1. Select the menu command **Insert > Command step** or the corresponding icon of the toolbar.
2. Click on the required location in the open recipe until the mouse pointer shows the command symbol to insert a command step.
3. Open the properties dialog of the command step. The command step is configured in the "General" tab.
4. Select the desired targets from the command targets offered. In the tree view, navigate to the desired recipe element and use the arrow key to move it in the list of command targets. Alternatively, you can select the target object in the recipe editor and, keeping the left mouse button pressed, drag it to the required command step object and then release the left mouse button.
5. Select your command from the list of available commands.
6. If you only want to sent a command for a specific status, under "Filter" select the status that the recipe phase must have during runtime for the corresponding command to be passed.
7. Close the dialog with "OK".

Additional information

"General" tab command step properties (Page 886)

Example of a command step (Page 572)

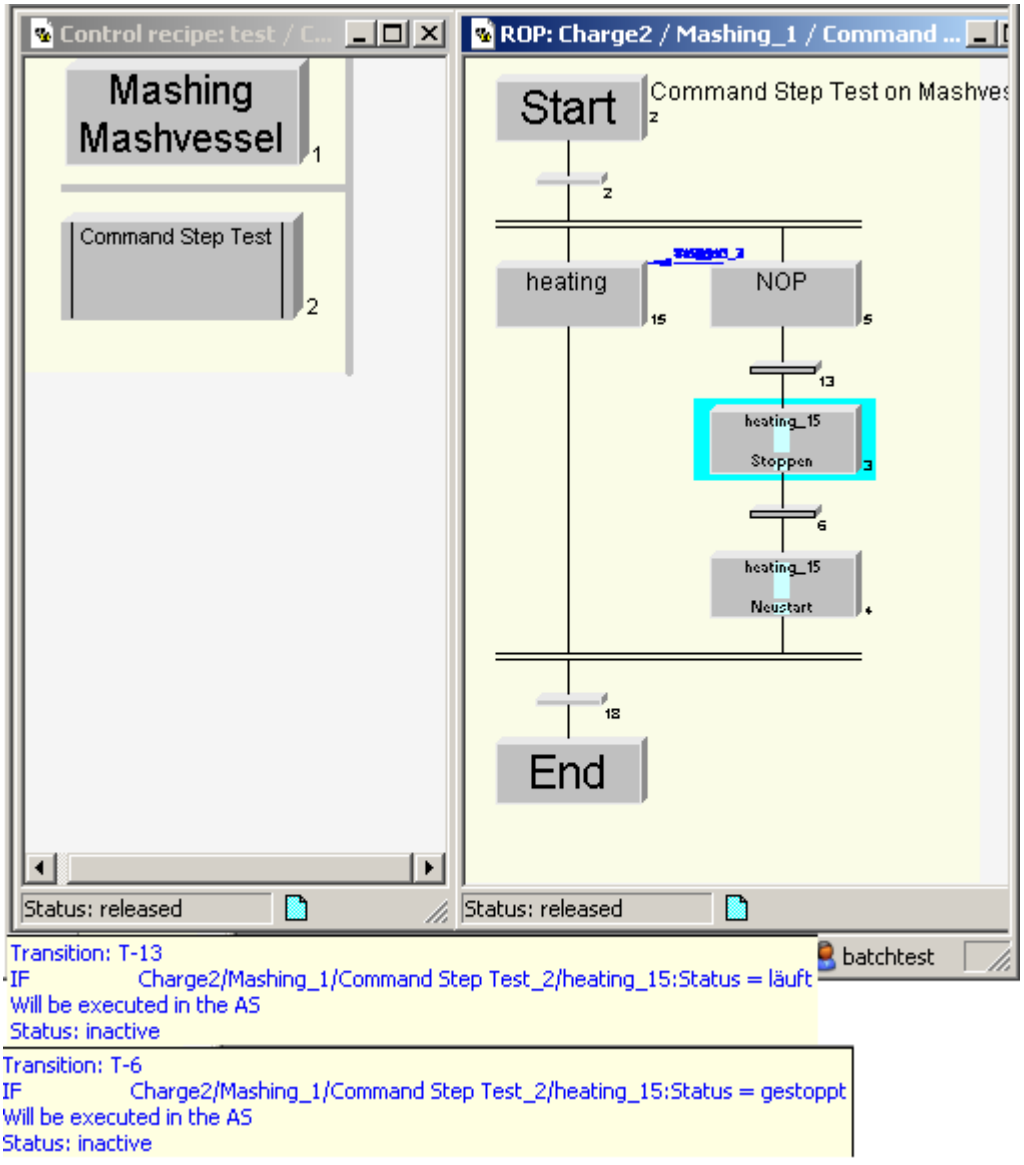
10.4.5.6 Example of a command step

Introduction

In automatic mode, process conditions may require that one recipe object is influenced by other recipe objects.

Example recipe

We provide an example recipe to show you how to configure two command steps with the Stop and Restart commands. The figure shows an example recipe after it has been configured in the RE. The required functionality will now be added to this recipe.



Configuration in the RE

The following describes how to configure the command steps.

1. Edit transition 13. The transition contains a process condition intended to stop the "heating" recipe phase for example.
2. Insert a command step after transition 13 in the simultaneous branch.

3. Select the "Heating" recipe phase as the target object in the properties dialog and "Stop" as the command.
4. Transition 6 contains the following status query. Has the "heating" recipe stopped? The effect is that the follow-up command "Restart" is executed only when the target object shows this status.
5. Insert a command step after transition 6 in the simultaneous branch.
6. Select the "Heating" recipe phase as the target object in the properties dialog and "Restart" as the command.
7. Save your recipe and release it.

Result

A prompt is issued in transition 13 in process mode asking if the "heating" recipe phase is running. Then the "heating" recipe phase is stopped with command step 3. The "heating" recipe phase does not go immediately to "Stop"; it goes through its "stopping" transition state. A prompt is issued in transition 6 asking if the "heating" recipe phase has stopped. If it has, the "Restart" command is transferred by command step 4 to the "heating" recipe phase. This resets the "heating" recipe phase and starts it again.

10.4.5.7 Simultaneous branch (Insert menu)

Overview

In the BATCH Recipe Editor, this function inserts an AND divergence. The steps and transitions in the simultaneous branches are executed at the same time. Control is passed to the successor transition or successor step only when the last steps and transitions of the simultaneous branches have been executed or are satisfied.

With simultaneous branches, the branches are processed only when all branches can be processed. This ensures, for example, that it is only possible to "heat" when the "agitator" is active.

Note

If two equipment phases of the same unit are installed in one simultaneous branch and one of the two equipment phases is in automatic mode and the other in manual, during processing, the unit will be occupied by the equipment phase in automatic mode.

At this point, execution of the simultaneous branch stops. Even the equipment phase in the automatic mode, that is occupying the unit is not processed.

Selection

Clicking the double line selects the entire simultaneous branch. If you click one of the lines that join the double lines from within the simultaneous branch, you select a sequence.

To select a simultaneous branch (Page 548)with a lasso, both double lines and a certain amount of space to the right and left between the individual objects (structure elements) must be included within the lasso frame.

Inserting

Proceed as follows to insert simultaneous branches in the diagram in the BATCH Recipe Editor:

1. Select the menu command **Insert > Simultaneous branch** or click the corresponding button in the toolbar.
2. Click between two objects in the diagram.

Proceed as follows if you require a parallel procedure to an existing structure in the BATCH Recipe Editor:

1. Select the menu command **Insert > Simultaneous branch** or click the corresponding button in the toolbar.
2. Position the mouse pointer above the first object for which you require a simultaneous branch.
3. Hold down the mouse button and drag the mouse pointer below the last object to be enclosed in the simultaneous branch.

Notes

- While you drag the mouse pointer, a line is displayed that indicates which parts will be included if you release the button at the present position.
- Depending on whether you release the button to the left or right of the vertical line, a new simultaneous branch is added to the left or right.
- You can cancel this operation by returning the mouse pointer to the initial position or by pressing the ESC key.

10.4.5.8 Synchronization (Insert menu)

Overview

With synchronization, you can coordinate the execution of recipe sequences in the units and between the units (hierarchical recipe). Synchronization is also possible in the sequences of the same simultaneous branch (hierarchical recipe, flat recipe).

At each synchronization point, you can decide whether or not the sequence is halted. If you select blocking, the sequence waits until the other sequences involved have reached the synchronization line or have already reached it (can already be advanced to the next step). If blocking is not selected, the sequence does not wait for the other sequences. The fact that the synchronization point was reached is still recorded.

Inserting

If you insert synchronizations between the units of a hierarchical recipe in the BATCH Recipe Editor, follow these steps:

1. Select the **Insert > Synchronization** menu command or the corresponding button in the toolbar.
2. Drag the mouse starting between two objects of the first recipe unit procedure (RUP) to a point between two objects of the recipe unit procedure (RUP) you want to synchronize. If there are other sequences between the RUPs, these are not included in the synchronization.

Expanding

1. Select the **Insert > Synchronization** menu command or the corresponding button in the toolbar.
2. Beginning at a synchronization point (junction between the sequence line and synchronization lines) drag the mouse pointer until it is located between two objects of the recipe unit procedure (RUP) you want to add in to the synchronization.

Removing a synchronization point

You can select and delete individual synchronization points or the synchronization line.

Properties

You can assign a name to the synchronization and decide whether or not execution is to be halted individually for each synchronization point.

Appearance of the synchronization point:

A synchronization point is displayed as a double line and the sequence line is interrupted if a synchronization point is for the sequence branch and the Blocking property was selected.

A synchronization point is displayed as a single line if a synchronization point is for the sequence branch and the "Blocking" property was **not** selected.

A synchronization point is displayed as a double line and the sequence line is not interrupted if it is **not** a synchronization point for the sequence branch.

You recognize synchronization lines lying on top of one another by the points displayed at the ends or by selection of the synchronization lines. You recognize objects not connected to the synchronization line (RUPs) from their notch.

10.4.5.9 Monitoring (Insert menu)

Overview

Process events can be monitored as well as a defined area of a recipe (monitoring area). Monitoring is an independent recipe structure, which you configure in the Recipe Editor.

Operating principle

A transition condition at the start monitors process values, states and events. When the transition condition is fulfilled, the monitoring runs concurrently. Monitoring is configured similar to all recipe structures and can contain all the topological elements (loops, AND, OR, synchronization lines, etc.).

Monitoring is started automatically as follows:

- With each entry into a monitoring area.
- With a jump to a monitoring area.
- With an automatic start of a step in the monitored area.

Monitoring is stopped automatically as follows:

- When the monitored area is exited with "Cancel" and "Reset". The status of the overall monitoring then becomes "inactive".
- By a configured logic, which ends with a jump without a jump destination. The status of the overall monitoring then becomes "completed".

Monitoring is restarted when the last transition in the monitoring is completed.

It is possible to monitor beyond synchronization lines. You can configure synchronization lines on the top level of the monitoring. They are displayed using the light red and dark red background color in the Recipe Editor.

The following restrictions apply to synchronization lines:

1. The nodes for a line are located in the direct sequences of the simultaneous branch.
2. If one of these sequences contains a monitoring object, rule 1 is applied to the content.

It is therefore still not possible to end synchronization lines between two recipe units and an AND, although this poses no problem to the sequence.

Representation in the Recipe Editor

The monitored recipe area and the monitoring itself are shown with a color frame. The monitored area has a light frame, the monitoring a dark one. The two areas are located parallel to one another. Each monitoring contains a loop by default. The loop indicates that the sequence is repeated at the end.

Double-clicking the selected "Monitoring" object opens the full recipe structure of a "Monitoring" inserted in the Recipe Editor. In the other direction, double-clicking on the name of the monitoring collapses the opened monitoring structure.

Limitations

- Monitoring does not automatically start actions in a monitored area.
- A manual operation to recipe objects within the monitored area starts or stops the monitoring.

- The system cannot prevent the recipe execution from stopping because no steps or too many steps are active if the parameter assignment and configuration are poorly performed in the monitoring itself.
- The system prevents inserting monitoring within monitoring.

Inserting monitoring

Proceed as follows to insert monitoring in the diagram of the BATCH Recipe Editor:

1. Select the **Insert > Monitoring** menu command or the corresponding button in the toolbar.
2. Click between two individual objects (structure elements) to insert a monitoring with a transition and placeholder step.
3. Double-click on the "Monitoring" title in the monitoring with the "Selection" setting. The default structure of the monitoring opens. The default structure contains a loop. The left transition is the monitoring condition and the right one is the repeat condition.

Additional information

Example of monitoring (Page 578)

10.4.5.10 Example of monitoring

Introduction

In automatic mode, it may be necessary to monitor a running recipe phase and end it automatically when certain conditions occur. We show you how to configure simple monitoring in the RE in the following example.

Theoretical basis

The following logic should be configured in a master recipe in the RE:

- A running recipe phase, "filling" in this case, should be monitored.
- The recipe phase should be aborted in the monitoring (concurrent condition).
- An operator instruction should provide information about the aborted recipe phase, and then be acknowledged or applied.
- The monitoring should then end.

The corresponding master recipe appears below.

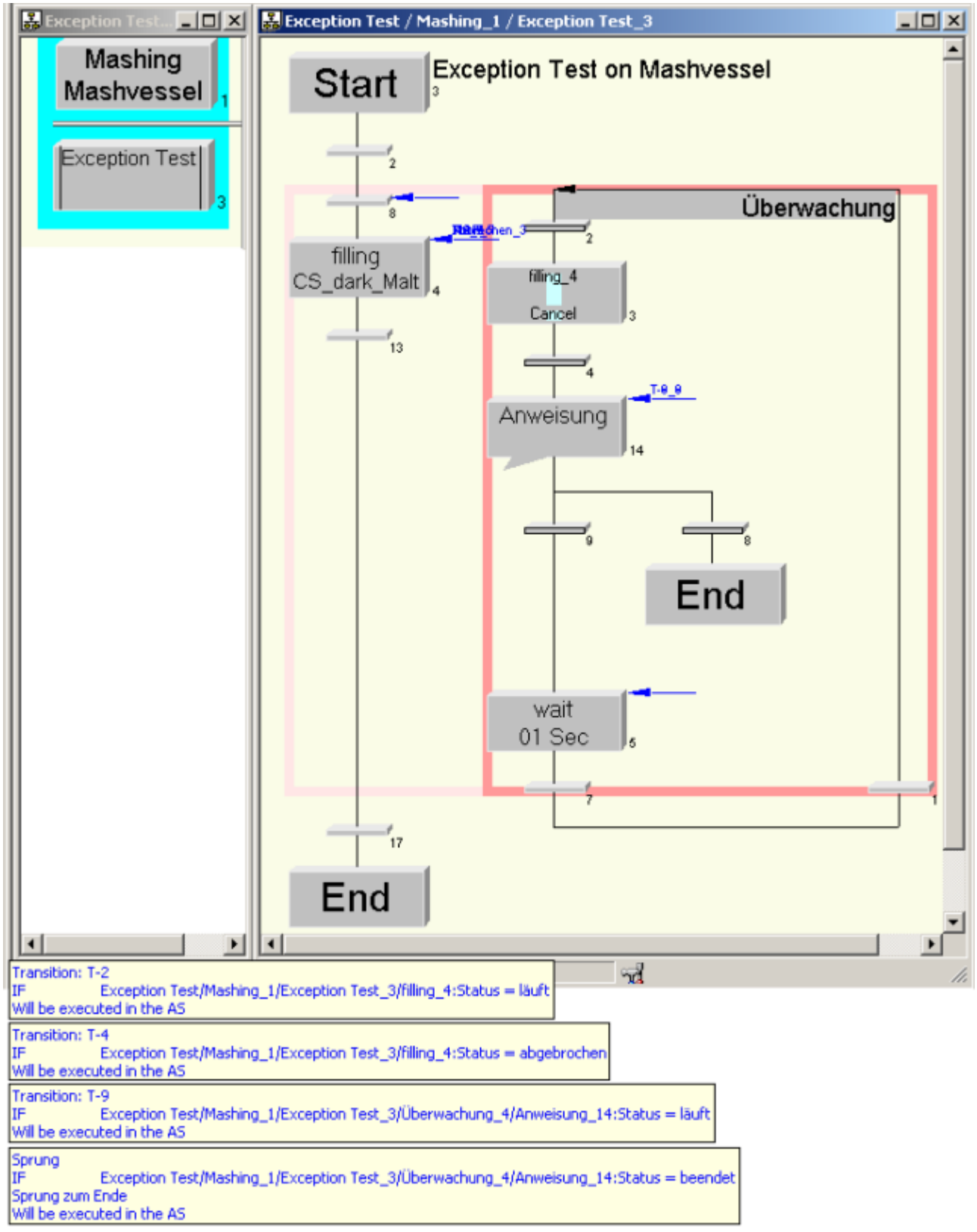


Figure 10-9 Monitoring

Configuration in the RE

1. Open the released master recipe in the RE for editing.
2. Open an ROP, "Exception Test" in this case.
3. Insert the "Monitoring" recipe object into your recipe. Use the Insert > Monitoring menu command or the corresponding icon of the "Insert" toolbar. Then click on the connecting line between the start and end steps.
4. Double-click on the "Monitoring" title in the monitoring with the "Selection" setting. The default structure of the monitoring opens. The default structure contains a loop. The left transition is the monitoring condition and the right one is the repeat condition. All subsequent recipe objects are inserted on the left connecting line after the monitoring condition.
5. Insert a recipe phase in the monitored area (light red frame) and select the "filling (EPH)" function in the properties dialog of the recipe phase.
6. Insert a command step in your monitoring (red frame).
7. Insert an operator instruction into your monitoring.
8. Insert a jump into your monitoring.
9. Insert a recipe phase into your monitoring.

Interim result

You have now inserted all the required recipe elements into your example recipe. Now configure the inserted recipe objects.

Configuration of the recipe objects

1. Configure the start condition T 2 for the monitoring, Transition 2. Operand 1 is the RPE status and Operand 2 is a constant. Select the recipe element "filling_1" and leave the "Status" attribute as is. Select the "running" value for Operand 2 and close all dialogs.
2. Configure command step 3 in the monitoring. The command step should be used to abort the "filling" recipe phase. Select the "filling_1" recipe phase and move it to the right window. Select "Cancel" under the commands. Close the dialog.
3. Configure Transition 4. The transition should include a prompt asking if the "filling_1" recipe phase is to be aborted. Operand 1 is the RPE status and Operand 2 is a constant. Select the recipe element "filling_1" in the monitoring and leave the "Status" attribute as is. Select the "aborted" value for Operand 2 and close all dialogs.
4. Configure the operator instruction in the "Instruction" tab of the properties dialog. The entry in the "Order" box may read as follows. "Check recipe element "filling_1". Close the dialog.
5. Configure Transition 9. The monitoring should now be completed. For this to happen, Transition 9 can never be fulfilled. Operand 1 is the RPE status and Operand 2 is a constant. Select the recipe element "filling_1" and leave the "Status" attribute as is. Select the "running" value for Operand 2 and close all dialogs.

6. Configure the transition of the jump. This should end the monitoring. Operand 1 is the RPE status and Operand 2 is a constant. Select the recipe element "filling_1" and leave the "Status" attribute as is. Select the "completed" value for Operand 2 and close all dialogs.
7. Enter 2 seconds, for example, as the run time in the properties dialog.

Final result

You have now configured all the recipe elements and transitions in your example recipe. Release the recipe and use it in a batch in process mode.

10.4.5.11 Transition (Insert menu)

Overview

You use this function to insert a transition into your master recipe.

In the recipe window with the units, the recipe operations can be executed without a transition. You can, however, also insert several transitions between steps and synchronization points.

In the step sequence window for the recipe operation, when you insert a transition, you also insert a step so that there is always a step between two transitions. Depending on the point at which you insert the transition, the order of the step and transition may be reversed.

Properties

Data on the "General" and "Condition" tabs can be edited. To form the transition conditions, the process tags defined in the corresponding recipe level (parameters from the properties of an ROP or RUP), constants, and all the values acquired with the TAG_COLL block can be used.

Text strings with more than 32 characters within a transition query are not supported.

10.4.5.12 Alternative branch (Insert menu

Overview

In the BATCH Recipe Editor, this function inserts an OR divergence.

An alternative branch consists of at least two vertically arranged sequences joined at top and bottom by a single horizontal line. Each alternative branch begins with a transition whose results determine which branch is executed. The transitions should be created so that the results select only one path.

Selection

If you click one of the two horizontal lines, you select the entire alternative branch. If you click one of the lines that join the horizontal lines, a sequence is selected.

To select a simultaneous branch with a lasso, both double lines and a certain amount of space to the right and left between the individual objects (structure elements (Page 544)) must be included within the lasso frame.

Inserting

Proceed as follows to insert alternative branches in the diagram in the BATCH Recipe Editor:

1. Select the menu command **Insert > Alternative branch** or click the corresponding symbol in the toolbar.
2. Click between two objects in the diagram.

If you require an alternative procedure to an existing structure in the BATCH Recipe Editor, Follow these steps:

1. Select the menu command **Insert > Alternative branch** or click the corresponding symbol in the toolbar.
2. Position the mouse pointer above the first object for which you require an alternative branch.
3. Hold down the mouse button and drag the mouse pointer below the last object to be included in the alternative branch.

Notes:

- While you drag the mouse pointer, a line is displayed that indicates which parts will be included if you release the button at the present position.
- Depending on whether you release the button to the left or right of the vertical line, a new alternative branch is added to the left or right.
- You can cancel this operation by returning the mouse pointer to the initial position or by pressing the ESC key.

10.4.5.13 Loop (Insert menu)

Overview

With this function, you can insert a loop (Page 549) in the BATCH Recipe Editor. In the return path, a transition is inserted first. In the straight sequence, there must also be a transition following the loop. In these transitions, you must define conditions that clearly specify the sequence.

Insert

Follow these steps to insert loops in the diagram in the BATCH Recipe Editor:

1. Select the menu item **Insert > Loop** or click the corresponding button in the toolbar.
2. Click between two individual objects (structure elements) to insert a loop with a step placeholder and a transition in the return path. By selecting the required recipe element and clicking on the placeholder, this is replaced by the desired function.

Follow the steps below if you want to repeat the processing an existing sequence of objects with a loop in the BATCH Recipe Editor:

1. Select the menu item **Insert > Loop** or click the corresponding button in the toolbar.
2. Press the left mouse button with the pointer located in the gap after the last object to be included in the loop.
3. Hold down the button and drag the mouse pointer upwards until all the required objects are included and then release the mouse button.

Remove

Select the entire loop and press the delete key to delete the content. If you only select the transition in the return path, the loop body remains after deleting.

Notes

- While you drag the mouse pointer, a line is displayed that indicates which parts will be included if you release the button at the present position.
- You can cancel this operation by returning the mouse pointer to the initial position or by pressing the ESC key.

Selecting

You can select a loop (Page 549) as follows:

- by clicking on one of the horizontal lines at the top or bottom,
- by clicking on the return path line,
- by clicking on one of the lines of the sequence in the body of the loop, or
- by opening a lasso while holding down the left mouse button that includes the entire body of the loop as well as the transition in the return path.

10.4.5.14 Jump (Insert menu)

Overview

A jump is a recipe transition with or without a jump destination.

You use this function to insert a jump into your recipe structure. With a recipe jump, the sequential processing within a recipe level (RUP) is interrupted and resumed at a configured jump destination. The currently running RUP/ROP ends at a location where the jump without jump destination is configured. The recipe jump is only executed if the configured step enabling condition (transition) is fulfilled.

Limitations

Prevented jump destinations when configuring in the Recipe Editor:

- A jump can only be performed within a recipe level (RUP/ROP).
- It is not possible to jump into or out of a simultaneous recipe branch.
- Jumps beyond synchronization lines.

Project setting to allow jump destinations beyond synchronization lines

A selection box for permitting unsafe jump destinations is available in the project settings dialog under Options > Settings > Project Settings in the BatchCC, "General" tab. This selection box is cleared in the default project settings. When it is enabled, unsafe jumps are permitted beyond synchronization lines. These jumps make the recipe execution unsafe. Steps may be started twice or recipes may stop.

Note

Pay attention to the following when using jump destinations beyond synchronization lines:

- Recipe elements in other recipe unit procedures are not started.
- Recipe unit procedures not yet active remain inactive.

Special system characteristics for monitoring

If you use a jump to jump to a monitored area, the monitoring is started. If you jump out of a monitored area, the monitoring is ended.

Inserting

On inserting, the Recipe Editor automatically forces an alternative branch with a jump without a jump destination.

Proceed as follows to insert jumps in the diagram in the BATCH Recipe Editor:

1. Select the **Insert > Jump** menu command or the corresponding button in the toolbar.
2. Click the required location in the opened recipe until the mouse pointer shows the jump symbol to insert a jump.
3. You configure the transition of the jump on the "Condition" tab of the properties dialog and then in the Transition Wizard. You configure the jump destination on the "General" tab of the properties dialog. Alternatively, you can also select the jump object in the Recipe Editor and, keeping the left mouse button pressed, drag it onto the required jump destination object. Then release the left mouse button.

Additional information

Example of a recipe jump (Page 585)

10.4.5.15 Example of a recipe jump

Introduction

The following example shows you the purpose of a recipe jump; it shows you how to configure it in the Recipe Editor and how it reacts in process mode. The example is intended to demonstrate how to use and apply the "Jump" recipe object to meet your purposes in recipes.

Theoretical basis

The following master recipe (initial recipe) is expanded by logic that works with four different jump mechanisms. In this example, a simple condition is used to execute the jump.

All operands listed in the Transition Wizard are generally available to you for a transition.

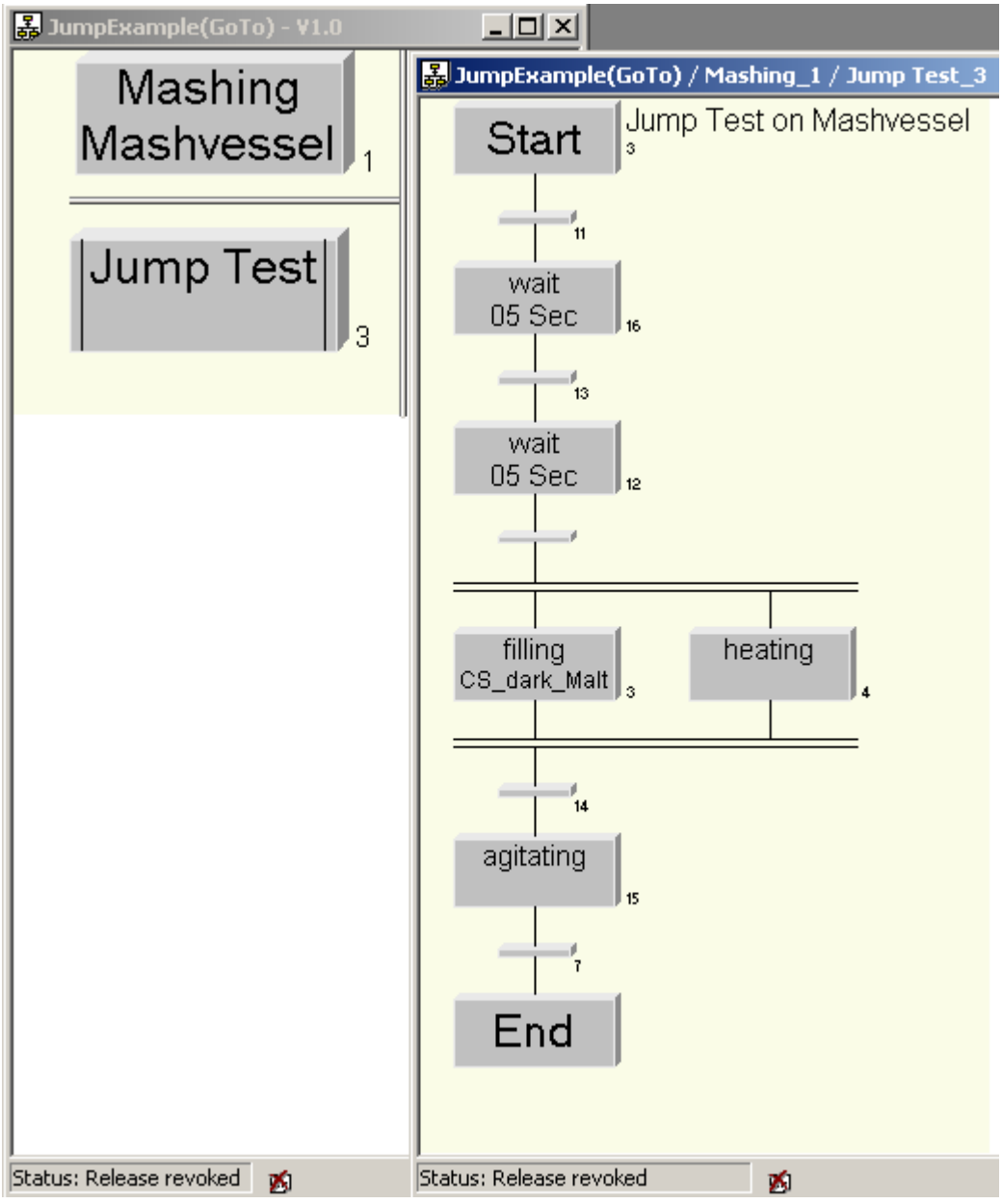


Figure 10-10 Initial recipe

Logic implemented by the "Jump" recipe element

The recipe shown above contains no jumps and is executed sequentially or from left to right. The purpose of inserting jumps in the "Jump Test" ROP is to implement a recipe for heating the mash vessel based on 4 parameters (JumpTest1 to 4) using the following logic:

1. If the "JumpTest1" parameter is true, then the recipe should continue to run without delay.
2. If the "JumpTest2" parameter is true, then the recipe should skip the subsequent "filling" and "heating" recipe steps and immediately continue with the "agitating" recipe step.

3. If the "JumpTest3" parameter is true, then the recipe should return to the first wait step. This creates a loop of sort.
4. If the "JumpTest4 parameter is true, then the ROP should end immediately.

Requirement for the configuration

You have configured and opened a new master recipe in the Recipe Editor similar to the one shown above.

Configuration in the Recipe Editor

1. Double-click on the "Jump Test" ROP.
2. Open the "Parameter" tab.
3. Define the following four parameters:
   - Name: JumpTest1, data type: Boolean
   - Name: JumpTest2, data type: Boolean
   - Name: JumpTest3, data type: Boolean
   - Name: JumpTest4, data type: Boolean
4. Confirm your entries with "OK".
5. Click on the menu command Insert > Jump or on the corresponding recipe object in the toolbar.
6. Click after the second wait step and before the transition to the vertical connecting line. This inserts the first jump.
7. Repeat step 2 twice.

Configuration of the first transition conditions

Now configure Transition 5 to match the logic shown above.

1. Double-click on Transition 5, specify a new condition and click "Change".
2. In the Transition Wizard, select "Parameter from the next highest recipe level" for Operand 1 and "Constant" for Operand 2. Then click "Next".
3. Select the "JumpTest1,PP" parameter and click "Next".
4. Leave the "=" operator shown as is and click "Next".
5. Select the "True" target value and click "Next". Then click "Finish".
6. Close the properties dialog with "OK".

This completes the configuration of the first transition condition.

Configuration of the other transition conditions

Now configure transitions 2, 9 and 10 to match the logic shown above. Carry out steps 1 to 6 described above using the three remaining parameters.

You have now configured all transitions with jump destinations in the master recipe. Save your recipe.

Recipe following configuration in the Recipe Editor

Your master recipe appears as follows after configuration.

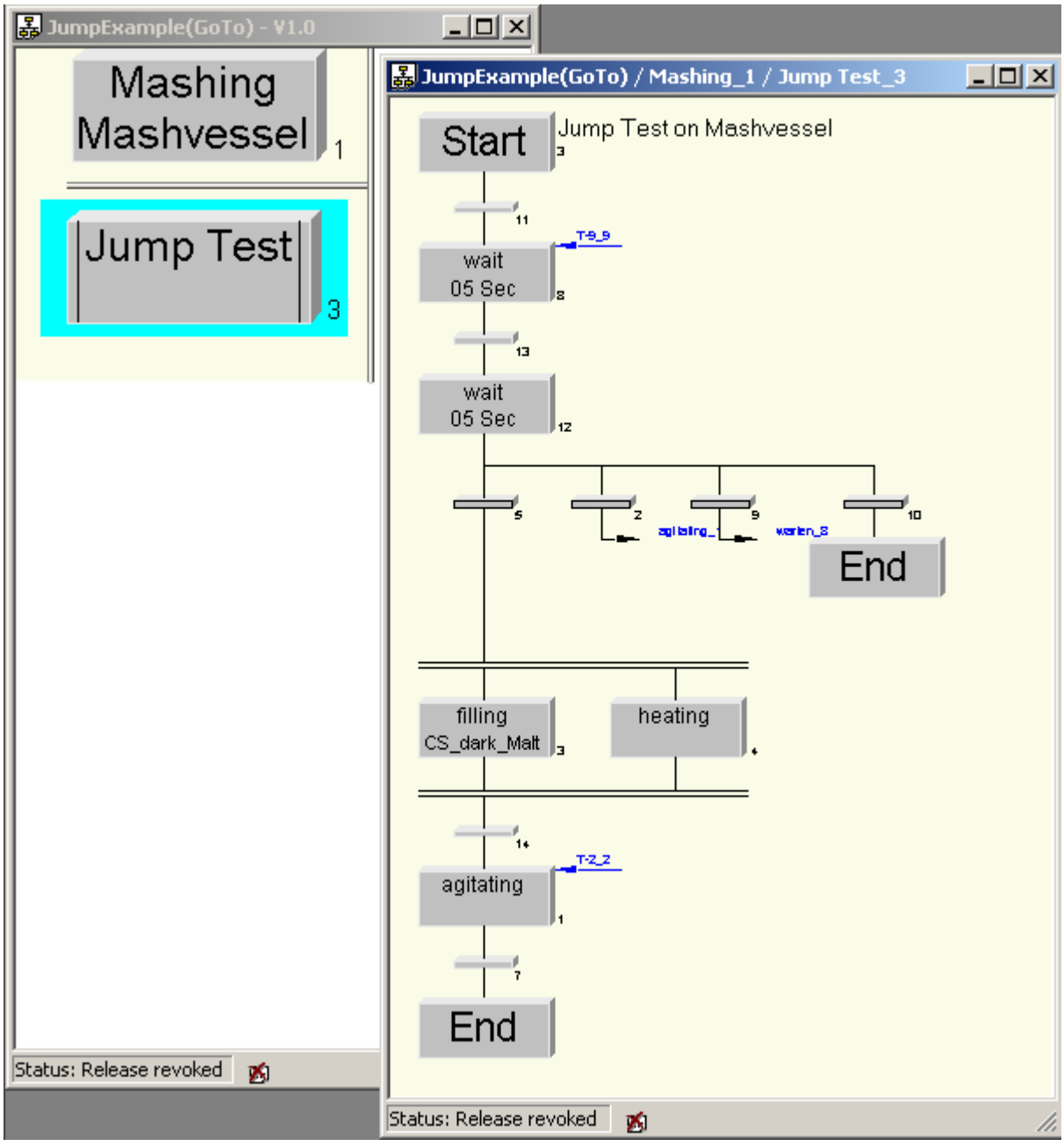


Figure 10-11 Final recipe for release

Testing recipes in process mode

Proceed as follows to test the reaction of the expanded master recipe in process mode:

1. Release your master recipe in the BATCH Control Center (release for testing and production).
2. Create a new batch in the BatchCC with the master recipe configured above.
3. Release the batch.
4. Start the batch.
5. The master recipe used in the batch waits for your action at the four transitions.
6. Click on the "Jump Test" ROP and select the "Object properties" command in the shortcut menu.
7. Switch to the "Parameters" tab and click "Change".
8. Depending on your test scenario, select the value "true" for one of the four "JumpTestX" parameters and then click "OK".

Result for the second condition

The batch execution for the second condition is illustrated below as a result.

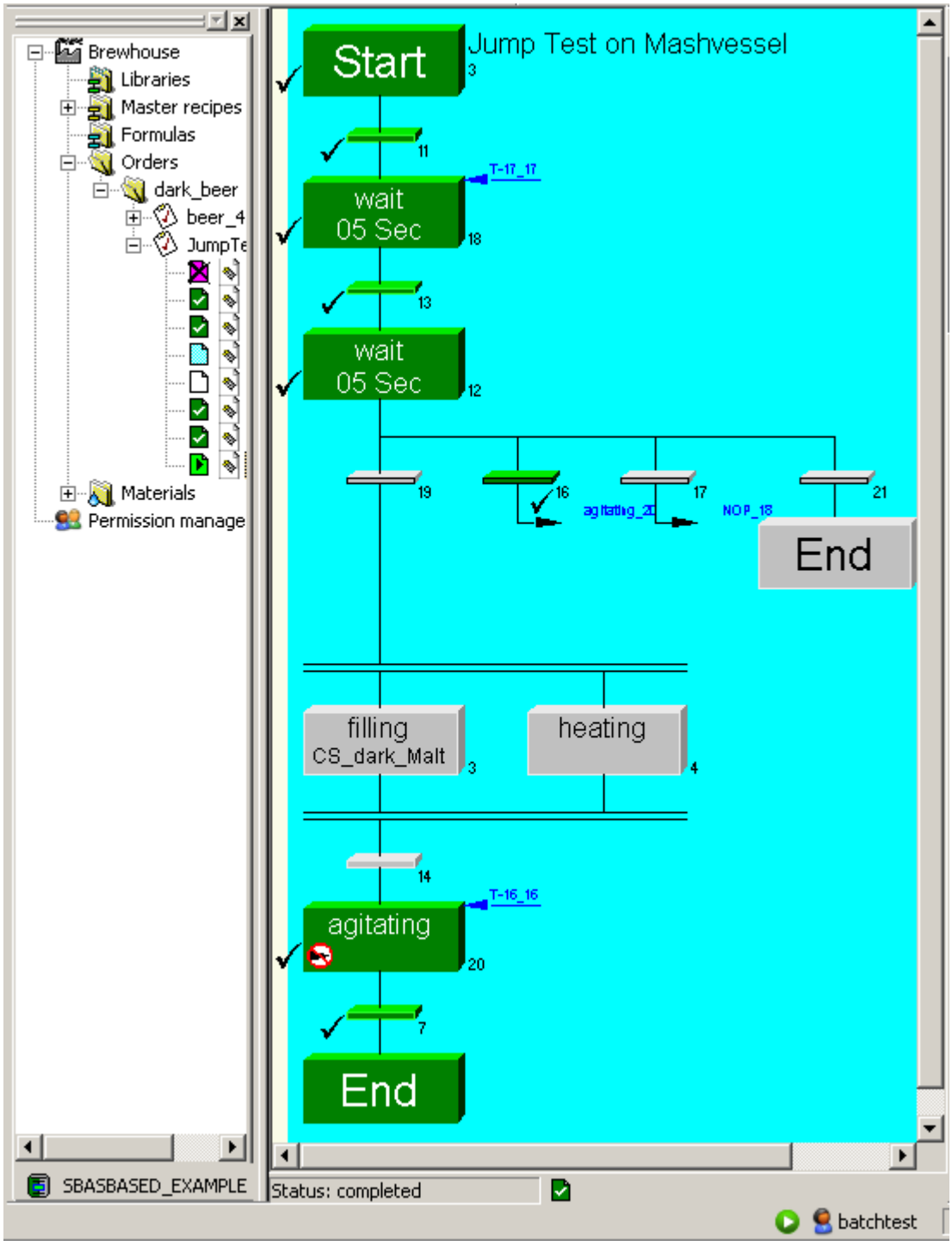
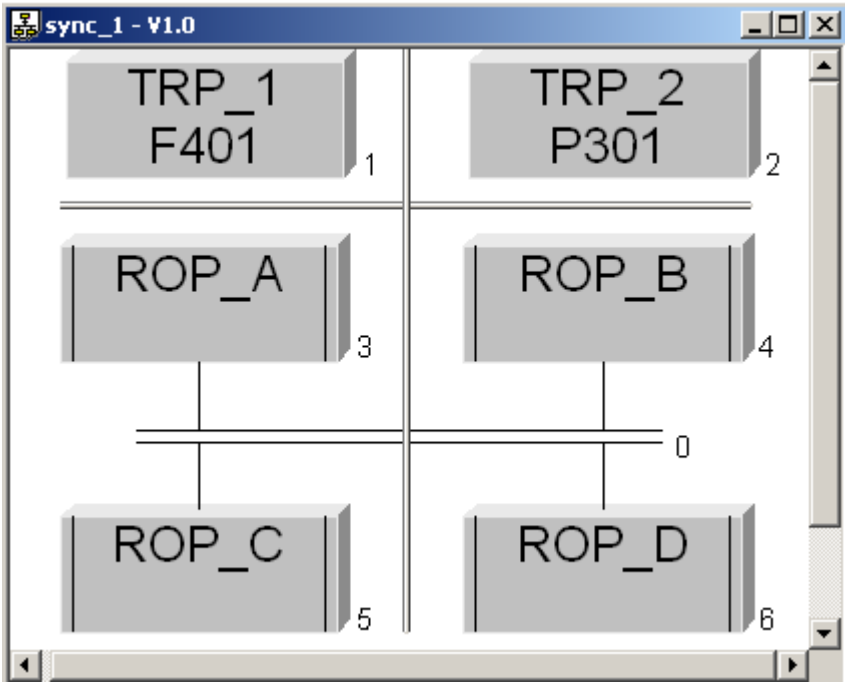


Figure 10-12 Batch execution in process mode

10.4.5.16 Configuring synchronization lines

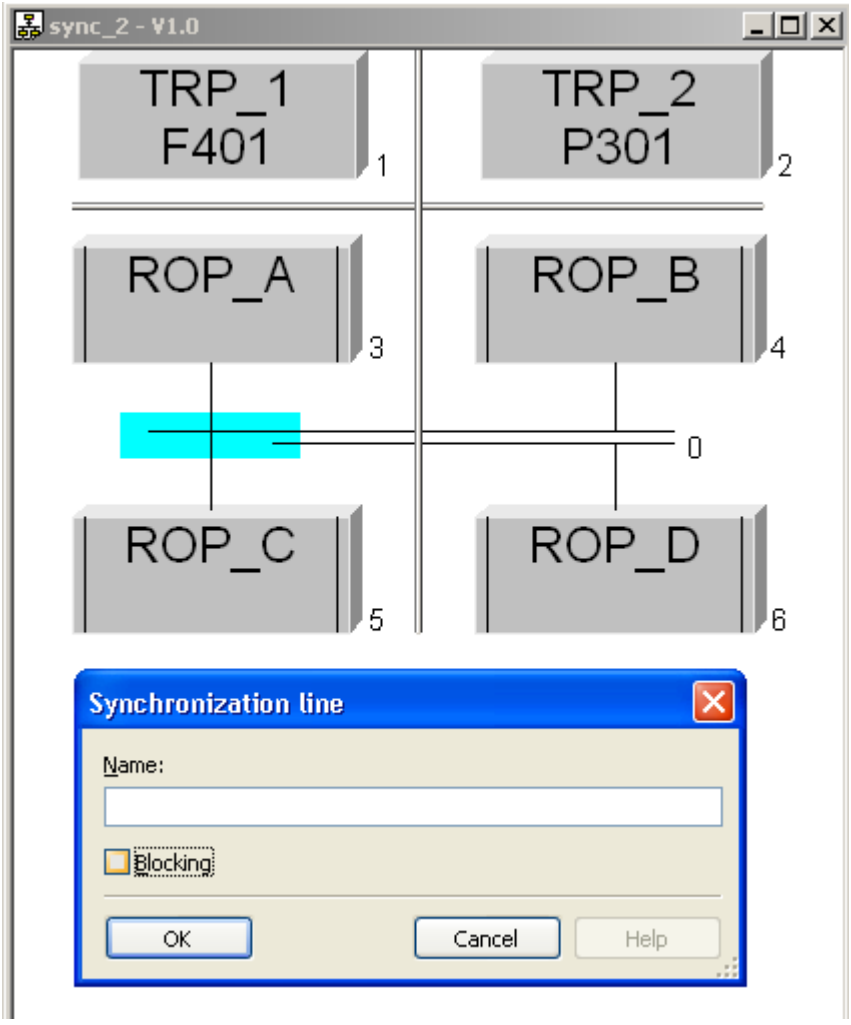
Three examples are offered below to show and explain the semantics and the handling of synchronization lines.

Example 1



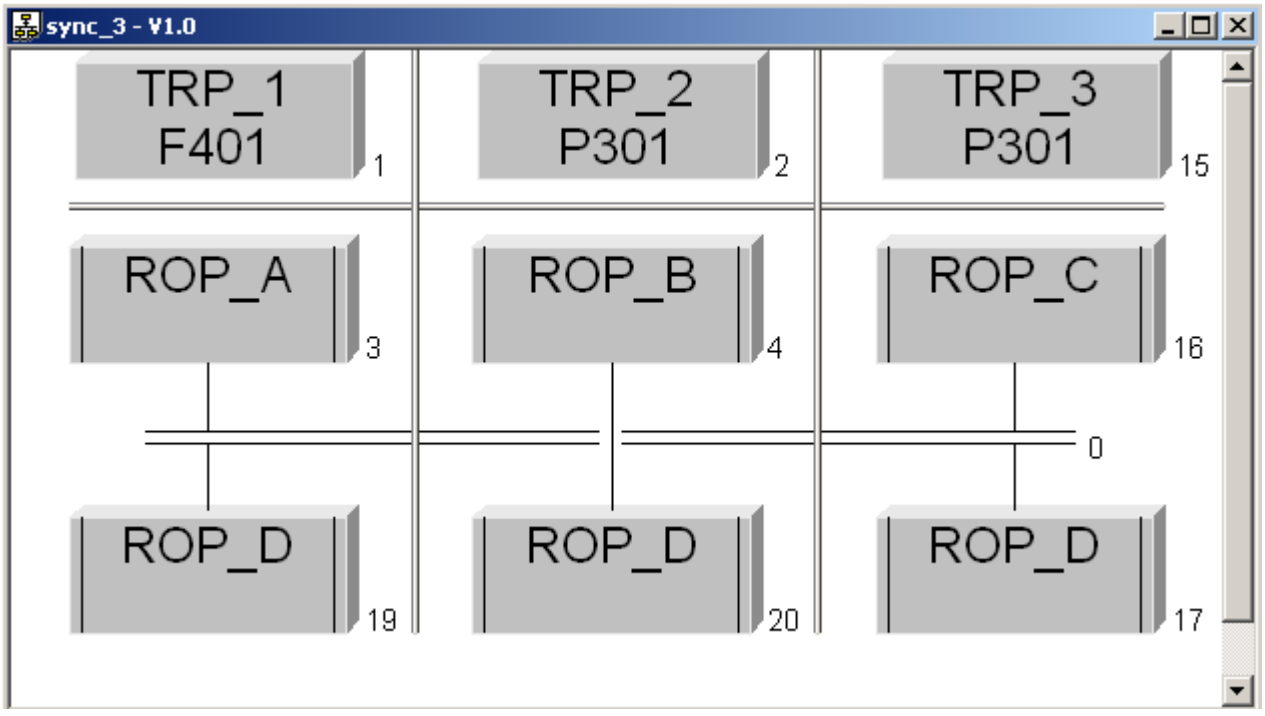
Synchronization line 0 runs through two RUPs, RUP_1 and RUP_2. When all ROPs before the synchronization line are completed, in this case ROP_A and ROP_B, the subsequent ROPs are started, in this case ROP_C and ROP_D.

Example 2



ROP_D must wait for ROP_A and ROP_B in this recipe structure. ROP_C, in contrast, starts immediately when ROP_A is completed.

Example 3



The synchronization occurs between RUP_1 and RUP_3. RUP_2 is not involved.

10.4.5.17 Working with substructures

By clicking on the icon or Selecting with a lasso, you can select a substructure. To change to the substructure, double-click on the icon of the substructure. A new window opens showing the content of the substructure.

Note

Substructures are only created in flat recipes.

Substructures have the same functional options as recipe operations in hierarchical recipes.

Insert

Proceed as follows to insert substructures in the BATCH Recipe Editor:

1. Select the menu command **Insert > Recipe procedural element** or click the corresponding button in the toolbar.
2. Click between two individual objects (structure elements) or on a substructure placeholder.

Removing

Select the substructure box and press the delete key to delete the content.

If you do not want to delete the content of the substructure, select the menu command **Edit > Resolve substructure**. The content of the substructure is then embedded in the diagram instead of the substructure box.

Nesting depth

A substructure itself can contain other substructures. When the maximum nesting depth is reached, the insertion of substructures is rejected and the following error message is displayed:

Maximum nesting depth reached. Solution: Break up substructures or arrange nested simultaneous and alternative branches.

Additional information

Resolve substructure (Page 1078)

10.4.5.18 Adding comments to structure elements

Procedure

With the menu command **Edit > Text**, you open a dialog box in the BATCH Recipe Editor in which you can enter a comment for the object (structure element) selected in the recipe.

Note

The text of the comment is displayed beside the objects if you activate the object comments with the menu command **View**

10.4.5.19 Filtering library references

If a library reference is inserted within a recipe, all library operations / library substructures of the same unit class are offered for selection. There are no unit classes if the unit is allocation through conditions. All library operations and library substructures are thus offered for selection.

If you want to restrict the selection of library references to allowed unit classes, you should work on the basis of unit classes and thereby filter the selection.

Library operations with identical unit classes are offered for selection for nested recipes.

Requirement

Before you can work with a unit class basis, you need to deactivate the "Unit selection according to conditions" check box in the "General" tab of the "Project settings" dialog. This setting then applies to newly created library operations or library substructures and recipes.

Procedure

1. Create a new library operation / library substructure in the Batch Control Center.
2. Open the "Properties" dialog of the library operation or library substructure and open the "Allocations" tab.
3. Click on the "Edit" button and open the "Candidates" tab.
4. Activate only the desired unit class and close all dialogs.

Result

The selection for library references in a recipe is limited to the unit class by the filter criterion.

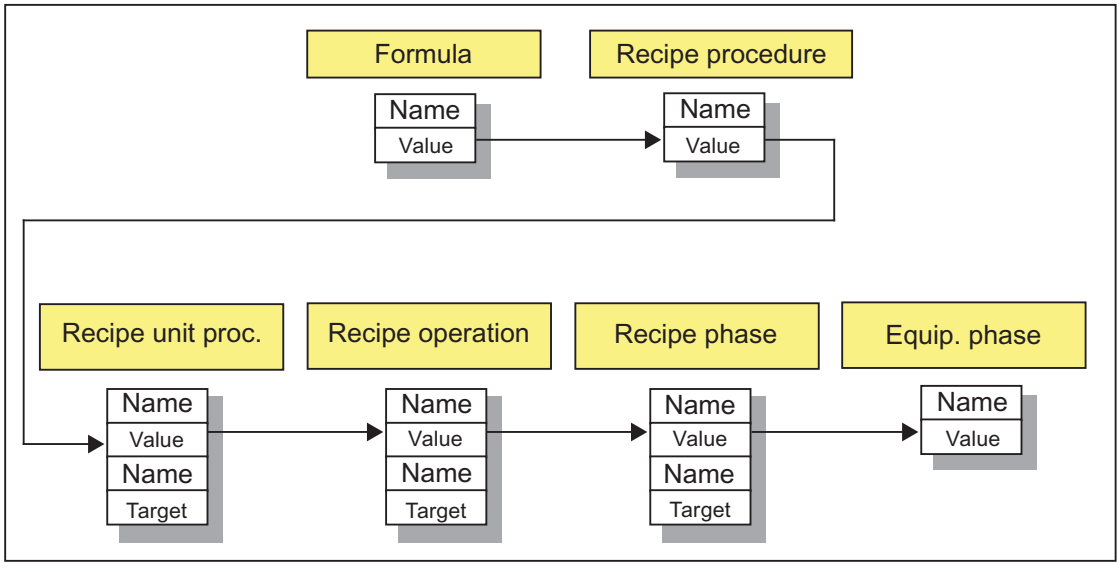
10.4.6 Setting recipe properties

10.4.6.1 Passing formula parameters in the recipe

Forwarding the formula parameters in the recipe

The same formula parameter can be used more than once in different recipe steps of various types. A formula parameter can also be used at the same time in transition conditions.

The schematic below shows the possible use of a formula parameter.



10.4.6.2 Parameter interconnections

Overview

Parameter values (setpoint and process value) can be passed between the structure elements of the recipe hierarchy in both directions while the recipe is executing. When setting the properties of the recipes (Page 613) and the individual recipe steps, you can enter the relevant specifications for each input material/output material and process parameter for:

- Source
- Data target

Note

Text length for STRING data type

Since SIMATIC BATCH V6.1, the number of characters that can be edited in "STRING" data type parameters in recipes has been changed from 16 to 254.

As the configuring engineer, you can increase the number of characters of string setpoints within an SFC type via parameter assignment (Characteristics > Setpoints). The "IEPAR_STR"-type block can only process setpoints with a maximum of 16 characters. However, it is not possible to increase the number of characters here.

If, when a batch is processed, a greater number of characters is written than the block in the AS (SFC-type or IEPAR_STR) can process, the setpoint is automatically shortened to the maximum possible length.

Reference to data source

A source (setpoints) from the next higher level can be assigned for the recipe objects RUP, ROP, RPH, and SUB.

Example: An input material in the RUP can be the source for an input material in a ROP. The name of the input material is referenced.

Data source = recipe procedure (RP)

Note

Only parameters of the recipe steps and transitions that reference the level of the recipe procedure as the data source ("passed up" recipe header parameters) can be used as formula parameters for batch planning.

Reference to data target

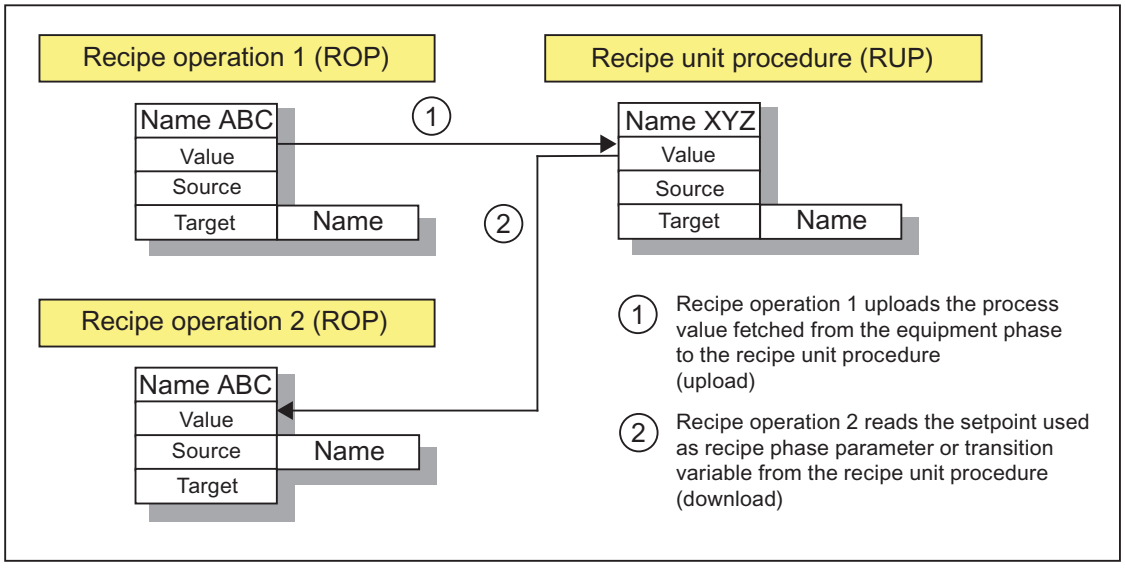
For the RUP, ROP, RPH, and SUB recipe objects, the received process values can be passed on to the next higher level.

Example: A process value in the ROP can have a parameter in a RUP as its target. This means it is also possible to use the actual value of a step as the setpoint of a subsequent step. The name of the parameter is referenced.

Note

Parameters that have a reference to a data source are not used as target parameters.

Example of a hierarchical recipe



10.4.6.3 Setting the properties of the recipe header parameters

In the properties of the recipe header (recipe header parameter), configure the Properties of the recipes (Page 613). The material and production data and the process parameters contain all the parameters passed up for operator instructions (formula) from those in the recipe procedure elements (RUPs, ROPs and RPHs) lower in the hierarchy. Additional parameters can be added to these.

Open tab dialog box

There are two ways in which you can open the "Properties of <Recipe name>" tab:

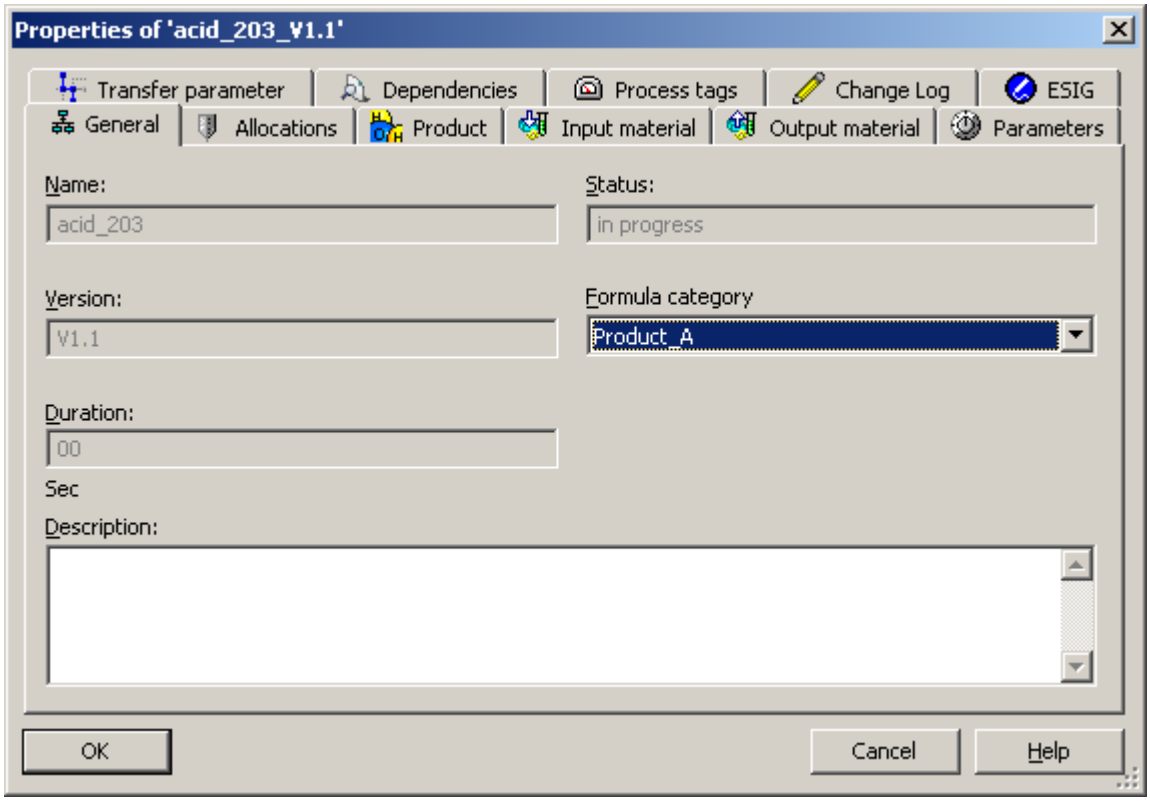
- In the BATCH Control Center
- In the BATCH recipe editor. Described below.

Procedure in the BATCH Recipe Editor

1. Open the recipe.
2. Select the menu item **Recipe > Header parameters**.
   Result: The "Properties of the <recipe name>" dialog is displayed with the header parameters. In the dialog tabs, all the Properties of the recipe are available, which must/can be specified for a recipe in addition to the recipe structure. This is the same properties dialog that you can select with the **Edit > Properties** menu command in BatchCC.
   Some of the properties (parameters) already have a fixed value due to the detailed configuration of the individual recipe elements (RUPs, ROP, EPHs, transitions) following the basic control. You can recognize parameters or settings that can still be modified by the white editing fields.
3. Make the settings you require in the tabs and confirm with "OK".

Entering the properties

You enter the properties of the recipes in the following tab. Click the "Help" button for context-sensitive help on each individual input or output box in the tab.



Reference to formula category

With the "Category" input box in the "General" tab, you assign the formula category with the required structure for material and production data (formula) to the master recipe. This is only possible when the formula category has already been created in BatchCC. You can set this option in BatchCC later.

See also section: Relationship between header parameters, formula category and formula (Page 329)

Electronic signatures

Operator actions relating to recipes can be signed. You configure electronic signatures in the "ESIG" tab.

See also section: Specifying electronic signatures (Page 408)

10.4.6.4 Setting the properties of steps

Properties of the steps

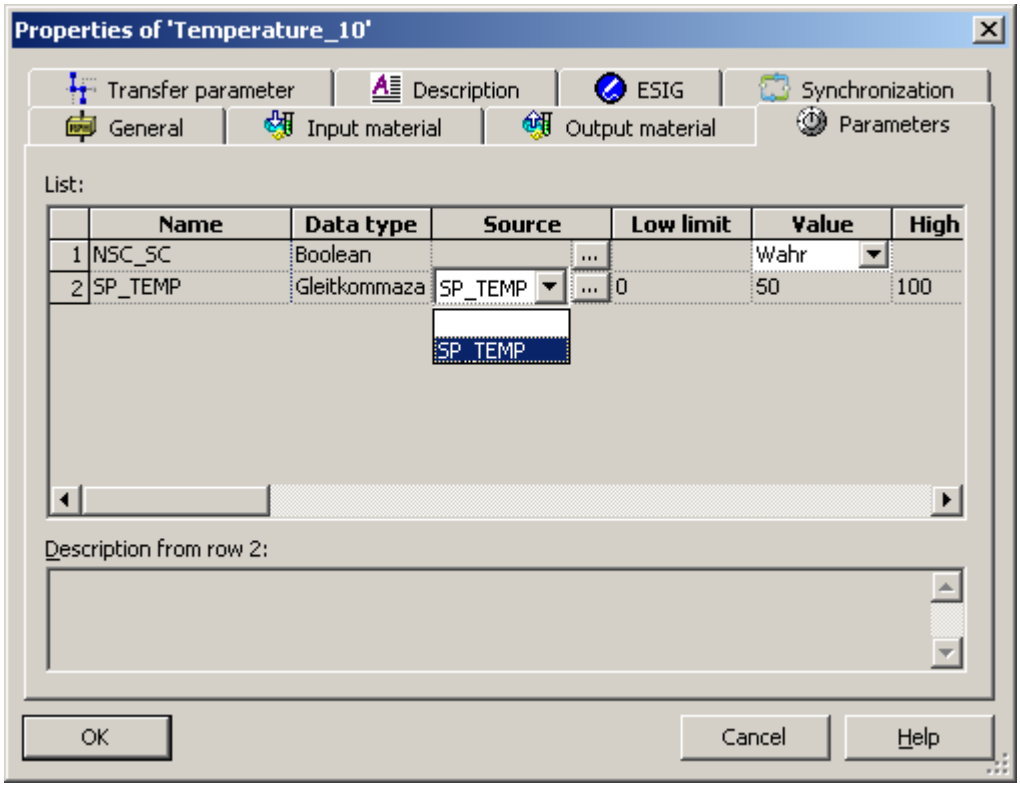
In the object properties of the recipe procedure elements (RUP, ROP, NOP, RPH, SUB) you define the material and production data (formula) and the parameters for each individual element. The parameters for input materials, output materials and process parameters for the recipe phases in the sequences are specified by assigning the recipe phase (of the type EOP, EPH). Additional parameters can be added to these.

Procedure in the BATCH Recipe Editor

1. Open the master recipe.
2. Select a recipe procedure element.
3. Select the "**Properties"** command in the shortcut menu.
   The "Properties of <stepname>" dialog opens.
   The tabs contain all the properties that can or must be specified for the relevant recipe procedure element.
4. Make the settings you require in the tabs and confirm with "OK".

Entering the properties

You enter the properties of the step in the following tab. Click the "Help" button for context-sensitive help on each individual input or output box in the tab.



Passing parameters

Using the "Source" and "Target" table columns, you can interconnect the parameters of different hierarchical levels in both directions (mouse click on the button beside the parameter):

- For the RUP, ROP and RPH recipe objects, you can select a source from the next higher level. Example: A parameter in the recipe procedure can be the source for a parameter in an RUP.

  Note

  Parameters of the recipe steps that reference the level of the recipe procedure as the source ("passed up" recipe header parameters) can be used as formula parameters for batch planning.

- For the RUP, ROP, RPH, and SUB recipe objects, the received process values can be passed on to the next higher levels. Example: A process value in the RUP can have a parameter in a recipe procedure as its target. This means it is also possible to use the actual value of a step as the setpoint of a subsequent step.

  Note

  Parameters can only be passed when the parameter types and units of measure match.

  Parameters that have a reference to the data source cannot be used as target parameters.

Properties of library references

Note

In the properties dialog of a library reference, most properties of the library operation are displayed and cannot be modified. To modify the properties, you must open the library operation explicitly in the BATCH Recipe Editor.

Scaling with minimum and maximum limit

The physical limits of the process cell instance is displayed as limit values. If the setpoint value is adjusted, the possible minimum and maximum setpoint values are also displayed in the tool tip.

If you remain within these limits (tooltip), the permissible quantities of a Batch between the "minimum quantity of a Batch" and the "maximum quantity of a Batch" is ensured.

Setpoints outside the limits specified in the tooltip are also possible. In the event of this, warnings are issued during the validation and the quantity of a batch is limited.

Low limit

This displays the minimum value of the parameter that would be of practical value as the setpoint. If a discrete parameter type or text parameter is set for this parameter (in other words not "floating point" type!), there is no minimum limit since only permitted entries are displayed as the value. If scaling is selected, the value depends on the reference scale and the minimum limit of the actual amount from the recipe header.

The minimum limit is calculated so that the parameter value cannot fall below the low limits of the block following scaling.

Value

Here, you can enter the set point. A default value is displayed that is taken from the data of the basic control. The value entered must be between the high and low limits.

There are several possible reasons for a violation of the limits:

- The limits in the process cell data are too narrow.
- The selected scaling is too extreme.
- The limits for the batch quantity in the recipe header are too far away from the reference quantity.

High limit

This displays the maximum value of the parameter that would be of practical value as the setpoint. If a discrete parameter type or text parameter is set for this parameter (in other words not "floating point" or "integer" type!), there is no high limit since only permitted entries are displayed as the value. If scaling is selected, the value depends on the reference scale and the high limit of the actual amount from the recipe header.

The high limit is calculated in such a way that the parameter value cannot exceed the high limits of the block following scaling.

If the high limit is below the low limit so that no possibility exists to enter a correct value, this is caused by the high and low limits in the header parameters being too far apart or the use of a scaling that would push the value beyond the limits.

Electronic signatures

Operator actions relating to recipe steps can be signed. You configure electronic signatures in the "ESIG" tab.

Additional information can be found in the following section: Specifying electronic signatures (Page 408)

See also

Parameter interconnections (Page 596)

Passing formula parameters in the recipe (Page 595)

10.4.6.5 Specifying recipe limits

Definition of terms

Recipe limits relate to the product to be processed. They form additional limits to those for equipment modules from basic engineering. Recipe limits are configured in master recipes in the BATCH Recipe Editor for a recipe phase in the "Properties" dialog. If you have selected "Yes" for the "Allow online setpoint change" project setting in the "Batches" folder, recipe limits can be modified during batch operation. The new recipe limits are displayed in the BATCH Recipe Editor, in BatchCC, and in the BATCH OS controls.

Equipment limits = Parameter limits for equipment modules. Basic engineering

Recipe limits = Parameter limits for different products. Recipe engineering

Checking the recipe limits

The inputs for parameter limits are checked during recipe creation as well as before batch release. In so doing, the writing of setpoints is always checked against the recipe limits. Target and cross-interconnections are also setpoint changes that are checked. When the recipe is created, each limit violation within the validation is output as a warning. During batch operation, messages are displayed in the "Extended batch information" window in BatchCC.

The recipe limits and the associated setpoints are changed during quantity adaptation (linear or quadratic).

Additional information: Scaling functions (Page 615)

Interaction between equipment and recipe limits

Recipe limits are optional and are not required in a master recipe or for a batch. If you specify only the high recipe limit for a setpoint, the low limit obtains its value from the equipment module. If you do not specify any recipe limits, the limits of the equipment modules apply.

Input and representation of recipe limits

You enter recipe limits for recipe phases, operator instructions, and parameter steps. The limits are displayed in the "Parameters", "Input material", and "Output material" tabs of the "Properties" dialog of a recipe phase, container (RUP, ROP, SUB), and formula. For active batches, the recipe limits can be changed exclusively via OSC (online structure changes) on batches released for testing with appropriate OSC user permission.

Recipe limits cannot be viewed or changed on faceplates.

Representation in reports

The batch report contains no limits. Both equipment and recipe limits are displayed in the master recipe report.

Use scenario

A "Reactor" unit contains the "Heater" equipment phase, among other things. The heater has a range from 20 °C to 100 °C. These temperature values form the low and high equipment limits that a setpoint/initial value must be within. During production of a specific product on this equipment, however, there are product-specific limits for the heater that must be complied with. In case of non-compliance, the product will be faulty. In this situation, you use the new additional recipe limits for the recipe creation in the BATCH Recipe Editor. This further limits the setpoint/initial value within the engineering limits so that the optimum product quality is achieved. If you now specify a setpoint/initial value that is outside the recipe limits, you will be notified of a limit violation. A valid setpoint/initial value must be entered to continue work.

10.4.6.6 Setting a recipe phase for "Continuous operation"

During creation of a recipe, a flag can be set for a recipe phase that is not self-completing so that this recipe phase (equipment phase) is not completed.

- This is necessary when an equipment phase (for example, agitating) is required to continue after recipe operations.
- A second application is the setting of different parameters for the equipment phase without having to turn it off and on again (for example during a flying control strategy change).

Procedure in the BATCH Recipe Editor

1. Open the master recipe.
2. Select a recipe procedure element.
3. Select the "Properties" command in the shortcut menu (selected with a right-click).
   Result: The "Properties of <step name>" dialog opens.
4. Select the "Continue" check box.
5. Confirm with "OK".

10.4.6.7 Setting the control strategy of a recipe phase

Recipe phases can be implemented with various control strategies (set of setpoints) that can be used in the manual mode or in the automatic mode (recipe mode). The control strategies are configured along with their parameters in the engineering system. In the recipe editor, the control strategies defined in this way are available in plain language under the name of the control strategy. During parameter assignment, only the parameters belonging to the selected control strategy are displayed.

Procedure in the BATCH Recipe Editor

1. Open the master recipe.
2. Select a recipe procedure element.
3. Select the command "**Properties**" in the context menu.
   Result: The"Properties of <batch name>" tab dialog box will be displayed.
4. Select the required control strategy of the recipe step in the "Control strategies" field.
   Result: In the tabs "Input material", "Output material" and "Parameters", only the parameter values belonging to the selected control strategy and thus the valid parameter for this recipe step are displayed.
5. Confirm with "OK".

10.4.6.8 Allowing online modification of setpoints

Specifying the ability to make online changes for recipe phases, operator dialog, recipe operations, and recipe unit procedures

The ability to make online changes to parameter values is specified in the properties dialogs for recipe phases, operator dialogs, recipe operations, and recipe unit procedures. You open the properties dialog by selecting a recipe element and clicking the "Properties" command in the associated shortcut menu. You specify the ability to make online changes in the "Input materials", "Output material" and "Process parameters" tabs using the "Modifiable" and "Effective immediately" columns.

Note

The default values for online changes in the properties dialogs are set project-wide via the computer settings in the Recipe Editor (Options > Settings > Computer settings) in the "Batches" folder. These are the "Allow online setpoint change" and "Transfer setpoint changes to active step" settings.

During batch control, the parameter input fields for changing the parameter value are editable.

Modifications in transitions

For transitions, process parameters updated at runtime can also be used for the evaluation of transitions. You can specify that the modification should take immediate effect in the properties dialog of the transition. Using the "Effective immediately" column for operands 1 and 2, you can specify that the value of the process parameter will take effect immediately when changed.

10.4.6.9 Setting the properties for transitions

Properties of transitions

In the properties of the transitions, you configure the step enabling conditions. The step enabling conditions are specified as "Boolean expressions". A single condition always consist of two operands (1st operand = tag 2nd operand = variable or number) that are logically linked by a relational operator.

Event parameters which are not calculated in a equation must not be located on the same recipe level.

Otherwise, this could result in these parameters no longer being updated properly here if they are referenced as source in a recipe phase. Therefore, only use parameters referenced as target from a higher recipe level for the result parameter.

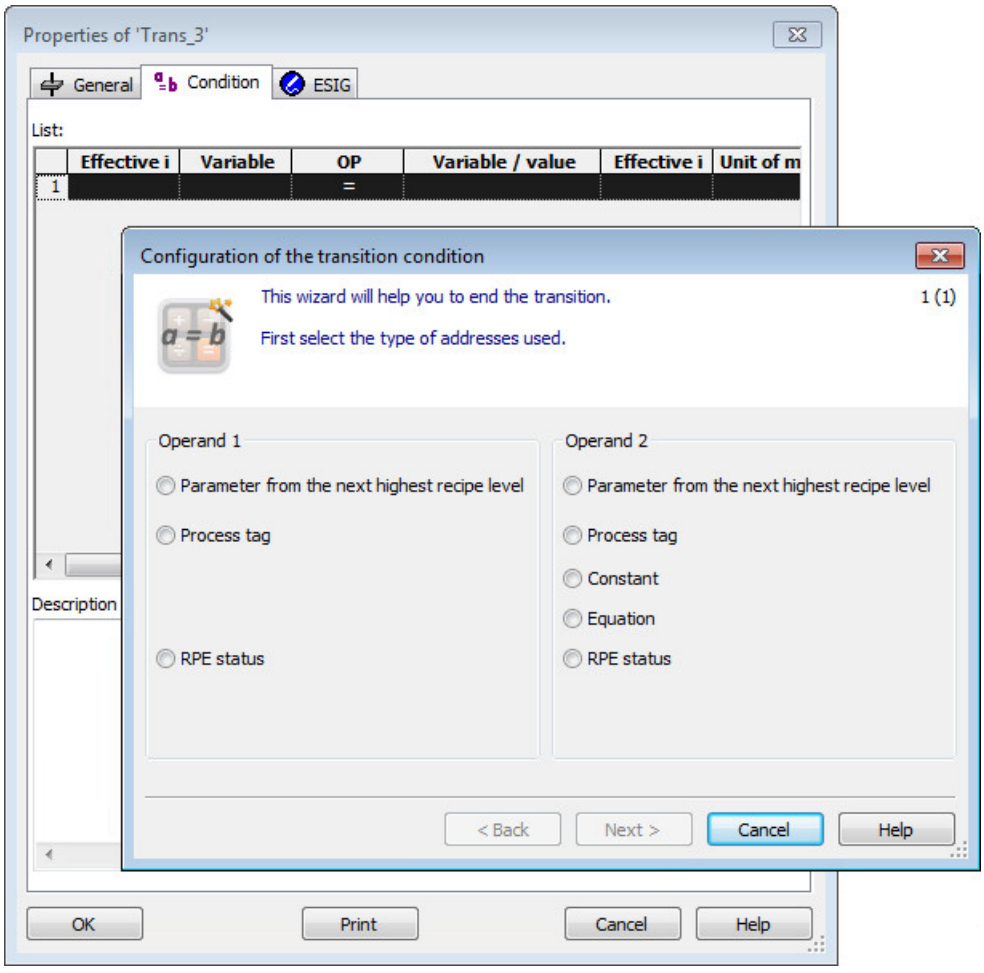
Procedure in the BATCH Recipe Editor

1. Open the recipe.
2. Select a transition.

3. Select the command "Properties" in the shortcut menu.
   Result: The "Properties of <transition name>" tab is displayed. Configure the step enabling conditions in the "Condition" tab.
4. Make the desired settings:
   - You can insert additional step enabling conditions with the "New" button.
   - You can change an existing step enabling condition may marking it and pressing the "Change" button.
5. Change the logic operation of the individual conditions as required:
   - Right click on a logic gate. A selection of Boolean logic operators appears. Select the suitable logic operation.
6. Confirm with "OK".

Entering properties

You enter the properties of the transitions in the following tab. The dialog for configuring a condition appears by clicking the "New" or "Change" button. This is where you can specify the type of operand (Parameter from the next highest recipe level, Process tag, RPE status, Constant or Equation) of a condition. Use the "Help" button to get context-sensitive instructions for each specific input/output field on the tab.



Note

When using a process tag in conjunction with an SFC type, the process value on the SFC type is read.

Unit wide parameter selection

Here you can select the parameters from basic control (Parameter from the next highest recipe level) regardless of the units. When the batch is made, the required unit is selected along with the parameters specific to the unit.

Electronic signatures

Operator actions relating to transitions can be signed. You configure electronic signatures in the "ESIG" tab.

See also section: Specifying electronic signatures (Page 408)

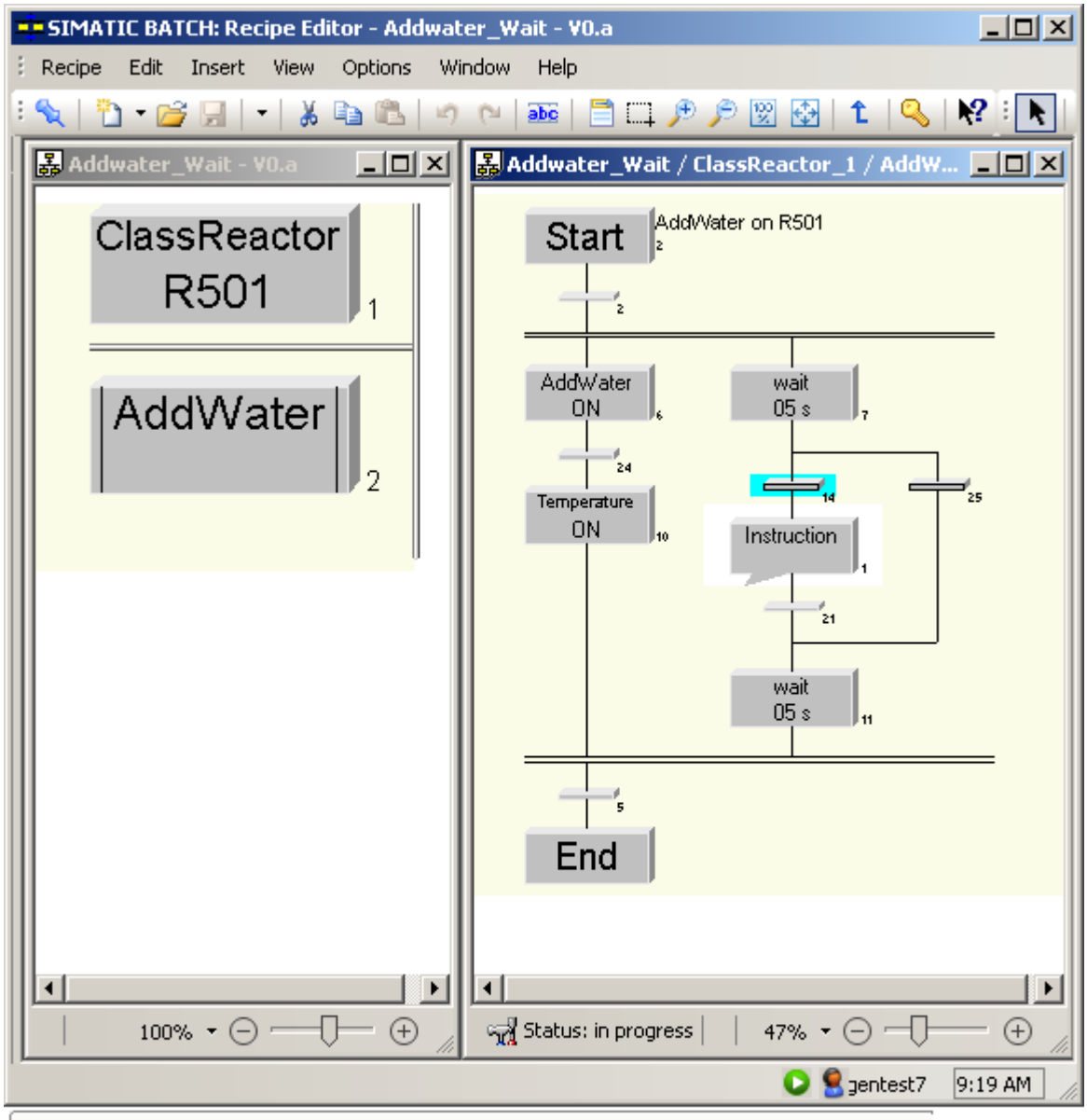
10.4.6.10 Configuring expanded status in transitions

Introduction

This example describes the configuration of a transition, in which an "extended status" of a recipe element is queried in a condition. You can use such a recipe design to automatically react to the status of certain recipe elements.

Example recipe

This shows how an error in the first recipe phase, "heating", is detected and the reaction to it. In the graphic, a sample recipe is expanded by the required functionality.



Transition: Trans
IF Addwater_Wait/ClassReactor_1/AddWater_2/AddWater_6:Erw. Status contains Fehler
Will be executed in the AS

Transition: Trans
IF Addwater_Wait/ClassReactor_1/AddWater_2/AddWater_6:Status = beendet
Will be executed in the AS

Configuration of the transition conditions

The following describes how to configure transition conditions 14 and 25.

1. Open a master recipe released for editing in the Recipe Editor.
2. Double-click on Transition 14 in the simultaneous branch. Click "New" on the "Condition" tab. Then click "Change".
3. In the Transition Wizard, select "RPE Status" for "Operand 1" and "Constant" for "Operand 2". Then click "Next".
4. Open the full structure of your recipe in the "Recipe element" navigation window and select "AddWater_6", select the "Ext. Status" attribute and click "Next".
5. Click "Next".
6. Select the expanded status with the "Error" value from the list, click "Next" and then "Finish".
7. Close the properties dialog of the transition.
8. Double-click on Transition 25 in the simultaneous branch. Click "New" on the "Condition" tab. Then click "Change".
9. In the Transition Wizard, select "RPE Status" for "Operand 1" and "Constant" for "Operand 2". Then click "Next".
10. Open the full structure of your recipe in the "Recipe element" navigation window and select "AddWater_6", select the "Status" attribute and click "Next".
11. Click "Next".
12. Select the status with the "Completed" value from the list, click "Next" and then "Finish".
13. Close the properties dialog of the transition.
14. Save your master recipe and release it.

Result

You can observe the following reaction in process mode. In Transition 27 of the simultaneous branch, there is a query asking if the "AddWater_6" recipe phase is in the error state. If it is, an operator instruction is issued reporting the event, for example, and needs to be acknowledged. If the "AddWater_6" recipe phase is not in the error state, automatic mode is resumed with Transition 14 in the query as to whether or not the "AddWater_6" recipe phase has completed.

10.4.6.11 Information on the ROP monitoring time

Setting the batch runtime

To achieve better planning of batches, you can change the runtime for recipe operations that has been calculated by the system and overwrite it if necessary. The monitoring time is set by you and generates a system message, if the current ROP runtime is exceeded.

Offline and online configuration

Offline configuration in the Recipe Editor

New text boxes have been added to the "ROP properties" dialog in the "General" tab:

- "Runtime" in seconds text box
- "Monitoring time" in seconds text box
- "Scaling of the runtime" selection box
- "Overwrite runtime" check box.

The "Runtime" text box usually shows the runtime calculated by the system. You can specify your own runtime if you have previously selected the "Overwrite runtime" check box.

Online display in WinCC process picture using smart objects (controls) from the object palette in WinCC Graphics Designer.

The expired runtime is shown in both the BATCH Control Center as a tooltip at the corresponding recipe operation and in WinCC Runtime in a process picture with the corresponding control.

While the ROP is running, the expired runtime is displayed as the current time minus the start time. When the ROP is finished, the expired time is shown as the end time minus the start time.

The time count begins when the ROP is in the "STARTING" status and ends when the ROP has the "COMPLETED", "ABORTED" or "STOPPED" status. The time count is performed when the ROP is in the "HELD" status.

The "Runtime", "Monitoring time" and "Runtime scaling" attributes cannot be changed online. Only the "Runtime" attribute at the command and NOP block can be changed.

Online monitoring

You can monitor the runtime of a ROP by entering a monitoring runtime greater than 0. If the expired runtime is greater than the monitoring time, the expanded status "Time expired" is set. The expanded status (EXSTATE) is shown as a clock symbol on the ROP object in the BATCH Control Center.

The BCS continues to generate WinCC message number 2021221 with the following standard properties:

Class 5	OS control message
TYPE 80	Batch error
Text	Recipe operation step runtime error

The WinCC message also contains the batch name, batch ID and step number. You cannot disable the generation of messages, but you can edit and adapt the message properties.

Unit_PLC block interface

Output – BOOL - "QErrContMonTime": This output is set to true if at least one active recipe structure has reached the configured monitoring time point.

10.4.6.12 Selecting types of locations for transfer parameters

Recipe editor

You can now select types of locations from all the available locations (local and remote) in the recipe editor for transfer parameters (source, destination and via), from those created by default or those from user-defined allocations.

Difference between standard and user-defined allocation

The difference in the allocations is that reference can only made to available and unavailable units in the local Process Cell in the standard allocations, whereas reference can also be made to unavailable units of remote Process Cells in the user-defined allocations.

Allocation strategy

Depending on the allocation strategy, all standard allocations are always offered for the transfer parameters, whereas user-defined allocations are only offered with the "Preferred unit" and "Process parameters" allocation strategies. The "The longest out of use" (late binding) and "Operator dialog" allocation strategies are not offered, since the actual location and therefore the unit must be specified for the transfer parameter at the time the batch is released.

Additional information

Importing remote Process Cells (Page 251)

Preparing ES data for SIMATIC BATCH (Page 252)

10.4.6.13 Specifying the properties of the library objects

Properties of steps and transitions

The properties of the steps and transitions within the library objects are entered in the relevant properties dialogs in the same way as with master recipes:

- Setting the properties of steps (Page 599)
- Set the properties for transitions (Page 605)

Properties of the recipe header parameters

The header parameters of the library operation in hierarchical recipes differ from those of master recipes only in the following way:

Unit class

A library operation is always created for a specific unit class. When you create a recipe in the BATCH Recipe Editor, the unit class is referenced in the "General" tab of the properties dialog.

A unit is not allocated. This occurs only when the operation is bound into the recipe unit procedure (RUP) of a master recipe as a library reference.

All other header parameters are configured in the same way as for a master recipe:

Setting the properties of the recipe header parameters (Page 597)

10.4.6.14 Overview of the properties of master recipes

Definition

"Properties of master recipes" refers to all the information complying with the ISA-88 standard (1995) that must or can be specified for a master recipe in addition to the recipe procedure. These properties include the recipe name/version/status, material and production data (formula), parameters, measured values and unit allocations.

Selectable master recipe properties

The table below lists all the properties that can be displayed and/or modified for each master recipe in the "Properties of <recipe name>" dialog. These master recipe parameters are also known as **recipe header parameters**.

Tab	What is set or displayed	Meaning/comment
General	Name and version	Name of the master recipe, cannot be changed
	Status	Status display of the master recipe, e.g., "In progress"
	Duration	Here, the longest time for one execution of the recipe is calculated. It is the sum of the step times of the path through the recipe.
	Formula category	There may be a reference to an existing formula category.
Allocations	Allocation list	The unit allocations of the recipe specified by the detailed configuration of the recipe unit procedures (RUP) are listed here; with information on the calculated start time and duration. In an additional dialog, you can modify the unit class and preferred unit (along with the selection strategy). When units are selected by conditions, the available units can be specified by conditions.

Tab	What is set or displayed	Meaning/comment
Product	Product, Quality	Settings for the main product
	Product code	Unique numeric code for the project (e.g. an internal command code) with which the product can be identified.
	Reference quantity	The reference quantity is meant for quantity scaling, this means, the parameters in the recipe relate to this value and they have to be adjusted in the event of discrepancies in the batch quantity.
	Minimum scale, maximum scale	Limits the upper and lower limits of the batch quantity. In batch planning, the quantities specified are checked to make sure they are not lower/higher than the values entered here.
Input material	Material list	For the steps linked to EOPs, EPHs or the operator dialogs, the entries are taken from the basic automation; for a library reference from the library operation. New materials can also be created. For each input material configured, the material, quality, scaling function and required quantity are specified. Either concrete values (internal formula) or reference to values of an external formula.
Output material	Material list	For the steps linked to EOPs, EPHs or the operator dialogs, the entries are taken from the basic automation; for a library reference from the library operation. New materials can also be created. For each output material configured, the material, quality, scaling function and required quantity are specified. Either concrete values (internal formula) or reference to values of an external formula.
Parameter	Parameter list	For the steps linked to EOPs, EPHs or the operator dialogs, the parameters are taken from the basic automation; for a library reference from the library operation. New parameters of the type real, bool, integer, string and enumeration can also be created. Either concrete values (internal formula) or reference to values of an external formula.
Process tags	Measured variables that will be logged	Measured variables for the batch report: You can select measured variables for archiving. As measured variables, the process values of the parameter blocks (EPAR_) linked with the EOP, EPH and TAG_COLL blocks are available.
Change log	List of modifications	List in which the modifications made to the recipe are documented.
ESIG	Electronic signature	Specifying electronic signatures in compliance with FDA or 21 CFR Part 11: The "electronic signatures" function allows the operator to enter one or more signatures in the form of dialogs similar to the logon prompts normal in Windows when operator input is made to recipes, recipe steps etc.

10.4.6.15 Scaling functions

Master recipes are generally set without a specified quantity. All parameters refer to the reference quantity of the recipe. The actual batch quantity (limited by the low or high limit) will differ from this.

Using scaling routines, you can make the procedures dependent on the quantity. Depending on the concrete quantity for the batch, the parameters are corrected using the selected scaling function. There are two standard scaling routines available:

- Linear: The value is multiplied by the quotient batch quantity/reference quantity.
  Setpoint = value * quantity / reference quantity
- Quadratic: The value is multiplied twice by the quotient batch quantity/reference quantity.
  Setpoint = value * (quantity / reference quantity)^2

Example

Header parameters	Reference Scale:	10
	Minimum quantity:	1
	Maximum quantity:	100

Recipe phase	Parameter:	Setpoint_A:	Value: 1
			Scaling: linear
		Setpoint_B:	Value: 5
			Scaling: linear
		Setpoint_C:	Value: 10
			Scaling: linear

Batch_A	Quantity: 1	Setpoint_A:	0.1
		Setpoint_B:	0.5
		Setpoint_C:	1
Batch_B	Quantity: 5	Setpoint_A:	0.5
		Setpoint_B:	2.5
		Setpoint_C:	5
Batch_C	Quantity: 10	Setpoint_A:	1
		Setpoint_B:	5
		Setpoint_C:	10

Senseless values

Note

Please make sure that you enter feasible values for the minimum quantity and the maximum quantity in the recipe header (depending on the limit values of the parameters from the ES).

Below, you will find examples with senseless values and examples with corrected limit values.

Example with invalid limits (limits in the recipe header are too wide)

The master recipe is intended for quantities of 2 to 15. With these limit values, there are no valid values for the parameters of the recipe phases:

	Scaling:	Linear	
	Low limit	Parameter/reference quantity	High limit
Instance parameter	3		20
Recipe header	2	10	15
Parameter	15	13	13.33333333
Quantity of the batch		15	
Online		19.5	
	Scaling:	quadratic	
	Low limit	Parameter/reference quantity	High limit
Instance parameter	3		20
Recipe header	2	10	15
Parameter	75	13	8.88888889
Quantity of the batch		12	
Online		18.72	

Example with valid limits (recipe limits corrected)

The range was restricted in the recipe header. The value 13 can be used.

	Scaling:	Linear	
	Low limit	Parameter/reference quantity	High limit
Instance parameter	3		20
Recipe header	3	10	15
Parameter	10	13	13.33333333
Quantity of the batch		15	
Online		19.5	
	Scaling:	quadratic	
	Low limit	Parameter/reference quantity	High limit
Instance parameter	3		20
Recipe header	5	10	10
Parameter	12	13	20

Quantity of the batch		12	
Online		18.72	

Legend	
Instance parameter:	Limits from the engineering system
Recipe header:	Limits for the batch quantity
Parameter:	Limits displayed in the dialog for the recipe phase
Batch quantity:	Actual quantity for the batch

10.4.6.16 Configuring synchronization with SIMATIC IT

SIMATIC BATCH provides a synchronization mechanism to allow interaction with SIMATIC IT MES (Manufacturing Execution System).

To this end, the synchronization function "Mes_Sync_Request" can be configured directly in the properties of the elements RUP, ROP, RPH in the master recipe. To do this, the event "MES_Sync_Request" must be selected in the properties of this element in the "Synchronization" tab under the "Start" action.

After SIMATIC BATCH has activated the "Mes_Sync_Request" event, the system waits for the required feedback event "MES_Sync_Req_Release" from SIMATIC IT to start or resume the running of the batch.

If, however, SIMATIC IT is not available, you can unlock the batch and resume it without an abort using the "Unlock step" command in the shortcut menu of the batch control.

Additional information

Unlock step (Page 1100)

Additional status identifier (Page 467)

10.5 Other functions

10.5.1 Saving recipes and library objects

When you create a new recipe with the "**New**" menu command, it is opened with a default name. Before you complete editing, the recipe must be saved.

Procedure

1. When you save for the first time, select the menu command **Recipe > Save as**.
2. In the next dialog you enter the name and version.

Result: The next time you save, you can use the "**Save**" command unless you want to change the name or version.

10.5.2 Validating recipes

Introduction

The validation covers the consistency of the library operations and Process Cell data used in the created recipe.

Requirement

This is only possible when the recipe is edited with the elements step, transition and structure element along with the corresponding configuration of the recipe data (header).

Procedure in the BATCH Recipe Editor

1. Open the recipe you want to validate (master recipe or library object).
2. Select the menu command **Recipe > Validate**.

Result: A result display or error list is displayed that indicates whether or not the recipe header is completed, whether materials exist, whether steps and transitions in the recipe are configured and whether the normalized batch quantity is correct. Incorrect elements are displayed in red in the graphic recipe structure. Validation is also possible in BatchCC.

Note

By double-clicking an entry in the error list, you can jump to the part of the recipe that caused the problem.

You can use the validation control at any time. Validation does not change the recipe status.

10.5.3 Releasing a recipe for testing or production

Requirement:

The requirement for this function is the validation of the recipe. The validity of the recipe is first checked automatically when you start this command.

Procedure in the BATCH Recipe Editor

1. OPen the recipe that will be tested (master recipe or library object).
2. Select the menu command **Recipe > Release for Testing** or **Release for production**.

Result: When it is released, the recipe has the status "released for testing" or "released for production". If errors occur in the validation, the problems are displayed and the recipe status remains "In Progress...". You can also release a recipe in BatchCC.

Note

From the error list you can go to the part of the recipe that is the cause of the error by double clicking on the list entry.

10.5.4 Revoking a release

Note

Only recipes that have not been released can be edited. If you want to edit master recipes or recipe objects that have already been released, the release must be revoked explicitly.

This is possible only when the option "Allow editing of recipes in the "Release revoked" status" is activated in the general settings of BatchCC. Navigate to this option via the menu command **Options > Settings** in the "General" tab.

Procedure in the BATCH Recipe Editor

1. Open the recipe (master recipe or library objects).
2. Select the menu command **Recipe > Revoke release**.

Result: After revoking the release, a recipe released for testing has the status "being processed" and recipe released for production has the status "Release revoked" and can be edited.

You can also revoke a release in BatchCC.

BATCH OS controls 11

11.1 Introduction

OLE custom controls (OCX) for SIMATIC BATCH

New SIMATIC BATCH OS controls are available for operating and monitoring batch processes on a PCS 7 OS client. You can use the BATCH OS controls as a graphical user interface (GUI). They are configured in the WinCC Graphics Designer for process mode. All the required operator inputs for SIMATIC BATCH can be performed in process mode (Runtime) using the OS controls.

