SIEMENS

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Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring to property damage only have no safety alert symbol. The notices shown below are graded according to the degree of danger.



Danger

indicates that death or severe personal injury will result if proper precautions are not taken.



Warning

indicates that death or severe personal injury may result if proper precautions are not taken.

Caution

with a safety alert symbol indicates that minor personal injury can result if proper precautions are not taken.

Caution

without a safety alert symbol indicates that property damage can result if proper precautions are not taken.

Notice

indicates that an unintended result or situation can occur if the corresponding notice is not taken into account.

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The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notices in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:



Warning

This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

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Preface

Purpose of the Manual

BATCH Getting Started gives you an overview of the software package SIMATIC BATCH together with the SIMATIC PCS 7 process control system and lets you learn the functions of the batch process control.

Getting Started is intended for new users of SIMATIC BATCH.

Require Knowledge

General knowledge in the area of automation engineering and process control engineering is required to understand this documentation.

It is assumed that the reader knows how to use PCs or other equipment similar to PCs (such as programming devices) operating under Windows operating systems approved for PCS 7.

SIMATIC BATCH requires the base software of PCS 7. You should already be familiar with working with the configuration as described in the manual "Process Control System SIMATIC PCS 7 V7.0, Getting Started – Part 1".

Scope of the Documentation

This documentation applies to the software package SIMATIC BATCH V7.0 in combination with the process control system, SIMATIC PCS 7 V7.0.

Additional Support

If you have questions about using the products described in this manual that are not answered in this document, please contact your local Siemens representative.

You can find your local Siemens representative at:

http://www.siemens.com/automation/partner

You can find a guide to the collection of technical documentation for individual SIMATIC products and systems at:

http://www.siemens.de/simatic-tech-doku-portal

You can find the online catalog and the online ordering system at:

http://mall.automation.siemens.com/

Training Center

We over a variety of course to help you become familiar with the PCS 7 process control system. Please contact your regional training center or the central training center in Nuremberg, Germany.

Phone: +49 (911) 895-3200.

Internet: <u>http://www.sitrain.com/</u>

Technical Support

You can reach the Technical Support for all A&D products

- Via the Web formula for the Support Request <u>http://www.siemens.com/automation/support-request</u>
- Phone: + 49 180 5050 222
- Fax: + 49 180 5050 223

Additional information about our Technical Support can be found on the Internet pages <u>http://www.siemens.com/automation/service</u>

Service & Support on the Internet

In addition to our documentation, we offer our Know-how online on the internet at: http://www.siemens.com/automation/service&support

where you will find the following:

- The newsletter, which constantly provides you with up-to-date information on your products.
- The right documents via our Search function in Service & Support.
- A forum, where users and experts from all over the world exchange their experiences.
- Your local representative for Automation & Drives.
- Information on field service, repairs, spare parts and more under "Services".

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1 Part 1: Introduction Batch Processes

1.1 Technical Process Categories

	Manufactoring	Distribution	Storage
	process	process	process
	"Transformation"	"Transport"	"Saving"
Process engineering	Refinery, Chemical Reactions	Gas distribution, Pipeline	Tank, Bunker
Production	Turning,	Assembly line,	Storage
engineering	Milling	Packaging	

Distinction between Process Engineering and Production Engineering

- The products of industrial processes are normally produced liquid or solid materials
 - physical / chemical / biological processes
 - safety, complete control of (dangerous) processes
 - undetermined (cannot be predicted)
 - at times cannot be interrupted
- Production processes are used to produce specific amounts of goods, for example screws, computers....
 - mechanical activities
 - throughput, speed
 - determined (predictable)
 - can be interrupted

Division within Industrial Processes

- Continuous process
 - Started up once and then operated continuously over a longer period of time
 - Synonym: Continuous flow process
 - Examples: Ammonia synthesis, ethylene production
- Discontinuous process (batch process)
 - Produces the product in individual batches
 - Synonym: Batch process
 - Examples: Production of plastics, paints, fertilizers

Evaporators Chemical Reactor Group Water Condenser Vacuum Pan to Hot Well Evaporator -#-(LT (LIC) Steam 2 Feed Condensate -QR¢ Product Conti Batch

1.2 Characteristics of Continuous and Batch Processes

	Conti		Batch
~	Continuous product flow	~	Limited product quantities
~	Large product volumes	~	Small product volumes
~	Setpoint-driven	~	Recipe-driven
~	Changes rarely made to the plant	~	Changes often made in the process
~	Single-product plants	~	Different products in the same plant
~	Equilibrium states	~	Often only semi-automated -> manual interventions
~	Manual intervention rare	~	Production know-how is contained in the processes (recipes)
~	The automation includes the production know-how		

The main difference between batch and continuous processes is in production.

In a batch process, specific quantities of product are produced so that they can be uniquely identified.

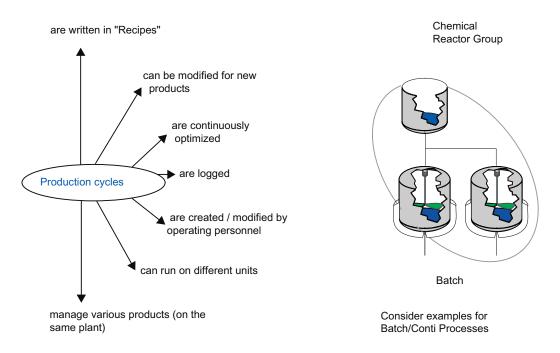
Recipes contain not only the