Which BATCH controls are available?

The following SIMATIC BATCH OS controls are available in the WinCC Graphics Designer in the object palette under Smart Objects for insertion in a process picture:

- Select and connect BATCH projects: SIMATIC BATCH OS Master (Page 635)
- Create Batch Process Cell, Batch orders: SIMATIC BATCH OS Process Cell (Page 637)
- Unit overview: SIMATIC BATCH OS Allocation (Page 643)
- ROP overview, controlling and monitoring batches: SIMATIC BATCH OS Properties (Page 647)
- Batch creation: SIMATIC BATCH OS Batch Creation (Page 659)
- Display BATCH messages: SIMATIC BATCH OS Monitor (Page 662)

How do I install the controls?

The six OS controls (*.ocx) are made available by installing SIMATIC BATCH with the program component "BATCH Base". The following components are installed for the OS controls with these programs:

- OS controls (*.ocx)
- Template with all six SIMATIC BATCH OS controls
- Connection of the OS controls to the SIMATIC BATCH Server
- Online help and What's this?

On which PCs in the SIMATIC PCS 7 environment can I use the controls?

- OS clients
- BATCH clients

Template with all SIMATIC BATCH OS controls

All available BATCH OS controls are provided in a template. You can find the template under the name **"@simatic_batchos.pdl"** in the WinCC project folder "wincproj\computer_name \GraCS".

If you configure the OS controls in your own process pictures, note that your process picture must always contain the following OS controls:

- OS control "Master": necessary because it is used to establish a connection to the BATCH project.
- OS control "Monitor": necessary because it is used to display and acknowledge operator input dialogs and confirmation dialogs.
- OS control "Batch Creation": only necessary if batches are generated. Not necessary if batches are being monitored in a process picture.

Check boxes for the OS controls "Process Cell", "Properties", "Allocation", and "Creation"

For the OS controls, there are check boxes for the following settings in the template screen:

Check boxes in the OS control "Process Cell"	Meaning
Show tree structure	If you select or clear the check box, the tree structure in the navigation area is displayed or hidden. The tree structure serves as a navigation within a batch. When cleared, the list view is displayed in the left area of the OS Control.
Batch scheduling mode	When selected, some table columns that are not necessary for scheduling are hidden. This makes the display easier to view in process mode.

Check boxes in the OS control "Properties"	Meaning
Show tree structure	If you select or clear the check box, the tree structure in the navigation area is displayed or hidden. The tree structure serves as a navigation within a batch. When cleared, the used control recipe is displayed in the left area of the OS Control.
Extended parameter display	Some table columns are displayed or hidden by selecting or clearing the check box.
Simplified process view	If you select or clear the check box, the tree structure or the control recipe used is displayed or hidden in the left area.

Check boxes in the OS control "Allocation"	Meaning
Advanced view	Some table columns are displayed or hidden by selecting or clearing the check box.

Check boxes in the OS control "Creation"	Meaning
Extended batch generation	Some fields that are not necessarily required for batch creation are displayed or hidden by selecting or clearing the check box.

You can select or clear check boxes in both the undocked status and the embedded status.

Control properties (attributes)

All OS controls have special properties (attributes) that you configure in the Graphics Designer. The properties allow you to adapt the OS controls exactly to your requirements. The attributes can be made dynamic. All the dynamization methods of WinCC are available for this. Additional information on the topic of dynamic process pictures is available in the WinCC Information System under "Working with WinCC".

Restrictions

- Changing an operator permission
  If there is a connection to a BATCH project via the SIMATIC BATCH OS Master control and changes are then made to the permissions in the BATCH project, these changes only take effect in the controls when you reconnect to the BATCH project (disconnect and reconnect) or when the user changes.
- Project settings
  Changes to the project settings in the BatchCC are recognized only after a new logon or reconnection to the project.
- Unit allocation
  The SIMATIC BATCH OS Allocation control primarily monitors the process cells that are available on the WinCC client and also in the BATCH project. If you connect to a BATCH project that does not recognize the same unit as the WinCC client, running batches and recipe elements may be delayed and the runtimes (Batch/RUP/ROP) are not correctly displayed. The data is entered in the unit overview only when there is a status change of the batch or recipe element.
- ESIG
  The OS controls for SIMATIC BATCH do not support electronic signatures. Operator inputs requiring a signature are not executed.
- While an online structure change is being made to a batch in BatchCC, this batch cannot be operated or monitored with the SIMATIC BATCH OS controls. Such batches are marked as locked in the OS controls and the range of functions in the shortcut menu is limited. Once you have applied the changes to the recipe structure in BatchCC, operator control and monitoring of the batch via the OS controls is again possible.

Displaying important system messages

If the SIMATIC BATCH system detects situations such as too little hard disk space, important system messages are displayed automatically in an extra window. The window with the messages always appears as a foreground window. Requirements for displaying important system messages are as follows:

- The two OS controls "SIMATIC BATCH OS Master" and "SIMATIC BATCH OS Monitor" are configured in one process screen.
- In process mode, a connection to a BATCH project is established via the "SIMATIC BATCH OS Master" OS control.

You also need to acknowledge some of the messages (critical messages) so that they are not displayed again. If such messages are already pending when you connect to the BATCH project, the message window is displayed immediately after the connection is made. If you close this window, you can display it again at any time by double-clicking on the message requiring acknowledgment in the "SIMATIC BATCH OS Monitor" OS control or by clicking on the corresponding icon in the toolbar of the "SIMATIC BATCH OS Master" OS control.

11.2 Configuration in the Graphics Designer

11.2.1 Inserting a control in a PCS 7 OS process picture

Working in the Graphics Designer

BATCH controls are configured in the Graphics Designer. In it you insert the desired control in your process picture. You then set the control properties with the corresponding dynamization or the properties dialog of Graphics Designer.

Requirement

A WinCC graphics file (*.pdl) is open in the Graphics Designer.

Procedure

1. Select the Control entry in the object palette under Smart Objects.
2. Left-click in the picture area and draw a rectangle keeping the left mouse button pressed. Then release the left mouse button. You can change the size of the control later if needed.
3. Select the desired control in the "Insert control" dialog that opens. You can find all the BATCH OS controls in the list under "SIMATIC BATCH OS ...".

Result

The result of the configuration is a process picture that can be used as an HMI platform for SIMATIC BATCH.

Updating the controls

Change the control properties in the Graphics Designer and save them, your changes take effect immediately when the picture changes in process mode.

11.2.2 Concept of communication channels

Why is there a communication channel in each control?

Controls are independent components that have to communicate with one other. This is the only way in which controls can trigger actions in other controls or monitor other controls. Controls can use this channel to view several projects simultaneously and to interact independently. This is the only way to integrate multiple controls in one picture and to configure them differently for different projects.

How do they work?

Each control is connected to a communication channel with the "CommunicationChannel" property. All controls that exhibit the same communication channel can communicate with one other.

What types of data can I process?

The "CtrlBOSMaster" control connects a BATCH project and its data to a communication channel. All controls on this channel can process the data from this project.

How long is the channel valid?

A control will be connected to a channel until the communication channel is changed dynamically by a script or the control is removed from the process, for example, by means of a picture change.

How many controls can be connected to a channel?

You can connect any number of controls to a channel. This is true even for identical controls. If several controls of the same type are connected to the one channel, they will all perform the requested action or represent the same data.

How long will a project stay connected to a channel?

Until it is explicitly separated using the "CtrlBOSMaster" control. Only then will the controls no longer be able to access project data on the respective channel. This means a connection to the project will remain active even when you change the channel.

11.2.3 Opening a control as a picture window

Dynamization of objects in the Graphics Designer

The following example is provided to give you ideas for configuring BATCH OS controls. In the Graphics Designer, we will show you different ways to dynamize a BATCH OS control using a C script.

Requirement

The "@simatic_batchos.pdl" template is open in the Graphics Designer.

Objective

The OS control "CtrlBOSMonitor" should only be displayed when the operator clicks a button in the process picture rather than continuously, as configured in the template. In our example, the button is intended to open two windows with the OS control "CtrlBOSMonitor". once as a sizable, movable, superimposed new process picture and at the same time as a sizable, movable, superimposed picture window. The picture window and the control window it contains are freely scalable.

Procedure "Modifying template"

For this configuration, you need a new process picture based on the template and another new process picture, in which you will insert the OS control "CtrlBOSMonitor".

1. Save the open template under a new name.
2. Delete the OS control "CtrlBOSMonitor" from the process picture. Do not delete the text field that reads "Messages". Save the picture.
3. Create a new process picture and insert the OS control "CtrlBOSMonitor". Save the picture.
4. Copy the text field from the template and insert is above the control in the new process picture.
5. Under Geometry in the picture properties, adjust the picture width and height to the size of the OS control. Save your picture.
6. Change to your new template and below the text field, insert the "Button" graphic object from the "Windows objects" folder. Give a name to the button and click OK.
7. From the "Smart objects" folder, insert a picture window below the button and double-click to edit the object properties.
8. Set the following attributes in the properties:
   - Object name - for example: picture window
   - Display - no, because it should be opened by clicking the corresponding button.
   - Sizable - yes
   - Movable - yes
   - Picture name - for example: CtrlBOSMonitor.pdl
9. Save your process picture in the Graphics Designer.

Procedure "Writing a C action for the button"

1. Open the object properties for the configured button and select the "Event" tab. On this tab, double-click "Mouse click". The action is now edited.
2. As shown in the figure, insert the two rows beneath the comments into the C action. The row SSMOpenTopField(SSMGetScreen(lpszPictureName),"ctrlBOSMonitor.PDL"); opens the new process picture. The row SetPropBOOL(lpszPictureName,"bildfenster","Visible",TRUE); opens the picture window. Since both instructions are linked to the button, both actions are executed at the same time. An alternative procedure is also possible. A line can be commented out. Remember the curly bracket to indicate the end of the program.

   Note

   Standard functions and internal functions

   In addition to the Project functions, the navigation window also includes the Standard functions folder and the Internal functions folder. In the Standard functions folder, you will find the "SSMOpenTopField" function in the "Split Screen Manager" folder; in the "Internal functions" folder, you will find the "SetPropBool" function in the "graphics > set > property" folder.

3. Click the "Generate action" command. This checks and saves the C action.
4. Click "OK" and close the "Object properties" dialog.
5. Save your picture in the Graphics Designer.

Result

If you have enabled WinCC Runtime, you can view the result after changing pictures. To do so, open the modified template using the "Picture by name" command and click on the button where you have placed the C action.

When you click the button, the process picture opens and can be adjusted in size and position in the workspace. However, the size of the inserted OS control will not change. When the picture window changes size, the OS control is scaled along with it. Both windows can be closed and reopened by means of the button. The "Dock/Undock" command allows you to detach the OS control from both the picture window and the process picture.

11.2.4 Editing the BATCH template screen for multi-VGA

Multi-monitor systems

The OS controls of SIMATIC BATCH can be displayed on several monitors at the same time in a multi-monitor system. The supplied template screen is already prepared for this purpose; in other words, when the screen is opened, a script sets the communications channel for all controls depending on the monitor number. The process data is displayed at the same time and is synchronized for all OS controls regardless of the monitor on which they are displayed and assuming that they are connected to the same project. This ensures that you always have the latest process data displayed regardless of which monitor you are currently using for operator control and monitoring.

If necessary, you can also view the script (C action) contained in the template screen and can adapt it to your purposes. The example below explains how you can edit the C action.

Requirement

The "@simatic_batchos.pdl" template is open in the Graphics Designer.

"Edit C action" procedure

For this configuration, you need a new process picture bases on the template.

1. Save the open template under a new name.
2. Make sure no graphic objects are selected. In the picture, right-click on a spot that does not contain any objects and select the "Properties" command.
3. Select the "Event" tab and open the "Miscellaneous" folder.
4. Double-click on the "Open Picture" attribute or right-click the lightning icon in the "Action" column and select "C action" from the shortcut menu.
5. Adapt the default C action to your requirements.
6. Click the "Generate action" command on the toolbar and close the dialog by clicking OK.
7. Close the "Object properties" dialog and save your process picture.

Result

In WinCC Runtime, you can view the result after changing pictures. To do so, open the modified template by means of the "Picture by name" command on each monitor. With an action in an OS control on one of the monitors, check whether the operator control dialog appears only there and whether the result of the operator action/change is displayed on the other monitors.

11.2.5 Displaying two BATCH process cells in one process picture

Displaying data from two BATCH process cells in one process picture

This example shows you how to configure a process picture in the Graphics Designer that will allow you to control and monitor two batch process cells including their unit allocation in batch mode.

Basic principles and conditions

- The PCs that are used to control both batch process cells are part of a Windows workgroup or domain in the same local network.
- SIMATIC Logon is used.

- The process picture to be configured should display the data from a local batch process cell (single-station system, "PC1") and a remote batch process cell (single-station system, "PC2").
- The purpose of this is to show the current unit allocations for both BATCH process cells during batch processing simultaneously in one picture.

Requirements

- A network connection has been set up between "PC1" and "PC2".
- The BATCH project is open in SIMATIC Manager.
- WinCC Explorer and Graphics Designer are open on "PC1".
- The OS package has been loaded by both OS servers.

Procedure: "Inserting OS controls into process picture"

To display two BATCH process cells or units, you need a new process picture with the BATCH OS controls for both process cell projects.

Proceed as follows (on "PC1"):

1. In the Graphics Designer, create a new file (process picture) and save it under a name of your choice.
2. Insert two of each of the following BATCH OS controls into your process picture:
   - Control "CtrlBOSMaster"
   - Control "CtrlBOSPCell"
   - Control "CtrlBOSCreation"
   - Control "CtrlBOSProperties"
   - Control "CtrlBOSAllocation".
3. Insert the BATCH OS control "CtrlBOSMonitor" into your process picture only once. Messages will be output in one control for both BATCH process cells.
4. Group or arrange all the BATCH OS controls in such a way that it is easy to tell which BATCH OS controls belong to which process cell.

Procedure: "Setting control properties"

In order for the BATCH OS controls to communicate with the corresponding SIMATIC BATCH servers (SBS), you must set the "SBIdent" or "ProjectName" attribute in the "CtrlBOSMaster" OS controls. The attribute for "CommunicationChannel" is used for internal communication and must be set for all OS controls.

Note

If you do not want to permanently store your BATCH projects and prefer to select them freely, do not enter the attributes listed in step 2.

Proceed as follows:

1. Open the object properties of the "CtrlBOSMaster" control for process cell 1 (on "PC1").
2. Under Control Properties, double-click the "ProjectName" attribute and enter the project name of the local BATCH project. Alternatively, you can specify the "DBIdent" attribute.
3. Check whether the same communication channel (for example, "1") is set for the "CommunicationChannel" attribute for all five OS controls for process cell 1.
4. Open the object properties of the "CtrlBOSMaster" control for process cell 2 (on "PC2").
5. Under Control Properties, double-click the "ProjectName" attribute and enter the project name of the remote BATCH project. Alternatively, you can enter the "DBIdent" attribute.
6. In all five BATCH OS controls for process cell 2, change the "CommunicationChannel" attribute to a separate communication channel, e.g. 2. All BATCH OS controls for process cell 2 must use the same communication channel.
7. Set the "CommunicationChannel" attribute for the "CtrlBOSMonitor" BATCH OS control to 0.
8. Save your process picture in the Graphics Designer.

Display of the new process picture in OS Runtime

There are two ways you can display the new process picture in process mode:

- Insert the process picture into the plant hierarchy of the PCS 7 project or
- Call the process picture using the "Picture by name" command.

The latter method will be explained here briefly:

1. If you haven't already done so, start OS Runtime.
2. On the button panel at the bottom, click the "Picture by name" button.
3. In the dialog that appears, select the process picture you just created and open it with "OK".

The new picture is now displayed.

Procedure: "Implementing the logon concept and roles management"

To ensure access to the local project on "PC1" and the remote BATCH project on "PC2" in WinCC Runtime, the necessary permissions must be assigned to you in SIMATIC BATCH permission management. More information on permission management in SIMATIC BATCH is available in SIMATIC BATCH help under BATCH Control Center > Defining user permissions.

The steps below refer to the logon concept in which permission management takes over a (logon) computer in a Windows workgroup. In this case, the "PC2" that is running the remote project is used for logon. This means that all necessary users and user groups are managed on this PC. However, any other PC in the workgroup can also be defined as the logon computer.

Settings in computer management on "PC2"

1. Create two new users in computer management. Example: "brewer1" and "technical1".
2. Create two new groups in computer management. Example: "batchbrewer" and "batchadmins".
3. Insert user "brewer1" into group "batchbrewer" and user "technical1" into group "batchadmins".
4. Also add user "technical1" to group "Logon_Administrator". Members of the Logon_Administrator group have permission to configure SIMATIC Logon and open roles management in SIMATIC BATCH.

Settings in WinCC Explorer on both PCs

1. Open the User Administrator and select the "SIMATIC Logon" check box. With this setting, the SIMATIC Logon user data are used for the WinCC Runtime logon. More information about this is available in WinCC help under Working with WinCC > User administration structure.
2. In the User Administrator, create the two groups: "batchadmins" and "batchbrewer" on the "Groups" tab. A connection between these two groups is established based on the matching names of the groups in the WinCC user administration and the Windows user administration. This means that a user "brewer1" logging on with SIMATIC Logon is granted the permissions set for WinCC in the User Administrator and for SIMATIC BATCH in permission management for this user's role. More information on SIMATIC BATCH permission management and SIMATIC Logon roles management is available in SIMATIC BATCH help under BATCH Control Center > Defining user permissions and under SIMATIC Logon > SIMATIC Logon roles management. Assign the appropriate permissions to the two groups in the User Administrator. To display the BATCH OS controls in process mode, you require the "Authorization for area" permission.

Settings in SIMATIC Logon on "PC1"

1. In computer management, create a new user (User1, for example) and assign this user to the "Logon_Administrator" group.
2. Launch SIMATIC Logon by selecting Start > SIMATIC > SIMATIC Logon > Configure SIMATIC Logon.
3. Logon with the "User1" you just created.
4. On the "Working environment" tab, click the "another computer" option button and enter the name of your logon computer, in this case "PC2". Save the settings with OK.

You can now delete the "User1" you just created whenever necessary, since the entire logon procedure now takes place on the "PC2" logon computer. The user "technical1" on "PC2" ensures that the "Configure SIMATIC Logon" application can be opened on "PC1" and that settings can be made there.

Checking settings in SIMATIC Logon on "PC2"

1. Launch SIMATIC Logon.
2. Log on to "PC2" with the user "technical1".
3. Check the settings on the "Working environment" tab. By default, the "this computer or a Windows domain" option button should be selected. Confirm the dialog with OK and close the application.

Result

The "PC2" from the network has been configured as the logon PC. The users and groups and the roles management are defined on this PC only.

In the new process picture, which uses the SIMATIC BATCH OS controls to show two BATCH process cells at the same time, the user "brewer1" can control and monitor both BATCH process cells on the local "PC1". To allow this, however, the permission for the relevant user role must be enabled on the "Computers and units" tab in the permission management on both PCs.

To configure the permission management for SIMATIC BATCH, the user "technical1" must be assigned the role of "Superuser" and must also be logged on in the BATCH Control Center.

11.2.6 Simple batch creation

The procedure for automated creation of batches at the push of a button is described below.

Procedure

1. Open a new picture in the Graphics Designer.
2. Insert the OS control "SIMATIC Batch OS Batch Creation".
3. Insert the Windows object "Button" in your picture and assign a text for the button.
4. Develop a C-action for the "Mouse click" event on the button. Open the editing window. Depending on your requirements, different properties of the OS Creation control can be addressed and set. You can apply the program code shown below directly to the editing window. In the example, the following properties are set for the batch creation: BatchName, BatchSize, StartMode, AutoReleaseBatch, and StartTrigger.
5. Confirm your entries and start the compilation.
6. Save your picture and test the functionality in process mode.

Result

You have dynamized a button using C-script and thus automated the batch creation. Each time the button is clicked, a batch with the following properties is created:

- Unless otherwise specified, the batch is created in the SystemOrder folder, if available. Commented out program lines.
- The batch uses the "Rec-Superglue V1.0" control recipe.

- The batch size is 100 kg.
- The batch is started immediately.
- The batch is released.
- The batch is created.

Example

Program code

```
#include "apdefap.h"
void OnClick(char* lpszPictureName, char* lpszObjectName, char* lpszPropertyName){
{
//    SetPropChar(    lpszPictureName,    "ctrlBosBatchCreation",    "OrderCategoryName",
"OrderCat"            ) ;
//    SetPropChar(    lpszPictureName,    "ctrlBosBatchCreation",    "OrderCategory",
"Order"               ) ;
SetPropChar(    lpszPictureName,    "ctrlBosBatchCreation",    "RecipeName",
"Rec_Superglue V1.0"  ) ;
SetPropChar(    lpszPictureName,    "ctrlBosBatchCreation",    "BatchSize",
"100"                 ) ;
SetPropWord(    lpszPictureName,    "ctrlBosBatchCreation",    "StartMode",
1                     ) ;
SetPropBOOL(    lpszPictureName,    "ctrlBosBatchCreation",    "AutoReleaseBatch",
TRUE                  ) ;
SetPropBOOL(    lpszPictureName,    "ctrlBosBatchCreation",    "StartTrigger",
TRUE                  ) ;}
}
```

11.3 Operations in process mode

11.3.1 Control: SIMATIC BATCH OS Master

What is the purpose of the "SIMATIC BATCH OS Master" control?

This control is the basis for all other BATCH OS controls in the same process picture and must always be present and configured. It ensures communication between the individual controls and the BATCH project (master). You should configure a separate communication channel for each project you want to load into the same process picture. We do not recommend connecting the Master OS Control over several communication channels with the same project in the same process picture.

The SIMATIC BATCH project that you want to work with and monitor can be connected manually or automatically.

- Manual connection
  - Update your project data with the function provided for this in the toolbar.
  - Select the project you want to work with and monitor from the list of displayed SIMATIC BATCH projects.
  - Select the "Connect project" command in the shortcut menu.
- Automatic connection
  You have the following options:
  - "AutoConnect" attribute
    You can find information about this in the section "AutoConnect (Page 693)".
  - "ProjectName" attribute
    You can find information about this in the section "ProjectName (Page 688)".
  - "DBIdent" attribute
    You can find information about this in the section "DBIdent (Page 689)".

Once the connection to the SIMATIC BATCH project has been successfully established, the "Project is activated" symbol is shown in the control on the corresponding project line.

To activate a SIMATIC BATCH project, the BATCH launch coordinator together with its applications needs to have the "Running" status on the corresponding BATCH Server. All five further OS Controls obtain their data from the activated SIMATIC BATCH project in this OS control, if they are set to the same communication channel.

Note

Each master control can only be connected to one SIMATIC BATCH project. If you want to connect to another BATCH project, the existing connection will be closed. If several master controls are connected to the same project through different communication channels and a master control closes this connection, all the other master controls will also lose the connection.

Information in the control

The information in the control is listed in tabular form. Each line of the table contains a BATCH project. The project name, the computer name where the project is located and the computer name of the redundant PC is listed for each BATCH project. A bold row in the table identifies a BATCH project on the local PC. The "Project", "Computer name" and "Redundancy" columns also show symbols indicating the status of the connection and the server. The following symbols can be displayed with their status:

Table column	Symbols	Meaning
Project (project name)		Activate project or project is activated.
		Deactivate project or project is deactivated.
Computer name		Server is master. The BATCH Launch Coordinator is in the "Running" status.
		Server is not connected. The BATCH Launch Coordinator is not in the "Running" status.
		Server in error status. The BATCH Launch Coordinator is in the "Error" status (red cross).
		Server of a single station system The BATCH Launch Coordinator is in the "Running" status.
Redundancy		Standby server.
		Server is not connected.

Shortcut menu in the control

Right-click on any table line with content to open the shortcut menu. The shortcut menu shows you the functions currently available. The following functions are available here:

Symbol	Function	Meaning
	Docking/undocking	Undock: The OS control is detached from the process picture and can be resized and positioned anywhere in the workspace. Dock: The relevant undocked OS control is reinserted at its original position in the process picture.
	Undock automatically	When you enable the command for the corresponding OS Control, it will be opened and positioned automatically in the workspace each time it is used.
	Change	If you click on the "Change" command with your left mouse button, you will open a drop-down list with additional commands. Use the listed commands to change to the respective OS control. If you have activated the command "Undock automatically" in the target OS control, the OS control will be displayed in undock state at that location in the workspace where it was saved last. The drop-down list will always offer the change into all OS controls, except for the change into itself or to the OS Control Monitor.
	Activate project	Activate the selected BATCH project. You obtain all BATCH data for all other BATCH controls on the same channel from the active server.
	Deactivate project	Deactivate the selected project. The BATCH data of this project is no longer available to any BATCH control.

Symbol	Function	Meaning
	Update loaded project	Use this function when new data has been generated from BATCH engineering (SIMATIC Manager / BATCH configuration dialog). This will ensure that the most recent data is displayed in the OS control.
	Important system messages	Opens the "Important system messages" dialog. The symbol is grayed out until an important system message about SIMATIC BATCH is pending. Only then is the symbol displayed in color and can be used permanently.

Toolbar with operator functions

A toolbar is also shown in the OS control, depending on the configured control property. The potential functions are the same as those available in the shortcut menu.

Operation of the control in process mode

Requirements:

- The "SIMATIC BATCH OS Master" control has been inserted in a process picture and appropriately configured.
- WinCC Runtime has been started and the process picture with this control is displayed.
- SIMATIC BATCH has been started on the PC from which the BATCH project originates.

11.3.2 Control: SIMATIC BATCH OS Process Cell

What is the purpose of the "SIMATIC BATCH OS Process Cell" control?

The control shows the Batch process cell for the selected BATCH project. It is used for batch planning, batch creation and even batch operator control. The OS control is divided into two areas, the navigation area on the left and the display area on the right. The sizes of the two areas can be individually adjusted. The display area has the tabs "Entire list", "Planning list", "Status list", "Results list", "Favorites" and "Order list". Operator functions for batch operation are available in both the toolbar and in the shortcut menu.

Information in the control

Navigation area: The navigation area shows the folder structure of your Batch process cell. The folder structure with names and contents is taken from the activated BATCH project. The top folder has the name of your Batch process cell. The folders arranged underneath correspond to the order category folders with the order folders created therein. Each order folder is displayed with name, folder symbol, and status symbol. The actual status of the order is indicated with the symbols of the order folders. The following symbols are assigned to an order:

Table 11-1 Status symbols of the order folders

Symbol	Status
	Order inactive
	Order active
	Order held
	Order completed You can find additional information on the "Completed" status in the section "Status display at the order folder (Page 472)".

In addition, the extended statuses of the current batches are displayed overlaying the order folder symbol.

Table 11-2 Overlaid order symbol

Order folder symbol	Overlaid symbol	Status
		Operator input required
		Error

The overlaid symbol is also displayed in the properties dialog of an order under Status.

Display area: The display area of the control displays the batch lists and the favorites list. Click the desired tab to select one of the lists. Any batches can be transferred to the "Favorites" tab from the Entire list, Planning list, and Status list.

Table 11-3 Tabs in the Process cell control

Symbol	Tab	Meaning
	Entire list	Shows all batches for the selected folder in the navigation area regardless of their status.
	Planning list	Shows planned and released batches for the selected folder in the navigation area.
	Status list	Shows released and running batches for the selected folder in the navigation area.
	Results list	Shows completed, aborted, canceled and stopped batches for the selected folder in the navigation area.

Symbol	Tab	Meaning
	Favorites	Displays the batches that you added to the Favorites beforehand.
	Order list	Shows all orders for the selected folder of the batch process cell.

Overview lists (Planning list, Status list and Results list): When batches change their status during process mode, they remain in their original list and are additionally entered into the list corresponding to the status. Use the "Update data" command or a "Picture change" to remove the batch whose status no longer matches from the lists.

Order list: A product name is only displayed in the "Product" column when all product names of the batches in the order have the same name. In all other cases, a placeholder in form of "<not unique>" is shown. A placeholder is also shown in the column when the units of measure of the batches in the order are not identical. If the batches involved in an order have different units of measure, the value "<not unique>" is displayed in the "Unit of measure" column. The "Quantity" value from the order creation is displayed in the "Currently planned quantity" column. As long as no batches are created in the order, a placeholder in form of "*******" is displayed. The actual order quantity is displayed in the "Actual quantity" column. A value is only displayed if a process value reference was configured in the master recipe used for the batches. In addition, at least one of the batches in the order must have reached its final state. The process value is updated depending on the processing status of the batches included in the order. If no process value reference is configured or if none of the batches in the order have reached a final state, a hyphen is shown as placeholder.

Additional information: "General" tab (Recipe procedure properties) (Page 846)

Status symbols of batches

Associable symbols for the status of batches are shown in all the tabs or lists. The following is an overview of the most commonly used status symbols similar to those in the BATCH Control Center.

Symbol	Status
	Planned
	Released
	Canceled
	Aborted
	Completed
	Completed and closed
	Completed, closed and archived
	Stopped and closed
	Aborted, error, closed and archived
	Running
	Paused after step, operation requested
	Locked batch

Shortcut menus in the OS control

There is a shortcut menu for both the navigation area and the display area.

Select an object (folder in the navigation area, batch in the display area) and right-click to open the shortcut menu providing the following commands. Commands are only shown in the shortcut menu if they can also be used for the selected object.

Shortcut menu commands in the navigation area:

Symbol	Command	Meaning
	New order category	Select the Batch process cell and click on this command to open the "New order category" dialog. You can create a new order category (folder) in this dialog. You can also enter a text description.
	New order	Select the order category (folder) and click on this command to open the "New order" dialog. Specify the name, planned quantity, a description and the start and end time of the new order in this dialog.
	New batch(es)	Configures the SIMATIC BATCH Creation control. Note: Even if multiple objects are selected, only the first batch is created.
	Properties	Depending on the selected object, opens the "Order category properties" or "Order properties" dialog. Enter a name and a description for the order category in the "Order category properties" dialog. Enter a description for the order in the "Order properties" dialog. You can toggle between the two dialogs using the tabs in the dialog.
	Delete	Deletes the selected object. In the navigation area, you cannot delete objects (folders) until after their contents have been deleted. Otherwise the command will not be available.
	Update	Updates the Batch process cell data in the entire control and sorts the batches in the respective lists.

Shortcut menu commands in the display area and toolbar:

Symbol	Command	Meaning
	Dock/Undock	Undock: The OS control is detached from the process picture and can be resized and positioned anywhere in the workspace. Dock: The undocked OS control is inserted back in its original position in the process picture.
	Undock automatically	When you enable this command for the corresponding OS control, the OS control is opened and positioned automatically in the workspace each time it is used.
	Change	When you click the "Change" command, a drop-down list opens with additional commands. Use the listed commands to change to the respective OS control. If you have activated the command "Undock automatically" in the target OS control, the OS control will be displayed in undock state at that location in the workspace where it was saved last. The drop-down list will always offer the change into all OS controls, except for the change into itself or to the OS Control Monitor.
	Print > Standard	The print job is sent directly to the default printer. You can find information on the "Print" command in the shortcut menu in the section "Printing, viewing and exporting a batch report (Page 683)".

Symbol	Command	Meaning
	Print Preview > Standard	The print preview for batch report is displayed. You can find information on "Print Preview" command in the shortcut menu in the section "Printing, viewing and exporting a batch report (Page 683)".
	New batch(es)	Creates new batches in the display area of the OS Control Creation based on a selected batch. In the case of multiple selection, the data from the batch that was first selected is always used as the template data.
	Creating the object	Creates a new object depending on the selected folder in the navigation area (new order category).
	Properties	Opens the "Batch properties" dialog. The dialog provides batch information on the following tabs: • Order category • Order • Batch • Parameter • Allocation • Comments
	Delete batch	Permanently deletes the selected batch following your confirmation.
	Release batch	Releases the selected batch following your confirmation.
	Cancel batch	Cancels the selected and released batch following your confirmation.
	Lock batch	Disables the selected and released batch following your confirmation.
	Unlock	Enables a selected and previously disabled batch.
	Start batch	Starts the selected and released batch following your confirmation.
	Pause batch after step	Holds the selected and running batch after the current step, if you have confirmed the command.
	Hold batch immediately	Holds the selected and running batch immediately following your confirmation.
	Resume batch	Resumes a batch that has been paused.
	Stop batch	Stops the selected and running batch following your confirmation.
	Abort batch	Aborts the selected and running batch following your confirmation.
	Abort batch (emergency)	Aborts the selected and running batch following your confirmation.
	Close batch	Closes all completed, stopped or aborted batches. This is necessary before you can use the "Archive" command.
	Archive batch	Starts the archiving for the closed batch once you have exited the confirmation dialog by pressing "Yes". Requirement: You have configured an accessible connection to the archive location in the "Archive" tab of the project settings.
	Display control recipe	Displays the control recipe for the selected batch in the "SIMATIC BATCH OS Properties" Control.
	Brief info	Opens a window in which the information for the selected object is displayed.
	Enter comment	Opens the "Comment" tab in the "Batch properties" dialog for the selected object. You can enter a comment for the batch there.
	Update	Updates the batch process cell data in the entire control.

Symbol	Command	Meaning
	Favorites > Add batch to favorites	Adds the selected batches to the "Favorites" tab.
	Open with BatchCC	If you select a batch, regardless of the tab it is in, it is displayed in the BatchCC.

Toolbar with operator functions

The tools on the toolbar are also context-sensitive. The only tools enabled there are those that can actually be used in a specific situation.

Operation of the control in process mode

The requirements for operation in process mode:

- The BATCH control has been inserted in a process picture and appropriately configured.
- WinCC Runtime has been started and the process picture with the BATCH controls is displayed.
- A BATCH project has been connected via the master.
- SIMATIC BATCH has been started on the PC from which the BATCH project originates.

Several process operations in the control are listed below:

1. Update your project data with the function provided for this in the toolbar.
2. Use the ""New order category" and "New order" commands to create a new order category and a new order. To do this, select the "Batch process cell" folder and then the "Order category" in the navigation area and select the corresponding command for each shortcut menu respectively.
3. Use the command "New batch(es)" from the shortcut menu to create new batches. To do so, select an order folder in the navigation area or an existing batch in the display area in the "Entire list" or "Planning list" tab and select "New batch(es)" in the shortcut menu. The data of the selected object serves as the template and is imported into the SIMATIC BATCH OS Creation Control for generating new batches. Only there can you then create new batches by using the command "Generate batch(es) and entering the desired quantity. The new batches are then created in the Entire list or Planning list.
4. Display a released batch in the "SIMATIC BATCH OS Properties" control in order to monitor it. Double-click on the corresponding batch in one of two lists mentioned above. The control recipe of the batch is then displayed in the SIMATIC BATCH OS Properties Control. The batch execution can be operated and monitored in detail in this control.
5. Start a released batch in the Entire list or Planning list. Select the required batch and select the "Start batch" command in the shortcut menu.

You have now used the most important commands and procedures in this control.

11.3.3 Control: SIMATIC BATCH OS Allocation

What is the purpose of the "SIMATIC BATCH OS Allocation"?

This control provides an overview of your units defined within your Batch process cells. In addition to the visualization of the units and their allocation, the process conditions for the batch runtime can also be shown in the shortcut menu and/or toolbar.

Control properties

The control can be configured with the properties (attributes) so that just one unit or individual units belonging to a specific naming scheme are displayed. You can change properties of the control in process mode using a script or assign it permanently in the WinCC Graphics Designer.

The control recipe of the corresponding batch is displayed in the SIMATIC BATCH OS Properties Control by using the "Display control recipe" command in the shortcut menu of the selected object.

Information in the control

The allocation data of the unit is listed in tabular form in the Control. Each line of the table contains a unit. For each unit, information is shown or read from the linked BATCH project in table columns and updated. A unit in use by a batch in progress is visualized with the corresponding status symbol in the "Batch" table column and is superimposed over any previous batch information. Only the major status symbols of the batch are listed for the "Batch" column.

Table column	Description	Symbol	Meaning
Unit	Unit name with symbol		Unit enabled for BATCH and free for new batches
			Unit enable for BATCH revoked
			Unit enabled for BATCH and currently allocated to batch
			Unit is registered for maintenance
			Unit allocated and enable for BATCH revoked
			No information about status of unit available, for example, AS cannot be reached or is in STOP.
			The unit is not defined or unknown. Not defined: The unit is not configured. Unknown: The unit is configured but not known within the process cell.

Table column	Description	Symbol	Meaning
Batch	Status symbols of the batch, name of the batch.		Batch running on unit
			Batch paused after step and recipe element requires operation.
Batch runtime	The batch runtime determined by the system	-	
Order category	Name of the order category		
Order	Name of the order		
Master recipe	Name of the master recipe		
Formula	Name of the used formula		
RUP (recipe unit procedure)	Symbol of the RUP, status symbol of the RUP, name of the RUP		
RUP runtime	The runtime for a recipe unit procedure (RUP) determined by the system. If a time-out occurs, a time symbol is displayed.		
ROP (recipe operation)	Symbol of the ROP, status symbol of the ROP, name of the ROP If wait steps occur, a time symbol is displayed. Italic font if more than one ROP is active.		
ROP runtime	The runtime for a recipe operation determined by the system. If a time-out occurs, a time symbol is displayed.		

Shortcut menu in the control

The commands available in the shortcut menu in the control are described based on examples in the following table.

The commands are essentially operator commands for active batches, like those listed previously for the SIMATIC BATCH OS Process Cell control.

Symbol	Shortcut menu command	Symbol	Subcommand	Meaning
	Unit		Revoke release	Use this command to revoke the unit enable for SIMATIC BATCH. This means that SIMATIC BATCH cannot occupy this unit.
			Register for maintenance	Use this command to sign on the unit for maintenance.

Symbol	Shortcut menu command	Symbol	Subcommand	Meaning
	Batch		New batch(es)	Creates new batches in the display area of the OS Control Creation based on a selected batch. In the case of multiple selection, the data from the batch that was first selected is always used as the template data.
			Properties	Opens the "Batch properties" dialog. The dialog provides batch information and settings on the following tabs: • Order category • Order • Batch • Parameter • Allocation: Unit and strategy selection • Comments • Chaining
			Delete batch	Deletes the batch. All list entries of this batch are thereby removed in this control.
			Close batch	Closes completed, aborted or stopped batches
			Hold batch after active step	Holds the selected and running batch after the current step, if you have confirmed the command.
			Hold batch immediately	Holds the selected and running batch immediately following your confirmation.
			Stop batch	Stops the selected and running batch following your confirmation.
			Abort batch	Aborts the selected and running batch following your confirmation.
			Abort batch (emergency)	Aborts the selected and running batch following your confirmation.
			Add batch to favorites	Adds the batch as a favorite to the "Favorites" tab in the OS control properties.
			Remove batch from favorites	Removes the batch from the favorites in the "Favorites" tab in the OS control properties.

Symbol	Shortcut menu command	Symbol	Subcommand	Meaning
	RUP, recipe unit procedure		Pause step (after step)	Holds the selected recipe element once it has executed.
			Hold step (immediately)	Holds the selected recipe element immediately.
			Stop step	Stops the selected recipe element.
			Abort step	Aborts the selected recipe element. The element is in the active or held state. An aborted batch step cannot be resumed.
			Abort step (emergency)	Aborts the selected recipe element even if there is no AS connection.
			Set breakpoint	Sets a breakpoint. Batch execution is stopped at the breakpoint. To set breakpoints, the status of the batch involved must be at least "released". Breakpoints are shown superimposed on the object in the navigation area.
			Add recipe element to favorites	Adds the RUP recipe element as a favorite to the "Favorites" tab in the OS control properties.
			Remove recipe element from favorites	Removes the RUP recipe element from the favorites in the "Favorites" tab in the OS control properties.
	ROP, recipe operation	Analogous to TRP		
	Display control recipe	-		Displays the selected batch in the "SIMATIC BATCH OS Properties" control.
	Brief info			Displays detailed information about the selected object in a separate window.
	Update			Updates the batch process cell data in the entire control.

Toolbar with operator commands

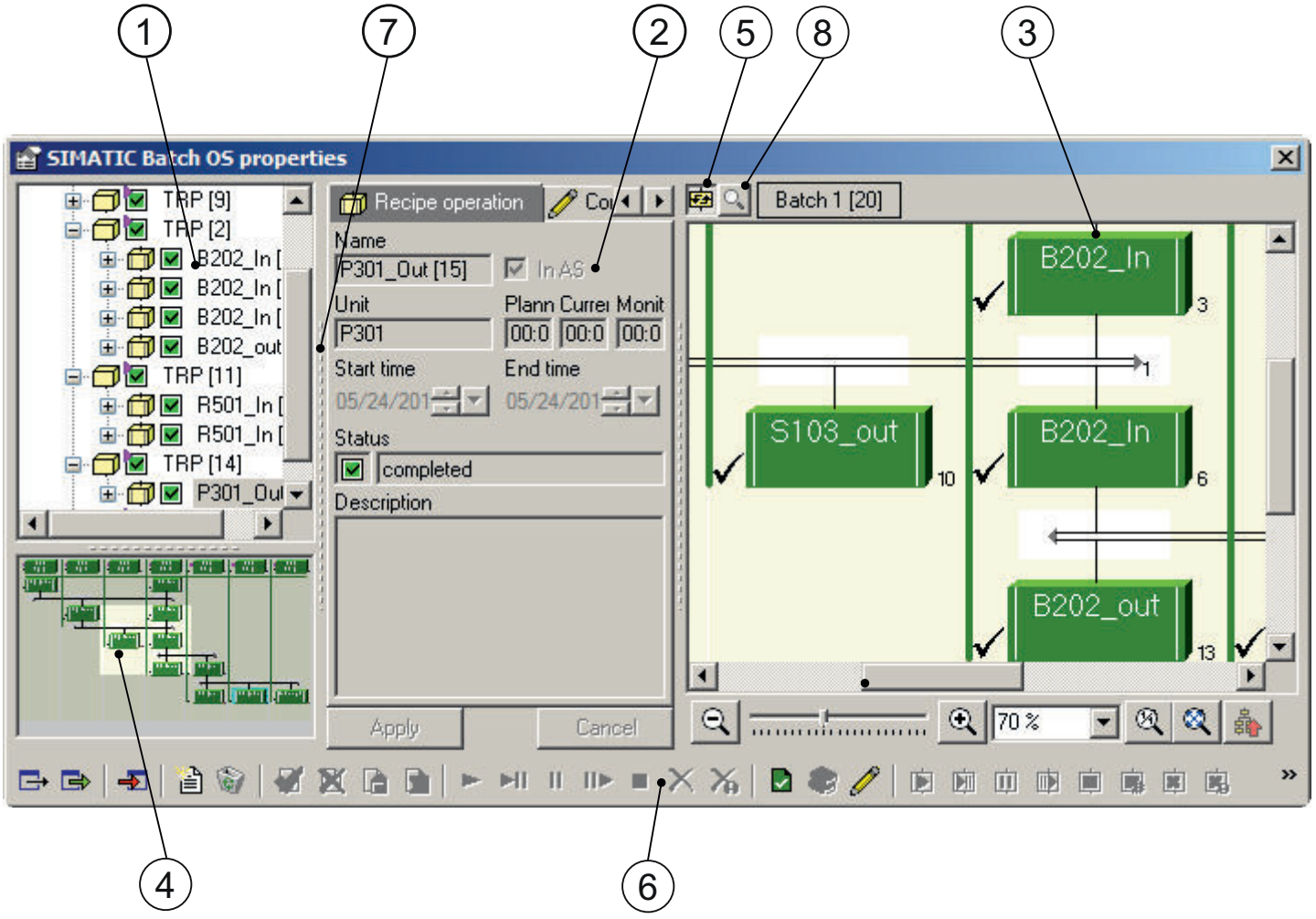
Except for the commands "Release batch", "Cancel batch", "Lock batch", and "Unlock", all commands available on the toolbar correspond to the commands you have available in the OS control Process Cell. The commands on the toolbar are also context-sensitive. The only commands enabled there are those that are actually useful in the specific situation.

11.3.4 Control: SIMATIC BATCH OS Properties

What is the purpose of the "SIMATIC BATCH OS Properties" control?

The control should be your central OS control for the operation and monitoring of batches in process mode. Here, a batch and its control recipe are displayed in detail. The control is divided into the navigation, tab, display, and overview areas.

Bring the control to the foreground and increase its size to the maximum.



Navigation area, ① in figure above

You navigate through your recipe structure in the navigation area. The top folder is designated by the batch name. Shown underneath are the units (recipe unit procedures) used in the recipe. Underneath the units are the recipe operations and recipe phases with transitions and other recipe objects. If you select a recipe object in the folder structure, you receive detailed information that is displayed in a synchronized manner in the windows, tab area ②, display area ③, and overview area ④. In addition, commands for the selected recipe object are available in the shortcut menu and the toolbar ⑥. Only commands permitted to be used in a particular situation are offered. Use the Synchronization command ⑤ to specify whether you want to display selected objects in a fixed size or variable size in the display area. Use the button ⑧ to open the search function. You use the search function to find recipe elements in the control recipe of the batch that correspond to the entered search criteria. The size of all the window sections can be adapted variably. To do this select the dashed line ⑦ between the window areas and keeping the mouse button pressed move it to the desired position.

Tab area, ② in the figure above

The context for the object selected in the navigation area is displayed on various tabs in the tab area. Parameters of a recipe function are displayed on the "Parameters" tab and setpoints are specified. The various tabs are generated and displayed only if corresponding data are present.

When batches are based on linear, hierarchical control recipes, autofocus is used by default. The "Overview" tab is then displayed in the tab area instead of the many standard tabs. The parameters involved in the current batch step are highlighted in bold, blue font color in the "Overview" tab. You use the following command button to toggle between the two tab views:



Additional information: Visualization and operation of control recipes (Page 680)

Display area, ③ in the figure above

The control recipe used by the batch is displayed in the display area along with all the recipe elements it contains. The shortcut menu in the control recipe view features commands for editing the individual batch steps. The following table contains additional operator inputs and settings. Navigations and zoom settings directly affect the display in the overview area.

Tool icon	Meaning
	Synchronization off. The control recipe displayed in the display area is always kept at the set size regardless of whether you make new selections in the navigation area, tab area, or overview area.
	Synchronization on. The size of the control recipe displayed in the display area is adjusted depending on the selection in the navigation area, tab area, or overview area.
	Opens the search dialog. Lets you search for text elements in the control recipe of a batch.

Tool icon	Meaning
	Autofocus on. Default setting is autofocus on. The order icon is only displayed in the OS control when simple linear control recipes are used in the batches. Simple linear control recipes consist of an RUP and do not include synchronization, a jump, an alternative branch or parallel branch. The command icon is not displayed for all other recipe structures. Note: If an object other than the one currently in focus is selected, autofocus is deactivated. Autofocus will have to be reactivated.
	The tab view is switched when autofocus is switched on. The switch takes place between the standard tab view and the "Overview" tab.
	Displaying higher-level recipe structure folders of the control recipe.
	Display control recipe in 1:1 original size
	Display control recipe to fit window.

Overview area, ④ in the figure above

The control recipe is displayed in overview format in the overview area. You can use the zoom settings in the display area to modify the size of the focus area on the control recipe in the overview area. You can move the focus area in the overview area. This changes the focus on the control recipe in the display area.

Toolbar, ⑥ in the figure

In the toolbar, the tool icons that you can use with the selected object are highlighted in color. The icons you cannot use are grayed out.

Tab area

Depending on the recipe objects you select in the navigation window, the following tabs are displayed with their detailed information in the tab area.

For simple, linear control recipes, the "Overview" tab is displayed automatically. Simple linear control recipes consist of an RUP and do not include synchronization, a jump, an alternative branch or parallel branch.

The parameters involved in the currently focused batch element highlighted in bold, blue font color in the "Overview" tab.

Tab	Information / Processing
Order category	• Name Name of the order category You can change the name in the text box. After making your change, click "Apply". The modified name will be applied immediately, for example, in the OS control "OSPCell". For batches that are already finished, the name of the order category at the time of execution is displayed. for example, in the OS control "OSAllocation". • Description Text box for a description
Order	The following are specified: • Name Name of the order • Batches Number of batches of the order • Planned quantity Planned quantity of the order • Currently planned quantity Currently planned quantity of the order • Actual quantity Actual quantity of the order • Unit of measure Unit of measure for the quantity • Status As symbol and text • Earliest start and latest end Earliest planned start and latest planned end • Description Text box for a description

Tab	Information / Processing
Batch	When a batch is in progress, the batch symbol on the tab is replaced by the symbol for the status of the current batch. The following are specified: • Name/ID Batch name and ID • Planned quantity Planned quantity of the batch • Recipe Name of the master recipe used (hierarchical only) • Actual quantity Actual quantity of the batch • Formula Formula used (if present) • Mode The start mode can be selected from the drop-down list, e.g. "Operation", "Immediate" or "Time-driven". • Status, e.g. released, running, completed. • Planned runtime This shows the runtime of the master recipe calculated for the individual step times in the recipe editor. • Product Product name of material used in the master recipe. If a material used in the batch is deleted in BatchCC, the recycle bin symbol is displayed.  Material/product deleted • Current runtime Current runtime of batch • Planned start and planned end Planned start time and planned end time for the batch • Start time and end time Actual start time and actual end time of the batch • Description Text box for a description
Parameter	The parameters from the batch header (RP) or from the unit (RUP), recipe operation (ROP) or the recipe phase (RPH) are listed.

Tab	Information / Processing
Recipe unit procedure (RUP)	The following are specified: • Name Name of RUP • In AS Activated: Recipe unit runs AS-based Deactivated: Recipe unit runs PC-based • Unit Name of the used unit • Planned runtime This shows the runtime calculated for the RUP in the recipe editor for the individual step times. • Current runtime Current runtime of the RUP • Monitoring time The monitoring time is a time defined for the RUP in the recipe. When the current RUP runtime is greater than or equal to the monitoring time you specify, a system message is generated. Monitoring is disabled when you enter a monitoring time of "0". • Start time and end time Actual start time and actual end time of the RUP • Status Status as symbol and text • Description Text box for a description

Tab	Information / Processing
Recipe operation (ROP)	The following are specified: • Name Name of ROP • In AS Activated: Recipe unit runs AS-based Deactivated: Recipe unit runs PC-based • Unit Name of the used unit • Planned runtime This shows the runtime calculated for the ROP in the recipe operation for the individual step times. • Current runtime Current runtime of the ROP • Monitoring time The monitoring time is a time defined for the ROP in the recipe. When the current ROP runtime is greater than or equal to the monitoring time you specify, a system message is generated. Monitoring is disabled when you enter a monitoring time of "0". • Start time and end time Actual start time and actual end time of the ROP • Status As symbol and text • Description Text box for a description

Tab	Information / Processing
Recipe phase	The following are specified: • Name Name of RPH • Control strategy Name of control strategy • In AS Activated: Recipe unit runs AS-based Deactivated: Recipe unit runs PC-based • Unit Name of the used unit • Planned runtime This shows the runtime calculated for the RPH in the recipe editor for the individual step times. • Current runtime Current runtime of the RPH • Monitoring time The monitoring time is a time defined for the RPH in the recipe. When the current RPH runtime is greater than or equal to the monitoring time you specify, a system message is generated. Monitoring is disabled when you enter a monitoring time of "0". • Start and end time Actual start time and actual end time of the RPH • Status As symbol and text • Description Text box for a description.
Monitoring	The following is specified: The name of the monitoring
Command step	Information on the command step, which controls other recipe elements that are listed in the "Shortcuts" tab.
Transition	The following are specified: • Name Name of the transition • Current runtime Current runtime of the transition • In AS Activated: Recipe unit runs AS-based Deactivated: Recipe unit runs PC-based • Start time and end time Actual start time and actual end time of the transition • Status As symbol and text • Description Text box for a description.
Jump	The following are specified: The name of the jump and the jump destination

Tab	Information / Processing
Instruction	The following is specified: The text for the instruction that you entered in the properties of the instruction step in the master recipe.
Operator dialog	The following are specified: • Name Name of instruction • Control strategy Name of control strategy • Unit Name of the used unit • Planned runtime Planned runtime for the operator dialog • Current runtime Current runtime of the operator dialog • Monitoring time The monitoring time is a time defined for the operator dialog in the recipe. When the current operator dialog runtime is greater than or equal to the monitoring time you specify, a system message is generated. Monitoring is disabled when you enter a monitoring time of "0". • Start and end time Actual start time and actual end time of the operator dialog • Status As symbol and text • You use the "Apply" button to acknowledge the instruction and the Operator dialog and, depending on your recipe configuration, to resume the batch execution.
Empty step	Recipe element with no function.
Wait step	Empty step with a defined time target before the recipe procedure continues.
Conditions	List of the logic conditions for enabling the transition.
Comments	Insert and apply comments.
Allocations	Representation of allocation data of the control recipe. You adjust the allocations and strategies for allocation at the batch level.
Control recipe	Display the control recipe for the selected object.
Message	Shows messages for objects with errors during batch control. The columns contain the type, status, name, path, message and time stamp of the objects with errors.

Note

Status of BATCH recipe objects (RUP, ROP, RPH, and transition)

Information on the status of recipe objects is provided in the section "Allocation statuses of batch steps (Page 465)".

Shortcut menu and toolbar for selected objects in the navigation area

The shortcut menu and toolbar contain operating commands for recipe step processing of active batches for each selected object in the navigation area. On both the shortcut menu and the toolbar, only commands that can be used for the specific use are offered.

Icon on toolbar or shortcut menu	Command	Meaning
	Dock/Undock	Undock: The OS control is detached from the process picture and can be resized and positioned anywhere in the workspace. Dock: The relevant undocked OS control is reinserted at its original position in the process picture.
	Undock automatically	When you use this command for the corresponding OS control, the OS control is opened and positioned automatically in the workspace each time it is used. This means that for certain types of operator input in one OS control, another corresponding OS control is opened automatically.
	Change	When you click the "Change" command, a drop-down list opens with additional commands. Use the listed commands to change to the respective OS control. If you have activated the command "Undock automatically" in the target OS control, the OS control will be displayed in undock state at that location in the workspace where it was saved last. The drop-down list will always offer the change into all OS controls, except for the change into itself or to the OS Control Monitor.
	New batch(es)	Creates new batches in the display area of the OS Control Creation based on a selected batch. In the case of multiple selection, the data from the batch that was first selected is always used as the template data.
	Delete batch	Permanently deletes the selected batch following your confirmation.
	Release batch	Releases the selected batch following your confirmation.
	Cancel batch	Cancels the selected and released batch following your confirmation.
	Lock batch	Disables the selected and released batch following your confirmation. You can recognize a locked batch by the "Locked batch" symbol.
	Unlock	Enables a selected and previously disabled batch.
	Start batch	Starts the selected and released batch following your confirmation.
	Pause batch after step	Holds the selected and running batch after the current step, if you have confirmed the command.
	Hold batch immediately	Holds the selected and running batch immediately following your confirmation.
	Resume batch	Resumes the held batch following your confirmation.
	Stop batch	Stops the selected and running batch following your confirmation.

Icon on toolbar or shortcut menu	Command	Meaning
	Abort batch	Aborts the selected and running batch following your confirmation.
	Abort batch (emergency)	Aborts the selected and released batch following your confirmation.
	Close batch	Closes completed, aborted or stopped batches This is necessary before you can use the "Archive" command.
	Archive batch	Starts the archiving for the closed batch once you have exited the confirmation dialog by pressing "Yes". Requirement: You have configured an accessible connection to the archive location in the "Archive" tab of the project settings.
	Enter comment	Opens the "Comment" tab in the "Batch properties" dialog for the selected object. You then enter a comment for the batch.
	Start step	Starts the selected recipe element (recipe unit or recipe step) after an abort or reset.
	Pause step (after step)	Holds the selected recipe element once it has executed.
	Hold step (immediately)	Holds the selected recipe element immediately.
	Resume step	Continues the selected and previously held recipe element.
	Stop step	Stops the selected recipe elements, which could not be properly completed.
	Abort step	Aborts the selected recipe element. The element is in the active or held state. An aborted batch step cannot be resumed.
	Abort step (emergency)	Aborts the selected recipe element even if there is no AS connection.
	Reset step	Resets the selected and previously aborted recipe element. You can start reset recipe elements again with the "Start step" command.
	Complete step	Ends the selected recipe element.
	Unblock step	Forces termination of the wait for external synchronization, for example, by SIT.
	Set/Remove breakpoint	Sets or removes a breakpoint. Batch execution is stopped at the breakpoint. To set breakpoints, the status of the batch involved must be at least "released". Breakpoints are shown superimposed on the object in the navigation area.
	Acknowledge breakpoint	Resumes a batch interrupted by a breakpoint.
	Hide parameter	The parameter lines for which the "Hide parameter" parameter property is activated in the master recipe are displayed or hidden. You can find information on using buttons in the section "Visualization and operation of control recipes (Page 680)".
	Update	Updates all data in the OS control.

Icon on toolbar or shortcut menu	Command	Meaning
	SFC visualization: Overview	Opens the SFC overview window for the selected recipe phase in the process picture workspace. This command is only supported when using SFC types. If the "Always display in faceplate" check box is enabled in the SFC topology settings in the WinCC Explorer, the SFC visualization is always displayed with the SFC overview window and SFC detail window.
	SFC visualization: Pane	Opens the SFC detail window for the selected recipe phase in the process picture workspace. This command is only supported when using SFC types. If the "Always display in faceplate" check box is enabled in the SFC topology settings in the WinCC Explorer, the SFC visualization is always displayed with the SFC overview window and SFC detail window.
	Open with BCC	Opens the batch shown in the OS control in the BATCH Control Center.
	Close	The batch displayed in the control is closed; the control no longer shows any data. You can display a new batch in the control at any time.
	View	Opens a menu in which you can select a control recipe view. The following views are available for selection: • Overview • Right • Left • Top • Bottom • Above • Below
	Add to favorites	Adds the selected object to the favorites.
		Removes the selected object from the favorites.

Favorites of the control recipe

The favorites of the control recipe are based on the master recipe used. This means that if another control recipe based on the same master recipe is opened, the recipe-related favorites are made available to you as well.

Operation of the control in process mode

The requirements for operation in process mode:

- The control has been inserted in a process picture and appropriately configured.
- WinCC Runtime has been started and the process picture with the BATCH controls is displayed.

- A BATCH project has been connected via the master.
- SIMATIC BATCH has been started on the PC from which the BATCH project originates.

Several process operations in the control are listed below:

1. Update your project data with the function provided for this in the toolbar.
2. Display the planned batch in the "SIMATIC BATCH OS Properties" control. To do so, double-click the appropriate batch in the planning list in the "SIMATIC BATCH OS Process Cell" control.
3. Release the batch. Select the batch in the navigation area and select the "Release batch" command in the shortcut menu.
4. Start the released batch. Select the batch in the navigation area and select the "Start batch" command in the shortcut menu.
5. Watch the batch execution on the "Control recipe" tab and in the control recipe view in the display area. Open all folders up to the recipe phase level to display the respective status.
6. Hold a recipe element immediately. Select an ROP in the navigation area and select the "Hold step" command in the shortcut menu.
7. Resume the immediately held recipe element. Select the held recipe element and click the "Resume batch" command in the shortcut menu.
8. Change a recipe parameter. Select the corresponding recipe phase in the navigation area and open the "Parameters" tab. Enter a new setpoint for the desired parameter in the "Setpoint" table column.
9. Change the unit allocation. Select the corresponding unit of your batch in the navigation area and open the "Allocation" tab in the display area. Select the desired unit in the selection box of the "Unit" column.

You have now used the most important commands and procedures in this control.

Additional information

Applications in process mode (Page 666)

See also

Hide parameter (Page 687)

11.3.5 Control: SIMATIC BATCH OS Batch Creation

What is the purpose of the "SIMATIC BATCH OS Batch Creation" control?

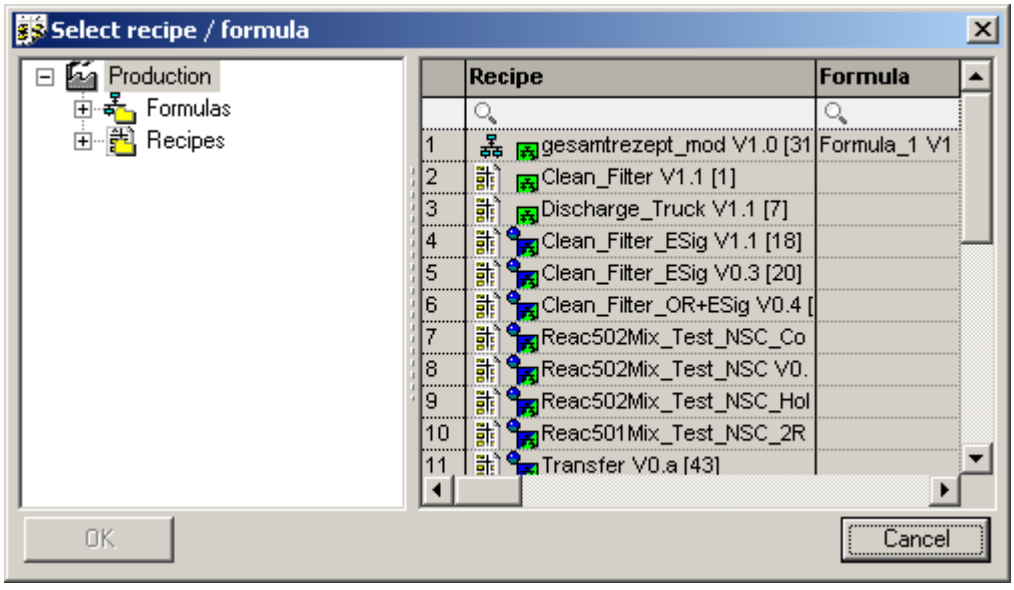
The control is used to create batches. There are two ways to create batches. Either select an existing recipe or an existing formula and the order category, or use the data from an existing batch as a template. In the latter case, use the "New batch(es)" command in the OS controls "Process Cell", "Allocation" and "Properties". In the case of multiple selection of template batches, the data of the first batch selected in the Control is always used.

Using existing batches as the basis for creating new batches

Whenever you use the "New" command in the OS controls "Process Cell", "Allocation" or "Properties", the selected batch is applied and displayed with its basic data (order category, order, etc.) as the new batch in the control "SIMATIC BATCH OS Creation". Use the "Generate batch(es)" or "Release batches" button in the OS control "Creation" to create one or more batches. New batches will then be listed as planned or released batches in the entire list or planning list for the OS control "SIMATIC BATCH OS PCell". Use this approach to easily create new batches in a simple manner based on an existing batch.

Open selection dialogs for master recipe/formula and order category

Click on the button to the right of the "Formula:" field to assign a master recipe or formula to a batch. The following dialog opens:



Here you select the required master recipe or formula and click on the button "OK".

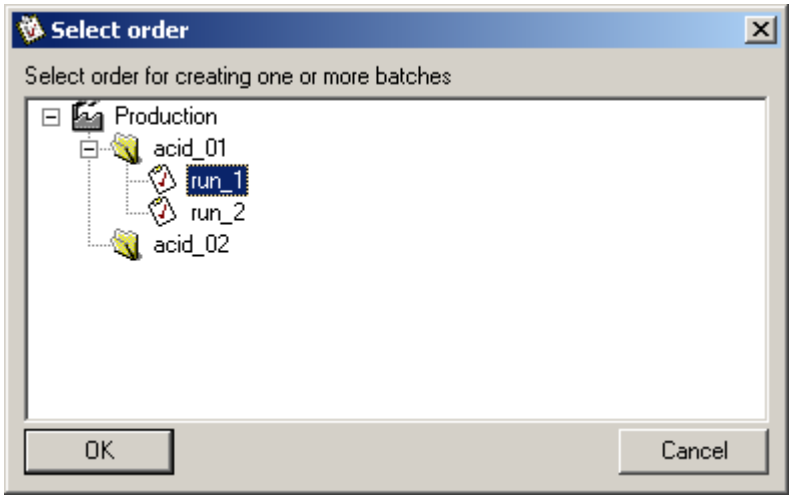
Note

Update in the control

Moving recipes/formulas to new folders within the BatchCC is only visible in this control after reactivating the corresponding BATCH project in the OS Master control.

These limitations do not apply to newly created recipes/formulas, including in new folders.

To assign an order to a batch, click the button to the right of the "Order category" box. The following dialog opens:



Select the required order and click "OK".

Toolbar

The toolbar lists the commands "Dock/Undock", "Undock automatically" and "Change". Use the command "Change" to represent one of the listed OS Controls in the work area as undocked OS Control if the command "Undock automatically" has been activated there.

Creating new batches

You create new batches as follows:

1. Click on the "..." button in the control to the right of the "Formula" display field.
2. In the dialog that opens, select a recipe or formula.
3. Click the "..." button to the right of the "Order category" display field.
4. In the dialog that opens, select the desired "Order".
5. Enter a batch name in the "Name" input box.
6. Enter the desired batch quantity in the "Quantity" text box.
7. Enter the desired start time.
8. Select the start mode. The following can be selected:
   - Operator action: Batch start with manual operation.
   - Immediately: Batch start immediately after release of the batch.
   - Time-driven: Batch start with specification of the start time.
9. Enter a descriptive text for the batch.
10. Specify the number of batches you want to produce. The batch name will automatically receive a consecutive number.

11. If you want the system to automatically release the new batches, select the "Release batches automatically" check box.
12. Use the "Generate batch(es)" or "Release batch" button. The label of the button and thus the command are dependent on the selection of the "Release batches automatically" check box.

You have now used the most important commands and procedures in this control.

11.3.6 Control: SIMATIC BATCH OS Monitor

What is the purpose of the "SIMATIC BATCH OS Monitor" control?

Messages relating to actions and reactions in the OS controls are displayed in this control. Always insert this control in your process picture. This control will let you track all the actions performed in process mode based on the messages.

Note

Even if you want to control and monitor more than one batch process cell in a process picture, insert the BATCH OS "Monitor" control (CtrlBOSMonitor) only once per process picture. Messages will be output for all batch process cells in this one control.

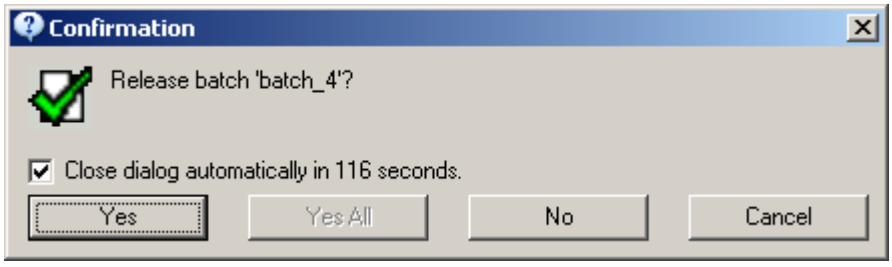
Messages document your process and are continuously generated by the system or by operator actions. The messages are shown in a table. They are sorted according to the time they enter a table and are assigned a separate line in the table. Each table row is subdivided into the following columns: Message number, message status with symbol, message text and message date. By clicking in the column header, you can change the message sorting to suit your needs. In the filter row, you can enter a filter criterion for each column, enabling you to filter according to specific messages. Commands on the toolbar and shortcut menu allow you to update, cancel, delete and confirm messages.

Additional information

Important system messages (Page 621)

Process actions and their confirmation in the dialog

A dialog appears for all your process actions to confirm the action you have triggered. All actions in the confirmation dialog create messages in the control, providing you with important information on process actions and the system.



Buttons:

Button Icon Check box	Meaning
Yes. Note: The button label may vary depending on the action	You confirm the selected action by clicking "Yes".
Yes, all.	You confirm the selected action for all objects by clicking "Yes, all".
No.	The selected action will not be performed.
Cancel	Cancels one or more actions. The action will not be performed.
Close dialog (Close button at the top right of the dialog.)	Closes the confirmation dialog with no action performed. The action remains pending and can be performed at a later point in time. To do this, open the message again.
Title bar	A symbol suitable to the action is displayed with the dialog name.
Action symbol with message text	The corresponding symbol and the message text are shown in the dialog for every action.
"Close dialog automatically in ... seconds" check box	If you select the check box, the confirmation dialog is automatically closed after a time specified by the system. If you clear the check box, the dialog remains open until you close it.

Table headers in the control

The control has the following table headers:

- Msg. no. Message number The message number is generated sequentially by the system.
- Status: In addition to the status information in text form, each message status also contains a status symbol to make it easier to understand. See Symbols for the message status.
- Message: Meaningful message in text form.
- Date: Time stamp of the message in the date format (DD.MM.YYYY) and time format (SS:MM:HH) (UTC +1). UTC = Universal Time Code.

Symbols for the message status

Symbol	Message status	Note
	Completed	The action is completed. 1 of 1 means that one command from a total of one command has been executed. If you select 10 objects, for example, and then use the "Release batch" command for all objects, 10 of 10 is displayed here when all commands have been executed.
	Error	An error is pending.
	User action required	This action requires a user action in the "Confirm" dialog and applies to all actions, except for the action "Create batch or batches".
	User action required	This action requires a user action in the "Confirm" dialog and only applies to the action "Create batch or batches".
	Aborted	The action was aborted This action remains in the message window until it is deleted. 0 of 1 means that no command from a total of one command has been executed.
	Running	Action is running.
	Important system message	An important system alarm is pending.

Symbols and message text for the message

Suitable symbols are shown for many message texts in the "Message" table column. This makes it easier to assign symbols to message texts and easier to interpret messages.

Symbol in message text	Note
	The master server of the project is not available.
	The BATCH process cell data of the connected project is currently being created, updated, restored or compressed.

Toolbar and shortcut menu with operator functions

The operator functions on the toolbar and shortcut menu are context-sensitive. This means that only operator functions/commands available for a specific situation are offered for use or enabled.

Symbol	Command	Note
	Docking/undocking	Undock: The OS control is detached from the process picture and can be resized and positioned anywhere in the workspace. Dock: The relevant undocked OS control is reinserted at its original position in the process picture.
	Show Properties	Opens a confirmation dialog when the selected messages have the status "User action required". Or shows the error in a dialog.
	Cancel	Cancels a started action. You can only use the "Cancel" command when the message has the status "User action required".
	Delete	You can only delete the selected messages with the status "User action required" and "Aborted".
	Update	Update the content of the message window.

Operation of the control in process mode

The requirements for operation in process mode:

- The BATCH control has been inserted in a process picture and appropriately configured.
- WinCC Runtime has been started and the process picture with the BATCH controls is displayed.
- A BATCH project has been connected via the master.
- SIMATIC BATCH has been started on the PC from which the BATCH project originates.

Several process operations in the control are listed below:

1. Update your project data with the function provided for this in the toolbar.
2. Sort the messages according to your needs. You can, for example, sort them by ascending or descending message number. To do so, double-click the "Msg. no." column header.
3. Deleting specific messages. Select the desired messages in the control and click the "Delete" command in the toolbar. The messages are deleted from the message window.
4. Open another confirmation dialog. Select the message line and click on the "Properties" symbol in the toolbar.
5. Cancel a message requiring user action and delete it. Select the message with the status "User action required". Click on the "Abort" symbol in the toolbar and then the "Delete" symbol.

You have now used the most important commands and procedures in this control.

11.4 Applications in process mode

11.4.1 Display actual quantity

The current order quantity as well as the batch quantity is displayed in the following OS controls. To display the value, a corresponding process value reference for the master recipe used in the batch must be specified. The process values are only displayed in the dialogs when the batches are completed. An update with open dialogs is not intended.

Information on the current quantity

OS control "Process Cell":

- Properties dialog of a batch
- Overview lists (Entire list and Results list)
- Property dialog of an order. If the units of measure for the process value reference and planned quantity are not the same, "<not unique>" is displayed for the unit of measure.

OS control "Properties":

- Batch tab

11.4.2 Showing tooltips

Information in tooltip

Hover the mouse pointer over an object in an OS control to display a corresponding Tooltip. The tooltip contains lots of useful information about the object. The tooltip remains visible until you move the mouse pointer away from the tooltip area.

Showing tooltips

As default, tooltips are not activated in the control properties and are therefore not available in process mode.

If you want to use the tooltips, set the control property "TooltipsEnable" for the SIMATIC BATCH OS Master control to "Yes" during configuration in the Graphics Designer. This setting then applies to all BATCH OS controls that can display tooltips.

Which objects in which OS controls contain tooltips?

Tooltips are available in the following OS controls:

OS control	Tooltips are displayed for the following user interface objects:
SIMATIC BATCH OS Process Cell	Icons in the toolbar
SIMATIC BATCH OS Allocation	Icons in the toolbar, allocation
SIMATIC BATCH OS Properties	Icons in the toolbar, graphic recipe display

11.4.3 Color text boxes

Information from text box colors

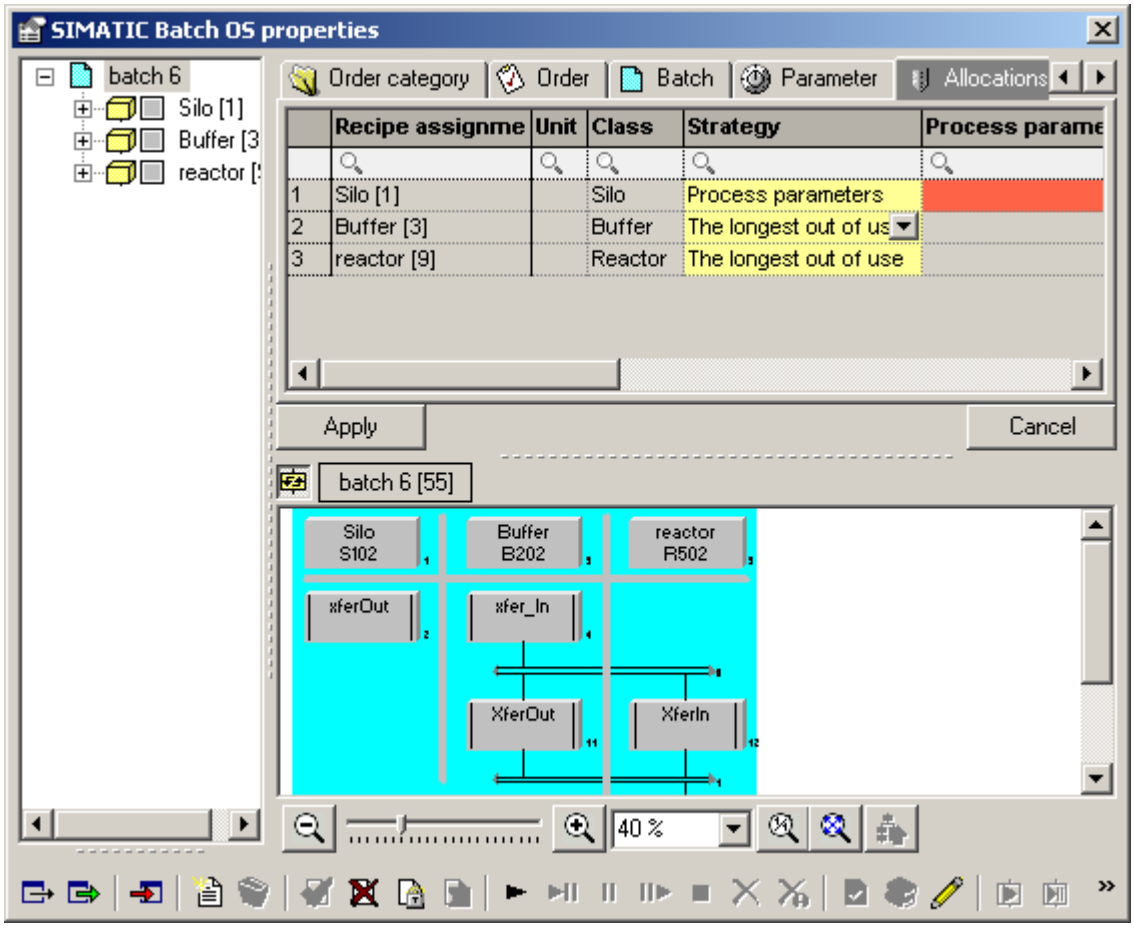
The entries you make in text boxes in BATCH OS controls are checked by the system and classified by adding color markers to the corresponding cell.

A yellow marker in the cell means that the cell has been edited and that the input is valid. You can reject your entries by clicking "Cancel" or save them by clicking "Apply".

An orange background marker means that an input is still missing.

A red marker means that your entry contains an error and cannot be applied by the system or that the BATCH Server rejects the entered values. Change your selection or the value for the row and then click the "Apply" button. A yellow marker means that the box is being edited.

A Caution symbol is displayed in a cell when you exceed the specified limits when entering parameters.



11.4.4 User settings

Introduction

Within the BATCH OS controls you can customize the preconfigured default settings for the appearance of controls.

The following user settings are saved in all OS controls:

- Window size
- Window position
- Changes in size of the individual areas within the Control by the perforated scroll bar. The change in size of the individual areas using the scroll bar can be set differently for an undocked and a not undocked Control.
- Layout or arrangement of the areas in the control. This setting is only valid for the Properties control and only if a default has not been set for the "ToolbarOrderAndVisibility" attribute.

General response of BATCH OS controls in process pictures

- When a process picture is closed, all user settings for this picture are saved temporarily and locally on the OS client for each individual client. This means that when an OS client is closed, all user settings saved for this OS client are lost. As a result, the default settings are restored every time an OS client is restarted.
- When a corresponding process picture is opened, all modified settings are read in on an individual client basis.
- Every time a different picture is selected, the most recent user setting saved is read in. Even in the case of visualization on multiple screens, the setting you saved last is always displayed. If, for example, a process picture open on multiple screens is closed on those screens one after the other, only the setting from the last picture closed remains saved.
- All user settings made using scripts have a higher priority and overwrite individual client user settings.
- All agreements apply in addition, without restriction, and separately even for undocked controls; in other words, controls which are placed in the workspace outside of WinCC.

11.4.5 Making Runtime help available

Help button in the BATCH OS controls toolbar

You can add a help button to the toolbar in each BATCH OS control. You use this button to launch the online help for the corresponding BATCH OS control in process mode. The delivery status does not include calling up the online help. You configure the availability of the online help in WinCC Explorer.

Requirements

- The BATCH project is in process mode (Runtime).
- All BATCH OS Controls will be displayed on the screen in a process picture.
- You have the necessary user permissions.
- The WinCC Explorer is open.

Procedure in WinCC Explorer

1. Open the OS project editor.
2. Select the "Runtime help available" check box on the "Layout" tab of the "OS project editor" dialog.
3. Close the dialog with "OK".

Result

The project has been reconfigured. If you change to a process picture that contains all the BATCH OS controls, you will notice that a help button has been added at the right end of each toolbar to call the online help. Click the help button to open the corresponding context-sensitive help.

To deactivate the online help for individual BATCH OS Controls, deselect the option "Runtime help available" in the "OS project editor" dialog.

11.4.6 Chaining batches

Chaining batches in the BATCH OS Process Cell control

In this Control, you can chain batches or cancel the chaining of batches. Chaining is possible if the predecessor batch does not have the status "Archived" or "Archiving" and if the successor batch has the status "Planned", "Enabled" or "Blocked" with interlock (no editing possible). No chaining is permitted to already exist and no cycle is permitted to arise in the chaining.

To chain two selected batches, a shortcut menu with the "Chaining" command group is available. You can revoke the chaining of previously chained batches. Once again, the appropriate command is available in the shortcut menu.

Set chaining parameters such as mode and time offset in relation to the previous batch (GAP Time) in the BATCH OS Properties Control once you have chained the batch in the BATCH OS Process Cell Control.

User permissions for chaining

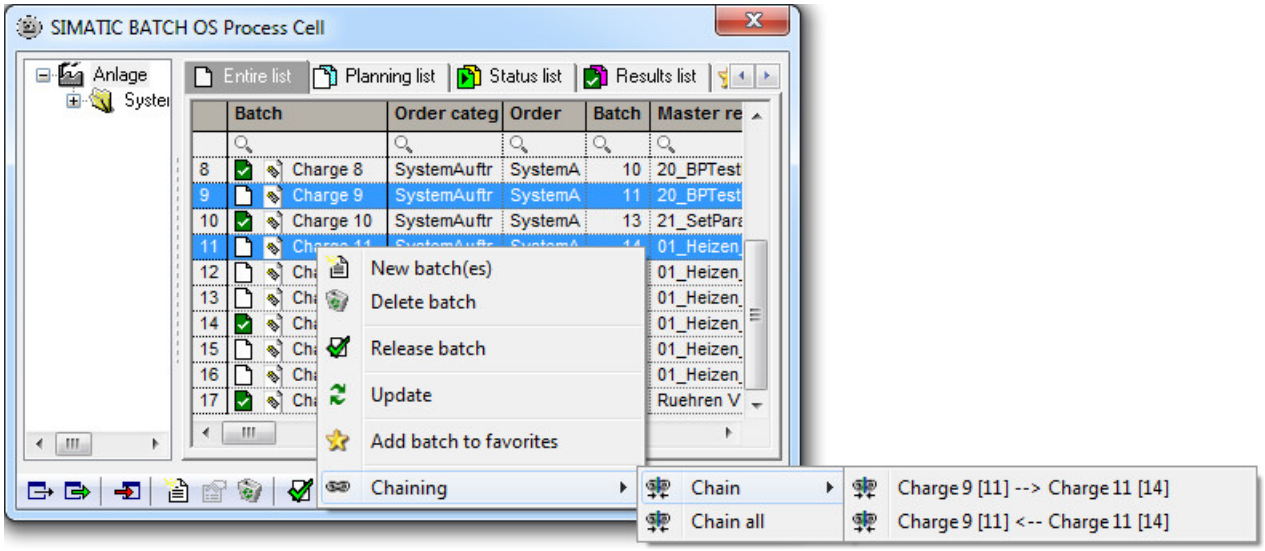
Settings for the chaining parameter and the time offset GAP Time mode in relation to a successor batch can be made with the required user permissions.

Functions that are not supported

- Electronic signatures (ESIGs) for batch chaining actions are not supported in the Control.
- The OS control does not support configuration of batch chaining based on the Gantt chart in BatchCC.
- A Gantt chart as displayed in BatchCC is not available for the BATCH OS controls. Enter the start time for the start batch of a batch chaining under "Planned start" on the "Batch" tab for a selected batch in the BATCH OS Properties control .

"Chaining" shortcut menu

The "Chaining" command is only available in the shortcut menu if you select two batches.



Shortcut menu command	Cascading menu 1	Cascading menu 2	Meaning
Chaining	Chain	→ ←	Chains the selected batches whereby the arrow points to the successor.
	Chain all		Chains all the selected batches to each other.

When you select a chained batch and open the "Chaining" shortcut menu, the following editing commands are available to you.

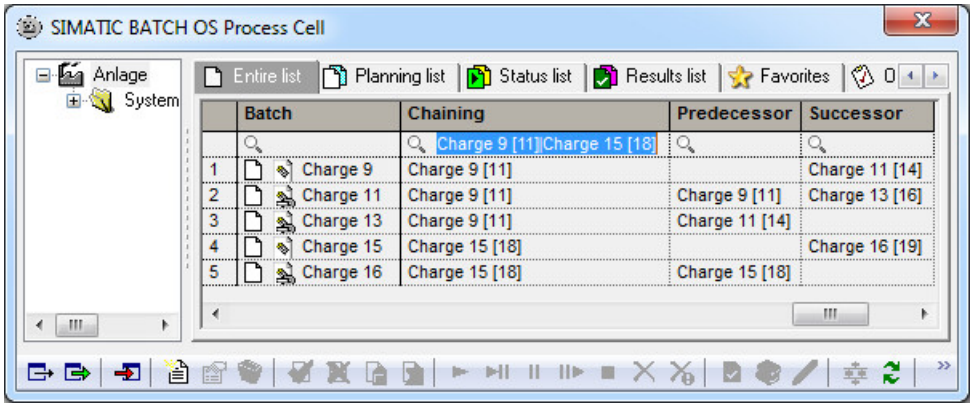
Shortcut menu command	Meaning
Go to predecessor	This shortcut menu command is only enabled if there is a predecessor batch. Selects the predecessor batch in the chain from the corresponding list.
Go to successor	This shortcut menu command is only enabled if there is a predecessor batch. Selects the successor batch in the chain from the corresponding list.
Unchain	Cancels the chaining to the successor batch for two selected and chained batches.
Clear chaining to predecessor	Clears the chaining to the predecessor batch. The following menu shows which batch is the predecessor batch. This command is only enabled if there is a predecessor batch.
Clear chaining to successor	Cancels the chaining to the specified successor for the selected batch.
Release all chainings	Cancels the chaining for the selected batches to their predecessor and successor batches.

Showing all chained batches

You can filter according to chained batches on all tabs in the SIMATIC BATCH OS Process Cell control as long as they appear in the various lists. Use the "Chaining", "Predecessor", and "Successor" tabs to show information about chained batches.

To show multiple chained batches, enter a combined filter criterion.

In the following figure, for example, Batch 9 [11]|Batch 15 [18]:



Column titles for chaining

Information about chained batches is shown in the "Chaining", "Predecessor", and "Successor" columns.

The name followed by the ID number of the first batch in the chain is displayed in the "Chaining" column. The ID is shown in square brackets. If a batch is not chained to other batches, the column is empty. The next two columns, "Predecessor" and "Successor", are also empty.

Chained predecessor and successor batches (if there are any) are displayed in the "Predecessor" and "Successor" columns respectively, followed by the batch IDs.

Additional information

For information about setting the mode and on GAP time, refer to the section "AUTOHOTSPOT".

11.4.7 Mode and GAP time settings for chained batches

BATCH OS Properties control, "Chaining" tab

The mode and time offset settings for chained batches can be made in the BATCH OS Properties Control. The corresponding user permissions for controls are required if you wish to change chaining properties. The Chaining tab is structured as follows:

"Chaining" tab table structure

Chained batches are displayed via the "Open control recipe" command in the shortcut menu. All chained batches are always displayed.

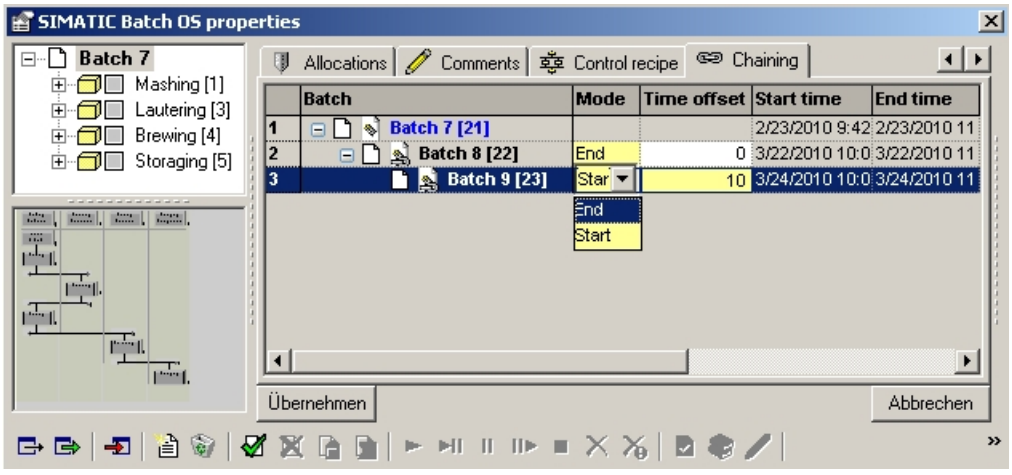


Table columns	Meaning	Functions
Batch	All batches in a chain are displayed here.	Use the +/- characters to show the predecessor/successor batches on the display.
Mode	Start logic operation or end logic operation. Should the successor batch be started when the predecessor batch starts or when it finishes?	The selection menu with the two modes "Start" and "End" is displayed when you click a cell in the "Mode" column for a chained batch. Select the type of logic operation.
Time offset	The time offset (also known as the GAP time), is the time between the end and the start of two chained batches.	Click a cell in the "Time offset" column with the mouse for a chained batch and enter the required time offset in seconds. The successor batch does not start until the time offset you specified is reached.
Start time	Displays the original planned start time for batches. The start time is specified when the batch is created.	None.
End time	Displays the end time originally calculated. The end time is determined by the master recipe used; it is calculated by the system.	None

Additional information

You will find information on chaining batches in the section "AUTOHOTSPOT".

11.4.8 Display of parameter interconnections

Display of interconnected parameters

Interconnected parameters (cross-interconnections and target interconnections) are displayed and edited on the "Parameters" tab in the OS Properties control.

Symbol in the "Name" table column	Meaning
	Part of a cross-interconnection.
	Part of a target interconnection.
	Part of a cross-interconnection and target interconnection.

Each parameter row shown in which one of the three symbols above is displayed contains command(s) to navigate to the corresponding parameter (source/target) in the shortcut menu. For example, if you select the batch folder in the navigation area and have also selected the "Parameters" tab, you will see all interconnected parameters of the control recipe of the batch at a glance. In the shortcut menu, the symbols indicate which direction you can navigate in the recipe hierarchy.

Additional information

Parameter interconnections (Page 596)

11.4.9 Searching batches

Using the search in the OS control properties

A button  is provided in the OS control properties for opening a search dialog allowing you to search for elements in a control recipe of an open batch.

The search always relates to the batch control recipe displayed in the OS control. The search results are displayed in tabular form at the same time with your entry and selection criteria. Each hit location is displayed in a row with the following columns:

- Type: Indication of the type found, for example, a parameter
- Element: Indication of the element found in the control recipe or in the batch
- Text: Indication of the found text

You can filter the contents of each column (Type, Element, Text) according to your requirements. To do this, enter your filter argument in the corresponding filter row of a column.

The found text is displayed in the lower section.

When you double-click on a result row, the found element is marked in the control recipe.

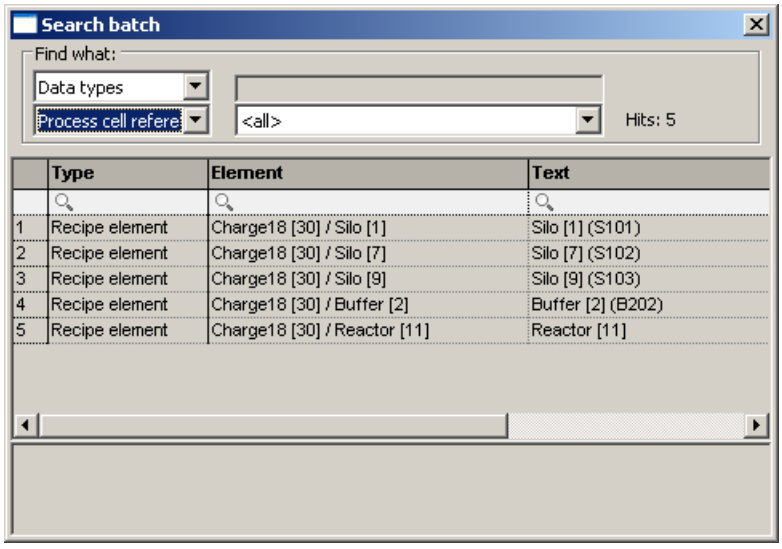


Figure 11-1 "Find" dialog (OS control)

Restrictions

The following restrictions apply for the search in the OS control properties compared to the search in BatchCC:

- The text search ignores labels on recipe elements.
- The search result cannot be saved.
- Searching within comments is not supported.
- In the text search, e.g., numbers, limits, setpoints and process values are not taken into consideration.

Additional information

Find recipe elements (Page 1087)

11.4.10 Display of transfer parameters

Display of transfer parameters

Interconnected transfer parameters (Via, Source, Destination) are displayed and edited on the "Parameters" tab in the OS Properties Control.

Transfer parameter symbol	Meaning
	Via transfer parameter
	Source transfer parameter

Transfer parameter symbol	Meaning
	Source Destination transfer parameter
	Source Destination Via transfer parameter
	Source Via transfer parameter
	Destination Via transfer parameter
	Destination transfer parameter

For each transfer parameter row listed, you can call up a drop down list box in the "Location" column and select and assign a transfer location. To do this, the batch must not have been started and the recipe step concerned must not be in progress.

When a recipe procedure element is running, changes to transfer parameters are only applied in the AS if you use the "Effective immediately" option in the recipe's parameter properties.

Click the "Apply" button to save your changes for Route Control.

11.4.11 Assigning materials

Input material and output material

Materials created in the BCC can be used as input material, as output material, and as input and output material. You can change the purpose assigned to a material if the batch has not yet been started or if the batch is not yet processing the recipe step concerned.

In the BATCH OS Properties control, select the batch/RUP/RPH concerned and click the "Parameters" tab. In the "Materials" column, you can overwrite or change the preselected material usage by selecting the usages listed in the drop down list for each specified parameter line. Please take into consideration that the option "effective immediately" was activated in the used master recipe in the recipe editor for the parameter import into the AS.

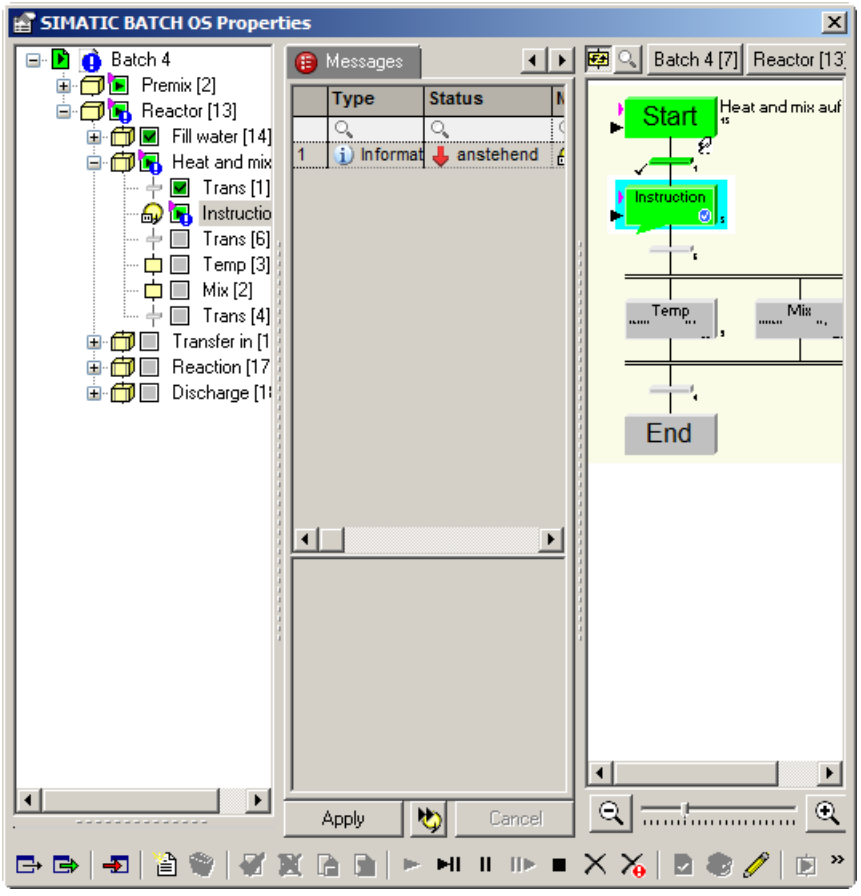
The following symbols define the materials:

Symbol	Meaning
	Input material
	Output material
	Input material and output material

11.4.12 Instruction in the operator dialog

Instruction in the operator dialog

If you configure operator instructions with blocking of the batch in a master recipe, the batch is not processed again automatically until you apply the individual instructions.



As soon as an operator instruction is pending, the corresponding batch step is overlaid by a blue symbol in the navigation area. The following symbol is also displayed in the tab area:



Figure 11-2 Jump to instruction

When you click on the symbol, you jump to the corresponding batch step in the "Instruction" tab. You can also select the batch step in the navigation area and open the "Instruction" tab. The instruction text is displayed in the "Instruction" tab; click the "Apply" button to acknowledge it. Batch processing then continues.

Pending operator instructions are automatically displayed in the message list of the "Messages" tab. This tab also offers the functions "Apply" and "Jump to instruction".

11.4.13 Visualization and operator control of transition conditions

BATCH OS Properties control, "Condition" tab

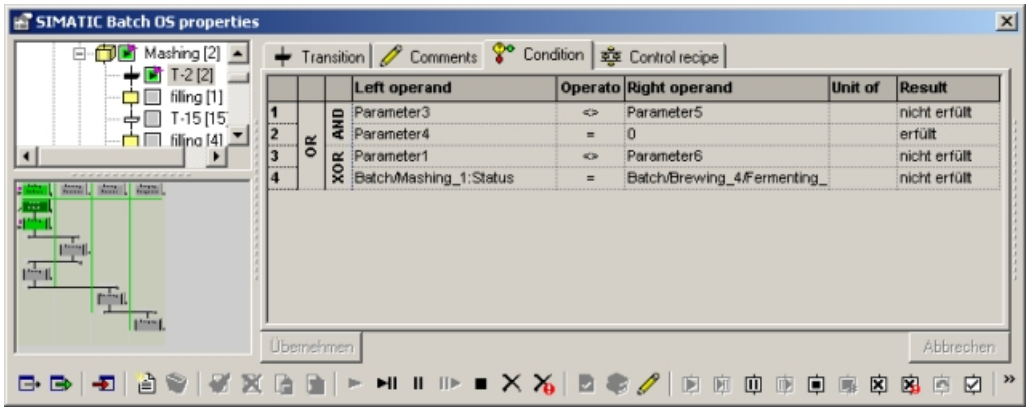
If a master recipe you are using contains transition conditions for enabling recipe steps, these transition steps are displayed in solid black in the navigation area.

Satisfying a transition condition

If a transition is not step-enabled because the process does not meet the transition conditions, manual step enable is possible using the "Complete step" command.

Displaying a transition condition

Click the transition in the navigation area to display the tab corresponding to the transition in the tab area. Go to the "Condition" tab, where the transition condition is displayed.



11.4.14 Positioning BATCH OS controls

Undocking and automatically undocking OS controls

When the "Dock/Undock" or "Undock automatically" commands are used, the OS controls are generally opened on the screen where the mouse pointer is positioned. It is possible to move OS controls around the workspace. The size and position of each OS control are stored in memory. When an OS control is undocked again manually or automatically, the stored size and location are used to display it.

Changing the size of an OS control

You can reduce the width of all outdocked OS controls so that the toolbar with the commands will be cut off. Click on the chevron symbol to expand the toolbar.

11.4.15 Filtering in BATCH OS controls

Using filters in OS controls

For filtering the lists, you can generally use the placeholders "*" and "?" for other characters in all OS controls. Filter searches are not case-sensitive. The linking character " | ", also often referred to as "pipe", is interpreted as "or".

Example

The search criterion "a*|b*" shows all rows with columns that start with a or b.

Note

If you are using the linking character " | " in folder names within the BatchCC, it cannot be resolved as a search criterion in the OS controls.

11.4.16 Sorting in BATCH OS Control

In OS controls you can sort the content in columns in the following batch lists:

- Entire list
- Planning list
- Status list
- Results list
- Favorites
- Order list

The sorting per user is persistent.

Requirement

The OS control is displayed.

Procedure

1. Click on the column name.

Result

With the first click, the contents of the column is sorted in ascending order.

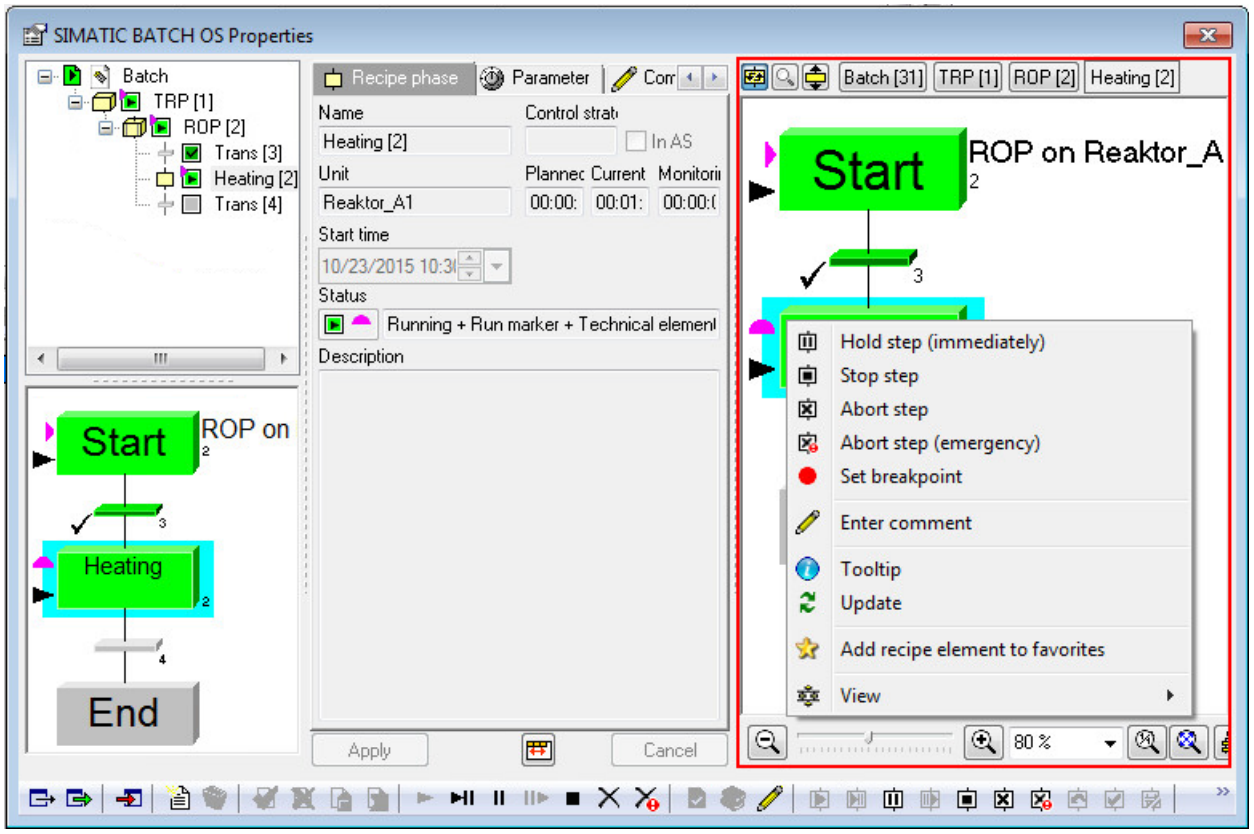
The second click sorts the contents of the column in descending order.

With each additional click, sorting alternates between ascending and descending order.

11.4.17 Visualization and operation of control recipes

Visualization of the control recipe in the BATCH OS Properties control

All recipe steps of the batch control recipe are displayed in this OS control. The status of individual recipe steps is identified by a color. The recipe overview is visible in the display area, inside the red border in the screenshot.



Functionalities

If you double-click on a recipe procedure element (RPE) in the display area, the corresponding tab is displayed in the tab area. There, you can make the settings and set operator actions for the selected RPE.

The following functionalities are offered.

Display area:

- Recipe step processing in the shortcut menu
- Display and edit properties of RPEs
- Zoom function
- Scroll bar for navigation
- Search function

- Autofocus function
- Display of substructures in the tooltip, if used
- Automatic and manual update of the recipe graphic
- Use of "Manual jump" functionality

Tab area:

- Enter RPE setpoints in "Online parameter modification" mode
- Display and operate operator dialogs
- Enter and acknowledge process values
- Display and operate transition conditions. Change transition logic or transition values

Handling the control recipe view in the OS control

The control recipe view in the OS control is a constantly up-to-date image of the active batch. The status of each recipe phase and the conditions of each transition are displayed in real time.

You can use the zoom function ① to resize the control recipe to suit your requirements depending on the available space. The zoom factor ② affects the size of the focus window in the overview window. The focus window ③ can be moved in the overview window, thereby moving the focus on the control recipe in the display area also. Settings in the control recipe view in the display area ④ have no effect on the control recipe view on the "Control recipe" tab in the tab area.

The shortcut menu ⑤ that opens when you select a recipe element provides commands for processing recipes and for the size ⑥ of the recipe view within the OS control. The set layout or arrangement of the areas in the OS control is saved as user settings if no default has been set for the "ToolbarOrderAndVisibility" attribute.

When you activate the Synchronization button ⑦, operations and selections are synchronized in all display areas. When the button is deactivated, operator inputs in the navigation area are not synchronized with the corresponding recipe steps in the overview area.

A mouse click on the Search ⑧ button opens the "Search batch" dialog.

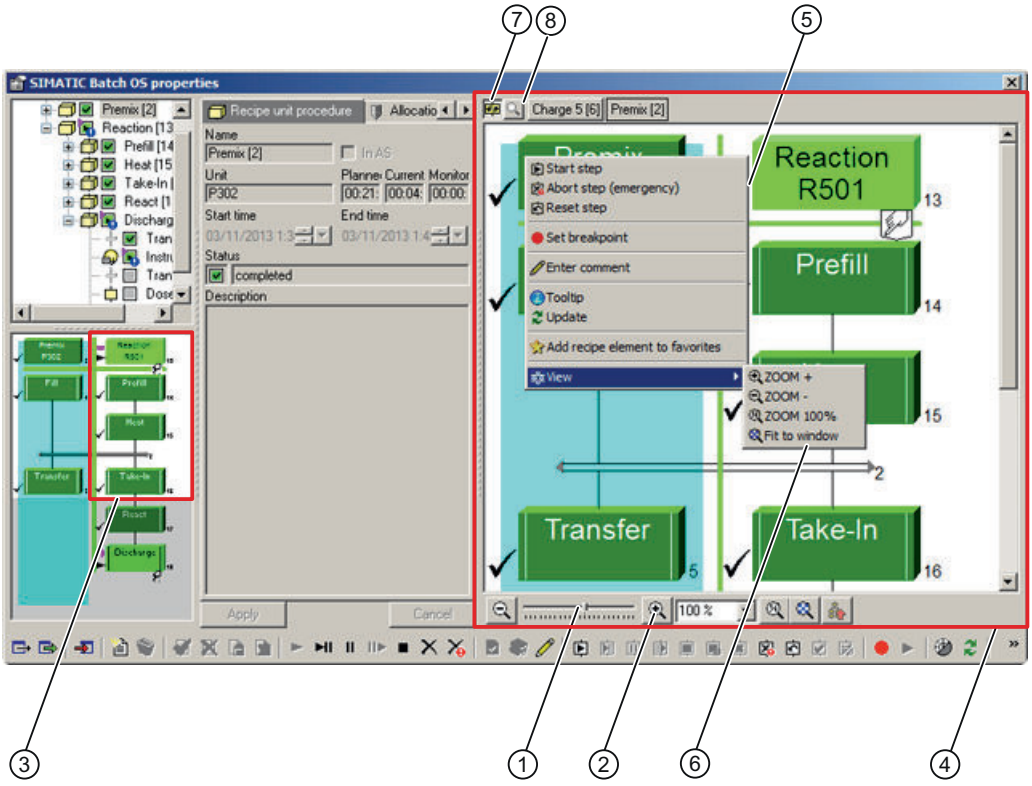


Figure 11-3 Control recipe view shortcut menu

Focus on active batch element

In the figure below, the SIMATIC BATCH OS Control Properties for a simple linear control recipe is displayed.

Simple linear control recipes consist of an RUP and do not include synchronization, a jump, an alternative branch or parallel branch.

Autofocus is automatically activated for batches based on such control recipes.

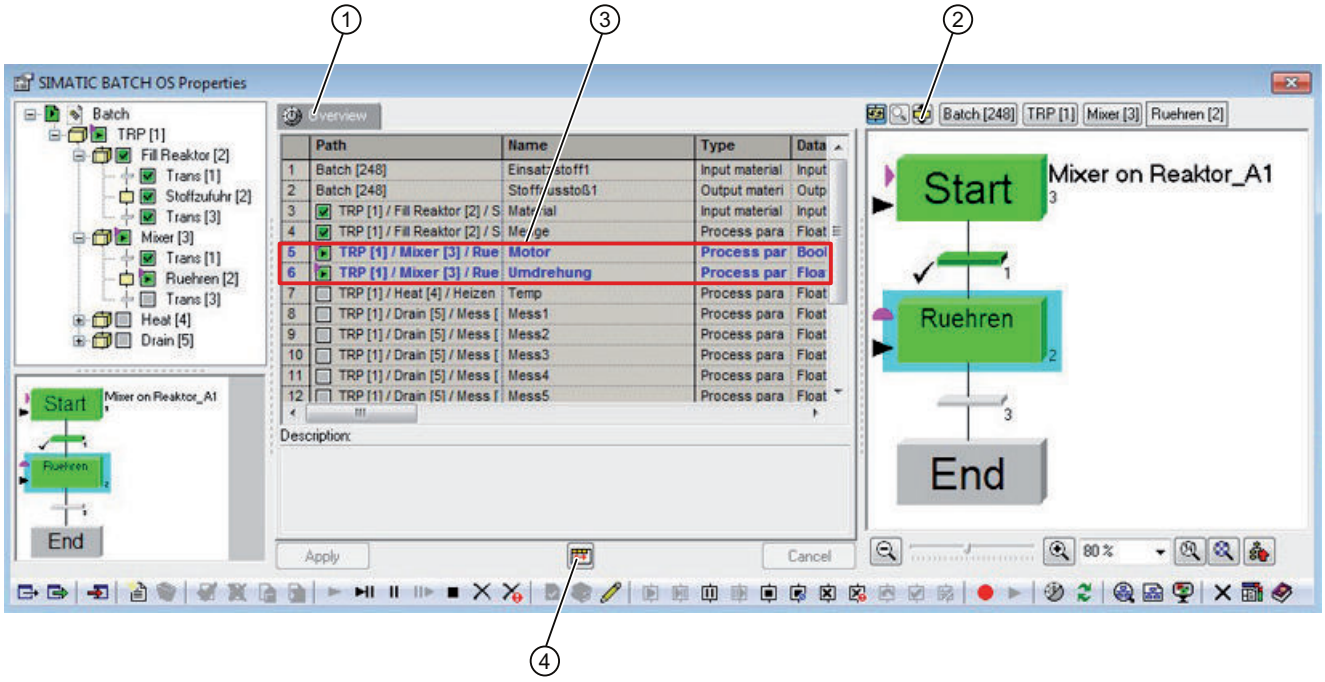


Figure 11-4 Focus on active batch element

The command icon Autofocus ② and Window change ④ is offered for use in the display area. The "Overview" ① tab is displayed in the tab area. Parameters of the active batch step are highlighted in blue ③. The active batch element is continuously opened and focused automatically down to the recipe phase level in the display area.

Autofocus is activated or deactivated with the button ②. A mouse click on the button ④ changes the view in the tab area from the "Overview" tab to the standard tabs.

Additional information

Control: SIMATIC BATCH OS Properties (Page 647)

11.4.18 Printing, viewing and exporting a batch report

11.4.18.1 Overview of printing and the print preview

OS Control "SIMATIC BATCH OS Process Cell"

You can print the batch report with the shortcut menu of a batch in the OS control "SIMATIC BATCH OS Process Cell" or display a print preview for the batch report.

You can print or export the batch report in the print preview.

You can only open one print preview, regardless of the number of OS controls used and the projects connected to the OS controls.

The view of the print preview is the same view as the print preview in BatchCC.

The "Print" shortcut menu command immediately sends the entire batch report to the default printer without further prompting. The default printer is the one set under Windows as the default printer.

The shortcut menu commands are not available on a Web client.

Note

Access to the operating system may be possible

- When setting up the system for using XPS and PDF printer drivers
- When operating in the print preview
  - "Print"
    Opens system dialog to select the printer, the number of copies, etc.
  - "Save" the reports (export)
    Opens a system dialog to select the directory/file name

Permission management may restrict these options according to customer requirements.

Requirements

- You have made the settings in the BatchCC for reporting.
  To make the settings, select the menu command **Options > Settings > Project settings** in the "Report creation" area.
- You have the necessary authorizations.
  To set the authorization, select the menu command **Options > Permission management** in the "Operator > OS-Controls" section of the "Individual permissions" tab.

Shortcut menu commands

The table shows the available shortcut menu commands:

Shortcut menu command	Authorization	Function
Print > <Selection of the report template[1)]>	Print batch report (OS controls)	All suitable report templates available on the information server are displayed and can be selected.
Print Preview > <Selection of the report template[1)]>	Open print preview (OS controls)	
Print Preview > <Selection of the report template[1)]> "Print" button	Open print preview (OS controls) and Print batch report (OS controls)	The batch report is printed.
Print Preview > <Selection of the report templates[1)]> "Export" button	Open print preview (OS controls) and export the batch report (OS controls)	The batch report is exported.

[1)] Select a suitable report template. The report templates are available on the IS.

The shortcut menu commands are available in the following tabs:

- Entire list
- Planning list
- Status list
- Results list
- Favorites

Additional information

You can find information on user rights in the section "Specifying user permissions (Page 308)".

You can find information on printing in the section "How to print a batch report (Page 685)".

You can find information on the print preview in the section "How to view the print preview (Page 686)".

You can find information on the OS control "SIMATIC BATCH OS Process Cell" in the section "Control: SIMATIC BATCH OS Process Cell (Page 637)".

You can find information on printing in process mode in the section "Security aspects (Page 82)".

11.4.18.2 How to print a batch report

The function is not available on a Web client.

Requirements

- The settings for reporting are made in the BatchCC.
- The user has the required operator authorization.
- The OS control "SIMATIC BATCH OS Process Cell" is open in process mode.

Procedure

1. Select the desired tab.
2. Select the batch.
3. In the shortcut menu, select the command "**Print** > <Selection of the report template>".

Result

The "Print" command immediately sends the batch report without further prompting to the default printer set under Windows.

A successful or unsuccessful print job is displayed in a message window and the "Messages" OS control.

Additional information

You can find information on the settings for reporting and the operator authorization in the section "Overview of printing and the print preview (Page 683)".

11.4.18.3 How to view the print preview

The function is not available on a Web client.

Requirement

- The settings for reporting are made in the BatchCC.
- The user has the required operator authorization.
- The OS control "SIMATIC BATCH OS Process Cell" is open in process mode.

Procedure

1. Select the desired tab.
2. Select the batch.
3. In the shortcut menu, select the command "**Print Preview** > <Selection of the report template>".
4. If you want to print the batch report, click on the "Print" button.
   - A dialog appears.
     In this dialog, for example, you can select a page range, select the printer and set the number of copies.
   - Click on the "Print" button in the dialog.
5. If you want to export the batch report, click on the "Export" button.
   - The standard dialog "Save As" appears.
   - Save the batch report.
6. Close the print preview.

Result

- Print
  The "Print" command immediately sends the batch report without further prompting to the default printer set under Windows.
- Export
  The batch report is exported as a PDF.

A successful or unsuccessful print job is displayed in a message window and the "Messages" OS control.

Additional information

You can find information on the settings for reporting and the operator authorization in the section "Overview of printing and the print preview (Page 683)".

You can find information on security aspects in the section "Security aspects (Page 82)".

11.4.19 Hide parameter

You can hide or display the parameters for phases in the "SIMATIC BATCH OS Properties" OS control.

Requirement

- The user has the user right "Display hidden parameter (OS Controls)".
  To set the authorization, select the menu command **Options > Permission management** in the "Operator > OS-Controls" section of the "Individual permissions" tab.
- In the "Parameters" tab of the recipe editor, the check boxes for the affected phase parameters are selected in the "Hide" column.
- The OS control "SIMATIC BATCH OS Process Cell" is open in process mode. The "Parameters" tab is selected.

Symbol

Symbol	Function	Authorization
	Default setting: The parameters are hidden.	"Show hidden parameters (OS controls)".
	The parameters are displayed.	

Procedure

1. Click on the icon to the display or hide the parameters.

Additional information

You can find information on user rights in the section "Specifying user permissions (Page 308)".

You can find information on the OS control "SIMATIC BATCH OS Properties" in the section "Control: SIMATIC BATCH OS Properties (Page 647)".

11.5 Control properties references

11.5.1 SIMATIC BATCH OS Master

11.5.1.1 CommunicationChannel

String.

Defines the communication channel for the selected BATCH project. All other SIMATIC BATCH OS controls that communicate via this channel can work with this BATCH project.

Note on dynamization

An existing connection to a BATCH project is retained even when the communication channel changes. This means the BATCH project can be used on the previous channel as well as the new one. If you do not want this feature, terminate the connection to the BATCH project before you change the communication channel. You can do this by deleting the project name in the **ProjectName** attribute or the database identification in the **DBIdent** attribute.

Default value = 1, maximum value = 100.

The attribute can be dynamized with the **CommunicationChannel** name.

11.5.1.2 DisplayMode

The attribute "DisplayMode" has no function.

The attribute cannot be dynamized with the **DisplayMode** name.

11.5.1.3 ProjectName

String.

If you enter a project name, only this project is displayed and automatically connected in the control, assuming that a project with this name is available and the "AutoConnect" attribute has the value "Yes".

If you do not enter a project name, the behavior depends on the value of the "AutoConnect" attribute.

By dynamizing (scripting) this property, you can also establish the connection to a BATCH project and terminate it again with an empty name. If you specify the database identification using the **DBIdent** attribute, the **ProjectName** attribute is ignored.

Only one BATCH project can be connected at a given time. If you want to connect to another BATCH project, the existing connection is first closed. If several controls of the type "SIMATIC BATCH Master" (master control) are connected to the same project through different communication channels and a master control closes this connection, all the other master controls will also lose the connection.

The default is no fixed project name.

The attribute can be dynamized with the **ProjectName** name.

11.5.1.4 DBIdent

String.

If you enter a database identification, only the corresponding project is displayed in the control, assuming that a project with this identification is available and the "AutoConnect" attribute has the value "Yes".

If you do not enter database identification, the behavior depends on the value of the "AutoConnect" attribute.

By dynamizing (scripting) this property, you can also establish the connection to a BATCH project and terminate it again with an empty identification. If you enter the database identification using this attribute, the ProjectName attribute will be ignored.

Only one BATCH project can be connected at a given time. If you want to connect to another BATCH project, the existing connection is first closed. If several controls of the type "SIMATIC BATCH Master" (master control) are connected to the same project through different communication channels and a master control closes this connection, all the other master controls will also lose the connection.

Default: No fixed value.

The attribute can be dynamized with the **DBIdent** name.

11.5.1.5 ProjectListColumnWidth

String.

Specifies the width of the table columns in the control. This is only possible if you use **Gridlist - 1** for the **DisplayMode** attribute. The column width setting does not depend on the column arrangement and is separated by a semicolon.

The default values for the column width are shown in the following table.

Table column	Column width
Project	130
Plant; cannot be used	120
Computer name	120
Redundancy	130

The attribute can be dynamized with the **ProjectListColumnWidth** name.

11.5.1.6 ProjectListColumnOrderAndVisibility

String.

Specifies the sequence of the table headers in the OS control. This is only possible if you use the attribute **DisplayMode, Gridlist - 1**. The values in the following table define the table column.

Table column title	Value	Description
Project	1	Name of the BATCH project
Computer name	3	Name of the BATCH server (master)
Redundancy	4	Name of the BATCH server (standby)

The values are separated by a semicolon and entered in the following syntax: 1;3;4. By changing the value sequence, you make a corresponding change in the column sequence. By leaving out a value, the corresponding table column title is not shown in the OS control.

Default: 1;3;4

The attribute can be dynamized with the **ProjectListColumnOrderAndVisibility** name.

11.5.1.7 ProjectListColumnResizeEnabled

Boolean variable.

Specifies whether or not the column width can be changed during process mode. If **yes** is set, an operator can adapt the column width in process mode.

The attribute can be dynamized with the **ProjectListColumnResizeEnabled** name.

11.5.1.8 ProjectListColumnFilterVisible

Boolean variable.

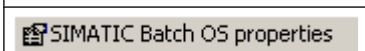
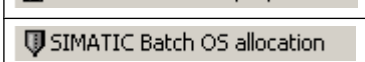
Specifies whether or not a filter will be displayed for each table column. If **yes** is set, a filter row is inserted in the control; if **no** is set, no filter row is inserted.

The attribute can be dynamized with the **ProjectListColumnFilterVisible** name.

11.5.1.9 ToolbarOrderAndVisibility

String.

Specifies the sequence of the elements in the toolbar. If individual values are not specified, the corresponding toolbar symbols are not displayed. The value 0 is used as a separator (grouping of symbols). The table below lists the elements and their values:

Toolbar elements	Symbol	Symbol menu	Value
Dock/undock			1
Undock automatically			6 / -6
Change		 SIMATIC Batch OS process cell	7
		 SIMATIC Batch OS properties	8
		 SIMATIC Batch OS allocation	9
		SIMATIC Batch OS batch creation	10

Toolbar elements	Symbol	Symbol menu	Value
Activate project			2
Deactivate project			3
Update loaded project			4
Important system messages			11 / -11

The values are separated by a semicolon and entered in the following syntax, for example: 1;2;3;4. Putting the toolbar elements in a different sequence would, for example, produce the following values: 2;;1;3;;4. Putting two semicolons between single digits is the same as a vertical line between the toolbar elements. The example mentioned above results in the following toolbar:



Use a negative or a positive value to specify whether or not the function "Undock automatically" should be used by default. Example: If you enter the value -6 instead of the specified value 6 for the attribute for the "Undock automatically" function, the button is displayed in the OS control as pressed, that is, the OS Control is automatically shown as undocked.

The attribute can be dynamized with the **ToolbarOrderAndVisibility** name.

11.5.1.10 ToolbarVisible

Boolean variable.

This attribute specifies whether or not the toolbar is displayed in the control.

Default: **Yes**, the toolbar is displayed.

The attribute can be dynamized with the **ToolbarVisible** name.

11.5.1.11 ContextMenuEnabled

Boolean variable.

This attribute specifies whether or not a context menu for objects is available within the control. If **yes** is set, a context menu is available with additional functions.

The commands available in the context menu depend on the **ToolbarOrderAndVisibility** attribute.

Default: Yes, use a shortcut menu.

The attribute can be dynamized with the **ContextMenuEnabled** name.

11.5.1.12 PropertiesTabOrderAndVisibility

String.

The character string specifies the logical sequence of the tabs in the properties dialogs and in the "SIMATIC BATCH OS Properties" control.

- The following is valid for tabs with the values 1 to 8:
  If a value is listed, the associated tab is shown.
  If a value is not listed, the associated tab is not displayed.
- The following is valid for tabs with the values 9 / -9 to 15 / -15:
  If a value is **not** listed, the associated tab is shown.
  If a value with a negative sign is listed, the associated tab is hidden.
  If a value without a sign is listed, the associated hidden tab is shown again.

Note that hiding tabs that contain configuration settings may result in malfunctions during operator control in process mode.

Tab name	Value
Order category	1
Order	2
Batch	3
Recipe structure element (RPE)	4
Transition	5
Parameter	6
Allocations	7
Comments	8
Conditions	9 / -9
Control recipe	10 / -10
Chaining	11 / -11
Favorites	12 / -12
Shortcuts	13 / -13
Messages	14 / -14
Overview	15 / -15

Default: Tab sequence 1;2;3;4;13;5;6;7;8;9;10;11;12;14;15

The attribute can be dynamized with the **PropertiesTabOrderAndVisibility** name.

11.5.1.13 TooltipsEnabled

Boolean variable.

This attribute specifies whether or not tooltips are displayed for objects when you hover the mouse pointer over them in the BATCH OS Controls. This is a central Control property which is then applied to all BATCH OS Controls.

Default: **No**, tooltips are not displayed.

The attribute can be dynamized with the **TooltipsEnabled** name.

11.5.1.14 UserRightsPriority

Enumeration.

The SIMATIC Logon user permissions system is currently used.

With "SIMATIC Logon - 1," you need to configure a BATCH application client in HW Config in PCS 7 Engineering for the SIMATIC PC station. Only then does the PC exist in the BATCH permission management and you can then assign the relevant rights for this PC and its operators.

The default value is "SIMATIC Logon - 1".

The attribute can be dynamized with the **UserRightsPriority** name.

11.5.1.15 AutoConnect

Boolean variable

The attribute specifies whether the project on the PCS 7 OS is automatically connected in process mode.

For the project to be automatically connected, a SIMATIC BATCH client must be configured on each PCS 7 OS.

- Value for AutoConnect: **Yes**
  - A project is entered for the attribute "ProjectName"
    The project entered is connected automatically.
  - A project is entered for the attribute "DBIdent"
    The project entered is connected automatically.
  - No project is entered for the attribute "DBIdent" or "ProjektName"
    On a single user system, the local or redundant project is connected automatically.
- Value for AutoConnect: **No**
  - No project is connected automatically.

Default:**Yes**

The attribute can be assigned dynamic properties using the name "AutoConnect".

11.5.2 SIMATIC BATCH OS Allocation

11.5.2.1 CommunicationChannel

String.

Defines the communication channel for the selected BATCH project. Select the same communication channel that you use in the "SIMATIC BATCH OS Master" control. This ensures that you obtain the data for the unit allocation from the relevant BATCH project.

Default value = 1.

The attribute can be dynamized with the **CommunicationChannel** name.

11.5.2.2 FilterUnitName

String

With this attribute, you set a filter criterion for the "Unit" table column. Only the units with the specified name pattern are listed. You can include wildcards in the name pattern. The following wildcards are possible:

- ?: Wildcard for exactly one character.
- *: Wildcard for any number of characters.

Example: Entering the criterion "M*vessel". Returns all units with the initial letter "M" followed by any number of characters and the postfix "vessel".

If there is only one unit displayed, a batch running on this unit will be displayed automatically in the SIMATIC BATCH OS Properties control.

Default: **Yes**

The attribute can be dynamized with the **FilterUnitName** name.

11.5.2.3 ColumnWidth

String.

Specifies the width of the table columns in the control. The specified column width does not depend on the column arrangement. The default values for column width are as follows:

Table column	Column width in pixels
Unit	80
Batch	90
Batch runtime	50
Order category	65
Order	65
Master recipe	70
RUP (recipe unit procedure)	70
RUP runtime	50
ROP (recipe operation)	70
ROP runtime	50
Formula	65

The values are entered, separated by a semicolon. The attribute can be dynamized with the **ColumnWidth** name.

11.5.2.4 ColumnOrderAndVisibility

String.

Specifies the sequence of the table headers in the control. The values in the following table define the table column.

Column name	Value
Unit	1
Batch	2
Batch runtime	3
Order category	4
Order	5
Master recipe	6
RUP (recipe unit procedure)	7
RUP runtime	8
ROP (recipe operation)	9
ROP runtime	10
Formula	11

The values are separated by a semicolon and entered in the following syntax: 1;2;3;4;5;6;7;8;9;10;11. By changing the number sequence, you make a corresponding change to the column name sequence.

The attribute can be dynamized with the **ColumnOrderAndVisibility** name.

11.5.2.5 ColumnResizeEnabled

Boolean variable.

This attribute specifies whether or not the column width of the table in the control can be adapted by the operator. If **Yes** is set, an operator can adapt the column width in process mode.

Default: Yes, the column width can be changed.

The attribute can be dynamized with the **ColumnResizeEnabled** name.

11.5.2.6 ColumnFilterVisible

Boolean variable.

The attribute specifies whether or not a filter row is displayed for each table column.

Default: Yes.

The attribute can be dynamized with the **ColumnFilterVisible** name.

11.5.2.7 ToolbarOrderAndVisibility

String.

The attribute specifies the sequence of the elements in the toolbar. If individual values are not specified, the corresponding toolbar symbols are not displayed in the OS control. The settings

made here also influence the shortcut menu. The table below lists the elements with their symbols and values.

Toolbar elements	Symbol	Symbol menu	Value
Dock/undock			1
Undock automatically			13 / -13
New batch(es)			2
Change		SIMATIC Batch OS master	18
		SIMATIC Batch OS process cell	17
		SIMATIC Batch OS properties	19
		SIMATIC Batch OS batch creation	20
Properties			3
Pause batch after step			4
Hold batch immediately			5
Resume batch			6
Stop batch			7
Abort batch			8
Abort batch (emergency)			9
Display control recipe			10
Update			11
Open with BCC			12
Delete batch			14
Close batch			15
Archive batch			16

The values are entered, separated by a semicolon. Changing the sequence of the symbols would, for example, produce the following values: 1;13;;2;3;14;;4;5;6;7;8;9;;15;16;;10;11;;12. The double semicolon or the value 0 create a vertical line separator in the toolbar. This allows you to group the command symbols.

Use a negative or a positive value to specify whether or not the function "Undock automatically" should be used by default. Example: If you enter the value -13 instead of the specified value 13 for the attribute for the "Undock automatically" function, the button is displayed in the OS control as pressed, that is, the OS Control is automatically shown as undocked.

Default: 1;13;;18;17;19;20;;2;3;14;;4;5;6;7;8;9;;15;16;;10;11;;12

The attribute can be dynamized with the **ToolbarOrderAndVisibility** name.

11.5.2.8 ToolbarVisible

Boolean variable.

This attribute specifies whether or not the toolbar is displayed in the control.

Default: Yes, the toolbar is used and displayed.

The attribute can be dynamized with the **ToolbarVisible** name.

11.5.3 SIMATIC BATCH OS Properties

11.5.3.1 CommunicationChannel

String.

Defines the communication channel for the selected BATCH project. Select the same communication channel that you use in the "SIMATIC BATCH OS Master" control. This ensures that you obtain the data for the unit allocation from the relevant BATCH project.

Default value = 1.

The attribute can be dynamized with the **CommunicationChannel** name.

11.5.3.2 OrderCategoryName

String.

With this attribute, you specify which batch from this order category will be displayed in the control. Apart from the **OrderCategoryName** attribute, the **OrderName** and **BatchName** attributes are also required to identify the batch.

As an alternative, you can use the **BatchID** attribute that should be preferred due to its performance.

Default: None

The attribute can be dynamized with the **OrderCategoryName** name.

11.5.3.3 OrderName

String.

With this attribute, you specify which batch from this order will be displayed in the control. Apart from the **OrderName** attribute, the **BatchName** and **OrderCategoryName** attributes are also required to identify the batch.

As an alternative, you can use the **BatchID** attribute that should be preferred due to its performance.

Default: None

The attribute can be dynamized with the **OrderName** name.

11.5.3.4 BatchName

String.

With this attribute, you specify which batch will be displayed in the control. Apart from the **BatchName** attribute, the **OrderName** and **OrderCategoryName** attributes are also required to identify the batch.

As an alternative, you can use the **BatchID** attribute that should be preferred due to its performance.

Default: None

The attribute can be dynamized with the **BatchName** name.

11.5.3.5 BatchID

Long integer.

This attribute specifies which batch will be displayed in the control. The entry of a BATCH ID has higher priority than the entry of the **BatchName** attribute.

Default: None

The attribute can be dynamized with the **BatchID** name.

11.5.3.6 TreeVisible

Boolean variable.

This attribute specifies whether or not the navigation area is displayed in the control. In the navigation area, the recipe structure is shown in the form of folders and contents. The status of batches is shown superimposed on the folder symbols. In process mode, the size of the navigation area can be adapted by pressing and holding down the left mouse button.

Default: Yes.

The attribute can be dynamized with the **TreeVisible** name.

11.5.3.7 ToolbarOrderAndVisibility

String.

Specifies the sequence of the symbols in the OS control toolbar. If individual values are not specified, the corresponding toolbar symbols are not displayed in the control. For certain toolbar symbols to not be displayed, negative values are required.

The values are separated by a semicolon and entered in the following syntax: 1;2;3;...39. Changing the sequence of the toolbar symbols in the toolbar would, for example, produce the following values: 2;1;;3;...39. A double semicolon or the value 0 create a vertical line separator in the toolbar. Toolbar symbols would then be grouped individually. The settings made here also influence the shortcut menu.

Toolbar elements	Symbol	Symbol menu	Value
Dock/undock			1
Undock automatically			30 / -30

Toolbar elements	Symbol	Symbol menu	Value
Change		SIMATIC Batch OS master	36
		SIMATIC Batch OS process cell	37
		SIMATIC Batch OS allocation	38
		SIMATIC Batch OS batch creation	39
New batch(es)			31
Delete batch			2
Release batch			3
Cancel batch			4
Lock batch			5
Unlock			6
Start batch			7
Pause batch after step			8
Hold batch immediately			9
Resume batch			10
Stop batch			11
Abort batch			12
Abort batch (emergency)			13
Close batch			14
Archive batch			15
Enter comment			25
Start step			16
Pause step (after step)			17
Hold step (immediately)			18
Resume step			19
Stop step			20
Unblock step			48 / -48
Abort step			21
Abort step (emergency)			22
Reset step			23
Complete step			24
Set/Remove breakpoint			34
Acknowledge breakpoint			35

Toolbar elements	Symbol	Symbol menu	Value
Hide parameter			28
Update			26
SFC visualization: Overview			32
SFC visualization: Pane			33
Open with BCC			29
Close			27
View			-
		Overview	40 / -40
		Right	41 / -41
		Left	42 / -42
		Top	43 / -43
		Bottom	44 / -44
		Above	45 / -45
		Below	46 / -46

Use a negative or a positive value to specify whether or not the function "Undock automatically" should be used by default. Example: If you enter the value -30 instead of the specified value 30 in the attribute for the "Undock automatically" function, the button is displayed in the OS control as pressed, that is, the OS Control is automatically shown as undocked.

Default:
1;30;;36;37;38;39;;31;2;;3;4;5;6;;7;8;9;10;11;12;13;;14;15;25;;16;17;18;19;20;21;22;23;24;;34;35;;28;26;;32;33;29;;27

The attribute can be dynamized with the **ToolbarOrderAndVisibility** name.

11.5.3.8 ToolbarVisible

Boolean variable.

This attribute specifies whether or not the toolbar is displayed in the control.

Default: **Yes**, the toolbar is used and displayed.

The attribute can be dynamized with the **ToolbarVisible** name.

11.5.3.9 ParametersListColumnOrderAndVisibility

String.

This attribute defines the sequence of the table columns in the "Parameters" tab of the properties dialog and in the SIMATIC BATCH OS Properties control.

If values are not specified, the corresponding columns are not displayed in the control.

If you delete all values from the attribute, the columns "Low recipe limit value", "High recipe limit value" and "Material (act)" are still displayed.

The columns "Low recipe limit value", "High recipe limit value" and "Material (act)" are hidden in the OS control by inputting the corresponding values with negative sign.

The following columns are available:

Column name	Value
Name	1
Type	2
Data type	3
Low limit	4
Setpoint value	5
High limit	6
Process value	7
Quality (1)	8
Unit of measure	9
Scaling	10
Material	11
Source	12
Target	13
Reference	14
Location	15
Location ID	16
Description	17
Time remaining	18 Note: To make the "Time remaining" table column visible in the control, enter the assigned value 18 manually.
Effective immediately	19
Low recipe limit value	20 / -20
High recipe limit value	21 / -21
Equation	22 Note: To make the "Equation" table column visible in the control, enter the assigned value 22 manually.
Material (act)	23 / -23

(1) The Quality column is not supported and exists only for compatibility reasons.

Default: 1;2;3;4;5;6;7;9;10;11;12;13;14;15;16;17;19

The attribute can be dynamized with the **ParametersListColumnOrderAndVisibility** name.

11.5.3.10 ParametersListColumnWidth

String.

This attribute defines the width of the table columns in the "Parameters" tab of the properties dialog and in the SIMATIC BATCH OS Properties control. The default values for column width are as follows:

Table column	Column width in pixels
Name	150
Type	75
Data type	75
Low limit	75
Low limit of the recipe	75
Setpoint value	75
High limit of the recipe	75
High limit	50
Actual value	75
Unit of measure	75
Scaling	75
Material	100
Source	75
Objective	75
Reference	70
Location	50
Location ID	150
Description	75
Immediately	40
Time remaining	75
Formula	75
Quality (1)	75

(1) The Quality column is not supported and exists only for compatibility reasons.

The values are entered, separated by a semicolon.

The attribute can be dynamized with the **ParametersListColumnWidth** name.

11.5.3.11 ParametersListColumnResizeEnabled

Boolean variable.

This attribute specifies whether or not the column width in the "Parameters" tab of the properties dialog and in the SIMATIC BATCH OS Properties control can be adapted. If **Yes** is set, an operator can adapt the column width in process mode.

Default: **Yes**, the column width can be changed.

The attribute can be dynamized with the **ParametersListColumnResizeEnabled** name.

11.5.3.12 ParametersListColumnFilterVisible

Boolean variable.

This attribute specifies whether or not a filter can be displayed for each table column in the "Parameters" tab of the properties dialog and in the SIMATIC BATCH OS Properties control.

Default: **Yes**, a filter row is displayed for all table columns.

The attribute can be dynamized with the **ParametersListColumnFilterVisible** name.

11.5.3.13 AllocationsListColumnWidth

String.

This attribute defines the width of the table columns in the "Allocations" tab of the properties dialog and in the SIMATIC BATCH OS Properties control. The default values for column width are as follows:

Table column	Column width in pixels
Recipe assignments	100
Unit	100
Class	150
Strategy	100
Process parameter	200
Start allocation	30

The values are entered, separated by a semicolon.

The attribute can be dynamized with the **AllocationsListColumnWidth** name.

11.5.3.14 AllocationsListColumnOrderAndVisibility

String.

This attribute defines the sequence of the table columns in the "Allocations" tab of the properties dialog and in the SIMATIC BATCH OS Properties control. If values are not specified, the corresponding columns are not displayed in the control.

The values are separated by a semicolon and entered in the following syntax: 1;2;3;4;5;6. By changing the sequence of the values, you make a corresponding change in the column sequence.

Default: 1;2;4;3;5;6.

The attribute can be dynamized with the **AllocationsListColumnOrderAndVisibility** name.

11.5.3.15 AllocationsListColumnResizeEnabled

Boolean variable.

This attribute specifies whether or not the column width in the "Allocations" tab of the properties dialog and in the SIMATIC BATCH OS Properties control can be adapted. If yes is set, an operator can adapt the column width in process mode.

Default: **Yes**, the column width can be changed.

The attribute can be dynamized with the **AllocationsListColumnResizeEnabled** name.

11.5.3.16 AllocationsListColumnFilterVisible

Boolean variable.

This attribute specifies whether or not a filter can be displayed for each table column in the "Allocations" tab of the properties dialog and in the SIMATIC BATCH OS Properties control.

Default: **Yes**.

The attribute can be dynamized with the **AllocationsListColumnFilterVisible** name.

11.5.4 SIMATIC BATCH OS Batch Creation

11.5.4.1 CommunicationChannel

String.

Defines the communication channel for the selected BATCH project. Select the same communication channel that you use in the "SIMATIC BATCH OS Master" control. This ensures that you obtain the data for the batch creation from the relevant BATCH project.

Default value = 1.

The attribute can be dynamized with the **CommunicationChannel** name.

11.5.4.2 OrderCategoryName

String.

With this attribute, you specify a name for an order category in which batches will be created. The name you enter for the order category will be displayed in the control.

Default: No name

The attribute can be dynamized with the **OrderCategoryName** name.

11.5.4.3 OrderName

String.

With this attribute, you specify the order in which batches will be created.

Default: None

The attribute can be dynamized with the **OrderName** name.

11.5.4.4 FilterRecipeEnabled

Boolean variable.

This attribute determines whether or not master recipes are displayed in the dialog for selecting recipes/formulas. If the setting is "Yes", recipes are available for selection.

Default: Yes.

The attribute can be dynamized with the **FilterRecipeEnabled** name.

11.5.4.5 FilterFormulaEnabled

Boolean variable.

This attribute determines whether or not formulas are displayed in the dialog for selecting recipes/formulas. If the setting is "Yes", formulas are available for selection.

Default: Yes.

The attribute can be dynamized with the **FilterFormulaEnabled** name.

11.5.4.6 FilterUnitName

String.

The attribute has no function.

11.5.4.7 FilterClassName

String.

This attribute specifies the filter for the first folder level of the master recipes or formulas in the dialog for selecting recipes/formulas. Only folder contents with master recipes and/or formulas matching your filter criterion are displayed in the dialog.

Default: No filter.

The attribute can be dynamized with the **FilterClassName** name.

11.5.4.8 FilterGroupName

String.

This attribute specifies the filter for the second folder level of the master recipes and/or formulas in the dialog for selecting recipes/formulas. Only folder contents with master recipes and/or formulas matching your filter criterion are displayed in the dialog.

Default: No filter.

The attribute can be dynamized with the **FilterGroupName** name.

11.5.4.9 FilterProductName

String.

This attribute specifies a set filter for the "Product" column of the dialog for selecting recipes/formulas.

Default: No filter.

The attribute can be dynamized with the **FilterProductName** name.

11.5.4.10 FilterFormulaCategoryName

String.

This attribute specifies a set filter for the "Formula category" column of the dialog for selecting recipes/formulas.

Default: No filter.

The attribute can be dynamized with the **FilterFormulaCategoryName** name.

11.5.4.11 FilterRecipeName

String.

This attribute specifies a set filter for the "Recipe" column of the dialog for selecting recipes/ formulas.

Default: No filter.

The attribute can be dynamized with the **FilterRecipeName** name.

11.5.4.12 FilterFormulaName

String.

This attribute specifies a set filter for the "Formula" column of the dialog for selecting recipes/ formulas.

Default: No filter.

The attribute can be dynamized with the **FilterFormulaName** name.

11.5.4.13 RecipeName

String.

With this attribute, you specify a fixed name for a master recipe in the control.

The name in the OS Control in process mode is updated after a picture change.

Default: None.

The attribute can be dynamized with the **RecipeName** name.

11.5.4.14 FormulaName

String.

With this attribute, you specify a fixed name for a formula in the control.

The name in the OS Control in process mode is updated after a picture change.

Default: None.

The attribute can be dynamized with the **FormulaName** name.

11.5.4.15 RecipeID

Long integer.

With this attribute, you store a fixed master recipe ID that will be used in the control.

Default: 0, no recipe ID.

The attribute can be dynamized with the **RecipeID** name.

11.5.4.16 FormulaID

Long integer.

With this attribute, you store a fixed formula ID that will be used in the control.

Default: 0, no formula ID.

The attribute can be dynamized with the **FormulaID** name.

11.5.4.17 BrowseRecipeOrFormulaVisible

Boolean variable.

With this attribute, you specify whether or not a browse button for recipes and formulas is displayed in the control.

Default: Yes.

The attribute can be dynamized with the **BrowseRecipeOrFormulaVisible** name.

11.5.4.18 RecipeOrFormulaEnabled

Boolean variable.

With this attribute, you specify whether or not the row in which the "recipe", "formula" and browse button are located is displayed in the control.

Default: Yes, the entire row and contents will be displayed.

The attribute can be dynamized with the **RecipeOrFormulaEnabled** name.

11.5.4.19 BrowseOrderAndOrderCatVisible

Boolean variable.

With this attribute, you specify whether or not a browse button for orders and order categories is displayed in the control.

Default: Yes.

The attribute can be dynamized with the **BrowseOrderAndOrderCatVisible** name.

11.5.4.20 OrderAndOrderCatEnabled

Boolean variable.

With this attribute, you specify whether or not the row in which the "order", "order category" and browse button are located is displayed in the control.

Default: Yes, the entire row and contents will be displayed.

The attribute can be dynamized with the **OrderAndOrderCatEnabled** name.

11.5.4.21 BatchSizeEnabled

Boolean variable.

With this attribute, you specify whether or not an operator is permitted to edit the text box for the number of batches.

Default: Yes.

The attribute can be dynamized with the **BatchSizeEnabled** name.

11.5.4.22 BatchSize

Floating-point number.

With this attribute, you specify a value for the quantity in the control.

Default: 0, no quantity set.

The attribute can be dynamized with the **BatchSize** name.

11.5.4.23 BatchCountEnabled

Boolean variable.

With this attribute, you specify whether or not the number of completed batches is displayed in the control.

Default: Yes.

The attribute can be dynamized with the **BatchCountEnabled** name.

11.5.4.24 BatchCount

Long integer.

With this attribute, you specify the required number of batches to be created.

Default: 1.

The attribute can be dynamized with the **BatchCount** name.

11.5.4.25 StartTimeVisible

Boolean variable.

This attribute specifies whether or not the start time of batches is displayed in the control.

Default: Yes.

The attribute can be dynamized with the **StartTimeVisible** name.

11.5.4.26 StartModeVisible

Boolean variable.

This attribute specifies whether or not the start mode of batches is displayed in the control.

Default: Yes.

The attribute can be dynamized with the **StartModeVisible** name.

11.5.4.27 StartMode

Enumeration.

With this attribute, you specify a start mode for batches. You have three options available:

- Manual - 0: Manual start.
- Instant - 1: Immediate start.
- Time - 2: Time-controlled start.

Default: Manual - 0.

The attribute can be dynamized with the **StartMode** name.

11.5.4.28 AutoReleaseBatchVisible

Boolean variable.

With this attribute, you specify whether or not the "Release batches automatically" check box is displayed and can be enabled in the control.

Default: Yes.

The attribute can be dynamized with the **AutoReleaseBatchVisible** name.

11.5.4.29 AutoReleaseBatch

Boolean variable.

With this attribute, you decide whether or not the "Release batches automatically" check box is enabled in the control.

Default: Yes.

The attribute can be dynamized with the **AutoReleaseBatch** name.

11.5.4.30 BatchNamePattern

String.

With this attribute, you store the name under which the batch will be created.

Default: None.

The attribute can be dynamized with the **BatchNamePattern** name.

11.5.4.31 BatchNamePatternVisible

Boolean variable.

With this attribute, you define whether or not the name under which the batch will be created can be edited. The name displayed can be overwritten at any time with the "Create new batch" function or a user input.

Default: Yes.

The attribute can be dynamized with the **BatchNamePatternVisible** name.

11.5.4.32 BatchDescription

String.

With this attribute, you specify a fixed text description for the batch to be created.

Default: empty, no text.

The attribute can be dynamized with the **BatchDescription** name.

11.5.4.33 BatchDescriptionVisible

Boolean variable

This attribute specifies whether or not a text box in which you can enter a batch description is displayed in the control.

Default: Yes.

The attribute can be dynamized with the **BatchDescriptionVisible** name.

11.5.4.34 StartTrigger

Boolean variable.

Use this attribute in process mode to instruct the control to create a batch with the existing settings. To use this function, set the attribute to **Yes.** When the control has created the batch, the attribute is reset to **No** again.

If an error occurs during creation of a batch, the event "OnBatchCreationFault" is triggered. You can react to this event by notifying the operator, for example.

Default: No.

The attribute can be dynamized with the **StartTrigger** name.

11.5.4.35 ToolbarOrderAndVisibility

String.

The attribute specifies the sequence of the toolbar symbols in the toolbar. If individual values are not specified, the corresponding toolbar symbols are not displayed in the toolbar. Two

consecutive semicolons create a vertical line separator in the toolbar. This allows you to group the toolbar symbols individually. The settings made here also influence the shortcut menu. The table below lists the elements with their symbols and values:

Toolbar elements	Symbol	Symbol menu	Value
Dock/undock			1
Undock automatically			2 / -2
Change		 SIMATIC Batch OS master	3
		 SIMATIC Batch OS process cell	4
		 SIMATIC Batch OS properties	5
		 SIMATIC Batch OS allocation	6

Use a negative or a positive value to specify whether or not the function "Undock automatically" should be used by default. Example: If you enter the value -2 instead of the specified value 2 for the attribute for the "Undock automatically" function, the button is displayed in the OS control as pressed, that is, the OS Control is automatically shown as undocked.

Default: 1;2;;3;4;5;6.

The attribute can be dynamized with the **ToolbarOrderAndVisibility** name.

11.5.4.36 ToolbarVisible

Boolean variable.

This attribute specifies whether or not the toolbar is displayed in the control.

Default: Yes.

The attribute can be dynamized with the **ToolbarVisible** name.

11.5.4.37 RecipeOrFormulaListColumnWidth

String.

This attribute defines the width of the individual table columns in the dialog for selecting recipes/ formulas. The default values for column width are as follows:

Table column	Column width in pixels
Recipe	175
Formula	160
Formula category	200
Product	75
No function. However, the value should not be deleted.	75
Class	75
Group	75

The values are entered, separated by a semicolon.

The attribute can be dynamized with the **RecipeOrFormulaListColumnWidth** name

11.5.4.38 RecipeOrFormulaListColumnOrderAndVisibility

String.

This attribute defines the sequence of the table columns in the dialog for selecting recipes/ formulas.

The values are separated by a semicolon and entered in the following syntax: 1;2;3;4;5;6;7. By changing the sequence of the values, you make a corresponding change in the column sequence. The value 5 has no function, but should not be deleted.

Default: 1;2;3;4;5;6;7.

The attribute can be dynamized with the **RecipeOrFormulaListColumnOrderAndVisibility** name.

11.5.4.39 RecipeOrFormulaListColumnResizeEnabled

Boolean variable.

This attribute specifies whether or not the width of the table columns in the dialog for selecting recipes/formulas can be adapted. If "Yes" is set, an operator can adapt the column width in process mode.

Default: Yes.

The attribute can be dynamized with the **RecipeOrFormulaListColumnResizeEnable** name.

11.5.4.40 RecipeOrFormulaListColumnFilterVisible

Boolean variable.

This attribute specifies whether or not a filter row is displayed for each table column in the dialog for selecting recipes/formulas.

Default: Yes.

The attribute can be dynamized with the **RecipeOrFormulaListColumnFilterVisible** name.

11.5.5 SIMATIC BATCH OS Monitor

11.5.5.1 CommunicationChannel

String.

Defines the communication channel for the selected BATCH project. Select the same communication channel that you use in the "SIMATIC BATCH OS Master" control. This ensures that you obtain the data for the unit allocation from the relevant BATCH project.

Default value = 1.

The attribute can be dynamized with the name **CommunicationChannel**.

11.5.5.2 ColumnWidth

String.

Specifies the width of the table columns in the control. The specified column width does not depend on the column arrangement.

The default values for the column widths are as follows:

Table columns	Column width in pixels
Message number (Msg. no.)	50
Status	75
Message	250
Date	170

The values are separated by a semicolon and entered in the following syntax: 50;75;250;170.

The attribute can be dynamized with the **ColumnWidth** name.

11.5.5.3 ColumnOrderAndVisibility

String.

Specifies the sequence of the table headers in the control. The values in the following table define the table column.

Table header	Value
Message number, Msg. no.	1
Status	2
Message	3
Date	4

The values are separated by a semicolon and entered in the following syntax: 1;2;3;4. By changing the sequence of the values, you make a corresponding change in the column sequence.

The attribute can be dynamized with the **ColumnOrderAndVisibility** name.

11.5.5.4 ColumnResizeEnabled

Boolean variable.

This attribute specifies whether or not the column width of the table in the control can be adapted by the operator. If **Yes** is set, an operator can adapt the column width in process mode.

Default: Yes, the column width can be changed.

The attribute can be dynamized with the **ColumnResizeEnabled** name.

11.5.5.5 ColumnFilterVisible

Boolean variable.

The attribute specifies whether or not a filter row is displayed for each table column.

Default: Yes.

The attribute can be dynamized with the **ColumnFilterVisible** name.

11.5.5.6 ToolbarOrderAndVisibility

String.

The attribute specifies the sequence of the toolbar symbols in the toolbar. If individual values are not specified, the corresponding toolbar symbols are not displayed in the toolbar. The settings made here also influence the shortcut menu. The table below lists the elements with their symbols and values:

Toolbar elements	Symbol	Value
Dock/undock		1
Update		2
Display properties		3
Cancel		4
Delete		5

The values are separated by a semicolon and entered in the following syntax: 1;;3;4;;5;2. Changing the sequence of the toolbar elements would, for example, produce the following values: 2;;1;3;4;5. A double semicolon or the value 0 create a vertical line separator in the toolbar. This allows you to group the toolbar symbols individually in the toolbar.

Default: 1;;3;4;;5;;2

The attribute can be dynamized with the **ToolbarOrderAndVisibility** name.

11.5.5.7 ToolbarVisible

Boolean variable.

This attribute specifies whether or not the toolbar is displayed in the control.

Default: Yes, the toolbar is used and displayed.

The attribute can be dynamized with the **ToolbarVisible** name.

11.5.6 SIMATIC BATCH OS Process Cell

11.5.6.1 CommunicationChannel

String.

Defines the communication channel for the selected BATCH project. Select the same communication channel that you use in the "SIMATIC BATCH OS Master" control. This ensures that you obtain the data for the unit allocation from the relevant BATCH project.

Default value = 1.

The attribute can be dynamized with the name **CommunicationChannel**.

11.5.6.2 FilterOrderCategoryName

String

This attribute defines the filter of the order category column. In this way, you can restrict the displayed batches to the order category specified in the filter. The following wildcards are possible:

- ?: Wildcard for exactly one character.
- *: Wildcard for any number of characters.

Default: None.

The attribute can be dynamized with the **FilterOrderCategoryName** name.

11.5.6.3 FilterOrderName

String.

This attribute defines the filter of the order column. In this way, you can restrict the displayed batches to the order specified in the filter. The following wildcards are possible:

- ?: Wildcard for exactly one character.
- *: Wildcard for any number of characters.

Default: None.

The attribute can be dynamized with the **FilterOrderName** name.

11.5.6.4 TabOrderAndVisibility

String.

The attribute defines the sequence of the tabs and which tabs are shown in the OS control. If you leave out values in the attribute or if you use a value with a negative sign instead, this tab is not shown in the OS control.

Example: 1;2;3;4;6;-5. The "Favorites" tab is not shown in the OS control "Process cell". The tabs are shown in the following sequence from left to right in the OS control "Process Cell": "Entire list", "Planning list", "Status list", "Results list", "Order list".

Default values: 1;2;3;4;5;6

The following values are available:

- 1: Entire list tab
- 2: Planning list tab
- 3: Status list tab
- 4: Results list tab
- 5: Favorites tab. This tab is always shown without specification of the value. If the tab is not to be shown in the OS control, it must be entered with a negative sign.
- 6: Order list tab. This tab is always shown without specification of the value. If the tab is not to be shown in the OS control, it must be entered with a negative sign.

The attribute can be dynamized with the **TabOrderAndVisibility** name.

11.5.6.5 TreeVisible

Boolean variable.

This attribute specifies whether or not a navigation area is displayed in the control. The batch process cell is displayed in the navigation area with its order category and order folders. In process mode, the size of the navigation area can be adapted by pressing and holding down the left mouse button.

Default: Yes.

The attribute can be dynamized with the **TreeVisible** name.

11.5.6.6 ColumnWidth

String.

This attribute specifies the width of the table columns in the following OS control tabs: "Entire list", "Planning list", "Status list", "Results list" and "Favorites". The column widths for the table columns in the "Order list" tab are entered separately following the delimiter "#". The specified column width does not depend on the column arrangement. The values are entered, separated by a semicolon. The default values for column width are as follows:

Table column	Column width in pixels
Batch	140
Order category	100
Order	100
Batch ID	40
Master recipe	75
Formula	75
Product	75
Status	50
Current quantity	75
Planned quantity	170
Mode	170
Chart start	75
Start time	75
Planned end	75
End time	170
Chaining	170
Predecessor	50
Successor	75
Delimiter "#"	**-**
Order	140
Order category	100
Status	50
Product	60
Planned quantity	50
Currently planned quantity	50

Table column	Column width in pixels
Current quantity	50
Unit of measure	40
Batches	40
Earliest start	170
Latest finish	170

The attribute can be dynamized with the **ColumnWidth** name.

11.5.6.7 ColumnOrderAndVisibility

String.

The attribute defines the sequence and display of the table columns for the tabs in the OS control.

The values are separated by a semicolon and entered in the following syntax: 1;2;3;4;5;6;18;7;17;8;9;10;15;11;16;12;13;14#1;2;3;4;5;6;7;8;9;10;11.

By changing the sequence of the values, you make a corresponding change in the column sequence in the OS control.

If you leave out values in the attribute, the corresponding columns are not displayed.

If you delete all values from the attribute, the columns "Chaining", "Predecessor", "Successor", "Product" and "Actual quantity" are still displayed.

The columns "Chaining", "Predecessor", "Successor", "Product" and "Actual quantity" are hidden in the OS control by inputting the corresponding values with negative sign.

Column header	Value
Batch	1
Order category	2
Order	3
Batch ID	4
Master recipe	5
Formula	6
Product	18 / -18
Status	7
Actual quantity	17 / -17
Planned quantity	8
Mode	9
Planned start	10
Start time	15
Planned end	11
End time	16
Chaining	12 / -12
Predecessor	13 / -13
Successor	14 / -14
Delimiter "#"	-

Column header	Value
Order	1
Order category	2
Status	3
Product	4
Planned quantity	5
Currently planned quantity	6
Actual quantity	7
Unit of measure	8
Batch	9
Earliest start	10
Latest finish	11

The attribute can be dynamized with the **ColumnOrderAndVisibility** name.

11.5.6.8 ColumnResizeEnabled

Boolean variable.

This attribute specifies whether or not the column width of the table in the control can be adapted by the operator. If **Yes** is set, an operator can adapt the column width in process mode.

Default: Yes, the column width can be changed.

The attribute can be dynamized with the **ColumnResizeEnabled** name.

11.5.6.9 ColumnFilterVisible

Boolean variable.

The attribute specifies whether or not a filter row is displayed for each table column.

Default: Yes.

The attribute can be dynamized with the **ColumnFilterVisible** name.

11.5.6.10 ToolbarOrderAndVisibility

String.

This attribute specifies the sequence of the symbols in the OS control toolbar. If individual values are not specified, the corresponding symbols are not displayed in the toolbar.

The values are separated by a semicolon and entered in the following syntax: 1;13;;18;17;...26. Changing the sequence of the elements would, for example, produce the following values: 2;13;;17;...26. Two consecutive semicolons or the value 0 create a vertical line separator in the toolbar. This allows you to group the toolbar symbols individually. The settings made here also influence the shortcut menu.

The table below lists the elements with their symbols and values:

Toolbar elements	Symbol	Symbol menu	Value
Dock/undock.			1
Undock automatically.			22 / -22
New batches			2
Properties			3
Delete batch			4
Release batch			5
Cancel batch			6
Lock batch			7
Unlock			8
Start batch			9
Pause batch after step			10
Hold batch immediately			11
Resume batch			12
Stop batch			13
Abort batch			14
Abort batch (emergency)			15
Close batch			16
Archive batch			17
Display control recipe			18
Enter comment			19
Update			20
Open with BCC			21
Change		 SIMATIC Batch OS master	24
		 SIMATIC Batch OS properties	25
		 SIMATIC Batch OS allocation	23
		 SIMATIC Batch OS batch creation	26

Use a negative or a positive value to specify whether or not the function "Undock automatically" should be used by default. Example: If you enter the value -22 instead of the specified value 22 for the attribute for the "Undock automatically" function, the button is displayed in the OS control as pressed, that is, the OS Control is automatically shown as undocked.

Default: 1;22;;24;25;23;26;;2;3;4;;5;6;7;8;;9;10;11;12;13;14;15;;16;17;19;;18;20;;21

The attribute can be dynamized with the **ToolbarOrderAndVisibility** name.

11.5.6.11 ToolbarVisible

Boolean variable.

This attribute specifies whether or not the toolbar is displayed in the control.

Default: Yes, the toolbar is used or displayed.

The attribute can be dynamized with the **ToolbarVisible** name.

11.6 OS controls on a Web client

You can display OS controls on a Web client.

Requirements

- In the engineering system, a SIMATIC BATCH client must be configured, compiled, downloaded, etc. in the PC station of the Web server.
- The role and rights must be set up (see "Role and Rights").
- The plug-in must be installed (see "Plug-in" section).
- The required number of "BATCH Web Client" license keys is installed on the SIMATIC BATCH server.
- The basic requirements for Web option for OS are met.

You can find information on the roles, rights, and plug-ins in following paragraphs.

Roles and rights

The "WebClientUser" role must be available and configured in the roles management of SIMATIC BATCH.

The "WebClientUser" role is used as the name in all languages.

The "WebClientUser" role is created automatically by the system and cannot be edited or deleted.

Specify the rights for the "WebClientUser" role in the permission management. In the factory state, rights have not yet been assigned to roles.

Note

All users, regardless of their specific user login, work in the Web client with these rights.

Even if the user in SIMATIC BATCH system is a member of other groups and possibly has more or fewer rights, this does not affect the Web client.

To define the rights, select the menu command **Options > Permission management**in the "WebClientUser" area of the "Individual permissions" tab.

The rights of the "WebClientUser" role are always used for the operation of the OS controls on the Web client. All users work with the same "virtual" user and therefore also have the same rights.

For technical reasons, all of the operations on the Web client are **not** linked to the logged-on user, but instead to a "virtual" user, "WebClientUser". The data in audit trails, logs, etc. therefore include the entry "WebClientUser" instead of the actual user logon. For this reason, all user settings, for example, the sort order of lists, are shared by all users working per Web client. A setting for the specific user is currently not possible.

You cannot achieve superuser status the Web client. This means no operations can be performed that are only allowed for users who have a super user role. This applies even if the logged-on user in SIMATIC BATCH has a super user role. This is not taken into account for logging on to the Web client.

Plug-in

Additionally install the "SIMATIC Batch OS Controls" plug-in on the Web Client for SIMATIC BATCH.

Special notes

- The name of the logged-on user is not displayed on the Web client. "WebClientUser" is displayed as the name.
- If you use the WinCC option "WinCC/Audit", the name "WebClientUsers" is displayed in the audit.
- The performance on a Web client depends on external factors and is typically below the performance of a normal client.
  External factors include:
  - Load on the server
  - Network load
  - Quantity structure
- The shortcut menu commands "Print, Print Preview, SFC Visualization Overview, SFC Visualization Pane" are not available for use on a Web client.
- A Web client always connects only with the PCS 7 project on the Web server. If other projects are specified in the properties of the OS controls, they are not taken into account in the Web environment.

Behavior with missing license key

If there is no "BATCH Web Client" license key for the BATCH Web Client on a BATCH Server PC, an error message is displayed on the BATCH Web Client when a connection is to be established.

A connection is not possible without license.

Additional information

You can find information on user rights in the section "Specifying user permissions (Page 308)".

You can find information on software components, areas of application, configuration options and commissioning Web options in the manual *Process Control System PCS 7; Web Option for OS.*

You can find information on licenses in the section "Licenses (Page 91)".

Differences between BatchCC and BATCH OS controls

12

12.1 Overview

Introduction

The sections below describe the differences between the BATCH Control Center (BatchCC) and the BATCH OS controls.

- Additional functions in the BATCH OS controls (Page 724)
- Functions that are not available in the BATCH OS controls (Page 725)
- Differences between BatchCC and BATCH OS controls (Page 727)

BATCH OS controls

The BATCH OS controls give users the option to monitor and control the batch process directly from the process pictures without having to call an additional BATCH application.

They are intended for pure process cell operation in runtime and therefore have limited operator input rights when compared to the Batch Control Center.

BATCH Control Center

The BATCH Control Center (BatchCC) includes additional functions for administration and batch planning that do not have to be accessible for the regular process cell operator.

Additional information

You will find additional information on the BATCH Control Center in the section "BATCH Control Center (Page 271)".

You will find additional information on the BATCH OS controls in the section "BATCH OS controls (Page 621)".

12.2 Additional functions in the BATCH OS controls

The table below lists functions that are only available in the OS controls:

Function	Description
Unit list with RUP/ROP	The current allocation of a unit is displayed until it is allocated again. You can call additional functions in the shortcut menu of the unit.
Release and service mode for units	You can do the following for units using BATCH OS controls: • Switch service mode on/off • Switch release on/off
Scripting/configuration options	The BATCH OS controls are implemented as ActiveX components and can be integrated in process pictures. This gives you a wide variety of options for parameter assignment. You can also access BATCH OS controls with the help of OS scripting.
Logging of actions	The user actions are only logged in a list in BATCH OS controls. This list is deleted and generated again with a picture change.
Parameter overview for linear recipes (autofocus)	There is a special table display for linear recipes. Linear recipes with branches, loops or similar are possible.

12.3 Functions that are not available in the BATCH OS controls

The table below lists functions that are not available in the BATCH OS controls:

Function	Description
Electronic signature	No configuration and input of electronic signatures If an electronic signature is required, a message with a reference to the configured electronic signature is shown.
Update process cell	Menu command is not available. A message box stating that the process cell must be updated (new data downloaded by the ES) is not displayed.
Structure change (OSC)	Menu command is not available.
Rights/User management	Menu command is not available. The rights are not displayed and cannot be edited.
Project/User settings	Menu command is not available. The project and user settings are not displayed and cannot be edited.
Backup/Restore	Menu command is not available.
Export/Import	Menu command is not available.
Neutral folders	Neutral folders created and displayed in the BatchCC below the top "Orders" level are not displayed and cannot be edited.
Flat recipes (batch planning)	The graphical representation of the content of flat recipes is not possible. Only the batch headers are visible. The header displays parameters, for example. Menu commands at batch level are possible. **Note** Operator instructions are not supported.
Chaining and unit allocations	No Gantt chart for chaining and unit allocations Alternative representations in table form are possible.
Libraries	The libraries are not displayed.
Formulas/Formula categories	Formulas/Formula categories cannot be edited. Only the selection when creating a new batch, for example, is possible.
Display of elements that are currently being processed	Menu command is not available.
Comparing recipes/libraries	Menu command is not available.
Editing recipes/libraries/formulas/formula categories/ materials (create, open, release, revoke release, etc.)	Menu commands or elements are not available.
Log	Menu command is not available.
Commenting PCS 7 OS messages	Menu command is not available.
Detailed information in case of a batch release	Plausibility errors are not displayed in detail but only as general error message.
Create batch: Automatic calculation of the batch number including quantity	Menu command is not available.

Function	Description
Save batch as recipe	Menu command is not available.
Wait NOPs	The runtime cannot be changed.
"Process tags" tab	The tab is not displayed in the "SIMATIC BATCH OS Properties" control for recipe objects of the control recipe.

12.4 Differences between BatchCC and BATCH OS controls

The table below lists functions that are resolved differently:

Function	BATCH OS controls	BatchCC
Basic structure and functionality of the user interface	Since the BATCH OS controls are configured based on a component approach, the display and operating paradigms are not uniform.	Display and operating paradigms are uniform.
Operator dialog	The operator dialogs are not opened as separate windows.	The operator dialogs are opened as separate windows.
Properties of recipes/batches	All parameters are shown in a list in the BATCH OS controls. Configured MES sync requests are displayed in a graphic but not in the form of a parameter list	BatchCC has multiple tabs for different parameters (PP, PI, PO, TP). Configured MES sync requests are displayed in a separate tab in BatchCC.
Online help	The standard help can optionally be activated via the settings of the operator station. There is no F1 help.	There is an F1 help.
Command interlock during process cell update	The commands (menu items) are offered independently of the process cell status. A corresponding message box is displayed during execution of a command while the process cell is being updated.	The commands (menu items) are not offered during a process cell update.
Query whether the BATCH Control server is to start without redundant partner	Query does not take place.	The query is made when BatchCC starts.
Change setpoints while batch is planned	Change to phases, transitions and the recipe header is possible	Changes only possible to recipe header
Recipe elements (e.g. phase) as "Favorite"	Individual elements can be given the "Favorite" attribute. These elements are shown in the "Favorites" list.	Recipes, libraries, formulas, batches, etc. can be stored for direct access in the "Shortcuts" window with drag-and-drop.
Batch in tree view	Internal batch elements are displayed in a tree view.	Only the recipe header or batch header is displayed.

Function	BATCH OS controls	BatchCC
Release batches automatically	The "Release batches automatically" function can be activated and deactivated with the "Release batches automatically" check box. **Note** The function is independent and does not have an effect on the function in the BatchCC.	The function can be activated and deactivated in the "Batches/Release batches automatically" project settings. **Note** The function is independent and does not have an effect on the function in the "Create batch" OS control.
Permission of the logged-on user "Display properties"	This right does not have an effect on the behavior in the OS controls. The properties are always displayed.	The properties are only displayed if the check box was activated in permission management.

Recommended procedure 13

13.1 How do I restore a SIMATIC BATCH server to its original state?

Question

How can I restore a SIMATIC BATCH server to its original state?

Objective

The aim is to restore a previously created backup file of recipe data on the SIMATIC BATCH server using the **Options > Restore** command.

Requirements

- The database of the SIMATIC BATCH server must be empty or must not yet exist.
- You have created a backup file in the BatchCC using the **Options > Backup** command.
- You must archive required batch data beforehand in the BatchCC. These data are not included in the backup file.

Procedure

1. Exit all SIMATIC BATCH applications in the process cell and exit the BATCH Launch Coordinator. Right-click the corresponding symbol on the **Taskbar > Exit**. This ensures that BATCH processes do not prevent the deletion action in the following step.
2. In the released BATCH folder "sbdata" on the SIMATIC BATCH server, delete the following folders. The location of the BATCH folder "sbdata" depends on the type of installation and the operating system used, as follows. Open the "Shares" folder in Computer Management under System > Shared Folders > Shares. The shared folder name is "BATCH" and the folder path is also displayed.
   - Delete the "EDS" folder (on a "distributed system", this folder is located on the OS server).
   - Delete the relevant project folder "SB8_*"
     If there are several BATCH project folders, the corresponding project can be verified according to the information in the "PCellName" and "ProjectName" rows of the "SB8_*.INI" file.
3. If you are using a redundant configuration, perform steps 1 and 2 on the redundant SIMATIC BATCH server.
4. Load the batch files from the ES (SIMATIC Manager) in the BATCH configuration dialog to the BATCH server(s). This will generate a new project folder: "SB8_*".
5. Start the BATCH Launch Coordinator. Start > SIMATIC > BATCH > BATCH Launch Coordinator.

6. Activate the SIMATIC BATCH Launch Coordinator. Right-click the corresponding symbol on the **Taskbar > Startup/shutdown > Start**. The BATCH Launch Coordinator can also be started automatically depending on the settings you have made there.
7. Start the BatchCC and load the backup file of the BATCH project data using the **Options > Restore** command.

Result

You have restored the SIMATIC BATCH server to its original state and then reloaded the project data from the back up file onto the server.

See also

Restore (Options menu) (Page 1052)

13.2 What should I know about the BATCH project database?

Project database

The BATCH project database grows continually as a result of your entries and configurations. The growth of the database affects the response time for reading data from the database and slows down your system. To prevent this, you can remove unnecessary data records from the database.

Tips:

- Close completed batches. Command in the shortcut menu: Close
- Archive closed batches. Command in the shortcut menu: Archiving
- Delete archived batches. Command in the shortcut menu: Delete object.
- The following settings on the "Batches" tab of the project settings in the BatchCC perform the actions listed above automatically:
  - Close and archive batches automatically
  - Automatically delete archived batches
  - Allow deleting of completed, not archived batches Note that with this setting, the batch was not archived and the batch data is therefore no longer available.

13.3 What effects do changes to SFC types have on SIMATIC BATCH?

Changes to the configuration with and without changing the interface

Changes to SFC types in the PCS 7 basic engineering may or may not lead to interface changes. Depending on this, the configuration procedures to update your batch process cell will differ. Updating the batch process cell also has effects on the behavior of batches in process mode and also on objects you have created in the BatchCC.

Changes to the SFC type	Interface change?
Adding parameters	Yes
Deleting parameters	
Changing the type of the parameter (for example Bool to Real)	
Renaming parameters	No
Changing setpoint limits	
Changing the unit of a parameter	
Changes to the step and transition configuration	

The term "Parameter" used in the table means only BATCH-relevant parameters such as control strategies and setpoints.

Flowchart for configuration steps

The following flowchart illustrates the steps in configuration for changes in the PCS 7 basic engineering and in the SIMATIC BATCH engineering.

Note

Any changes to the project must always be clarified with all the configuration engineers involved in the project.

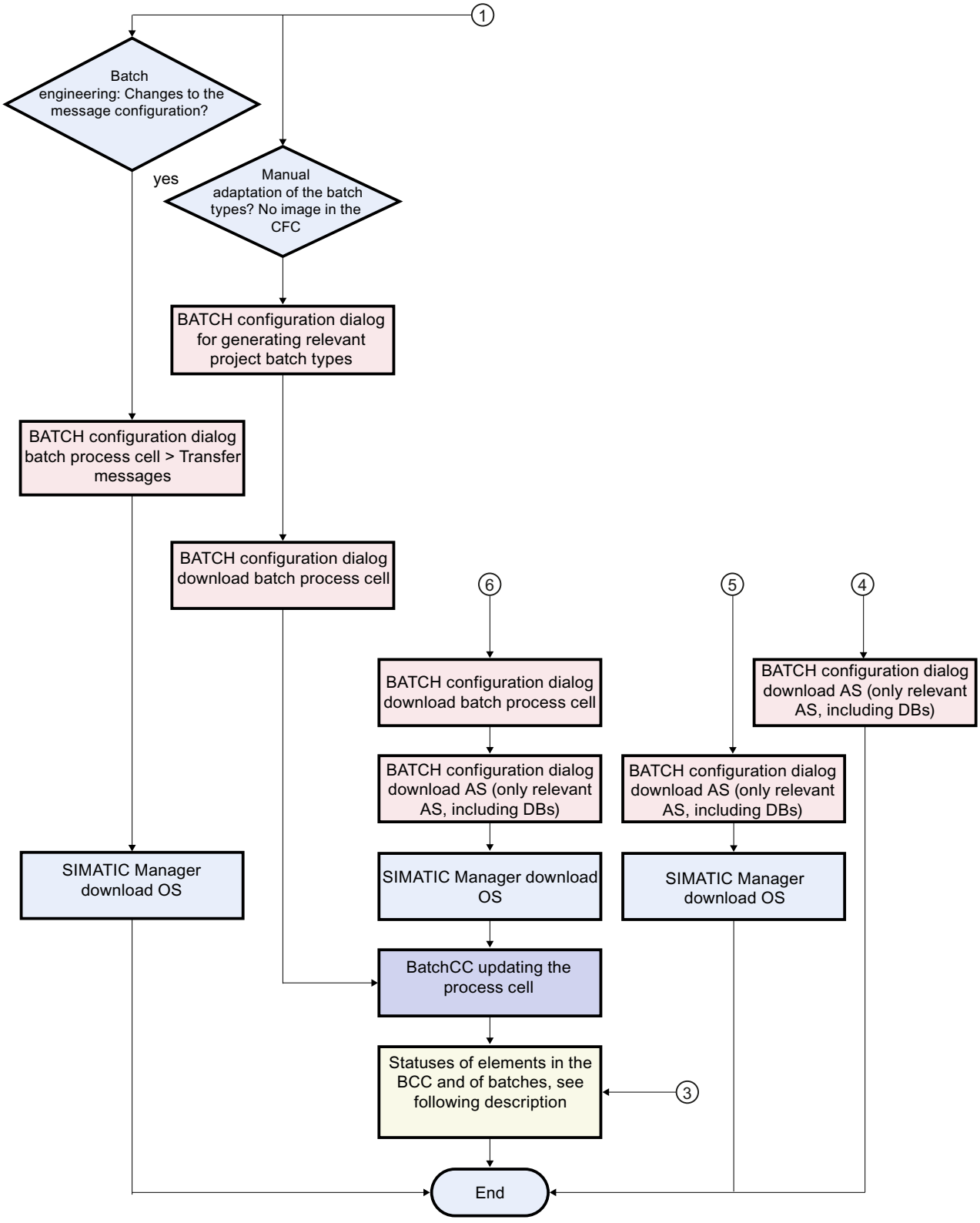


Figure 13-1 SIMATIC BATCH procedure 1

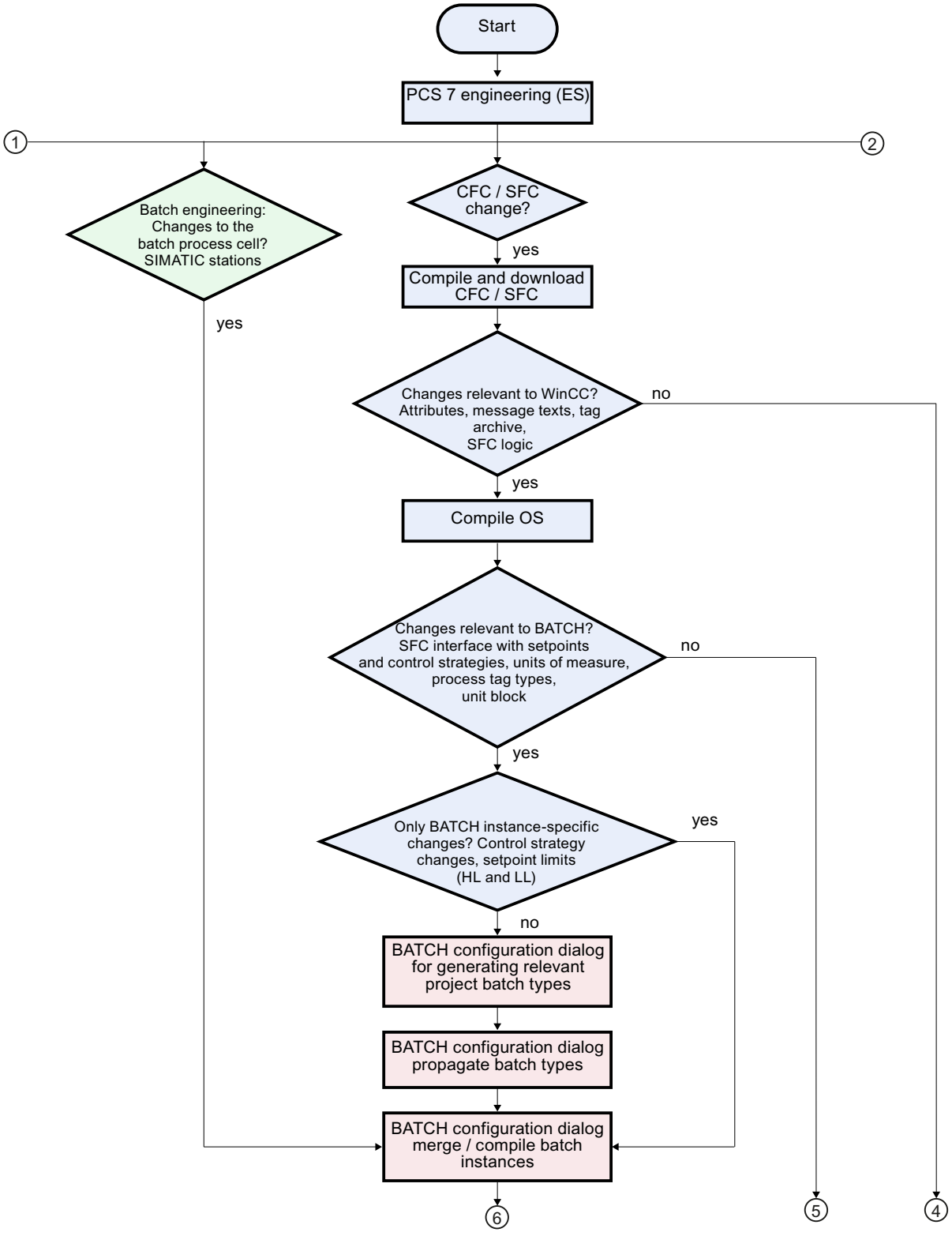


Figure 13-2 SIMATIC BATCH procedure 2

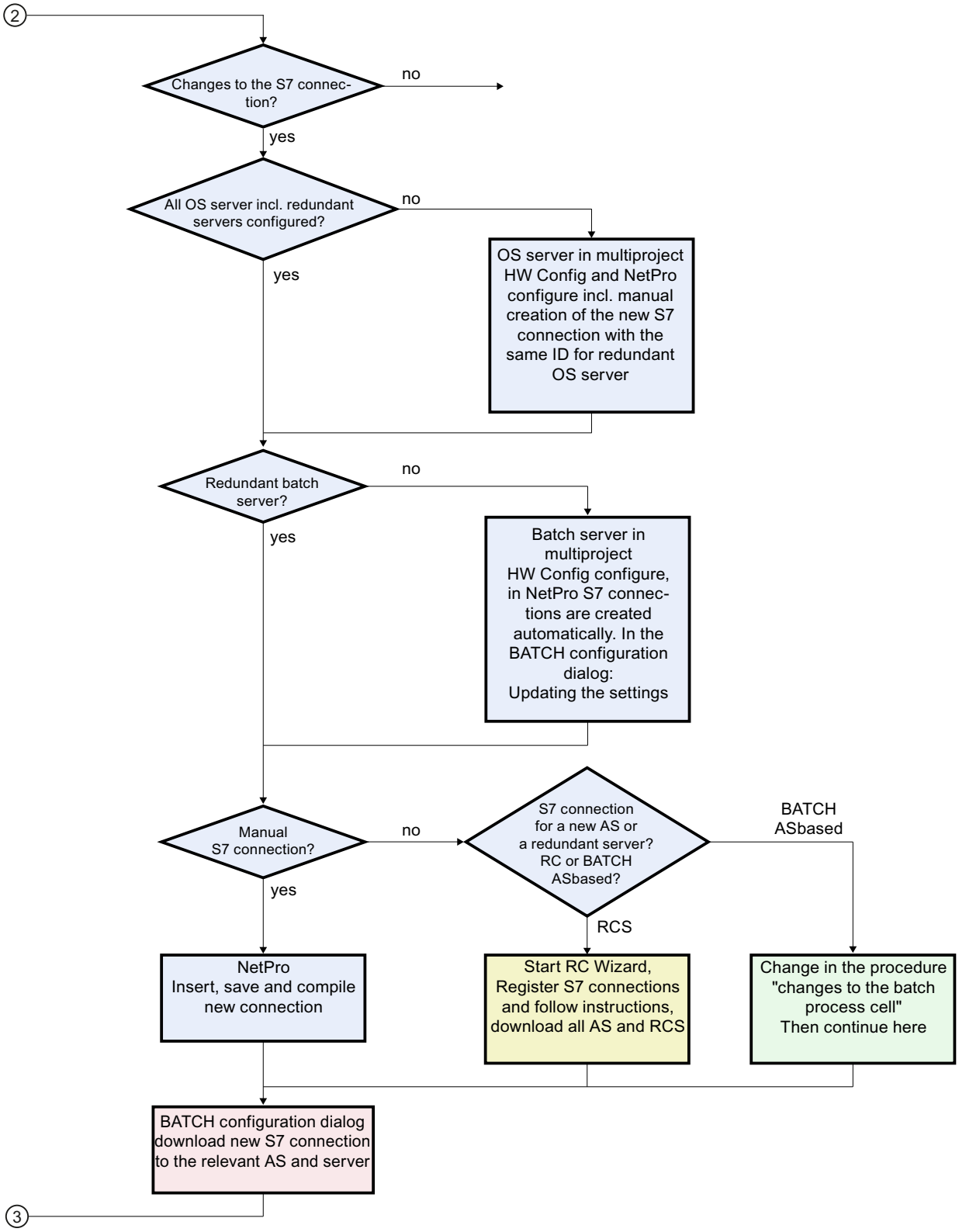


Figure 13-3 SIMATIC BATCH procedure 3

Effects on objects in BatchCC and on batches

Interface changes and their application to the BATCH Control Center or the active batch operation have the following effects:

- You can release and start planned batches.
- You can start released batches.
- Running batches. Definition: After updating the process cell, all the units specified in the master recipe are allocated a batch and the batch is in the "Running" status.
  - The batch is continued as far as the recipe step in which the interface change was made.
  - The batch changes to the error status at this point. The "red lightning" icon is displayed for the batch in the BatchCC.
  - You then need to control and operate the modified equipment phase manually using a suitable faceplate in your process picture (WinCC Runtime).
  - Reset the step with the error in the BatchCC.
  - Resume the batch following the manually operated equipment phase.
- Running batches. Definition: After updating the process cell, none of the units specified in the master recipe is allocated yet or the units are waiting for allocation.
  - The unit in which the change was made cannot be allocated to the batch. In process mode, a WinCC message is generated and displayed. In the Batch CC, the "red lightning" icon is displayed for the batch.
  - Reset the step with the error in the BatchCC and start it again.

Effects of interface changes in the basic engineering on existing master recipes

A change to the SFC type with an interface change can have the following effects on existing master recipes and batches:

- Master recipes in which objects of the modified SFC type are used, lose their release (release invalid).
- Created batches that use a copy of the master recipe cannot be released.
- Released batches lose their release and are invalid. These batches cannot be used and must be deleted.
- Running batches can change to the error status and later recipe phases are no longer started since the instance of the SFC type is held and can no longer be started.

Reaction to errors in the validation

To eliminate errors reported during validation or to confirm changes made to your SFC types, click on the relevant error row in the validation dialog and exit the dialog with the "OK" button. This confirms the changes to the instance.

General information

Whenever you make interface changes, warning dialogs are displayed pointing out the possible consequences.

Changes to SFC types without changes to the interface do not have effects on running batches in SIMATIC BATCH.

13.4 How are IEPH/IEOP blocks connected to the user blocks?

Special case

if you want to connect a recipe step to a self-created user block (SCL code), you should base this on description below.

The IEPH/IEOP block acts as an interface

The IEPH/IEOP block serves as the interface between a BATCH recipe step of the type RPH (recipe phase) and a self-created user block in the automation system for control and status information.

Description of functions

The IEPH/IEOP block is used to pass on the batch control commands to the user block (basic function blocks) and process the status messages of the user block in the status word of the IEPH/IEOP block for batch control.

The user block contains the status processing for an equipment phase. The internal algorithm only permits the status transitions described below.

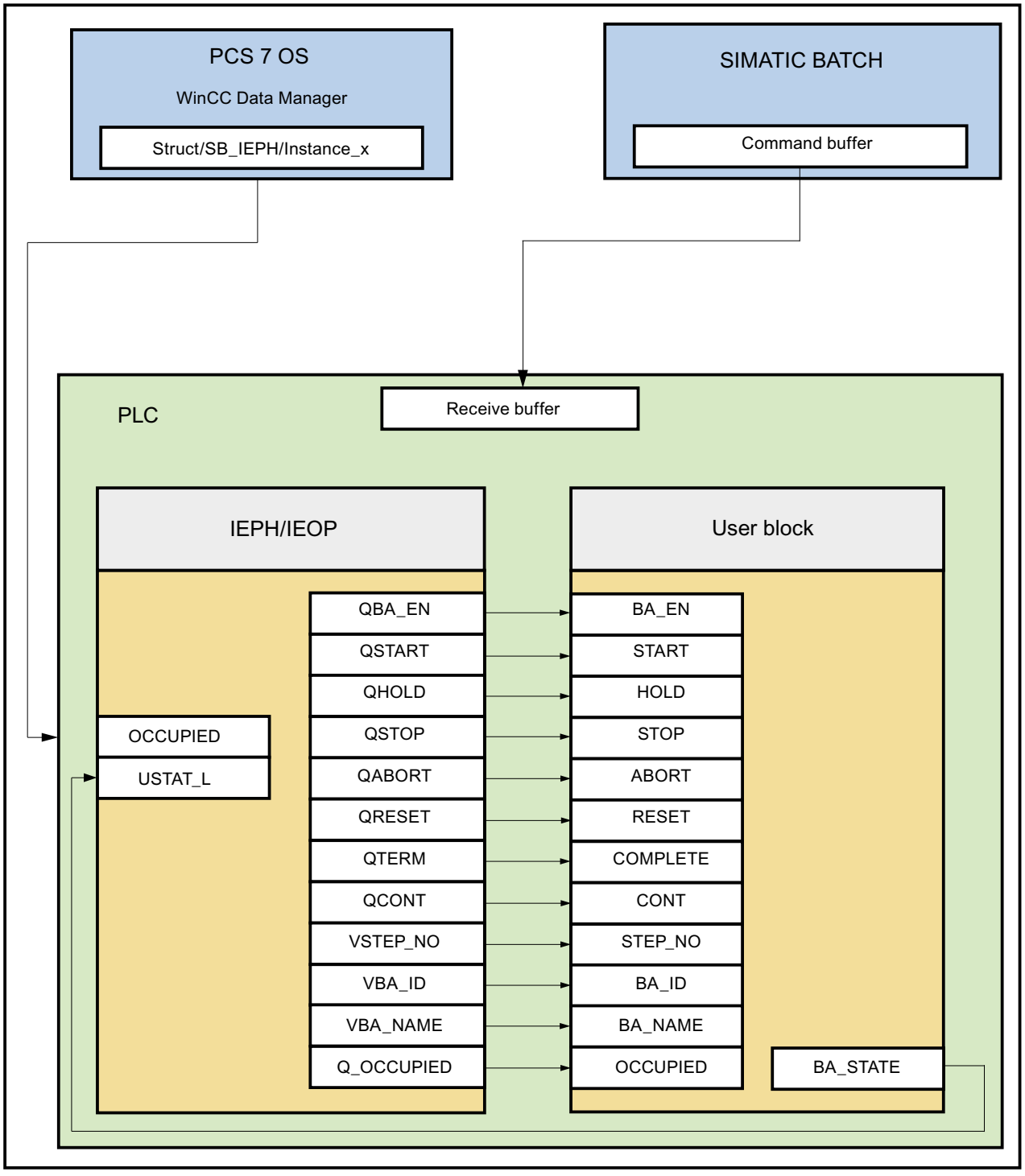
Note

The user program must comply precisely with these conditions so that SIMATIC BATCH can process the "equipment phase" according to the BATCH specifications.

The user block must be processed in the same cycle as the corresponding IEPH/IEOP block.

Interfaces for BATCH and PCS 7 OS (WinCC)

Communication between the BATCH control server (BCS), WinCC Data Manager and CPU is displayed in the image below.



When starting a batch, the corresponding units (representative block UNIT_PLC) are allocated via the WinCC Data Manager. The UNIT_PLC passes the allocation on to the IEPH/IEOP

block. SIMATIC BATCH controls the IEPH/IEOP block via the S7 DOS connection between SIMATIC BATCH and the AS. As shown in the previous image, the IEPH/IEOP block passes its control commands on to the interconnected user block.

BATCH-related input and output parameters

The user block interconnected with the IEPH/IEOP block requires the following parameters:

IN parameter	OUT parameter	Parameter type	Description
BA_EN		BOOL	Enable for BATCH
START		BOOL	Command: Start
HOLD		BOOL	Command: Hold
STOP		BOOL	Command: Stop
ABORT		BOOL	Command: Abort
RESET		BOOL	Command: Reset
COMPLETE		BOOL	Command: Complete
CONT		BOOL	Continuous operation
STEP_NO		DWORD	Batch step number
BA_ID		DWORD	Batch ID
BA_NAME		STRING[32]	Batch name
OCCUPIED		BOOL	Unit allocation
	BA_STATE	DWORD	Status word for BATCH

Allocation of the status word "BA_STATE"

The status word BA_STATE must have the following allocation:

Bit	Hex value	Meaning	Bit	Hex value	Meaning
0	0x0000 0001	IDLE	16	0x0001 0000	Reserved
1	0x0000 0002	RUNNING, ISA-88 state	17	0x0002 0000	Automatic / manual
2	0x0000 0004	COMPLETED, ISA-88 state	18	0x0004 0000	Release for batch
3	0x0000 0008	HELD, ISA-88 state	19	0x0008 0000	Error monitoring time
4	0x0000 0010	ABORTED, ISA-88 state	20	0x0010 0000	Reserved
5	0x0000 0020	READY, ISA-88 state	21	0x0020 0000	Update (write setpoint and process values)
6	0x0000 0040	STOPPED, ISA-88 state	22	0x0040 0000	Lock start
7	0x0000 0080	Not used	23	0x0080 0000	Continue option
8	0x0000 0100	Not used	24	0x0100 0000	Allocated

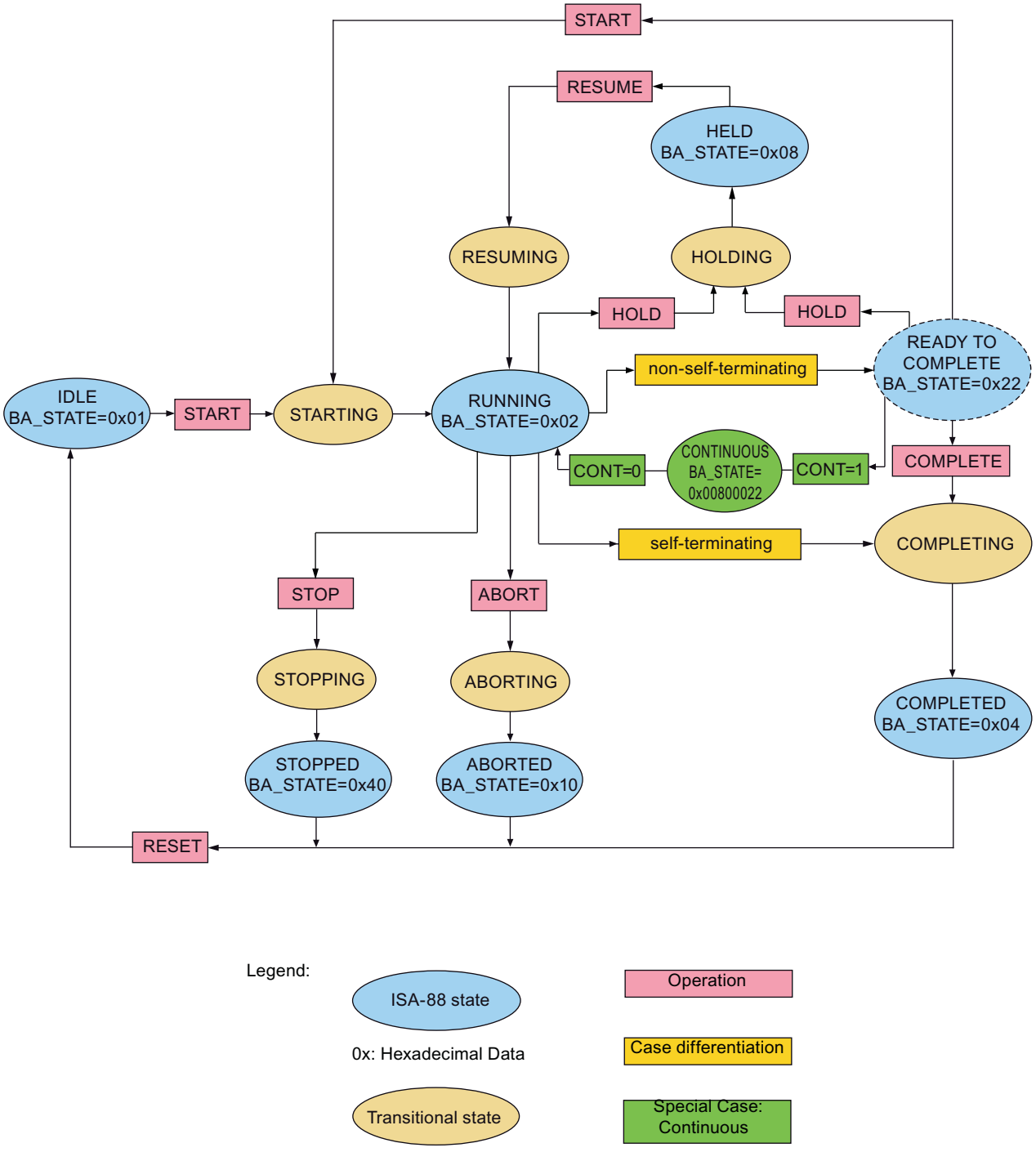
Bit	Hex value	Meaning	Bit	Hex value	Meaning
9	0x0000 0200	STARTING, ISA-88 state	25	0x0200 0000	Reserved
10	0x0000 0400	RESUMING, ISA-88 state	26	0x0400 0000	Reserved
11	0x0000 0800	COMPLETING, ISA-88 state	27	0x0800 0000	Reserved
12	0x0000 1000	HOLDING, ISA-88 state	28	0x1000 0000	Reserved
13	0x0000 2000	ABORTING, ISA-88 state	29	0x2000 0000	Reserved
14	0x0000 4000	STOPPING, ISA-88 state	30	0x4000 0000	Reserved
15	0x0000 8000	Not used	31	0x8000 0000	General error

Note

The BA_STAT status word can contain an ISA 88 status and other operating modes (for example automatic or manual). It is not possible for more than one ISA -88 status to be present at the same time. The continuous mode may only be set in the ready to complete status.

State transition diagram of an equipment phase

The illustration below shows the state transition diagram, which must be displayed by the user block.



13.5 How are transfer parameters configured and used?

Introduction

Transfer parameters use locations of the type "LOCATION" (Source, Via, Dest). The term "location" denotes input and output points in units, for example, the outlet valve of a tank.

You can select a previously defined location in a recipe as a transfer parameter and continue to use its unique value in batch mode in your automation program.

Configuration

1. Locations are created as an equipment property of data type "LOCATION" under equipment properties in the global declarations in the SIMATIC Manager. The settings "Source", "Via" and "Dest" (destination) are provided as additional properties. A location can have all properties (Source, Via, Dest).
2. In the equipment properties of a unit (Plant view), you create a new instance of the location using a new equipment property. Assign the global location under type in the object properties. Now the object is instantiated and given a system-wide unique value or a number.
3. Open the SFC type or the interface block of the corresponding technical function in which you want to use the transfer parameter. Create a new setpoint in the characteristics. In the new declaration line, assign a name and select the appropriate transfer parameter in the "Data type" column. The block is supplemented with the new inputs/outputs when the CFC chart of the technical function is updated.
4. Once the engineering of the AS, PCS 7 OS and BATCH is completed, you can use the defined transfer parameters when creating recipes and assign the instanced locations.

Result

In batch mode, the value of the location is written to the corresponding technical function by the transfer parameter. The pending value at the corresponding block output can be used, for example, for route control using SIMATIC Route Control.

Additional information

Display of transfer parameters (Page 675)

"Location" dialog (Page 908)

"Transfer parameter" tab (Page 842)

Selecting types of locations for transfer parameters (Page 612)

13.6 How do I use S7-PLCSIM with SIMATIC BATCH for AS-based operation?

S7-PLCSIM

In S7-PLCSIM, you can run and test your STEP 7 user program in a simulated programmable logic controller (PLC).

With a few adjustments, on a single station you can set up an existing PCS 7 project with SIMATIC BATCH for use with S7-PLCSIM.

Note

Simulation for testing purposes only

All of the following settings apply exclusively to simulation for testing purposes on a single-station system with no connection to real automation systems.

If you want to return to plant operation following a test simulation, you must take all the required actions described in reverse order.

Note

TCP/IP

S7-PLCSIM can only communicate via an S7 connection based on the TCP/IP protocol.

Objective

The objective is to operate and monitor batch processes in BatchCC for testing purposes, the recipe logic of which runs in the automation system and is simulated in S7-PLCSIM.

Requirements

- Installation of SIMATIC PCS 7 option S7-PLCSIM V5.4 SP5 Upd1
- An open PCS 7 project with SIMATIC BATCH in the SIMATIC Manager
- Master recipe containing recipe unit procedures (RUPs) that are executed on the AS

Procedure

1. In the SIMATIC Manager, click on the menu command **Options > Simulate Modules**. This starts S7-PLCSIM. In the selection list, select the "PLCSIM (TCP/IP)" connection type and set **Menu > Run > Mode selector position** to **RUN-P**.
2. Open HW Config for your AS. Open the object properties for the configured communication processor and check if the "Store configuration data on the CPU" is activated in the "Options" tab. This setting is mandatory for S7-PLCSIM.

3. Compile the hardware configuration and download it to S7-PLCSIM. After download, the connection type set in S7-PLCSIM is applied and displayed in the status line of SIMATIC Manager.
4. Open NetPro. Save and compile your network configuration. Then select your AS and download the selected station to S7-PLCSIM as well. The PC station does not have to be downloaded because the communication with the AS is not controlled by the Station Configuration Editor. Close Netpro and HW Config.
5. Open a CFC and compile the entire program. After loading the CFCs to the AS, close CFC.
6. Select the PCS 7 OS in your PC station and compile it. Click on the "Connection" button here in the wizard. In the "Select the Network Connection" dialog, check or select TCP/IP in the "WinCC Unit" column for the Ethernet subnet and click "OK". Then perform all further steps in the wizard and click "Compile" at the end.
7. Open the PCS 7 OS and check in WinCC Explorer whether the new connection setting has been adopted. To do this, select in the Tag Management > SIMATIC S7 Protocol Suite, the TCP/IP channel unit and click on "System Parameters" in the shortcut menu. Switch to the "Unit" tab and check whether "PLCSIM.TCPIP.1" is set in the selection list under "Logical device name". If not, select the appropriate entry from the drop-down list (see information on the status bar in SIMATIC Manager), and apply the setting.
8. Open the BATCH configuration dialog in SIMATIC Manager and make all the additional BATCH configurations there.
9. Select your AS in the process cell data. Select the "Simulation (TCP/IP) on/off" option in the properties. Then load the SIMATIC BATCH server. Make sure that memory configuration of your CPU and the corresponding allocation used for the recipe logic are entered and selected for AS-based mode.
10. Save the simulation with the menu command **Simulation > Save target system as**.
11. To allow the S7 connection to be established to the AS, the "SIMATIC BATCH Server Control Service" must be started manually in the user context and not in the system context.
    - Open the "Services" dialog via Start> Run under the "services.msc" item for this.
    - Double-click on "SIMATIC BATCH Server Control Service".
    - Change to the "General" tab.
    - Select "Manual" from the drop-down list.
    - Open the "Log On" tab.
    - Select the "This Account" option.
    - Click on the "Browse ..." button.
    - In the input box, enter the local administrator of the work group or the domain from your Windows user management.
    - Click the "Check Name" button.
      The user selected here, must also be used for the Windows logon to use PLCSim.
    - Click on the "OK" button.
    - Close all open dialogs.

12. For the Windows Server and Windows 7 operating systems, the BATCH Control server must be modified in such a way that it is started as an interactive user and not by the launch coordinator in system mode.
    - To do this, open the "Properties of Bfserverhostx" dialog by selecting **Start > Run** and specifying "dcomcnfg".
    - Select the DCOM configuration "Bfserverhostx".
    - Click on "Properties" in the shortcut menu.
    - Change to the "Identity" tab.
    - Select the "Interactive user" option.
    - Close the dialog with "OK".
13. Restart your PC.
14. Open the "Services" dialog via **Start> Run** specifying "services.msc".
15. Start the "SIMATIC BATCH Server Control Service".
    This step is required after every restart of the PC.
16. After BATCH Runtime starts again, start BatchCC.
17. Update the process cell to adopt the data.
18. Create a new batch that uses a control recipe in which recipe unit procedures are executed in the AS.
19. Release the batch.
20. Start the batch for simulation.

Result

They have simulated your user program in S7-PLCSIM.

13.7 How do I configure and use dynamic unit parameters?

13.7.1 How do I configure parameter steps?

A parameter step refers to a recipe step in a master recipe at which parameter values are configured that are passed to a unit. During configuration in the Recipe Editor, the parameter step is identified by a special symbol, a frame at the recipe step symbol. In this example, you pass setpoints to a unit that you then query in a transition condition. To control the properties of units using batch control, some configurations in components from basic engineering and BATCH engineering are required.

Requirements

- The software and the project have been updated.
- You are using BATCH blocks from the current block library.

Description of configurations

The configurations below give you an exemplary overview of the different configuration steps and the possible applications of your processes.

Creating an enumeration

1. Open the "Enumerations" folder in SIMATIC Manager within the "Shared Declarations" of your project. Create a new enumeration. Example: "TA_states".
2. Create two values for the unit property "UnitState", for example, clean and dirty.

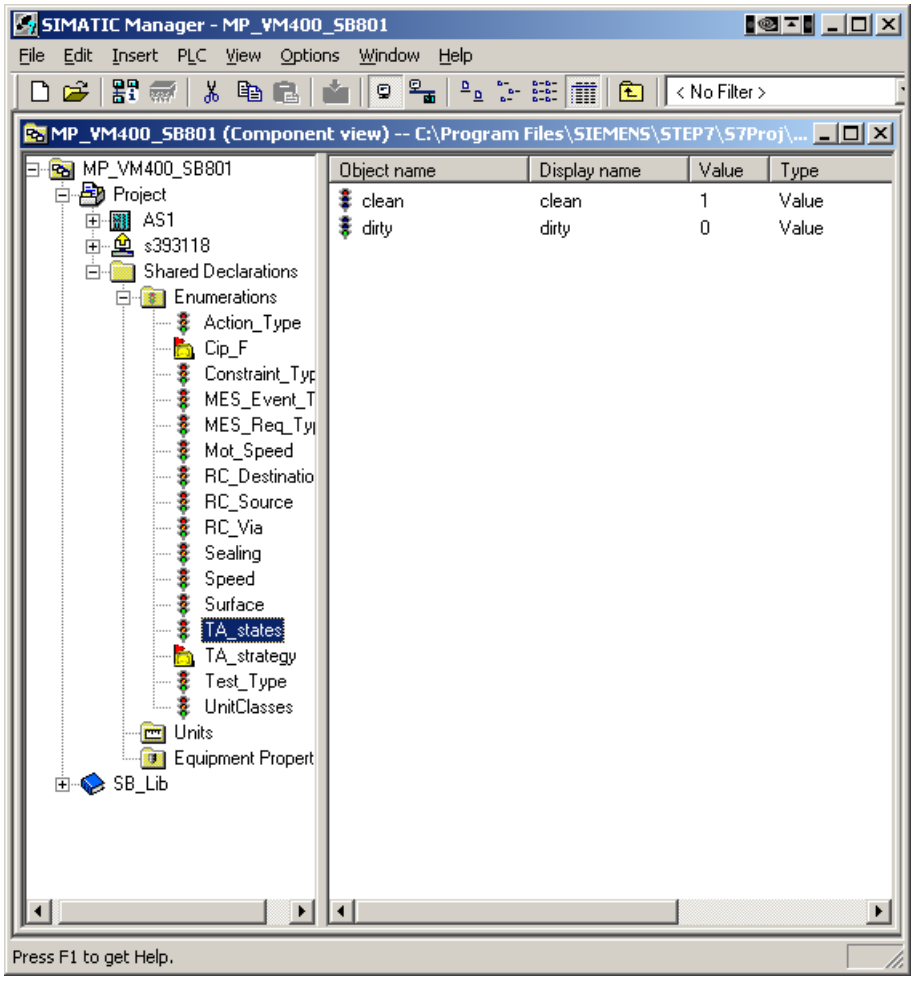


Figure 13-4 Creating an enumeration

Opening the CFC chart of a unit and editing block connections

1. Open a CFC chart of an existing unit and make the "UnitStatus" connection visible in the project properties.
   When you place the "UNIT_PLC" block from the BATCH library listed above as new instance in your chart, it along with other block connections is already visible.
2. Double-click the visible connection and select the "TA_states" enumeration you created under Enumeration.

3. Then select the value of the enumeration, for example, clean and exit the dialog.

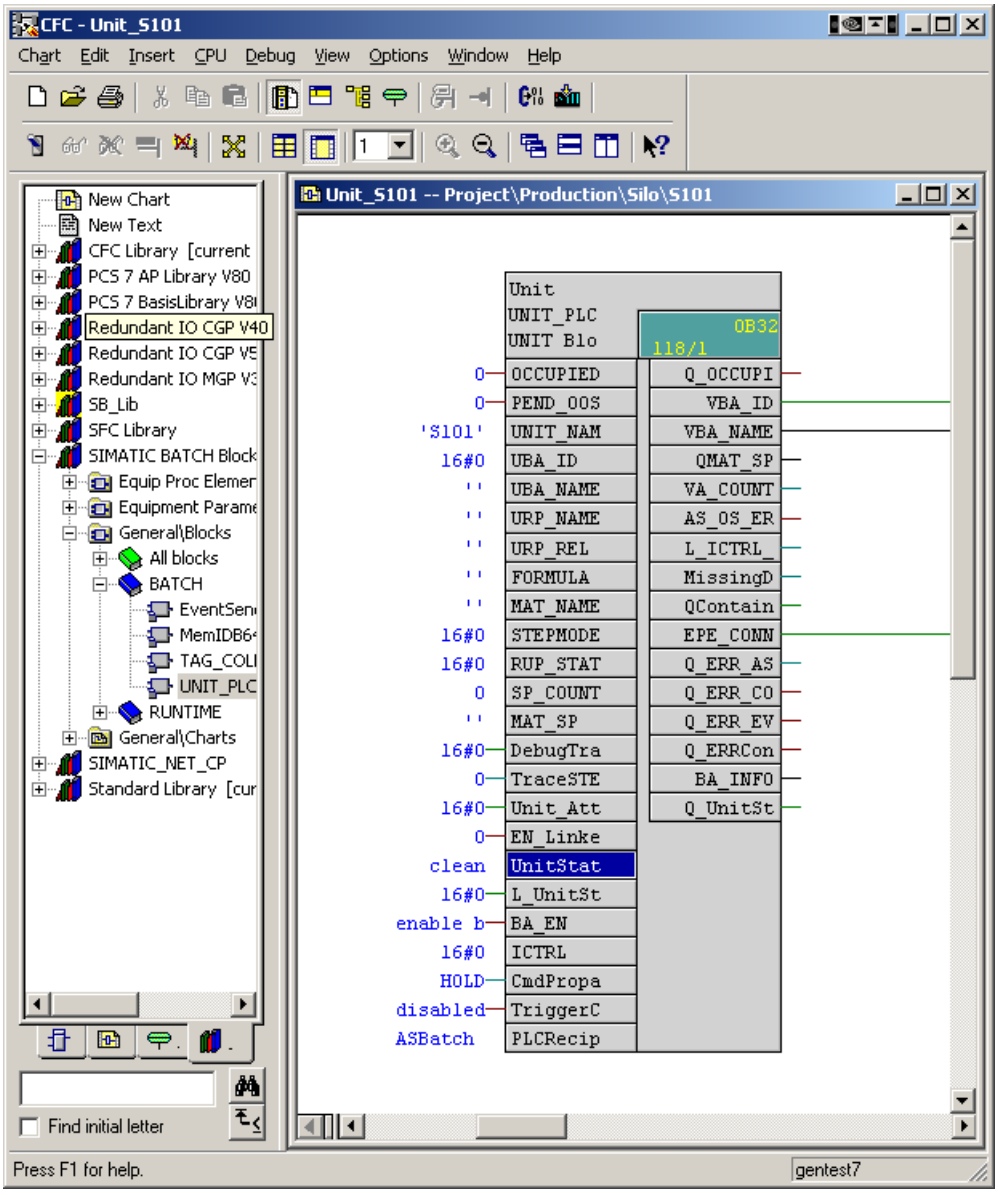


Figure 13-5 Selecting enumeration at block contact

4. Compile and download the CFC charts and exit CFC afterward.

Engineering in the BATCH configuration dialog

1. To make the new configuration data available in SIMATIC BATCH, you have to generate/ propagate the batch types and compile/merge the batch instances. To do so, open the BATCH configuration dialog in SIMATIC Manager and start these actions.
2. If necessary, transfer the BATCH messages to the PCS 7 OS, and then download your Batch process cell.

PCS 7 OS

1. Compile and download your PCS 7 OS.
2. Start process operation on the PCS 7 OS.

Engineering in BatchCC and in the Recipe Editor

1. If BATCH Runtime has not been started in the BATCH launch coordinator, start it with the corresponding command from the shortcut menu of the BATCH launch coordinator.
2. Open BatchCC and update your batch process cell. Only then can the new engineering data be used in SIMATIC BATCH.
3. Open a master recipe in which you want to configure a new parameter step.
4. Insert a recipe function or a recipe operation which includes the recipe function in the corresponding unit procedure.
5. Open the object properties of the recipe function and select "Unit" under function in the "General" tab. In the "Parameter" tab, select the value that the function is to include during batch execution, here "dirty".
6. Save the recipe.

7. You can use the property passed to the unit in a transition query, for example. Another equipment phase is only executed, for example, when the property of the unit is "clean". In this case, you configure a process tag as operand1 in the transition wizard and a constant as operand2. The process tag (clean, dirty) is available under "_Unit_Properties" > "UnitStatus_Param".

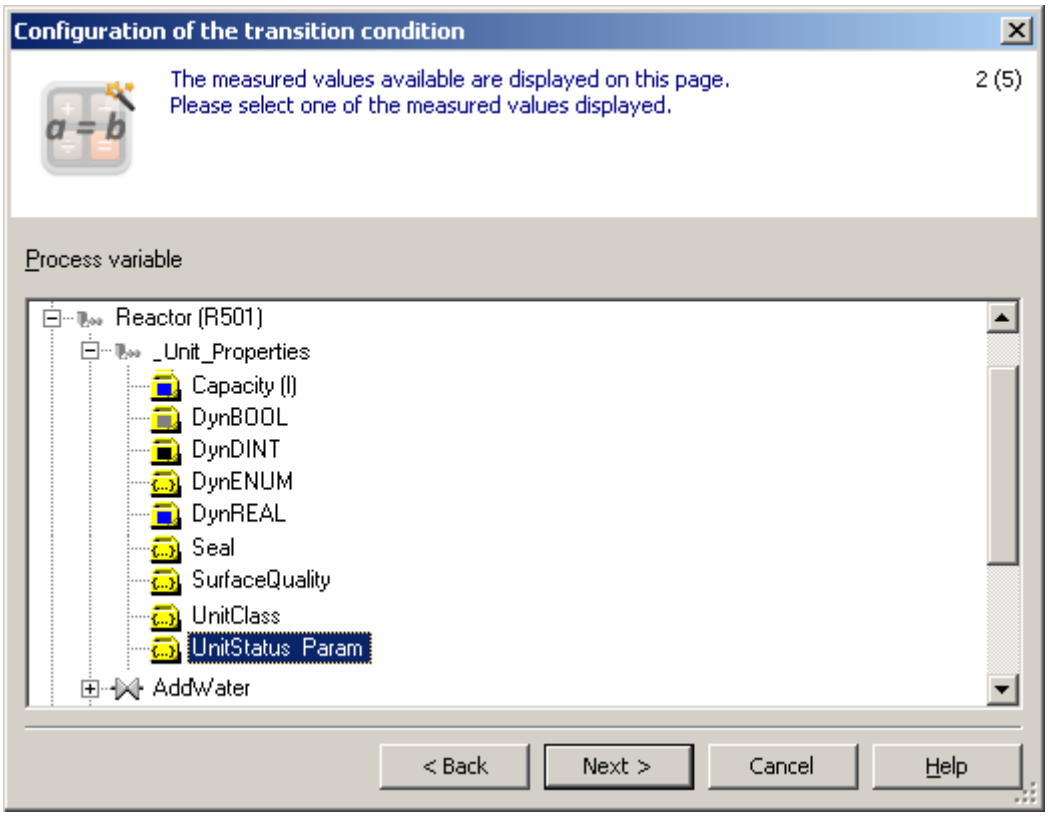


Figure 13-6 Configuring the transition condition

8. Save your master recipe and release it for production. The final master recipe can look like this:

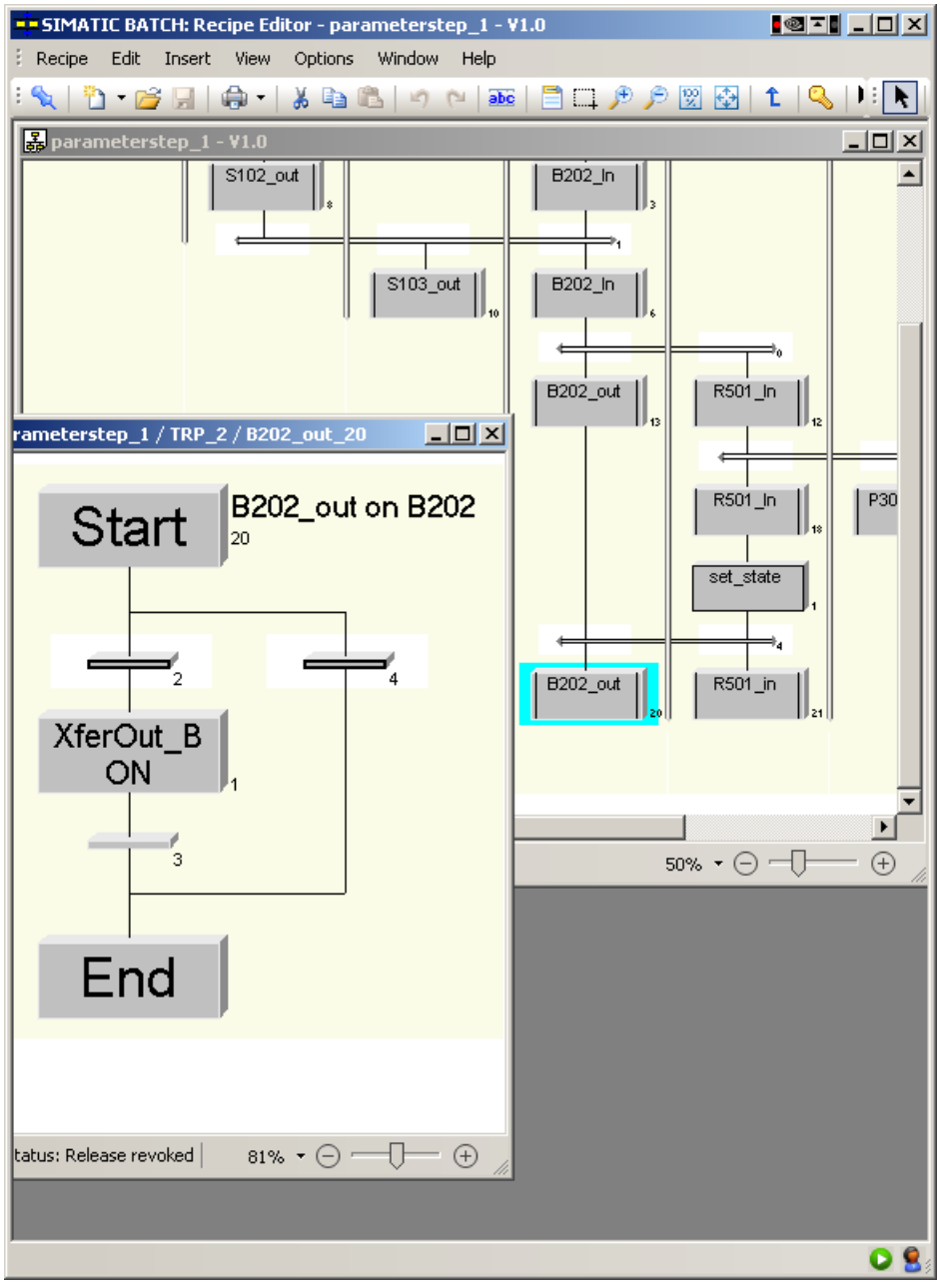


Figure 13-7 Recipe with transition query

Batch behavior

Create a new batch with the created master recipe. Release the batch and start it.
During batch processing, the parameter step on the corresponding unit, here R501, sets the input "UnitStatus" to the value "dirty". If the next transfer function or the alternative branch is run, depends on the result of the transition. The transfer function is only started when the value is "clean". The alternative branch is executed in our example. This means that no other phases are executed and the batch is completed.

13.7.2 How do I configure parameter groups?

The configuration of a control strategy as dynamic unit parameters takes place at the interface blocks IEPH or IEOP, same as the control strategy configuration.

Note

Control strategy assignment at the IEPAR_ENUM block

- There may be only one dynamic control strategy parameter. At each IEPAR_ENUM block, you must select the same control strategy type at the "SP_VAL" connection.
- The "SP_VAL" connection of an IEPAR_ENUM interface block interconnected in a chart must always be assigned to an enumeration or a control strategy data type.

The validation signals an error in the BATCH configuration dialog in both cases. This error must be eliminated prior to the download.

Requirements

- The software and the project have been updated.
- You are using BATCH blocks from the current block library.

Description of configurations

The configurations below give you an exemplary overview of the different configuration steps and the possible applications of your processes.

Inserting a control strategy in the shared declarations

Create a new control strategy with three values, for example, in the "Shared Declaration" folder of your project.

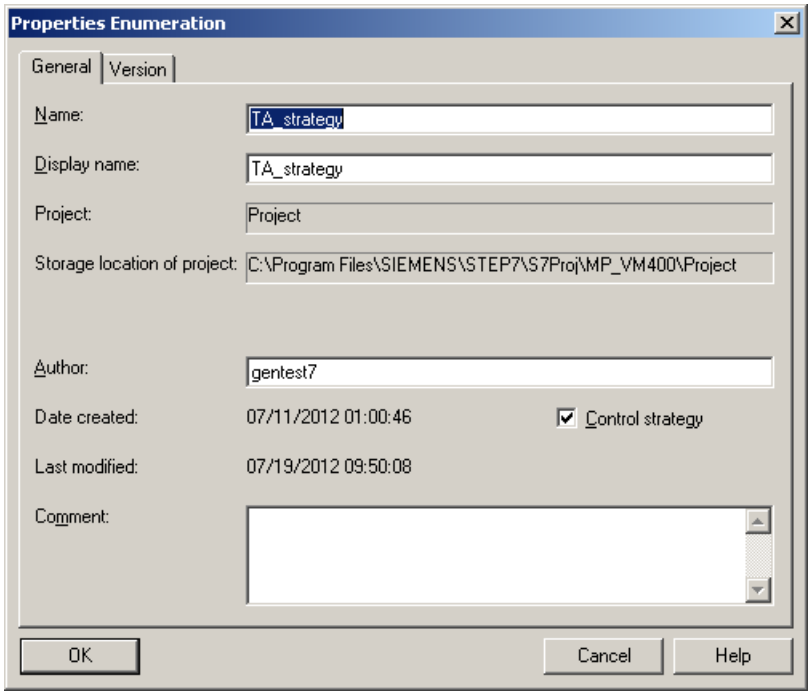


Figure 13-8 Creating a control strategy

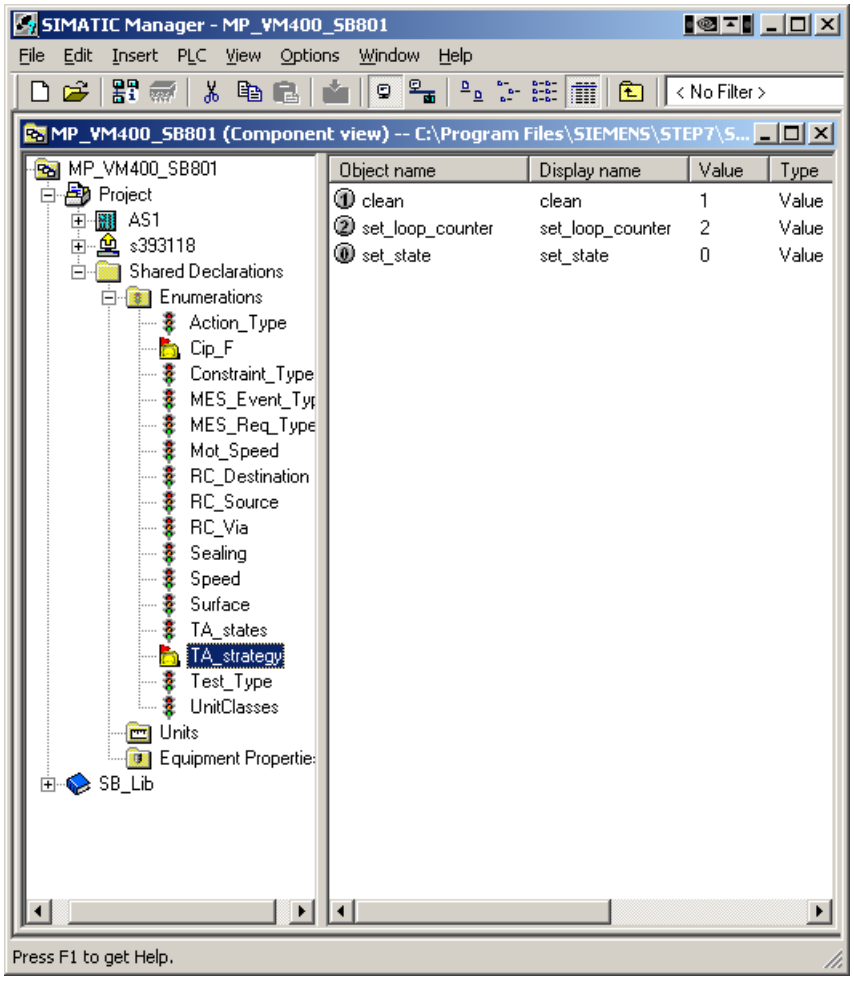


Figure 13-9 Creating a control strategy parameter

Inserting IEPAR_X blocks and interconnecting them with unit block "UNIT_PLC"

You can connect all parameter interface blocks of the different data types with a "UNIT_PLC" unit block using the "EPE_CONN" I/O.

1. Open a chart in the CFC chart containing a "UNIT_PLC" unit block of your process cell. Setpoints are passed to SIMATIC BATCH at this unit block.
2. Select the "Libraries" tab and navigate to the parameter interface blocks in the BATCH block library.

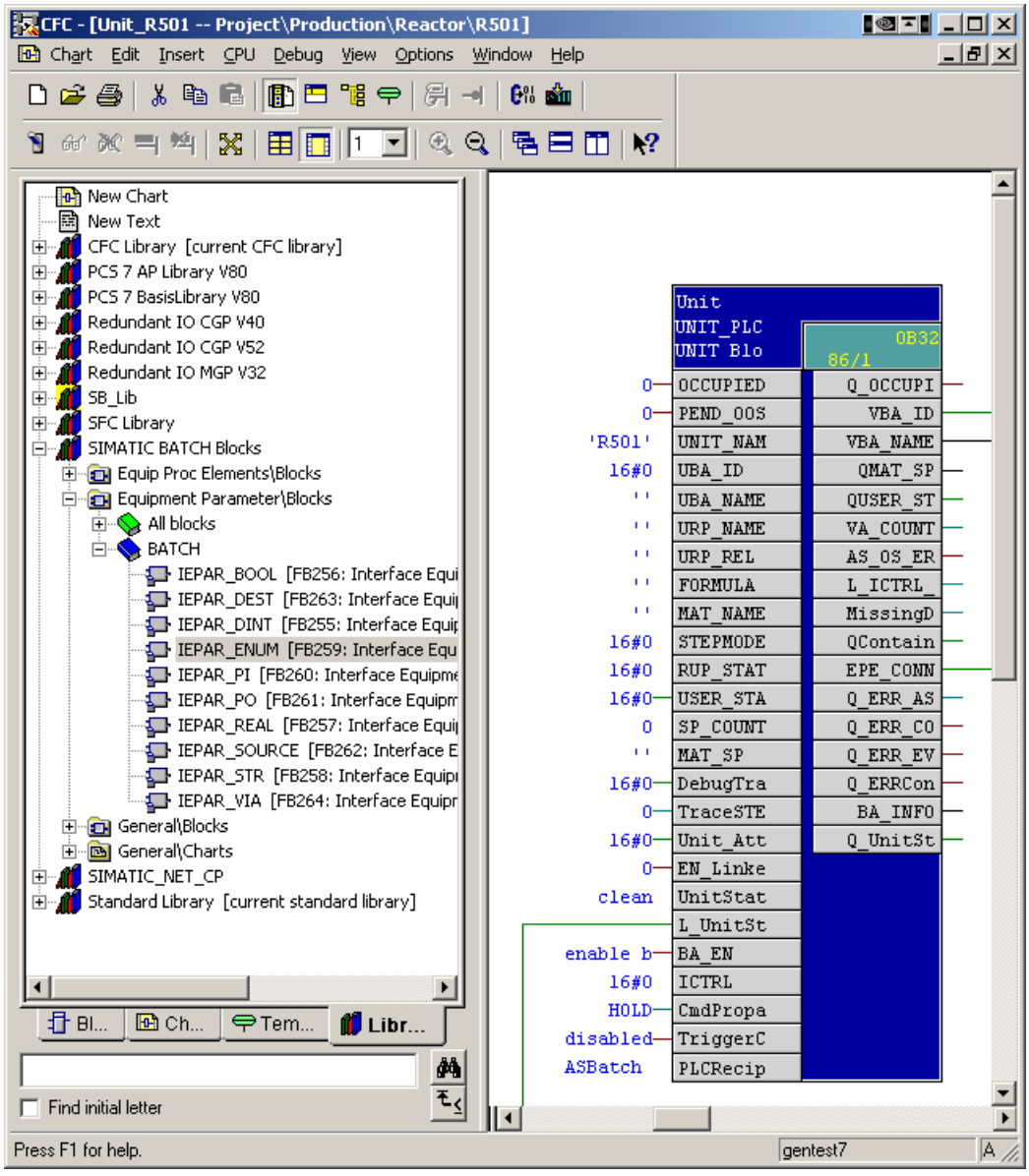


Figure 13-10 BATCH parameter interface blocks

3. Insert the parameter interface blocks required for your configuration in the open chart. The blocks of type BOOL, ENUM, REAL and DINT are configured as an example for later use in SIMATIC BATCH. Then interconnect the "EPE_CONN" I/O at the "UNIT_PLC" block with

all "EPC_CONN" I/Os at the parameter interface blocks. Assign a name in the object properties of each interface block.

Selecting a control strategy and value for I/O "SP_VAL" at "IEPAR_ENUM" block

Assign the control strategy "TA_strategy" created in the shared declarations and "clean" as initial value in the properties of the I/O "SP_VAL".

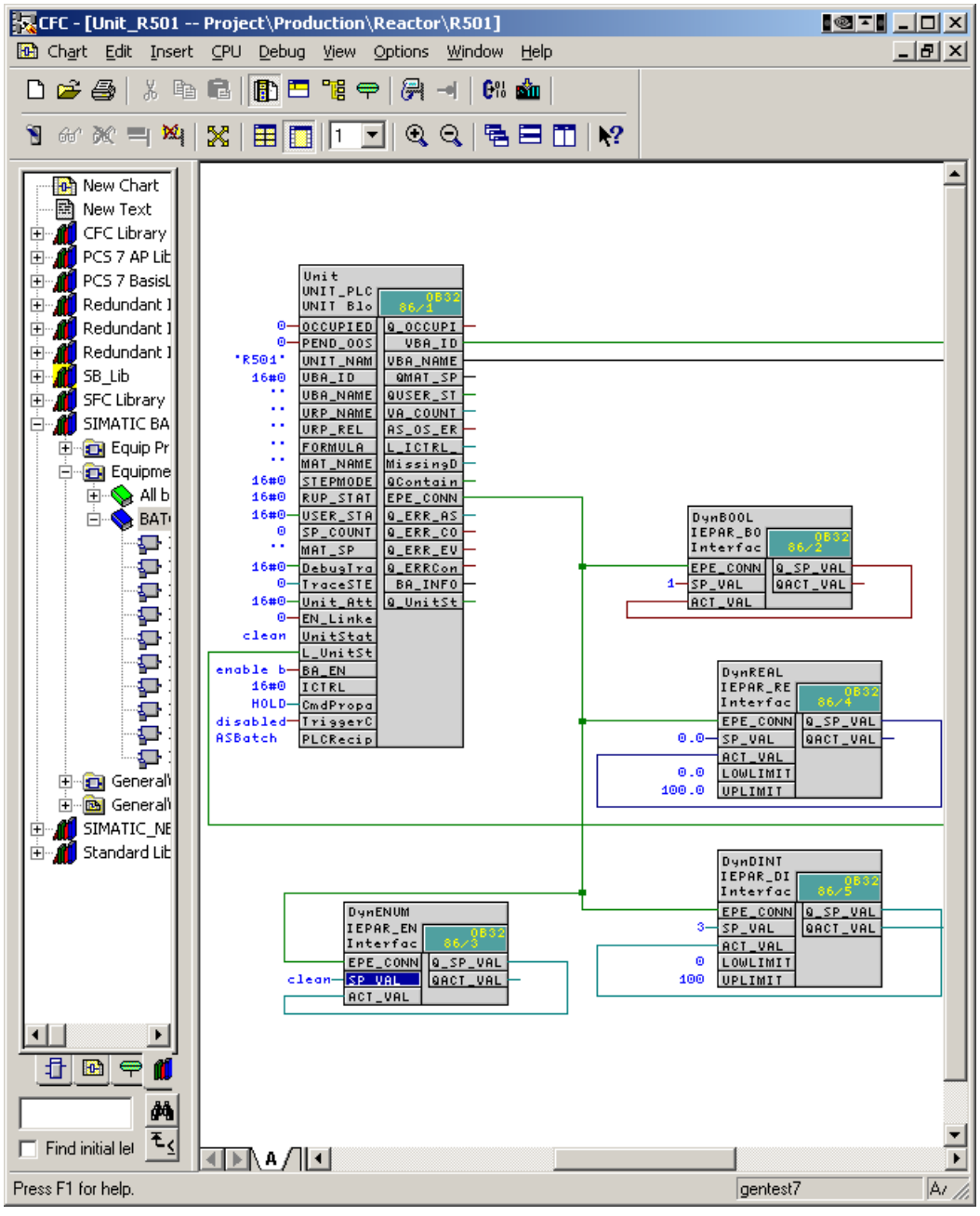


Figure 13-11 Assigning a control strategy to block I/O "SP_VAL" of parameter block "IEPAR_ENUM"

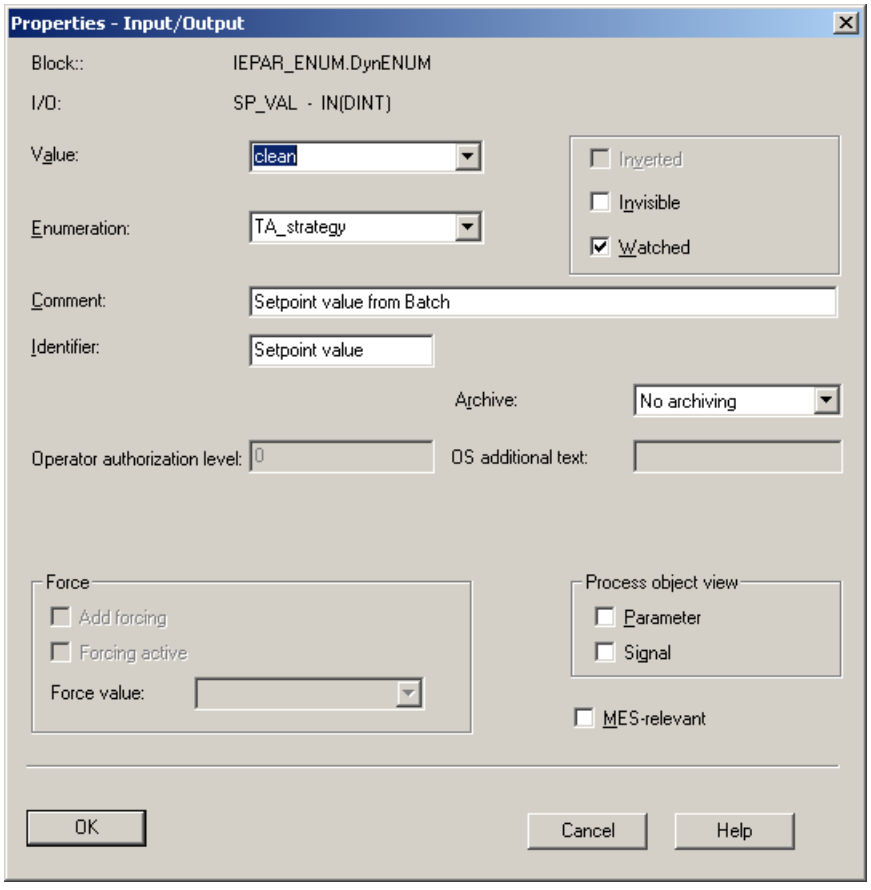


Figure 13-12 Assigning a control strategy and initial value to the I/O

Compiling and downloading CFC, compiling and downloading PCS 7 OS

1. Compile your changes in the the CFC charts and download them to the AS.
2. Compile your PCS 7 OS and download the changes to the target station.

BATCH engineering in the SIMATIC Manager

1. Open the BATCH configuration dialog for your multiproject or your project.
2. Generate the batch types and propagate them in the multiproject.
3. Compile the batch instances and merge them in the multiproject.
4. You check this by opening the structures you have extended in the instances. In our example, these are the instances "DynREAL", "DynBOOL", "DynDINT" and "DynENUM" in the "Reactor" > "R501" folder that are listed as new.

5. Assign the desired parameter groups to each unit.

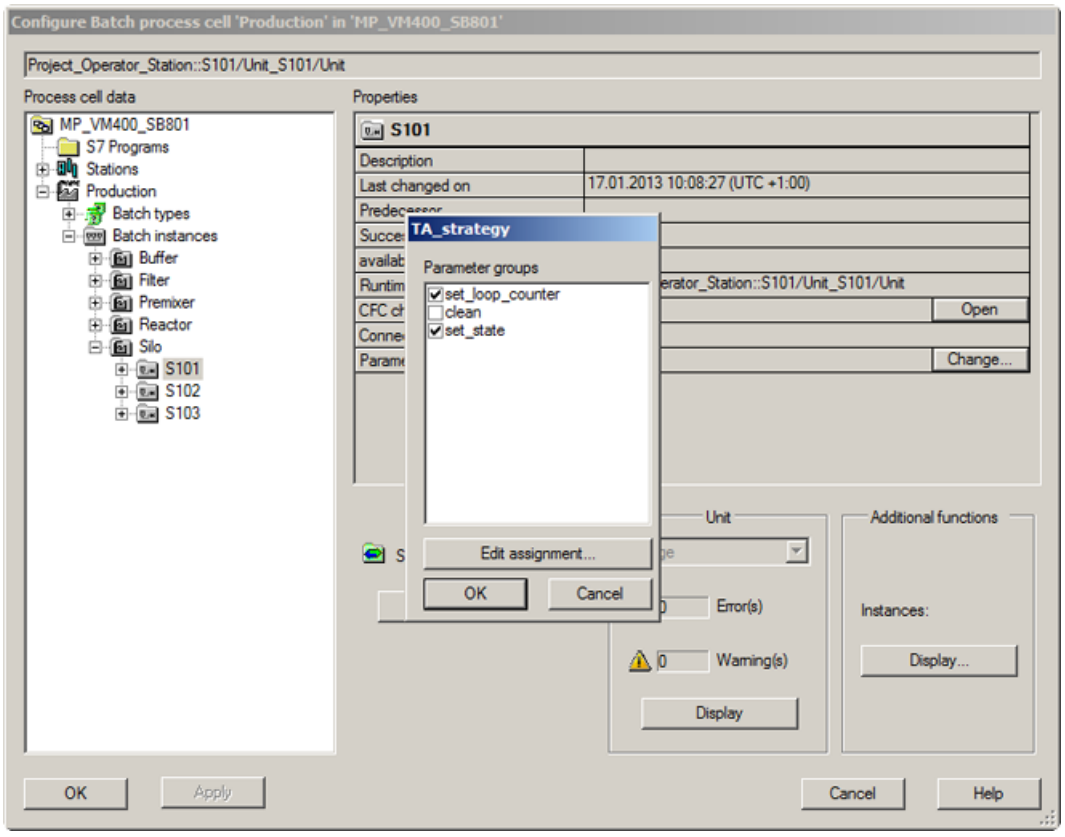


Figure 13-13 Assignment of parameter groups to the units

6. For the parameter group assignment, navigate to the control strategy parameter under Batch Types > Equipment Properties. Click "Edit" in the display window.

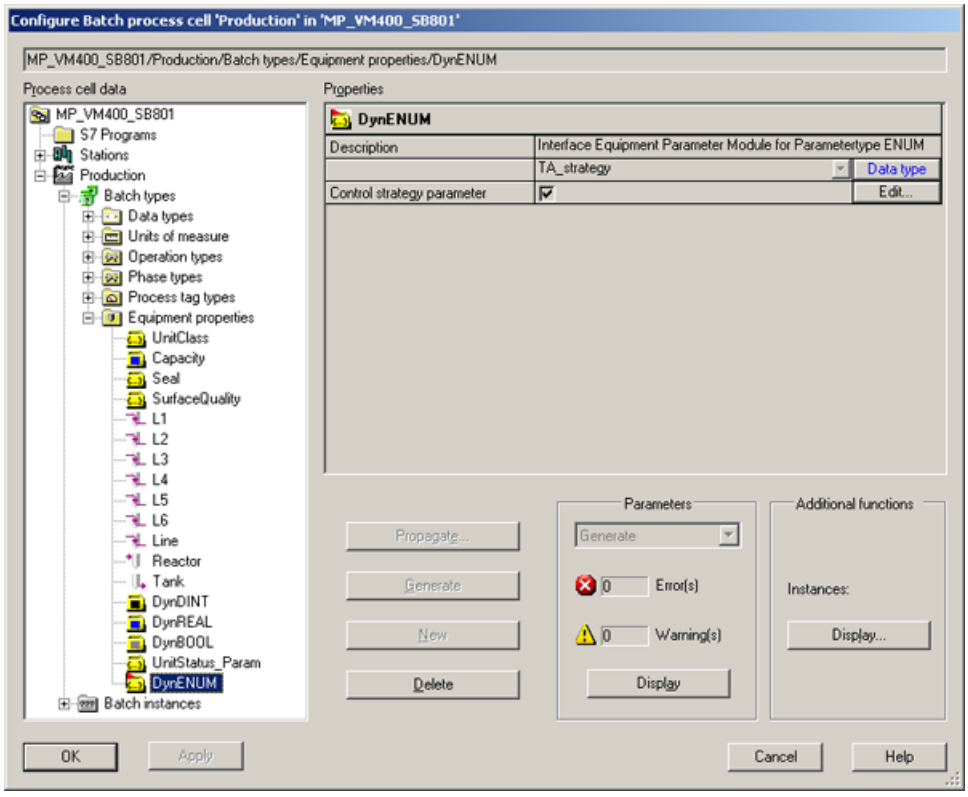


Figure 13-14 Dynamic unit parameters, equipment properties

7. In the dialog that opens, specify the parameter groups to which you want to assign the given parameters. You can find additional information in the online help. With recipe engineering, only the parameters selected here are made available for a selected parameter group.

Note

The selection made here always refers to the entire batch process cell.

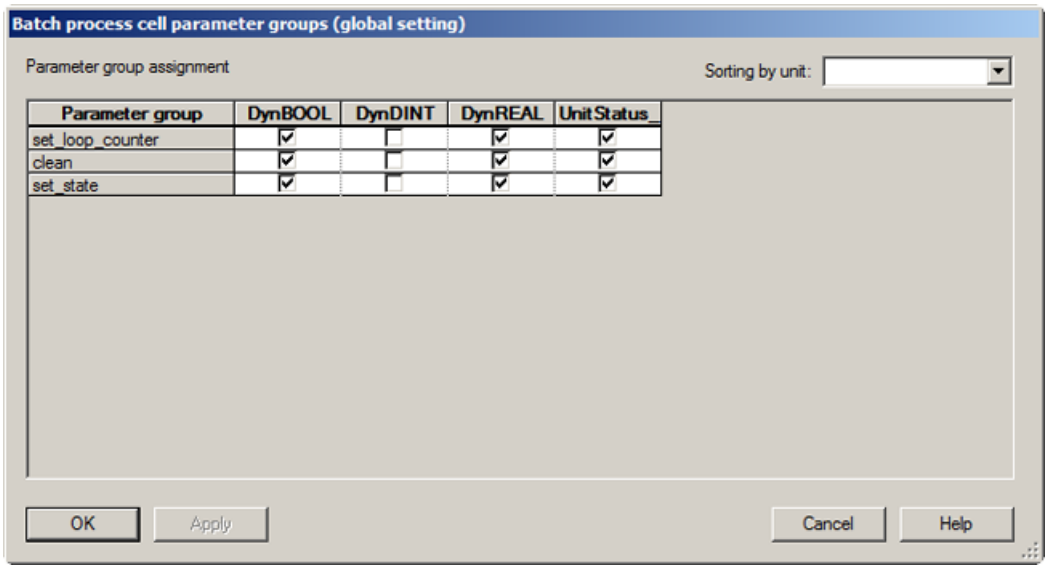


Figure 13-15 Parameter group assignment of the batch process cell

8. Download your process cell data to the BATCH server. To do so, select your process cell and select "Download" in the shortcut menu.

Recipe engineering

1. Make sure that the project was activated on the PCS 7 OS and on the BATCH server and then open BatchCC.
2. Update the process cell data in BatchCC.
3. Select an existing master recipe and cancel its release, if necessary. Then open it in the Recipe Editor.
4. The existing master recipe is now extended by a parameter step and a parameter query in the Recipe Editor (as an example). The means the unit procedure Reactor R501 is being processed.
5. Insert a new recipe function. In the properties, select "Unit" under function and one of the configured control strategies for control strategy.

6. Open the "Parameters" tab. Here the parameters created in basic engineering are available for input and selection of values. The entered values are passed to the process by batch control and can be used.

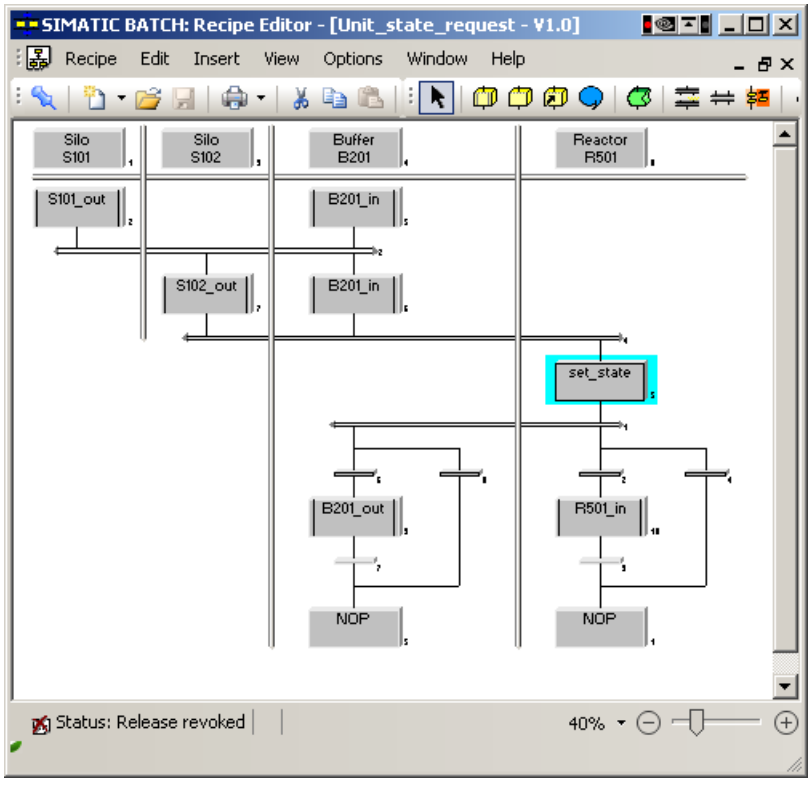


Figure 13-16 Creating a parameter step

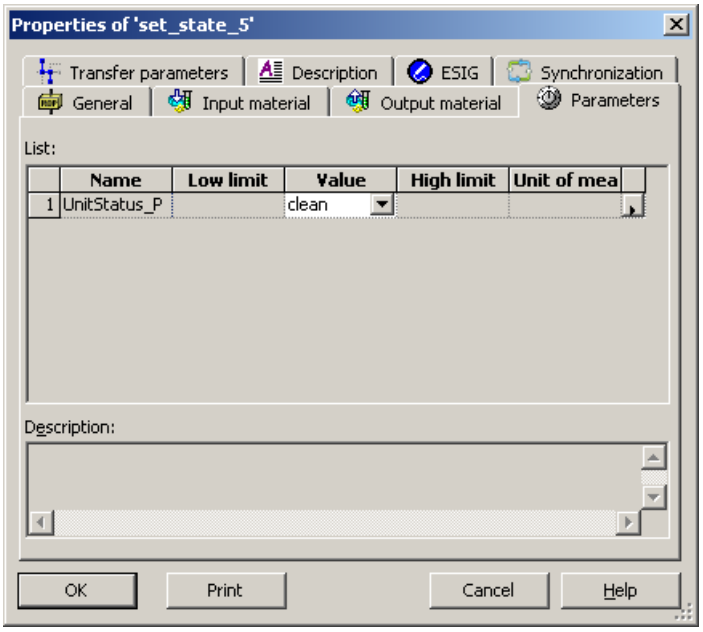


Figure 13-17 Selecting a parameter value

7. You can query the values passed by batch control from a parameter step, here "set_state", in transition conditions and thus make the batch execution dependent on the dynamic values at the unit, here R501, name: UnitStatus_param. A master recipe extended by this functionality can look like this. The values at the unit are queried in conditions in the transitions. Depending on the value, the next steps are either executed or bypassed in an alternative branch.

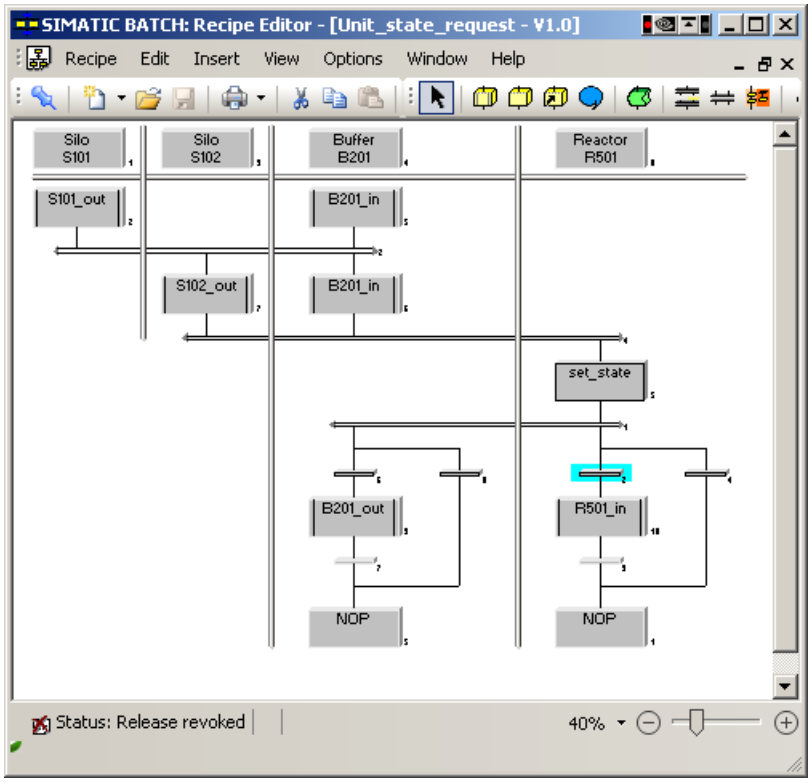


Figure 13-18 Transition query

Result

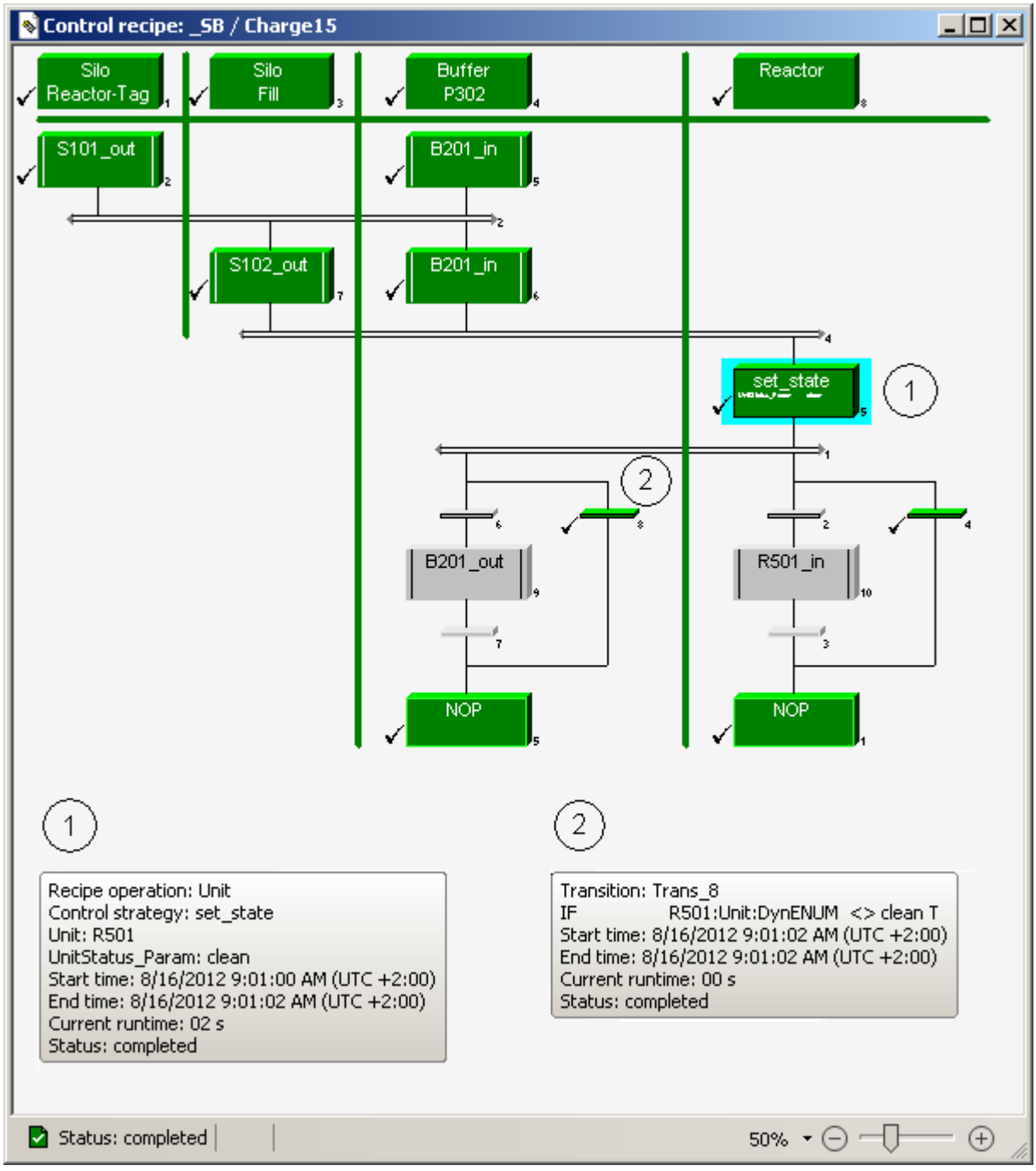


Figure 13-19 Batch execution

13.7.3 How do I configure conditions for the unit allocation?

Unit parameters dynamically define the properties of units. Setpoints are transferred to the units and the actual process values are queried. When a unit is allocated, the process values of possible units are queried in a transition via batch control.

Description of configurations

Two reactors serve as an example. Depending on their dynamic properties, one of the two reactors is to be allocated for further batch execution. A condition is configured in a corresponding master recipe for this purpose.

Requirements

- Parameters from batch control or the process, e.g., probe, are passed dynamically to the units available for selection. In our example, the value of the input "UnitStatus" is set to "Clean" at reactor R501 and the value at reactor R502 is set to "Dirty".
- The corresponding IEPAR parameter blocks have been configured at the possible units.
- All engineering data have been compiled and downloaded and available updated in BatchCC.

Procedure

1. Open an existing master recipe in the Recipe Editor. Make sure that the release has been canceled.
2. Open the header parameters of the recipe and go to the "Allocations" tab. Select the "Condition" check box for the "Reactor" unit. Only then will you be able to define a condition for the unit allocation at the unit in the master recipe.

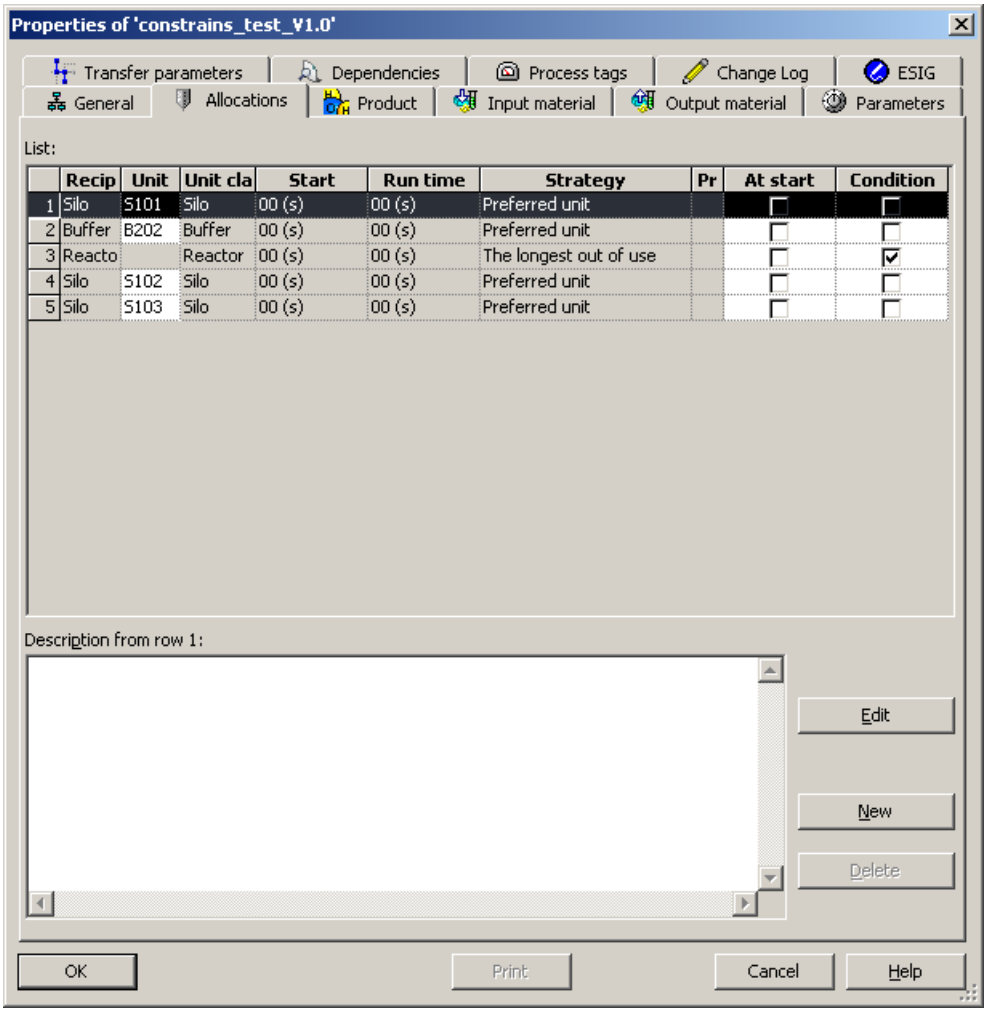


Figure 13-20 Condition when allocating the unit class

3. Select the unit recipe procedure, here "Reactor", on which you want to insert the condition for the allocation. Select "The longest out of use" as strategy in the "Allocation" tab. This means one of the two units is allocated even if both are possible.

4. Go to "Condition" tab and click "New" to formulate the conditions. In the transition wizard, select "UnitStatus_Param (TA_states)", for example, as parameter of the "TA_States" enumeration and click "Next". Select the operator "=" and click "Next". Select the value of the parameter, e.g., "clean" and click "Next". Click on the first button "AND" and then on "New". Select the equipment attribute "UnitClass [UnitClasses]" and click "Next". Select the operator "=" and click "Next". In the next dialog specify the target value, here it is the unit class "Reactor", click "Next" and then "Finish".

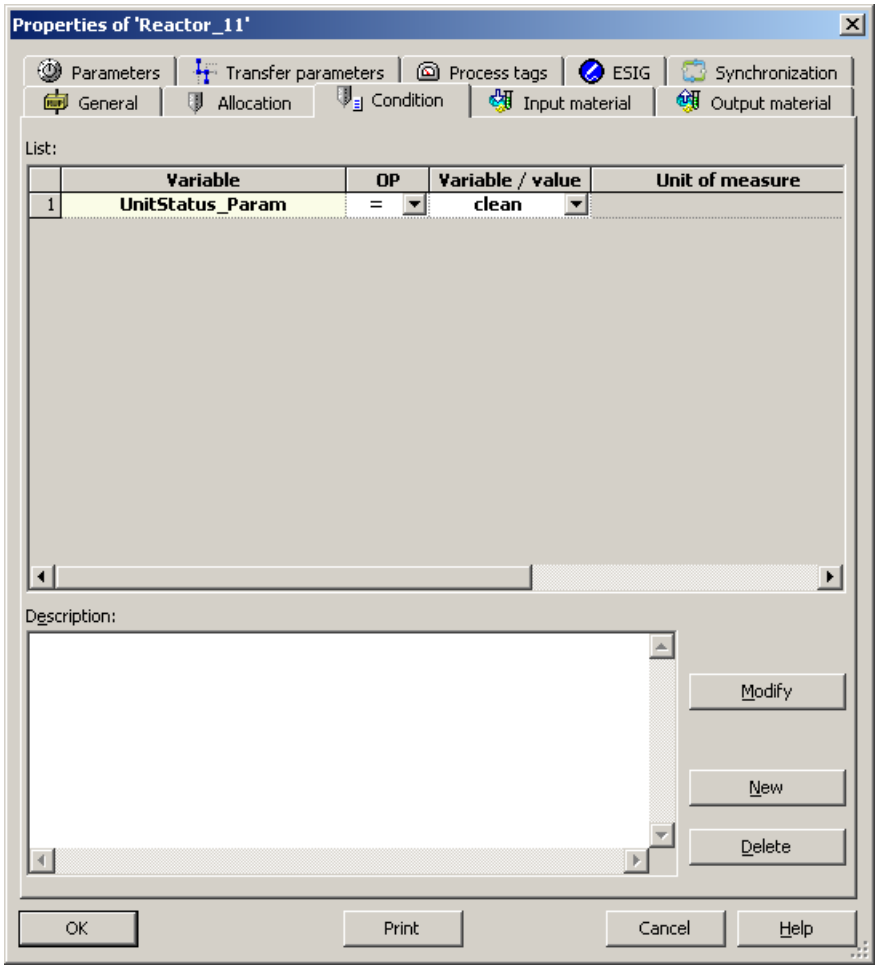


Figure 13-21 Condition with allocation

5. Close the properties dialog, save the recipe, and release it.

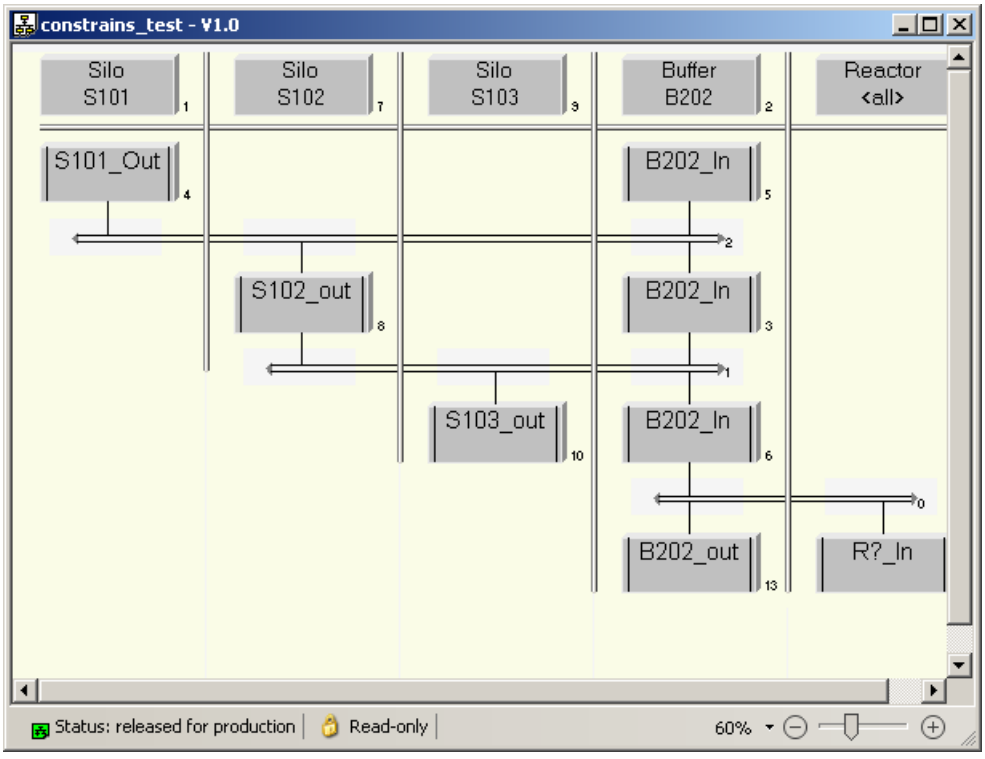


Figure 13-22 Master recipe for unit selection using condition

6. Create a batch with the master recipe you have just created.
7. Set the input "UnitStatus" at the "UNIT_PLC" block of reactor R502 to the created enumeration "TA_states" and select the value "dirty". As a result, if there is an allocation condition for the Reactor unit class, the condition will only be true for Reactor 501, allowing it to be selected dynamically for further batch execution.

Result

The "R501" unit is allocated in the batch execution and the transfer function from buffer B202 to reactor R501 is executed. The condition for the allocation was true for reactor R501 and not for reactor R502.

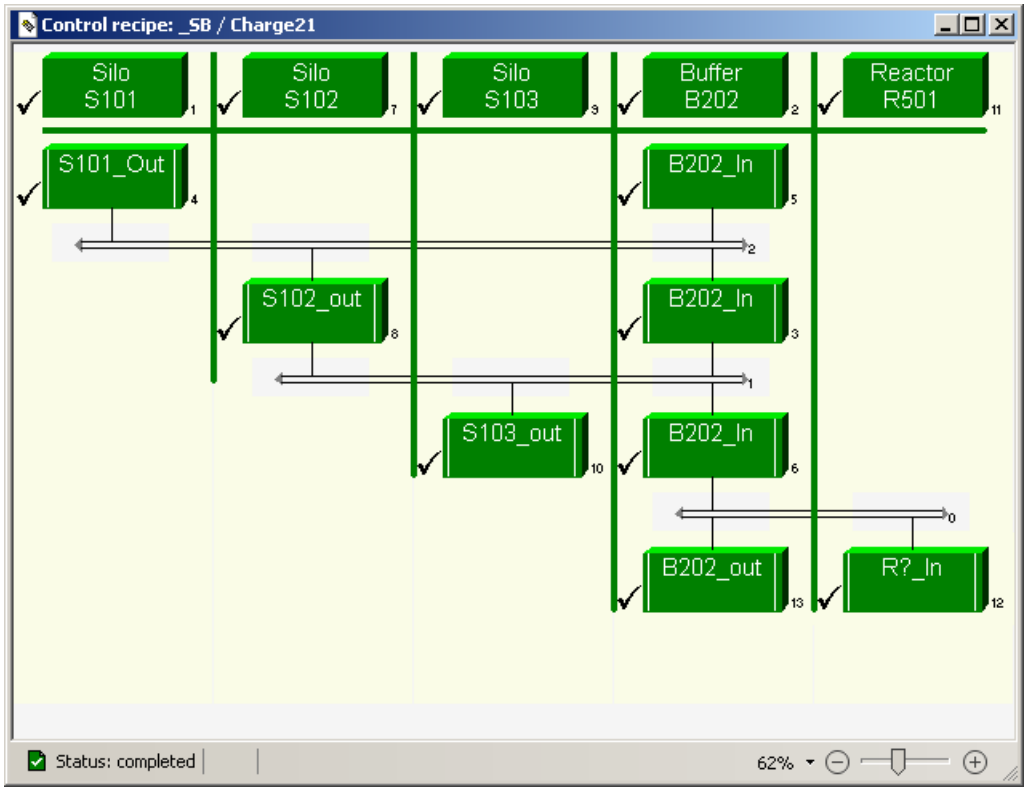


Figure 13-23 Control recipe of the executed batch

Appendix 14

14.1 Batch standard definitions

List of all ISA-88 terms in German, English and French.

Deutsch	English	Français
Anlage	process cell	Cellule de processus
Anlagenkomplex	area	Zone
Anpassroutine	scaling function	Routine d'ajustement
Basisautomatisierung	basic control	Automatisation de base
Bediener	operator	Opérateur
Belegung	allocation	Affectation
Betriebsmittel	resource	Ressource
Charge	batch	Lot
Chargenplan	batch schedule	Programme de lots
Chargenbericht	batch report	Journal des lots
Chargenprozess	batch process	Processus de fabrication par lots
Chargensteuerung	batch control	Commande des lots
Einrichtung	equipment	d'équipement
Einsatzstoff(e)	input material	Matière(s) d'entrée
Einzelsteuereinheit	control module	Module de commande
Fahrweise	mode of operation	Mode d'opération
Formula	formula	Formule
Formula-Kategorie	formula category	Affecter la catégorie de formule
Geräte	process equipment	Machines
Grundfunktion	master recipe phase	Phase de recette principale
Grundoperation	master recipe operation	Opération de recette principale
Grundrezept	master recipe	Recette principale
Istwert	process value	Valeur de mesure
Messstelle	tag	Point de mesure
Nebenprodukt	by-product	Sous-produit
Normansatz	reference scale	Quantité prescrite
Operation	operation	Opération
Produktionsauftrag	production order	Ordre de fabrication
Produktionsstrang	line	Ligne de production
Prozedur	procedure	Procédure
Prozedurelement	procedural element	Elément de procédure
Prozedurmodell	procedural model	Modèle procédural
Prozedursteuerung	procedural control	Automatisation de procédure
Prozess	process	Processus
Prozessabschnitt	process stage	Stade de processus

Deutsch	English	Français
Prozessausstoß	process output	Sortie de processus
Prozesseinsatz	process input	Entrée de processus
Prozessoperation	process operation	Opération de processus
Prozessparameter	process parameter	les paramètres de processus
Prozessschritt	process action	Action de processus
Rezept	recipe	Recette
Rezeptersteller	recipe creater	recipe author
Rezepterstellung	recipe creation	Création des recettes
Rezeptfunktion	recipe phase	Phase de recette
Rezeptkopf	recipe header	En-tête de recette
Rezeptoperation	recipe operation	opération de recette
Rezeptprozedur	recipe procedure	Procédure de recette
Rezeptverwaltung	recipe management	Gestion des recettes
Sollwert	setpoint	Valeur de consigne
Steuerfunktion	control recipe phase	Phase de recette exécutable
Steueroperation	control recipe operation	Opération de recette exécutable
Steuerrezept	control recipe	Recette exécutable
Stoff	material	Matière
Stoffausstoß	output material	les matières de sortie
Strang	path	Ligne, train
Techn. Einrichtung	equipment module	Module d'équipement
Technische Funktion	equipment phase	Phase d'équipement
Technische Operation	equipment operation	Opération d'équipement
Teilanlage	unit	Unité
Teilanlagenprozedur	equipment unit procedure	Procédure d'unité d'équipement
Teilprozedur	unit procedure	Procédure d'unité
Teilrezept	unit recipe	Recette d'unité
Teilrezeptprozedur	recipe unit procedure	procédure de recette d'unité
Verfahrensrezept	general recipe	Recette générale
Werksrezept	site recipe	Recette de site

14.2 Abbreviations

The abbreviations and acronyms used in this documentation have the following meanings:

Abbreviation	Meaning
AF	Automation function
AS	Automation system (PLC)
API	Application Programming Interface
BCC	BATCH Control Center
BCS	BATCH control server
CBSN	Consistence BATCH state notification
BDM (CDV)	Batch data management
CFC	Continuous Function Chart
CoL	Certificate of license
EMOD	Equipment module
EOP	Equipment operation
EPAR	Equipment parameter
EPE	Equipment procedural element
EPH	Equipment phase
ES	Engineering system
HMI	Human machine interface
IDLE	Not in operation
IEOP	Interface equipment operation
IEPH	Interface equipment phase
ISA	Instrumentation, Systems & Automation Society
LUT	LookUp tables
MES	Manufacturing Execution System
NOP	No operation, placeholder (empty step / empty transition)
OS	Operator station
PCell	Process cell
PCS 7	Process Control System 7
PDM	Process Device Manager
PLC	Programmable logic controller (CPU)
RC	Route Control
RPH	Recipe phase
ROP	Recipe operation
RP	Recipe procedure
RPE	Recipe procedure element
RE	Recipe editor
SCI	SIMATIC Control Interface
SFC	Sequential Function Chart
SP	Setpoint
SB	SIMATIC BATCH
SIT	SIMATIC IT
SUB	Substructure

Abbreviation	Meaning
SUIR	Software update in run
EPH	Equipment phase
TIA	Totally Integrated Automation
EOP	Equipment Operation
RUP	Recipe unit procedure
VAB	Processing block
XML	Extensible Markup Language

14.3 Keyboard commands

14.3.1 Key combinations for menu commands

Introduction

Every menu command can be selected by typing a key combination with the ALT key.

Press the following keys in the order shown:

- ALT key
- The letter underlined in the menu name you require (for example ALT, R for the "Recipe" menu when the "Recipe" menu is displayed in the menu bar). The menu opens.
- The letter that is underscored in the menu command (for example, N for the "New" menu command).
  If the menu command has further submenus, these are then opened. Repeat the actions above until you have selected complete menu command by typing in the relevant letters.

When you enter the last letter in the key combination, the menu command is executed.

Examples

Menu commands	Key combination
Recipe > New...	ALT, R, N
Edit > Go to, previous error	ALT, E, G, P

14.3.2 Key commands for menu commands

Functions

The following table lists examples of menu commands with the corresponding key commands for the recipe editor.

Function	Key combination
Open... (Recipe menu) (Page 1071)	Ctrl + O
Save (Recipe menu) (Page 1071)	Ctrl + S
Save graphic ... (Recipe menu) (Page 1072)	Ctrl + shift + G
Check validity (Recipe menu) (Page 1072)	Ctrl + Alt + K
Exit (Page 1084)	Alt + F4
Undo (Edit menu) (Page 1075)	Ctrl + Z
Redo (Edit menu) (Page 1076)	Ctrl + Y

Function		Key combination
Cut (Edit menu) (Page 1085)		Ctrl + X
Copy (Edit menu) (Page 1085)		Ctrl + C
Insert (Edit menu) (Page 1086)		Ctrl + V
Delete (Edit menu) (Page 1076)		Del
Select all (Edit menu) (Page 1086)		Ctrl +A
Go to	Go to > Previous error (Edit menu) (Page 1077)	Alt + F7
	Go to > Next error (Edit menu) (Page 1076)	Alt + F8
"Find" dialog (Page 1087)		Ctrl + F
Properties (Edit menu) (Page 1077)		Alt + Enter
Open object (Edit menu) (Page 1077)		Ctrl + Alt + O
Recipe procedural element (Insert menu) (Page 567)		Ctrl + R
Recipe phase/operation (Insert menu) (Page 568)		F4
Library reference (Insert menu) (Page 569)		Ctrl + B
Operator instruction (Insert menu) (Page 569)		Ctrl + F2
Simultaneous branch (Insert menu) (Page 574)		F9
Transition (Insert menu) (Page 581)		F3
Alternative branch (Insert menu (Page 581)		Ctrl + F9
Loop (Insert menu) (Page 582)		Ctrl + F7
Zoom in (Page 1066)		Alt + +
Zoom out (Page 1066)		Alt + -
Normal size Resetting the zoom factor (Page 1066)		Ctrl + 1
Fit Optimal zoom factor (Page 1067)		End
Fit automatically Possibilities for adapting the edit window (Page 529)		Shift + End
Display errors (Options menu) (Page 1081)		F11
Display all errors (Options menu) (Page 1081)		Shift + F11
Help topics (Help menu) (Page 1096)		F1 If there is a currently active context, for example, a selected menu command, the corresponding help topic is displayed, otherwise the table of contents of the online help is displayed.

Additional information

International/German key names (Page 779)

Numeric pad international/German (Page 779)

14.3.3 Moving the mouse pointer when editing texts

Functions

Function	Key combination
One line up or one character to the left in a text consisting of only one line.	UP ARROW
One line down or one character to the right in a text consisting of only one line	DOWN ARROW
One character to the right	RIGHT ARROW
One character to the left	LEFT ARROW
One word to the right	CTRL+RIGHT ARROW
One word to the left	CTRL+LEFT ARROW
To the beginning of the line	HOME
To the end of the line	END
To the previous screen	PgUp
To the next screen	PgDn
To the beginning of the text	CTRL+HOME
To the end of the text	CTRL+END

Additional information:

International/German key names (Page 779)

14.3.4 Moving the mouse pointer in the menu bar/shortcut menu

Functions

Function	Key combination
Move to the menu bar	F10
Move to the shortcut menu	SHIFT+F10
Move to the menu that contains the underscored character A	ALT+A
Select a menu command	Underlined character in the menu command
Move one menu command to the left	LEFT ARROW
Move one menu command to the left	RIGHT ARROW
Move one menu command up	UP ARROW
Move one menu command down	DOWN ARROW
Activate the selected menu command	ENTER
Exits the menu or returns to text,	ESC

Additional information

International/German key names (Page 779)

14.3.5 Moving the mouse pointer in dialog boxes

Functions

Function	Key combination
Move from one input box to the next (left to right and top to bottom)	TAB
Move one input box back	SHIFT+TAB
Move to input box with the underlined character X	ALT+ X
Select in a list of options	Arrow key
Open a list box	ALT+DOWN ARROW
Select or deselect an object in a list	SPACEBAR
Confirm the entries and close the dialog box ("OK" button)	ENTER
Close the dialog box without saving the changes ("Cancel" button)	ESC

Additional information

International/German key names (Page 779)

14.3.6 Selecting texts with key commands

Functions

Function	Key combination
One character to the right	SHIFT+RIGHT ARROW
One character to the left	SHIFT+LEFT ARROW
One word to the right	CTRL+SHIFT+RIGHT ARROW
One word to the left	CTRL+SHIFT+LEFT ARROW
The text to the beginning of a line	SHIFT+HOME
The text to the end of a line	SHIFT+END
One line of text up	SHIFT+UP ARROW
One line of text down	SHIFT+DOWN ARROW
To the previous screen	SHIFT+PgUp
To the next screen	SHIFT+PgDn
To beginning of file	CTRL+SHIFT+HOME
To end of file	CTRL+SHIFT+END

Additional information

International/German key names (Page 779)

14.3.7 Accessing help with key commands

Functions

Function	Keys
Open help	F1 If there is a currently active context, for example selected menu command, the corresponding help topic is displayed, otherwise the contents of the online help.
Close help	ALT+F4

14.3.8 International/German key names

Functions

International key name	German key name
HOME	Pos1
END	End
PAGE UP	Page Up
PAGE DOWN	Page Down
CTRL	Strg
SHIFT	Umschalt
ENTER	Eingabetaste
DEL	Entf
INSERT	Einfg
BACKSPACE	Zurück

14.3.9 Numeric pad international/German

Keys in the numeric pad

The coding of the keys in the numeric pad is language dependent.

Use the keys in the main block of the keyboard for key commands.

Example:

To execute the key command “Ctrl+1” press the keys “Ctrl” and “1”.

Use the “1” from the main block. The “1” in the numeric pad works only with some languages.

14.4 Command line parameters for BatchCC

Parameters

The following table shows the required command line parameters for starting BatchCC and the viewer for archived batches.

Command line parameters	Description	Example
-v	Starts the BatchCC in the "Viewer for archived batches" mode	"C:\Program Files (x86)\SIEMENS\BATCH \sbbatchcc32ux.exe" -v
-o	Starts the BatchCC in the 'Foreground' mode. This means that the window is always on top of all other normal windows including WinCC Runtime. Other windows with the 'Foreground" attribute can, however, be on top of the BatchCC window.	"C:\Program Files (x86)\SIEMENS\BATCH \sbbatchcc32ux.exe" -o
-c="x;y;dx;dy"	Permitted display area. The screen coordinates define the area in which BatchCC can move. x,y: Top left corner of the area, dx, dy width and height of the area.	"C:\Program Files (x86)\SIEMENS\BATCH \sbbatchcc32ux.exe" -c="0;0;1000;1000"

Context help references 15

15.1 Dialogs

15.1.1 BCC and RE dialog box user settings

15.1.1.1 "Format" tab

The layout settings made here apply to working with the BATCH Recipe Editor and in the recipe view during batch control.

Alignment

The alignment specifies the display of recipe objects at connecting points of simultaneous branches (Page 548) and alternative branches (Page 549) in recipes. Depending on whether the attachment points are to the left, centered or to the right, you obtain a different appearance. If you change the option from "Left" to "Centered" or "Right", the view is changed immediately. The option applies to libraries, master recipes and batches.

Step/transition:

The recipe phases (EOP/EPH) and the transitions can be displayed in four different views:

Display unit

With this option, you can prevent the display of the unit on the boxes of the steps in flat recipes.

When this option is activated, the name of the unit to which this EOP/EPH was assigned is displayed on the recipe phase.

The unit appears, however, only when no setpoints have been selected for display.

Display single-line labeling larger

To make the texts in steps clearer, they are displayed in larger characters if this option is enabled.

Display tooltips on the tools

If the option is active, the properties of the recipe steps are displayed as a tooltip.

Max. number of parameters in tooltips

Maximum number of parameters in the tooltip for a recipe step.

Max. number of lines in the tooltips

Maximum number of text lines in the tooltip for a recipe step.

15.1.1.2 "Dimensions" tab

The layout settings made here apply to working with the BATCH Recipe Editor and in the recipe view during batch control.

Vertical spacing of the objects:

Specifies the spacing between objects above and below their icons.

Horizontal spacing of the objects:

Specifies the spacing between objects to the left and right of their symbol.

Selection range of lines:

Specifies the tolerance for line selection. If low values are set, the line must be hit exactly to select the sequence.

Line width:

Specifies the width of lines. "0" specifies a hairline, its thickness depends on the currently selected resolution.

Grid in X/Y direction:

The grid is used as a factor for all other dimensions. It enlarges or reduces everything, similar to zooming.

Width and height of steps and transitions:

You can set the width and height of the steps and transitions.

Connector distance from margin:

You can change the position of the steps and transitions relative to the line.

15.1.1.3 "Zoom" tab

The layout settings made here apply to working with the BATCH Recipe Editor and in the recipe view during batch control.

Minimum zoom:

Specifies the lower limit of the zoom.

Normal size:

When a recipe is opened or recreated, it will be designated the size, specified as normal size. In addition to this, the normal size button in the toolbar is set to this size.

Maximum zoom:

Specifies the upper limit of the zoom.

Zoom factor:

The factor affects increasing and decreasing the size

- When you use the buttons in the toolbar "Zoom in (alt + +) and "Zoom out (alt + -)
- When you hold down Ctrl key while using the mouse scroll wheel

The factor can be set in the range from 110% to 400%.

Zooming in and zooming out using the status bar is not influenced by the factor.

Center zoom area on selected objects:

If this option is activated, the zoom is centered on a selected object. If the option is not activated, the centering of the zoom no longer changes.

15.1.1.4 "Font" tab

Here you can set different fonts.

Note

These settings apply to all applications that are linked to the same database.

15.1.1.5 "Language" tab

User interface language for BatchCC and BATCH Recipe Editor

In the "Language" tab, you can set the desired user interface language for the BATCH Control Center and the BATCH Recipe Editor. Select the corresponding check box and close the dialog with "OK".

Some texts and elements depend on the installed operating system.

- Texts
  After changing the language setting, texts that depend on the operating system are still displayed in the language in which the operating system was installed.
  This involves the following objects of the operating system within BatchCC and the recipe editor:
  - "Minimize", Maximize" and "Close" texts for tooltips
  - Comments when using filters in the list views
  - Texts in the system menu of the title bars
  - Texts in the preview window and in the printout of the preview window, Update process cell dialog, Preview tab
  - Shortcut keys depend on the language set for text services and input languages.
- Elements
  The recommended display language of the operating system is English or German. Other display languages, such as Chinese, may cause display errors.
  Buttons may be outside the display area, for example. You can display elements that are not visible by manually resizing.

Customized user interface language

The change in user interface language in the BATCH Control Center and BATCH Recipe Editor is user-specific. This setting does not change the language of the dialogs and shortcut menus of the BATCH Launch Coordinator, BATCH control server and BATCH data management (CDV). The language change for these objects is set on the BATCH server using the "Server language" command in the shortcut menu of the BATCH Launch Coordinator.

15.1.2 BCC and RE dialog box project settings

15.1.2.1 Display

Introduction

Under "Display" you can edit the basic project settings for the appearance and range of functions of SIMATIC BATCH. All properties are grouped in corresponding folders. The value of any property can be set. You choose between "Yes" or "No" to indicate whether or not you want to use the relevant property in BatchCC.

The default setting for all values is "Yes". All listed properties are thus shown and can be used in SIMATIC BATCH by default.

Allocation strategies

Allocation strategies is the list of strategies you can use during recipe creation in the Recipe Editor. Decide which of the listed strategies is used for recipe creation. Select "Yes" or "No" as appropriate.

Tree view in BatchCC

Here, you decide which of the listed objects is displayed in the tree view or navigation window in the BatchCC. Set the value of objects you do not want displayed to "No". Displayed or hidden objects relate exclusively to the display in the BatchCC.

Tabs for editing recipes

Here, you decide which tabs are displayed in the properties dialogs when creating and editing recipes (online structural changes). Set the value of properties you do not want displayed to "No".

Activating recipe elements in the Recipe Editor

Here, you decide which recipe elements are displayed in the navigation window of the Recipe Editor. Set the value of properties you do not want displayed to "No".

"OK" button

Exits the dialog and saves your settings.

"Standard" button

If you click this button, all project settings you have changed in this tab are reset to the default setting, i.e., "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

Additional information

Customizing the properties dialogs for RPEs (Page 283)

15.1.2.2 General

Introduction

In the "General" folder, you edit the basic project settings for the appearance and range of functions of SIMATIC BATCH.

Allow simultaneous ROPs

If you configure simultaneous recipe operations (ROPs) in master recipes, set the value of this property to "Yes". The "Insert simultaneous branch" command can then be selected in the Recipe Editor. If you set the "Allow simultaneous ROPs" property to "No", only chains of ROPs can be configured. In this case, multiple ROPs are never simultaneously active.

The default setting of this property is "Yes".

Allow editing of recipes with "Release revoked/invalid" status

The setting "No" prevents recipes whose status is "Release revoked/invalid" from being released again under the same name/version. This setting only affects recipes that are released for production.

The default setting of this property is "Yes".

Allow jump beyond synchronization lines

If you set the value of this property to "Yes", jump destinations beyond synchronization lines are permitted.

Additional information:

- Jump (Insert menu) (Page 583)
- Monitoring (Insert menu) (Page 576)

The default setting of this property is "No".

Transfer setpoints when changing from manual to automatic

If you change an active phase from manual to automatic mode, the SFC type initially continues to work with the setpoints that were set in manual mode. In this case, SIMATIC BATCH has so far supplied no setpoints for the phase. If you set the value of this property to "Yes", at the changeover from manual to automatic mode, SIMATIC BATCH delivers the setpoints to the phase, provided that the SFC type and SIMATIC BATCH have matching control strategies. This instructs the SFC type to adopt the setpoints from SIMATIC BATCH in automatic mode.

The default setting of this property is "No".

Validation plausibility check

If the value of the property is set to "Yes", the system initiates a validation plausibility check. There validation checks to determine whether or not unit-type process parameters have been selected. If units are not selected at the time of the validation, an error is signaled. If validation plausibility check is not used, only a warning is signaled and the validation is completed successfully.

The default setting of this property is "Yes".

Unit selection according to conditions

The unit selection is made according to conditions for all unit assignments from the point in time when this property is activated. As a result, the "Conditions" option is activated on the "Allocations" tab of the properties dialogs of the recipe header. This option limits the usable units. This means that the only equipment phases and operations offered for recipe steps are those that are available in the limited set of units.

The default setting of this property is "No".

Allow importing of materials

If you set the value of this property to "Yes", then during import of recipes, associated materials that are not yet contained in BatchCC are imported.

The default setting of this property is "No".

Display indexes

During the creation of recipes (flat, hierarchical) in the Recipe Editor, indexes are assigned automatically and displayed on the lower right when recipe elements are inserted. Indexes are visible during master recipe creation in the Recipe Editor and in batches in the control recipe view in BatchCC and OS control "Properties". Once made, a setting can be changed at any time. A setting made is immediately implemented in the respective views and indexes are displayed accordingly.

Note

Comparing recipes

The comparison of master recipes is based on unique indexes for individual recipe elements. Therefore, you should use the "Unique" value for the project setting "Display indexes" in the "General" tab.

There are three options for the setting:

- Container/Terminal: If you use this value, the index assignments are controlled by the remaining free indexes. During editing (deleting or inserting recipe elements), a complex mixture of indexes can arise as well as duplicate indexes. Elements such as synchronization lines, simultaneous branches, alternative branches, loops and jumps are not numbered. The indexes specified by the system are always displayed in reports, regardless of this project setting.
- Chronological: If you use this value, the index assignments are controlled by the remaining free indexes. The displayed indexes are assigned and displayed sequentially within the elements. During editing (deleting or inserting recipe elements), a complex mixture of indexes can arise as well as duplicate indexes. Elements such as synchronization lines, simultaneous branches, alternative branches, loops and jumps are not numbered. The indexes specified by the system are always displayed in reports, regardless of this project setting.
- Unique: If you use this value, duplicate IDs are never generated and displayed by the system. Intensive changes to master recipes produce large ID numbers.

Note

Library elements in master recipes

Special rules apply to indexes for library references within master recipes. The following applies to the "Unique" setting:

- Placeholder element in the master recipe: A unique index is assigned and displayed for the placeholder element of the referenced library.
- Library: The recipe elements within the actual library get a new range of independent indexes. When libraries are created, new, unique indexes are created and displayed for all recipe elements.

The default setting of this property is "Unique".

Release recipe element after stop/abort

This setting is used to release and reset (idle state) the process cell objects (EPHs, EOPs, but not the unit) assigned to the recipe element when the "Stop step" or "Abort step" command is selected. The recipe element concerned is displayed in the control recipe view without an assignment ID but in the stopped or aborted state as appropriate.

The default setting of this property is "Yes".

Additional information:

Manual jump (Page 453)

Force step-transition-step sequence

With this project setting, you specify whether or not the step-transition-step sequences must be adhered to at editing level 2 (ROP) during recipe creation in the Recipe Editor. If you set the value of this property to "No", steps and transitions are only automatically added when absolutely necessary. Example: loops, OR branches.

The default setting of this property is "Yes".

Area-oriented WinCC messages

With the setting in the configuration, you decide whether or not WinCC messages are displayed on the PCS 7 OS area oriented. Previously, the unit matching the WinCC message was displayed in the "Area" column.

If the option "Yes" is set, the relevant OS area ID is used in the "Area" column of the WinCC message. The OS area ID can be set in the settings of the plant hierarchy.

If the option "No" is set, the name of the relevant unit is displayed in the "Area" column.

The setting only applies to WinCC messages that have a reference to an OS area ID. WinCC messages that are not assigned to any OS area ID are generated without an area ID.

Permit start of IEPH/IEOP in error state

You use this project setting to specify whether a start command is sent by SIMATIC BATCH to the IEPH/IEOP interface blocks in error state.

If an error is pending at the IEOP/IEPH interface blocks, SIMATIC BATCH has so far not sent a start command to the block. The start command could be operated at the batch but was not sent to the block. The default setting of this property is "No".

Using optimized startup characteristics for SFC type

The following applies when a batch starts an SFC type:

- Value of this property "No"
  The control strategy and the setpoints are initially sent to the block. Then the start command is sent to the block.
- Value of this property "Yes"
  The control strategy, the setpoints and the start command are sent to the block simultaneously.
  The SFC type is started faster.

The "No" value for the property is **only** relevant for PC-based operating mode. In AS-based mode, optimized startup characteristics are also enabled with the value "No".

The default setting of this property is "Yes".

"OK" button

Exits the dialog and saves your settings.

"Standard" button

When you click this button, all project settings you have changed in this tab are reset to the default settings.

Apply

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.2.3 Warning/Error

Introduction

In this dialog you specify project settings for warning and error messages.

Messages are displayed in separate dialogs in the "Extended batch information" dialog in BatchCC.

Note

A distinction is made between warning and error for the hard disk memory property. The distinction is that if the available hard disk memory space that was specified for an error is too low, specific functions are locked in addition to the messages. In both cases, the text boxes limit the possible values to the permitted range.

Number of batches per order/number of batches warning

Set the value for this property "Yes" and enter a value for the maximum number of batches per order, above which a warning message will be displayed.

Database size warning / database size

Set the value for this property to "Yes" and enter a value for the database size, above which a warning message will be displayed. The default setting is no warning message and a database size of 4000 MB.

Validation: Always show warnings

If you use this property, the messages will be displayed even if only warnings and no errors are found. Otherwise, the message is displayed only if there is an error, but it shows both errors and warnings.

Report opening of write-protected recipes

Released recipes are read-only. If you use this property, you will be notified of this fact when write-protected recipes are opened.

Note

Alternatively you can also highlight write-protected objects with other background colors.

Error: Free hard disk space / Warning: Free hard disk memory space

The hard disk on which the database for data of SIMATIC BATCH is stored is monitored for its free space.

For the monitoring, enter a value for the property "Error: free hard disk memory space" and a value for the property "Warning: free hard disk memory space".

The value represents the available memory space in percentage of the total hard disk memory space.

If the entered value is exceeded, a message is generated in the message system of the OS and the "Messages" OS control.

Note

Undershooting the value of the error

Active batches continue to run and can be operated.

The following functional restrictions occur:

- Updating the process cell data is not possible in the BCC.
- Control recipes cannot be released or started.
- New libraries, master recipes, formulas, formula categories, materials, qualities, new job folders and batches cannot be created

Stable system behavior and cannot be ensured until the hard disk space has been increased.

The following conditions apply for the values:

- Value for the error < Value for the warning
- Value range for the error: 1 to 89
- Value range for the warning: 2 to 90

Monitoring time for batch and step commands

When a batch or step command does not result in the desired target status within the selected time in seconds, the command is treated as not appropriately completed and a warning message is output. The warning message shown as dialog is acknowledged with the "OK" button. The further recipe execution is not affected by the warning message. The warning message is only output for your information. The warning message is also displayed in the "Extended batch information" dialog in BatchCC.

The default value is 30 seconds. Numbers between 10 and 10000 seconds are permitted.

You can find additional information in the section "Extended batch information (Page 293)".

"OK" button

Exits the dialog and saves your settings.

"Standard" button

When you click this button, all project settings you have changed in this folder are reset to the default settings.

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.2.4 Color settings

The layout settings made here apply to the BATCH Recipe Editor and the recipe view in BatchCC during batch control.

The colors of the recipe steps (start, end, substructures,...) and transitions depend on the status and can be set separately according to text on the icon, icon surface and icon frame.

Note

These settings apply to all applications that are linked to the same database.

Click in a row to change the color of a property. A link symbol appears at the far right in the highlighted row. Click on the link symbol and select a new color for the selected property.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

Click this button to reset all project settings you have changed in this tab to the default setting "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.2.5 Versioning

Overview

In this dialog you can make settings for versioning.

Methods

There are two options for versioning your recipes, formulas, and libraries:

- Free versioning
- System-aided versioning

Note

Recipes, formulas and libraries imported from older SIMATIC BATCH versions with the "Restore" function continue to use the "free versioning" method. You cannot switch to "system-aided" versioning.

The archiving method set for exporting should also be used for importing. Otherwise, you may not have the ability to set the version during the import. In this case, use unique object names, because multiple object names with the same version may otherwise be present.

"Free versioning" option

If you select this option and enter a version number under "Preset version", this version number will be used in recipes, formulas and libraries. The default setting of the preset version is V1.0.

Use the "Save as" command to rename the element and specify the version ID.

"System-aided versioning" option

If you select this option and enter a number for the major or minor version under "Preset version", this assembled version number will be used in recipes, formulas and libraries. The default setting for the preset version is V01.00.

If you use system-aided versioning , the response is as follows:

- Save: When "Saving" an element, for example, the edited recipe is overwritten with the current name and current versions. The name and version do not change.
- Save as: With "Save as", you have the following options for an element:
  - Enter a new name. The version number is set to a default version.
  - Increment the major version. The major version is incremented, the minor version is reset.
  - Increment the minor version. The minor version number is incremented.

Note

With the procedure for "system-aided versioning", you have the option of circumventing the actual restriction mechanism in the "Save" and Save as" dialogs. The "Retain version [1.0]" or "New name with preset version [1.0]" options are offered for selection in both dialogs.

When you set the "system-aided versioning" option, you cannot rename an existing recipe, formula or library. This function is not offered in the shortcut menu of the element.

"OK" button

Closes the dialog and saves your settings.

"Default" button

Click this button to reset all project settings you have changed in this tab to the default setting "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Closes the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.2.6 Used Plug-in Modules

This dialog is relevant only if you run the validation based modules that can be created and modified externally (plug-in modules).

Here, all the plug-in modules registered for the current project are listed regardless of whether the module exists or functions correctly.

Status display for the modules

✖	Module cannot be used, however module is registered for the current project: This means that SIMATIC BATCH cannot execute all functionalities. This status is obtained if, for example, a module is registered but in the meantime it has been deleted or renamed.
✔	Module usable. This does not mean that the module will actually be used. To find this out, the dialog has to be opened with the "More" button.
!	Module exists but the internal logic of the module is signaling a problem.

Update

This button is only active when a module has the "Module unusable" status.

If the module (file) exists on the PC but is not correctly registered, this button can be used to select the file and to change the status to "Module useable". This status will only be adopted if the module itself functions correctly.

Add

Opens the "Installed plug-in modules" dialog in which you can add modules whose files are on the computer.

Remove

This button is active only when a module is selected. This revokes the registration of the project. The entire functionality of this module is therefore disabled.

More

This button is active only when a module is selected. Opens the "Plug-in details" dialog for specifying the functionality of the module.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

Click this button to reset all project settings you have changed in this tab to the default setting "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.2.7 Installed plug-in modules dialog box

From the installed modules shown in this dialog, you select the modules that will later be used by SIMATIC BATCH. Select a row and then click "OK".

The dialog lists all installed modules that are **not** yet being used by SIMATIC BATCH. The modules are installed on the computer. The icon indicates the status of the module.

This dialog also allows you to add plug-in modules whose files are on the computer but that are not yet known to SIMATIC BATCH. This is useful when the module could not be registered automatically as a SIMATIC BATCH Plug-in (for example if the module was installed before SIMATIC BATCH).

Note

The PlugIn DLL to be used should be stored on the local PC, ideally in the BATCH installation folder. If the DLL file is addressed in another directory, on a network drive or via a network path, this can lead to malfunctions and error messages due to missing windows user permissions.

Status display for the modules

Icon	Description
	Module cannot be used, however module is registered for the current project: This means that SIMATIC BATCH cannot execute all functionalities. This status is obtained if, for example, a module is registered but in the meantime it has been deleted or renamed.
	Module usable. This does not mean that the module will actually be used. To find this out, the dialog has to be opened with the "More" button.
	Module exists but the internal logic of the module is signaling a problem.

Add

Adds installed modules that are not yet known to SIMATIC BATCH.

15.1.2.8 Electronic signatures

Introduction

This dialog provides an overview of actions that can be furnished with an electronic signature project-wide. The entries in the list are fixed and cannot be changed or expanded.

By selecting an action and then clicking the "Edit" button, the selected action is assigned a user role for the required electronic signature. Only then can the check box be selected or cleared. By setting or removing the check mark in a corresponding check box, the associated "Electronic signatures" are activated or deactivated with respect to the entire project. The settings that you make here are not user-specific or computer-specific. In contrast to the electronic signatures for batch elements, this setting applies centrally to all objects - on which a corresponding action can be executed.

Layout of the tab

The dialog has a table layout with the following contents:

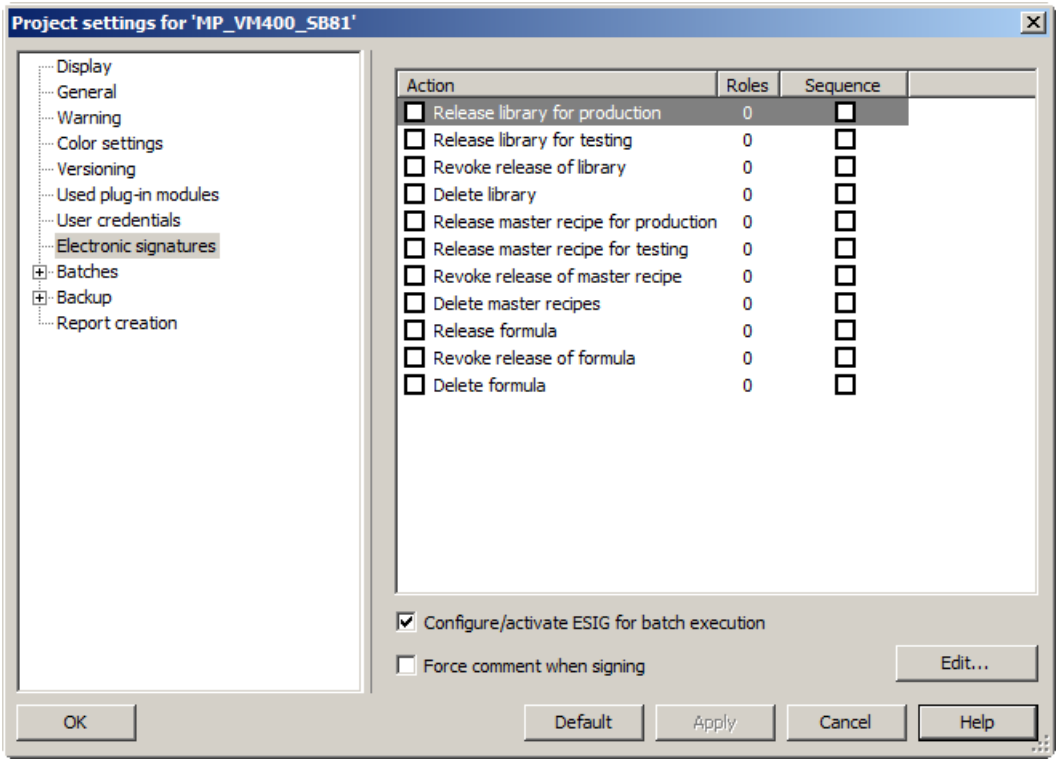


Table columns	Operator action	Display
Column headers	Click on one of the column headers to arrange the contents in ascending or descending order.	To the right next to the column header a character for "Descending" or "Ascending" is displayed.
Action	Click a check box to activate or deactivate the desired action.	The check box is selected or cleared.

Table columns	Operator action	Display
Roles	Click on an action and then click on the "Edit" button to assign one or more user roles to the action.	The number of assigned user roles for this action is displayed as a number.
Sequence	Selected check box: If multiple user roles are assigned then the configured sequence is used when signing electronically. Cleared check box: A sequence is not used if multiple user roles are assigned. To change the sequence where multiple user roles are assigned, select an action and then click "Edit".	The check box is selected or cleared.

Buttons and check boxes

Configure/activate ESIG for batch execution	If you select the check box, the use of ESIGs for objects is possible. If the check box is cleared, an ESIG configured in the master recipe is not evaluated and the "ESIG" tab is not included in the properties dialog (object properties) of the object. This option is not possible with the "BATCH Basic" license key. Note: Existing ESIGs are not deleted when this option is deactivated.
Force comment when signing	If you select this check box, the user(s) configured for the signing must also enter a comment in the comment field in addition to their electronic signature. If no comment is entered, the dialog cannot be closed and the recipe execution cannot be continued.
Edit	Opens the "Configure roles dialog. Use this dialog to define the user roles.
OK	Saves your settings and closes the dialog.
Standard	Resets the settings you have made to the standard settings (as delivered).
Cancel	Exits the dialog without saving your changes.
Help	Opens the help for this context.

Canceling the signature process

Before this action is actually performed, the configured electronic signatures must be provided. If more than one signature is required, the object can go into the "Checking" state. This means that at least one - but not all - required signatures have been provided. An element in the "Checking" state can be reset to its original state using the "Cancel signature procedure" command in the "SIMATIC BATCH: Sign" dialog.

The settings from this dialog will only be considered the first time an action is executed. If the element is already in the "Checking" state, the signature procedure must either be completed or canceled – even when the signatures have been deactivated. That is, deactivating electronic signatures does not change the statuses of the elements (for example, "Checking").

15.1.2.9 Batches > Settings

Introduction

You enter the basic project settings for batches in this dialog. All adjustable settings are arranged in groups. Click a property, and then select a setting in the "Value" column. You also obtain descriptions for each selected property in a window below.

General > Allow online setpoint change

Specifies the default setting "Modifiable" for newly created parameters in the Recipe Editor.

If "Modifiable" is selected, changes to parameters (setpoints) of the control recipe are permitted during batch control.

Default setting: Yes.

General > Allow deleting of completed, not archived batches

When you use this property, batches are deleted without "Close" and "Archive" beforehand. The corresponding command is "Delete immediately" and requires the appropriate user permission in BatchCC.

Default setting: No.

General > Transfer setpoint changes to active step

Specifies the default setting "Effective immediately" for newly created parameters in the Recipe Editor.

With recipe phases of the type EPH and EOP, parameter values changed by the operator will become effective immediately; this means they are transferred from the running recipe steps (EPH and EOP) in the control recipe directly to the automation system where they effect the block running in the AS. If you use the property, a setpoint change is applied immediately in the AS. If the property is not enabled, a newly entered value is only saved, and then used the next time the function is called.

Default setting: No.

General > Automatically delete archived batches

If you set this property to "Yes", batches that were previously archived are automatically deleted from the corresponding order folder in BatchCC.

Default setting: No.

General > Use predefined batch name

If you set the value of this property to "Yes", the predefined settings for the batch name assignment are used during batch creation.

Default setting: No.

General > Release batches automatically

If you set the value of this property to "Yes", newly added batches are automatically released once they are created.

Default setting: No.

General > Open operator dialogs automatically

If you set the value of this property to "Yes", all configured operator dialogs will open automatically in the control recipe view in BatchCC when a control recipe is opened. Use the value "No" to prevent all operator dialogs of open batches from being opened and displayed immediately.

Default setting: Yes.

General > Extended continuous mode

If you set the value of this property to "Yes", equipment phases continue to run in continuous mode even after the end of the batch and are not completed automatically.

Equipment phases in extended continuous mode can be applied to other batches.

With the default setting "No", equipment phases are automatically completed at the end of the recipe unit procedure or at the end of the batch and do not continue to run when the corresponding unit is released.

Default setting: No

Close and archive > Archive automatically

If you set this property value to "Yes", batches that are completed, aborted or stopped will be closed and archived automatically . Batches requiring an electronic signature for these actions will be ignored.

Default setting: No

Close and archive > Wait time after closing

You specify the wait time between the manual closing and the archiving of the batch. To do this, select the required wait time in days from the selection box. The preset default value is seven days. Enter a number between 0 and 30.

Structure changes > Allow online structure changes

If you set this property value to "Yes", online structure changes on this BATCH client are possible. The default setting for this property is "No" or not allowed. Note that there are additional requirements for recipe structure changes in runtime. A reference to the topic is listed at the end of this section.

Default setting: No.

Structure changes > Active batches have to be held

If the "Allow structure change" property is set to "Yes", this property can be used. Online structure changes are only possible if active batches are held. After completing the online structure change, the batches must be resumed.

Default setting: Yes.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

When you click this button, all project settings you have changed in this tab are reset to the default settings.

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

Additional information

Requirements for online structural changes (Page 494)

Extended continuous mode (Page 437)

15.1.2.10 Batches > Predefined batch name

In this dialog, you define the static and dynamic content for the automatic generation of batch names.

Batch names that are created with predefined names automatically receive a file extension (file suffix). You recognize the file extension by the underscore followed by a number, starting with one. The numbers are incremented automatically.

Requirement

To use predefined batch names, set the value of the "Use predefined batch names" property to "Yes". The property is found in the project settings under Batches > Settings.

Batch name area

The following static and dynamic name elements are available for selection:

- <None>: Not assigned to a special name element.
- Recipe/Formula
- Formula category
- Order
- Order category

The following attributes are available and can be selected for the listed elements:

- Text
- Date
- Time

Recipe/Formula

- Name
- Version
- ID: Identification number for recipes and formulas
- Product name
- Product code

Formula category, order, and order category

- Name

Only if you choose "<None>" as element and "Text" as attribute will the "Additional text" input box be enabled for text input. Enter any static content of a name here. Note that the total name length is limited to 32 characters. Too many characters will prevent the batch from being released.

When you have defined a batch name, click the "Add" button. This applies the selected element and the attribute in a table display. The batch name comprising these name parts is displayed in the Example area.

Repeat the process for each desired name-forming element. As a result, the batch name becomes longer and longer.

The system increments a predefined batch name automatically. The predefined batch name is retained until it is changed in this dialog or the functionality in the settings for batches is reset to "No".

Table display

Use the "Up" and "Down" buttons to define which name elements are positioned where in the batch name. To do so, select a name element in the table display and click the corresponding "Up" or "Down" button. The newly positioned name elements are shown in the Example window.

Example

In the "Example" area, the selected name elements are shown in the specified order.

staticText{{Recipe/Formula:Id}}{{Order:Name}}

The selected settings for the batch names are stored in the system database.

Validation

When batches are added to an order, a validation is performed in which a check is made to determine whether the batch name is unique. If not, the batch will not be created.

"Delete" button

The "Delete" button is used to delete selected name elements.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

When you click this button, all project settings you have changed in this tab are reset to the default settings.

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.2.11 Batches > Archiving > Archiving method

Introduction

In this dialog you specify the settings for archiving closed batches. Batch data are saved in XML format when the following available archiving methods are used:

- Directory
- SQL server
- FTP server

The dialog is organized in the following areas:

- Method. Here you select the required archiving method.

  Note

  For security reasons and in view of confidential recipe and manufacturing data, we recommend the use of the PH or SQL server for archiving.

- Version selection or selection of XML archive formats.
- Button for a connection test. If you click the "Test" button, a connection test is carried out for the connection to the specified archive storage location with the selected archiving method.

"Directory" method

You can use this simple archiving method to copy archive files to a shared folder in the network. The easiest possible configuration with regard to the security settings is to enable write access to the shared directory for the Windows user group "Everyone".

Note

To establish access to the shared folder, the user data of the logged-on user are used. As user, you are responsible for ensuring that an application can access the shared folder. Use this option to restrict access to the specified user. The access for the "Everyone" group poses security problems and is therefore not recommended.

Procedure

Select the "Directory:" option.

1. Enter the folder name in the input field in conformity with UNC notation. Example: \ \<Computer name>\<Name of the shared folder>. If you have already created a shared folder in the network, you can use the "..." button to search for this folder and select it.
2. Click on the "Test" button to test the connection.
3. Close the dialog.

The following is checked in a connection test:

- Has a value been entered in the "Directory" text box?
- Does the specified directory conform to UNC notation?
- Can the specified PC be accessed?
- Can the specified directory be written to?

If one of these tests fails, a message is displayed and the dialog cannot be exited with the current information. Correct the settings and run the test again or cancel it.

"SQL server" method

This method saves the archive file in an SQL server database as XML. It does not change the archive file or split it into several tables. In addition to the archive file that is saved in a field of the database, additional information about the batch is saved in the same record. This additional information can include, for example the product name, batch name, start of the batch, completion of the batch or information about the user who performed the archiving.

In addition to the creation of a new SQL server database if one does not yet exist, this method also requires the specification of "Logon" and "Password" in the "User credentials" folder for logon to the SQL server. If a user uses a domain for access, the domain must also be entered.

Procedure

1. Select the "SQL server" option.
2. If the network already contains an SQL server database, you can either enter the name directly in the text box or select the required SQL server name from the available entries in the drop-down list.
   Note that for this technique, you require your own SQL server instance.
3. Click the "Create" button to create a new SQL server database. The "Create SQL Server Database" dialog opens. Click "Help" button in this dialog to view additional information about this dialog. Administrator rights on the SQL server and in SIMATIC BATCH are required for this.
4. In the "User credentials" folder, specify a user that is a member of the Windows user group "SIMATIC BATCH".
5. Click on the "Test" button to test the connection.
6. Close the dialog.

The following is checked in a connection test:

- Has a value been entered in the "SQL Server" text box?
- Can the specified SQL server be accessed?
- Is there a database with the specified name? This name is derived from the internal name of the SIMATIC BATCH project.
- Is there a table with the name "tblBatches" in the database?
- Can the "tblBatches" table be written to?

If one of these tests fails, a message is displayed and the dialog cannot be closed with the current information. Correct the settings and run the test again or cancel it.

"FTP server" method

In addition to a fully configured FTP server, this method requires you to enter the "Login:" and "Password" in the "User credentials" folder and the connection to be used (default: port 21). The domain only needs to be entered if the username in the FTP server configuration is derived from a domain user (default for IIS (Internet Information Server) FTP servers).

The logon to be used here, with or without the domain, depends on the configuration of the FTP servers. If the access is configured for logon from a domain, for example, XX001\User1, a domain must also be specified for SIMATIC BATCH. If the access to the FTP server is only configured for a local logon, the "Domain" text box can remain empty in the "User credentials"

folder. This is equivalent to the name of the PC on which the FTP server is running. With this method, an existing logon that is only locally available on the PC with the FTP server can also be used.

For further information, follow the "Setting up the FTP server" link under "Additional information" at the end of the section.

Procedure

1. Select the "FTP Server" option.
2. Enter the computer name or the IP address of the FTP server in the text box.
3. In addition to specifying the computer name or IP address of the FTP server, it is also possible to specify the port number. Obtain the port number of the FTP server from the person who configured the FTP server on which you want to archive.
4. Enter the domain, your logon name and password in the "User credentials" folder.
5. To test the connection, click the "Test" button.
6. Close the dialog.

The following is checked in a connection test:

- Has a value been entered in the "FTP Server" text box?
- Can the specified FTP server be accessed?
- Is write access to the FTP server possible?

If the tests fail, a message is displayed and the dialog cannot be closed with the current information. Correct the settings and run the test again or cancel it.

Note

An FTP server stores the files in a configured directory. To protect archive data, give this directory access protection.

SIMATIC BATCH does not support saving of archive data in subfolders. It is always saved in the root directory.

Version

XML archive formats of the following SIMATIC BATCH versions are available to you in SIMATIC BATCH. The version specifications relate to the "Directory", "SQL Server", and "FTP Server" archiving methods. The selection of archive formats must be observed when you use the XML archive files subsequently, for example, in the viewer for archived batches. The XML archive format of the installed SIMATIC BATCH version is always preset. This ensures that all new functions of a version are saved in the archive file. The following table applies to all methods except PH.

Check box	Meaning
V7.0	V7.0 corresponds to the previously existing archive format in SIMATIC BATCH V7.0 and V6.1.x. If you want to print batch archives with SBReport, use archive format V7.0.
V7.0 SP1	The V7.0 SP1 archive format has a different syntax and structure than V7.0. The archive file with object-relational structure is suitable for automated further processing for storage of the data in relational databases. There is an XML schema for this that is also installed.
V7.0.8	This is the archive format of SIMATIC BATCH AS based V7.0 SP2. Similar to the archive format V7.0 SP1 with additional attributes. There is an XML schema for this that is also installed.
V7.1.2	If you install SIMATIC BATCH V7.1 SP2, this archive format is then set and used by default. There is an XML schema for this that is also installed.
V8.0.0	If you install SIMATIC BATCH V8.0.0, this archive format is then set and used by default. There is an XML schema for this that is also installed.
V8.0.1	If you install SIMATIC BATCH V8.0.1, this archive format is then set and used by default. There is an XML schema for this that is also installed.
V8.1.0	If you install SIMATIC BATCH V8.1.0, this archive format is then set and used by default. There is an XML schema for this that is also installed.
V8.2.0	If you install SIMATIC BATCH V8.2.0, this archive format is then set and used as default. There is an XML schema for this that is also installed.
V9.0	When you install SIMATIC BATCH V9.0 or V9.01, this archive format is preset and used. There is an XML schema for this that is also installed.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

Click this button to reset all project settings you have changed in this tab to the default setting "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

Additional information

- You will find information on versioning in the section "Versioning (Page 795)".
- You will find information on the security aspects and the archiving method "SQL Server" in the sections:
  - Security aspects (Page 82)
  - Basic principles (Page 500)
  - Create SQL Server database (Page 501)
  - Setting up an SQL server (Page 503)
  - User credentials (Page 918)

15.1.2.12 Batches > Archiving > Creating reports

Introduction

In this dialog, you select print templates for reports that are used during the archiving of batches.

Creating reports when archiving batches:

The table shows report templates, including custom report templates, of the "Batch" type. The file name for the "Batch" type is structured as follows: "name_batch.rdl". The file name may only be changed in the "name" section. The report templates for batches are identified by the designation "_batch" in the file name, which cannot be changed. The underscore may only be used once in the entire file name. The report templates are available in the installation folder \SIEMENS\BATCH\RSTemplates according to your installation.

Select one or more report templates for PDF report creation using the corresponding check box. The PDF files generated automatically during archiving are stored, depending on the selecting archiving method, in the specified directory in addition to the archive file of the batch (*.xml).

Note

Do not delete the supplied template files for reports.

You can find additional information about this in the section "Delivery type of SIMATIC BATCH (Page 86)".

"OK" button

Saves your settings and closes the dialog.

"Standard" button

When you click this button, all project settings you have changed in this tab are reset to the default setting, "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Closes the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

Additional information

Project settings folder "Archive" (Page 805)

15.1.2.13 Batches > Archiving > Process data archive

Information and connection test

This dialog is for information purposes. The displayed data originates in your PCS 7 project. The names of the PH archive servers are displayed if configured redundantly. By clicking on the "Test" button, you can start a connection test to the PH archive server.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

This function cannot be executed in this dialog.

"Apply" button

This function cannot be executed in this dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

Additional information

PH archive server (Page 504)

Functionality of the viewer for archived batches (Page 517)

15.1.2.14 Backup > Settings

In this dialog, you define the settings for automatic exports of your batch process cell data. A backup

file is where all BATCH project data, such as process cell settings, project settings, libraries, formulas, master recipes, and materials, are saved. Batch data are saved in archive files and not in backup files. The use of a backup file as a restore requires a consistent process cell environment. A backup file may only be restored on the BATCH process cell on which it was generated.

Properties area

The values of the following properties can be set.

Property	Default value	Remark
Use automatic backup?	No	Decide whether or not you will use automatic backup. Yes: Automatic backup is active and will be used. No: Automatic backup is not active and will not be used. An automatic backup does not exclude a manual backup.
Automatically expand file name of the backup file?	No	Decide whether your selected file name of the backup file will be automatically expanded with the date and time.
Maximum number of backup files	5	Select the maximum number of backup files for the specified target directory. The maximum number is limited to 100 backup files. If the maximum number of backup files is reached, the backup file with the oldest date is always deleted.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

When you click this button, all project settings you have changed in this tab are reset to the default settings.

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.2.15 Backup > Automatic backup

In this dialog, you define the name of the backup file and specify the time when the automatic backup will be performed.

Backup file area

File name

In the Backup file area, you enter your choice of name for the backup files under "File name". The file name may contain up to ten letters.

If you have selected the "Expand file name automatically" property, the system dynamically appends the date and time to the selected file name. You set this property in the Backup > Settings dialog.

If the value of the "Automatically expand file name of the backup file" is set to "No", the file name will have a four-digit number added to it. The number 1 then corresponds to the format "0001". If only one backup file is set, the number is incremented with each new backup. Here, all the backup files in the set directory are taken into account. If a selected file name matches a backup file name that has already been created, the system identifies the highest number and increments this. As long as the selected file name is not changed, the calculated number for the maximum number of backup files is taken into account. This is also the case for backup files added to the target directory manually by a user. If these backup files correspond to the set naming scheme of SIMATIC BATCH, they are also deleted. Deleting is always started before an automatic backup is started. In the file system, deletion is not updated immediately.

Directory

Under Directory, you choose the file location for the backup files. Click the "..." button and select a folder for the file storage. Only shared folders are offered for selection.

Interval area

In the Interval area, you select the time when automatic backups are performed. Select one of the specified time intervals and set the desired date and time of the backup.

Interval	Remark
Once	The automatic data backup starts once. The automatic data backup is then ended and no further data backup is performed.
Daily	The automatic data backup will start daily.
Weekly	The automatic data backup will start weekly.
Monthly	The automatic data backup will start monthly.

Time: Selection or input of the time

Date: Selection or input of the date

"OK" button

Exits the dialog and saves your settings.

"Standard" button

When you click this button, all project settings you have changed in this tab are reset to the default settings.

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

Additional information

Backup (Options menu) (Page 1052)

Security aspects (Page 82)

15.1.2.16 Report creation

Introduction

In this dialog, you can select the contents of your reports. Settings for the Microsoft Reporting Services and for the automatic saving of the reports as PDF file from the print preview are included.

Property

You can change the values of the following report properties from the initial default setting, "Yes", show all, to custom settings:

- Show history in reports: Specifies whether or not the editing history is to be displayed in the report of a batch.
- Show messages in batch reports: Specifies whether or not the WinCC messages (operation messages and operator prompts) are to be displayed in the report of a batch.
- Show transitions in batch reports: Specifies whether or not transitions are to be displayed in the report of a batch.
- Show trends in batch reports: Specifies whether or not measurement trends are to be displayed in the report of a batch. Measured values and trends are only available in the batch report if the batch data management (CDV) has collected and prepared all measured values from the PCS 7 OS. This transmission can take a few minutes.
- Show all levels in batch reports: Yes: All objects of all levels are displayed. No: In flat control recipes, all objects of the first level (SUB, RF, ...) are displayed. In hierarchical control recipes, all objects of the first two levels (RUP, ROP, monitoring, ...) are displayed.

Additional information about each selected report property is dynamically displayed in a text box below.

Reporting Services

The connection data for "Reporting Services" are determined by the system.

- Reporting Services protocol:
  The transmission protocol for access to the Microsoft Reporting Services is displayed.
  The protocols "http" and "https" are available.
  The default setting is the hypertext transfer protocol. The secure hypertext transfer protocol is used for encryption and authentication of the communication between server and client.
- Reporting Services host name:
  The server suffix for access to the Microsoft Reporting Services is displayed.
- Reporting Services port:
  The port for access to the Microsoft Reporting Services is displayed.
  A port represents part of the network address.

Saving the print preview

With the following properties, you set a default directory for storing reports exported as PDF files from the print preview. You also can specify whether the file name and the directory can be changed before saving the PDF file. Do not use local paths, instead use a UNC path.

- Default directory for PDF files: Input box for specifying a default directory in which the PDF files generated from the print preview are saved. Use the right-hand button to open a search dialog for selecting the required shared folder. This folder is not used for storing archived batches.
- With the additional "Name and directory of PDF file can be changed" option, you can specify whether or not you have the option of changing the file name and directory name before the reports are saved. If the option is not enabled, the corresponding PDF file is saved with a file name generated by the system in the configured directory. A part of the created file name includes the object name you assigned in BatchCC. Note that PDF files may be overwritten if the "Name and directory of PDF file can be changed" option is not enabled.

Information Server

If you have included a PH archive server in the PCS 7 configuration, to be able to access print templates for printing and the print preview of batch data on a BATCH client, the Web Service URL on the SIMATIC Information Server must be specified. You will find the address in the Reporting Services Configuration Manager on the SIMATIC Information Server.

"OK" button

Exits the dialog and saves your settings.

"Standard" button

Click this button to reset all project settings you have changed in this tab to the default setting "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

15.1.3 BCC Properties dialog box shared tab

15.1.3.1 "Allocation" tab

Tree structure

You use the tree structure to specify the structure view in which the units are offered for selection in the "Equipment selection" field:

- Class view: All units are listed in the "Unit selection" field sorted according to unit class without an area structure. Units that do not belong to any unit class are displayed flat in the tree.
- Area view: All areas with the subordinate units are listed in the "Unit selection" field. Units that do not belong to any area are displayed flat in the tree.

Equipment selection:

- For unit selection without conditions
  This list displays the existing areas and unit classes from the basic engineering for selection, depending on the tree structure. The units available in each case are visible underneath. Select the possible unit candidates here. The unit candidates limit the phases that can be used during execution of this recipe unit.
- For unit selection with conditions:
  All units are displayed as not modifiable under "Equipment selection". The units that are to be selected have already been selected automatically.

Strategy:

You use the strategy to specify how one of the possible units is selected for the actual batch execution:

- Preferred unit: If no other assignment is made before creating a batch, the unit specified as the preferred unit is used for the batch.
- The longest out of use: The unit that has not been used for the longest time will be used.
- Operator selection: The assignment of the unit is performed manually by an input in an operator dialog.
- Process parameters: The variable selected in the "Process parameters" field determines the unit to be used.

Preferred unit:

You select the preferred unit for batch processing.

Process parameters:

You select the variable with the "Unit" data type that determines on a process-dependent basis the unit to be selected during batch execution. With the button to the right, you open the next dialog "Level/....". The interconnection of the process parameter can be checked and set here.

Start allocation:

If this check box is selected, the entire batch processing will start only if the unit required by this unit recipe is free. This unit is allocated at the start of the batch even if the actual processing begins later. Use this procedure to ensure the availability of the unit.

Available phases:

- For unit selection without conditions:
  For recipes, the equipment phases still available after taking into account the restrictions are displayed (intersection).
  For library operations, if several unit classes are selected, the union set of equipment phases is displayed.
- For unit selection with conditions:
  The union set of all selected units is displayed under "Available phases".

Note

The selection of "Strategy" or "Preferred unit" has no effect on the display of the available phases. The phases corresponding to the selected units under "Equipment selection" are displayed here. All possible phases are shown at first (union set). Once phases are selected in the recipe (phases used), the available units and therefore the phases displayed here are filtered.

15.1.3.2 "Input material" tab (Procedure/Step/Formula/Batch properties)

The input materials are listed in the properties of the header (recipe procedure), the unit recipes, the steps, the formula category, formula and batch.

For steps with a link to EOP, EPH or for operator dialogs, the entries are taken from the basic engineering and for library sequences from the library object. Parameters can be created and deleted in the other objects.

In the formula category, you can specify the parameters that are not specific to the procedure as data structures. In the formula, you enter the "genuine" recipe values for the data structure.

Button for showing and hiding table columns

After the "Unit of measure" column listed below, there is an empty column with a button for hiding or showing the following columns. This allows you to make the Parameters tab clearer and simpler.

Button for printing parameters

Using a button in the table view, you can open a shortcut menu for printing the displayed parameters. If you click the **Print** button in the shortcut menu, the table view along with the parameters is output immediately to the default printer set in Windows.

If you click **Print...**, a Windows dialog opens in which you can select another printer set up in Windows. If you click "OK" after making the selection, the parameters are printed.

List:

- **Name**: For steps that are linked to an EOP, EPH or library sequence, the name is adopted from the ES or from the library object. You can specify a name for the other steps.
- **Material (set)**: You can select from the input materials created in BatchCC. Click the button to the right of the text box to open a dialog in which you can select the materials.
- **Material (act)**: Displays the last (most recent) available process value.
- **Code (set)**: Indicates a unique code, for example, an internal company code for the selected input material in the form of a string.
- **Code (act)**: Indicates a unique code, for example, an internal company code for the last (most recent) available process value in the form of a string.
- **Low limit**: For steps that are linked to an EOP, EPH or library sequence, the low limit is adopted from the ES or from the library object. The limit is unit-dependent. The limits are applied to the higher-level steps linked to the source or destination.
- **Low recipe limit:** input of the low recipe limit. The low recipe limit must be within the engineering limits. Values outside this range are marked in red during input and are not permitted. If you click the X button, the entered value is reset to the original limit from the ES. The setpoint for the amount of input material must then be within the recipe limits. Otherwise, the validation signals an error. The low recipe limit is not unit-dependent, but rather quantity-dependent. The recipe limits are adopted for the higher-level steps linked to the source or destination.
- **Quantity (set)**: The specific recipe value is entered here. For dosing, a final dosing value for an ingredient can be specified here. When linked with a data source, this value is fetched from the higher-level and can only be modified there.
- **OK:** The "OK" column containing the check box is then displayed if you call up the "Properties " dialog > "Parameters" tab of a control recipe during batch processing and then click the "Change" button for the selected parameter row. If the check box in the "OK" column is selected, entered values are applied. If the check box is not selected, no values will be applied. If a limit is violated, the entered value is shown in red. A distinction is made between recipe phases and operator instructions:
  - For recipe phases: If the check box is selected, the setpoint entered is within the specified limits and can be transferred to the AS. You can find additional information in the section "Changing setpoints (Page 482)".
  - For operator instructions: If the check box is selected, the process value entered is within the specified limits and will be accepted by the system. If the system detects a limit violation, the check mark is removed from the check box. The entered value is not adopted by the system and is not shown in the batch report. If you as the user nevertheless want to apply the value and show it in the batch report, select the check box.

- **Quantity (act)**: Displays the last (most recent) available process value.
- **High recipe limit value:** input of the high recipe limit. The high recipe limit must be within the engineering limits. Values outside this range are marked in red during input and are not permitted. If you click the X button, the entered value is reset to the original limit from the ES. The setpoint for the amount of input material must then be within the recipe limits. Otherwise, the validation signals an error. The high recipe limit is not unit-dependent, but rather quantity-dependent. The recipe limits are adopted for the higher-level steps linked to the source or destination.
- **High limit:** For steps that are linked to an EOP, EPH or library sequence, the high limit is adopted from the ES or from the library object. The limit is unit-dependent. The limits are applied to the higher-level steps linked to the source or destination.

  Note

  If the master recipe has yet to be assigned to a unit, the high and low limits are marked in green. The limits indicate the "shell" over all unit candidates.

- **Unit of measure**: The parameters are specified in greater detail by the units of measure. The units of measure are entered in the ES and adopted when the process cell data are imported.
- **Scaling**: You can define processes dependent on quantities with Scaling functions (Page 615). Depending on the specific quantity of the batch, the quantity in this row is corrected via the set scaling function. The linear and quadratic scaling functions are available by default.
- **Source**: For the RUP, ROP, and RPH recipe objects, an input material can be selected as the data source from the next higher level in the selection field. This assumes that the higher recipe level contains an input material with the same data type and unit of measure.
  If there is no interconnectable input material in the list box, click the "..." button to create and interconnect a new input material at the appropriate recipe level.
  Examples:
  The recipe phase fetches the setpoint from the ROP level. This can fetch the setpoint from the recipe unit procedure level, etc. The recipe procedure, in turn, can fetch the setpoint from the formula.
- **Target**: For the RUP, ROP, and RPH recipe objects, the process values from the process can be passed on to the next higher levels.
  Example:
  The process value of a recipe phase can be passed up to the recipe level of the recipe header. This also enables the process value of a recipe step to be used as the setpoint for a subsequent recipe step. The button next to the parameter opens a dialog in which you can create and interconnect new parameters on all levels.
- **Process value ID / Setpoint ID:** You can use the ID number to specify whether the parameter value is to be saved for logging in the SIMATIC BATCH archive. With an ID number higher than zero, the setpoint or process value is also made available on an interface for an external program. Assigning unique ID numbers for the parameter values makes processing in an external application easier. ID numbers from 0 to 32767 can be entered. Following creation of a new operation type, the default value is 1 or the value that was set in the ES.
- If the master recipe has yet to be assigned to a unit, the high and low limits are marked in green. The limits indicate the "shell" over all unit candidates.

- **Usage (formula)**: Here, a connector indicates graphically whether or not the variable is the source for a parameter in the assigned master recipe.
- **Display**: A maximum of three parameters can be displayed in the step boxes of the SFC display. Select the parameters you want to be displayed in the step box. All the parameters are output in the tooltip text.
- **Modifiable (procedure, step):** Parameters can be changed during batch control. If the recipe step is currently being processed there will be no reaction to the parameter modification. The modified parameter will only become effective when the step is processed again.

  Note

  Effects of parameter references

  The following behavior applies in the case of parameter references (source or target interconnections):

  - If parameters are designated as "Modifiable", the operator is permitted to enter new values.
  - If parameters are designated as "Not modifiable", the operator is not permitted to enter new values.
  - If parameters are designated as "Not modifiable" and are interconnected with a source, parameters nevertheless assume modified values of the source. If the operator enters a new value on a parameter interconnected with a source, the parameter reference is resolved. Resolved parameter references remain resolved in the subsequent course of the recipe.

- **Effective immediately (step of type EPH, EOP, operator dialog):** Parameters can be changed during batch control. If the recipe step is currently being processed, the changed parameter value will become effective immediately; in other words, it is transferred from the running recipe step in the control recipe directly to the controller, where it takes effect in the executing block. This option can also be set for parameter references.
- **Hide**: If you select this check box, the value of the parameter is not displayed or the parameter row does not appear in the table.
- **Equation:** Configure arithmetic expressions at transitions and recipe parameters of recipe unit procedures (RUPs), recipe operations (ROPs), and recipe phases (RPHs) to calculate setpoints from parameters from the next highest recipe level and constants.
- **Visible externally:** If you select the check box, the parameter will be output to the batch via the API command "GET_PARAMETER" without interconnection to the recipe header, regardless of the recipe structure.

New (in the dialogs for recipe procedure, RUP, ROP sequence, formula category):

You can create new lines for input material.

Delete (in the dialogs for recipe procedure, RUP, ROP sequence, formula category):

You can delete a selected line. Remember that this line can be a data source or target.

Description:

In the dialogs for the recipe procedure, the RUP and the ROP sequence, you can enter an explanatory text.

Additional information

You can find information about recipe limits in the section "Specifying recipe limits (Page 602)".

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.3.3 "Dependencies" tab

All elements related to the selected element are displayed in tabular form in the dialog. Dependent elements might be library, master recipe or formula elements.

What is displayed?

Depending on the context in which you call this dialog, different elements will be displayed.
If you call the dialog in the BCC with aster recipe > Properties > "Dependencies" tab, all formulas and libraries assigned to or used in this master recipe will be displayed.
If you open the dialog in the BCC with Library > Properties > "Dependencies" tab, you will see all master recipes that use this library.

"Name" table column

The "Name" column consists of 3 parts. 2 symbols and the name of the element. The first symbol indicates the processing status of the element, for example, "In process". The second symbol indicates the type of the element, for example, a flat or hierarchical recipe.

"Status" table column

The "Status" column shows the current status of the element in plain text.

15.1.3.4 "ESIG" tab

Introduction

In this tab, you specify the electronic signatures required for operator actions affecting a batch, recipe procedure, recipe unit procedure, recipe operation, recipe phase or transition.

After enabling the function, assign users who will supply the electronic signature to each row using the "..." button in the "Roles" column of the "Configure roles" dialog.

Activate

Selecting the check box activates the "Electronic signature" function for the object. The dialog is updated and possible operator actions for the object are listed in a table.

Table of operator actions

- **Operation:** Displays all the actions relating to the object that can be signed. The display is refreshed when you click the "New" button.
- **Active:**Here, you select the operator actions that you want to have signatures for.
- **Sequence:**Here, you select the actions for which the signatures must be entered in a specific order per action (assuming that more than one signature is required per action).
- **All at once:** Signing all at once means that all the required electronic signatures must be entered in an open signing dialog box before the operator action is taken.
  Some operator actions on a gray background only work when they are signed all at once. With actions that trigger underlying actions, the signing of operator actions must always be performed all at once on one PC within a signing dialog. Not all at once means that several signatures can be made individually on different PCs in different signing dialogs. The operator action is executed only when all signatures have been entered.
- **Roles:** By clicking on this column, you open the "Configure roles" dialog box to select the user roles for which the substitute will enter the signatures.

Configured roles

When you select an operator action in the top window, the configured user roles required to provide an electronic signature are displayed in the required sequence in the bottom window.

"Edit Roles" button

Click this button to open the "Confiure roles" dialog. Here, you assign a user role to supply the electronic signature for an operator action.

OK

Saves your entries and closes the dialog.

Cancel

Discards your entries and closes the dialog.

Help

Opens the online help for this dialog.

Additional information

Specifying electronic signatures (Page 408)

15.1.3.5 "Recipe" dialog box

In this dialog, you create new parameters on the recipe procedure level (recipe header parameter), on the recipe unit procedure (RUP), and on the recipe operation level (ROP). A connection to the new parameter is also created.

Depending the type of connection, source or destination, the following applies:

Source	:	Read the setpoint of the parameter.
Target	:	Write the process value to the parameter.

Operation and handling in the dialog

The parameters of the various recipe levels are displayed in tabular form in the left window. The following functions are provided in the "Parameters" column:

- Select/clear check box: If the check mark set on the selected level, a new parameter is created on this recipe level.
- Symbols: The following symbols can be displayed.

Symbol	Meaning
	This parameter is created by clicking "OK".
	No new parameter is created on this recipe level.
	The parameter name already exists at this recipe level and cannot be created. In this case, use a new parameter name.

- Parameter name: If you click the parameter of the selected recipe level, the existing parameter name is displayed in the right window. You cannot use it as the new parameter name. If you click again on the parameter name, it is available again for the name change.

15.1.3.6 "Change Log" tab (Library/Recipe/Formula/Batch/Material properties)

In this list, you can document the modifications made to the object.

Button for printing parameters

Using a button in the table view, you can open a shortcut menu for printing the displayed parameters. If you click the **Print** button in the shortcut menu, the table view along with the parameters is output immediately to the default printer set in Windows.

If you click **Print...**, a Windows dialog opens in which you can select another printer set up in Windows. After making a selection, click "OK" to print the parameters.

List:

- **Date:** The list entry is made by the system with the current date and system time.
- **User:** Indicates the name logged on as user in the BatchCC.

- **Action:** The actions recorded by the system such as "Create new" relating to an object are logged here. You can extend these system entries with the "New" button.
- **Computer name:** Each action you perform is recorded with the entry of the computer name. This is the name of the computer on which you initiated this action.

New:

This allows you to add information to the system entries. After clicking the "New" button, a line appears with the date and user. You can then enter a descriptive text. After clicking "OK", the entry is saved and can no longer be modified.

Description:

Text box for descriptive text available after clicking "New" button.

Delete

You can only delete an entry in the log if you have created the entry and have not yet exited the dialog with "OK".

Additional information

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.3.7 "Condition" tab (Recipe procedure/Batch properties)

The "Conditions" tab in the properties dialog of a selected recipe unit procedure can be opened from the BATCH Recipe Editor and from the BatchCC.

In the BATCH Recipe Editor, you configure at a recipe unit procedure the conditions according to which the unit candidates are allocated. Define the conditions in such a way that at least one candidate meets them. If none of the candidates meet the conditions, the validation signals an error.

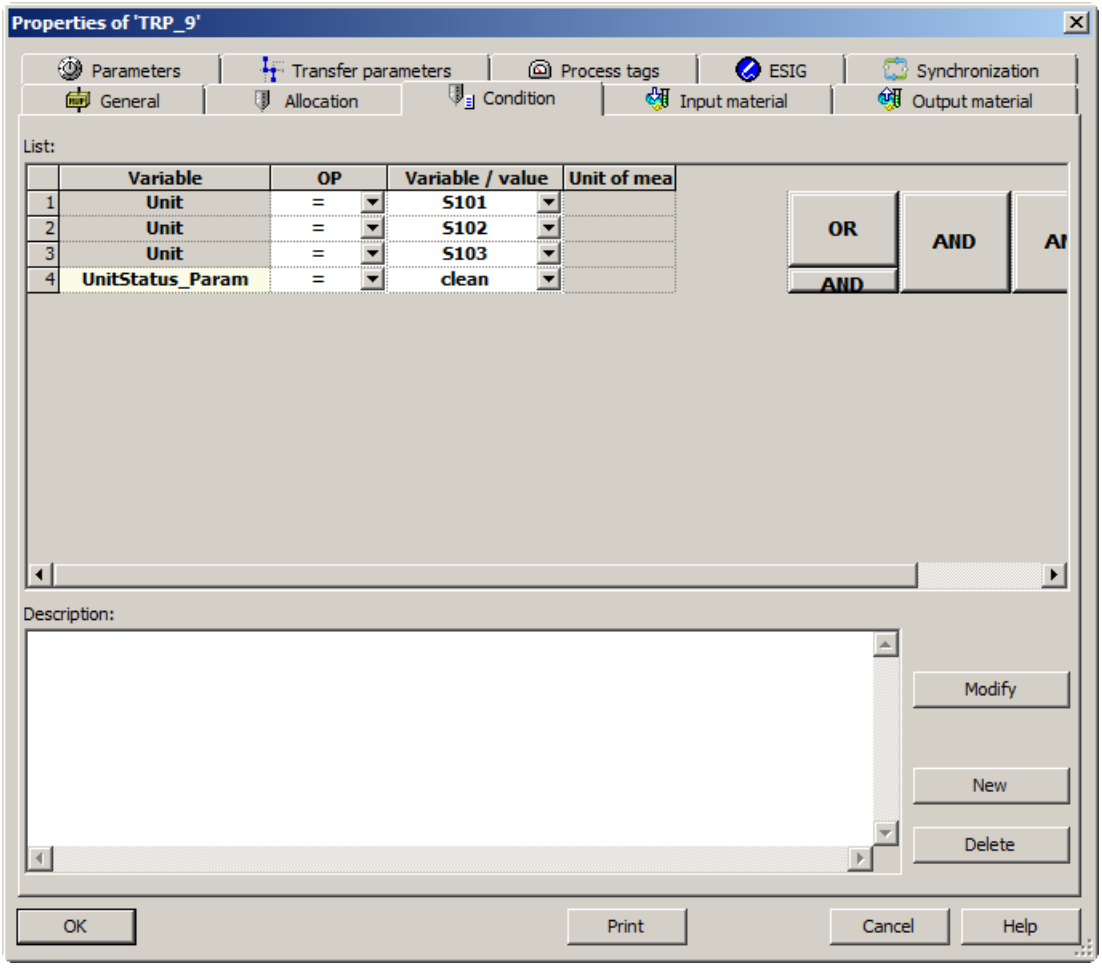


Figure 15-1 Properties of an RUP in the Recipe Editor, "Conditions" tab

The results for the individual conditions are displayed for each candidate in process mode. Based on the symbols, you can identify which of the conditions have switched and thus allocate a specific unit for batch processing.

When the dialog is opened, the first row of possible candidates is automatically selected. When you select a different candidate, its conditions are displayed together with the switch results in the "Conditions" area. You always select a candidate with a left-click on the candidate number.

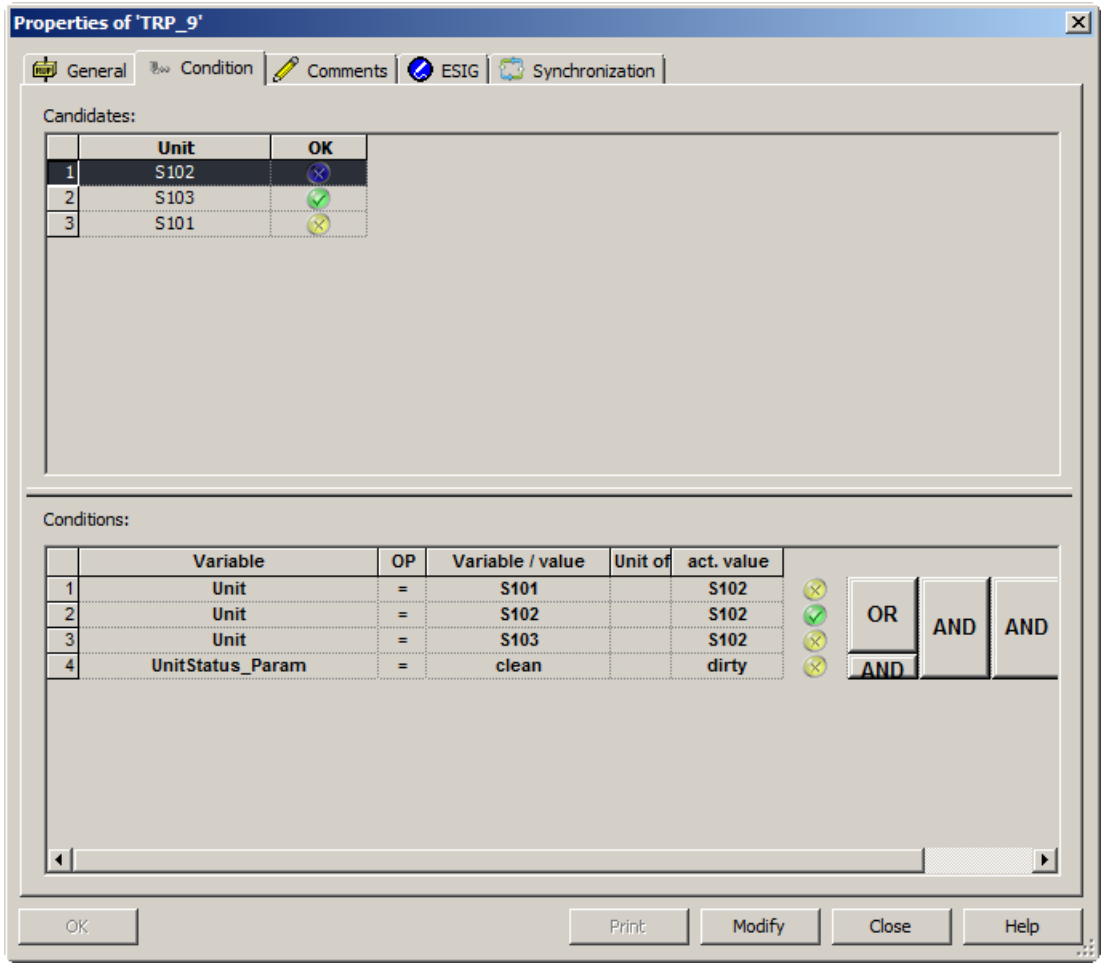


Figure 15-2 Conditions for candidate 1

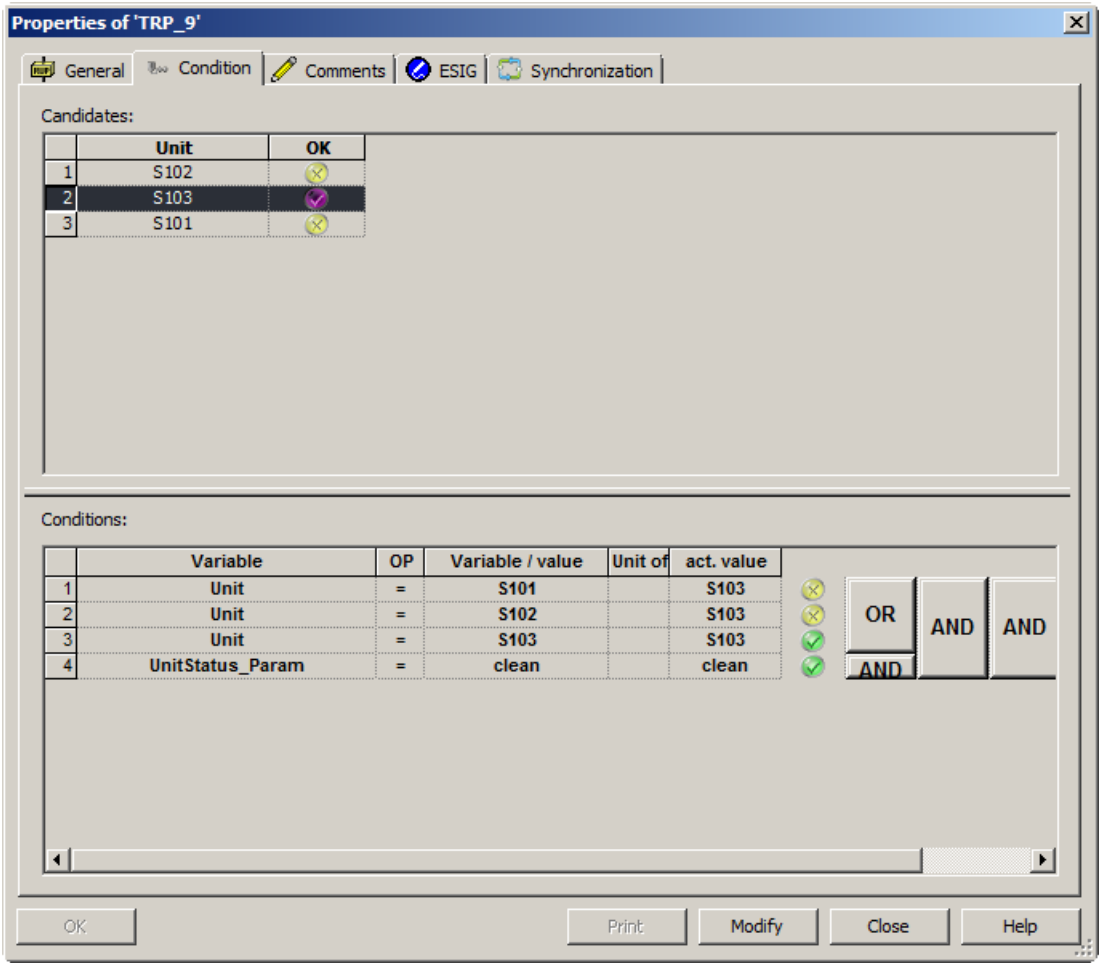


Figure 15-3 Conditions for candidate 2

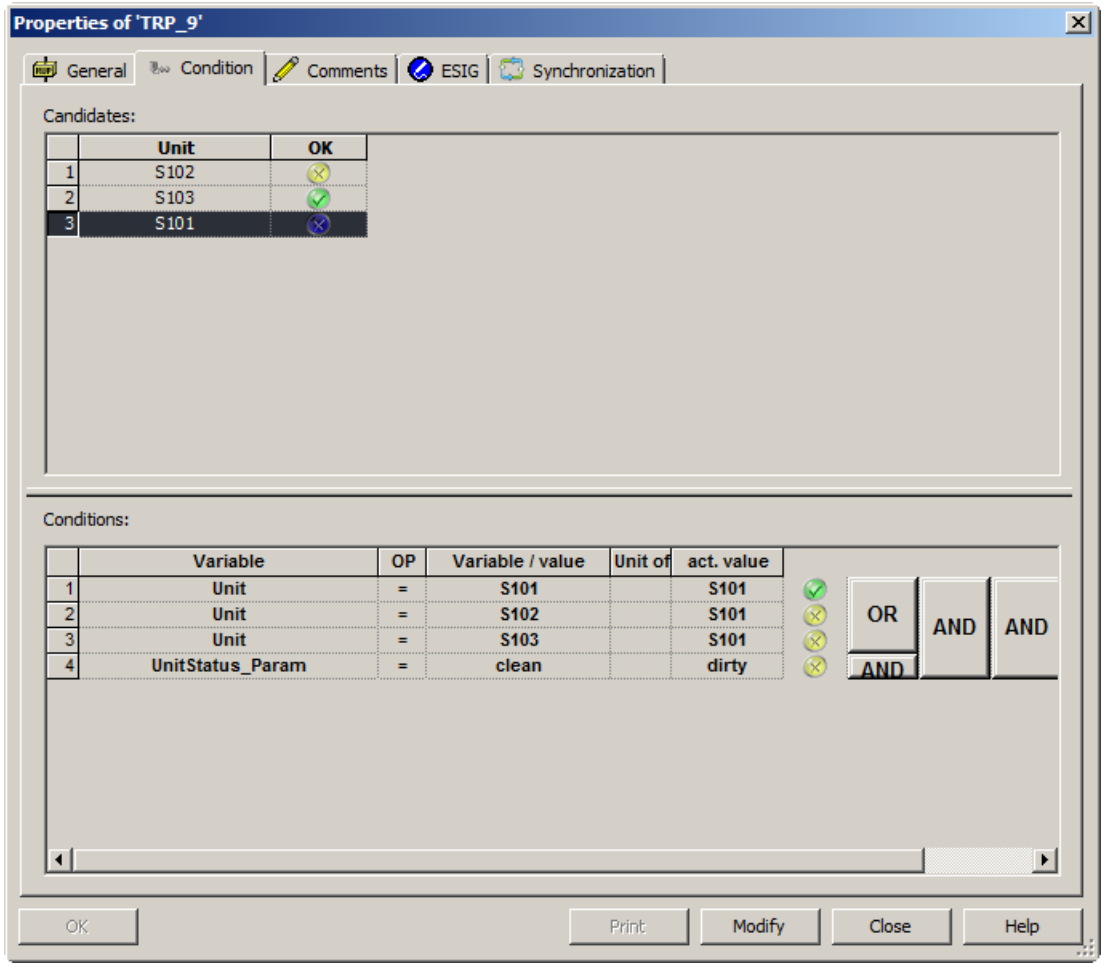


Figure 15-4 Conditions for candidate 3

Selecting units

For a more efficient selection of suitable units in the BATCH Recipe Editor, specify process-specific conditions for the unit in this tab. All units fulfilling these conditions are displayed in the "Allocation" tab. This enables, for example, the inclusion of additional units in the batch process (for batches that have not yet been released) without a recipe change in the event of process cell expansions following an update of the process cell in the Batch Control Center.

The table is empty when the tab opens for the first time. You can insert new condition lines with the "New" button. By marking a condition line and pressing the "Change" button, the subsequent dialog for configuration of the conditions opens. The dialog guides the user in entering the operands and the interconnection operation. Result: The "Condition" tab is correspondingly updated upon closing the subsequent dialog. A line always contains the information for exactly one condition. Additional conditions can be consequently entered by using the "New" button. Existing "conditions" can be changed using the "Change" button or by double-clicking a condition. A direct entry in the "Condition" tab is not possible.

If you use the allocation strategy "Preferred unit" with a condition, a preferred unit must have been selected at the latest during batch planning. Otherwise the batch cannot be released.

Combining conditions

Logical operators (see below) are used to combine conditions. You select the desired logical operators using shortcut menu commands on the displayed operator buttons. Note that, before you insert a condition, you decide which other condition the new condition is to be combined with. Accordingly, you choose the appropriate combination level by pressing the corresponding operator button behind the condition line to be combined.

A selected condition line can be deleted by pressing the "Delete" button.

List

- **Variable (first variable):** The first variable shows the attribute of the unit (equipment property) that should fulfill a condition.
- **Relational operator OP:** The relational operator shows the relationship between two variables. The symbols of relational operators have the following meaning:
  - = : Equality.
  - <>: Inequality.
  - >=: Is the left variable greater than or equal to the right variable?
  - <=: Is the left variable less than or equal to the right variable?
  - >: Is the left variable greater than the right variable?
  - <: Is the left variable less than the right variable?
- **Variable/value (second variable):** The second variable shows the value of the unit attribute (equipment property) needed to fulfill the desired condition.
- **Unit of measure:** The physical unit specified for the variable is displayed here.
- **Logical operators:** You can use logical operators to flexibly combine your conditions (shortcut menu commands). By single clicking the button with the right mouse button, you open a menu for selecting the required logic operation. The logic operations provide the result "satisfied" (or true) as follows:
  - AND : all conditions are fulfilled
  - OR : at least one of the conditions is fulfilled
  - NAND: not all conditions are fulfilled
  - NOR : none of the conditions are fulfilled
  - XOR : at most one condition is fulfilled
- **Change:** Click the "Change" button to start the dialog-guided input of a condition created previously with the "New" button.
- **New:** Use the "New" button to insert new rows for additional conditions.
- **Delete:** The "Delete" button deletes the selected condition (row).

Evaluation of operator input with graphic display

During the runtime of a batch, the configured conditions are resolved and the result is displayed graphically.

The "Candidates" area displays all candidates configured in the Recipe Editor that are possible for the condition in rows in a table.

- **"Unit" column**: Name of the unit from the master recipe.
- **"OK" column**: The following symbols are displayed:

Symbol	Meaning
	OK, unit can be used as a possible candidate.
	Not OK, unit cannot be used as a possible candidate.
	Unit or its parameters invalid, not initialized or unknown.

In the "Conditions" area, the evaluations of the conditions during runtime are shown in a table as results. The following symbols are displayed:

Symbol	Meaning
	OK, condition was met.
	Not OK, condition was not met.
	Current value or condition invalid, not initialized or unknown.

Additional information

Unit selection via conditions for a flat recipe (Page 561)

Unit selection via conditions for a hierarchical recipe (Page 562)

15.1.3.8 "Allocations" tab (Recipe procedure/Batch properties)

"Allocations" tab

This tab shows you information about allocations of units by running batches in a tabular form.

Button for printing parameters

Using a button in the table view, you can open a shortcut menu for printing the displayed parameters. If you click the "Print" button in the shortcut menu, the table view along with the parameters is output immediately to the default printer set in Windows.

If you click the "Print..." button, a Windows dialog opens in which you can select another printer set up in Windows. If you click "OK" after making the selection, the parameters are printed.

List:

- **Recipe assignments:** This column lists the unit recipes used in the recipe and their names. You can enter the name of the unit recipe in the hierarchical recipe using the properties of the unit recipe; you can enter the name directly in a flat recipe.
- **Unit:** The preferred unit for the unit recipe is entered in this column. You can enter the selection of the unit class and the preferred unit with the "Change" button or in the properties of the unit recipe.
- **Unit class:** The unit class specified for the unit recipe is entered in this column. This specification is made, for example, by selecting units for the unit recipe. If this value is set, only library operations with the same assigned unit class can be used in the recipe unit procedure.
- **Start:** The calculated start time is specified relative to the start of the first unit. If the first step of a unit recipe is started dependent on a synchronization function, the start value results from the calculated time of the first unit recipe as far as the synchronization line.
- **Run time:** Duration calculated from the time values entered in the recipe steps in the format day:hours:minutes:seconds.
- **Strategy**: This column shows how one of the potential units is selected for the actual batch execution:
  - Preferred unit: If no other assignment is made before creating a batch, the unit specified as the preferred unit is used for the batch.
  - The longest out of use: The unit that has not been used for the longest time will be used.
  - Operator selection: The allocation of the unit can be performed manually in an operator dialog.
  - Process parameters: The variable selected in the Process parameters field determines the unit.
- **Process parameters**: Variable with the "Unit" data type that determines, on a process-dependent basis, the unit to be selected when the batch is executed.
- **At start**: If this check box is selected, the entire batch processing will start only if the unit required by this unit recipe is free. This is regardless of whether the units of other unit recipes, which were executed in chronological order prior to this unit recipe, are free.
- **Condition**: If this check box is selected, the units that can be used for this unit recipe are selected by a set of conditions. Special dialogs for entering the conditions are enabled for this purpose. The third column, "Unit class", is available after this check box is selected.

Description of line n:

You can enter an explanatory description for a selected line here.

Edit (in the recipe procedure dialogs):

A dialog opens for the selected line:

- If the "Condition" option was active, two tabs will be displayed. Edit the condition for the unit in the first tab, "Condition". In the second tab "Allocation" you will see the preview:
  - Left: All units that fulfill the given conditions are displayed as selected under "Equipment selection".
  - Right: The union set of the phases of all selected units is displayed under "Available phases".
- If the "Condition" option was not active, only the "Allocation" tab for unit selection is displayed.

New (in the recipe procedure dialogs):

Creates a new reference to unit recipes.

Delete (in the recipe procedure dialogs):

Deletes the selected row if the corresponding unit recipe was also deleted in the graphic user interface.

Additional information

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.3.9 "Process tags" tab (RP, RUP, ROP properties)

For the recipe procedure (RP), recipe unit procedure (RUP), and sequence in a recipe operation (ROP sequence) recipe objects, or in the header data of the library operation, you can select data that will be stored in the archive of SIMATIC BATCH as trend data.

Unit

In the Unit window, you can select the measured variables to be archived in the tree structure using the unit and the equipment phase. All measured variables are offered here, which were assigned a WinCC process tag variable during the configuration in ES (see also section Configuring use of archive data from WinCC archives (Page 193)). Use the arrow key to add a selected measured variable to the list of process tags to be recorded (archive value list).

As measured values, the process values of the parameter blocks (EPAR_) linked via the EOP, EPH and TAG_COLL blocks are available.

The measured variables are detected during the execution of the object at which they are entered in the archive value list. This means that values that have to be recorded during the entire batch are entered in the archive value list of the recipe unit procedure. Values that only need to be acquired during a recipe operation are entered in the ROP properties in the archive value list.

15.1.3.10 "Parameters" tab (Procedure/Step/Formula/Batch properties)

The parameters are listed in the properties of the recipe header (recipe procedure), unit recipes, steps, formula category, formula, and batch.

The parameters are taken from the basic engineering for steps with a link to EOP, EPH or for operator dialogs and from the library object for library sequences. Parameters can be created and deleted in the other objects.

In the formula category, you can specify the parameters that are not specific to the procedure as data structures. In the formula, you enter the actual recipe values for the data structure.

Button for showing and hiding table columns

After the "Unit of measure" column listed below, there is an empty column with a button for hiding or showing the following columns. This allows you to make the Parameters tab clearer and simpler.

Button for printing parameters

Using a button in the table view, you can open a shortcut menu for printing the displayed parameters. If you click the **Print** button in the shortcut menu, the table view along with the parameters is output immediately to the default printer set in Windows.

If you click **Print...**, a Windows dialog opens in which you can select another printer set up in Windows. After making a selection, click "OK" to print the parameters.

List:

The following column titles are displayed:

- **Name**: For recipe steps to which an EOP, EPH or library reference is assigned, the name is taken from the configuration (ES/BatchCC) and cannot be changed. You can specify a name for the other steps.
- **Low limit**: For steps that are linked to an EOP, EPH or library sequence, the low limit is adopted from the ES or from the library object. It is unit-dependent. The limits are applied to the higher-level steps linked to the source or destination.
- **Low recipe limit:** input of the low recipe limit. The low recipe limit must be within the engineering limits. Values outside this range are marked in red during input and are not permitted. If you click the X button, the entered value is reset to the original limit from the ES. The setpoint for the amount of input material must then be within the recipe limits. Otherwise, the validation signals an error. The low recipe limit is not unit-dependent, but rather quantity-dependent. The recipe limits are adopted for the higher-level steps linked to the source or destination.
- **Value:** The specific recipe value is entered here. When linked with the data source, this value is fetched from the higher-level and can only be modified there.

- **OK:** The "OK" column containing the check box is then displayed if you call up the "Properties " dialog > "Parameters" tab of a control recipe during batch processing and then click the "Change" button for the selected parameter row.
  If the check box in the "OK" column is selected, entered values are applied. If the check box is not selected, no values will be applied. If a limit is violated, the entered value is shown in red. A distinction is made between recipe phases and operator instructions:
  - For recipe phases: If the check box is selected, the setpoint entered is within the specified limits and can be transferred to the AS. You can find additional information in the section "Changing setpoints (Page 482)".
  - For operator instructions: If the check box is selected, the process value entered is within the specified limits and will be accepted by the system. If the system detects a limit violation, the check mark is removed from the check box. The entered value is not adopted by the system and is not shown in the batch report. If you as the user nevertheless want to apply the value and show it in the batch report, select the check box.
- **Value (act):** Displays the current process value. Process values from the current batch are then displayed, when the corresponding batch step is active, for example, with the Running or Held status. The corresponding unit must be allocation, in addition. The value is constantly updated in the dialog in the BCC. The process value is transferred to the BATCH database only when the batch step reaches a final status, for example, Completed, Aborted, or Continuous. Hover the mouse pointer over the cell to get more information in a tooltip. The time stamp tells you when the process value was recorded. The activation counter shows how often the element has been activated. In loops, this counter is usually equivalent to the number of passes. However, manual activation (reset, start) is also an instance of activation and increments this counter.
  Note: If the background of this cell is red, the (process) value displayed in the cell may not correspond to the possible setpoints. The value is displayed just as it was read in this case.
- **High recipe limit value:** input of the high recipe limit. The high recipe limit must be within the engineering limits. Values outside this range are marked in red during input and are not permitted. If you click the X button, the entered value is reset to the original limit from the ES. The setpoint for the amount of input material must then be within the recipe limits. Otherwise, the validation signals an error. The high recipe limit is not unit-dependent, but rather quantity-dependent. The recipe limits are adopted for the higher-level steps linked to the source or destination.
- **High limit**: For steps that are linked to an EOP, EPH or library sequence, the high limit is adopted from the ES or from the library object. It is unit-dependent. The limits are applied to the higher-level steps linked to the source or destination.

  Note

  If the master recipe has yet to be assigned to a unit, the high and low limits are marked in green. The limits indicate the "shell" over all unit candidates.

- **Unit of measure:** The parameters are specified in greater detail by the units of measure. The units of measure are entered in the ES and adopted when the process cell data are imported.

- **Data type:** For recipe steps to which an EOP, EPH or library reference is assigned, the data type is taken from the configuration (ES/BatchCC) and cannot be changed. If you create a new parameter, you have the option of creating a data type yourself. You can choose from standard data type such as BOOL, REAL, INTEGER, etc. and the user data types from the global declarations in the ES. You can continue to use the standard data type "Status" in transitions, to control a ROP independent of the status of another ROP, for example.
  Text length for STRING data type
  As of SIMATIC BATCH V6.1, the number of characters that can be edited in "STRING" data type parameters in recipes is 254 instead of 16.
  As the configuring engineer, you can increase the number of characters of string setpoints within an SFC type via parameter assignment (Characteristics > Setpoints). The "IEPAR_STR"-type block can only process setpoints with a maximum of 16 characters. However, it is not possible to increase the number of characters here. If, when a batch is processed, a greater number of characters is written than the block in the AS (SFC-type or IEPAR_STR) can process, the setpoint is automatically shortened to the maximum possible length.
- **Source**: For the RUP, ROP, and RPH recipe objects, a parameter can be selected as the data source from the next higher level in the selection box. This requires a parameter in the next higher recipe level with the same data type and of the same unit of measure. If the selection box does not contain an interconnectable parameter, click "..." to create and interconnect a new parameter at the appropriate recipe level.
  Example:
  The recipe phase fetches the setpoint from the ROP level. This can fetch the setpoint from the recipe unit procedure level, etc. The recipe procedure, in turn, can fetch the setpoint from the formula.
- **Scaling**: You can define processes dependent on quantities with Scaling functions (Page 615). Depending on the specific quantity of the batch, the parameters in this row are corrected using the set scaling function. The linear and quadratic scaling functions are available by default.
- **Target**: For the RUP, ROP, and RPH recipe objects, the process values from the process can be passed on to the next higher level.
  Example:
  The process value of a recipe phase can be passed up to the recipe level of the recipe header. This also enables the process value of a recipe step to be used as the setpoint for a subsequent recipe step. The button next to the parameter opens a dialog in which you can create and interconnect new parameters on all levels.
- **Usage (formula)**: Here, a connector indicates graphically whether or not the variable is the source for a parameter in the assigned master recipe.
- **Setpoint ID, Process value ID**: With an ID number higher than zero, the setpoint or process value is also made available on an interface for an external program. Assigning unique ID numbers for the parameter values makes processing in an external application easier. When a new operation type is created, the default value is 1 or the value set in the ES.
- **Display**: A maximum of three parameters can be displayed in the step boxes of the SFC display. Select the parameters you want to be displayed in the step box. All the parameters are output in the tooltip text.

- **Modifiable (procedure, step):** Parameter should be modifiable during batch control. If the recipe step is currently being processed there will be no reaction to the parameter modification. The modified parameter will only become effective when the step is processed again.

  Note

  Effects of parameter references

  The following behavior applies in the case of parameter references (source or target interconnections):

  - If parameters are designated as "Modifiable", the operator is permitted to enter new values.
  - If parameters are designated as "Not modifiable", the operator is not permitted to enter new values.
  - If parameters are designated as "Not modifiable" and are interconnected with a source, parameters nevertheless assume modified values of the source. If the operator enters a new value on a parameter interconnected with a source, the parameter reference is resolved. Resolved parameter references remain resolved in the subsequent course of the recipe.

- **Effective immediately (step of type EPH, EOP, operator dialog):** Parameters can be changed during batch control. If the recipe step is currently being processed, a changed parameter value will become effective immediately; in other words, it is transferred from the running recipe step in the control recipe directly to the controller, where it takes effect in the executing block. This option can also be set for parameter references.
- **Hide**: If you select this check box, the value of the parameter is not displayed or the parameter row does not appear in the table.
- **Equation:** Configure arithmetic expressions at transitions and recipe parameters of recipe unit procedures (RUPs), recipe operations (ROPs), and recipe phases (RPHs) to calculate setpoints from parameters from the next highest recipe level and constants.
- **Visible externally:** If you select the check box, the parameter will be output to the batch via the API command "GET_PARAMETER" without interconnection to the recipe header, regardless of the recipe structure.

Only with operator instructions

- **Setpoint modifiable:** If the check box is activated, the setpoint can be changed in the operator instruction. The setpoint is the expected diagnostics value that the operator enters when the operator instruction appears for batch execution. The expected event (setpoint) can be changed in the control recipe.
- **Process value modifiable:** When the check box is selected, the operator can enter the diagnostic value as a process value in the operator instruction in the batch execution. If the check box is cleared, the process value is displayed but it cannot be changed.
- **Hide**: If the check box is selected, the values are not visible and cannot be changed.

New (in the dialogs for recipe procedure, RUP, ROP sequence, formula category):

You can create new parameters of the following types: user-defined enumeration type, floating point, integer, and string.

Delete (in the dialogs for recipe procedure, RUP, ROP sequence, formula category):

You can delete a selected parameter line. Remember that this parameter can be a data source or target.

Description of a referenced object:

In the dialogs for the steps with links to EOP, EPH or a library sequence, the linked object is displayed here.

Description:

In the dialogs for the recipe procedure, the RUP and the ROP sequence, you can enter an explanatory text.

Additional information

You can find information about recipe limits in the section "Specifying recipe limits (Page 602)".

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.3.11 "Output material" tab (Procedure/Step/Formula/Batch properties)

The output materials are listed in the properties of the header (recipe procedure), the unit recipes, the steps, the formula category, formula and batch.

For steps with a link to EOP, EPH or for operator dialogs, the entries are taken from the basic engineering and for library sequences from the library object. Parameters can be created and deleted in the other objects.

In the formula category, you can specify the parameters that are not specific to the procedure as data structures. In the formula, you enter the "genuine" recipe values for the data structure.

Button for showing and hiding table columns

After the "Unit of measure" column listed below, there is an empty column with a button for hiding or showing the following columns. This allows you to make the Parameters tab clearer and simpler.

Button for printing parameters

Using a button in the table view, you can open a shortcut menu for printing the displayed parameters. If you click the **Print** button in the shortcut menu, the table view along with the parameters is output immediately to the default printer set in Windows.

If you click **Print...**, a Windows dialog opens in which you can select another printer set up in Windows. After making a selection, click "OK" to print the parameters.

List:

- **Name**: For steps that are linked to an EOP, EPH or library sequence, the name is adopted from the ES or from the library object. You can specify a name for the other steps.
- **Material (set)**: You can select from the output materials created in BatchCC. Click the button to the right of the text box to open a dialog in which you can select the materials.
- **Material (act):** Displays the last (most recent) available process value.
- **Code (set)**: Indicates a unique code, for example, an internal company code for the selected end product (output material) in the form of a string.
- **Code (act)**: Indicates a unique code, for example, an internal company code for the last (most recent) available process value in the form of a string.
- **Low limit**: For steps that are linked to an EOP, EPH or library sequence, the low limit is adopted from the ES or from the library object. The limit is unit-dependent. The limits are applied to the higher-level steps linked to the source or destination.
- **Low recipe limit:** input of the low recipe limit. The low recipe limit must be within the engineering limits. Values outside this range are marked in red during input and are not permitted. If you click the X button, the entered value is reset to the original limit from the ES. The setpoint for the amount of input material must then be within the recipe limits. Otherwise, the validation signals an error. The low recipe limit is not unit-dependent, but rather quantity-dependent. The recipe limits are adopted for the higher-level steps linked to the source or destination.
- **Quantity (set)**: The real recipe value is entered here. For dosing, a final dosing value for filling can be specified here. When linked with the data source, this value is fetched from the higher-level and can only be modified there.
- **OK:** The "OK" column containing the check box is then displayed if you call up the "Properties " dialog > "Parameters" tab of a control recipe during batch processing and then click the "Change" button for the selected parameter row. If the check box in the "OK" column is selected, entered values are applied. If the check box is not selected, no values will be applied. If a limit is violated, the entered value is shown in red. A distinction is made between recipe phases and operator instructions:
  - For recipe phases: If the check box is selected, the setpoint entered is within the specified limits and can be transferred to the AS. You can find additional information in the section "Changing setpoints (Page 482)".
  - For operator instructions: If the check box is selected, the process value entered is within the specified limits and will be accepted by the system. If the system detects a limit violation, the check mark is removed from the option button box. The entered value is not adopted by the system and is not shown in the batch report. If you as the user nevertheless want to apply the value and show it in the batch report, select the check box.
- **Quantity (act):** Displays the last (most recent) available process value.
- **High recipe limit value:** input of the high recipe limit. The high recipe limit must be within the engineering limits. Values outside this range are marked in red during input and are not permitted. If you click the X button, the entered value is reset to the original limit from the ES. The setpoint for the amount of input material must then be within the recipe limits. Otherwise, the validation signals an error. The high recipe limit is not unit-dependent, but rather quantity-dependent. The recipe limits are adopted for the higher-level steps linked to the source or destination.

- **High limit**: For steps that are linked to an EOP, EPH or library sequence, the high limit is adopted from the ES or from the library object. The limit is unit-dependent. The limits are applied to the higher-level steps linked to the source or destination.

  Note

  If the master recipe has yet to be assigned to a unit, the high and low limits are marked in green. The limits indicate the "shell" over all unit candidates.

- **Unit of measure**: The parameters are specified in greater detail by the units of measure. The units of measure are entered in the ES and adopted when the process cell data are imported.
- **Source**: For the RUP, ROP, and RPH recipe objects, an output material can be selected as the data source from the next higher level in the selection box. This assumes that the higher recipe level contains an output material with the same data type and unit of measure. If there is no interconnectable output material in the list box, click the "..." button to create and interconnect a new input material at the appropriate recipe level.
  Examples:
  The recipe phase fetches the setpoint from the ROP level. This can fetch the setpoint from the recipe unit procedure level, etc. The recipe procedure, in turn, can fetch the setpoint from the formula.
- **Target**: For the RUP, ROP, and RPH recipe objects, the process values from the process can be passed on to the next higher levels.
  Example:
  The process value of a recipe phase can be passed up to the recipe level of the recipe header. This also enables the process value of a recipe step to be used as the setpoint for a subsequent recipe step. The button next to the parameter opens a dialog in which you can create and interconnect new parameters on all levels.
- **Setpoint ID, Process value ID**: You can use the ID number to specify whether the parameter value is to be saved for logging in the SIMATIC BATCH archive. With an ID number higher than zero, the setpoint or process value is also made available on an interface for an external program. Assigning unique ID numbers for the parameter values makes processing in an external application easier. ID numbers from 0 to 32767 can be entered. When a new operation type is created, the default value is 1 or the value set in the ES.
- **Scaling**: You can define processes dependent on quantities with Scaling functions (Page 615). Depending on the specific quantity of the batch, the quantity in this row is corrected via the set scaling function. The linear and quadratic scaling functions are available by default.

- **Modifiable (procedure, step):** Parameter should be modifiable during batch control. If the recipe step is currently being processed there will be no reaction to the parameter modification. The modified parameter will only become effective when the step is processed again.

  Note

  Effects of parameter references

  The following behavior applies in the case of parameter references (source or target interconnections):

  - If parameters are designated as "Modifiable", the operator is permitted to enter new values.
  - If parameters are designated as "Not modifiable", the operator is not permitted to enter new values.
  - If parameters are designated as "Not modifiable" and are interconnected with a source, parameters nevertheless assume modified values of the source. If the operator enters a new value on a parameter interconnected with a source, the parameter reference is resolved. Resolved parameter references remain resolved in the subsequent course of the recipe.

- **Effective immediately (step of type EPH, EOP, operator dialog):** Parameters can be changed during batch control. If the recipe step is currently being processed, the changed parameter value will become effective immediately; in other words, it is transferred from the running recipe step in the control recipe directly to the controller, where it takes effect in the executing block. This option can also be set for parameter references.
- **Equation:** Configure arithmetic expressions at transitions and recipe parameters of recipe unit procedures (RUPs), recipe operations (ROPs), and recipe phases (RPHs) to calculate setpoints from parameters from the next highest recipe level and constants.
- **Visible externally:** If you select the check box, the parameter will be output to the batch via the API command "GET_PARAMETER" without interconnection to the recipe header, regardless of the recipe structure.
- **Usage (formula)**: Here, a connector indicates graphically whether or not the variable is the source for a parameter in the assigned master recipe.
- **Display**: A maximum of three parameters can be displayed in the step boxes of the SFC display. Select the parameters you want to be displayed in the step box. All the parameters are output in the tooltip text.
- **Hide**: If you select this check box, the value of the parameter is not displayed or the parameter row does not appear in the table.

New (in the dialogs for recipe procedure, RUP, ROP sequence, formula category):

You can create new lines for output material.

Delete (in the dialogs for recipe procedure, RUP, ROP sequence, formula category):

You can delete a selected line. Remember that this line can be a data source or target.

Description:

In the dialogs for the recipe procedure, the RUP and the ROP sequence, you can enter an explanatory text.

Additional information

You can find information about recipe limits in the section "Specifying recipe limits (Page 602)".

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.3.12 "Transfer parameter" tab

In this dialog, you configure the route control of source locations through an intermediary location and to a destination location. All configurations you have made on the ES are displayed in this dialog. To configure route control for SIMATIC BATCH, you must select locations for at least two parameters (source and destination) in the "Location" column using the "..." button.

It is only practical to define route controls for an equipment phase (transfer phase) that you have configured in the recipe editor.

Button for showing and hiding table columns

In the tabular view, there is an empty column with a button for hiding or showing the following columns. This allows you to make the Parameters tab clearer and simpler.

Button for printing parameters

Using a button in the table view, you can open a shortcut menu for printing the displayed parameters. If you click the **Print** button in the shortcut menu, the table view along with the parameters is output immediately to the default printer set in Windows.

If you click **Print...**, a Windows dialog opens in which you can select another printer set up in Windows. After making a selection, click "OK" to print the parameters.

Requirements

- Route Control must be installed on the appropriate PCs.
- An equipment property with the data type "Location" is configured in the shared declarations of the SIMATIC Manager.
- The required location must be assigned to each required Unit (instanced).

List:

- **Name**: This displays the name assigned at the function block.
- **Location (act):** Displays the reference, the location, and the location ID, separated by a slash "/". Example: "RUP(Reactor_A2) / Dest_L / 203". Process values are only displayed for completed, aborted and stopped batches. The process values are displayed in the sequence: Reference, Location, Location ID. Click the "Change" button and then select a new interconnection (process values) instead of the cross-interconnection. When selecting process values with the transfer parameters, the existing cross-interconnections are deleted.
- **Reference (set):** The name of the unit recipe procedure is displayed here. When you select a location, the location ID and process cell reference are automatically displayed in the respective parameter line. If you do not use the optional parameter "Via", the "Reference" and "Location" columns remain empty. If the final unit has not yet been decided, a question mark appears in the "Location ID" column.
- **Location (set):** Click "..." to open the "Locations" dialog. There you navigate to the required unit, select the required location and confirm your selection with "OK". Depending on the parameter type you would like to assign to a location, you may only display the "source" type locations. If you have not configured the required equipment properties, no locations will be offered for selection.
  Meaning: n. a. unit = unit cannot be allocated for SIMATIC BATCH.
- **Data type:** For steps that are linked to an EOP, EPH or library sequence, the data type is adopted from the ES or from the library object. The parameter type/transfer type Source, Destination or Via is displayed.
- **Source:** For the RUP, ROP, and RPH recipe objects, you can select a parameter as the data source from the next higher level in the selection box. This assumes that there is a parameter in the higher recipe level with the same data type.
  If there is no interconnectable parameter in the list box, click the "..." button to create and interconnect a new parameter at the appropriate recipe level.
  Example:
  The recipe phase fetches the setpoint from the ROP level. This can fetch the setpoint from the recipe unit procedure level, etc. The recipe procedure, in turn, can fetch the setpoint from the formula.
- **Location ID (set):** The unique location ID generated by the system during engineering in the SIMATIC Manager is displayed here.
- **Target:** For the RUP, ROP, and RPH recipe objects, the process values from the process can be passed on to the next higher level.
  Example:
  The process value of a recipe phase can be passed up to the recipe level of the recipe header. This also enables the process value of a recipe step to be used as the setpoint for a subsequent recipe step. The button next to the parameter opens a dialog in which you can create and interconnect new parameters on all levels.
- **Hide**: If you select this check box, the value of the parameter is not displayed or the parameter row does not appear in the table.

- **Modifiable (procedure, step):** Parameter should be modifiable during batch control. If the recipe step is currently being processed there will be no reaction to the parameter modification. The modified parameter will only become effective when the step is processed again.
- **Visible externally:** If you select the check box, the parameter will be output to the batch via the API command "GET_PARAMETER" without interconnection to the recipe header, regardless of the recipe structure.

"Change" button

Click the "Change" button to make changes to the transfer parameters.

"Delete" button

You can delete a selected line.

Additional information

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.4 BCC Library Properties dialog box

15.1.4.1 "General" tab (Library operation properties)

Name and version

You specify the name and version of the library operation when you create a new library operation or when you Save as.... The name cannot be modified in this tab.

Status:

The status provides you with information on the status of the library operation:

- **In progress**: Initial status of a newly created or copied library operation.
- **Released for testing**: Library operations that have been released for testing can be used for creating a batch for test purposes.
- **Released for production**: This status indicates that the library operation has been tested for normal production.
- **Testing release**: This status indicates that the system is currently checking for errors following a process cell update (validation).

- **Release revoked**: This status indicates that the library operation must no longer be used for new batches.
- **Unknown:** Status of a library operation unknown. An error may have occurred when creating the library operation. Delete this library operation or open it again so that the library operation changes to the "In progress" status.

Duration:

The longest time for the processing of a recipe is calculated here (usage "in progress"). It is determined from the sum of step times through the course of the recipe, which in total equals the greatest time. The time is entered as an empirical value in the steps. The output format is day:hours:minutes:seconds.

Description:

You can enter an explanatory description for the library operation.

15.1.4.2 "Allocations" tab (Library operation properties)

Parameter:

- **Recipe assignments:** This column lists the unit recipes used in the recipe and their names. You can enter the name of the unit recipe in the properties of the unit recipe.
- **Unit class:** This column shows the unit classes of the unit recipes. You can select the unit class in the properties of the unit recipe.
- **Start:** The calculated start time is specified relative to the start of the first unit. If the first step of a unit recipe is started dependent on a synchronization function, the start value results from the calculated time of the first unit recipe as far as the synchronization line.
- **Run time:** Duration calculated from the time values entered in the recipe steps in the format day:hours:minutes:seconds.
- **Condition**: If this check box is selected, the conditions for the unit can be edited in this unit recipe. The third column, "Unit class", is available after this check box is selected.

Description:

You can enter an explanatory description for a selected line here.

Edit:

A dialog opens for the selected line:

- If the "Condition" option was active then two tabs will be displayed. In the first tab, "Condition", edit the condition for the unit. In the second tab "Allocation" you will see the preview:
  - Left: Under "Device selection" all units that satisfy the specified conditions are displayed as selected.
  - Right: The union set of the phases of all selected units is displayed under "Available phases".
- If the "Condition" option was not active then only the tab "Allocation" is displayed for unit selection.

New:

Creates a new reference to unit recipes. Use the "New" function if you want to work with Route Control or a flat recipe.

Delete:

Deletes the selected row if the corresponding unit recipe was also deleted in the graphic user interface.

Additional information

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.5 BCC Recipe Properties dialog box

15.1.5.1 "General" tab (Recipe procedure properties)

You have called this properties dialog in the recipe editor for the open master recipe with the menu item "Header parameters".

Name and version

The name and version of the recipe procedure are specified when you create a new recipe or when you use the Save as... command. If you want to change name and version, use the shortcut menu command "Rename" at the selected master recipe.

Status:

The status provides information on the status of the recipe procedure:

- **In progress**: Initial status of a newly created or copied recipe procedure.
- **Released for testing**: Recipe procedures that have been released for testing can be used for creating a batch for test purposes.
- **Released for production**: This status indicates that the recipe procedures have been tested and are designated for regular production.
- **Testing release**: This status indicates that the system is currently checking for errors following a process cell update (validation).
- **Release revoked**: This status indicates that the recipe must no longer be used for new batches.
- **Release invalid:** This status shows that the test of the recipe was not successful when updating the process cell data. In this status you can edit and release the recipe procedures.
- **Unknown:** Status of a recipe unknown. An error may have occurred when creating the recipe. Delete the recipe or open it again so that the recipe has the status "In progress".

Formula category:

A formula category (from the "Formula" folder) can be assigned to the open recipe with this selection box.

The respective master recipes can then be assigned later to exactly these formulas.

Duration:

The longest time for the processing of a recipe is calculated here (usage "in progress") and displayed. It is determined from the sum of the step times of the path through the recipe that yields the longest time. The time is entered as an empirical value in the steps. The output format is day:hours:minutes:seconds.

Scaling the runtime:

The type of runtime scaling is displayed here. You can use scaling functions to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. The linear and squared scaling functions are available by default.

Overwrite runtime:

The "Duration" text box usually shows the runtime calculated by the system. You can enter your own runtime in the "Duration" text box if you have previously selected the "Overwrite runtime" check box. You can also select and apply one of the two default scaling functions "Linear" or "Squared".

Process value reference:

To specify the parameter that represents the value of the actual quantity, click the button "...". The corresponding parameter is searched for and selected in the selection dialog that opens. The parameter is a standard parameter that is configured in SIMATIC Manager on the ES. The value of the selected parameter is displayed and saved in the batch.

The value is only displayed for batches that reach the status "Completed", "Held" or "Aborted". All other statuses are not supported. This is identified with a symbol in the list views. When no parameter is selected as actual value reference, a hyphen "-" is displayed for the value "Actual quantity" in dialogs and overview lists.

Description:

Enter an explanatory description for the recipe in this text box.

Additional information

Overview lists (Page 288)

Parameter selection (Page 848)

15.1.5.2 Parameter selection

All available parameters are displayed in this dialog in a tree view. You use this option to determine if the parameters are displayed as recipe references or as process cell references. You navigate to the parameter whose actual value is used and acknowledge the dialog after selecting an actual value reference with the "OK" button. The parameter selection is displayed and saved as path information in the "Actual value reference" field in the "Properties of ..." dialog. You can make changes to your selection at any time.

Reference type:

You use this option to determine in which type the parameter selection is displayed in the tree view. Regardless of your selection, all parameters of the open master recipe configured in the ES are displayed.

Recipe reference: Shows all parameters of the recipe phases within the recipe unit procedures of the open master recipe in the tree view.

Process cell reference: Shows all parameters of the equipment phases within the recipe unit procedures of the open master recipe in the tree view.

None: The activated reference is deactivated.

Tree view

In this area you select the required parameter.

Buttons

OK: Uses the highlighted parameter to display the current value and exits the dialog.

Cancel: Does not apply any selection and exits the dialog.

Help: Opens the online help for this dialog.

Additional information

Overview lists (Page 846)

"Batch" dialog properties

15.1.5.3 "Product" tab (Recipe procedure properties)

Product:

With the button to the right of the input field, you open a dialog in which you can select the materials to be used as products (BatchCC > materials). The selected product becomes the main product of the recipe to which the quantity information relates.

Quality:

You can select a quality for a selected product to specify the product more precisely. Only the qualities assigned to the selected product are displayed.

Product code:

This displays the code of the selected product.

Reference quantity for quantity scaling:

The reference scale is the reference quantity for quantity scaling. All quantity-dependent values in the recipe relate to this quantity.

The quantity scaling factor results from the ratio: specific quantity to reference scale.

Unit:

Here, you specify the unit of measure for the minimum/maximum and reference scale.

Minimum quantity of a batch:

The minimum quantity is the lower limit for a concrete quantity. In the batch planning a check is made to ensure that the quantity is not less than the value entered here.

In the parameters of the recipe phases (EOP/EPH) and the operator dialogs (OD), this value is included in the calculation when determining the lower limits. If the minimum quantity is too low, this may mean that the lower limit of the parameter is violated by quantity scaling.

Maximum quantity of a batch

The maximum quantity specifies the upper limit for a concrete quantity. Batch planning makes sure that the quantity does not exceed the value entered here.

In the parameters of the recipe phases/operator dialogs, this value is included in the calculation when determining the upper limits. If the maximum quantity is too high, this can violate the high limit of the parameter after quantity scaling!

Note on specifying amounts

Note

The entries made for reference quantity, minimum quantity and maximum quantity of a batch are the basis for all quantity-dependent parameters in the master recipe. The parameters also have an upper and lower limit value.

When using linear/squared scaling functions, avoid using a master recipe for both large and small batch quantities. Otherwise, this can lead to scaled setpoints being outside the parameter limits. If these limits are exceeded, this is detected during validation and displayed as a "Warning".

Additional help: The setpoints derived per parameter from the specified reference quantity, minimum quantity and maximum quantity of a batch are displayed as a tooltip for each parameter value in the "Input material", "Output material" and "Parameters" tabs.

Example – High limit 10000 violated:

- In the "Product" tab: reference quantity = 600, minimum quantity of the batch = 400, maximum quantity of the batch = 800
- In the "Parameters" tab: low limit = 0, value = 9000, high limit = 10000

Result: The settings maximum quantity = 800, reference quantity = 600 and setpoint = 9000 result in a scaled setpoint of 12000, however the maximum for this parameter is 10000. For this master recipe the maximum quantity of the batch of 800 is too great, it should be a maximum of 666,667.

15.1.6 BCC Formula Properties dialog box

15.1.6.1 "General" tab (Formula property)

Introduction

The properties of the formula are displayed, as follows:

- Name
- Version
- Status (processing status)

- Formula category for which the formula was created
- Reference quantity for quantity scaling (from the referenced master recipe)

Master recipe:

In this input field, you select a suitable master recipe for the selected formula. The master recipes assigned to the relevant formula category are displayed (master recipe property). After you have made your selection, the "Reference quantity for quantity scaling" is updated in the adjacent field.

Description:

You can also enter a comment explaining the formula.

The "Description" text field is limited to 255 characters. Any additional characters are not saved.

15.1.6.2 "Product" tab (formula property)

Product:

With the button to the right of the input field, you open a dialog in which you can select the materials to be used as products (BatchCC > materials). The selected product becomes the main product of the formula to which the quantity information relates.

Product code:

This is where the code for the selected product is displayed. The product code is read from the created material and can only be changed there.

Standard quantity for quantity scaling:

The standard quantity is the reference for quantity scaling. All quantity-dependent values in the recipe are based on this quantity. The quantity scaling factor is derived from the ratio: Concrete quantity to reference quantity.

The value for the reference quantity for quantity scaling is read from the master recipe used and can only be changed there.

Minimum quantity of a batch:

The minimum quantity limits the concrete quantity downward. In batch scheduling the system ensures that the quantity is not less than the value entered here.

The value for the lower limit of a batch is read from the master recipe used and can only be changed there.

Maximum quantity of a batch:

The minimum quantity limits the concrete quantity upward. In batch scheduling the system ensures that the quantity is not greater than the value entered here.

The value for the upper limit of a batch is read from the master recipe used and can only be changed there.

Description of the product

The description of the product is read from the created material and can only be changed there.

15.1.7 BCC Order (Batch) Properties dialog box

15.1.7.1 "Add batch" dialog box (creating batches)

"Main characteristics" tab

You can create new batches in this tab. New batches are shown as a line in a list. If the list is still empty, add a new batch with the "New" button. If you have called the function based on an existing master recipe or a formula, the list contains a line in which the data of the base object are entered and a unique name is displayed for the new batch. The batches generated in this way are stored in an order and order category created by the system. You can edit the batch properties or batch data in the individual columns. Fields that are released for editing, are highlighted in white. You can open selection dialogs using buttons in the various fields. Each batch contains the following properties:

- **Name:** Input of a new or change to an existing batch name. This batch name must be unique within an order.
- **"Parameters" button:**
  Opens a dialog with the tabs "Allocations", "Input material", "Output material", "Parameters" and "Transfer parameters". The "Allocations" tab shows the unit recipes and their assigned units in the master recipe used. You can edit the values in the columns "Unit", "Strategy" and "At start". In the "Input material', "Output material", and "Parameters" tabs, you can edit the setpoints for this batch.
- **Status:** For batches to be newly created, the system set the status planned.
- **Release:** Enables the "Released" status for this batch when it is generated.
- **Mode:** You determine the start mode:
  - **Operation:** The operator triggers the start of the released batch.
  - **Immediately:** A batch is started immediately once released.
  - **Time-driven:** If you select this mode, you can set a start date and a start time in the "Start" column.
    You can find additional information in the section "Order of batch processing (Page 415)"

- **Start:** The start time of the batch is specified here in the "Time-driven" mode. This field can also be used in a different mode. However the system ignores this information. Exception: Process cell allocation list - this information is used here to display a potential conflict.
  If batch start times are shown in red in the "Start" column, this means that there is a conflict with the end time specified in the order. The batch time specified in the order does not lie between the start and end time. To check the order time, open the dialog "Properties of ..." for the corresponding order.
- **Min:** Minimum quantity. This limits the minimum actual quantity.
- **Quantity**: Quantity for quantity scaling of the quantity-dependent values used in the recipe. The functions for scaling the values relate to this quantity, however, the entry can still be modified before starting a batch.
- **Max:** Maximum quantity, upper limit of the concrete quantity
- **Product, recipe procedure / formula, formula category:** This is where you specify the formula or master recipe (without formula reference).
- **Unit of measure**: Specifies the unit of the product.
- **Quality:** Shows the quality of the product.
- **Duration:** This shows the run time of the recipe calculated from the individual step times in the recipe editor.

"No. of copies" input box

Enter a number between 0 and 100 in the input box for the number of copies for the selected object. You can create a maximum of 100 copies.

Click on the “Copy" button. The desired number of batches is then shown in the table list.

"Copy" button

Working with a template: If you select a batch in the table and then click the "Copy" button, the selected batch becomes a template for all other copies. Batches generated with the "Copy" button have the properties of this template.

If you work with a template, set all the properties (batch quantity, start mode, formula) of this batch before you copy.

Copied batches are always inserted at the end of the list.

"Automatic" button

This allows you to automate the creation of the batch. After entering the total quantity, the number of batches and quantities are calculated automatically. A maximum of 100 batches can be created in automatic mode.

"New" button

The "New" button opens a dialog in which you can select a formula or a master recipe. You can then make the settings for the batch quantity, start mode, master recipe / formula etc.

"Delete" button

The "Delete" button deletes a previously selected batch.

"OK" button

This generates the batches shown in the table in the appropriate batch folder.

"Print" button

This immediately prints the batches shown in the table list on the selected printer without prior layout configuration.

"Cancel" button

This closes the dialog without batches having been created.

"Help" button

Opens the online help for this dialog.

Additional information

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.7.2 "Comments" tab

Introduction

This dialog is displayed as a tab in the Dialog properties dialog of RUP, ROP, RPH etc. You can create comments for an element of a control recipe.

Requirement

The "Comments" tab in the properties dialog is only visible in the control recipe.

Procedure

1. To add new comments, click "Add comments".
2. In the window that opens enter a comment text and exit the dialog by clicking on the "OK button.

Result

A new comment line with the comment text you have entered is inserted in the "Comments" tab of the properties dialog. The corresponding data is also automatically entered in the "Time Stamp", "User" and "Computer" columns.

Notes about the dialog

- Only the first 138 characters of the comment are displayed in the "Comments" column. If the comment is longer, it can only be fully displayed in the "Comments:" display box below in the dialog.
- You cannot create or edit existing comments. You can only enter new comments.
- If you close the dialog with "Cancel", all new comments are discarded.
- To save new comments, you must close the dialog by clicking "OK".
- The first line under the column serves as a search function. If you want to find comments, enter a search criterion as a filter. If you want to find computer names, for example, enter the initial letter of the PC you are looking for followed by *, for example, "A*". All computer names with the initial letter A are displayed or filtered.

15.1.7.3 "General" tab (Properties of a batch)

In this tab, you can edit the data for a created batch.

- **Name**: The name of the batch was assigned on creation.
- **Order:** The order was assigned on creation of the batch.
- **Order category:** The order category was assigned on creation of the batch.
- **Master recipe:** The name of the master recipe used in the batch is displayed.
- **Formula:** The formula is assigned to a batch on creation.
- **Status:** The current status of a batch is specified by the system, e.g. planned, released, completed.
- **Product:** The product from the master recipe is displayed in the batch.
- **Planned quantity:** Quantity for quantity scaling of the quantity-dependent values used in the master recipe. The scaling functions for the values of the master recipe in the batch are based on this quantity. Exponential numbers are not allowed as input values.
- **Actual quantity:** The value of the assigned process parameter.
  To display a value, an actual value reference is selected under the header parameters of the master recipe in the "General" tab.
  Current values are only displayed for completed, stopped and aborted batches.

  Note

  The following is displayed instead of the value:
  - A dash when no actual value reference is specified
  - A symbol when the following conditions are met:
    - A value was configured in the recipe.
    - The status of the batch is not completed, stopped or aborted.

    The symbol represents the "Waiting" for an actual value.

- **Start time:** The required start time of the batch
- **Batch ID:** The batch ID is assigned by the system.

- **Duration:** This shows the runtime of the master recipe calculated for the individual step times in the recipe editor.
- **Area:** The permitted area (lower limit / upper limit) of the quantity from the master recipe is displayed.
- **Start mode:** You determine the start mode:
  - **Operation:** The operator triggers the start of the released batch. This field can also be used in other modes. The system, however, ignores the information. Exception: Plant allocation list - here this information is used to display a potential conflict.
  - **Immediately:** A batch is started immediately once released.
  - **Time-driven:** If this mode is selected, a start date and a start time can be specified in the start time.
- **Description:** Here, you can enter an explanatory text for the batch.

15.1.7.4 "Chaining" tab (Create order)

Displaying and configuring chaining

If configured, the chaining of the selected batch (predecessor, successor) is shown in this tab.

You can also create chaining for the respective batch in the "Planned" state. Select the start mode and time. The chaining of a planned batch can be modified up to its release. If a batch is chained, the chaining symbol appears at the batch in the BCC. Chaining settings you make here will be applied in the "Set batch order" dialog. The chained batch (successor batch) never starts automatically in process mode before the originally selected start time. Manual intervention is possible, however.

Predecessor

If the batch is already linked to a predecessor batch, the following will be displayed in the Predecessor area. If the batch is in the "Planned" state, you can change the settings of the predecessor chaining.

- Name: Name of the predecessor batch.
- Selection box: Click on the selection box to open the "Select batch" dialog. Select the predecessor batch here.
- "Delete" button If you click this button, all the settings for chaining to the predecessor are deleted.
- Mode: Select the mode for your predecessor chaining.
  - Start: This batch starts running as soon as the predecessor batch starts.
  - End: This batch starts running when the predecessor batch has been completed.
- Time offset to previous batch: Enter the desired time offset to the predecessor batch. The time format is "Days:Hours:Minutes:Seconds". If you enter 500 seconds for example, it will be displayed as 08:20 minutes:seconds. You can only specify times for up to 24 days.

Successor

If the batch is already linked to a successor batch, the following will be displayed in the Successor area. If the batch is in the "Planned" state, you can change the settings of the successor chaining.

- Number of the successor.
- Batch: Name of the successor batch.
- Status: Status of the successor batch.
- Order: Name of the order from which the successor batch originates.
- Mode: Select the mode for your successor chaining.
  - Start: This batch starts running as soon as the successor batch starts.
  - End: This batch starts running when the successor batch has been completed.
- Time offset: Enter the desired time offset to the successor batch. The time format is "Days:Hours:Minutes:Seconds". If you enter 500 seconds for example, it will be displayed as 08:20 minutes:seconds.
- "Add" button Click this button to open the "Select batch" dialog. Here you select the successor batch.
- "Delete" button. Click this button to delete the selected successor batch.

Additional information

Chaining batches (Page 391)

15.1.7.5 Select batch

Selecting predecessor and successor batches

All batches, regardless of their status, are offered for selection. Select the desired predecessor or successor batch for your chaining and click "OK". Click "Cancel" to discard your selection.

15.1.8 BCC Material Properties dialog box

15.1.8.1 "Qualities" tab (Materials)

Introduction

In this tab, you can edit, create, or delete the qualities of a material.

Delete:

If you have selected a quality for a material in the list, you can delete the quality from the database with **Delete**. The deleted quality no longer appears in the list.

New:

Select **New...** to create a quality for a material in the database. In the "Properties of <quality>" configuration dialog, you can enter the data for the new quality. The new quality appears in the list.

15.1.8.2 "General" (Materials) tab

Introduction

In this tab, you can create or edit the materials.

Rules

- A material or a quality can have a maximum of 255 characters.
- The material code is alphanumeric and can have a maximum of 16 characters.
- The quality code is numeric and possible in the range 0 to 2147483647.
- Both the material name and the material code must be unique.
- The quality and the quality code must be unique within a material.
- When you delete a material, the system checks which recipes, libraries and formulas contain use it. If this material is used there, it cannot be deleted.

Name:

Enter a name for the material.

Code:

Here, you enter a unique identification (for example, a company-internal code) for the material in the form of a string. This code can be used to specify setpoint output and process value input at the interface blocks IEPAR_PI, IEPAR_PO or IUNIT_BLOCK to identify the material or product.

Use as input material and/or output material:

You can specify whether the material you have entered is an input material or an end product/ output material.

See also:

"Quality" tab (Materials) (Page 857)

15.1.8.3 "Change log" tab

All performed actions on this element are documented in tabular form in the "Change log" tab. The following table columns are displayed:

- **Date:** The system enters the date and time.
- **User:** The system enters the logged on user.
- **Action:** The recorded actions to this element are displayed by the system. For example, an action is "created, Name:IM_A, Version: 1.1, ID: 17" or "edited". The ID is generated by the system and used for the assignment in the database.
- **Computer name:**Each action you perform is recorded with the entry of the computer name. This is the name of the computer on which you initiated this action.

15.1.9 BCC tab

15.1.9.1 "Select formula or master recipe" dialog box (creating an order)

In this dialog, you select the recipe to be used or the formula to be used for a new batch to be created.

The left window shows the folder structure with the released elements of your SIMATIC BATCH plant it contains.

In keeping with the selection of a folder in the left window, the right window shows all lower-level elements without a folder structure.

In this window, you can use filter rows to search for specific elements.

Select the required master recipe or the required formula in the left or right window and confirm your selection with the “OK” button.

To support your selection, you can activate the preview window. This shows the graphic structure for the selected element.

Result: A master recipe and a formula were assigned to the batch.

Selected element

In this area of the dialog, you will see information about the selected master recipe or the selected formula.

- Name: Name of the master recipe or the formula
- Type: Type of master recipe or formula. For example with master recipes, a hierarchical or flat master recipe.
- Status: Release status of the master recipe or the formula. For example released for testing.
- Product: The product used in the master recipe. Example: Water.

"Properties" button:

If you select a recipe or a formula you can open the properties dialog of the master recipe or formula using the "Properties" button. The various tabs of the dialog display all the parameters of the master recipe or the formula.

"Preview" check box

If you select the "Preview" check box, the dialog is expanded by a new window on the right in which the selected master recipe or formula is displayed graphically.

"AS-based" check box

This check box is only selected if you select a master recipe in which a recipe unit procedure (RUP) is executed in the AS in the selection windows.

15.1.9.2 "Change of candidates" dialog box

Introduction

When a batch is released or when setpoints are changed online, this dialog displays the units to be activated or deactivated in order to execute the action.

If the action can only be completed when one or more unit candidates are activated or deactivated, you will see the necessary information here and have the opportunity of confirming or canceling the action.

Note

If a batch is released, canceling leads to canceling release: the batch is not released.

If you change setpoints, you cannot exit the parameter dialog with "OK". It is possible to cancel the parameter dialog without changing parameter settings.

Unit

Name of the unit.

Unit name

Name of the recipe unit procedure in the batch.

Description

The activations/deactivations of the units still to be executed are displayed here:

- If activated: Unit was deactivated and must now be activated.
- If deactivated: Unit was activated and must now be deactivated.

15.1.9.3 "Backup/Restore" dialog

Introduction

In this dialog, you can generate or restore a complete backup of your configured data (libraries, master recipes, production orders, materials, user permissions etc.) as an sbb file.

File selection field

You use the usual functions to navigate to the folder that contains the desired restore file (sbb file) and mark the file.

Save/Find

Target/source path of the sbb file

File name

Name of the file that is to be restored.

File type

Restore files (*.sbb/*.xml).

"Without log" check box

If you want to omit the archived data in the log when restoring your BATCH data, select the check box. This means that a new log will be created without including the log data contained in the backup file.

Start ID, last ID and "Read out IDs" button

To ensure that no deleted IDs can be used internally in the system for batch, recipe/library, formula, category and material objects following a restore, as of version SB V7.1 SP2, it is possible to have the system ascertain the last assigned IDs for these objects in the "Restore" dialog and to set them. This action is executed by the "Read out IDs" function in the "Restore" dialog. Following a restore, newly generated objects then begin at the next higher ID. If this function is not enabled (default setting), 1 is entered as the start ID and the previous behavior is retained; in other words, newly created objects begin with the first free ID.

Save

Following selection of the destination path, use this button to create the backup.

Open

Following selection of the source path, use this button to restore the backup files. The database for SIMATIC BATCH is recreated with the data of the backup file.

Note

After you have restored backup files in BatchCC, the assignment of user roles in SIMATIC Logon performed previously (permission management) must be repeated.

Additional information

Restore (Options menu) (Page 1052)

Automatic backup (Page 813)

15.1.9.4 "Assignment" tab in the "Updating the process cell" dialog

Displaying the dialog

You have executed the "Updating process cell" command. After importing the process cell objects from the selected process cell, the "Updating process cell" dialog is always displayed in the "Assignment" tab.

What is displayed in the dialog?

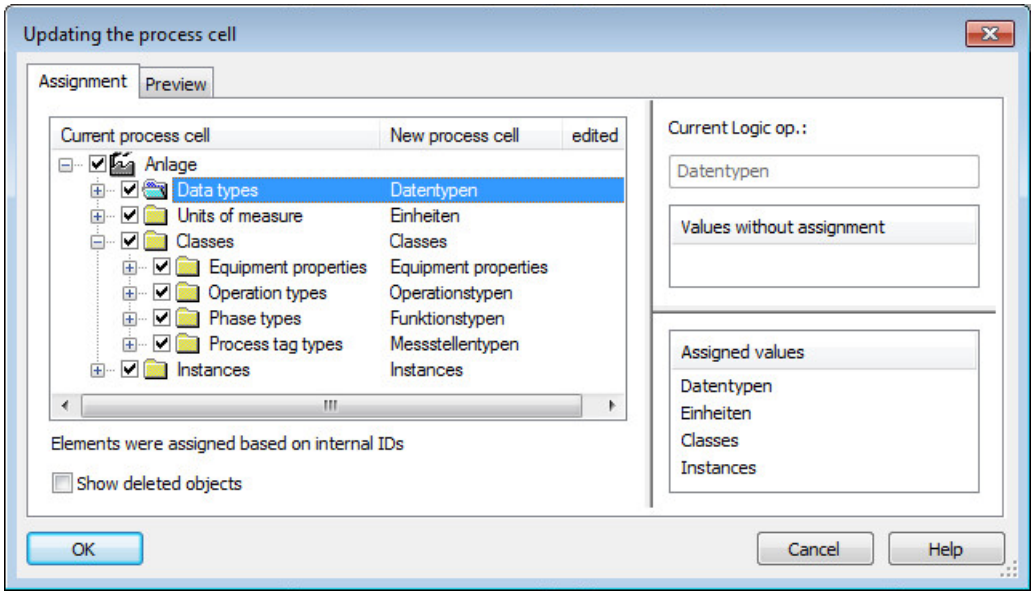
The dialog displays assignments of process cell objects. Process cell objects of the process cell you have selected are loaded by the system from the relevant database and compared with the process cell objects from the current engineering in the dialog.

What operator actions must be taken?

If you have made changes or expansions in the basic engineering, these must be synchronized or updated in the database. During the synchronization, the system automatically makes and displays assignments. These need to be checked and, if necessary, modified and then applied. When you exit the dialog with the "OK" button, the displayed or set object assignments are adopted in the database of the new process cell and the old assignments are overwritten.

How is the information displayed and used in the dialog?

The object assignments are displayed in three windows.



In the left-hand window, you can see all the assignment objects in the "Current process cell" table column in which you can navigate. These are process cell objects from the process cell database. The "New process cell" table column displays the process cell objects from the basic engineering and their assignment for every object in the "Current process cell" column. A cross is displayed in the "edited" table column if you have changed an assignment. Each process cell object in the "Current process cell" table column is preceded by a check box with the following meanings.

Symbol	Description	Meaning
☐	Check box with white background	No object from the process cell to be imported could be assigned. The database object is not assigned to any current object from the basic engineering.
☑	Check box with check mark on a gray background	The database object is assigned to a current object from the basic engineering, however at least one lower-level object is not. The object can be assigned but at least one lower-level element has no assignment.
☑	Check box with check mark on a white background	The object and all lower-level objects must be arranged according to the objects that will be imported. The database object is assigned to a current object from the basic engineering, however at least one lower-level object is not.

Here, you can cancel the existing assignment for an object. To do this, click the check box. The check mark then disappears. The selected database object now has no value assigned from the basic engineering.

The top right window "Values without assignment" displays the unassigned process cell objects of the process cell to be imported that match the object selected in the left-hand window. If values are displayed here, you can assign them to a selected object in the left-hand window by double clicking. All underlying objects are also assigned. Any existing assignment is automatically deleted by this action. As the result, the newly assigned a value appears in the lower right window and a cross is entered for the selected object in the "edited" column in the

left window. The right lower window only provides information. You cannot make any input in this window.

Infotext: Objects were ... assigned

When you open the "Updating the process cell" dialog, values are automatically assigned to all process cell objects. The values can be assigned by "internal IDs" or "Names". The following applies for the assignment:

- When importing recipes from a different batch process cell, the process cell objects (units of measure, data types, classes and instances) are assigned by their names.
- When opening the "Updating the process cell" dialog, internal IDs are used that are assigned in the ES.
- When a reorganization is triggered in the ES or if the internal IDs get too large, all process objects are numbered again and the assignment takes place by names.

Depending on which case applies, the infotext will indicate how the objects were assigned. By means of IDs or names. This information will help you evaluate the assignments and change them, if necessary.

"Show deleted objects" button

If you select this option, deleted objects are displayed in the left window. You can assign such objects from the BATCH database with this setting. The default setting is to not show deleted objects. Any object of the tree that is not assigned for a process cell update becomes a deleted object. You can permanently remove deleted objects from the BATCH database using the command **Options > Compress data**, provided these objects are not referenced or used in any recipe or formula.

What are the consequences of an incorrect or missing assignment?

Changes in the basic engineering, for example deleting, moving, renaming objects or the use of a stored PCS 7 project created with the "Reorganize" option can mean that the assignments displayed and automatically made in the dialog are incorrect. In this case, you should always check your changes in this dialog and, if necessary, cancel or correct the assignment and only then exit the dialog with the "OK" button.

When you add or delete objects in the ES, the automatic assignments can be considered as not critical since these objects and their assignments will be recreated or objects already included along with their value assignments will no longer be used. Whatever the situation, incorrect or missing assignments cause errors in the validation that is performed automatically when the process cell is updated. During the validation, a check is made as to whether the assignments between the database and basic engineering are consistent for all objects used in the BATCH engineering. If there are inconsistencies between objects, this means that they change to the "Release invalid" status. Process cell objects that become implausible during

the process cell updating are marked in the BatchCC. Depending on the project settings, edit such process cell objects and eliminate the causes of the problem.

Note

Deleting objects in the ES

Objects deleted in the ES are not automatically removed from the database, in other words, all deleted assignments remain in the dialog and are stored again in the database of the new process cell.
If you want to delete these objects in the database as well as in the dialog, use the "Compress data" command in the BATCH Control Center. The deleted ES objects are then also removed from the process cell database.

Additional information

Reading process cell data into SIMATIC BATCH (Page 320)

Updating process cell data after changes in the engineering system (Page 321)

Updating a BATCH process cell (Page 323)

"Preview" tab in the "Updating the process cell" dialog (Page 865)

Project settings > "General" (Page 788)

15.1.9.5 "Preview" tab in the "Updating the process cell" dialog

Introduction

The preview window displays all the changes in the engineering relevant to the BATCH process cell and it can be printed out as documentation. This is the case in particular, if there are changes to function types, for example when creating, deleting, modifying or even when adding parameters of phase types.

Changes in the engineering that are displayed in the preview window

- "Name was changed from <%s> to <%s>"
- "Comment was changed from <%s> to <%s>"
- "Code was changed from <%s> to <%s>"
- "CFC chart was changed from <%s> to <%s>"
- "Online name was changed from <%s> to <%s>"
- "Type was changed from <%s> to <%s>"
- "Moved from <%s> to <%s>"
- "Version of data old:<%s> new:<%s>"
- "Unit was changed from %s(%d) to %s(%d)"
- "Data type was changed from %s(%d) to %s(%d)"

- "LL was changed from %g to %g"
- "HL was changed from %g to %g"
- "Order of the parameters was changed"
- "deleted"
- "new"
- "The number of possible allocations has changed from %d to %d"
- "Parameter %s RTName was changed <%s> <%s>"
- "Parameter %s New Value added"
- "%s attribute changed from <%s> to <%s>"

The characters "<% followed by a letter>" or "% followed by a letter" are placeholders for parameters.

"Print..." button:

With the "Print" button, the change log displayed in the preview window is output to a printer.

Additional information

"Assignment" tab in the "Updating the process cell" dialog (Page 862)

15.1.9.6 "Create batches" dialog box

Introduction

In this dialog, you can automate the creation of batches. After entering a total quantity, the number of batches is calculated automatically with the appropriate quantities.

Master recipe

Displays the master recipe selected in the previous dialog.

Formula

Displays the formula selected in the previous dialog.

Minimum/maximum quantity of a batch

Displays the minimum and maximum quantity for the formula/master recipe selected in the previous dialog "Select formula".

A comma is converted to a period in numbers for their display and their continued use within SIMATIC BATCH. This means that a period is used as the decimal separator. A thousand separator is not used or displayed.

Requested quantity

Here, you enter the required quantity of the product.

Name of the batches

Here you enter the name required for the batches.

Start mode of batches

Select the Start mode for all new batches (operator, immediate, time-driven).

Planned start time of the batches

Select the planned start time of all new batches.

Strategy, Maximum utilization

Select this option if you want each batch to produce the maximum possible quantity. The last batch produces the remainder.

Strategy, Proportional quantities

Select this option if you want each batch to produce the same quantity.

Calculate batches

When you click this button, the system starts to calculate the required batches. The batches and the production quantity is then displayed in a table.

15.1.9.7 "Copy formula" dialog

In this dialog box, you can copy a formula within the same formula category by entering the new **name** and the **version** of the copy.

15.1.9.8 "Add comment" dialog box

This dialog is used to specify a new comments. The comment can consist of several lines. If you close the dialog with "Cancel", the text you have entered is discarded. The maximum length of a single comment is 1024 characters.

15.1.9.9 "Comment on messages" dialog box

Introduction

The dialog is used to comment on individual messages. It is called in the BatchCC if you have opened the control recipe view. Select the entire control recipe, a RUP, ROP, RPH or a transition and click on the "Comment on messages ..." command in the shortcut menu.

If no Process Historian is configured in a multiproject, the shortcut menu command can be executed.

Requirements

- You have opened the control recipe view in the BatchCC.
- The "Comment on messages ..." dialog is open.

Procedure

1. Select a message in the upper message window.
2. Then click "Add comments ...".
3. In the "Add comments" dialog that opens, enter the comment for the selected message. Close the dialog with "OK".

Result

A new comment for a selected message is shown immediately in the lower comment windows with its time stamp, user ID, computer name and comment text. The comment text is also shown in the "Comment:" field in its entirety.

Notes about the dialog

- All current messages of the WinCC long-term archive are displayed in the above message window in real time.
- The lower comment window and "Comment" field below it are enclosed by the group field "Comments". Both belong together and show the available comments for a selected message (line at the top of the list). If another line is selected in the upper list, the content of the second list also changes. A comment text with max. 128 characters is displayed in the "Comments" column of the comment window. If the comment has more characters, it can be fully formulated in the "Comments:" display box below this.
- You cannot create or edit existing comments. You can only enter new comments.
- If you close the dialog with "Cancel", all new comments are discarded.
- To save new comments, you must close the dialog by clicking "OK".

15.1.9.10 "Import objects from file" dialog

Use this dialog to select the file to be imported. Set the data type to "Export files (*.sbx)".

Tip:

After selecting a file with the *.sbx extension, the right table "Elements contained in export file" is filled out. The type (master recipe, libraries, formula category) and number of objects of the type are displayed on a line depending on the content of the sbx file.

The assistant for the import process is started after selecting the desired file and pressing OK.

15.1.9.11 "Quality" dialog (Materials)

Introduction

In this dialog, you can create or edit a quality.

Name:

Enter a name for the quality.

Code:

You can specify a code for the quality you have entered (positive integer).

Description

In the "Description" text box, you can enter explanatory text for the newly created quality.

15.1.9.12 "General" tab (Order category property)

In this dialog, you can enter or modify the **name** of the order category and a **description**.

15.1.9.13 "General" tab (Plug-in details)

In this dialog, you select the functionality of the module and configure it for application during validation.

The options for the respective functions are only enabled (can be enabled) when the module provides the corresponding functions. A module does not need to provide every functionality. It is theoretically possible that the module provides none of the functions.

If the user selects a functions, the system ensures that only one module can be configured for this function when more than one module provides the selected function. If another module has already been configured for this functionality, this is indicated by a message.

15.1.9.14 "General" tab (New order category)

In this dialog, you can specify or modify the **name** and a **description** of the order category.

15.1.9.15 "General" tab (Properties of an order)

This tab displays the data for a new order and edit the batches that are created in it.

Order:

- **Name**: Specification of an order name.
- **Status:** The status display is not currently used.
- **Planned quantity:** Planned total quantity of the order (order quantity). Is specified during order creation and cannot be changed for this order.
- **Currently planned quantity:** Requested quantity. As long as no batches are created in the order, a placeholder is displayed. If batches are created in the order, the "Requested quantity" value from the "Create batches" dialog is displayed.
- **Actual quantity:** Sum of the individual quantities of all batches in the folder. If no actual value reference was specified, a hyphen is shown in the display field. As long as no batch of the order has reached the final state (Completed, Stopped, Aborted), the number zero is displayed. Whenever a batch of the order has reached a final state, the value in the "Actual quantity" field is updated and displayed.
  If the number can no longer be displayed and stored, then "1.#INF" is displayed in the field. The value is larger than 3.40282e+038".
- **Unit of measure**: Unit of the product. If the units of measure of the process value reference and product are not identical, the value <not unique> is displayed instead of a unit of measure.
- **Earliest start/ latest end for the batches:** Earliest start and latest end of the batches (date, time) of the order (optional).
- **Batches:** Number of batches in this order.
- **Description:** Field for text input. Enter an explanatory text for the order folder.

Additional information

Process value reference, "General" tab (Recipe procedure properties) (Page 846)

15.1.9.16 "General" tab (Create order)

In this tab, you can edit the following data for a new order and edit the batches that are created in it:

- **Name:** Enter an order name.
- **Status:**The status display is not currently used.
- **Planned quantity:** Planned total quantity of the order (order quantity).
- **Actual quantity:** The actual total quantity of the order (order quantity) is adapted from the number of batches and the respective batch quantity.
- **Unit of measure:**Unit of the product

- **Earliest start and latest end of the batches:**Earliest start and latest end of the batches (date, time) of the order (optional)
- **Batches**Number of batches in this order
- **Description:** An explanatory text can be entered

15.1.9.17 "General" tab (RPH unit class properties)

Function:

A list box with the functions stored in basic engineering is displayed.

Unit class:

The unit class selected in the "Allocations" tab in the RUP is displayed.

Preferred unit:

The preferred unit selected in the "Allocations" tab in the RUP is displayed as the unit class.

Run time:

You can enter a time you have calculated for the processing of this function. The format is day:hours:minutes:seconds.

Runtime scaling:

Using scaling functions (Page 615), you can influence the quantities used. Depending on the concrete quantity for the batch, the duration of a step is corrected using the selected scaling function. As standard, linear and quadratic scaling functions are available:

Description of the phase:

The text entered for the EPH in the basic engineering is displayed.

15.1.9.18 "General" tab (Command step properties)

Function:

You can configure the command step in the "General" tab of a command step. To pass an ISA88 command to one or more recipe objects, you need to select a target step, the target command to be passed and perhaps the status the target object should have.

Selecting target objects in the navigation area and transferring them to the command target list

Select the desired targets from the command targets offered. In the tree view, navigate to the desired recipe element and use the arrow key to move it in the list of command targets. You can select several targets. If you want to delete a target object from the list of command targets, select it and click the left arrow key.

Command:

Select your desired command from the list of available commands. All available commands are listed in the Shortcut menu commands (Page 1097) folder.

Note

The Restart command is a combination command and contains both the Reset and Start commands.

Only commands applicable to the current target object status are permitted. See status changes with recipe steps (Page 427).

Filter:

Under "Filter", select the status that the respective recipe phase should have in runtime so that a command will be passed.

"Select all monitored" check box:

If you select this check box, all possible target objects arranged within your monitoring will be listed. The check box is not shown if you do not use any command steps in monitored recipe areas. The check box is cleared in the default setting.

Runtime

If a runtime is specified for the command step, the step retains the RUNNING status for this period. Otherwise, it ends as soon as the command is sent.

Monitoring time

It is not possible to enter a monitoring time for the command step and the input box is always grayed out. The execution of commands for recipe procedure elements cannot be monitored. The command step cannot wait until all commands have executed.

Scaling the runtime

You use scaling functions (Page 615) to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. By default, "linear" and "quadratic" scaling functions are available for selection. The scaling involves both the runtime and monitoring time.

15.1.9.19 "General" tab (Library operation unit class properties)

Name and version

You specify the name and version of the library operation when you create a new library operation or when you Save as.... The name cannot be modified in this tab.

Status:

The status provides you with information on the status of the library operation:

- **In progress**: Initial status of a newly created or copied library operation.
- **Released for testing**: Library operations that have been released for testing can be used for creating a batch for test purposes.
- **Released for production**: This status shows that the library operation tested for production is provided.
- **Testing release**: This status indicates that the system is currently checking for errors following a process cell update (validation).
- **Release revoked**: This status indicates that the library operation must no longer be used for new batches.
- **Release invalid:** This status shows that the test of the library operation was not successful when updating the process cell data. In this status you can edit and release the library operation.
- **Unknown:** Status of a library operation unknown. An error may have occurred when creating the library operation. Delete this library operation or open it again so that the library operation changes to the "In progress" status.

Unit class:

The unit class selected in the "Allocation" tab of the library operation is displayed.

"Monitoring time" in seconds text box

You specify the monitoring time and a system message will be generated if the current ROP runtime is greater than or equal to the monitoring time you have set. Monitoring is disabled when you enter a monitoring time of "0".

Scaling the run time:

You can use scaling functions to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. The linear and quadratic scaling functions are available by default.

"Overwrite runtime" check box.

If you select this check box, the "Run time" text box can be edited. You can then change the run time calculated by the system. If you clear the check box again, the run time calculated by the system is entered and used.

Description:

You can enter an explanatory description for the recipe operation.

15.1.9.20 "Batches" tab (Properties of an order)

In this tab, you can view the data for the batch of the order and if necessary modify it.

- **Name**: Entry of a batch name. This batch name must be unique within an order.
- **"Parameters" button:**
  Opens a dialog with the tabs "General", "Input material", "Output material" and "Parameters". The "General" tab displays information about the recipe used in this batch. You can change the setpoints set for this batch in the "Input material", "Output material" and "Parameters" tabs.
- **Status:** The system plans and specifies the status for new batches that will be created.
- **Mode:** You determine the start mode:
  - **Operation:** The operator triggers the start of the released batch. This field can also be used in other modes. The system, however, ignores the information. Exception: process cell allocation list - there this information is used to display potential conflict.
  - **immediately:** A batch is started immediately once released.
  - **time-driven:** If this mode is selected, a start date and a start time can be specified in the start time.
- **Start:** The start time of the batch is specified here in the "Time-driven" mode.
- **Min:** Downward limitation of the concrete quantity
- **Planned quantity:** Quantity for quantity scaling of the quantity-dependent values used in the recipe. The scaling functions for the values are based on this quantity. The entry can still be modified before starting a batch.
- **Actual quantity:** Sum of the individual quantities of all batches in the folder. The actual total quantity of the order (order quantity) is adjusted from the number of batches and the respective batch quantity. If the number can no longer be displayed and stored, then "1.#INF" is displayed in the field. The value is larger than 3.40282e+038". Totals calculations of individual batch quantities only make sense if they refer to a uniform quantity unit. In case of different quantity units, the value "not unique" is displayed instead of the concrete value.
- **Max:** Maximum quantity, upper limit of the concrete quantity
- **Product, recipe procedure/formula, category:** This is where you specify the formula or master recipe (without formula reference).
- **Unit of measure**: The unit of measure of the product is displayed here.

- **Quality:** The product quality is displayed here.
- **Duration:** This shows the run time of the recipe calculated from the individual step times in the recipe editor.

15.1.9.21 "Batches" tab (Create order)

Input boxes and buttons

In this tab, you can create new batches and edit the data for new or existing batches.

- **Name**: Entry of a batch name. This batch name must be unique within an order.
- **"Parameters" button:**
  Opens a dialog with the tabs "General", "Input material", "Output material" and "Parameters". The "General" tab displays information about the recipe used in this batch. In the "Input material', "Output material", and "Parameters" tabs you can change the setpoints for this batch.
- **Status:** For batches to be newly created, the system set the status planned.
- **Release:** Enables the Released status for this batch when it is generated.
- **Mode:** You determine the start mode:
  - **Operation:** The operator triggers the start of the released batch.
  - **Immediately:** A batch is started immediately once released.
  - **Time-driven:** If you select this mode, a start date and a start time can be specified in the "Start" column.
- **Start:** The start time of the batch is specified here in the "Time-driven" mode. This field can also be used in a different mode. However the system ignores this information. Exception: plant allocation list - here this information is used to display a potential conflict.
- **Min:** Minimum quantity. Limits the minimum actual quantity.
- **Quantity**: Quantity for quantity scaling of the quantity-dependent values used in the recipe. The functions for scaling the values relate to this quantity, however, the entry can still be modified before starting a batch.
- **Max:** Maximum quantity, high limit of the actual batch quantity
- **Product, recipe procedure/formula, category:** Here, you assign the formula or master recipe (without formula reference) to the batch.
- **Unit of measure**: Shows the unit of the product.
- **Quality:** Shows the quality of the product.
- **Duration:** Shows the runtime for the recipe calculated from the individual step times in the recipe editor.

No. of copies:

Specifies the number of copies to be created when you click the "Copy" button.

Copying

Working with copies: Select a batch in the table and then click "Copy". The copy is added as the last row in the table. The selected batch is always the batch that is copied as the template. All batches copied afterwards have the properties of the template.

Automatic

This allows you to automate the creation of the batch. After entering the total quantity, the number of batches and batch quantities are calculated automatically. A maximum of 100 batches can be created in automatic mode.

New

You create new batches with the "New" button. You then make the settings for the batch quantity, Start mode, master recipe/formula etc.

Delete:

The "Delete" button deletes a previously selected batch.

Working batches as a template

First set all properties (batch quantity, start mode, formula) of a batch and then select this batch to make it the template. After this, create further batches with the "Copy" button.

Select another batch in the table and then click "Copy", the selected batch then has the status of a template and all subsequently created batches have the properties of the new template.

Additional information

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.9.22 Tab "Batch messages" (settings)

The settings made here apply to the display of messages during the batch process when working with the BATCH data management.

The display can be set differently for each level of the batch report:

- Status message: Display of the status messages of the equipment phases/operations or batch control. The list is in ascending chronological order. The time stamp, the event and the origin are displays with each status message.
- Operating message: Displays the operating texts, the time stamp, the event, the user name and the comment of the operator per operating message.
- Error message: Displays error and disturbance messages in ascending chronological order.
- Limit value violation: Displays the limit value violations of input materials, output materials and process parameters.

15.1.9.23 Tab "Batch messages" (settings)

The settings made here apply to the display of measured values when working with the BATCH data management. Display of the measured values can be activated per level of the batch report (procedure level, RUP level, ROP level).

On this level, all the configured measured variables with their higher level designations are listed. Following the listing of the measured variables, the measured variables are displayed as a trend.

15.1.9.24 "Rename ..." tab

In this dialog, you can enter a new **name** or/and a new **version** for an existing batch object (master recipe, formula etc.).

15.1.9.25 "Candidates" tab

Tree structure

With the tree, you specify the structure view in which the units are displayed for selection in the "Unit according to condition" field:

- Class view without instances: All unit classes are displayed.

Unit according to condition

All conditions corresponding to the unit candidates are displayed under "Unit according to condition".

15.1.9.26 "Computers and units" tab

All computers

The "All computers" list box displays all configured BATCH clients. You need super user rights to define user roles for the displayed BATCH clients. Select or clear the check boxes for each computer to specify the user roles that will be accepted on them. If you click on the "+", you can open the user roles below a computer and you can close these again by clicking on the "-".

Units of the process cell

The "Units of the process cell" list box displays all the units of the process cell standardized for SIMATIC BATCH. By selecting or clearing the check boxes for each unit, you specify the user roles that will be accepted for the unit. If you click on the "+", you can open the user roles below a unit and you can close these again by clicking on the "-". This applies only to operator control of batches.

Note

The settings take effect only for operator control of batches starting from the RUP level (RUP, ROP, recipe phase). Batches can continue to be operated even if the user is not authorized for all units.

Status displays

	Symbolizes characteristics of the user currently logged on (such as role of the current user).
	User roles with yellow frame have super user status. Caution: The name of this role need not necessarily be "Super user" or something similar. A member with this role automatically has all rights. The rights of the role super user status cannot be changed.

15.1.9.27 "Advanced" tab (plug-in details)

This dialog provides additional information about the module.

The following information is supplied by the module itself:

- Date/time when the module was created.
- Detailed description.

The following information is read from the registry: Installation path.

15.1.10 RE tab

15.1.10.1 "Synchronization" tab

Synchronization

Settings in the "Synchronization" tab are relevant only for SIMATIC IT.

List:

- **Action:** The allocation of the units or all RPEs, except transitions, first needs to be confirmed by SIMATIC IT or an external client (API) before SIMATIC BATCH continues the batch execution.
- **Event:** Selection of the event or activation of synchronization with an external client. You can use the "Unblock step" function to release an element that has been blocked by the synchronization.

Button for printing parameters

Using a button in the table view, you can open a shortcut menu for printing the displayed parameters. If you click the **Print** button in the shortcut menu, the table view along with the parameters is output immediately to the default printer set in Windows.

If you click **Print...**, a Windows dialog opens in which you can select another printer set up in Windows. After making a selection, click "OK" to print the parameters.

SIMATIC BATCH and SIMATIC IT

With recipe procedure elements (RPEs), for which the "MES_SYNC_REQUEST" action is configured in the Recipe Editor, the BATCH Control Server (BCS) pauses recipe processing, the RPE goes into the "blocked" state, and the BCS waits until it receives a command for continuing from the API server. Only then will the BCS begin processing the paused RPEs.

15.1.10.2 "Select the material" dialog box

Finding materials

After setting filters, you can search for materials in this dialog box. Enter the name, code and input material and then click the "Filter" button.

You can also use the wildcard * or ? to filter. For example, you can filter all objects beginning with A using A*. With ? in a name, you can search for all objects with this name and a variable at the location of the ? character

Folder:

Here, you can preselect the folder of the tree in BatchCC.

15.1.10.3 "Synchronization line" dialog box

Name:

Here, enter a name for the synchronization point.

Blocking / non blocking

With this selection, you can decide whether or not processing should wait at this synchronization point for the recipe unit procedures linked via the synchronization line.

Additional information

Synchronization between recipe unit procedures (Page 541)

Configure synchronization lines (Page 591)

15.1.10.4 "General" tab (RPH unit class properties)

Function:

You receive a selection list of the EPH-type phases entered in the basic engineering. The selection is restricted to the unit class and permitted units selected in the RUP.

Unit class:

The unit class selected in the "Allocation" tab in the RUP is displayed.

Control strategy:

The control strategies for the phase entered in the basic engineering are displayed. Select the desired control strategy here. The parameters belonging to the control strategy are displayed in the "Parameters" tab and can be changed there.

Note

Only the default values of parameters displayed for the currently set control strategy can be modified. Browsing through all control strategies for the phase and the respective setting of new parameter values is not possible. When a change is made to a different control strategy, the default parameter set from the basic engineering is always displayed to begin with and can be changed for the particular current control strategy.

Preferred unit:

The selected preferred unit for the unit class is output in the RUP in the "Allocations" tab.

Run time:

You can enter a time that you have determined for the runtime of this phase. The format is day:hours:minutes:seconds.

Monitoring time:

You can enter a time for monitoring the phase. If this time elapses and the phase has not yet been executed, the message "Runtime exceeded" is output.

Scaling the run time:

You can use scaling functions (Page 615) to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. By default, "linear" and "quadratic" scaling functions are available for selection. The scaling function involves scaling both the runtime and monitoring time.

Continue:

With this option, a flag can be set for a recipe phase that is not self-terminating so that this recipe phase is not completed when the "running" state is exited. Thus you can implement a control strategy change on the fly with two consecutive recipe steps without interrupting the automation level.

If the "Continue" option is selected, this is also indicated in the recipe phase by three dots that stand for "Continue".

Note

The flag for the "Continue" option can always be set. However it is the user's responsibility to determine whether it is possible for this operating mode to take effect.

For this two requirements must be met, which can even be changed during runtime of the batch:

- I/O SELFCOMP = 0 (with SFC external view or SFC type instance)
  To prevent the equipment phase from completing of its own accord following execution and, therefore, enable it to continue, this condition must be fulfilled during configuration in the CFC.
- I/O ENASTART = 1 (with SFC external view or SFC type instance)
  If you want to restart the same equipment phase in a second recipe step with modified setpoints, this condition must be fulfilled in the CFC.

Description of the function:

A text that was entered in the basic engineering for the EPH is displayed.

15.1.10.5 "General" tab (RPH unit names properties)

Function:

You receive a selection list of the EPH-type phases entered in the basic engineering.

Note

The selected recipe phases influence the selection of possible units as an additional condition. Concurrent use of recipe phases that cannot run on the same unit result in an empty unit list.

Control strategy:

The control strategies for the phase entered in the basic engineering are displayed. Select the desired control strategy here. The parameters belonging to the control strategy are displayed in the "Parameters" tab and can be changed there.

Note

Only the default values of parameters displayed for the currently set control strategy can be modified. Browsing through all control strategies for the phase and the respective setting of new parameter values is not possible. When a change is made to a different control strategy, the default parameter set from the basic engineering is always displayed to begin with and can be changed for the particular current control strategy.

Unit names

Here all allocations known for the recipe are listed by entering the unit name (recipe allocations). This display corresponds to the information in the recipe header in the "Allocations" tab. Activating the check box preceding an allocation switches the desired unit allocation active for the recipe phase.

Use the "New assignment" button to create an additional (new) assignment to a unit. A previously selected existing assignment can be changed via the "Edit assignment" button. The information in the recipe header in the "Allocations" tab will be updated accordingly.

Run time:

You can enter a time that you have determined for the runtime of this phase. The format is day:hours:minutes:seconds.

Monitoring time:

You can enter a time for monitoring the phase. If this time elapses and the phase has not yet been executed, the message "Runtime exceeded" is output.

Scaling the run time:

You can use scaling functions (Page 615) to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. The linear and quadratic scaling functions are available by default.

Release unit on completion

After completely running through the recipe phase, the used unit will be released.

Continue:

With this option, a flag can be set for a recipe phase that is not self-terminating so that this recipe phase is not completed when the "running" state is exited. Thus you can implement a control strategy change on the fly with two consecutive recipe steps without interrupting the automation level.

If the "Continue" option is selected, this is also indicated in the recipe phase by three dots that stand for "Continue".

Note

The flag for the "Continue" option can always be set. However it is the user's responsibility to determine whether it is possible for this operating mode to take effect.

For this two requirements must be met, which can even be changed during runtime of the batch:

- I/O SELFCOMP = 0 (for SFC outside view or SFC type instance)
  To prevent the equipment phase from completing of its own accord following execution and, therefore, enable it to continue, this condition must be fulfilled during configuration in the CFC.
- I/O ENASTART = 1 (with SFC external view or SFC type instance)
  If you want to restart the same equipment phase in a second recipe step with modified setpoints, this condition must be fulfilled in the CFC.

Description of the function:

A text that was entered in the basic engineering for the EPH is displayed.

15.1.10.6 "General" tab (ROP properties)

Phase/Library reference:

You obtain a list box of the phases of the type EOP or EPH stored in basic engineering or a sequence stored in the library. The selection is restricted to the unit class and approved units in the RUP.

Unit class:

The unit class selected in the RUP in the "Allocations" tab is output.

Preferred unit:

The selected preferred unit for the unit class is output in the RUP in the "Allocations" tab.

Run time:

You can enter a time that you have determined for the run time of this function. The format is day:hours:minutes:seconds.

Description of the function:

The text entered in basic engineering for the EOP or EPH or in the library sequence is displayed.

15.1.10.7 "General" tab (ROP sequence properties)

Substitute representation for sequence

A ROP sequence is the substitute for a step sequence in the graphic representation of the recipe unit procedure. In the underlying step sequence, only phases of the type EPH can be addressed.

Name:

You can assign a name to an ROP.

Unit class:

The unit class selected in the "Allocation" tab is displayed.

Preferred unit:

The preferred unit selected in the "Allocation" tab is displayed as the unit class.

"Runtime" in seconds text box

This is where the longest time for a straight cycle of the recipe unit is calculated and displayed by the system. It is determined from the sum of step times through the course of the recipe, which in total equals the greatest time. The time is entered in steps as a value based on experience. The calculation may include inaccuracies for recipe operations in which loops are used. The output format is day:hours:minutes:seconds.

You can enter your own run time if you have previously selected the "Overwrite runtime" check box.

"Monitoring time" in seconds text box

You specify the monitoring time and a system message will be generated if the current ROP runtime is greater than or equal to the monitoring time you have set. Monitoring is disabled when you enter a monitoring time of "0".

Scaling the run time:

You can use scaling functions to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. The linear and quadratic scaling functions are available by default.

"Overwrite runtime" check box.

If you select this check box, the "Run time" text box can be edited. You can then change or overwrite the run time calculated by the system. If you clear the check box again, the run time calculated by the system is then entered and used.

Description:

You can enter an explanatory description for the unit recipe here.

15.1.10.8 "General" tab (transition properties)

Name:

A name is automatically assigned to a transition.

Description:

Enter an explanatory text here.

15.1.10.9 "General" tab (jump properties)

Name:

A name is automatically assigned to a transition.

Description:

Enter an explanatory text here.

Jump destination:

Select the desired destination for the "Jump" object from the selection box. Only available jump destinations are offered for selection.

Additional information

Jump (Insert menu) (Page 583)

15.1.10.10 "General" tab (Command step properties)

Function:

You can configure the command step in the "General" tab of a command step. To pass an ISA88 command to one or more recipe objects, you need to select a target step, the target command to be passed and perhaps the status the target object should have.

Selecting target objects in the navigation area and transferring them to the command target list

Select the desired targets from the command targets offered. In the tree view, navigate to the desired recipe element and use the arrow key to move it in the list of command targets. You can select several targets. If you want to delete a target object from the list of command targets, select it and click the left arrow key.

Command:

Select your desired command from the list of available commands. All available commands are listed in the Shortcut menu commands (Page 1097) folder.

Note

The Restart command is a combination command and contains both the Reset and Start commands.

Only commands applicable to the current target object status are permitted. See status changes with recipe steps (Page 427).

Filter:

Under "Filter", select the status that the respective recipe phase should have in runtime so that a command will be passed.

"Select all monitored" check box:

If you select this check box, all possible target objects arranged within your monitoring will be listed. The check box is not shown if you do not use any command steps in monitored recipe areas. The check box is cleared in the default setting.

Runtime

If a runtime is specified for the command step, the step retains the RUNNING status for this period. Otherwise, it ends as soon as the command is sent.

Monitoring time

It is not possible to enter a monitoring time for the command step and the input box is always grayed out. The execution of commands for recipe procedure elements cannot be monitored. The command step cannot wait until all commands have executed.

Scaling the runtime

You use scaling functions (Page 615) to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. By default, "linear" and "quadratic" scaling functions are available for selection. The scaling involves both the runtime and monitoring time.

15.1.10.11 "General" tab (RUP properties)

Name:

You can assign a name to a recipe unit procedure.

"Execute in AS" check box

If you select the " Execute in AS" check box, the recipe logic for the selected recipe unit procedure will be executed in the automation system. The following conditions must be met before the check box is enabled:

- For a recipe unit procedure selected in the master recipe, there must be a CFC chart with the "UNIT_PLC" block in the unit (plant view).
- The recipe must be released for editing in the Recipe Editor.
- There must be no active structure change (OSC).

If the caution icon is shown in the dialog, one of the conditions is not met and the check box is grayed out. If you position the mouse pointer on the caution icon, you will see a message indicating why the check box is not enabled.

Unit class:

The unit class selected in the "Allocation" tab is displayed.

Preferred unit:

The preferred unit selected in the "Allocation" tab is displayed as the unit class.

Run time:

This is where you calculate the longest time for a straight cycle for the recipe unit. It is determined from the sum of step times through the course of the recipe, which in total equals the greatest time. The time is entered as an empirical value in the steps. The output format is day:hours:minutes:seconds.

"Monitoring time" in seconds text box

You specify the monitoring time and a system message will be generated if the current ROP runtime is greater than or equal to the monitoring time you have set. Monitoring is disabled when you enter a monitoring time of "0".

Scaling the run time:

You can use scaling functions to make processes quantity-dependent. Depending on the specific quantity of the batch, the duration of a step is also corrected via the set scaling function. The linear and quadratic scaling functions are available by default.

"Overwrite runtime" check box.

If you select this check box, the "Run time" text box can be edited. You can then change the run time calculated by the system. If you clear the check box, the run time calculated by the system is then entered and used.

Description:

You can enter an explanatory description for the unit recipe here.

15.1.10.12 "General" tab

Function:

The "Instruction" dialog for entering an instruction contains the "Instruction" and "General" tabs. The dialog is displayed for recipe execution in batch mode when an instruction needs to be acknowledged by the operator. You can enter instructions in both tabs.

The "General" tab contains the following data for your information.

Function:

The recipe function name is displayed.

Current unit:

The name of the employed unit is displayed.

Planned run time:

The planned run time specified during the recipe creation is given in seconds.

Path:

The path of the instruction function within the control recipe is given. Example: reactor / acid_11 / batch1 / reactor_9 / xferCon_10 / Instruction_4

The information is derived from: Order category / Order / Batch / Recipe unit procedure / Recipe operation / Recipe phase

The attached numbers originate from the control recipe.

Selecting the RUP (recipe unit procedure) in the graphic

When you click on this button, the RUP containing the instruction is selected in the corresponding control recipe.

Selecting the OPD (operator dialog) in the graphic

When you click on this button, the instruction is selected in the corresponding control recipe.

Description of the function:

The text you entered during the creation of the master recipe is displayed.

"Apply" button

Click "Apply" to acknowledged the instruction and "OK" to release it for execution.

"OK" button

The button is enabled only after you have applied the instruction. Clicking "OK" continues the execution of the recipe, depending on the master recipe used in your configuration.

15.1.10.13 "Instruction" tab (operator instruction properties)

Order

If you want to give the operator an instruction, e.g., pour into a container, or important information, e.g., take a sample, you can enter the instruction text here. After you have configured the activation status, this text is then displayed in batch mode. Three activation statuses are possible. They are described under activation status. Instruction texts can be formatted in any way. Tools are available in a toolbar for custom text formatting. The formatted text is output in the control recipe view in BatchCC or in the BATCH controls when the recipe runs.

The following limitations apply:

- Text formattings for instruction texts are configured in master recipes. Changes to instruction texts during recipe execution are possible only in OSC mode.
- Only the text and not the format information is saved in the SQL database and in the report, archive, archive XML and API.
- Pictures and hyperlinks are not supported in instruction texts.

Note

An instruction text is available for runtime only in the languages in which it was created in the Recipe Editor. Example: When an operator instruction has only been configured with the English language setting in the Recipe Editor, it appears in runtime only if the language selected in BatchCC is also English. The instruction field remains empty for all other languages. If the text is to be displayed in both English and German, this must be configured again in the Recipe Editor with English and German language settings.

Activation status

- Activate and do not block batch: The output of the instruction is for information purposes only. The execution of this recipe segment is not held.
- Activate and block batch: The execution of this recipe segment waits at the current step until the instruction is acknowledged.
- Do not activate: No operator instruction is output (commented NOP phase).

Note

If the operator instruction in BatchCC is accepted when the connection to the AS or to WinCC is disconnected, the operator prompt remains in the faceplate of the unit (UNIT_PLC) until the corresponding unit is released again by the recipe control.

Buttons in batch mode

If an instruction text interrupts the batch execution, the following buttons are available for accepting it.

Button	Meaning
OK	Closes the dialog and continues executing the batch. If you have accepted the instruction, the "OK" button is available for selection.
Print	The "Print" button is not available for the instruction text.
Apply	The pending instruction or order is not acknowledged until you click the "Apply" button.
Close	Closes the dialog without accepting the instruction. Batch mode is not continued.
Help	Opens the help for the particular context.

15.1.10.14 "Condition" tab (transition properties)

How do I configure transition conditions?

You can configure the conditions for a transition in this tab. The table is empty when the tab opens for the first time. You can insert new condition lines with the "New" button. Selecting a condition line and pressing the "Change" button opens the dialog for configuration of the conditions. The dialog guides the user in entering the operands and the interconnection operation.

Result: The "Condition" tab is updated accordingly upon closing all the dialogs. A line always contains the information for exactly one condition. You can enter additional conditions one after the other using the "New" button. You can change an existing "Condition" using the "Change" button or by double-clicking on the condition line. A direct entry in the "Condition" tab is not possible.

You can use logic operators to combine configured conditions. You set the logic operators by right-clicking on the operator button via the shortcut menu.

The condition can be deleted by pressing the "Delete" button.

The configured conditions are shown in the control recipe in the tooltip of the transition.

List

- **Effective immediately:** The process value for operand 1 can be changed during batch control. If the transition is currently in progress then the changed parameter value should become effective immediately. This option can also be set for parameter references.
- **Variable:** The name of the variable configured during engineering is entered. This is the variable used as the 1st operand used for the condition. The first operand can be a parameter from the next highest recipe level, a process variable (process value from the automation process) or an RPE status (status of the recipe procedure element).
- **Act. value:** The actual value of the first operand is displayed here. If no actual value is available, a symbol is displayed. Hover the mouse pointer over the symbol to view a corresponding tooltip. This enables you to see at a glance the difference between an empty field (e.g. an empty character string) and a missing process value (e.g. a unit on which the recipe step is to be processed has not yet been assigned).

- **OP, relational operator:** The relational operator (OP) shows the relationship between two operands. The symbols of relational operators have the following meaning:
  - = : Equality.
  - <>: Inequality.
  - >=: Is the left variable greater than or equal to the right variable?
  - <=: Is the left variable smaller than or equal to the right variable?
  - >: Is the left variable greater than the right variable?
  - <: Is the left variable less than the right variable?

  Note

  Floating point values may not be checked for equivalence or nonequivalence in transitions. This can lead to invalid value transfer (e.g. 2.1. -> 2.09999996).

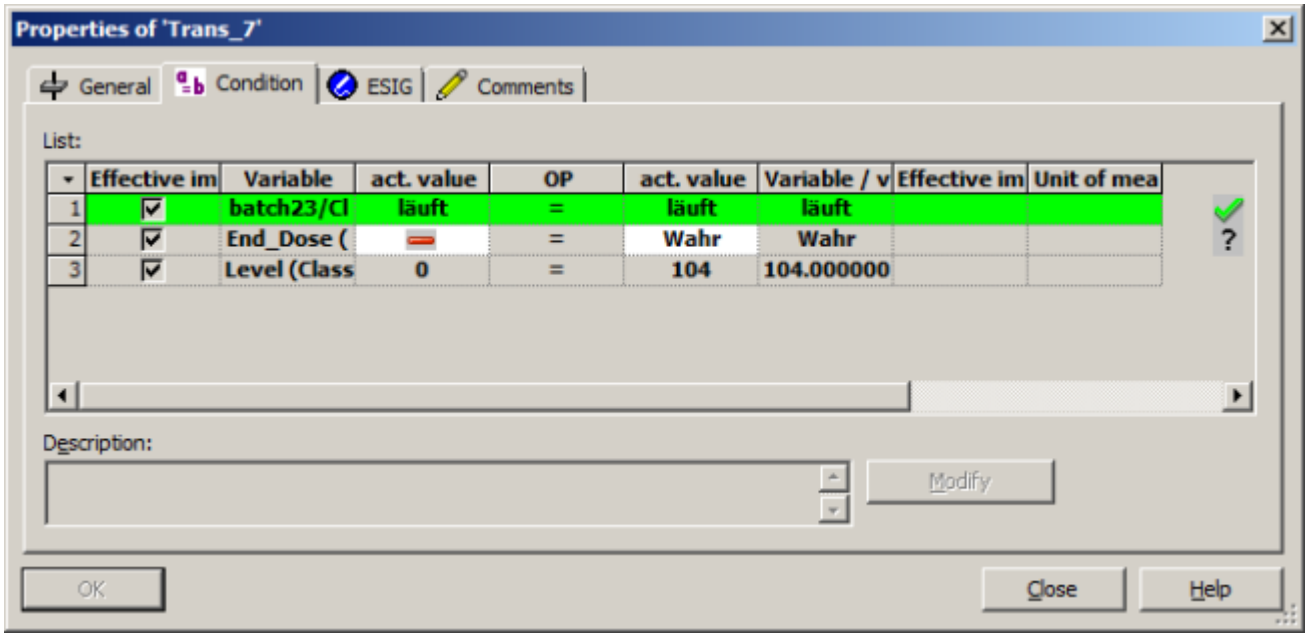
- **Act. value:** The actual value of the second operand is displayed here. If no actual value is available, a symbol is displayed. Hover the mouse pointer over the symbol to view a corresponding tooltip. This enables you to see at a glance the difference between an empty field (e.g. an empty character string) and a missing process value (e.g. a unit on which the recipe step is to be processed has not yet been assigned).
- **Variable/value:** The name of the variable configured during engineering is entered. This is the variable used as the 2nd operand used for the condition. The second operand can be a parameter from the next highest recipe level, a process tag, constant, equation or RPE status. In the case of a constant, you have the option of performing a linear or quadratic quantity scaling. An equation is used for the arithmetic calculation of setpoints.
  You can use the "Change" button at the bottom right of the dialog to change the values of constants during batch operation. The "Variable / value" cell is then released for entering a new value. A write lock symbol is simultaneously displayed at the transition in the control recipe. Enter a new value for the constant and close the dialog by clicking "OK". The new value takes immediate effect in batch mode and is valid for this batch.

  Note

  If you use constants as the second operand of the condition, the constant is displayed in both the "Variable / value" column as well as the "act. value" column.

- **Effective immediately:** A process value for operand 2 can be changed during batch control. If the transition is currently in progress then the changed parameter value should become effective immediately. This option can also be set for parameter references.

- **Unit of measure:** The unit of measure specified for the process tag of the first operand is displayed here.
- **Result display for conditions:** The result display for the individual conditions appears on the right-hand side of the dialog. A check mark indicates whether the condition was fulfilled when the transition was enabled. A question mark means that the transition status is unknown or that the transition has not yet been enabled. An "X" means that the transition condition was not fulfilled.



Logical operators

Using the buttons on which you select a logic operator, you can flexibly combine your conditions with two-level operators. Right-clicking one of the two operator buttons opens the shortcut menu for selecting the logic operation.

The logic operations provide the result "satisfied" (or true) as follows:

- AND : all conditions are fulfilled,
- OR : at least one of the conditions is fulfilled,
- NAND : not all conditions are fulfilled,
- NOR : none of the conditions are fulfilled,
- XOR : at most one condition is fulfilled.

Follow these steps, for example, if you want to configure the following logic for your conditions:

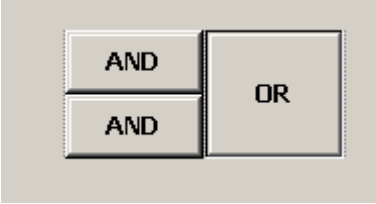


Figure 15-5 Two-level combination logic for transition conditions

Procedure

1. Click "New" to insert a new condition and configure it by pressing "Change". The new condition is linked by default with "AND".
2. Click the first "AND" operator button and then "New" to insert a new condition line with an AND operation. Then click "Change" to configure the condition.
3. Click the second "AND" operator button, insert a new condition, and configure it.
4. Click the first lower "AND" operator button and insert an empty condition. Click "Change" to configure the condition.
5. Right-click the second operator button and change the operator to "OR" in the shortcut menu.

Result:

You have created a two-level combination logic for your conditions.

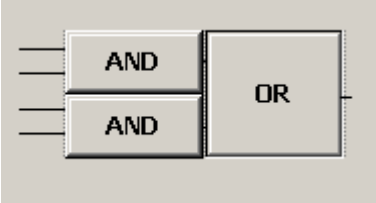


Figure 15-6 Result of interconnected conditions

The first partial result is fulfilled, when the first two conditions are fulfilled. The second partial result is fulfilled, when conditions 3 and 4 are fulfilled. The total result for the transition is fulfilled, when either the first or the second partial result is fulfilled.

Dialog buttons

- **OK:** Saves your entries and closes the dialog.
- **Print:** Prints the conditions listed on the screen in tabular form immediately to the configured printer.
- **Change:** The button has a variety of meanings depending on context. For recipe engineering in the Recipe Editor, click the "Change" button to open the interactive dialog for entering a condition previously created with the "New" button. In batch mode, you can use this button to change the value of a constant in the control recipe.
- **New:** Click the "New" button to insert new rows for additional transitions. The button is only available in the Recipe Editor.

- **Delete:** The "Delete" button deletes the selected condition (row). The button is only available in the Recipe Editor.
- **Close:** Closes the dialog without saving changes.

Additional information

You can find information about displaying buttons in the section ""Language" tab (Page 786)".

15.1.10.15 "Allocation list" tab (library reference properties)

Transition queries within a library operation can contain queries of other recipe unit procedures. Since a library operation is created independent of a master recipe, after inserting the library operation into a recipe unit procedure as a library reference, a unique assignment has to be made between such transition queries and other recipe unit procedures.

Parameter:

- Library reference: This column lists the units referenced by the transition queries of the library operations and their names.
- Unit class: This column shows the unit class of the library operation.
- Allocation: In this column, the recipe unit procedures for which queries are made within the library operation (for example, transition queries of other recipe units) are assigned. If several recipe unit procedures are available, no new assignment can be made.

15.1.10.16 "Description" tab (ROP, RPH properties)

Description:

In the dialogs for the steps with links to EOP, EPH or a library sequence, you can enter an explanatory text.

15.1.10.17 "Subcondition" tab

This displays the conditions for the units of the lower-level recipe level.

The lower-level conditions are linked by AND to the upper level (cannot be changed).

15.1.11 Dialog boxes

15.1.11.1 "Validate" dialog box

This dialog displays the results of the validation. You can call up the validation function yourself or it is started and run automatically by the system during configuration. The validation function is available and is executed with the following configurations:

- In the recipe editor to check the recipe
- When a batch is added
- When a batch is released
- When a process cell is updated

Display

By selecting or deselecting the check box, you specify which event types are displayed. The following event types are possible:

- Errors and/or
- Warnings and/or
- Information

The system always shows all three event types. The numbers in brackets indicate the number of objects related to the event type.

Reported errors must be eliminated otherwise the validation will not be completed successfully. An object with errors will not be used.

Sorting and filter functions

The column contents can be sorted by clicking on the table header of any column. Below the table headers there is also a filter function for each column. Here, enter your filter criterion so that only the required validation messages are displayed.

Eliminating errors with a comment

For each error, the type, number, element name and a comment are shown in a table row. The comments contain information for localizing and eliminating errors. When you select a row, other information is displayed in the lower area. The information depends on the object and includes, for example the date, time, ID, name, quantity information etc.

If the error is in a master recipe and the recipe editor is open, you can open the relevant master recipe at the location of the error by double clicking on one of the error rows.

Save to file

You can save the information from the validation as a text file by clicking the "Save to file" button.

15.1.11.2 "No candidates available" dialog box

This dialog displays the results of the validation. You can call up the validation function yourself or it is started and run automatically by the system during configuration. The validation function is available and is executed with the following configurations:

- In the recipe editor to check the recipe
- When a batch is added
- When a batch is released
- When a process cell is updated

Display

By selecting or deselecting the check box, you specify which event types are displayed. The following event types are possible:

- Errors and/or
- Warnings and/or
- Information

The system always shows all three event types. The numbers in brackets indicate the number of objects related to the event type.

Reported errors must be eliminated otherwise the validation will not be completed successfully. An object with errors will not be used.

Sorting and filter functions

The column contents can be sorted by clicking on the table header of any column. Below the table headers there is also a filter function for each column. Here, enter your filter criterion so that only the required validation messages are displayed.

Eliminating errors with a comment

For each error, the type, number, element name and a comment are shown in a table row. The comments contain information for localizing and eliminating errors. When you select a row, other information is displayed in the lower area. The information depends on the object and includes, for example the date, time, ID, name, quantity information etc.

If the error is in a master recipe and the recipe editor is open, you can open the relevant master recipe at the location of the error by double clicking on one of the error rows.

Save to file

You can save the information from the validation as a text file by clicking the "Save to file" button.

15.1.11.3 "Change log" dialog

List of modifications

This list documents the changes made by the system administrator with **date**, **name**, **action** and **computer name**, for example, permissions for units modified.

Data affected by the action

Detailed information on the changes, for example, the units for which the permissions were changed.

15.1.11.4 "Select project" dialog

When BatchCC (BATCH client) was started, several BATCH servers with process cell projects were found. The second column of the list shows the status of the BATCH servers. If "no connection" appears, this BATCH server is currently not in operation or no connection can be established to it.

If you select a project and click the "OK" button, you establish the connection to the BATCH server with the required process cell project. As an alternative, you can also double-click on the required entry.

The **Update** button updates the list of process cell objects again. In other words, BATCH servers (process cell objects) that were started while the "Select project" dialog was open are also displayed.

If you select the **Update cyclically** option and specify a time, the list of possible process cell projects is updated cyclically.

15.1.11.5 "Create new formula category" dialog box

In this dialog box, you can enter the **names**, and a **description** of the new object.

With the **Edit > Rename** menu command in BatchCC, you can change this information later.

15.1.11.6 "Information" dialog box

Introduction

This dialog box appears as soon as the BATCH clients start and when there is a redundancy failover. The dialog is displayed until all the DBs/server applications required by the BATCH client are available.

It displays all computers and resources of a unit in SIMATIC BATCH:

- DB server project
- DB server offline
- DB server online
- SIMATIC BATCH applications

Dialog description

The following columns are available:

- The "Computer" column contains the computer name of the corresponding resource.
- The "Redundancy status" column shows the redundancy status of the computer.
- Under "Status of the applications / Notes", you will see additional text that depends on the status of the SIMATIC BATCH applications.

Rule

All components listed in the dialog must meet the following criteria to allow the BATCH clients to start:

- Redundancy status: Master or Standalone
- Starting the BATCH Launch Coordinator: Running

Ignore status of BATCH server applications

With this option, the BATCH client starts immediately (only possible at the start of the application) without waiting for all required server applications to become available. The status of the "SIMATIC BATCH applications" is ignored.

This means that it is possible to work with the application without the BATCH control server, Batch data management (Batch CDV) etc. being operational. In some circumstances you can only work offline.

Note

The "Ignore status of BATCH server applications" function cannot be used with redundant BATCH servers.

Work without redundant partner

If you select a row with the description "User action necessary", the "Work without redundant partner" button is activated. With this button, the computer can be instructed to work without its redundant partner and (in the case of redundancy with data replication) without its partner database.

Note

If a computer is used without its redundant partner, none of the redundancy characteristics of the overall system are available any longer.

Close application

Closes the BatchCC or the BATCH Recipe Editor.

15.1.11.7 ""Folder" dialog box (Properties)

In this dialog box, you can enter the name and a description of the new folder.

15.1.11.8 "View permissions of the logged in user" tab

Introduction

This dialog displays the permissions of the logged-on user as specified by the system administrator for all functions of BatchCC and the BATCH Recipe Editor.

User group/function

The "user groups/function" selection list displays all the user roles and their possible functions when working with individual batch objects (recipes, batches etc.) defined for BATCH flexible (read only).

Description

Here you will see a brief description of the function.

Application

The applications affected by this permission are listed in the "Application" column.

15.1.11.9 "Permissions management" dialog

Introduction

You define the permissions for user functions for the user groups and user roles defined in the SIMATIC Logon roles management in this dialog. Permissions for user functions are assigned to each group or role. By assigning permissions, you define the user function scope of BatchCC, BATCH Recipe Editor, and BATCH OS controls for each user role.

Requirements

- Users and user groups have been created in the Windows Computer Management.
- The users and groups created in Windows have been assigned to the required user roles in the SIMATIC Logon roles management in the BatchCC. Additional information can be found in section "Specifying the user roles" below.
- You are logged onto the BatchCC as a user with the "Super user" user role.

Status displays on user groups

Symbol	Meaning
	Symbolizes that a user with this role is logged on.
	The "Super user" user role is represented with a yellow outline. A member of this group automatically has the permissions for all user functions. The permissions of the "Super user" role cannot be changed. Note: The name of this user role does not have to be "Super user" or a similar name. The name of the user role can be changed in the SIMATIC Logon permission management.

User groups/function

The "User groups/function" selection list shows all user roles defined for SIMATIC BATCH in the SIMATIC Logon permission management. Each role contains identical function groups in which permissions for user functions are organized. Function groups contain individual user functions or user function groups. Multiple user functions are organized into user function groups. The grouping facilitates assignment of permissions. The permissions for user functions such as "Edit", "Delete", and "Export" are organized into groups.

You use the plus and minus signs in front of folders to navigate in the selection list. By selecting or clearing the check boxes, you assign the permissions for user functions with respect to the user role.

The following user roles are predefined in the SIMATIC Logon roles management and displayed under individual permissions in the permission management:

- Super user
- Factory manager
- Shift manager
- Process engineer
- Automation engineer
- Emergency operator
- Operator

Description

Brief explanation of the user function.

Application

The BATCH applications required to execute the function appear here. For example, the BATCH Control Center (BatchCC) and the BATCH Recipe Editor.

Note

Permissions for user functions for the BATCH application "OS Controls" are not marked in the "Application" column. In general, the user functions also apply to the BATCH OS controls if they are counted among the BATCH OS controls.

Manage logons...

Opens the "Manage logons" dialog. Customized settings of the appearance of BatchCC and Recipe Editor are reset to the default values in this dialog.

Assign default permissions...

By clicking the "Assign default permissions" button, you open the "Select standard role" dialog. You use this dialog to overwrite the permissions of a user group with the default permissions of any other group.

First, select the user group to which you want to assign default permissions of another group. The "Assign default permissions..." button is only enabled when a user group is selected. Select one of the six standard roles to replace the permissions of the selected user group with the permissions of the selected standard role. Confirm your changes with "OK". Click "Yes" in the security prompt that appears. Your changes only take effect when you click the "OK" button in the permission management dialog.

Generate info file...

Clicking "Generate info file ..." opens a selection dialog in which you can specify where the "RightsInfo.html" information file should be saved. This file contains all information on user roles and their established permissions for user functions in SIMATIC BATCH.

Additional information

Introduction to permission management (Page 308)

Specifying user permissions (Page 310)

Changing user permissions (Page 315)

Generating and displaying an info file with individual permissions (Page 317)

Select default role (Page 908)

15.1.11.10 "Configure roles" dialog box

Introduction

In this dialog, you define the electronic signatures to be entered for actions and their sequence by selecting user roles.

Available roles

All user roles allowed to execute and sign the action.

Configured roles

All user roles that must sign. The sequence in the list indicates the order in which the signatures must be entered if the "Sequence" option is enabled in the "ESIG" tab.

Function of the buttons:

	Use these icons to move the "available roles" for operator input in the direction of "Configured roles", and vice-versa.
	Use these icons to specify the signature sequence if multiple signatures must be obtained. First click on a user role in the "Configured roles" list.

15.1.11.11 Dialog box "SIMATIC BATCH: Sign"

Introduction

In this dialog, you sign an action.

Note

A user can sign only once within a dialog. This is also the case when the user has several of the required user roles.

Element

Name of the object (batch, recipe procedure, recipe unit procedure, recipe operation, recipe phase, transition).

Information area

Status change: The type of operator input that must be signed is specified in this area. Operator action: Displaying the operator action

Conditions: This area displays the condition for which the entry of the electronic signature is required.

- Entry: For example, "All at once" or "Individually".
  All at once: This setting is displayed if you have selected the "All at once" check box during configuration. This means that if more than one signature is required, all signatures must be provided at the same time, in other words, in an open "Sign" dialog box.
  Individually: If more than one signature is required, the signatures can be entered individually; in other words, the signatures dialog can be opened several times on different BATCH clients.
- Sequence: For example "Any" or "In sequence"
  Any: This setting is displayed if you have selected the "Sequence" check box during configuration. If several signatures are required, there is no fixed sequence.
  In sequence: If several signatures are required per action, they must be entered in a specific sequence.

Times: This area displays the time of the request for an electronic signature and its validity.

- Requested at: Time at which the signatures were requested.
- Valid until: Time by which all signatures should be entered. Not currently used.

Signatures

This field displays all the user roles that are required to sign. If a sequence has been set, the listed sequence must be kept to.

"Sign" button

With this button, you enter your signature after first selecting your user role.

Abort signature

This shows the user role that canceled the signature procedure.

Cancel signature process

The request for entry of signatures can be canceled with this button. This function is possible only by one of the user roles above.

15.1.11.12 "Select unit" dialog box

When the "Operator selection" strategy is configured, this dialog can be opened as soon as SIMATIC BATCH wants to allocate a unit and the corresponding status is set at the recipe step in the control recipe. This is indicated by the following icon.



Figure 15-7 Allocation of the unit by operator selection

You can see here which batch is currently using a specific unit. The unit is selected by selecting an entry and confirming the dialog with "OK".

If this unit is already in use, the recipe unit procedure waits until the selected unit is available again. If the conditions for allocation of the unit are not met, the recipe unit procedure waits until the conditions are met and the unit is available.

Note

Before you select a unit, look up the current values for the individual conditions in the "Properties of" dialog on the "Conditions" tab.

If more than one user attempts to make a selection at the same time, the allocation goes to the first user. All other selected units are ignored.

See also

Process cell optimization with online assignment of a unit (Page 564)

15.1.11.13 Create SQL Server database dialog box

Introduction

The "Create SQL Server database" dialog offers several possibilities for creating a new SQL server database:

- Area: SQL script:
  An SQL script is a file containing simple text with SQL statements. The statements in the text can be executed on an SQL server computer by an SQL administrator. This is necessary if the SQL server is not installed on the local computer and SIMATIC BATCH is not installed on this SQL server computer. The SIMATIC BATCH administrator (super user) can send this SQL script to the SQL server administrator. The SQL server administrator then uses this information to create the SQL database.

  "Script in file" button: The SQL script is saved as a file.

  "Script in clipboard" button: The SQL script is copied to the clipboard and can then be inserted into other application using the key combination "Ctrl" + "V" (paste).
- Area: Creating a database with local SQL server:
  If the SQL server is running on the local computer and you as the user have the necessary rights to create an SQL server database, you can use the "Create Database" button to create a database. No intermediate steps such as copying files or texts are necessary.

15.1.11.14 "Export" dialog box

Introduction

Use this dialog box to export master recipes, libraries, and formula categories to a file. Use the file format "*.sbx". The generated file can be used for an import in the BATCH Control Center.

Rules

- All required data is always exported. If for example you only select master recipes then all libraries and formula categories used in these master recipes will also be exported.
- Export formula categories, directly through selection, or indirectly via a master recipe, then all formulas as well will always be exported.

Dialog elements

Navigation and selection window	In the navigation and selection window select the elements that will be exported, or select all elements of your batch process cell. Navigate in the tree structure via the "+" button and activate the appropriate check box for the desired element.
Progress	The total progress display shows you the temporal progress of the export process.
Info and result display	All processing information is displayed, and at the end of the export process the result is displayed.
Libraries	Progress display for libraries.

Master recipes	Progress display for master recipes.
Formula categories	Progress display for formula categories.

Buttons

Export selected elements	Use this button to start the export process for the activated elements. Use the following dialog to specify the target directory and names of the export file.
Cancel	The button will only be visible during the export process. The export process can be canceled with this button. If the export process is cancelled a log will not be created.
Log	The button is only displayed if errors occurred during the export process. Click on the "Log" button to open a log window. Error information will be displayed in plain text in the entries area. Use the "Save to file" button to save the log file.
Close	The export process is completed when the progress bar has reached its end. If the export process is concluded then close the dialog via this button.
Help	Opens the help for this context.

15.1.11.15 Select PCell, Recipe, Library dialog

This dialog allows you to select the required element in a folder structure.

When you open the top process cell folder, the two folders "Libraries" and "Master recipes" can be listed as lower-level folders. You can only change the value for "Show extended SFC structures", which is in project settings in folder "Display" under "Activating recipe elements", to "No" for the "libraries" folder. This means that only the master recipe folder, which is always included, is shown in this dialog. The other lower-level folder structures correspond to those from Batch CC.

You can open a selected object that has been released with the button "OK".

Under Description, text entered for a selected object in BatchCC in the "Properties" dialog can be displayed.

15.1.11.16 "Save as..." dialog

A copy is created when you save a library, recipe or formula. There are three options for making a copy with "Save as":

- New name with set version [version number]
  You use a new name for the element with "Save as". The version number is applied.
- Incrementing the major version
  The major version number is incremented.
- Incrementing the minor version
  The minor version number is reset to the default value of the minor version.

15.1.11.17 "Select standard role" dialog

Introduction

The permissions for user functions of selected standard roles are reset in this dialog. As a result of this action, the user roles are reset to the initial default values in the delivery condition.

Requirement

On the "Individual permissions" tab of the permission management dialog, you have selected the user group to which you want to reassign the default permissions of a user role.

Procedure

1. Select the user group to which you want to reassign default permissions. You must select a check box for a user group in order for the "Assign default permissions..." button to become active.
2. Select one of the six standard roles to reset the permissions of this user group to the delivery condition.
3. Confirm your entries with "OK".
4. Click "Yes" in the security prompt that appears.
5. Your changes only take effect when you click the "OK" button in the "Permission management" dialog.

Result

The customized permissions for user functions for the selected user group have been reset to the default values.

15.1.11.18 "Manage logons" dialog

You reset the customized settings for selected user logons to default values in this dialog. Select the check box for the relevant user and click the "Reset" button. In the dialog that then appears, confirm that the user settings for the selected user or users were reset.

15.1.11.19 "Location" dialog

What do I set in this dialog box?

In this dialog you will enter the start and end location (source and target) of a material transport. SIMATIC BATCH allocates the units and forwards the transfer parameters to SIMATIC Route Control. SIMATIC Route Control executes the material transfer and reports to SIMATIC BATCH that the transport has taken place successfully.

Selecting locations

The "Location" dialog lists all recipe unit procedures with their locations of the selected data type (source, destination, over).

Locations are configured under equipment properties in SIMATIC Manager.

After selection of a location, the properties "Reference", "Location and "Location ID" will be adopted in the properties dialog of the recipe function in the "Transfer parameters" tab.

Process mode

In process mode, only the location can be changed in the control recipe but not the reference.

"New assignment" button

Opens the dialog in which you select a unit so that you can assign the respective location.

"Edit assignment" button

Opens a dialog in which you can alter an existing allocation.

Additional information

"Transfer parameter" tab (Page 842)

Additional information is available in the online help on SIMATIC Route Control in the section "Interaction between SIMATIC BATCH and SIMATIC Route Control".

15.1.11.20 "Find" dialog

Find recipe elements

You can use the "Find" dialog to locate specific elements in recipes, batch, or libraries. You can use the search function in BatchCC, in the BATCH Recipe Editor, and in the BATCH OS controls. The hit locations are shown in a table. If you double-click a table object, the corresponding recipe opens in the editor and the hit location is highlighted in color. The search result can be saved as a text file.

You can search for the following elements, for example:

- Text
- Data such as data type, control strategy type, unit, library reference, category, or material
- Structures such as cross-references, source and target interconnections, jumps, monitoring, command steps, operator instructions, and synchronization
- Materials
- Status and extended status
- Recipe unit procedures, recipe steps and transitions
- Parameters

When a single master recipe is open in the Recipe Editor, you can also search for the process cell reference object.

The search for these elements can be used in recipe steps, transitions, container objects (RUP/ROP/SUB) in the recipe header or libraries.

The dialog is accessed via the menu command "Find" in the "Edit" menu, or via the corresponding menu command from the shortcut menu. When the master recipe/library is selected or open, you can also use the keyboard shortcut "Ctrl+F". You can search simultaneously in multiple objects with multiple selection in a detail view.

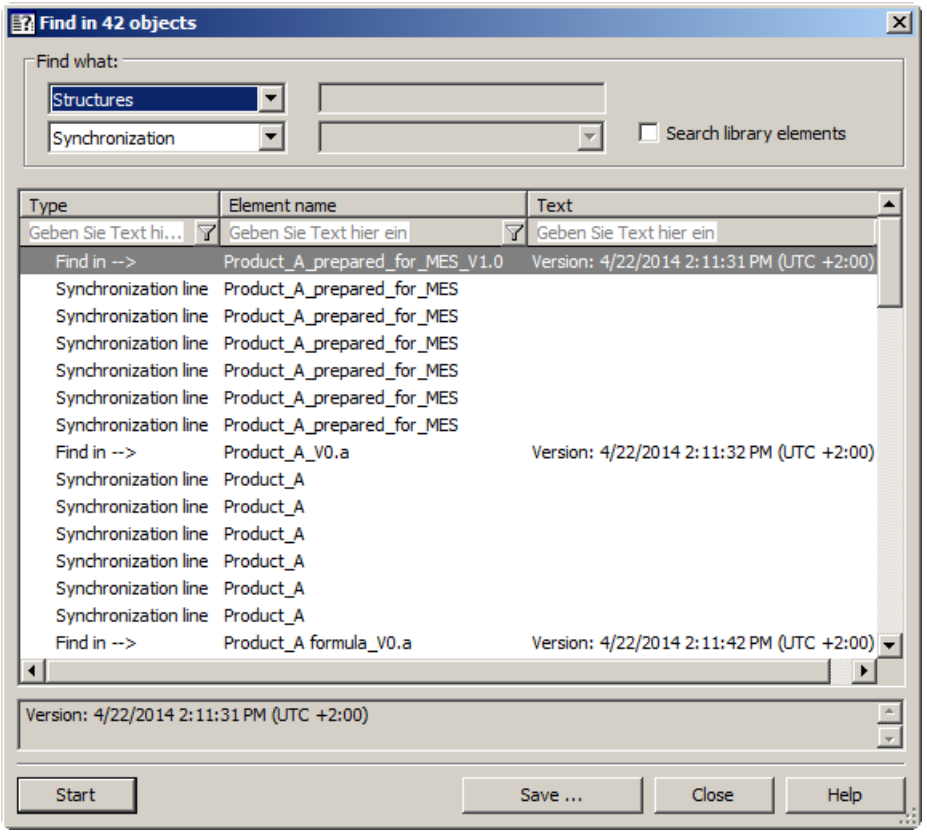


Figure 15-8 "Find" dialog

Dialog description

The dialog is divided into various sections.

In the upper section, "Find what", you can specify your search. You search for text, data types, and structures. Other fields are offered depending on your selection. For a text search, enter a keyword in the text box and click "Start". All printable characters, including text sections, can be used as search terms in any length. Wildcards cannot be used. The text search only finds elements that you can select or enter during the creation of recipes. For example, no comments on blocks or units from PCS 7 engineering are included in the search. Parameter names are searched. Additional criteria are available for the "Data types" and "Structures" selection, allowing you to fine tune your search.

If you not only want to search these selected recipes / library elements, but also the library elements referenced by them, select the check box and restart the search.

Note

The "Search" dialog is also used when searching for process cell references.

"Properties of master recipe" dialog, "Allocations" tab, "References ..." button.

The dialog that was opened does not include the "Search library elements" check box.

Process cell references are always searched for in the library elements in these dialogs.

The hits are displayed in the dialog. Hits in library elements cannot be opened at this point.

The search results are presented in tabular form in the middle section. There are filters available for each column, allowing you to filter or sort the search results based on your requirements. You use wildcards here.

The text found according to the criterion is displayed in the lower section.

Dynamic searching

If objects are open in the recipe editor, the search starts immediately when criteria are entered or changed in the selection boxes. If you have selected objects in a detail view or in the navigation tree, the search begins after clicking the "Start" button.

Displaying the hit location

When you click on a hit location displayed in the table, the corresponding recipe object is opened and highlighted in the BATCH Recipe Editor. The search dialog remains open and you can edit the opened master recipe, as long as the corresponding master recipe has not been released. In this state, the displayed hit locations in the search dialog are always based on the criteria with which the search was opened or started.

Examples

Question: In which objects does the "Liter" unit occur? Find what: Data types > Unit > l.

Question: Which elements contain parameters in the form of cross-interconnections? Find what: Structures > Cross-interconnections.

Question: Which objects contain the jump recipe reference? Find what: Structures > Jumps.

Question: Is the element with ID 2:14 in a recipe? Find what: Structures: ContID:TermID > 2:14.

Start button

Starts the search.

Save button

Opens a dialog in which you can save your search results as a text file to any location on your hard disk.

Close button

Closes the dialog.

Help button

This opens the online help.

15.1.11.21 Batch process cell (process cell object)

Definition

The user can configure the batch process cell at this object. As the basis for creating recipes in SIMATIC BATCH, the batch type of the process cell at this object must be edited and synchronized with the block instances of the CFC charts. The batch instances are generated here by compiling the process cell.

The object knows the distribution of the batch process cell (all information of the PC stations with BATCH applications). The configuration data is downloaded to the PLC based on this distribution.

See also

How to compile and download the process cell data (Page 214)

Compiling the Batch process cell data in single project engineering (Page 222)

Compiling the process cell data in multiproject engineering (Page 222)

Compiling and Downloading Batch Process Cell Data (Page 224)

15.1.11.22 Batch objects (Insert menu)

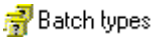
With this command, you can create the following Batch objects for the configurations for SIMATIC BATCH:

Batch process cell

You can configure the batch process cell on this object. As the basis for recipe creation in SIMATIC BATCH, in this object the batch types of the process cell are edited and compared with the block instances of the CFC charts. The batch instances are created here through the compile of the process cell. The object knows the distribution of the batch process cell (all

information of the PC stations with BATCH applications). Through the download the configuration data are loaded into the target systems according to this distribution.

Batch types



This object is used to generate batch types and to save batch types from batch process cells in order to insert them into other batch process cells.

15.1.11.23 BATCH application

Definition



This object represents a BATCH application. Here, it is a representative for the BATCH Control Server, project database, offline database, and/or online database components.

The BATCH server (BATCH Control Server) and the BATCH clients of a process cell project generally run on different PCs. In order to download and distribute the process cell data of a project among these PCs, a SIMATIC PC station must be created for each BATCH server and BATCH client in the component view (SIMATIC Manager). The SIMATIC PC stations necessary for this are configured in HW Config with the BATCH application.

See also

Basics of configuration (Page 144)

Configuring the BATCH server (Page 146)

15.1.11.24 BATCH application (stdby)

Definition



This object represents a BATCH application. Here, it is a representative for the redundant BATCH Control Server, project database, offline database, and/or online database components.

A SIMATIC PC station must be created for each redundant batch application in the component view (SIMATIC Manager). The SIMATIC PC stations necessary for this are configured in HW Config with "BATCH application (stdby)".

See also

Basics of configuration (Page 144)

Configuration of the redundant BATCH server (Page 64)

15.1.11.25 BATCH application client

Definition



This object represents a BATCH client application. Here, a BATCH client is a representative for the BATCH Recipe Editor, the Batch Control Center (BatchCC) for operator control and monitoring of batches, and the batch data management.

The BATCH server and the BATCH clients of a process cell project generally run on different PCs. In order to download and distribute the process cell data of a project among these PCs, a SIMATIC PC station must be created for each BATCH server and BATCH client in the component view (SIMATIC Manager). These SIMATIC PC stations are configured in HW Config with the BATCH applications.

See also

Basics of configuration (Page 144)

Configuring the BATCH server (Page 146)

15.1.11.26 SIMATIC BATCH

This opens a dialog box in which all the configuration work relevant to Batch can be undertaken.

15.1.11.27 Batch types in a library or within a project

Dialog box

In this dialog box, you can configure batch types that can be inserted in concrete Batch process cells later.

- Batch types
  - **Data types:** The system specifies the standard data types, output material, Boolean, input material, floating point number, integer and string. User data types are created, deleted and edited in the "Shared declarations" folder in the Component view of the SIMATIC Manager.
  - **Units of measure**: By selecting the "Units of measure" folder, you can create new units of measure; by selecting an existing unit of measure, you can change its properties.
  - **Operation types, phase types and process tag types**: By selecting the relevant folder, you can create new operation types, phase types and process tag types. You can change properties by selecting one of the existing objects. The order of the type parameters can be changed in the process cell tree using drag-and-drop. If you use the SFC types of the EOP/EPH variant, the batch types are only read in and displayed in this dialog box (read only). Any modifications must be made in the SFC chart.
  - **Equipment properties:** By selecting the "Equipment properties" folder, you can create new equipment properties (unit parameters); by selecting an existing unit parameter, you can change its properties.
    For project data created with SIMATIC BATCH < V6.1, the unit class is displayed here as an equipment property with the "Unit classes" user data type. This user data type has all existing unit classes as values. Under "Batch types", each unit is assigned the "Unit class" equipment property with the value they previously had as a unit class (a reactor, for example).

Edit

The batch types can be edited.

15.1.11.28 WinCC archive variable

Dialog box

This dialog box is a browser that displays all operator stations and their WinCC archives of a single project or all operator stations of all projects in any project of a multiproject. By browsing through the WinCC archives, you can select the WinCC process tag and by clicking the "Apply" button, you assign the instance parameter.

Note

If there is an OS with the name "wincc" in the project, none of the existing WinCC Tag Logging archives are displayed in this dialog box. Therefore, avoid using the name "wincc" in Batch projects.

The measured variable at the parameter instance in a multiproject is read-only.

Apply

The variable is accepted when it is applied and the connection between the instance parameter of the unit and the selected measured variable is established.

15.1.11.29 "Display" additional function

Dialog box

This dialog box displays all objects that use the previously selected Batch type. These can be instances, instance parameters, units or equipment properties.

Using a filter, you can display either all attributes of a particular object or only specific attributes.

Further functions include:

- Opening a CFC chart
- Editing a control strategy parameter
- Assigning a WinCC archive tag

15.1.11.30 Control strategies of ....

Function

The appropriate parameters are assigned to a mode of operation in this dialog box. This means that later in the batch control only the parameters selected here will be considered for an appropriately set mode of operation. If the modes of operation are restricted to the instance (EPH or EOP) allocated to the phase type or operation type, then later in the recipe also only the modes of operation released here will be used.

15.1.11.31 WinCC archive variable

Function

This dialog displays all operator stations and their WinCC archives of a single project, or in the case of a project of a multiproject, all operator stations of all projects. By browsing in the WinCC archives, you can select the WinCC process tag variable and assign it to the instance parameter with the "Apply" button.

Note

If an OS with the name "wincc" is in the project then none of the available WinCC taglogging archives will be displayed in this dialog box. Consequently in batch projects avoid using the name "wincc".

In the multiproject the measured value is only readable on the parameter instance.

Apply

With Apply, the variable is applied and the connection of the instance parameters of the unit with the selected measured values is executed.

15.1.11.32 "Display" additional function

Function

Use this dialog field to display all objects that use the previously selected batch type. These can be instances, instance parameters, units, or equipment properties.

Using a filter, you can display either all attributes of a particular object or only specific attributes.

Additional functions can be:

- Opening a CFC chart
- Editing a mode of operation parameter
- Assigning a WinCC archive tag

15.1.11.33 Computer settings (shortcut menu BATCH start coordinator)

Setting the language

You select the required language for the shortcut menu and tooltip text of the BATCH Launch Coordinator in the task bar in this dialog.

15.1.11.34 User credentials

In this dialog, you authenticate yourself for the following functions in SIMATIC BATCH:

- Authentication for the archiving methods SQL server, FTP server and PH
- Authentication for saving automatically generated PDF files in a selected default directory
- Authentication for saving an automatic backup in a selected directory

Property

User credentials:

- Domain: Input box for the name of the domain.
- Login: Input box for the name of your logon.
- Password: Input box for the characters of your password.

Note

The user must be a member of the Windows user group "SIMATIC BATCH"

"OK" button

Exits the dialog and saves your settings.

"Standard" button

Click this button to reset all project settings you have changed in this tab to the default setting "Yes".

"Apply" button

Saves your settings without closing the dialog.

"Cancel" button

Exits the dialog without saving your settings.

"Help" button

Opens the online help for this dialog.

Additional information

You will find information on the security aspects and the archiving method "SQL Server" in the sections:

- Security aspects (Page 82)
- Basic principles (Page 500)
- Create SQL Server database (Page 501)
- Setting up an SQL server (Page 503)
- Batches > Archiving > Archiving method (Page 805)

15.1.12 SIMATIC BATCH configuration dialog

15.1.12.1 "S7 program" selection

In the process cell data list, you have selected the "S7 programs" object.

S7 programs from the basic engineering in the SIMATIC Manager that are not yet assigned to an automation system are displayed. In addition, the S7 program must contain BATCH objects. For example, an SFC type of the "EPH" category.

Runtime name in the dialog header

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.

S7 programs/objects

Button	Function
Update	The basic data of the BATCH process cell is generated or updated.. The necessary configuration data from the basic engineering in the SIMATIC Manager is generated or updated for the BATCH process cell.
Compile/download	Opens the "Compile/download" dialog. The dialog consists of various tabs in which you compile/download blocks (data and memory blocks), charts or programs.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The "Display" button activates the logging. The selected log is generated as an XML file with the specified layout and displayed in Internet Explorer. With the "S7 program" selection, all errors or warnings related to the S7 program are displayed. When you select an object, you can also right-click and select the "Display log" function to show errors or warnings for an individual object.

"OK" button

Saves your settings and ends the dialog.

"Apply" button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.2 "CPU" selection

In the "Process cell data" list you have selected the "CPU" object.

Runtime name in the dialog header

Logical path within the navigation tree

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	This column displays texts that you entered in the properties dialog of the object as comments in the SIMATIC Manager.
Memory setup (code +data)	Specify the actual memory setup of your CPU here. For example 8, 12 or 30 MB. You will find the current memory setup of your CPU by selecting the CPU in the component view in SIMATIC manager. Select "Component state" from the short-cut menu and click on the "Memory" tab.
Allocation for recipe logic	Select a percentage of your work memory that you want to allocate to the recipe logic. The following percentages are available for selection: 0%, 10%, 20%, 30%, 40% and 50%. Note: If you are not using the AS-based mode, select 0% as the allocation for the recipe logic. You will find further information on planning the memory space required for the recipe logic on the AS in the section "Obtaining the memory expansion and setting the allocation (Page 220)".

CPU

Button	Function
Update	The memory blocks of the BATCH process cell are updated.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. With the "CPU" selection all errors or warnings related to the CPU are always displayed. In a selected object you can right-click and select the "Display log" function to show object-specific errors or warnings.

Additional functions

No additional functions available.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

See also

"Chart folder" tab (Page 1010)

15.1.12.3 "S7 program" selection

In the Process cell data list you have selected the "S7 program" object. The S7 program is assigned to a CPU in an automation system. The name displayed as the folder name is the name you assigned in the basic engineering in the SIMATIC Manager.

Runtime name in the dialog header

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	Information about the selected object is displayed in this text field. If you entered a comment for the object in the properties in the basic engineering, this is displayed here.
Last changed on	This text box displays the date and time of the last change in the following format: Example: 09/15/2010 08:24:47 (UTC +2:00), Coordinated Universal Time. The entries "UTC +X" or "UTC -X" specify the current actual difference between the national time and UTC.
Logical path	The S7 program logical path is displayed in this text field.

S7 program

The following functions are available for your charts in the "S7 program" area:

Button name	Function
Compile	Opens the "Compile program" dialog from the SIMATIC Manager.
Download	Opens the "Download PLC" dialog from the SIMATIC Manager. In the case of a complete download, you must first set the CPU to "STOP" mode manually. Note: The "download" button is only displayed if S7 programs are assigned to an automation system.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The "Display" button activates the logging. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. With the "S7 program" selection, all errors or warnings related to the S7 program are displayed. When you select an object, you can also right-click and select the "Display log" function to show errors or warnings for an individual object.

Additional functions

Units: "Display" button: The units assigned to this S7 program are listed in this dialog.

"OK" button

Saves your settings and ends the dialog.

"Apply" button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.4 "Connections" selection

In the "Process cell data" list you have selected the "Connections" object.

Runtime name in the dialog header

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.

The table shows the local S7 connection between the BATCH application on the PC and the automation system. This is the connection data from NetPro.

Connections

Name of the object selected in the process cell tree.	
Update	Click this button after you have made changes in the connection configuration in NetPro. This applies the current connection data from the basic engineering in the BATCH configuration dialog.
Compile	With this, you save and compile the current connection data in the current project.
Download	With this, you download the current connection data to the relevant stations in the current project.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Connections" to show all connection errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

"Display" button. Opens your current connection configuration in NetPro.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available after you make changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.5 "Stations" selection

In the "Process cell data" list you have selected the "Stations" object.

Runtime name in the dialog header

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data. You expand, for example the structure of the process cell objects using the preceding plus character or collapse the structures using the minus character. The name of the folder is taken from the basic engineering in the SIMATIC Manager.

Properties

Name of the object selected in the process cell tree.

Stations

Button	Function
Update	The basic data of the BATCH process cell is generated or updated.. For AS-based operation, the configuration from basic engineering is adapted as follows: • The necessary CFC charts are created or updated for AS-based operation. Example: @ASB_Mem. • The BATCH application or standby BATCH application in your SIMATIC PC station is / are replaced. • Missing S7 connections between the Batch application and the AS are created. Note S7 connections are created for H-CPUs. You have to configure fault-tolerant connections in Netpro yourself. They are then used by SIMATIC BATCH.
Compile / Download	Opens the "Compile / Download" dialog. The dialog consists of various tabs in which you compile/download blocks (data and memory blocks), charts or programs.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Stations" to show all station errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.6 "Station" selection

In the "Process cell data" list you have selected the "Station" object.

Runtime name in the dialog header

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree. Information about the station is displayed in the "Description" text field. If you entered a comment for the object in the properties in the basic engineering, this is displayed here.

Simulation (TCP/IP) on / off: **Caution**, select the check box only for test mode on a single-station system with the simulation software, S7-PLCSIM. Please note that additional configuration steps must be carried out for simulation. You can find detailed instructions here (Page 744). If you select the option, you then have to update the station data and load it onto the BATCH servers. A new communication link is created only when you update the process cell in BatchCC.
You must disable the option for production or normal operation.

Station

Button	Function
Update	The basic data of the BATCH process cell is generated or updated.. For AS-based operation, the configuration from basic engineering is adapted as follows: • The necessary CFC charts are created or updated for AS-based operation. Example: @ASB_Mem. • The BATCH application or standby BATCH application in your SIMATIC PC station is / are replaced. • Missing S7 connections between the Batch application and the AS are created. Note S7 connections are created for H-CPUs. You have to configure fault-tolerant connections in Netpro yourself. They are then used by SIMATIC BATCH.
Compile / Download	Opens the "Compile / Download" dialog. The dialog consists of various tabs in which you compile/download blocks (data and memory blocks), charts or programs.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Station" to show all station errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

No additional functions available.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.7 "Multiproject/Project" selection

Multiproject/project selection

In the "Process cell data" list you have selected the "Multiproject/project" object.

Path in the topmost display field

Logical path from the multiproject

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	A comment is displayed that you have entered in the SIMATIC Manager in the "Object properties" for the multiproject or project.

Multiproject/Project

Button	
Settings	The button is only displayed for a single project and multiproject. If you click this button, another dialog opens with the following four tabs: • Distribution • OS objects • Process cells. Only on the multiproject • System characteristics

"OK" button

Saves your settings and ends the dialog.

Accept button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH help for this context.

15.1.12.8 "Batch process cell" selection

You have selected the "Batch process cell" object in the "Process cell data" list.

Path in the topmost display field

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You describe your Batch process cell in this text box.
Process cell component grouping	If you have configured one or more enumerations as an equipment property in SIMATIC Manager, you can specify one of them as a grouping criterion for the Recipe Editor from the drop-down list. This process cell component grouping is used as a unit class in the Recipe Editor.
Using V4 components	Activate the check box if you want to configure and use batch types for V4 blocks. If there are already batch types for V4 blocks the check box will be activated.

Batch process cell

Buttons	
Check validity	As with the compile function all batch instance blocks of the selected equipment modules will be imported. A check for consistency with the batch types and conformity to ISA-88 will then take place. Validity errors and warnings are displayed in the log field and can be viewed by clicking the "Display" button. In addition the errors and warnings are also indicated on each object by a red or yellow lightning icon. Selecting the appropriate object and clicking on the "Display" button shows you the object-based errors or warnings.
Transfer messages	This button is only released in a single project and in a multiproject. Activating this button opens the "Transfer messages to the ..." dialog for transfer of batch-specific messages into the OS. Click "Yes" to start the transfer process. Click on the "No" button and the transfer process will not be started and the dialog will be ended.
Download...	This button is only released in a single project and in a multiproject. Activate this button to open the dialog for downloading the batch components.

Log

Drop-down list box	The logs for the following batch processes are offered for selection in a drop-down list: • Validity • Transfer messages • Download
"Errors" display field	The number of errors for the selected log is displayed.

"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

See also

Introduction (Page 190)

15.1.12.9 "Batch types" selection in a multiproject

Batch types selection

In the list "Process cell data" you have selected the object "Batch types".

Path in the topmost display field

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You describe your batch types in this text box.
Last changed on	The most recent change of the batch types are specified with date and time.

Batch types

Buttons	
Propagate	Use this button to open the "Propagate types total process cell" dialog.
Generate	Use this button to open the "Generate types" total process cell" dialog.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. With the "Batch types" selection all errors or warnings of the batch types are always displayed. In a selected object you can also right click to select the "Show Log" function to also show object-specific errors or warnings.

Additional functions

Print	This prints all batch types of the process cell in tabular form.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.10 Selection of "BATCH types in the project of a multiproject"

Selection of batch types in the project of a multiproject

In the list "Process cell data" you have selected the object "BATCH types in the project of a multiproject".

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	A description of your batch types is displayed in this text box.
Last changed on:	The last change of the batch types is specified with date and time.

Batch types

Button	
Status display	This shows the current status of the batch types in the project. The status display can show the following three states: 1. Up-to-date: All information on the batch types of the project agree with the batch types of the multiproject. 2. No longer up-to-date: All information on the batch types of the project doe not agree with the batch types of the multiproject. 3. ????????: This status occurs when a project is removed non-editable from a multiproject for editing. A statement on the status of the batch types in the project is not possible in this case.
Update	With the "Update" button, you update the batch types in your project (as part of a multiproject). In other words, the batch types of the multiproject are read in.

Additional functions

Print button: This prints all batch types of the process cell in tabular form.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.11 "Data types" selection

Data types selection

In the "Process cell data" list you have selected the "Data types" object

The following standard data types are specified by the system in the navigation tree:

- Floating point number
- Integer
- String
- Input material
- Output material
- Material
- Source
- Dest.
- Via
- TKey
- Location
- Boolean

The batch types defined by the user follow after the last standard data type. These user data types are generated, deleted, and changed in the "Global declarations" > Enumerations" folder of the PCS 7 project in the SIMATIC Manager.

Path in the topmost display field

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.

Data types

Button	
Delete	Click on the "Delete" button to open the "Delete data types" dialog. Click "Yes" to delete all unused user data types in SIMATIC BATCH. When you use the "Generate" function in the BATCH configuration dialog, the data types are loaded again from the ES. This function is practical when you have declared user data types that are not relevant for SIMATIC BATCH.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process Cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

"OK" button

Saves your settings and ends the dialog.

Accept button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH help for this context.

15.1.12.12 "Data type" selection

Selection data type

In the "Process cell data" list you have selected the "Data type" object.

Path in the topmost display field

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the data type in this text box. For standard data types a description text is specified and you cannot change it. For user data types enter the description texts within the global declarations under enumeration when selecting an object in the object properties in the SIMATIC Manager.
Control strategy	The check box is only displayed for user data types. The mode of operation can be activated or deactivated in the SIMATIC Manager within the global declarations under enumerations, when selecting an object, in the object properties.

Data type

No functions available.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process Cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Parameter	
Display...	Only available for selected user data types. All instance parameters that refer to this user data type are listed in a dialog field.

"OK" button

Saves your settings and ends the dialog.

Accept button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.13 "Data type parameters" selection

Data type parameters selection

In the "Process cell data" list you have selected the "Data type parameters" object

Path in the topmost display field

Logical path within the navigation tree.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	The description of the data type parameter is displayed in this text field. Enter the description text within the Global declarations > Enumerations > Enumeration type > Value, in the object properties in the Comment field in the SIMATIC Manager.
Label	Enter the label within the Global declarations > Enumerations > Enumeration type > Value, in the object properties in the Value field in the SIMATIC Manager.

Value

No functionality available.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

None.

"OK" button

Saves your settings and ends the dialog.

Accept button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.14 "Units of measure" selection

Units of measure selection

In the "Process cell data" list you have selected the "Units of measure" object. Units are created, deleted and edited in the "Shared declarations - Units of measure" folder of the project in the SIMATIC Manager.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.

Units of measure

Button	
Delete	Click on the "Delete" button to open the "Delete units of measure" dialog. Click on the "Yes" button to delete all units of measure that are not used in SIMATIC BATCH. Points of use in recipes, libraries and batches cannot be checked. This function is useful if you have declared units of measure in SIMATIC Manager within the global declarations that are not relevant for SIMATIC BATCH.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

"OK" button

Saves your settings and ends the dialog.

Accept button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.15 "Unit of measure" selection

Unit selection

In the "Process cell data" list you have selected the "Unit of measure" object.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	The description of the unit of measure is displayed in this text field. You can enter a descriptive text in the object properties in the SIMATIC Manager.

Unit of measure

Display of possible functions.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Parameter: Displays.

All the instance parameters that refer to this unit of measure are listed in a dialog box. You can select certain attributes via a filter, or there is no instance.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.16 "Operation types" selection

Operation type selection

In the "Process cell data" list you have selected the "Operation type" object.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.

Operation types

Button	Description
New	Click "New" to add a new operation type from version 5/6i.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

"OK" button

Saves your settings and ends the dialog.

Accept button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.17 "Operation type" selection

Operation type selection

In the "Process cell data" list you have selected the "Operation type" object. You can only change and use the properties and functions of the selected object with versions 5 and 6i.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the operation type in this text box.
"Allow operator instruction" check box	With this option, you specify whether or not this operation can be used by an operator instruction.
Default instance	If at least two block instances of an SFC type are configured within the plant hierarchy, the row is displayed. If multiple block instances are deleted, the row disappears again. Select one of the possible block instance names from the drop-down list. The selected default instance is given preference when creating recipes.

Operation type

Buttons	
New	If you click "New" button, a new version 5/6i operation type parameter is added.
Delete	To delete the selected operation type, click the "Delete" button.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display box	The number of warnings for the selected log is displayed.
"Display" button	The logging function is enabled with the "Display" button. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. If "Process cell" is selected and you click the "Display" button, all errors or warnings of the process cell are displayed. You can also right-click on a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Instances	
"Display" button	All instance parameters that refer to this unit of measure are listed in a dialog box. Certain attributes can be selected via a special filter.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.18 "Operation type parameters" selection

Operation type parameters selection

You have selected the "Operation type parameters" object in the "Process cell data" list. You can only change and use the properties and functions of the selected object with versions 5 and 6i.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the operation type parameter in this text box.

Assigned data type	Assign the required data type to the type parameter. All standard data types and user data types are available for selection. You must declare required user data types under the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Data type" button	Activating this button takes you to the corresponding data type. With the "Back" button of the data type, you return to beginning selection.
Assigned unit of measure	Assign the unit of measure to the type parameter. You must declare required units of measure under "Units of measure" in the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Unit of measure" button	Activating this button takes you to the appropriate unit. With the "Back" button of the unit of measure, you return to this location.
"Archive measured value" check box	Select this check box if you wish to establish a connection to a WinCC archive tag for the instance parameters. This selection is required for assigning instance parameters to WinCC archive tags. You then make this assignment on the instance parameters of the corresponding operation type.
"Test manufacturing instruction" check box	A type parameter is selected here if it is to be provided in the batch log for the manual check (manufacturing instruction).
"Control strategy parameter" check box	If this check box is selected, you can make the control strategy settings for this type at the type parameter. This option is only available after at least one control strategy type has been configured under data types.
Events log ID:	Here, you can specify a value from 0 to 65535 that can be evaluated later in a user batch report to allow filtering. Different values are permitted for setpoint and process value. This means, for example, that you could filter according to setpoints with setpoint ID < 1000 AND setpoint ID ≥ 500 and according to process values with process value ID ≤ 2000. The user can specify how convenient such a query is in his log software.

Parameters

Button	
Delete	Click "Delete" to delete the selected operation type parameter.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Instances	
"Display" button	All instance parameters that refer to this unit of measure are listed in a dialog box. Certain attributes can be selected by means of a special filter. Or no instance exists.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.19 "Phase types" selection

Phase types selection

In the "Process cell data" list you have selected the "phase types" object.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.

Phase types

Button	
New	Click "New" to add a new phase type. The default is version 5/6i.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

"OK" button

Saves your settings and ends the dialog.

Accept button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.20 "Phase type_EPH" selection

Phase type selection

You have selected the "Phase type_EPH" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	The description of the phase type is entered or displayed in this text box.
Allow operator instruction:	With this option, you specify whether or not this phase can be used by an operator instruction.
V blocks	Indicates the version of the phase type used. The following block types are available for selection in the drop-down list box: AF24: The block has 24 parameters. AF12: The block has 12 parameters. AF6: The block has 6 parameters. AF16S: The block has 16 parameters. Using Batch block instances of different versions (EOP, IEOP, SFC-TYPE) but the same phase type automatically results in so-called mixed operation. However mixed operation is permitted exclusively for combinations of versions 5, 6i, and SFC type. Mixed operation of version V4.02 with other versions is not allowed. Allowed versions / combinations are: Version = 4.02 Version = V5 Version = V6i Version = V6 Mixed version = V5 / V6i Mixed version = V5 / V6 Mixed version = V6i / V6 Mixed version = V5 / V6i / V6
Default instance	If at least two block instances of an SFC type are configured within the plant hierarchy, the row is displayed. If multiple block instances are deleted, the row disappears again. Select one of the possible block instance names from the drop-down list. The selected default instance is given preference when creating recipes.

Phase type

Buttons	
New	if you click the "New" button, a new phase type parameter of the selected version is added. When a phase type parameter is created, the version of the type can no longer be changed.
Delete	Click the "Delete" button to delete the selected phase type.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display box	The number of warnings for the selected log is displayed.
"Display" button	The logging function is enabled with the "Display" button. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. If "Process cell" is selected and you click the "Display" button, all errors or warnings of the process cell are displayed. You can also right-click on a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Instances	
"Display" button	All instances that refer to this phase type are listed in a dialog. Or no instance exists.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.21 "Phase type_AF" selection

Phase type selection

You have selected the "Phase type_AF" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the phase type is entered or displayed in this text box.
"Allow operator instruction" check box	With this option, you specify whether or not this phase can be used by an operator instruction.
V4 block	Indicates the version of the phase type used. The following block types are available for selection in the drop-down list box: AF24: The block has 24 parameters. AF12: The block has 12 parameters. AF6: The block has 6 parameters. AF16S: The block has 16 parameters. Using Batch block instances having different versions (EOP, IEOP, SFC-TYPE) but the same phase type automatically results in so-called mixed operation. However mixed operation is permitted exclusively for combinations of versions 5, 6i, and SFC type. Mixed operation of version V4.02 with other versions is not allowed. Allowed versions / combinations are: Version = 4.02 Version = V5 Version = V6i Version = V6 Mixed version = V5 / V6i Mixed version = V5 / V6 Mixed version = V6i / V6 Mixed version = V5 / V6i / V6

Phase type

Buttons	
New	Click the "New" button to add a new phase type parameter of the selected version. If a phase type parameter is created, the version of the type can no longer be changed.
Delete	Click the "Delete" button to delete the selected phase type.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Instances	
Display button	All instances that refer to this phase type are listed in a dialog. Or no instance exists.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.22 "Phase type parameters_EPH" selection

Phase type parameters_EPH selection

You have selected the "Phase type parameters_EPH" object in the "Process cell data" list. You can only change and use the properties and functions of the selected object with versions 5 and 6i.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the phase type parameter in this text box.
Display name	The display name is derived from the basic engineering of the SFC type. The display name specified under Characteristics > Setpoints is displayed in the configuration dialog. Name must be changed in basic engineering.
I/O name	The I/O name is derived from the basic engineering of the SFC type. The I/O name specified under Characteristics > Setpoints is displayed in the configuration dialog. Name must be changed in basic engineering.
Assigned data type	Assign the required data type to the type parameter. All standard data types and user data types are available for selection. You must declare required user data types under the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Data type" button	Activating this button takes you to the corresponding data type. With the "Back" button of the data type, you return to beginning selection.
Assigned unit of measure	Assign the unit of measure to the type parameter. You must declare required units of measure under "Units of measure" in the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Unit of measure" button	Activating this button takes you to the appropriate unit. With the "Back" button of the unit of measure, you return to this location.
"Archive measured value" check box	Select this check box if you wish to establish a connection to a WinCC archive tag for the instance parameter. This selection is required for assigning instance parameters to WinCC archive tags. You then make this assignment on the instance parameters of the corresponding operation type.
"Test manufacturing instruction" check box	A type parameter is selected here if it is to be provided in the batch log for the manual check (manufacturing instruction).
"Control strategy parameter" check box	If this check box is selected, you can make the control strategy settings for this type at the type parameter. This option is only available after at least one control strategy type has been configured under data types.
Events log ID:	Here, you can specify a value from 0 to 65535 that can be evaluated later in a user batch report to allow filtering. Different values are permitted for setpoint and process value. This means, for example, that you could filter according to setpoints with setpoint ID < 1000 AND setpoint ID ≥ 500 and according to process values with process value ID ≤ 2000. The user can specify how convenient such a query is in his log software.

Parameters

Button	
Delete	Click "Delete" to delete the selected phase type parameter.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Instances	
"Display" button	All instance parameters that refer to this unit of measure are listed in a dialog box. Certain attributes can be selected by means of a special filter. Or no instance exists.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.23 "Phase type parameters_AF" selection

Phase type parameters_AF selection

You have selected the "Phase type parameter_AF" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the phase type parameter in this text box.
Assigned data type	Assign the required data type to the type parameter. All standard data types and user data types are available for selection. You must declare required user data types under the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Data type" button	Activating this button takes you to the corresponding data type. With the "Back" button of the data type, you return to beginning selection.
Assigned unit of measure	Assign the unit of measure to the type parameter. You must declare required units of measure under "Units of measure" in the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Unit of measure" button	Activating this button takes you to the appropriate unit. With the "Back" button of the unit of measure, you return to this location.
Parameter type	In the option fields specify whether this is a setpoint or an actual value.
Parameters	Depending on whether a setpoint or actual value is involved, a parameter name is selected here from the available parameter names of an AF block. Setpoint parameters: • AF6: URP_1 to URP_6 • AF12: URP_1 to URP_12 • AF16S: URP_1 to URP16 • AF24: URP_1 to URP_24 Process value parameters: • AF6: PV_1_1 to PV_1_6 • AF12: PV_1_1 to PV_1_6 ... PV_2_1 to PV_2_6 • AF16S: PV_1_1 to PV_1_6 ... PV_2_1 to PV_2_6 ... PV_3_1 to PV_3_4 • AF24: PV_1_1 to PV_1_6 ... PV_2_1 to PV_2_6 ... PV_3_1 to PV_3_6 ... PV_4_1 to PV_4_6
Drop-down list box for parameter	In the following drop-down list box you can decide whether ... • A setpoint parameter **without reference** to a process value parameter (none) • A process value parameter **without reference** to a setpoint parameter (none) • A setpoint parameter **with reference** to a process value parameter (PV_x_x) • A process value parameter **with reference** to a setpoint parameter (URP_x) . As reference parameter the free parameters, i.e. parameters that are not yet referenced, and suitable relative to data type and unit, are offered.

"Reference" button	This button is displayed when a reference exists from the set value to the actual value, or vice-versa. click on the button to jump between the reference parameters of the set and actual value.
"Archive measured value" check box	Activate this check box if you want to establish a connection to a WinCC archive variable for the instance parameters. This selection is required for assigning instance parameters to WinCC archive tags. You then make this assignment on the instance parameters of the corresponding operation type.
"Test manufacturing instruction" check box	A type parameter is selected here if it is to be provided in the batch log for the manual check (manufacturing instruction).
"Control strategy parameter" check box	If this check box is selected, you can make the control strategy settings for this type at the type parameter. This option is only available after at least one control strategy type has been configured under data types.

Parameters

Button	
Delete	Deletes a phase type parameter.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Instances	
"Display" button	All instance parameters that refer to this unit of measure are listed in a dialog box. Certain attributes can be selected by means of a special filter. Or no instance exists.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.24 "Process tag types" selection

Process tag types selection

In the list "Process cell data" you have selected the object "Process tag types".

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.

Process tag types

Button	
New	Click on the "New" button to create a new process tag type.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.25 "Process tag type" selection for the TAG_COLL block

Process tag type selection

In the list "Process cell data" you have selected the object "process tag type".

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the process tag type parameter in this text box.

Process tag type

Buttons	
New	Click "New" to add a new process tag type.
Delete	Click "Delete" to delete the selected process tag type.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional function

Instances: Display

All the instance parameters that refer to this process tag type are listed in a dialog box.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.26 "Process tag type" selection for the TRANS block

Process tag type selection

In the list "Process cell data" you have selected the object "process tag type".

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the process tag type parameter in this text box.

Process tag type

Buttons	
New	Adds a new process tag type parameter.
Delete	Deletes the complete process tag type.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Instances: Display

All the instances that refer to this process tag type are listed in a dialog box. Certain attributes can be selected via a special filter.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.27 "Process tag type parameters" selection for the TAG_COLL block

Process tag type parameters selection

You have selected the "Process tag type parameters" object in the "Process cell data" list. You can only change and use the properties and functions of the selected object with versions 5 and 6i.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

The following commands are contained in the shortcut menu: Delete, rename and show instances. use the "rename" command to assign a new name to the process tag type parameter.

Sorting of the process tag type parameters in the navigation tree

Select a process tag type parameter and drag it to the desire position within the types. During recipe creation, the parameters of this phase type appear in the specified order in the parameter list of the recipe step. You cannot move control strategy parameters. These are always displayed as the last object.

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the process tag type parameter in this text box.
Assigned data type	The data type assigned to the type parameter is displayed here. You must declare required user data types under the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Data type" button	Activating this button takes you to the corresponding data type. With the "Back" button of the data type, you return to beginning selection.
Assigned unit of measure	You can assign a unit to the selected type parameter from the drop-down list. The line is only shown in case of a possible assignment.
"Unit of measure" button	Activating this button takes you to the appropriate unit. With the "Back" button of the unit of measure, you return to this location.

Archive measured value	Select this check box if you wish to establish a connection to a WinCC archive tag for the instance parameters. This selection is required for assigning instance parameters to WinCC archive tags.
Test manufacturing instruction	A type parameter is selected here if it is to be provided in the batch log for the manual check (manufacturing instruction).
Events log ID	Here, you can specify a value from 0 to 65535 that can be evaluated later in a user batch report to allow filtering. Different values are permitted for setpoint and process value. This means, for example, that you could filter according to setpoints with setpoint ID < 1000 AND setpoint ID ≥ 500 and according to process values with process value ID ≤ 2000. The user can specify how convenient such a query is in his log software.

Parameters

Button	
Delete	Click "Delete" to delete the selected process tag type parameter.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Instances: Display

All the instance parameters that refer to this process tag type parameter are listed in a dialog.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.28 "Process tag type parameter" selection for the TRANS block

Process tag type parameters selection

In the list "Process cell data" you have selected the object "process tag type parameters".

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the process tag type parameter in this text box.
Allocated data type	Allocate the desired data type to the type parameter. All standard data types and user data types are available for selection. You must first specify user data types you require in "Data types".
Allocated unit of measure	Allocate the physical unit of measure to the type parameter. You must first specify units of measure you require in "Unit of measure".
"Unit of measure" button	Activating this button takes you to the appropriate unit. With the Back button of the unit of measure, you return to this location.
Parameters	Here, one of the available parameter names of a TRANS block is selected: • Parameter of the data type Boolean: TP1 to TP10 • Parameter of the data type floating point: TP11 to TP20
Archive measured value	Here, you select a type parameter when you require a connection to a WinCC process tag. This selection is necessary for the assignment of type parameter -> process tag archive tag that you then make in the instance parameter of the corresponding operation type.
Check manufacturing instruction	Here, you select a type parameter if it is intended for manual testing (manufacturing instruction) in the batch report.
Move up/Move down	Opening the type in the process cell tree displays all process tag type parameters for a selected process tag. By selecting and dragging them with the mouse these can be moved to any location within a process tag type. In the sequence thus specified the parameters of this process tag type are displayed for recipe creation in the parameter list of the recipe step.
Data type	Clicking this button jumps to the corresponding Batch data type. With the Back button of the Batch data type, you return to this location.

Note

Editing, creating, and deleting batch types is only possible in the single project or in the multiproject. In all other projects, the type descriptions are read-only!

Parameter

Button	
Delete	Deletes the selected process tag type parameter.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Instances: Display

All the instance parameters that refer to this process tag type parameter are listed in a dialog box. Certain attributes can be selected using a filter.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.29 "Process tag instance parameters" selection

Process tag instance parameters selection

You have selected the "Process tag instance parameters" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the process tag type parameter in this text box.
Runtime name	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart Not possible in the multi-project.	CFC chart name in which the block is placed. Click on the "Open" button to open the appropriate CFC chart and select the block.
Measured value Not possible in the multi-project.	With "Generate/update archive tags" option selected (object property of the OS): The assigned archive tag is displayed read-only in this case. With "Generate/update archive tags" option cleared (object property of the OS): In this case, an assignment to a WinCC archive tag must be made after selecting the Measured variable check box for the type parameter. To do so, select this line and select the arrow displayed on the right to open the WinCC archive tag dialog. In this dialog, it is possible to search for all WinCC archive tags of all available operator stations of the project or for all projects of a multiproject.
Parameters	Activating this button takes you to the corresponding process tag type parameter. With the "Back" button of the process tag type parameter, you return to this location.

Parameters

Button	
Compile Not possible in the multi-project.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

Not possible in the multiproject	
"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.30 "Process cell" selection (V4.02)

Process tag selection

In the "Process cell data" list you have selected the "process tag" object.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	Description: You can display or enter the description of the interface block in this text box. You can enter a descriptive text in the object properties in the SIMATIC Manager.
Runtime name	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is located.
"Open" button Not possible in the multi-project.	Click on the "Open" button to open the appropriate CFC chart and select the block.
Assigned process tag type	Typing definition for process cell neutral recipe creation.
"Type" button	Clicking this button jumps to the corresponding process tag type. With the Back button of the process tag type, you return to this location.

Bloc

Button	
Compile This button only exists for a project and not for a multiproject.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

Not possible in the multiproject.	
"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

"OK" button

Saves your settings and ends the dialog.

"Apply" button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.31 "Process tag" selection

Process tag selection

In the "Process cell data" list you have selected the "process tag" object.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	Description: You can display or enter the description of the interface block in this text box. You can enter a descriptive text in the object properties in the SIMATIC Manager.
Runtime name	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is located.
Open button Not possible in the multi-project.	Click on the "Open" button to open the appropriate CFC chart and select the block.
Assigned process tag type	Typing definition for process cell neutral recipe creation.
Type button	Clicking this button jumps to the corresponding process tag type. With the Back button of the process tag type, you return to this location.

Bloc

Button	
Compile This button only exists for a project and not for a multiproject.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.32 "Process tag parameters" selection

Process tag parameter selection

In the list "Process cell data" you have selected the object "process tag parameter".

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the interface block is displayed In this text field. Description texts are entered in the object properties in the SIMATIC Manager.
Run time name	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is located.
"Open" button Not possible in the multiproject.	Click on the "Open" button to open the appropriate CFC chart and select the block.
"Parameters" button	Clicking this button takes you to the corresponding process tag type parameter. With the Back button of the process tag type parameter, you return to this location.

Bloc

Button	
Compile This button only exists for a project and not for a multiproject.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

Not possible in the multiproject	
"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

"OK" button

Saves your settings and ends the dialog.

"Apply" button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.33 "Equipment properties" selection

Equipment properties selection

In the list "Process cell data" you have selected the object "Equipment properties". Equipment properties are created, deleted and edited in the "Shared declarations - Units of measure" folder of the project in the SIMATIC Manager.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data The "Delete" command is available in he context menu; its function is described under the Equipment properties.

Properties

Name of the object selected in the process cell tree.

Equipment properties

Button	
Delete	Click on the "Delete" button to open the "Delete equipment properties" dialog. Click "Yes" to delete all unused equipment properties in SIMATIC BATCH. When you use the "Generate" function in the Batch configuration dialog, the equipment properties are loaded again from the ES. This function is practical when you have declared equipment properties that are not relevant for SIMATIC BATCH.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display box	The number of warnings for the selected log is displayed.
"Display" button	The logging function is enabled with the "Display" button. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. If "Process cell" is selected and you click the "Display" button, all errors or warnings of the process cell are displayed. You can also right-click on a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.34 "Equipment properties parameters (type)" selection

Equipment property parameters selection

In the list "Process cell data" you have selected the object "Equipment properties parameter". You can only change and use the properties and functions of the selected object with versions 5 and 6i.

All the information displayed in this dialog originate from the shared declarations you have configured in the SIMATIC Manager.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	You can display or enter the description of the equipment properties parameter in this text box.
Allocated data type	This displays the assigned data type. Required user data types must be declared under global declarations and must be made available to SIMATIC BATCH through the "Generate" button.
Assigned "unit of measure"	This displays the assigned unit of measure. You must declare required units of measure under the shared declarations and make them available by using the "Generate" function in SIMATIC BATCH.
"Data type" button	Activating this button takes you to the appropriate data type. Use the Back button on the data type to return to the initial selection point.

Parameter

No function.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Instances: Displays.

All the instance parameters that refer to this type parameter are listed in a dialog box. Certain attributes can be selected using a filter.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.35 "Equipment property parameters (instance)" selection

Equipment property parameters (instance) selection

You have selected the "Equipment property parameters (instance)" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	General comment on this object.
Setpoint	Value specified in the plant view under Unit > Object properties > BATCH attributes.
Parameters	Activating this button takes you to the corresponding equipment property type. With the "Back" button, you return to this location.

Batch process cell

No function.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.36 Selection "unit"

Unit selection

You have selected the "Unit" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the unit is displayed in this text box. You enter description texts in the object properties for the unit in SIMATIC Manager.
Predecessor/successor	This is where the predecessor or successor (unit) assigned in the plant hierarchy of the unit properties on the "ISA-88 type definition" tab is displayed.
Available	If you have activated the "Unit available for batches" option in the properties dialog of the unit in the plant hierarchy, then there is a tick in the option box. If the option is not used then there is no tick in the options box.
Runtime name	The runtime name is automatically during compiling/merging of the batch instances and displayed here. It corresponds to the WinCC tag name plus the OS name as prefix.
CFC chart	The name of the CFC chart configured for the unit is displayed here.
"Open" button Not possible in the multiproject.	Click on the "Open" button to open the appropriate CFC chart and select the block.
Connection UNIT_NAME	If you have specified an identifier for the UNIT_NAME parameter of the UNIT_BLOCK block, it is displayed here and used in the subsequent recipe creation. If no identifier was specified for this parameter, the entry is empty and the name of the hierarchy folder is used in the subsequent recipe creation. The reason for this is that the identifiers of hierarchy folders in the PH often have a naming scheme and a unit name cannot therefore be freely selected. To make this possible however, the UNIT_NAME parameter can be used in the UNIT_BLOCK block.

Unit

Button	
Compile This button only exists for a project and not for a multiproject.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

Not possible in the multiproject	
"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.37 "Equipment module (EMOD)" selection

Equipment module selection

In the list "Process cell data" you have selected the object "Equipment module".

Display field under dialog title

Logical path display

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	A description of the equipment module is displayed in this text box. You can enter a descriptive text in the object properties for the unit in the SIMATIC Manager.

Equipment module

No function.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.38 "Neutral folder" selection

Neutral folder selection

In the list "Process cell data" you have selected the object "Neutral folder".

Display field under dialog title

Logical path display

Process cell data

For navigation in the process cell data

Properties

Name of the object selected in the process cell tree.	
Description	A description of the equipment module is displayed in this text box. You can enter a descriptive text into the object properties of the neutral folder in the SIMATIC Manager.

Neutral folders

No special functions are available after selecting the "Neutral folder" object in the process cell tree.

Note

Neutral folders are used only to group units or equipment modules so that the arrangement in the process cell tree is clearer. CFC charts with BATCH modules, which are located directly in a neutral folder are not taken into consideration by BATCH Engineering.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The "Display" button activates the log. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button always shows all errors/warnings for the selected "Process cell". Moreover, on a selected object you can right-click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

The batch instances configured in the selected folder are displayed via the "Display" button.

"OK" button

Saves your settings and closes the dialog.

"Apply" button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

"Cancel" button

Closes the dialog without saving changes.

"Help" button

Opens the SIMATIC BATCH online help for this context.

15.1.12.39 "EPH" selection

EPH equipment phase selection

You have selected the "EPH equipment phase" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the equipment module is displayed in this text box. You enter description texts in the object properties in SIMATIC Manager.
Runtime name:	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is placed.
Assigned phase type:	Type definition for process cell-neutral recipe creation.
"Type" button	Activating this button takes you to the corresponding phase type. With the "Back" button of the phase type, you return to beginning selection.
Control strategies:	If the assigned phase type was defined as a control strategy type, you can exclude certain control strategies from the control strategies defined for the type using the "Change" button. The control strategies excluded in this manner will no longer be available for this instance in batch control. For SFC types this is not possible because the control strategies are defined in the block. If a control strategy is not defined the line will not be displayed.
"Change" button	Use the "Change" button to exclude certain control strategies from all the control strategies defined on the type.
"Open" button not possible in the multiproject.	Click on the "Open" button to open the appropriate CFC chart and select the block.

Block

No function.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.40 "EPH parameters" selection

EPH parameters selection

You have selected the "EPH parameters" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the equipment module is displayed in this text box. You enter description texts in the object properties for the unit in SIMATIC Manager.
Runtime name	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is placed.
Setpoint	This displays the setpoint defined for the parameter of the corresponding block in the CFC chart. The following applies: "low limit <= setpoint <= high limit". The validity is checked during validation.
"Parameters" button	Activating this button takes you to the corresponding phase type parameter. With the "Back" button of the phase type parameter, you return to beginning selection.
Measured value	With the "Generate/update archive tags" option activated (object property of the OS): In this case, the assigned archive tag is read-only. With the "Generate/update archive tags" option deactivated (object property of the OS): In this case, after the "measured variable" check mark is set for the type parameter, an assignment to a WinCC archive tag must be made here. By selecting this line, an arrow is displayed on the right. Selecting this arrow in turn opens the WinCC archive tag browser. With this dialog it is possible to browse any WinCC archive variable of all available OS's of the project or all projects of a multiproject.
High limit	This displays the high limit of the setpoint defined for the parameter of the corresponding block in the CFC chart. The high limit is displayed for the data types REAL, INTEGER, Input and Output material. The Boolean, string and user data types do not have any limits.
Low limit	This displays the low limit of the setpoint defined for the parameter of the corresponding block in the CFC chart. The low limit is displayed for the data types REAL, INTEGER, Input and Output material. The Boolean, string and user data types do not have any limits.
Setpoint	This displays the setpoint defined for the parameter of the corresponding block in the CFC chart. The following applies: "low limit <= setpoint <= high limit". The validity is checked during validation.

Block

No functions.

Log

Not possible in the multiproject	
"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.41 "EOP" selection

EOP equipment operation selection

You have selected the "EOP equipment operation" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the equipment operation is displayed in this text box. You enter description texts in the object properties in SIMATIC Manager.
Process cell component grouping	Runtime name: Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is placed.
"Open" button Not possible in the multi-project.	Click on the "Open" button to open the appropriate CFC chart and select the block.
Assigned operation type	Type definition for process cell-neutral recipe creation.
"Type" button	Activating this button takes you to the corresponding operation type. With the "Back" button of the operation type, you return to beginning selection.
Control strategies	If the assigned operation type was defined as a control strategy type, you can exclude certain control strategies from the control strategies defined for the type using the "Change" button. The control strategies excluded in this manner will no longer be available for this instance in batch control. For SFC types this is not possible because the control strategies are defined in the block. If a control strategy is not defined the line will not be displayed.
"Change" button	Use the "Change" button to exclude certain control strategies from all the control strategies defined on the type

Batch process cell

Buttons	
Compile This button only exists for a project and not for a multiproject.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.42 "EOP parameters" selection

EOP parameters selection

You have selected the "EOP parameters" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	Description: The description of the equipment module is displayed in this text box. You enter description texts in the object properties for the unit in SIMATIC Manager.
Runtime name	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is placed.
"Open" button Not possible in the multi-project	Click on the "Open" button to open the appropriate CFC chart and select the block.
High limit	This is where the high setpoint limit is displayed that was defined on the parameter of the appropriate block in the CFC chart. The high limit is displayed for the data types REAL, INTEGER, input and output material. The Boolean, string and user data types do not have any limits.

Low limit	This displays the low limit of the setpoint defined for the parameter of the corresponding block in the CFC chart. The low limit is displayed for the data types REAL, INTEGER, input and output material. The Boolean, string and user data types do not have any limits.
Setpoint	This displays the setpoint defined for the parameter of the corresponding block in the CFC chart. The following applies: "low limit <= setpoint <= high limit". The validity is checked during validation.
"Parameters" button	Activating this button takes you to the corresponding phase type parameter. With the "Back" button of the phase type parameter, you return to beginning selection.

EOP parameters

Button	
Compile Only for single project not for multiproject	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.43 "Batch types in project removed for editing" selection, master characteristic

Batch types in project removed for editing selection

In the list "Process cell data" you have selected the object "Batch types" in project removed for editing. Master characteristic.

Run time name in the dialog header

Display of the run time name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You describe your batch types in this text box.
Last changed on	The most recent change of the batch types are specified with date and time.

Batch types

Button	
Generate	Use this button to start the dialog "Generate types - entire process cell" to generate or import the batch types. All SFC types (EPH, EOP), all BATCH interface blocks in the CFC charts from which the types are generated and the shared declarations (enumerations, units, and equipment properties) are loaded from the projects you have selected.

Log

"Errors" display field	The number of errors for the selected log are displayed.
"Warnings" display field	The number of warnings for the selected log are displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file with the specified layout and displayed in the Internet Explorer. The "Display" button is always shows all errors/warnings for the selected "Process cell". Moreover on a selected object you can right click to select the "Display Log" dialog to also show object-specific errors or warnings.

Additional functions

Print	Prints all batch types of the process cell in tabulated form.

OK button

Saves your settings and ends the dialog.

Apply button

Your settings will be saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.44 "Batch types in project removed for editing" selection, slave characteristic

Batch types in project removed for editing selection

You have selected the "Batch types in project removed for editing" object in the "Process cell data" list. Slave characteristic.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You describe your batch types in this text box.
Last changed on	The most recent change of the batch types is specified with date and time.

Batch process cell

Button	
Generate	Use this button to start the dialog "Generate types - entire process cell" to generate or import the batch types. All SFC types (EPH, EOP), all BATCH interface blocks in the CFC charts from which the types are generated, and the shared declarations (enumerations, units, and equipment properties) are read in from the projects you have selected.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Button	
Print	Prints all batch types of the process cell in tabular form.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.45 Convergence of "Batch instances" selection

Batch instances selection

You have selected the "Batch instances" object in the "Process cell data" list.

Display field under dialog title

Logical path display

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	Enter a description for the batch instances in this text box.
Last changed on	This displays the local time stamp of the last change for the batch instances.

Batch instances

Button	
Merge	If projects with process cells, standardized according to ISA-88, are located in your PCS 7 multiproject, the button is then activated or useable. Pressing this button opens the "Merge/compile" dialog for all the projects available in the multiproject. This action also effectively results in the propagation of all selected projects.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click "Display" to show all process cell errors or warnings. You can also right-click on a selected object and select the "Display Log" function to display object-specific errors or warnings.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.46 Translate "Batch instances" selection

Batch instances selection

You have selected the "Batch instances" object in the "Process cell data" list.

Display field under dialog title

Logical path display

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	Enter a description for the batch instances in this text box.
Last compiled on	Local time stamp of the last compilation.

Batch instances

Button	
Compile	If a process cell, standardized according to ISA-88, are located in your PCS 7 project, the button is then activated or useable. All batch instance blocks of all CFC charts in the project (UNIT/EPH/EOP, EPAR*, IUNIT/IEPH/IEOP, IEPAR, TAGCOLL and SFC type blocks) are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88. The validity errors and validity warnings are displayed in the log field and can be visualized using the "Display" button.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.47 Selection of "batch types in the multiproject"

Batch types in the multiproject selection

You have selected the "Batch types in the multiproject" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You describe your batch types in this text box.
Last changed on	The most recent change of the batch types is specified with date and time.

Batch types

Buttons	
Propagate	This button opens the dialog box for selecting projects involved in the propagation of Batch types. After running this function, the type description of all selected projects is consistent.
Generate	Use this button to start the dialog "Generate types - entire process cell" to generate or import the batch types. All SFC types (EPH, EOP), all BATCH interface blocks in the CFC charts from which the types are generated, and the shared declarations (enumerations, units, and equipment properties) are loaded from the projects you have selected.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Buttons	
Print	Prints all batch types of the process cell in tabulated form.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.48 Selection of "BATCH types in the project of a multiproject"

Batch types in the project of a multiproject selection

You have selected the "Batch types in the project of a multiproject" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	A description of your batch types is displayed in this text box.
Last changed on:	The most recent change of the batch types is specified with date and time.
Status display	This shows the current status of the batch types in the project. The status display can show the following three states: 1. Up-to-date: All information on the batch types of the project agree with the batch types of the multiproject. 2. Not up-to-date: All information on the batch types of the project doe not agree with the batch types of the multiproject. 3. ????????: This status occurs when a project is removed non-editable from a multiproject for editing. A statement on the status of the batch types in the project is not possible in this case.

Batch types

Button	
Update	With the "Update" button, you update the batch types in your project which is a component of a multiproject. In other words, the batch types of the multiproject are read in.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Print: This prints all batch types of the process cell in tabular form.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.49 Selection of "BATCH types in the project"

Batch types in the project selection

You have selected the "Batch types in the project" object in the "Process cell data" list.
Definition of project: This is a standalone PCS 7 project.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	You describe your batch types in this text box.
Last changed on	The most recent change of the batch types is specified with date and time.

Batch types

Button	
Generate	With this button, you start to generate or read in the batch types. All SFC types (EPH, EOP) and all BATCH interface blocks in the CFC charts from which the types are generated are read in.

Log

Drop-down list box	Logging for the generation is offered.
"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Print: This prints all batch types of the process cell in tabular form.

Note

Editing, creating and deleting batch types is possible only in a project of multiproject or in a multiproject but not in a standalone project.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.50 "AF" selection

Equipment procedural element selection

In the list "Process data" you have selected the object "Equipment procedural elements".

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the interface block is displayed in this text box. You enter description texts in the object properties in SIMATIC Manager.
Runtime name	Corresponds to the WinCC variable name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is placed.
"Open" button Not possible in the multi-project.	Click on the "Open" button to open the appropriate CFC chart and select the block.
Assigned phase type:	Type definition for process cell-neutral recipe creation.
"Type" button	Activating this button takes you to the corresponding block type. With the Back button of the block type, you return to this location.

Block

Button	
Compile This button only exists for a project and not for a multiproject.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.51 "AF parameter" selection

AF parameters selection

You have selected the "AF parameters" object in the "Process cell data" list.

Runtime name in the dialog header

Display of the runtime name.

Process cell data

For navigation in the process cell data.

Properties

Name of the object selected in the process cell tree.	
Description	The description of the interface block is displayed in this text box. You enter description texts in the object properties in SIMATIC Manager.
Runtime name	Corresponds to the WinCC tag name plus the OS name as prefix.
CFC chart	CFC chart name in which the block is placed.
"Open" button Not possible in the multi-project.	Click on the "Open" button to open the appropriate CFC chart and select the block.
High limit	The high limit is omitted with the data types Boolean, string and user. This displays the high limit of the setpoint defined for the parameter of the corresponding block in the CFC chart. For process values, this value is always 0.
Low limit	The low limit is omitted with the data types Boolean, string and user. This displays the low limit of the setpoint defined for the parameter of the corresponding block in the CFC chart. For process values, this value is always 0.
Setpoint	This displays the setpoint defined for the parameter of the corresponding block in the CFC chart. "Low limit ≤ setpoint ≥ high limit". The validity is checked during validation. For process values, this value is always 0.
"Parameters" button	Activating this button takes you to the corresponding phase type parameter. With the "Back" button of the phase type parameter, you return to this location.

Parameters

Button	
Compile This button only exists for a project and not for a multiproject.	All batch instance blocks of the CFC chart of the selected object are read in. This also implicitly involves a check for consistency with the batch types and conformity to ISA-88.

Log

Not possible in the multiproject.	
"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

Additional functions

Display of possible additional functions.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.52 Download Batch process cell ...

Dialog box

The complete distribution of the batch process cell is displayed in this dialog box.

Component

If a download is necessary, the check boxes are set automatically and cannot be changed. After a successful download, the check box is deactivated again and can be reactivated.

PC station

The name of the higher-level PC station is displayed.

Target system

The computer name of the specific component is displayed.

Verify

For external target systems you can check whether the downloaded data are up-to-date by clicking the button in this column. With this action the system checks whether the target computer can be reached and whether the data are up-to-date. The result is displayed in the "Status" column.

Click on the button in the column header to check all components.

Note

Components of local target systems are checked automatically.

Status

The following status displays are possible:

Check BATCH installation	There is no BATCH installation on the target computer.
Check WinCC installation	There is no WinCC installation on the target computer.
Check sharing	The BATCH folder "sbdata" is is not correctly shared or the share name is not "BATCH". Permissions or release name must be checked.
Unreachable	Remote PC station is not reachable, download is not possible.
Project checked out	The project with the required components is checked out.
Not downloaded	No process cell data has been downloaded yet. The download can be started.
Downloaded	Process cell data downloaded. A new download process can be triggered.
No longer up-to-date	The downloaded data is no longer up-to-date. A new download process can be triggered.
System error	There was a system error when downloading.
Check/download OS	The OS has not yet been correctly downloaded.

Start

Activates the download process.

15.1.12.53 Generate types

Dialog box

In this dialog box you start generating or importing the batch types of all included projects. The following will be imported:

- SFC types of the category EPH or EOP
- User function blocks with the UDA "S7_tagcollect", V6-TAG_COLLECT
- BATCH interface blocks in CFC plans

If a compare should be necessary beforehand, then propagation to all relevant projects will be executed by the system.

Project

Name of all projects of the multiproject with a batch process cell.

Note

Projects that have been removed for processing are indicated by a transparent symbol. You cannot generate batch types of these projects; the check box is grayed out.

Include

If you activate the check box in the column header, the types for all projects will be generated. In the column you can also activate projects individually for inclusion.

Path

Paths of all projects of the multiproject with a batch process cell.

Process cell

Name of the plant hierarchy process cell from the ES.

Type status

The following status displays are possible:

- Up-to-date: The local types are identical to the types of the multiproject (master).
- Not up-to-date: The local types are not identical to the types of the multiproject (master).

Result

The following results are possible:

- OK
- Error. See the "Generate" log for details.

Start

Starts to generate all batch types.

15.1.12.54 Propagate types

Dialog box

In this dialog box the batch types of the multiproject are propagated for all included projects. After executing the "Propagate types" function, the batch types will be up-to-date in the included projects. If a compare of the CFC charts should be required then this will be executed automatically.

Project

Shows all projects of the multiproject with a batch process cell.

Note

Projects that have been removed for processing are indicated by a transparent symbol. The batch types cannot be propagated on these projects; the check box is grayed out.

Include

If you activate the check box in the column header, all batch types for all projects will be propagated. In the column you can also activate projects individually for inclusion.

Path

Paths of all projects of the multiproject with a batch process cell.

Batch process cell

Name of the batch process cell project.

Type status

The following status displays are possible:

- Up-to-date: The local types are identical to the types of the multiproject (master).
- Not up-to-date: The local types are not identical to the types of the multiproject (master).

Result

Results of the propagate action. Specifically the following results are possible:

- OK
- Error. See the "Propagate" log for details.

Start

Starts the propagate process. All batch types of the multiproject will be propagated on all selected projects.

15.1.12.55 Merge/compile

Dialog box

All batch-relevant projects of the multiproject are displayed in this dialog. Batch-relevant projects are those with a batch and PH process cell object. If there is no current compile in the respective project the check box will be activated automatically in the Compile column. If the check box is not activated then the existing unit data will be used for merging.

No longer up-to-date batch types will be updated prior to compiling. A necessary compare of the CFC charts with the batch types will be executed automatically.

Project

Here all projects of the multiproject with a batch process cell are listed.

Note

Projects of a multiproject that have been removed for editing are indicated by a transparent symbol. Such projects cannot be compiled because the check box is grayed out.

Include

If you want take all units in the projects into account when merging, activate the check box in the column header. Non-activated check boxes will not be taken into consideration when merging.

Note

If a compile of a project is required then the check box for compile will be activated automatically.

When including projects that have been removed for editing, a copy of the last status will be used for the merge. Note in this regard that the compile of the project that is removed for editing may be more up to date than the copy. This status is indicated in the appropriate table cell by a colored background.

Compile

If you want to compile all units in the projects prior to merging, activate the check box in the column header. Non-activated check boxes will not be taken into consideration when compiling. In this column you can also activate individual projects for the compile.

Path

Paths of all projects of the multiproject.

Batch process cell

Name of the batch process cell object.

Note

In projects that are removed for editing you can supplement the batch types of all batch process cells with operation, phase, and process tag types. These batch process cells are indicated by a special marking, a blue bar.

Type status

The following status displays are possible:

- Up-to-date: The local types are identical to the types of the multiproject (master).
- Not up-to-date: The local types are not identical to the types of the multiproject (master). Propagate your batch types.

Note

The type status of the compile copy is displayed for projects that are removed for editing. Note in this regard that the batch types in the project that has been removed for editing may be more up-to-date than the batch types in the multiproject.

Compile status

Displays the results of the specific actions (propagate, update, and compile).

Start

Starts the compile and merge.

15.1.12.56 Check/convert ES data

Introduction

After installation of a new CFC/SFC version it may be necessary to convert the database format. The BATCH configuration dialog will not open without a check.

Start

Click on the "Start" button to check whether a format conversion is necessary. If a format conversion is not necessary then this will be indicated by a green dot with the designation "OK" in the "Convert format" column. If format conversion is necessary then this will start immediately after the format check.

Close

Closes the dialog.

15.1.12.57 "Distribution" tab

Dialog box

The distribution of the batch process cell is displayed in this dialog box. Specifically these are the target computers of the following components:

- Batch database server - master
- Batch database server - standby
- BATCH server
- BATCH Server - standby
- BATCH Client.

Note

Distribution of master or standby components to different target systems is not permitted.

PC station

All PC stations defined in the project for the individual server components are listed in a drop-down list. For example, if the project contains multiple BATCH servers, you can decide which BATCH server is to be used for the process operation (runtime). If you change the PC station of a component, then the other components will be automatically changed over to the selected PC station. Consequently only permissible distributions are possible. Where you change the assignment is up to you.

Target system

The computer name of the PC station of the specific component is displayed.

Update

Use this button to re-import the distribution topology and thus update the data in this dialog.

To ensure that all externally changed data have been correctly taken into consideration in an action in the "Configure batch process cell" configuration dialog, you should use this function before executing such an action.

15.1.12.58 "OS objects" tab

Settings in the "OS objects" tab

Information relating to all operator stations (PCS 7 OS) of the project, or relating all projects of the multiproject is displayed in this dialog. In addition specify here the OS that will be used as message OS. The batch messages will only be transferred to this selected OS.

All column information is not filled in for the standby OS and OS client.

Operator stations

- **Message texts**
  Select the OS in which the batch message texts will be downloaded via the "Transfer messages" button. This OS is the operator station with which the BATCH control server (BCS) will communicate in process operation. Only one OS can be selected as message OS.
- **Name**
  Listing of the names of all operator stations of the project, or all projects of the multiproject.
- **Target system**
  Listing of the computer names of the respective target OS.
- **Project type**
  The project type of the operator station is displayed, standalone, or multiple-station project.
- **Symbolic computer name**
  Display of the symbolic computer name of the respective OS. The symbolic computer name is comprised of the S7 project name and the name of the OS, separated by an underscore.
- **Create/update archive variables**
  Display of the status of the check box "Create/update archive variables" from the dialog "Properties - OS", in the "Target OS and standby OS" tab.
- **Project**
  Name of the project of the operator station. This column is only displayed for multiprojects.
- **Path**
  Path of the project of the operator station. This column is only displayed for multiprojects.

Update

Click on this button to re-import the information of the operator stations, and thus update the data in this dialog.

To ensure that all changed data have been correctly taken into consideration for an action from the SIMATIC BATCH configuration dialog, "Configure batch process cell', you should execute this function prior to any such action.

15.1.12.59 "Project languages" tab

Display language and languages installed in project

This dialog shows information on all the configured languages in the PCS 7 project. The information shown originates from the language settings made in SIMATIC Manager.

In the table column "Display language" the languages set in the SIMATIC Manager dialog "Change language" are shown as active. The dialog can be opened in SIMATIC Manager via **Options > Multilingual text management > Change language**.

In the table column "Languages installed in project" the languages set in the dialog "Add, remove language, set default language" or the languages that are set as default are shown. The dialog can be accessed in SIMATIC Manager via **Options > Languages for display devices**.

15.1.12.60 "System characteristics" tab

Dialog box

The system characteristics of the batch process cell is displayed in this dialog. The dialog is organized in the following areas:

- Startup characteristics with time information
- Runtime characteristics with time information for monitoring and a setting for units
- Disable batch data management and set the message language
- Downloading a batch process cell without compiling and downloading the basic configuration

Times

The entered times indicate when a time-out should be reported for the BATCH Server applications when booting or ending. Since these times depend on certain supplementary conditions, e.g. size of the batch process cell (Pcell), computer power, etc., they should not be selected too small.

Default: Startup 300 s and exit 90 s.

Monitoring times

SIMATIC BATCH offers you the possibility of monitoring the communication capability of the BATCH server on a project-specific basis from the participating automation systems.

Monitoring is performed by the "UNIT_PLC" unit block, which can be allocated by SIMATIC BATCH. The BATCH server sets the LIFE input of the allocated "UNIT_PLC" blocks cyclically at approximately one third of the configured monitoring time. If this sign of life does not arrive within the monitoring time, the "UNIT_PLC" block sets the output "AS_OS_ERR" to 0. If the sign of life is sent again, the "AS_OS_ERR" output is reset to 1. This allows you to react to the missing communication link to the BATCH server in the automation system. The monitoring is

only performed when you specify a time not equal to 0. You cannot set a value less than 15 seconds.

Additional information: Communication monitoring (Page 231)

Units

If you select the check box, all text entries (batch name, batch ID, product, product version, recipe, recipe version, as well as formula) in the "UNIT_PLC" block and in the corresponding faceplate are deleted when the corresponding unit has been released.

If you clear the check box, only the text entries (batch name and batch ID) are deleted in the block and in the "UNIT_PLC" faceplate. All other text entries remain intact when the appropriate unit has been released.

Deactivate batch data management (CDV)

If you select the check box, the BATCH component "CDV" is deactivated. With this setting, BATCH messages and process values are not collected by the CDV. This data is missing in reports and archives. A corresponding note is output in the print preview and in the batch report. This setting is not changed over during operation. Download the change in the BATCH engineering to the BATCH server in the BATCH configuration dialog. Stop BATCH Runtime and the BATCH project in the BATCH Launch Coordinator. Then, restart the project and Runtime.

The check box is cleared by default.

Message language

Select the language in which the batch data management (CDV) will collect the BATCH messages from a drop-down list box.

Downloading a batch process cell

If you select the check box, you can download the BATCH process cell to the BATCH server despite changes in the basic engineering (SFC and CFC) that have not been compiled and downloaded to the AS.

The check box is cleared by default. This means that downloading the batch process cell is only possible if you have also compiled and downloaded the current data from the basic engineering to the AS.

15.1.12.61 "Process cells" tab

Introduction

This tab is only available for a multiproject.

The dialog is used to display process cell names, and if the names do not agree, then to make a necessary name adaptation. Due to the SIMATIC BATCH configuration guidelines it is

necessary to establish name agreement between plant hierarchy process cell and batch process cell over all projects of a multiproject.

Batch process cell name of the multiproject

In this input field you can assign a new name for your batch process cell. When exiting the dialog with the "OK button all batch and plant hierarchy process cells will be renamed to this name.

S88 process cells only

The check box is activated per default. Thus in the table below only plant hierarchy process cells that have the ISA S88 type definition will be displayed.

Project

Name of the project.

Path

Display of the project path.

Batch process cell

Name of the Batch process cell.

Process cell

This table column is only displayed if the check box "S88 process cells only" is activated.

If the names are the same in the multiproject, this is a display field.

If the names are not the same in the multiproject, this is an input field. The names that deviate from the names of the batch process cell are displayed with a red font. This means that you must establish the same names. Either rename the names displayed in red uniformly, rename all names displayed in black, or use a new name.

Note

If the names do not agree then all process cell names can only be renamed if all projects are added in the multiproject.

PH folder

This table column is only displayed if the check box "S88 process cells only" is deactivated.

All 1st level hierarchy folders from the ES are displayed.

If a name conflict occurs when renaming a process cell (ISA-88 type definition), the name of the respective PH folder can be changed here.

Update

This button reads in the process cell topology again and therefore updates the data in this dialog.

To ensure that all changed data have been correctly taken into consideration for an action from the SB configuration dialog, "Configure batch process cell', you should execute this function prior to any such action.

15.1.12.62 "Chart folder" tab

What tasks do you perform in the "Chart folder" tab?

In the "Chart folder" tab, you update, compile and download the charts of your S7 program and the memory blocks required for AS-based mode to the AS. If you use a multiproject, each project can contain an AS and therefore a chart folder in which the charts must be compiled as program and downloaded.

Requirements for AS-based mode

- To be able to use the "AS-based" mode, the memory configuration for code and data must be specified in MB in the BATCH configuration dialog in the properties of the CPU as well as the percentage of this memory allocated to the recipe logic.
- For each AS, there must be a CFC chart (@ASB_Mem) in which the memory blocks (MemIDB64) are placed. Depending on your settings for the memory configuration, the number of CFC charts and the memory blocks contained in them will be recalculated and adapted according to a formula by the system. This adaptation may mean regenerating, adding or deleting CFC charts or memory blocks and is performed automatically by the system when updating if changes were made in the basic engineering. Remember that the number of CFC charts is decisive for the memory space on the AS.
- Before these configurations can be undertaken by the system, the SIMATIC BATCH blocks must be already installed and included in the block folder of the project.

How are the dialog and its tabs displayed?

You open the "Compile/Download" dialog if you have selected the "Stations" folder or the "SIMATIC station" folder in the BATCH configuration dialog and then click the "Compile / Download..." button. Then click on the "Chart folder" tab.

Layout of the tab

The meaning of the column headers, the information contained in the table, and the functions that can be used (buttons and check boxes) are described below.

Name

Name of the CFC chart @ASB_Mem containing the MemIDB64 memory blocks. The CFC chart originates from the chart folder in the basic engineering.

"Update" check box

If you select the check box in the "Update" column header or below the individual object and then click the "Start" button, the system recalculates and adjusts the number or memory blocks. This means that changes in the basic engineering are adopted.

Name

Name of the folder containing the CFC/SFC charts and SFC types. Name of the S7 chart folder.

"Compile" check box

If you select the "Compile" check box in the column header or below the individual object and then click the "Start" button, the "Compile program" dialog is displayed. Here you can set the scope for compiling the charts as a program. If you then click the "OK" button, the compilation is started according to your settings. At the end of the compilation, the relevant log is displayed.

The symbols for the "Compile" and "Download" functions are as follows:

Symbol	Meaning
	The object must be compiled/downloaded
	The object was not compiled/downloaded. Check the log for the action. Click the button in the "Log" column and repeat the action.
	The object was successfully compiled/downloaded, however with warnings. Click the "Log" button to view the warnings.
	The object was successfully compiled/downloaded.

Operating mode

The availability of the AS is checked.

"Download" check box

If you select the "Download" check box in the column header or below the individual object and then click the "Start" button, the "Download S7" dialog is displayed. Here, you can set the download mode. If you then click the "OK" button, the download to the AS is made. At the end of the download, the relevant log is displayed.

"Log" button

Each object listed in the table corresponds to an S7 chart folder of a project. For each object row, there are two buttons in the "Log" column. If you click the left button, the BATCH validation of the stations is displayed. If you click the right button, the result logs of compiling and downloading the S7 program will be displayed.

Project path

The "Project path" column displays the project path to your S7 program in the SIMATIC Manager. There you will find all the data blocks that will be downloaded to the AS.

Project

The "Project" column displays the name of your project in the SIMATIC Manager. Here, you will find the units.

Path

The "Path" column displays the storage path of your project on hard disk.

"Start" button

If you have enabled the selected objects for updating, compiling or downloading the "Start" button is enabled. If the necessary settings have not been made, the button is grayed out and cannot be used.

"Close" button

With this button, you close the "Compile/Download" dialog.

"Help" button

With this button, you display the relevant topic in the online help.

Additional information

"CPU" selection (Page 920)

Obtaining the memory configuration and setting the allocation (Page 220)

15.1.12.63 "Connections" tab

What tasks do you perform in the "Connections" tab?

In the "Connections" tab, you compile and download the station and connection configuration created in HW Config and NetPro. The functions from basic engineering are used.

How are the dialog and its tabs displayed?

You open the "Compile/Download" dialog if you have selected the "Stations" folder or the "SIMATIC station" folder in the BATCH configuration dialog and then click the "Compile / Download..." button. Then click on the "Chart folder" tab.

Layout of the tab

The meaning of the column headers, the information contained in the table, and the functions that can be used (buttons and check boxes) are described below.

Name

Name of the connection table from the basic engineering. A connection table is opened in NetPro.

"Compile" check box

If you select the check box in the "Compile" column header or below the individual object and then click the "Start" button, the network data from the connection table is saved and compiled in NetPro.

The symbols for the "Compile" and "Download" functions are as follows:

Symbol	Meaning
	The object must be compiled/downloaded
	The object was not compiled/downloaded. Check the log for the action. Click the button in the "Log" column and repeat the action.
	The object was successfully compiled/downloaded, however with warnings. Click the "Log" button to view the warnings.
	The object was successfully compiled/downloaded.

Operating mode

The operating mode of the AS is read out. If the AS cannot be reached, this status is displayed.

"Download" check box

If you select the check box in the "Download" column header or below the individual object and then click the "Start" button, the data from the connection table is downloaded to the target stations.

"Log" button

Each object listed in the table represents a row. For each object row, there is a button in the "Log" column. If you click the button, the result of compiling and downloading the connections will be displayed.

Project path

The "Project path" column displays the project path to your S7 program in the SIMATIC Manager. There you will find all the data blocks that will be downloaded to the AS.

Project

The "Project" column displays the name of your project in the SIMATIC Manager.

Path

The "Path" column displays the storage path of your project on hard disk.

"Start" button

If you have enabled the selected connections for compiling or downloading, the "Start" button is enabled. If the necessary settings have not been made, the button is grayed out and cannot be used.

"Close" button

With this button, you close the "Compile/Download" dialog.

"Help" button

With this button, you display the relevant topic in the online help.

15.1.12.64 "External process cells" selection

External process cells selection

All imported, external process cells are listed under the node.

Process cell data

For navigation in the process cell data.

External process cells in the navigation area

Button	
Update	A search is performed for imported, external process cells in SIMATIC Manager and the results are displayed in the navigation area of the dialog.
Generate	The locations of all external process cells are generated.
Compile	All instances of locations are complied together with the associated folder structure.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. You can also right-click on a selected object and select the "Display Log" function to display object-specific errors or warnings.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.65 "Process cell" selection

Selecting a process cell among external process cells

Batch types and instances of external process cells are listed under the process cell node.

Process cell data

For navigation in the process cell data.

Properties

Name of the process cell as a bold title. The name is specified in the source project and cannot be changed here.

Description: The description text for the external process cell is specified in the source project and cannot be changed here.

External process cell

Button	
Check validity	This checks whether all locations you have configured in the source project are plausible for SIMATIC BATCH and can be used.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and shown in Internet Explorer. Select "Process cell" and click on the "Display" button to show all process cell errors or warnings. You can also right-click on a selected object and select the "Display Log" function to display object-specific errors or warnings.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.66 Control strategies of...

In this dialog box, you assign the parameters to a control strategy. Later in batch control, only the parameters selected here are taken into account for this control strategy. If the control strategies are restricted for the instance (EPH or EOP) assigned to the phase type or operation type, only the control strategies enabled here can be used later in the recipe.

15.1.12.67 Parameter groups of the batch process cell

In this dialog box, you determine which dynamic parameters are assigned to which parameter group. The parameter groups are arranged in the rows and the parameters in the columns of a table. Select or clear the appropriate check boxes to specify the parameter group assignment. Your selection applies to the entire batch process cell and not to each specific unit.

Filter and filter properties
You can select a unit as a filter using the "Sorting by unit" entry in the drop-down list. The filter criterion limits the table display to the selected unit based on your selection.

- If no filter argument is selected, all parameter groups of the batch process cell are displayed in the rows. The columns display the dynamic parameters of all units that have instantiated the dynamic control strategy parameter. The parameter group assignment is enabled for all dynamic parameters.
- When you select a unit, all parameter groups assigned to this unit are displayed in the rows. The columns display all dynamic parameters of the units to which one of these parameter groups has been assigned. The parameter group assignment is enabled only for the dynamic parameters that match the unit used for filtering.

15.1.12.68 "Batch types" selection

Batch types selection

All imported equipment properties (locations) of the imported external process cell are listed under the node.

Process cell data

For navigation in the process cell data.

Properties

Name of the selected object in the process cell data as a bold title.

Description: Description text for batch types of the external process cell.

Last changed on: The last change of the batch types is specified with date and time.

Batch types

Button	
Generate	All configured equipment properties (locations) for SIMATIC BATCH are created.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging function is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click "Display" to show all process cell errors or warnings. You can also right-click on a selected object and select the "Display Log" function to display object-specific errors or warnings.

Additional functions

"Print" button: This prints all configured equipment properties of the process cell in tabular form.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.12.69 "Batch instances" selection

Batch instances selection

All imported equipment properties (locations of the units) of external process cells are listed under the node.

Process cell data

For navigation in the process cell data.

Properties

Name of the selected object in the process cell data as a bold title.

Description: Description text for batch instances of the external process cell.

Last change: The last change of the batch instances is specified with date and time.

Batch instances

Button	
Compile	All configured equipment properties (locations of the units) and their folder structure are created for SIMATIC BATCH.

Log

"Errors" display field	The number of errors for the selected log is displayed.
"Warnings" display field	The number of warnings for the selected log is displayed.
"Display" button	The logging is activated with the "Display" button. The selected log is generated as an XML file in the specified layout and displayed in Internet Explorer. Select "Process cell" and click the "Display" button to show all process cell errors or warnings. You can also right-click a selected object and select the "Display log" function to display object-specific errors or warnings.

OK button

Saves your settings and closes the dialog.

Apply button

Your settings are saved without closing the dialog. The button is only available if you have made changes in the dialog.

Cancel button

Closes the dialog without saving changes.

Help button

Opens the SIMATIC BATCH online help for this context.

15.1.13 Dialogs from within the SIMATIC Manager

15.1.13.1 "General" object properties tab of the batch process cell

Function

In this dialog field the general attributes of the batch process cell object are displayed.

Name:

You can change the name of the current object if a PH process cell of the same name does not exist in the ES.

Project path:

The logical path from the project to the current object via the components is displayed.

Storage location of project:

Physical path of the project.

Author:

Name of the configurator.

Date created:

Creation date of the object.

Last modified:

Date of the last change to the object.

Comment:

Enter a comment here to enter specific information about the object. A comment is optional.

15.1.13.2 "General" object properties tab of the BATCH applications

Function

The "General" tab provides information about the BATCH applications.

Short name:

A short description of the task of the application is displayed. The displayed brief information is stored for each component in the hardware catalog.

Name:

The name of the application is in the "Name" field; you can change this name in accordance with your specifications. If you change the short name, the new name appears in the SIMATIC Manager.

Comment

In this field, you can, for example, enter the purpose of the application.

Note

To change names or comments, open the object properties in HW config. Attention: The system does not check for identical names.

15.1.13.3 "Merge / Compile" tab

Introduction

All BATCH projects of the multiproject are displayed in this tab. BATCH projects are those with a batch and PH process cell object.

Note

You cannot download batch data and transfer messages in a removed BATCH project.

Generate types prior to compiling

Activate the check box if the batch types will be generated prior to the action "Merge/Compile". Not yet up-to-date batch types will be updated prior to compiling. A necessary compare of the CFC charts with the batch types will be executed automatically.

In the default setting, the check box is not enabled.

Note

The batch types will be generated from all projects in the multiproject.

Transfer messages

Select the check box if you want the BATCH messages transferred to the PCS 7 OS prior to the action "Merge/Compile". In the default setting, the check box is not enabled.

Batch process cells in the projects

This area of the dialog displays the batch process cells in the projects of a multiproject in the form of a table. One project of the multiproject is listed per row. Information about the project is shown in the relevant columns.

Project

In the "Project" column, you will see the name of the project.

Note

Projects that have been removed for editing are indicated by a transparent icon. Such projects cannot be compiled because the check box is grayed out.

Path

In the "Path" column, you will see the path of the project.

Batch process cell

The "Batch process cell" column displays the name of the batch process cell that you assigned in the BatchCC.

Note

In projects that are removed for editing you can supplement the batch types of all batch process cells with operation, phase, and process tag types. These batch process cells are indicated by a special marking, a blue bar.

Process cell

In the "Process cell" column, you will see the name from the plant view. This is the name that you assigned to the "Process cell" object type during the S88 type definition.

Note

The name of the batch process cell and the name of the process cell must be identical.

OK

Saves your settings and begins generation, merging of the base data and finally the compilation of the instances according to your settings. Make sure that messages cannot be transferred when an OS is active.

Cancel

Discards your settings and closes the dialog.

Help

Opens the help for this context.

Additional information

Compiling and Downloading Batch Process Cell Data (Page 224)

15.1.13.4 "Download" tab

Introduction

The complete distribution of your batch process cell is displayed in this tab. The "Status" column displays the status of all components involved using colored traffic light symbols. Based on the color scheme, you can quickly recognize which components need to be downloaded.

Possible components of a batch process cell that need to be downloaded to the destination systems.

- Batch database server (master/standby)
  - Project database
  - Offline database
  - Online database
- Batch server (master/standby)
- BATCH client

Component

If a download of individual components is necessary, the check boxes of these components are set automatically and cannot be changed. After a successful download, the check boxes are deactivated again and can be reactivated.

By selecting the check box in the "Component" column, all existing components are downloaded.

PC station

The name of the higher-level PC station is displayed.

Target system

The computer name of the specific component is displayed.

Verify

For external target systems you can check whether the downloaded data are up-to-date by clicking the button in this column. With this action the system checks whether the target computer can be reached and whether the data are up-to-date. The result is displayed in the "Status" column.

If you click the button in the column header, all components are checked.

Note

Components of local target systems are checked automatically.

Status

The following status displays are possible:

Status	Symbol	Remark
Downloaded		Process cell data downloaded. A new download process can be triggered.
No longer up-to-date		The downloaded data is no longer up-to-date. A new download process can be triggered.
Non-existent or not configured		
Check BATCH installation		There is no BATCH installation on the target computer.
Check WinCC installation		There is no WinCC installation on the target computer.
Check sharing		The BATCH folder "sbdata" is is not correctly shared or the share name is not "BATCH". Permissions or release name must be checked.
Unreachable		Remote PC station is not reachable, download is not possible.
Project checked out		The project with the required components is checked out.
Not downloaded		No process cell data has been downloaded yet. The download can be started.
System error		There was a system error when downloading.
Check/download OS		The PCS 7 OS has not yet been correctly downloaded.

OK

Saves your settings and closes the dialog.

Cancel

Discards your settings and closes the dialog.

Help

Opens the online help for this context.

15.2 BCC menu commands

15.2.1 Program menu

15.2.1.1 New process cell (Program menu)

This function reads in the data of the basic control for a selected process cell. The data of basic basic consists of the block instances of the SFC types created in the CFC charts or the SIMATIC BATCH-specific blocks UNIT_BLOCK, IEOP, IEPH, EPAR, and TAG_COLL, as well as the supplementary data in the hierarchy folders.

15.2.1.2 Updating of the process cell

If you have made changes to the BATCH-relevant process cell data (e.g., in CFC charts with SFC types/BATCH interface blocks or to type descriptions) in the engineering system (ES), you must update the process cell data in BatchCC.

Updating process cell data after changes in the engineering system (Page 321)

15.2.1.3 Print (Program menu)

With this function, you can start the printout of the data displayed in the list boxes in BatchCC.

15.2.1.4 Print preview

You can display a print preview of the selected data with this function. The print command is also provided in the preview window. You cannot edit in the print preview.

The menu command is only available when a control recipe is displayed and selected in the display window of the BCC.

15.2.1.5 Print setup

With this function, you open a dialog in which you can make the settings you require for the current printer.

15.2.2 Edit menu

15.2.2.1 Validate master recipe (Edit menu)

Requirement:

This is only possible when the recipe is edited with the elements step, transition and structure element along with the corresponding configuration of the recipe data (header).

To validate the recipe:

Select the recipe you want to check.

Select the menu command **Edit > Validate** or the shortcut menu command (right mouse button).

The validation covers the consistency of the library operations and process cell data used in the created recipe. A result display or error list is displayed that indicates whether or not the recipe header is completed, whether materials exist, whether steps and transitions in the recipe are configured and whether the normalized batch quantity is correct.

Within the BATCH Recipe Editor, you can also jump to the part of the recipe that caused the problem by double-clicking the entry in the error list.

Validation does not change the recipe status (Page 350)

See also:

Opening recipes (Page 1030)

15.2.2.2 Validate library operation (Edit menu)

Requirement:

This is only possible when the recipe is edited with the elements step, transition and structure element along with the corresponding configuration of the library operation data (recipe header).

Validation:

1. Select the library operation you want to validate.
2. Select the menu command **Edit > Validate** or the shortcut menu command (right mouse button).

The validation covers the consistency of the process cell data used in the created library operation. A result display or error list is displayed that indicates whether or not the recipe header is completed, whether materials exist, whether steps and transitions in the recipe are configured.

Note

In the error list, you can double-click on the list entry to jump to the part of the recipe that caused the problem within the BATCH Recipe Editor.

15.2.2.3 Validate formula (Edit menu)

A formula is checked for the following:

- That the values are within the limits of the linked master recipe parameters
- If parameters have been deleted or added in the formula category

- Parameter type changes in the formula category
- That the master recipe is released
- You must have already selected input materials and output materials.

Any errors detected during the check are displayed and can be saved in a file.

15.2.2.4 Validate batch (Edit menu)

A "Validity check" for planned batches may be necessary if, for example, the following situations occur:

- You perform an update of your Batch process cell.
- You change the following batch properties so that the configured boundary conditions become invalid.
  - Changing the quantity
  - Changing the assignment of the units
  - Changing setpoints
- You delete materials that are in use.

15.2.2.5 Rename (Edit menu)

With this function, you can change the name and version of the selected object.

15.2.2.6 Create new formula category (Edit menu)

In BatchCC, this command creates a new formula category with its name, version and description.

15.2.2.7 Create new formula (Edit menu)

With this function, you can create a new formula for the selected formula category with name and description. You can edit in the Properties of the new formula.

15.2.2.8 Create new order category (Edit menu)

In BatchCC, this command creates a new order category with its name, version and description.

15.2.2.9 New order (Edit menu)

This function creates a new order and a selectable number of new batches. When you create a new batch, you can assign the formula or the master recipe.

Note

There is a fixed assignment between a batch and the formula/master recipe.

15.2.2.10 New (Edit menu)

This command creates a new batch for an order. When you create the batch, the dialog displays the master recipes and formulas released for testing or production. However, only the master recipes that were not assigned to a formula category are displayed. You can assign the formula or the master recipe.

15.2.2.11 Create new batch (Edit menu)

You use this function to open a dialog where you can create new batches based on the selected object (master recipe or formula). When this occurs, the properties (header parameters) of the base object are transferred, but they can still be adapted. If the data of the utilized base object are valid for creating a batch, you can create a new batch immediately by clicking "OK". Batches generated in this way are stored in the following order folder tree created by the system in BatchCC: Orders\System order category\System order.

Note

Master recipe with formula category

If you select a master recipe for batch generation which is linked to a formula category containing a single formula only, this recipe data is used for the batch generation.

Additional information

"Add batch" tab (Page 852)

15.2.2.12 Create new library structure (Edit menu)

Use this function to create a new library structure for flat master recipes (Page 534). To edit the recipe further, you must then start the recipe editor.

15.2.2.13 Create new library operation (Edit menu)

Use this function to create a new library operation for hierarchical master recipes (Page 536). You must start the Recipe Editor for further editing.

15.2.2.14 Create new quality (Edit menu)

In BatchCC, this command creates a new quality with its name, code and description.

15.2.2.15 Create new material (Edit menu)

In BatchCC, this command creates a new material with its name, code, description and possibly also quality.

15.2.2.16 Create new flat master recipe (Edit menu)

With this function, you can create a new flat master recipe (Page 534) with name, version and description. You edit the recipe with the recipe editor.

15.2.2.17 Create new hierarchical master recipe (Edit menu)

With this function, you can create a new hierarchical master recipe (Page 536) with name, version and description. The recipe is edited with the aid of the Recipe Editor.

15.2.2.18 Open library operation (Edit menu)

You can open a library operation by double-clicking on the required library operation or using the context menu (right mouse button). The appropriate application, BATCH Recipe Editor, is started with the library operation.

If the BATCH Recipe Editor has already been started, a (further) window opens with the library operation.

Note

All further editing can only be done with the BATCH Recipe Editor.

15.2.2.19 Open list of process cell (Edit menu)

This function is not available for the selected object.

15.2.2.20 Open list of orders (Edit menu)

This command opens a new window listing all the orders of the order category with the configured batches and their properties.

15.2.2.21 Open list of library operations (Edit menu)

This command opens a new window listing all the library operations, the processing status, the author and the date last changed.

15.2.2.22 Open list of batches (Edit menu)

This command opens a new window listing all the batches of the order with all configured batch properties.

15.2.2.23 Open list of formula categories (Edit menu)

This command expands the tree with the master recipes of the selected master recipe category.

15.2.2.24 Open the list of formulas (Edit menu)

This command opens a new window listing all formulas of the selected formula category, the processing status, the author and the date last changed.

15.2.2.25 Open list of master recipes (Edit menu)

This command opens a new window listing all the recipes, the processing status, the author and the date last changed.

15.2.2.26 Open list of recipe categories (Edit menu)

Use this command to open a new window in which all recipes are listed showing the edit status, the editor, and the date of the last change.

15.2.2.27 Open list of materials (Edit menu)

This command opens a new window listing all the materials with their defined codes and qualities.

15.2.2.28 Open master recipe (Edit menu)

You can open recipes by double-clicking the required recipe or using the context menu (right mouse button). The appropriate application, BATCH Recipe Editor, is started with the recipe.

If the BATCH Recipe Editor has already been started, a (further) window opens with the recipe.

Note

All further editing can only be done with the BATCH Recipe Editor.

15.2.2.29 Print

This command prints the batch report for a previously selected element.

15.2.2.30 Print preview

This command is used to display the batch report in a preview window within the BatchCC. A maximum of two objects can be displayed simultaneously in the preview window. Within the preview window, a toolbar offers buttons for page navigation within the batch report. A button for exporting the batch report in PDF format is also available.

15.2.2.31 Properties of an order category (Edit menu)

This command opens the dialog for the order category. You can enter an order category with its **name** and a **description**.

15.2.2.32 Properties of a library operation (Edit menu)

This function opens the dialog for editing the header data of a library operation. Here, the setpoints for material and parameters and the unit assignment can be modified for a library operation that has not yet been released.

15.2.2.33 Properties of a formula category (Edit menu)

Formulas are used for the definition of parameters required for a recipe independent of the procedure. You specify the parameter structure for a group of recipes in the properties of the formula category.

This category is assigned permanently to recipes (selection in the header properties of a recipe procedure, master recipe).

Recipes assigned to a category are then available for selection in the formulas within the category.

15.2.2.34 Properties of a formula (Edit menu)

This function opens the dialog for editing formula properties. Here, you can enter the values of the parameter structure (material and parameters) and specify the assignments to variables in the master recipe.

15.2.2.35 Quality properties (Edit menu)

This command opens a dialog for the selected quality. You can enter the name, code and a description for this quality.

15.2.2.36 Properties of an order (Edit menu)

This function opens the dialog for an order.

15.2.2.37 Display properties of master recipe (Edit menu)

This function opens the dialog for editing recipe header data. Here, the product, the setpoints for materials and parameters and the unit assignments can be modified for a recipe that has not yet been released.

15.2.2.38 Folder properties (Edit menu)

This command opens the dialog box for the selected folder. You can enter the name, code and a description for this folder.

15.2.2.39 Material properties (Edit menu)

This command opens a dialog for the selected material. You can enter the name, code, a description and the qualities for this material.

15.2.2.40 Batch properties (Edit menu)

This function opens the dialog for entering a batch name, selecting a master recipe, specifying the batch quantity and the start and end time of the batch.

15.2.2.41 Release library operation for testing (Edit menu)

Requirement:

This is only possible when the library operation is valid. Validity is first checked with this command.

To release library operations:

1. Select the library operation.
2. Select the menu command **Edit > Release for testing** or the context menu command (right mouse button).

Result

After it has been released, the library operation has the "Released for testing" status.



Note

If errors occur in the validation, the problems are displayed and the library operation status remains "in progress...".

See also:

Difference between release for testing and for production (Page 1075)

15.2.2.42 Release library operation for production (Edit menu)

Requirement:

The prerequisite in this regard is the validity of the library operation. Validity is first checked with this command.

Release library operations:

1. Select the library operation.
2. Select the menu command **Edit > Release for production** or the context menu command (right mouse button).

Result

After it has been released, the library operation has the "Released for production" status.



See also:

Difference - release for testing or release for production (Page 1075)

15.2.2.43 Revoke release of formula (Edit menu)

Introduction

You can revoke the release of a formula in BatchCC.

Revoke release:

1. Select the formula.
2. Select the menu command **Edit > Revoke release** or the context menu command (right mouse button).

Result

After revoking the release, a formula released for testing has the "In progress" status or a formula released for production has the "Release revoked" status.

Icon	Meaning
	In progress
	Release revoked

15.2.2.44 Release formula (Edit menu)

Requirement:

Validation of the formula and a released master recipe are required for the release. Validity is first checked with this command.

Release formulas:

1. Select the formula.
2. Select the menu command **Edit > Release** or the shortcut menu command (right-click).

Result

After it has been released, the formula has the "Released" status.



Note:

If errors occur in the validation, the problems are displayed and the formula status remains "in progress".

15.2.2.45 Release master recipe for testing (Edit menu)

The requirement for this function is the validation of the recipe. Validity is first checked with this command.

To release a recipe:

1. Select the recipe.
2. Select the menu command **Edit > Release for testing** or the context menu command (right mouse button).

Result

After it has been released, the recipe has the "Released for testing" status.



Note:

If errors occur in the validation, the problems are displayed and the recipe status remains "In Progress...". Release is also possible in the BATCH Recipe Editor.

See also:

Validation (Page 1025)

Status of the recipes and status changes (Page 350)

Open recipes (Page 1030)

Difference - release for testing or release for production (Page 1075)

15.2.2.46 Release master recipe for production (Edit menu)

Requirement:

The validity of the recipe is required for this. Validity is first checked with this command.

Release recipes:

1. Select the recipe.
2. Select the menu command **Edit > Release for production** or the shortcut menu command (right mouse button).

Result

After it has been released, the recipe has the "Released for production" status.



Additional information:

Check validity (Page 1025)

Status of the recipes and status changes (Page 350)

Open recipes (Page 1030)

Difference - release for testing or release for production (Page 1075)

15.2.2.47 Release for testing (Edit menu)

This function cannot be executed for the selected object.

15.2.2.48 Revoke release of library operation (Edit menu)

Procedure

1. Select the library operation.
2. Select the menu command **Edit > Revoke release** or the context menu command (right mouse button).

Result

After revoking the release, a library operation released for testing has the "In progress" status or a library operation released for production has the "Release revoked" status.

Icon	Meaning
	In progress
	Release revoked

15.2.2.49 Revoke release of master recipe (Edit menu)

Introduction

You can revoke the release of a master recipe in BatchCC.

Revoke release:

1. Select the recipe.
2. Select the menu command **Edit > Revoke release** or the shortcut menu command (right mouse button).

Symbols in BatchCC

After revoking the release, a recipe released for testing has the status "In progress" or a recipe released for production has the status "Release revoked".

Symbol	Meaning
	In progress
	Release revoked

Principle

A recipe released for production cannot be directly transferred to the status "Release for testing" using the command "Revoke release".

After manually scaling a recipe in recipe editor, produced for example by updating process cells with validation errors, a master recipe formerly released for production can be transferred to the status "Release for testing" via the "Editing status".

Additional information

Releasing recipes for production (Page 1034)

Status of the recipes and status changes (Page 350)

Open recipes (Page 1030)

15.2.2.50 Release for production (Edit menu)

This function cannot be executed for the selected object.

15.2.2.51 Copy formula (Edit menu)

This command copies a selected formula within the order.

15.2.2.52 Unlock (Edit menu)

If a Batch object is being edited by one user, it is locked for other users. You can use this function to cancel the lock and make the object editable.

When a different BATCH client even on the same PC wants to unlock a write-protected object, you will see a warning to inform you that the locking BATCH application, which can even be a BATCH server, will be separated from the database and can no longer be used if you unlock the write protection. You will not always see immediately that the application cannot be used. You must stop the BATCH application in any case, even with the Task Manager, if necessary, and then restart it.

The "Unlock" command is available only to users who belong to a role with super user status. This means there is no special permission that can be assigned to any user.

Note

This command is reserved for emergency situations in which you need to control a BATCH object. Use the "Unlock" command only if the application, for example, the BatchCC that locks the object is not accessible and you cannot complete the editing there normally.

15.2.2.53 Delete order category (Edit menu)

Select the order category you want to delete.

Select the menu command **Edit > Delete** or the context menu command (right mouse button).

15.2.2.54 Delete library operation (Edit menu)

Select the library operation you want to delete.

Select **Edit > Delete** from the menu or the context menu command (right mouse button). The library operation you have selected is deleted following a prompt for confirmation. This function cannot be reversed. If you have selected more than one library operation, you are prompted to confirm deletion of each recipe separately. Library operations can only be deleted when they are not used in recipes.

15.2.2.55 Delete batch (Edit menu)

Procedure

1. Select the batch you want to delete.
2. Select the menu item **Edit > Delete** or the context menu item (right mouse button).

Note

The selected batch is deleted following a prompt for confirmation. This function cannot be reversed. If you have selected more than one batch, a prompt for confirmation is displayed for each batch separately.

15.2.2.56 Delete formula category (Edit menu)

Select the formula category you want to delete.

Select the menu item **Edit > Delete** or the context menu item (right mouse button).

Note

The selected formula category is deleted following a prompt for confirmation. This function cannot be reversed. If you have selected more than one formula category, you are prompted to confirm deletion of each category separately. Formula categories can only be deleted when there are no formulas belonging to them.

15.2.2.57 Delete formula (Edit menu)

Select the formula you want to delete.

Select the menu item **Edit > Delete** or the context menu item (right mouse button).

Note

The selected formula is deleted after a prompt for confirmation. This function cannot be reversed.

15.2.2.58 Delete quality (Edit menu)

Select the quality you want to delete.

Select the menu command **Edit > Delete** or the context menu command (right mouse button).

Note

The selected quality is deleted immediately after you answer the prompt for confirmation. Deleting is permanent and cannot be undone.

15.2.2.59 Delete order (Edit menu)

Select the order you want to delete.

Select the menu item **Edit > Delete** or the context menu item (right mouse button).

The selected order is deleted following a prompt for confirmation. This function cannot be reversed. If you have selected more than one order, you are prompted to confirm deletion of each order separately.

15.2.2.60 Delete master recipe (Edit menu)

Procedure

1. Select the recipe you want to delete.
2. Select the menu item **Edit > Delete** or the context menu item (right mouse button).

Note:

The selected recipe is deleted after a prompt for confirmation. This function cannot be reversed. If you have selected more than one recipe, you are prompted to confirm deletion of each recipe separately.

15.2.2.61 Delete object (Edit menu)

Select the folder you want to delete.

Select the menu command **Edit > Delete object** or the identical command from the context menu.

15.2.2.62 Delete material (Edit menu)

Select the material you want to delete. Select the menu command **Edit > Delete** or the shortcut menu command (right-click).

Note

Information on deleting

Materials that are used in libraries, formulas or master recipes cannot be deleted. You can use the search function to locate the point of use. Then revoke the use and save the object. Only then can the material be deleted.

15.2.2.63 Deleting shortcuts

Deletes a previously selected object from the shortcut window.

15.2.2.64 Delete all shortcuts

Deletes all shortcuts contained in the shortcut window.

15.2.2.65 Displaying list of order categories (Edit menu)

This command opens a new window listing all the order categories with the configured orders and batches and their properties.

15.2.2.66 Display list of materials (Edit menu)

This command opens a new window listing all the materials with their defined qualities.

15.2.2.67 Archive batches (Edit menu)

With this function, you can archive several closed batches at one time. Open a batch overview and select the batches to be archived. Then select the archive menu command in the shortcut menu (right mouse button).

15.2.2.68 Archive batch (Edit menu)

With this function, you can archive each closed batch individually. Select the object in the Tree structure and select the Archive menu command in the context menu (right mouse button).

15.2.2.69 Export library

Start the assistant for exporting the library.

15.2.2.70 Export master recipe

Start the assistant for exporting the master recipe.

15.2.2.71 Find (Edit menu)

Opens a dialog in which you can search for specific elements in recipes, libraries and batches. If you use the search function in a detail view, you can select multiple objects for the search.

Additional information

"Find" dialog (Page 909)

15.2.2.72 Export formula category

Start the assistant for exporting the formula category. All corresponding formulas are exported.

15.2.2.73 Export (Options menu)

Start the assistants for exporting libraries, master recipes and formula categories.

15.2.2.74 Create folder (Edit menu)

With this function, you create a new folder below an object to achieve a better overview.

Note

Structure depth of folders in BatchCC

As the structure depth of folders increases, the time does too, e.g. the time for the detailed view to be displayed. We recommend not exceeding a structure depth of 5 folders.

15.2.2.75 Compare (Edit menu)

Starts the comparison of the two selected objects. The result is shown in the "Recipe comparison" window within BatchCC.

Additional information

Comparing recipe objects (Page 358)

15.2.2.76 Compare with (Edit menu)

Opens a dialog for selecting a comparison object. Depending on the type of the first selected object, the corresponding comparison objects in the Master recipes, Libraries or Formulas folders are displayed for selection.

Additional information

Comparing recipe objects (Page 358)

15.2.2.77 Update element (Edit menu)

This function updates the entries selected in BatchCC. This is useful, when there are problems on the connection between the BATCH server and BATCH client. If the BATCH server can no longer pass on the changes to the client, BatchCC will, for example, display incorrect (old) data. With this command, you instruct BatchCC to query the current data for an entry at the BATCH server.

15.2.2.78 Insert new object (Edit menu)

Function

Dynamic selection for creating a new object (e.g. recipe). By clicking this icon, you display a menu of the objects that can be selected.

15.2.3 Control menu

15.2.3.1 Abort (Control menu)

Overview

With this command, you abort a batch before its planned end.

The command executes only after you confirm the prompt for confirmation.

Within the framework of the prompt for confirmation, you have various options to abort a batch with the following buttons.

- "Abort batch"
- "Abort batch (except conti.)"
  Note! Steps in continuous operation are not aborted!

The batch changes to the status "Aborted".

When batches are aborted, all the units occupied by the batch are released once again.

You cannot continue an aborted batch.

Note

If a batch does not contain any recipe steps in continuous operation, only the default prompt for confirmation appears.

Function of the "Abort batch" button

When you click this button, you abort the batch including all recipe steps in continuous operation.

Abort batch (except conti.)

When you click this button, all recipe steps and their equipment phases are aborted except for equipment phases of recipe steps running in continuous operation.

These are not aborted initially until the end of the batch.

How the equipment phases react at the end of the batch is specified by the project setting for extended continuous operation.

- If you have selected "Yes" for the extended continuous operation, these equipment phases continue to run after the end of the batch.
  The equipment phases can be occupied again by other batches.
- If you have selected "No" for the extended continuous operation, this button is not available with the batch.
  With ROPs and RUPs, as described above all recipe steps and their equipment phases are stopped apart from equipment phases of recipe steps running in continuous operation.

Note

Recipe steps which have been configured in continuous operation but have not yet reached the "ready to complete" status are also aborted.

Additional information

- Batches > Settings (Page 801)
- Extended continuous mode of equipment phases (Page 437)
- Manual jump (Page 453)
- Commands for controlling batches (Page 447)
- Abort step (Page 1099)

15.2.3.2 Abort (emergency) (Control menu)

The "Abort (emergency)" command can be used to abort a batch when no AS connection is available.

The "Abort (emergency)" command can be used when the following rules are observed:

- This command is only active and visible when the user currently logged on has a role with super user status. Note: The "super user" status has nothing to do with the name of the role. The role must have super user status, which is indicated by a yellow outline around the icon.



- If the "Abort (emergency)" command is used when a connection to the AS is available, the command has the same effect as the normal "Abort" command. In other words, the batch is only actually in "aborted" status when the statuses of the blocks of the AS have been reported back as such.
  There is no guarantee, therefore, that executing this command will result in a quicker abortion (when an AS connection is available).
- If the Abort (emergency) command is used when no connection to the AS is available, the status of the batch and the active elements are aborted regardless of the block states. The user is responsible for manually bringing the blocks in the AS to a non-critical state. Even if the connection to the AS has been re-established, these SIMATIC BATCH blocks must be reset before they can be used again.
- For safety, a prompt appears asking the user if he really wants to abort the batch with the note that no AS connection is available and that the interface blocks of the allocated unit may need to be released manually.

- The Abort (emergency) command is not offered by the SIMATIC BATCH API.
- BatchCC has no information as to whether or not there is a connection between the BATCH client and AS. This command is therefore always available, even when the connection between the BATCH client and AS is intact.

Note

For additional safety, batches are only actually aborted once the "Abort (emergency)" command has been used three times.
The first command attempts a normal "Abort", the second command attempts to release the recipe phases and units, and the third command places the batch in "Aborted" status in any case, even if recipe phases are still active and/or allocated.

15.2.3.3 Close (Control menu)

You can close a completed, stopped or aborted batch in the BatchCC. This is necessary before you can use the "Archive" command.

15.2.3.4 Comment on batch (control menu)

Opens a dialog for the entry of comments on the batch. You can enter comments for a batch at the time it is scheduled or during or after batch execution without having the hold the batch. A comment can no longer be added for closed batches.

15.2.3.5 Comment on batch element (Control menu)

Opens a dialog in which you can enter comments on an individual batch element - once the batch is planned, during its execution or after a batch has run, without having to stop the batch.

15.2.3.6 Resume (Control menu)

This command resumes batches that have been held in the batch control. If the equipment procedural elements were also stopped, these also return to the "running" state.

15.2.3.7 Release (Control menu)

With this command, you release a planned batch for production.

15.2.3.8 Pause after step (Control menu)

You can stop a charge that is running using the "Pause after step" command in batch control. In contrast to the "Hold immediately" command, this command simply prevents the control recipe from passing control to the next step. Active equipment procedural elements are not affected and continue until they are complete.

Batch control waits before processing the next transition or starting the recipe step until the "Resume" command is received.

15.2.3.9 Hold immediately (Control menu)

You can stop batches that are running with the "Hold immediately" command in batch control. In contrast to the "Pause after step" command, not only the batch itself but also all the equipment procedural elements currently active in the control recipe are put on hold.

15.2.3.10 Unlock (Control menu)

With this command, you can cancel the lock for a batch.

15.2.3.11 Lock (Control menu)

With this command, you can lock a batch. A locked batch cannot be started in an automatic sequence or with time-controlled start. You can remove the lock for further processing or abort it from this point.

15.2.3.12 Start (Control menu)

With this command, you start a released batch. Batches with the Start mode "Immediate" and "Time-driven" are started automatically but they can also be started with this command.

Note

You cannot start a batch if it is chained to another batch and this predecessor batch has not yet started or been completed (depending on the chaining mode)!

15.2.3.13 Stop (Control menu)

Overview

With this command, you abort a batch before its planned end.

The command executes only after you confirm the prompt for confirmation.

Within the framework of the prompt for confirmation, you have various options to stop a batch with the following buttons.

- "Stop batch"
- "Stop batch (except conti.)"
  Note! Steps in continuous operation are not stopped!

The batch changes to the status "Stopped".

When batches are stopped, all the units occupied by the batch are released once again.

You cannot continue a stopped batch.

Note

If a batch does not contain any recipe steps in continuous operation, only the default prompt for confirmation appears.

Function of the "Stop batch" button

When you click this button, you stop the batch including all recipe steps in continuous operation.

Function of the "Stop batch (except conti.)" button

When you click this button, all recipe steps and their equipment phases are stopped except for equipment phases of recipe steps running in continuous operation. These are initially not stopped until the end of the batch.

How the equipment phases react at the end of the batch is specified by the project setting for extended continuous operation.

- If you have selected "Yes" for the extended continuous operation, these equipment phases continue to run after the end of the batch.
  The equipment phases can be occupied again by other batches.
- If you have selected "No" for the extended continuous operation, this button is not available with the batch.
  With ROPs and RUPs, as described above all recipe steps and their equipment phases are stopped apart from equipment phases of recipe steps running in continuous operation.

Note

Recipe steps that were configured in continuous operation but have not yet reached the "ready to complete" state are also stopped.

Additional information

- Batches > Settings (Page 801)
- Extended continuous mode of equipment phases (Page 437)
- Manual jump (Page 453)
- Commands for controlling batches (Page 447)
- Stop step (Page 1098)

15.2.3.14 Cancel (Control menu)

With this command, you cancel a batch. After this command has executed, the batch can no longer be released or started.

15.2.3.15 Open control recipe (Control menu)

With this command, you open the graphic recipe representation of a batch. In this view, the steps and transitions are shown graphically.

15.2.3.16 Save as recipe (Control menu)

You use this command to save a batch as a new master recipe in the master recipes folder in BatchCC. The new recipe name is generated from the batch name, but you can rename it should you so wish. A modified recipe can then be used in a newly created batch.

We advise using this command to save modified control recipes (OSC mode) as reusable master recipes.

The versioning concept selected or set during master recipe creation (free or system-supported versioning) is also used for the new master recipe (save batch as master recipe).

The command "Save as recipe" is not dependent on whether changes are or were made in OSC mode. Each batch, including unmodified batches, can be saved as a recipe.

See also

Scope of services and features (Page 492)

15.2.3.17 Start (Control menu > Structure change)

This command is used to start OSC mode and therefore a recipe structure change during ongoing batch operation.

The command is only available if the following conditions are met:

- The "Allow online structure change" check box must be selected under structure changes in the "Batches" folder of the project settings. Also check the value for the 'Active batches have to be held" property.
- As logged-on user, you have the permission "Start structure changes".
- The master recipe used for the batch has been released for testing.
- The control recipe used for the batch may not contain any recipe unit procedures that are executed in the AS.
- The window with the corresponding control recipe is open in the BatchCC and is active.
- The batch is in one of the following states:
  - Planned
  - Locked
  - Released
  - Held
  - Paused after step

Ensure that other users cannot edit in this mode.

See also

Scope of services and features (Page 492)

15.2.3.18 Accept changes (Control menu > Structure change)

You can use this command to save changes made to your control recipe in OSC mode (structure changes during operation).

The menu command is only available if you have also made a change to the control recipe.

See also

Scope of services and features (Page 492)

15.2.3.19 Reject changes (Control menu > Structure change)

You can use this command to reject changes made to your control recipe in OSC mode (structure changes during operation). This means that no changes to the control recipe are accepted.

See also

Scope of services and features (Page 492)

15.2.4 Planning menu

15.2.4.1 Order category list (Planning menu)

Opens the list with all order categories of the process cell.

Requirement: The "Order" folder is selected beforehand in the BatchCC.

15.2.4.2 Batch result list (Planning menu)

Opens a dialog showing all completed batches in table format. The dialog has the following table columns: Order category, Order, Batch, Batch ID, Product, Master recipe, Formula, Status, Planned quantity, Actual quantity, Mode, Start and End.

The display is updated dynamically.

Note

Depending on the status, batches are transferred from the Planning list to the Status list, for example, or from the Status list to the Results list. But these batches also initially remain in the currently open list. They do not disappear from the corresponding list until the next time the list is opened.

Batch control

When you select a batch and right-click, the shortcut menu offers control commands appropriate for the context.

Filter mechanism

Each table column contains a filter cell. You can enter a filter criterion in these filter cells to limit the display to specific batches. You can use the "*" and "?" characters as placeholders. The question mark is a placeholder for any character and the multiplication sign for any character string. Example: ?a*. Shows, for example, all orders with an "a" as the second character in the name. This filter mechanism is not case-sensitive.

Additional information

Status of the batches (Page 404)

15.2.4.3 Batch planning list (Planning menu)

Opens a dialog showing a table overview of all newly created or planned batches that are not yet active. The dialog has the following table columns: Batch, Batch ID, Product, Master recipe, Formula, Status, Planned quantity, Actual quantity, Mode, Start and End.

The display is updated dynamically.

Note

Depending on the status, batches are transferred from the Planning list to the Status list, for example, or from the Status list to the Results list. But these batches also initially remain in the currently open list. They do not disappear from the corresponding list until the next time the list is opened.

Batch control

When you select a batch and right-click, the shortcut menu offers control commands appropriate for the context.

Filter mechanism

Each table column contains a filter cell. You can enter a filter criterion in these filter cells to limit the display to specific batches. You can use the "*" and "?" characters as placeholders. The question mark is a placeholder for any character and the multiplication sign for any character string. Example: ?a*. Shows, for example, all orders with an "a" as the second character in the name. This filter mechanism is not case-sensitive.

Additional information

Status of the batches (Page 404)

15.2.4.4 Batch status list (Planning menu)

Opens a dialog showing all released and activated batches in table format. The dialog has the following table columns: Order category, Order, Batch, Batch ID, Product, Master recipe, Formula, Status, Planned quantity, Actual quantity, Mode, Start and End.

The display is updated dynamically.

Note

Depending on the status, batches are transferred from the Planning list to the Status list, for example, or from the Status list to the Results list. But these batches also initially remain in the currently open list. They do not disappear from the corresponding list until the next time the list is opened.

Batch control

When you select a batch and right-click, the shortcut menu offers control commands appropriate for the context.

Filter mechanism

Each table column contains a filter cell. You can enter a filter criterion in these filter cells to limit the display to specific batches. You can use the "*" and "?" characters as placeholders. The question mark is a placeholder for any character and the multiplication sign for any character string. Example: ?a*. Shows, for example, all orders with an "a" as the second character in the name. This filter mechanism is not case-sensitive.

Additional information

Status of the batches (Page 404)

15.2.4.5 Set batch order (Planning menu)

Opens a dialog for chaining batches. You specify whether a batch is chained to a predecessor or successor batch. Chainings already configured in BatchCC are shown in the "Schedule batches" dialog and can be modified. You specify a predecessor batch or successor batch and specify whether the predecessor or successor batch should be started or already completed before the batch object starts. You also specify the chronological order of chained batches.

Note

It is possible to chain batches in such a manner that two batches are their own reciprocal successors and predecessors. This results in both batches never being started. Ensure during configuring that loops or interruptions do not result when deleting chained batches.

Additional information

Setting batch order; chaining batches (Page 391)

15.2.4.6 Production order list (Planning menu)

Opens the list of production orders:

- If you had previously selected the "Orders" folder, all production orders are displayed.
- If you had previously selected an "order category" folder, only the production orders belonging to this category are displayed.

15.2.4.7 Unit allocation (Planning menu)

Opens an overview of all batches and their unit allocations. Symbols indicate whether or not there is a conflict or will be a conflict in the future due to double allocation of the units by pending batches.

15.2.5 Options menu

15.2.5.1 Log off (Options menu)

This function logs off the current user.

Note

Following logon via a smart card reader, the logoff must also be performed via the smart card reader and not using the "Options > Log off" menu command in Batch CC or the Recipe Editor.

15.2.5.2 Permission management (Options menu)

This function opens the "Permission management" dialog. Here, you can make settings for the individual permissions of the user groups for computers (PCs) and the units of the batch process cell.

15.2.5.3 Roles management (Options menu)

This function opens the dialog "SIMATIC Logon roles management". In this dialog, you assign users created in Windows to specific roles in SIMATIC BATCH.

Requirements for running or releasing the command in the BatchCC:

- Installation of SIMATIC Logon.
- The user logged on in the BatchCC is a member of the Windows user group "Logon_Administrator" or is a member of the "SIMATIC BATCH" Windows group and is assigned the "Super user" role.

Note

If you add a new Windows user to the Windows "Logon_Administrator" group, the "Roles management" command in the "Options" menu of BatchCC is only activated for use after another logon via the **Options > Log off** menu command.

If you do not use SIMATIC Logon, the user logged on in Windows is also used or permitted as the user for the logon in the BatchCC. This user then has all the permissions of a user with the super user role in SIMATIC BATCH. You cannot use the following functions in the "Options" menu of BatchCC:

- Log off
- Permission management
- Roles management

15.2.5.4 Backup (Options menu)

Using this menu command, you can create a complete backup of your configured data, such as libraries, master recipes, materials, user permissions etc. as a backup file.

The internal, compressed xml-Format "*.sbb" is available as the file extension.

If completed batches exist that have not yet been archived then you are informed in an info dialog that you should archive these batches before making a backup.

You can restore the backup data in the BatchCC with the menu command **Extras > Restore**. For this, the Batch database must be empty or not yet available.

Additional information

Security aspects (Page 82)

15.2.5.5 Restore (Options menu)

With this command, you can completely restore backed up recipe data from a backup file (Options > Backup command) in *.sbb and *.xml formats.

Setting start IDs for batch, recipe/library, formula, category and material objects

To ensure that no deleted IDs can be used internally in the system for batch, recipe/library, formula, category and material objects following a restore, as of version SB V7.1 SP2, it is possible to have the system ascertain the last assigned IDs for these objects in the "Restore" dialog and to preset them. This action is executed by the "Read out IDs" function in the "Restore" dialog. Following a restore, newly generated objects then begin at the next ID. If this function is not enabled (default setting), 1 is entered as the start ID and the previous behavior is retained; in other words, newly created objects begin with the first free ID.

Note

To be able to use this function, the backup file must be created with a software version SIMATIC BATCH V7.1 SP2 or higher.

Requirements

- The BATCH database is still empty or does not yet exist. Only in this case can the restore function in the BATCH Control Center be selected and executed.
- Only backup files from the current or an older SIMATIC BATCH version are supported.

Procedure

To execute the "Restore" function, perform the following steps:

1. Start BatchCC.
   Result: The editing window in BatchCC is still empty.
2. Select the menu command Options > Restore. Select the backup file (*.sbb) you require.
3. Decide whether the log (database log) should be restored. Select or clear the check box.
4. In the input boxes, you can set a start ID for objects such as batches, recipes/libraries, formulas, categories and materials. In order to know the counter number you are starting from, click the "Read out IDs" button. The last IDs contained in the backup are then displayed. Select a least one higher start ID number.
5. Then, in the boxes for batches, recipes/libraries, formulas, categories and materials, enter the ID (e.g., ID for your first new batch) in the adjacent input box in each case under "Start ID" or leave the default at Start ID = 1.
6. Click the "Open" button.

Result

The data is restored in BatchCC. The current database for SIMATIC BATCH is recreated with the data of the backup file.

Note

You do not need user permission to restore BATCH backup data. Before a restore, you should not assign any users or groups to the roles in the SIMATIC Logon roles management, as these will otherwise be overwritten by the assignments saved in the restore file. It is then necessary to repeat the assignment carried out previously in SIMATIC Logon.

Note

Following a restore, check the connection information for the reporting services in the project settings dialog under Logging > Log and adjust the settings.

Note

After a "Restore", all OS messages retain the status that the OS messages had before the "Backup".

The information required for the status changes is no longer available.

Additional information

"Backup/Restore" dialog (Page 861)

How do I restore a SIMATIC BATCH server to its original state? (Page 729)

Security aspects (Page 82)

15.2.5.6 Export (Options menu)

Start the assistants for exporting libraries, master recipes and formula categories.

15.2.5.7 Import (Options menu)

You can use this function to import libraries, formula categories and master recipes (including the used library operations and formula categories).

15.2.5.8 Logbook (Options menu)

Opens the "Log" in the BatchCC. The log displays user actions made in the BatchCC.

Additional information

Log (Page 296)

15.2.5.9 Active applications (Options menu)

Opens the "Elements being processed" dialog. The dialog is divided into a navigation area and a display area. The navigation area shows the applications for the elements that a user is editing. You use the node elements to open or close the tree structure. A bar is shown for the allocated application in the display area. The time bar indicates the duration and the date and time for the allocated application on this PC.

15.2.5.10 Compress data (Options menu)

With this command, you can compress the data (reorganize). Compressing does not change the existing data.

Note: Compressing can take some time depending on the amount of data. During this time, working with the system is restricted to some extent!

15.2.5.11 Start Recipe Editor (Options menu)

This function starts the BATCH Recipe Editor in BatchCC.

15.2.5.12 Start viewer for archived batches (Options menu)

You use this function to start the viewer for archived batches function in BatchCC. You use the viewer to display and print archived batches in a control recipe.

15.2.5.13 Always on top (Options menu)

With this command, the window of the Batch Control Center always appears in the foreground, regardless as to whether or not other software applications are open on the PC.

15.2.5.14 Migration > Finalize (Options menu)

When you update the BATCH project to a new software version of SIMATIC BATCH (for example, a service pack), it may be necessary to adapt the project data to the requirements of the new software version in BatchCC.

In such situations, you must select the **Migration > Finalize** menu command after installing the new software version.

Please see the readme file for the new SW version to determine whether finalizing is necessary. The necessary procedure for this is also described in the readme file.

15.2.5.15 Migration > Prepare (Options menu)

When you update the BATCH project to a new software version of SIMATIC BATCH (for example, a service pack), it may be necessary to adapt the project data to the requirements of the new software version in BatchCC.

In such situations, you will need to use the menu command **Migration > Prepare** before installing the new software version and after installing preparatory data of the new software version.

Please see the readme file for the new SW version to determine whether preparation is necessary. The necessary procedure for this is also described in the readme file.

15.2.6 View menu

15.2.6.1 Toolbar (View menu)

This function toggles the display of the symbol bar on (check mark) and off.

The toolbar is located below the menu bar. It contains a series of buttons that trigger the more commonly required functions of the menu bar. In the status bar, you can see more detailed information about the function. Click on the icon to trigger the function. Icons that cannot be selected are displayed in gray.

You can tell which function is stored for the specific icon by placing the cursor on an icon (do not click). A small field will be displayed with the designation.

Note

The icons can only be activated with a mouse or trackball.

15.2.6.2 Control bar (View menu)

This function toggles the display of the control bar on (check mark) and off. The control bar is located below the menu bar.

It contains buttons with which you can control the running of a batch:

- Start: Start: Starts a released selected batch
- Pause after step: Holds a batch at the end of active steps
- Hold Holds a batch and active steps
- Resume: Resumes a held batch
- Stop: Stops a batch
- Cancel: Cancels a batch

and symbols for optimizing the screen layout in the graphic representation of the recipe of the batch:

- Zoom in: maximizes in fixed levels
- Zoom out: minimizes in fixed levels
- Normal size: Switches to normal representation
- Area used: Fit the recipe representation to the display area

Clicking the button triggers the function. Buttons that cannot be selected are displayed in gray.

You can see which function is triggered by a button in the toolbar by positioning the mouse pointer on the button (without clicking). A box appears with the name of the button.

Note

You can only activate buttons using a mouse or trackball.

15.2.6.3 Shortcuts (View menu)

With this function, you open the "Shortcuts" window. The window is shown in the right window area in the BatchCC. It can then be positioned by the user. The shortcut window is used to store objects as favorites.

Additional information

Shortcut window (Page 295)

15.2.6.4 Full view Control recipe (View menu)

Use this function to open the "Overview for control recipe" dialog. The window is shown in the right window area in the BatchCC. It can then be positioned by the user. The overview for control recipes is used for orientation and navigation in bulky recipe structures.

Additional information

Overview of the control recipes (Page 403)

15.2.6.5 Output (View menu)

This function toggles the display of the output window for BATCH messages on (check mark) or off.

When the BatchCC is opened on a PC where the redundant BATCH server is running, the output window for BATCH messages is not displayed.

Additional information

Output window for messages (Page 292)

15.2.6.6 Extended batch information (View menu)

With this function, you enable (check mark) or disable the "Extended batch information" window.

Additional information

Extended batch information (Page 293)

15.2.6.7 Project: (View menu)

The project window displays all the available objects such as libraries, master recipes and orders of a BATCH project in a tree structure. With this function, you can turn the project window on or off.

Additional information

Editing window with BATCH objects (Page 298)

15.2.6.8 Update tree view (View menu)

With this function, you update all the objects in the tree view in the project window.

15.2.7 Options > Import... menu

15.2.7.1 Import - Select Objects

Introduction

The name of the previously selected import file is shown in the "Import file" field. The list below it shows the objects included in the previously selected type (master recipes, libraries, formula categories).

Note

If you have selected the wrong import file, select the correct import file for the selected type using the "..." browse button or by entering the name of the file.

If you have inadvertently selected the wrong type for the import file, you need to cancel the Import Assistant and start the import again by selecting the menu command **Options > Import ...**.

All Batch objects contained in the import file are displayed when the file is selected. You can now select the objects to be imported from those displayed.

Note

You can select multiple objects. When several lines are marked, you can select or deselect the check boxes using the space bar. You can also use the shortcut menu to make the selection.

Requirement: The specified or selected file must be exported from the BATCH Control Center with the menu command **Options > Export**. Only export files from the current or an older SIMATIC BATCH version are supported.

Result: The entries are always checked for discrepancies before the dialog is closed. For example, does the currently open batch process cell already contain a saved recipe with the same name? If so, this will be indicated by a red exclamation point in the recipe row and the

dialog cannot be exited with the "Next" button. In this case, specify a new recipe name or exclude the recipe from the import by removing the check mark. Then press "Next".

Recipe/Library/Formula Category

This column contains the objects to be imported, for example, master recipes. The check box indicates whether the element is to be imported or not.

Status displays:

Symbol	Meaning
	There is a conflict that must be resolved.
	Data are imported under a new name.
	Data are replaced by data from the target process cell.
	Data are imported unchanged.
	Data have been deselected for the import.

New name

A new name for the object to be imported can be specified here. Only this name then appears following the import. If the name is already in use in the target process cell and you do not wish to use the object in the target process cell, you should rename the object at this point. Otherwise, you cannot continue the import process.

Select the element to be imported and click "Rename" in the shortcut menu to change the name. A dialog then opens for entering the required change.

Note

Information regarding the status of the object is specified here.

Next

Goes to the next page. If the data on the current page are incomplete, a warning appears and the element creating the problem is marked on the list.

15.2.7.2 Import - Assign Objects

Introduction

In this dialog, you make the assignment between the recipe elements: libraries, formula categories, materials or roles

- The process cell data of the import file are listed on the left.
- The process cell data of the open Batch process cell (target process cell) is listed on the right.

The import status of the individual elements are displayed as follows:

- A box with a check indicates that the element should be imported.
- An empty box indicates that the element should not be imported. If you do not import an element, the imported recipe/library/formula category is not valid.

Make assignments:

- The Import Assistant checks if specific elements are already in the target process cell. If any are, the Import Assistant suggests using these elements instead of the original elements by automatically creating an assignment.
- If you want to change/create an assignment, mark the line with the element for which you want to make an assignment and double-click on the corresponding element right in the window listing those elements that are still available for assignment. You can optionally use the left arrow instead of double-clicking.
- If you do not want to use an assignment, you can remove it using the appropriate command from the context menu or the right arrow.

Result: The system checks if all elements with a check mark are unique. If an element is not unique, import it with a new name/version/code or replace the affected element by the element in the target process cell if it matches.

Libraries/formula categories/materials/roles

The objects to be imported (libraries, for example) are displayed in this column. The check box indicates if the element should be imported. If you do not import an element, the imported recipe/library/formula category is not valid.

Status displays:

Icon	Meaning
	There is a conflict that must be resolved.
	Data will be imported under a new name.
	Data will be replaced by data from the target process cell.
	Data will be imported unchanged.
	Data have been deselected for the import.

New name

When available, a new name for the object to be imported can be specified here. Only this name then appears following the import. If the name is already in use in the target process cell and you do not wish to use (no assignment) the object in the target process cell, you should rename the object at this point. Otherwise the import process cannot be further executed.

Double-click on the line or use the appropriate command from the context menu to change the name. A dialog opens in which you can enter the required change.

Assigned

This displays the assigned element.

Note:

This is where information on the status of the object is specified.

Used library, formula category, material, roles

The name of the selected object is shown in the left list.

Replace with

This lists the objects in the open Batch process cell.

Back

Goes to the previous page. The previously configured data (assignments) are maintained.

Next

Goes to the next page. If the data on the current page have not been completely processed an error message will be output and the element with a problem will be marked in the list.

15.2.7.3 Import - Process cell Update

Introduction

In this dialog, the process cell data of the import file is listed in a tree structure in the "Process cell from import file" column on the left. The assigned elements of the open batch process cell are listed in the "Current process cell" column. To the left of each element in the tree structure is a check box with the following meaning:

- White background:: No element from the open batch process cell could be allocated.
- Check mark on a white background: The element and all lower-level elements must be arranged according to the elements that will be imported.

  Note

  The assignment is made by matching names.

- Check mark on a gray background: The element could be assigned but at least one lower-level element has no assignment.

All allocated list elements are specified in the "Current process cell" column. In the "Edited" column any entry that you change will be marked with an "x". In the "Used element" window the element from the import file will be displayed that is currently being edited.

Note

Check the assignment made in the left list and correct it if necessary.

Comparison if there are differences between source and target process cell

Because objects are not imported in the batch process cell, but rather replaced, direct activation of a check box by clicking in the left column is not possible here. The check box is selected automatically if an object from the right column is selected for replacement.

Replace with

The "Available elements" window shows the unassigned elements of the open process cell matching the element selected in the left window. By double-clicking an element in this list, you assign the element to element selected in the tree. All underlying elements are also assigned. Any existing assignment is automatically deleted by this action.

Deleting assignments

If you click the check box in the tree, the assignment is removed.

Back

Goes to the previous page. The previously configured data (allocations) remain intact.

Next

Goes to the next page. If the data on the current page are incomplete, a warning appears and the element creating the problem is marked on the left.

15.2.7.4 Import - Assign Parameters

Introduction

Additional assignments must be made for formula categories and libraries. When a formula category is replaced, for example, information must be provided as to how the interconnected parameters must be replaced.

The library or formula category assignments are listed in the drop-down list of "affected assignments". You need to define how the corresponding parameters are to be interconnected for each of these assignments. The Import Assistant makes the assignments as much as possible by comparing names.
Check and correct these as necessary. If you cannot make an assignment, remove the check mark in the check box of the respective row. If you exclude one or more elements, the imported recipe/library/formula category is not valid.

- The parameters of the elements from the import file are listed on the left.
- On the right are the parameters that can be entered in the currently selected line in the left list.

The status of the assignments found are displayed as follows:

- A box with a check indicates that the element should be imported.
- Empty boxes mean that the element will not be imported. If you do not import an element, the imported recipe, library is not valid.

Making assignments

- The Import Assistant checks if specific elements are already in the target process cell. If any are, the Import Assistant suggests using these elements by automatically creating an assignment.
- If you wish to change/create an assignment, mark the line with the element for which you want to make an assignment and double-click on the corresponding element right in the window listing those elements that are not yet assigned. Alternatively you can also activate the left arrow instead of double click.
- If you do not want to use an allocation you can ether remove it via the shortcut menu or remove it with the right arrow.

Result

The system checks if all elements with a check mark have an assignment. If they do not, correct this and press "Next" again.

Parameters

This column contains the objects to be imported (e.g., parameters). The check box indicates whether you want to import the element. If you do not import a parameter, the imported recipe or library will become invalid.

Status displays

Symbol	Meaning
	There is a conflict that must be resolved.
	Data are imported under a new name.
	Data are replaced by data from the target process cell.
	Data are imported unchanged.
	Data have been deselected for the import.

Assigned

The assigned element is displayed here.

Note

This is where information on the status of the object is specified.

Used parameter

This displays the name of the selected object.

Replace with

This lists objects in the open Batch process cell that are not yet assigned. The only parameters shown are those that match the parameters selected in the left list. This is exactly the case when the original parameters' data type and unit of measure match after they are replaced (performed in the process cell synchronization) by the data type and unit of measure of the available parameters.

Back

Goes to the previous page. The previously configured data (allocations) remain intact.

Next

Goes to the next page. If editing of the data on the current page is not complete, an error message is output and the problematic element is marked in the list.

15.2.7.5 Import - overview

Introduction

All allocations that you have made are listed again in this dialog box. Please check the listing and then start the import process.

Note

Copy the previously marked text via the clipboard to a document of the "Wordpad" application to document the allocation information formatted for the import.

Back

Goes to the previous page. Previously configured data (allocations) can thus be corrected.

Finish

This button triggers the import.

15.2.7.6 Import - recipes (BatchML)

Introduction

Plausibility checks are performed by the system for BatchML import. This plausibility checks only relates to the BatchML file and the data contained therein. No plausibility check of the recipe is performed as it is in the recipe editor or BatchCC.

This dialog displays messages for the BatchML import of the message class Error, Warning and Information.

"Import file" area

The path and name of the BatchML import file are displayed.

"Filter messages" area

Select the check box of a message class to display the associated message in the "More Information" area.

"Export Messages" button

This allows you to export all reports to a CSV file.

These messages cannot be displayed after the import. Exporting to a file is the only way to keep these messages.

"Back" button

Goes to the previous page.

"Next" button.

Goes to the next page.

You need to correct reported errors, otherwise the dialog cannot continue.

If warnings are reported or information provided, decide whether to continue the dialog.

We recommend in any case you view the messages of "Warning" class to be informed about changes possibly performed or omissions in the recipe to be created.

"Cancel" button

The dialog closes.

15.2.8 Control bar

15.2.8.1 Zoom in

Phase

In the BATCH Recipe Editor and in batch control, you can use this function to adapt the display of the recipe by increasing the size of the active work window by one level. The command can be repeated until the maximum size is reached.

Additional information

"Zoom" tab (Settings) (Page 785)

15.2.8.2 Zoom out

Function

In the BATCH Recipe Editor and in batch control, you can use this function to adapt the display of the recipe by decreasing the size of the active work window by one level. The command can be repeated until the minimum size is reached.

Additional information

"Zoom" tab (Settings) (Page 785)

15.2.8.3 Resetting the zoom factor

Function

In the BATCH Recipe Editor and during batch control, you can use this function to adapt the display of the recipe in each active work window to a medium zoom level (normal size). This zoom level displays as much as possible with still legible text and differs depending on the resolution of your monitor.

Additional information

"Zoom" tab (Settings) (Page 785)

15.2.8.4 Optimal zoom factor

Function

In the BATCH Recipe Editor and in batch control in the BatchCC, you can use this function to adapt the display of the recipe to the area being used in the work window.

15.2.8.5 Close substructure

Function

With this function, you can close a substructure in the BATCH Recipe Editor and display the parent structure in the same window.

15.2.9 Window menu

15.2.9.1 Update (Window menu)

Updates the content in the detailed view. You open the detailed view of the BATCH process cell objects "Libraries", "Master recipes", "Formulas", "Orders" and "Materials" with the "Details" command in the shortcut menu of each of these objects.

15.2.10 Functionality of the viewer for archived batches

15.2.10.1 Open and display archive file (mainly XML)

Use this command to open a search dialog in which you can navigate to an archive file. The default archive file format is XML files (*.xml). In the "Open" dialog, navigate to the required archive file and click "Open". The control recipe of the archived batch is then displayed.

15.2.10.2 Open and display archive from PH

Use this command to open a search dialog to select archived batches that were saved on a PH archive server (Process Historian) and then display them in the viewer. Make sure that a connection test has been successfully conducted in the project settings, "Process value archive" folder, with the "Test" button.

15.2.10.3 Dialog "Find batches"

Introduction

In this dialog you filter in archives for batches archived on a PH. You select individual search criteria to define which batches are displayed for selection. Then select the required batch and display it in the batch viewer for archived batches.

Requirements

- The batch concerned must have been closed and archived on the PH.
- The batch concerned must have been transferred from the archive storage location (ArchivDir) to the database. Only then will you be able to use the search dialog to find the batch concerned in an archive on the PH and display it in the batch viewer.
- The WinCC project on the PH must be in process mode (runtime).

Areas of the dialog

The dialog is divided into four areas. You enter your search criteria in three of these areas; the search result is then displayed in the fourth area.

- Time range: Batch search by specifying a time range. Only when the start and end time of a batch is within the specified time range will the batch concerned be found.
- Batch: Batch search by specifying a batch name and/or a batch ID.
- General search criteria: Batch search based on general criteria such as project, process cell, etc. Note that only criteria from the drop-down list can be selected for the "Project" and "Process cell" selection boxes. Customized inputs with wildcards are possible for all other criteria.
- Search result display: Displays the batches matching your search criteria in the form of a table.

Search criteria and wildcards

The following wildcards can be entered:

- ? Wildcard for any one character.
- * Wildcard for any number of characters.

You can only use wildcards at the beginning and the end of the search criterion. Example: *abc? Search by batch names containing any number of characters before the letters abc and any one character at the end.

Selecting a batch

To view a batch, select the row containing the batch concerned in the result display and click "OK". Double-click the batch concerned to view it. You can only view one batch at a time in the result display. The selected batch is then displayed in the batch viewer for archived batches.

Buttons and displays in the dialog

Button/Display	Meaning
Display field	Shows the number of batches found and displayed in the result table.
Reset	Resets all the filter criteria you entered to the default values.
Filtering	If you click the button, the search for batches that match your specified filter criteria starts.
OK	Displays a previously selected batch in a recipe view in the viewer for archived batches. Double-clicking the batch concerned also displays the batch in the viewer.
Cancel	Closes the dialog without saving your settings.
Help	Opens the help for this dialog.

15.2.10.4 Toolbar (View menu)

This function toggles the display of the toolbar on (check mark) and off.

The toolbar is located below the menu bar. It contains a series of buttons that trigger the more commonly required functions of the menu bar. In the status bar, you can see more detailed information about the function. Click on the icon to trigger the function. Icons that cannot be selected are displayed in gray.

You can tell which function is stored for the specific icon by placing the cursor on an icon (do not click). A small field will be displayed with the designation.

Note

The icons can only be activated with a mouse or trackball.

15.2.10.5 Control recipe in the viewer for archived batches

This is the control recipe for the batch you brought into view.

15.3 RE menu commands

15.3.1 Recipe menu

15.3.1.1 New > Hierarchical recipe (Recipe menu)

Function

Use this function to create a new hierarchical recipe (Page 536) in the BATCH Recipe Editor. A new recipe window will open. By inserting this step the first column will be created according to a recipe unit of a unit.

15.3.1.2 New > Flat recipe (Recipe menu)

Function

Use this function to create a new flat recipe (Page 534) in the BATCH Recipe Editor. A new recipe window will open that contains a base structure with start and end icon, in which substructures can be inserted.

15.3.1.3 New > Library element: Recipe operation (Recipe menu)

Function

Use this function to create a new recipe operation as a library object in the BATCH Recipe Editor for subsequent use in a hierarchical recipe. A new recipe window will open that contains a base structure with start and end icon.

15.3.1.4 New > Library element: Substructure (Recipe menu)

Function

Use this function to create a new substructure as library object in the BATCH Recipe Editor for subsequent use in a flat recipe. A new recipe window will open that contains a base structure with start and end icon.

15.3.1.5 Open... (Recipe menu)

Function

In the BATCH Recipe Editor, this function opens an existing recipe. A list box opens in which you can select the recipe to be edited in the tree with the levels process cell and recipes.

15.3.1.6 Open library object... (Recipe menu)

Function

Use this function to open a library operation in the BATCH Recipe Editor that already exists in the library. A selection window will open where you can select the recipe that will be processed in the tree structure with the levels process unit, and unit class.

15.3.1.7 Close (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to close the recipe or the library operations created for the library in the active recipe window.

15.3.1.8 Save (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to save the recipe or a library operation in the active recipe window.

15.3.1.9 Save as... (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to save an existing recipe or an existing library element displayed in the active recipe window under a new name or new version in the database.

15.3.1.10 Save graphic ... (Recipe menu)

Function

This feature allows you to save the recipe graphic displayed in the active window of the BATCH recipe editor as file on your hard disk. The default file name is that of the open master recipe. The storage location is ..\Documents and Settings\All Users\Application Data\Siemens \Automation\Logfiles\Batch. The file name and location can be freely selected. The various image formats are predefined.

15.3.1.11 Header parameters... (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to open a dialog box in which the properties of the recipe in the active window are displayed and can be edited.

15.3.1.12 Check validity (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to check the consistency and completeness of the recipe in the active window.

Additional information

Validate recipe (Page 1025)

15.3.1.13 Release for testing (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to release the recipe in the active recipe window for testing.

Additional information

Release recipe for testing (Page 1034)

Difference between release for testing and for production (Page 1075)

15.3.1.14 Release for production (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to release the recipe in the active recipe window for production, in other words, for the creation of batches.

Additional information

Release recipe for production (Page 1034)

Difference between release for testing and for production (Page 1075)

15.3.1.15 Revoke Release (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to revoke the release of the recipe in the active recipe window.

Additional information

Revoke recipe release (Page 1036)

15.3.1.16 Print... (Recipe menu)

Function

Use this function to printout the graphic of the recipe in the BATCH Recipe Editor

15.3.1.17 Print preview

Function

Use this function to display data in the same way that they will be printed.

Note

Editing is not possible in the print preview!

15.3.1.18 Print preview graphic (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to display the graphic of the recipe in the active recipe window as it will be printed.

Note

You cannot edit in the graphic print preview.

Additional information

Print... (Recipe menu) (Page 1073)

Print graphic (Recipe menu) (Page 1074)

15.3.1.19 Print graphic (Recipe menu)

Function

In the BATCH Recipe Editor, you can use this function to print the graphic of the recipe in the active recipe window. To do this, the "Print" dialog box opens in which you can specify the printer, the print range and number of copies to be printed.

If necessary, the graphic is distributed over several pages.

Additional information

Print preview graphic (Recipe menu) (Page 1074)

15.3.1.20 Last recipes edited (recipe menu)

Function

Lists the last recipes edited. Use this function to quickly reopen recipes in the BATCH Recipe Editor.

15.3.1.21 Last edited libraries (Recipe menu)

Function

Lists the last edited libraries. Use this function to quickly reopen library elements in the BATCH Recipe Editor.

15.3.1.22 Dialog "Save as" (BATCH Recipe Editor)

Function

To save an existing recipe or a library element, for example as a template, you can enter a new name and a version number.

With the "New folder" button, you can first create a new folder for the object. This button is only active if an element that supports creation of folders has been selected in the tree.

System property

Depending on which parameters, name, and version you are using the "Save as" function with, a different behavior results:

- If an existing object with a changed name is saved, the change log of the new object is recreated and is empty.
- If an existing object with the same name but with a different version is saved, the existing change log is retained along with its entries.

15.3.1.23 Difference - release for testing or release for production

Separate check routines can be integrated in the validation for release of a recipe. Appropriate check routines can be processed based on the differentiation - release for testing, or release for production. Thus for example only water can be approved as product for the recipe that has been released for testing.

15.3.2 Edit menu

15.3.2.1 Undo (Edit menu)

Function

Use this function to undo the last action. You can execute this function multiple times and thus undo all changes made since the last open or the last save.

Additional information

Redo (Edit menu) (Page 1076)

15.3.2.2 Redo (Edit menu)

Function

Use this function to restore the last undone action. Thus you can redo all commands that have been undone, if you have not made any changes since then.

Additional information

Undo (Edit menu) (Page 1075)

15.3.2.3 Copy (Edit menu)

This function cannot be executed for this selected object.

15.3.2.4 Delete (Edit menu)

Function

In the BATCH Recipe Editor, this command is used in a recipe to delete selected objects (structure elements).

Additional information

Cut (Edit menu) (Page 1085)

Paste (Edit menu) (Page 1086)

Copy (Edit menu) (Page 1085)

15.3.2.5 Go to > Next error (Edit menu)

Function

In the Batch Recipe Editor, you use this function to display the next object with an error (structure element and select it in the recipe. You can use this function to go to all points at which an error was detected in the validation.

This assumes that you have already run the validation function.

Additional information

Go to > To previous error (Edit menu) (Page 1077)

Check validity (Recipe menu) (Page 1072)

15.3.2.6 Go to > Previous error (Edit menu)

Function

In the Batch Recipe Editor, you use this function to display the previous object with an error (structure element and select it in the recipe. You can use this function to go to all points at which an error was detected in the validation.

Additional information

Go to > Next error (Edit menu) (Page 1076)

Validate (Recipe menu) (Page 1072)

15.3.2.7 Properties (Edit menu)

Function

In the BATCH Recipe Editor, you can use this function to open a dialog for the object selected in the recipe (recipe header, recipe phase, transition) where you can view object information or edit the object.

Note

If you require help on the dialog box, click the "Help" button or press the F1 button while you are in the dialog box.

15.3.2.8 Open object (Edit menu)

Function

Use this function in the BATCH Recipe Editor and in BATCH Control Center to open a new window for the substructure selected in the recipe. This window will display the content of the substructure. The parent window (for example a recipe window) remains open.

15.3.2.9 Text... (Edit menu)

Phase

In the BATCH Recipe Editor, you can use this function to open a dialog box, into which you can enter a text for the selected object (structure element) in the recipe.

Note

The text of the comment is displayed beside the objects if you activate the object comments with the menu command View > Display labeling.

15.3.2.10 Dissolve substructure (Edit menu)

Function

With this function you resolve a substructure (e.g. a library operation) in the BATCH recipe editor and embed it in the recipe. Click on the desired object beforehand.

Resolving a substructure means that the underlying recipe structure is inserted instead of the substructure.

15.3.2.11 Hide in substructure (Edit menu)

Function

Use this function in the Recipe Editor to form a substructure of single recipe elements within a flat recipe. Select the desired object beforehand.

- Selection with the lasso
  To open a lasso, drag the mouse while holding down the left mouse button. All the elements completely enclosed in the lasso frame are selected when you release the mouse button.
- Adding to your selection
  Hold down the Ctrl key while clicking on an element with the mouse. The element you have clicked is selected without deselecting previously selected elements.

Note

When hiding target target interconnections the parameter name of the target interconnection is automatically renamed.

In a flat recipe set up a target interconnection between header and function parameters; the parameter name remains unchanged and thus remains unique. If you hide the function within a substructure, the parameter name of the target interconnection is overwritten by the original name of the variable.

15.3.2.12 Select (Edit menu)

Function

Using this function in the BATCH Recipe Editor, you can change the Edit mode to the Select mode. There are two ways of selecting an object (structure element) in the recipe:

- Click the required object to select it
- Drag a lasso around the required object to select it.

Additional information

Selecting objects (Page 533)

15.3.3 View menu

15.3.3.1 Fit automatically (View menu)

Function

In the BATCH Recipe Editor and in batch control, this function adapts the display of a recipe in the active work window automatically to the window size (checked) if you change the size of the area being used.

15.3.3.2 Select zoom area (View menu)

Function

Use this function in the BATCH Recipe Editor and for batch control to adjust the zoom factor of the display in the active work window to the selected area.

15.3.3.3 Toolbars > Standard (View menu)

Function

This function hides or shows the toolbar (check mark).

The standard toolbar is located below the menu bar. It contains a number of icons with frequently required menu bar functions. Detailed information about this is displayed in the status bar. Click on the icon to trigger the function. Icons that cannot be selected are displayed in gray. If no object has been opened in the recipe editor, only icons that can be used are displayed in the toolbar.

You can tell which function is stored for the specific icon by placing the cursor on an icon (do not click). A small box will then be displayed with the designation.

Note

The icons can only be activated with a mouse or trackball.

15.3.3.4 Toolbars > Insert (View menu)

Function

In the BATCH Recipe Editor and Batch control, you can use this function to toggle the display of the toolbar for zooming recipes (check mark).

15.3.3.5 Status bar (View menu)

Function

This function toggles the display of the status bar on (check mark) and off. The status bar is displayed horizontally at the lower edge of the window. The following information can be included:

- Time
- Logged-on user
- Server status
- Info text for commands from the toolbars

Additional information

Layout of the main window

15.3.4 Options menu

15.3.4.1 Always in Foreground (Options menu)

Function

Use this command to always display the recipe editor on top, regardless of whether other software applications are open or will be opened on the PC.

15.3.4.2 Display all errors (Options menu)

Function

In the BATCH Recipe Editor, you can use this function to display the errors of all objects (structure elements) in the recipe structure following validation.

Additional information

Validation (Page 1025)

Display errors (Page 1081)

Clear error indicators (Page 1081)

15.3.4.3 Display errors (Options menu)

Function

In the BATCH Recipe Editor, you can use this function to display the errors of the selected object (structure element) in the recipe structure following validation.

Additional information

Validation (Page 1025)

Display all errors (Page 1081)

Clear error indicators (Page 1081)

15.3.4.4 Clear error indicators (Options menu)

Function

Use this function in the BATCH Recipe Editor to remove the colored highlighting of defective objects (structure elements) in the recipe structure, after a validity check.

Additional information

Validation (Page 1025)

Display errors (Page 1081)

Display all errors (Page 1081)

15.3.5 Window menu

15.3.5.1 New window (Window menu)

Function

Opens an additional view for the current window.

15.4 BCC and RE

15.4.1 Connection status to the BATCH Control Server

The status of the BATCH Control Server is shown on the right of the status bar. The connection to the BATCH control server can assume the following statuses:

Symbol in the status bar	Redundant configuration	Non-redundant configuration
	Both master and standby BATCH Control Servers are available.	The BATCH Control Server is available.
	The master server in a redundant configuration is available. Its standby server is not available. A redundancy switchover cannot take place in this status.	-
	Neither of the two redundant BATCH control servers is available. The BATCH Control Center is not ready to use.	The BATCH Control Server is not available. The BATCH Control Center is not ready to use.

In some situations, a progress bar is also displayed for processes that require longer.

15.4.2 Logged-on user

On the right of the status bar, you can see a user icon, the user name of the user currently logged on and the current system time.



Figure 15-9 User icon in BCC and RE

15.4.3 Print preview

You are in the print preview window. In the print preview, depending on the selected object (batch, master recipe, formula, library) in the BatchCC or Recipe Editor, the corresponding print data is prepared in the form of printable pages. The control bar at the top edge of the preview window contains functions for viewing, printing, and further processing of documents.

Note

The print preview window can be opened simultaneously a maximum of two times per BatchCC instance.

Control bar

The control bar offers you the following functions:

Symbol/button	Meaning
First page	Navigates to the first page of the document.
Go back one page	Goes back one page in the document.
Current page	Shows the page number of the page currently displayed in the print preview window.
Total number of pages	Shows the total number of pages in the document.
Next page	Goes to the next page of the document.
Last page	Navigates to the last page of the document.
Back	Function currently not available.
Hold	Interrupts the print data preparation process.
Window size, window width	Selection of the size in which the document should be displayed within the print preview window.
Print	Prints all pages of the document on the connected printer.
Update	Updates the print data in the print preview window.
Export	If you click on this button, a dialog opens in which you save the displayed document as a PDF file. Enter the file name and storage location and click Save.

15.4.4 Exit

This function closes all open windows and exits the application.

15.5 BCC and RE Edit menu

15.5.1 Cut (Edit menu)

Function

In the BATCH Recipe Editor, this command is used in a recipe to delete selected objects (structure elements) and place them on the clipboard. The objects can then be pasted at another location. The objects remain in the clipboard until further objects are cut or copied.

Note

You can only cut if you have selected only one object or if the selected objects are adjacent to or above each other.

Additional information

Paste (Edit menu) (Page 1086)

Copy (Edit menu) (Page 1085)

Delete (Edit menu) (Page 1076)

Undo (Edit menu) (Page 1075)

15.5.2 Copy (Edit menu)

Function

In the BATCH Recipe Editor, this command is used in a recipe to copy selected objects (structure elements) and place them on the clipboard. The objects can then be pasted at another location. The objects remain in the clipboard until further objects are cut or copied.

Note

You can copy if you have selected only one object or if the selected objects are adjacent to or above each other.

Note

When copying from transitions into another recipe operation (ROP), references in this ROP to non-existent parameters are cancelled and have to be re-parameterized.

Additional information

Cut (Edit menu) (Page 1085)

Paste (Edit menu) (Page 1086)

Delete (Edit menu) (Page 1076)

15.5.3 Insert (Edit menu)

Function

In the BATCH Recipe Editor, you can use this function to paste the content of the clipboard at the cursor position in the recipe if there are objects (structure elements) in it.

Note

After executing this command, make sure that you click with the mouse on the target position between two objects so that the content of the clipboard can be inserted there.

The following cannot be pasted:

- Parts of a hierarchical recipe into a flat recipe and vice versa
- Parts of a recipe phase into a recipe operation

Passed Parameters (Defer Relations)

When you insert recipe elements with passed (deferred) parameters, all parameters receive the displayed value. No new defer relations are created. Defer relations within a copy are retained. Transition references from the local RUP are interconnected where possible with existing RUPs with the same unit class.

Additional information

Cut (Edit menu) (Page 1085)

Copy (Edit menu) (Page 1085)

Delete (Edit menu) (Page 1076)

15.5.4 Select all (Edit menu)

Function

In the BATCH Recipe Editor and the BATCH control, you can use this function to select all objects (structure elements) in the recipe.

In BatchCC, you can use this function to select all objects in the detailed lists.

Additional information

Selecting objects (Page 533)

15.5.5 "Find" dialog

Find recipe elements

You can use the "Find" dialog to locate specific elements in recipes, batch, or libraries. You can use the search function in BatchCC, in the BATCH Recipe Editor, and in the BATCH OS controls. The hit locations are shown in a table. If you double-click a table object, the corresponding recipe opens in the editor and the hit location is highlighted in color. The search result can be saved as a text file.

You can search for the following elements, for example:

- Text
- Data such as data type, control strategy type, unit, library reference, category, or material
- Structures such as cross-references, source and target interconnections, jumps, monitoring, command steps, operator instructions, and synchronization
- Materials
- Status and extended status
- Recipe unit procedures, recipe steps and transitions
- Parameters

When a single master recipe is open in the Recipe Editor, you can also search for the process cell reference object.

The search for these elements can be used in recipe steps, transitions, container objects (RUP/ROP/SUB) in the recipe header or libraries.

The dialog is accessed via the menu command "Find" in the "Edit" menu, or via the corresponding menu command from the shortcut menu. When the master recipe/library is selected or open, you can also use the keyboard shortcut "Ctrl+F". You can search simultaneously in multiple objects with multiple selection in a detail view.

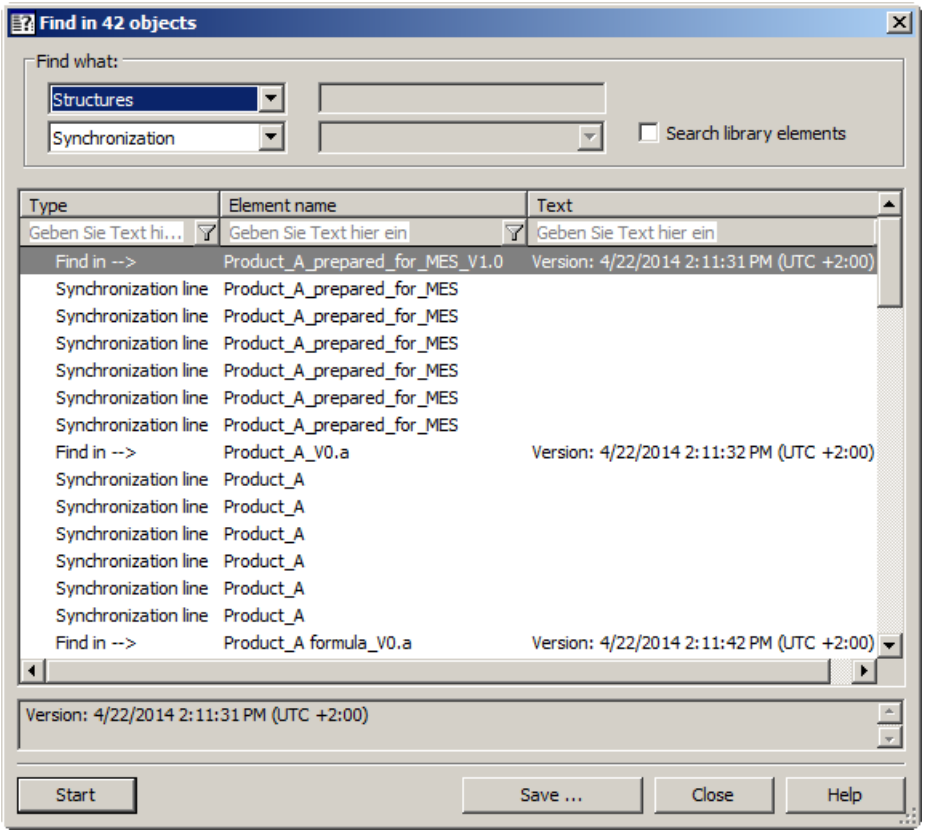


Figure 15-10 "Find" dialog

Dialog description

The dialog is divided into various sections.

In the upper section, "Find what", you can specify your search. You search for text, data types, and structures. Other fields are offered depending on your selection. For a text search, enter a keyword in the text box and click "Start". All printable characters, including text sections, can be used as search terms in any length. Wildcards cannot be used. The text search only finds elements that you can select or enter during the creation of recipes. For example, no comments on blocks or units from PCS 7 engineering are included in the search. Parameter names are searched. Additional criteria are available for the "Data types" and "Structures" selection, allowing you to fine tune your search.

If you not only want to search these selected recipes / library elements, but also the library elements referenced by them, select the check box and restart the search.

Note

The "Search" dialog is also used when searching for process cell references.

"Properties of master recipe" dialog, "Allocations" tab, "References ..." button.

The dialog that was opened does not include the "Search library elements" check box.

Process cell references are always searched for in the library elements in these dialogs.

The hits are displayed in the dialog. Hits in library elements cannot be opened at this point.

The search results are presented in tabular form in the middle section. There are filters available for each column, allowing you to filter or sort the search results based on your requirements. You use wildcards here.

The text found according to the criterion is displayed in the lower section.

Dynamic searching

If objects are open in the recipe editor, the search starts immediately when criteria are entered or changed in the selection boxes. If you have selected objects in a detail view or in the navigation tree, the search begins after clicking the "Start" button.

Displaying the hit location

When you click on a hit location displayed in the table, the corresponding recipe object is opened and highlighted in the BATCH Recipe Editor. The search dialog remains open and you can edit the opened master recipe, as long as the corresponding master recipe has not been released. In this state, the displayed hit locations in the search dialog are always based on the criteria with which the search was opened or started.

Examples

Question: In which objects does the "Liter" unit occur? Find what: Data types > Unit > l.

Question: Which elements contain parameters in the form of cross-interconnections? Find what: Structures > Cross-interconnections.

Question: Which objects contain the jump recipe reference? Find what: Structures > Jumps.

Question: Is the element with ID 2:14 in a recipe? Find what: Structures: ContID:TermID > 2:14.

Start button

Starts the search.

Save button

Opens a dialog in which you can save your search results as a text file to any location on your hard disk.

Close button

Closes the dialog.

Help button

This opens the online help.

15.6 BCC and RE Options menu

15.6.1 Important system messages (Options menu)

Opens the window for "Important system messages".

If the SIMATIC BATCH system detects situations such as too little hard disk space, these important system messages are displayed automatically in BatchCC, in the BATCH recipe editor and in the BATCH OS Control Monitor.

You need to acknowledge these system messages (critical messages) so that they are not displayed again. If there are system messages pending before you start the application, the window with the messages will be displayed immediately when you start the application or when you connect to a BATCH server.

If you close the window, it can be displayed again at any time.

Application	Icon	Opening the window with important system messages
BatchCC / BATCH recipe editor	-	Options > Important system messages menu
BATCH OS Control Master		Mouse click on the symbol in the toolbar.

See also

Control: SIMATIC BATCH OS Monitor (Page 662)

15.6.2 Settings > User settings (Options menu)

Function

Use this function to open the dialog "User Settings for ..."
The dialog contains tabs in which you can make custom user settings. All user-specific settings for the currently logged-in user will be displayed. All settings that you make here will be saved user-specifically in a database and will again be available to this user the next time he logs into SIMATIC BATCH.

The "Format" tab is displayed when the dialog is opened.

Additional information

"Format" tab (Settings) (Page 783)

"Dimensions" tab (settings) (Page 784)

"Zoom" tab (settings) (Page 785)

"Language" tab (settings) (Page 786)

User-specific session information (Page 281)

15.6.3 Settings > Project settings (Options menu)

Function

Use this function to open the "Project settings for ..." dialog.
The dialog contains tabs in which you adapt settings to the project. Project settings may be modified by users who have permission to "Change project settings". The project settings apply for all users who work with this project.

The "General" tab is displayed when the dialog is opened.

Additional tabs in this dialog

"General" tab (Page 888)

"Colors" tab (Page 794)

"Font" tab (Page 785)

"Archive" tab (Page 805)

"Versioning" tab (Page 795)

"Used plugin modules" tab (Page 796)

"Electronic signatures" tab (Page 799)

15.7 BCC and RE View menu

15.7.1 Display labelling (View menu)

Function

Use this function in the BATCH Recipe Editor and for batch control to switch the object labeling on (check mark) or off.

15.7.2 Pinning recipe/batch headers (View menu)

Function

This function allows you to fix the position of the recipe or batch headers in your recipe view. You can thus prevent the recipe/batch headers from disappearing from view when navigating to the end of long recipes. This makes it easier to read and arrange recipe phases for a RUP.

15.8 BCC and RE Window menu

15.8.1 Cascade (Window menu)

Function

Arranges the open windows so that they overlap and the header of the specific windows remains visible. Click the title bar of a specific window to move it to the foreground.

15.8.2 Horizontal (Window menu)

Function

Arranges all open windows one under the other so that all windows are visible and do not overlap.

15.8.3 Vertically (Window menu)

Function

Arranges all open windows next to each other so that all windows are visible and do not overlap.

15.8.4 Arrange icons (Window menu)

Function

Arranges the icons of all windows that have been reduced to icon size on the lower border of the work area.

15.8.5 Close all (Window menu)

Function

Closes all open windows.

15.8.6 Window management (Window menu)

Opens the Windows "Window" operating system dialog. The functions available in the dialog allow you to adapt and to save individual open objects as windows in the main window of the Batch CC. The following functions are available after you select the open windows in the main window:

- Windows in cascades
- Minimize window
- Close window
- Window horizontal
- Window vertical

15.9 BCC and RE Help menu

15.9.1 Introduction (Help menu)

Function

Opens the help window for SIMATIC BATCH and displays the help topic "Introduction". This topic provides a brief overview of the essential features of the application.

15.9.2 Getting started (Help menu)

Function

Calls a help topic that provides an overview of the tasks that you can execute with SIMATIC BATCH. The step-by-step instructions ensure that you have an easy time getting started with using the SIMATIC BATCH application.

15.9.3 Using help (Help menu)

Function

Offers information about use of the online help. You may find this information useful if you have never before worked with software products on a Windows platform.

15.9.4 Help topics (Help menu)

Function

Opens the help window for SIMATIC BATCH and displays the list of help topics you can select.

Additional information

Using help (Page 1096)

15.9.5 Info (Help menu)

This dialog box provides you with information about the installed version of the application and about the copyright.

15.10 Shortcut menu commands

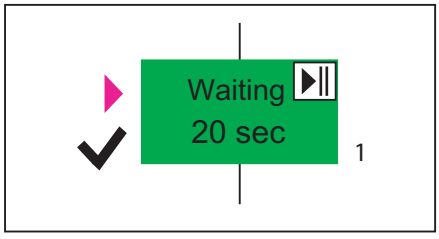
15.10.1 Start step

With this command, you start a recipe unit procedure (RUP) or a recipe procedure element (RPE). The "Start step" shortcut menu command is possible in the following statuses of the recipe procedure elements or recipe unit procedures:

- In the idle status. The element is started.
- In the statuses completed, aborted and stopped, the RPE is first reset by the system, in other words the step changes to idle and the step is then started automatically. You will find more detailed information in the section "Manual jump (Page 453)".
- In the "Continue" (Continuous) status, the recipe step is first completed by the system, then reset and finally started.

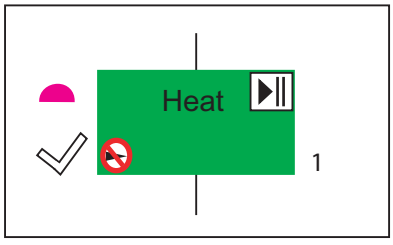
15.10.2 Pause step (after step)

Pause after batch step/transition has the effect that currently active lower-level recipe phases run to their end and the control recipe does not continue. The "Pause after step" identifier appears at the upper right of the step symbol for the recipe phase that has completed.



Note:

With non-self-terminating steps the step remains in the "Ready to complete" state.



For an active transition the command "Hold after step" works the same way as the command "Hold immediately".

15.10.3 Hold step (immediately)

In batch control, you can stop the selected step object (entire recipe, unit recipe, individual step, individual transition) immediately.

When you select individual steps/transitions, the processing of the steps is continued in simultaneous branches or on other units.

The function for the active step is stopped immediately on the programmable controller.

15.10.4 Resume step

In batch control, you can resume the held and selected step objects (entire recipe, unit recipe, individual step, individual transition).

15.10.5 Complete step

With this command, you terminate the selected recipe step(s).

15.10.6 Stop step

Overview

With the “Stop step” command, you stop a recipe step or a RUP/ROP before its planned end.

- Stop recipe step
  The recipe step is stopped regardless of whether the recipe step is running in continuous operation or not.
  The command executes only after a prompt for confirmation.

  Note

  You cannot continue a stopped recipe step.

- Stop RUP/ROP
  A RUP/ROP is stopped before the planned end analogous to a batch.
  You will find information on how to stop a batch before the planned end in the section "Stop (Control menu) (Page 1045)“.

Additional information

Operator commands for recipe steps (Page 449)

15.10.7 Abort step

Overview

With the “Abort step” command, you can abort a recipe step or a RUP/ROP before its planned end.

- Abort recipe step
  The recipe step is aborted regardless of whether the recipe step is running in continuous operation or not.
  The command executes only after a prompt for confirmation.

  Note

  You cannot continue an aborted recipe step.

- Abort RUP/ROP
  A RUP/ROP is aborted before the planned end analogous to a batch.
  You will find information on how to abort a batch before the planned end in the section "Abort (Control menu) (Page 1042)“.

Additional information

Operator commands for recipe steps (Page 449)

15.10.8 Abort step (emergency)

Use this function to abort an active or held selected batch step even when there is no AS connection.

This function is only active and visible when the user currently logged on has a role with super user status.

Note: The "super user" status has nothing to do with the name of the role. The role must have super user status, which is indicated by a yellow outline around the icon.



Note

An aborted step cannot be resumed.

The sequence in this part of the recipe remains where it is until the start of the sequencer, e.g. with the following transition.

15.10.9 Unlock step

With this function, you can unlock a batch element (RUP, ROP, RPH) that needs to be activated in the batch control if the synchronization between SIMATIC BATCH and SIMATIC IT using MES_SYNC_REQUEST is not working, for example because the SIMATIC IT connection is down.

Additional information

Additional status identifier (Page 467)

Configuring synchronization with SIMATIC IT (Page 617)

15.10.10 Reset step

You can reset and then restart an aborted step object (entire recipe, unit recipe, recipe step / transition) with the "Start" command.

15.10.11 Set breakpoint

During batch control, you can set breakpoints in the open control recipe for each control recipe element. If execution of the recipe reaches a recipe element with a breakpoint, only the run marker is set and the recipe element is neither occupied nor activated.

15.10.12 Remove breakpoint

Removes a set breakpoint in the open control recipe for a control recipe element. The control recipe element must have been selected beforehand.

15.10.13 Comment on batch element

During batch control, you can enter comments for an individual batch element–during or after batch execution–without having to hold the batch.

15.10.14 Comment on messages

Function

Opens a dialog for the entry of comments on the existing messages of batch control (system messages, process messages, error messages).

Requirement

If no Process Historian is configured in a multiproject, the shortcut menu command can be executed.

15.10.15 Sign

You can use this function in Batch control for a signature prompt in the "SIMATIC BATCH: Sign" dialog box to enter a signature.

Additional information

Signing conditions and status changes (Page 410)

15.10.16 Select unit

During batch control, you have the option of selecting a new unit, for example, after aborting a unit with this command. This function can only be used for recipe elements that can be configured with an allocation strategy.

15.10.17 Release unit

During batch control, you have the option of aborting the units involved. This function can be used on the elements RP, RUP, ROP, RPH and Transition that have a unique assignment to a unit allocated by SIMATIC BATCH.

In a flat recipe, this command is used to abort all recipe phases allocated to this unit before the unit is aborted.
Removes a set breakpoint in the open control recipe for a control recipe element. The control recipe element must have been selected beforehand.

15.10.18 Reset unit

During batch control, you have the option of resetting the affected unit. This function can be used on the elements RP, RUP, ROP, RPH and Transition that have a unique assignment to a unit used by SIMATIC BATCH.

This command caused all recipe phases in a flat recipe used in this unit to be reset before the unit is reset.

15.10.19 Open overview

Function

This function opens an overview window of the SFC visualization. Double-click in the window to display the content. The overview window is not closed automatically not even when BatchCC is closed. If you open the overview window again in another BatchCC, the overview window can be displayed twice.

If the "Always display in faceplate" check box is enabled in the SFC topology settings in the WinCC Explorer, the SFC visualization is always displayed with the SFC overview window and SFC detail window.

Requirements

- The corresponding recipe phase must be configured as an SFC type in PCS 7 Engineering.
- The PCS 7 OS Client add-on must also be installed on the PC in addition to an installation of the BATCH Client.

15.10.20 Open pane

Function

This function opens a detail window of the SFC visualization. The detail window is not closed automatically not even when BatchCC is closed. If you open the detail window again in another BatchCC, the detail window can be displayed twice.

If the "Always display in faceplate" check box is enabled in the SFC topology settings in the WinCC Explorer, the SFC visualization is always displayed with the SFC overview window and SFC detail window.

Requirements

- The corresponding recipe phase must be configured as an SFC type in PCS 7 Engineering.
- The PCS 7 OS Client add-on must also be installed on the PC in addition to an installation of the BATCH Client.

15.10.21 Control recipe: Batch

This is the control recipe for the batch you brought into view.

15.10.22 Number of queued jobs

Displays the number of queued jobs. Completed jobs with regard to the total number of jobs.

Additional information

Layout of the main window (BatchCC) (Page 276)

15.10.23 Current job being processed

Displays the job that is currently being processed.

Additional information

Layout of the main window (BatchCC) (Page 276)

15.10.24 Cancel queued jobs

Use this command to cancel processing of queued jobs.

Additional information

Layout of the main window (BatchCC) (Page 276)

15.11 Transition wizard

15.11.1 "General" transition condition (1/5) dialog box

Selecting a variable type

On the left, select the type of variable for operand 1; on the right, select the type of variable for operand 2. The two operands are logically linked by a relational operator. The following operands are available for selection:

- Parameter from the next higher recipe level
- Process tag: Process value from the automation process
- Constants: Constant value. Linear/quadratic quantity scaling is possible.
- Equation: Arithmetic calculation of setpoints
- RPE status: Status of the recipe procedure element (RP, RUP,ROP,RPH)

Note

Only practical combinations are allowed.

Next:

After selecting the type of variable, the "Next" button brings you to the corresponding configuration dialog for the configured variable type of operand 1. You then move on to select the operator and then to the configuration of operand 2. The final page of the wizard show you the resulting configured condition.

Finish

"Finish" closes the dialog.

15.11.2 "Operand 1/2" parameter (2/5) dialog box

You can enter the operand to achieve the desired condition. Select the desired parameter from those offered in the list.

Pressing the "Next" button brings you to the "Operator" dialog box.

15.11.3 "Operand1/2" dialog box process tag (2/5)

This is where you enter the operand to achieve the desired condition. Select the desired measured value from those offered in the list.

Click on "Next" to go to the "Operator" dialog box.

15.11.4 "Operand 1/2" recipe element (2/5) dialog box

Selecting a recipe element

This is where you enter the operand (RPE or transition) to achieve the desired condition. Select the object whose status you want to monitor from the list of those available in the current recipe.

Selecting an attribute

Select one of the two following attributes:

Attribute	Description
Status	ISA88 status. Example: Running, held, resuming, completed, completing.
Ext. status	Expanded status The following expanded states are available for selection as Operand2 in a dialog of the Transition Wizard: • Allocation error • Error • Breakpoint • Manual operation • Start lock • Time expired

Click "Next" to go to the next dialog box.

Using expanded status

You can now also use the expanded status of recipe elements in transitions as a condition for recipe step enabling in addition to the ISA88 status of recipe elements.

You can now determine if, for example, the ROP monitoring time has been exceeded. This information is contained in the "Time expired" expanded status of the ROP. When expanded status is enabled in a transition condition you can, for example, set a trigger in a monitoring structure.

You can also query the various expanded states within a transition for a recipe element in several conditions. In contrast to this, you can only query one state in a recipe element with the "Status" attribute.

15.11.5 "Operator" (3/5) dialog box

Dialog 3/5: Select operator for the condition

This dialog page shows the configuration of the condition completed up to this point and permits entry of the relational operator. In the middle field select the operator that specifies the logic operation condition of the two operands and therefore defines the condition.

Dialog 5/5: Overview of your transition condition

This page is display once again with the specified information upon completion of the configuration. You can complete the entry with the "Finish" button. The completed condition is entered as a result in the "Condition" tab.

15.11.6 "Equation editor" (4/5) dialog box

In this dialog box, you can configure arithmetic expressions in transitions and recipe parameters of recipe unit procedures (RUPs), recipe operations (ROPs) and recipe phases (RPHs) in order to calculate setpoints from parameters of the next highest recipe level and constants.

Permitted operators and addresses

Four basic types of logic (+;-;/;*) are offered for selection as operators. Only floating-point numbers and integers are available as operands. Parameters from the next highest recipe level and constants are offered for selection. The neighboring parameters are also available in recipe procedure elements (RUP, ROP and RPH).

Procedure

1. In the "Enter operation" area, click on the buttons of the desired operator. The "Equation" field displays "[...] Operation [...]".
2. If you want to expand the equation, select one of the operands [...] in the equation and then click on the required operation symbol. The selected operand is then expanded by the new expression.

   The rules of arithmetic are adhered to, where necessary the brackets are added automatically.
3. Click on one of the operands [...] in the "Equation" box. This enables the two boxes "Select parameter" and "Enter constant" for selecting or entering. Remember the following representation when selecting parameters
   - Parameters from higher recipe levels have the name of the higher recipe level as a prefix, for example, ROPx::parameter
   - "Neighboring" process parameters of this recipe procedure element do not have a prefix.
   - The prefix is omitted in transitions.
4. From the drop-down list, select the desired parameter or enter a constant and click "Apply". The term [...] is replaced by the selected parameter or constant.
5. Repeat step 3 for all operands.
6. Close the dialog with "OK".
7. If you wish to discard your entries, click "Delete". The equation is removed.

Result

The setpoint is calculated by the arithmetic operation.

15.11.7 "Operand 2" (4/5) dialog box

This is where you enter the operand to achieve the desired condition. The following constant entries are possible depending on the data type of operand 1:

- Floating point value and optional scaling routine (linear, quadratic)
- Enumeration type: Text selection from list
- Unit, also successor/predecessor from basic engineering as option

The value marked in the left window is always taken.

Click on "Next" to go to the "Operator" dialog box.

15.11.8 "Select operand" dialog box

On the left you can select the type of variable for operand 1; on the right the type of variable for operand 2:

- Parameter from the next highest recipe level
- Process tag: Process value from the automation process
- RPE status: Status of the recipe procedure element
- Constants: Constant value with optional linear or quadratic quantity scaling
- Equation: Arithmetic calculation of setpoints

"Next" button.

After selecting the operand type, the "Next" button brings you to the selection window for the parameters for this operand type (one each for operand 1 and operand 2) known in SIMATIC BATCH.

15.12 Help function for object cannot be executed

15.12.1 Updating the process cell

This function cannot be executed for the selected object.

15.12.2 Check validity (Edit menu)

This function cannot be executed for the selected object.

15.12.3 Archive (Edit menu)

This function cannot be executed for the selected object.

15.12.4 Revoke release (Edit menu)

This function cannot be executed for the selected object.

15.12.5 Unlocking

This function cannot be executed for the selected object.

15.12.6 Details (Edit menu)

This function cannot be executed for the selected object.

15.12.7 Print (Edit menu)

This function cannot be executed for the selected object.

15.12.8 Print preview (Edit menu)

This function cannot be executed for the selected object.

15.12.9 Properties (Edit menu)

This function cannot be executed for the selected object.

15.12.10 Export (Edit menu)

This function cannot be executed for the selected object.

15.12.11 Find (Edit menu)

This function cannot be executed for the selected object.

15.12.12 Copy the object (Edit menu)

This function cannot be executed for the selected object.

15.12.13 Delete (Edit menu)

This function cannot be executed for the selected object.

15.12.14 New (Edit menu)

This function cannot be executed for the selected object.

15.12.15 Open (Edit menu)

This function cannot be executed for the selected object.

15.12.16 Renaming

This function cannot be executed for the selected object.

Glossary

Allocation

A type of coordination control that allocates a resource to a batch or a unit.

Alternative branch

Structure element of a recipe with which an OR branch or an OR divergence is achieved. An alternative branch consists of at least two vertically arranged branches joined at top and bottom by a single horizontal line. With alternative branches, you can adapt the execution of the recipe to states in the process. The conditions in the top transitions of the sequences decide which sequence is executed.

Automation system

A programmable controller (PLC) consisting of a central rack, a CPU and various input/output modules.

Abbreviation: AS

Basic control

Basic control means the configuration of the automation system. This must be done separately from the recipe control strategy. As tools, you have the CFC or SFC editor available.

Batch

- Material that is being produced or that has been produced by a single execution of a batch process.
- An "imaginary" object representing the procedure for producing material at any point within the process.

Note: Batch means both the material created by and during the process as well as the unit that represents the manufacturing procedure for this material. Batch is used as an abstract contraction of the words "the production of a batch".

Batch control

Allows online monitoring and control and execution of the control recipe.

BATCH Control Center (BatchCC, BCC)

The Batch Control Center is a component of SIMATIC BATCH and provides you with a graphic user interface for monitoring and controlling batch processes. The BATCH Control Center manages all the data relevant to SIMATIC BATCH.

BATCH control server

The BATCH control server is a component of SIMATIC BATCH. The BATCH Control server handles communication with the process and controls and monitors execution of the current batches.

The BATCH control server does not have its own user interface. The BATCH control server is started on the runtime PC.

Batch planning list

A list of batches to be produced in a specific process cell. This contains information about when and in which order batches representing the required quantity of a product will be produced and which equipment will be used.

Batch process

A discontinuous process in which a required product is manufactured in a chronological sequence of production tasks involving one or more batches according to a set of rules (recipe).

BATCH Recipe Editor (RE)

The BATCH Recipe Editor is a component of SIMATIC BATCH and provides you with a graphic user interface for creating and modifying master recipes and library operations. Recipe creation is based on the BATCH objects from the batch process cell configuration in the engineering system of SIMATIC PCS 7, for example, units and equipment phases.

Batch report

A selection of data relating to one or more batches. A batch report documents the production of a batch and contains selected recipe data, process data and events.

BATCH reports

BATCH reports are SIMATIC BATCH components which ensure documentation of recipes and batch data. The batch report contains all the information required for the reproducibility of the batch process, quality assurance and the fulfillment of legal requirements.

BatchCC

See BATCH Control Center (BatchCC).

CFC

Continuous Function Chart (CFC): Programming language for convenient description of continuous processes by graphic interconnection of complex functions.

Control module

The lowest level of the grouping of equipment in the physical model that can implement basic control.

Control recipe

A type of recipe which, through its execution, defines the manufacture of a single batch of a specific product.

The control recipe is a copy of a particular version of the master recipe that is then modified as necessary with information for planning and execution making it specific to a single batch.

Control strategy

Different equipment phases that are mutually exclusive in terms of simultaneous operation belonging to the same equipment module are known as the control strategies of this equipment module, for example,

Equipment module: Ventilation in level 1 for control strategy 1, ventilation in level 2 for control strategy 2

Control strategy 1: Pressure overlay

Control strategy 2: Rinsing

Determinism (algorithm)

A deterministic algorithm is an algorithm in which only defined and reproducible statuses occur. In other words, an instruction in the algorithm is always followed by the same instruction assuming the same conditions. At any point in time, the next processing step of the algorithm is uniquely specified. This means that all interim results within the algorithm are always the same.

Device

See Equipment module.

Engineering station

PC station on which the process control system is adapted to the task in hand using the engineering system (ES).

Engineering system

Configuration system (ES) PC-based with which the process control system can be adapted visually to the task in hand.

Equipment

Collective term for: process sells, units, equipment modules and control modules.

Equipment module

A functional grouping of equipment that can execute a limited number of specific smaller processing activities.

Equipment phase

The smallest element of a procedural control that can execute a process-oriented task.

Formula

Material and production data: components of the recipe, which contains the following recipe information:

- Process inputs (resources for manufacture of products)
- Process outputs (expected results)
- Process parameters (global recipe parameters)

Formula category

A formula category can be assigned a class of formulas with the same raw material and production data structure. The only differences between the formulas of a formula category are the concrete parameter values.

The formula category contains the parameters that can be controlled by the operator during batch planning with SIMATIC BATCH using the formula. These parameters are included in the formula category with their data type and unit of measure.

General recipe

Recipe type describing processing requirements independent of equipment and location.

Hierarchy folder

The hierarchy folder is used to achieve hierarchical structuring of a process cell (of a project). It can contain further hierarchy folders or objects such as CFC/SFC charts, pictures, reports and additional documentation.

Hold immediately

The batch (control recipe execution) is held and all active steps are also held.

Input material

Raw material or other resource required to manufacture a product.

The name and quantity of a raw material or other resource required to manufacture a product.

Input material

Raw material or other resource required to manufacture a product.

The name and quantity of a raw material or other resource required to manufacture a product.

Library operation

You can use libraries to store recipe elements created with the BATCH Recipe Editor that you require often in the recipes of the process cell. Only recipe operations (ROPs) can be stored as recipe elements. Recipe operations that are managed in libraries are known as library operations.

Library reference

A library operation is not linked directly into a recipe unit procedure (RUP) but uses a library reference. The library operation cannot be modified within the master recipe; the library operation must always be opened explicitly in the BATCH Recipe Editor.

Loop

Structure element of a recipe consisting of a sequence with at least one recipe step and one return branch with a transition.

Master recipe

Recipe level that takes into account the capabilities of the equipment and contains information specific to the process cell. A master recipe is an indispensable recipe level without which control recipes cannot be created or batches produced.

Master recipes can contain material and production parameters as normalized, calculated, or fixed values. A master recipe can be derived from a general or site recipe from the enterprise level (refer to the standard IEC 61512-1: 1997.

NTLM

NT LAN Manager is an authentication method for computer networks

Operation

A procedural element that controls an independent processing activity consisting of the required algorithms for triggering, organizing and controlling phases.

Operator

see Operator.

The operator is the user of this software coordinates the batch during runtime.

Operator

see Operator.

The operator is the user of this software coordinates the batch during runtime.

Operator dialog

Input and display option for an operator instruction:

- Without acknowledgment
  Example: Entry of analysis process values.
- With acknowledgment
  Example "manual dosing": The operator is instructed which material and how much to add. The operator then enters the actual values that have been added and confirms the input (acknowledgment).

Operator instruction

The operator instruction allows instructions to be displayed to the operator during execution of a recipe. A distinction is made between the display of pure instructions (NOP step) and an instruction that allows operator input (operator dialog). The operator may also be required to acknowledge the instruction.

Operator station

OCM: (operator control and monitoring) station

Abbreviation: OS, PCS 7 OS

OSC (online structure changes)

Changes to recipe structures in planned, released and started batches are known as online structure changes. With online structure changes, you are able to refine your master recipes in test mode and adjust them perfectly to your processes.

Output material

The name and amount of material or energy expected as the result of executing a recipe.

A material (product, by-product, or waste product) expected as the result of executing a recipe.

Output material

The name and amount of material or energy expected as the result of executing a recipe.

A material (product, by-product, or waste product) expected as the result of executing a recipe.

Pause after step

A batch (control recipe execution) is paused, all active steps continue until they are completed, no new steps are started. In contrast to the "Hold immediately" command, this command simply prevents the control recipe from passing control to the next step.

Plant hierarchy

The plant hierarchy consists of hierarchy folders that in turn can contain further hierarchy folders, such as CFC/SFC charts, pictures, reports and additional documentation. It represents the functional structured hierarchy of the process cell regardless of the assignment of programmable controllers or operator control and monitoring systems. This is displayed in the Plant view of the SIMATIC Manager.

Procedural control

A control that controls equipment-oriented actions in an ordered fashion to allow execution of a process-oriented task.

Procedure

The strategy according to which a process is executed. This can refer to the production of a batch or to a non-production process, such as a cleaning operation.

Procedure element

A block for procedural control defined by the model of the procedural control.

Process

A sequence of chemical, physical, or biological activities for the conversion, transportation, or storage of material or energy.

Defined in DIN 28004: A sequence of chemical, physical, or biological activities for the conversion, transport, or storage of material or energy.

In everyday language a process is a method of achieving a target. In industry a process is used along with chemical, physical and biological knowledge and methods to obtain, produce, convert or eliminate materials. Example: Synthesis of ammoniac according to Haber and Bosch.

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convert or eliminate materials. Example: Synthesis of ammoniac according to Haber and Bosch.

Process cell

A logical grouping of facilities/devices that includes the equipment for creating one or more batches. The process cell determines the spectrum of logical control options for a set of process equipment within a process cell complex.

Within the plant hierarchy, the process cell is the highest level. This is followed by units and equipment modules.

Process cell complex

A process cell complex consists of several equal-ranked or interacting industrial processes with corresponding auxiliaries (according to DIN 28004). This is part of a factory with batch production that is defined by physical, geographical or logical boundaries within the factory.

Process operation

A larger processing activity that usually involves a chemical or physical conversion of the material being processed and that is specified without taking into account the target equipment configuration to be used.

Process parameters

Information required to manufacture a material that does not fall into the category of input material or output material. Typical information in the process parameters includes temperature, pressure and time.

Process stage

A part of a process that normally executes independent of other process stages and results in a planned sequence of chemical and physical conversions of the material being processed.

Process step

Smaller processing activities that are combined to form a process operation.

Processing block

The equipment phase/operation in SIMATIC BATCH consists of the BATCH interface block (CFC) and the processing block (usually SFC).

Production order

A production order contains information on the product, quantity, required quality and deadline.

Production request

Contains the specified production order data to produce a certain quantity of a product with a certain required quality at a certain time.

Project

A container for all objects of an automation solution regardless of the number of stations, modules and how they are networked.

Recipe

The required amount of information necessary to define the production requirements for a specific product. A recipe is a set of rules and information required to define how a product is manufactured. There are the following recipes: general recipe, site recipe, master recipe and control recipe.

In SIMATIC BATCH, the following recipe types are used:

- Master recipe
- Control recipe

Recipe control strategy

In a recipe control strategy, the sequence of production steps for making a product can vary from one batch to the next.

The essential aspect of a genuine recipe control strategy is that new recipes can be specified and executed ...

- by the chemist or process technician (not a programmer or control system specialist)
- using a user interface adapted to his/her needs (not using the programming/configuration user interface of the control system)
- without interventions in the software structure of the control system (in other words, without the risk of changing interlocks or validated structures)
- during operation (without reloading/restarting) of the control system

... specify and execute new production processes (= recipes). Such changes, nevertheless, mean changes in the sequences of the process steps and not simply changes to parameter values.

Recipe header

Information on the purpose, the source and the version of the recipe, for example recipe and product identification, author and output date.

Recipe operation

An operation that is part of a recipe procedure in a master or control recipe. Depending on the recipe type, this becomes the master recipe operation or the control recipe operation.

Abbreviation: ROP

Recipe phase

A phase that is part of a recipe procedure in a master or control recipe. Depending on the recipe type, this becomes the master phase or the control phase.

Abbreviation: RPH

Recipe procedure

The part of a recipe that describes the strategy for producing a batch.

Abbreviation: RP

Recipe unit procedure

A unit procedure that is part of a recipe procedure in a master or control recipe.

Abbreviation: RUP

Reference quantity

The reference scale is the reference quantity for quantity scaling. All quantity-dependent values in the recipe relate to this quantity.

The quantity scaling factor results therefore from the ratio: specific quantity to reference scale.

Resources

Resources are units (including transport and cleaning equipment), input materials, products etc. and even personnel.

Scaling function

You can use scaling functions to make processes quantity-dependent. Depending on the concrete quantity for the batch, the parameters are corrected using the selected scaling function. There are two standard scaling routines available:

- Linear: The value is multiplied by the quotient batch quantity/reference quantity.
- Quadratic: The value is multiplied by the quotient quantity/reference quantity.

Sequential control

Control in which device-oriented actions are controlled in an ordered fashion to allow a process-oriented task to be performed.

SFC

Sequential Function Chart (SFC): A graphic representation of a sequential program consisting of interconnected steps, actions and specific links with step enabling conditions.

SFC is a suitable method of representation (description of the processing sequence) of the entire procedural rules with sequential and parallel steps providing clarity in the process controls.

Simultaneous branch

Structure element of a recipe that implements an AND branch or an AND divergence. A simultaneous branch consists of at least two horizontally arranged sequences joined at top and bottom by double lines. A simultaneous branch results in the simultaneous execution of more than one sequence. This allows processes to be executed at the same time.

Site recipe

A site-specific recipe type. Site recipes can be derived from general recipes taking into account regional constraints such as language or available materials.

Step

A step is the smallest functional unit of an SFC chart. The smallest structural unit in a recipe is known as a recipe step.

Structure element

Structure elements of a recipe consist of an arrangement of basic elements. The following are examples: "simultaneous branch", "alternative branch" and "loop".

SUIR

Software update in run (software update during operation)

Synchronization line

The synchronization lines coordinate the execution of recipe sequences in the units or of the recipe operations (ROPs) between the units.

Synchronization point

At each synchronization point, it is possible to decide whether the execution of the recipe sequence should be held.

Transition

A transition contains conditions that must be satisfied so that the controller can move on from one state to the next or pass control from one step to the next.

Unit

A grouping of related control modules and/or equipment modules and their equipment in which one or more larger processing activities can be performed.

Only one batch is ever processed at any one time in a unit. Units generally operate independent of each other. Examples of larger units include caustic soda, carbene addition, extraction, distillation.

Unit class

Each unit can be assigned to a unit class in the plant hierarchy.

In the BATCH Recipe Editor, the candidates that can be selected as the unit and the possible associated phases (EOP/EPH) is restricted to a unit class. The great advantage of this is that when you convert the master recipe to the control recipe, the actual unit allocation is always successful since the master recipe contains only the permitted unit candidates.

Unit of measure

The unit of measure is a dimension or quantity with a specific value. Examples of units of measure: 1 m, 1 kg, 1 €.

Unit procedure

A strategy for executing a related process within a unit. It consists of a sequence of operations and the required algorithms for triggering, organizing and controlling these operations.

Unit recipe

A part of a (control) recipe that uniquely specifies the sequence of production requirements for a unit. The unit recipe contains the unit procedure and the corresponding material and production parameters, recipe header, requirements of the equipment and other information.

WinCC

WinCC is a neutral Windows-based system for solving visualization and process control tasks in production and process automation.

WinCC provides function modules designed for industry for graphic representation, messaging, archiving and logging. With its powerful process interface, fast picture updating and secure data archiving, it ensures high availability.

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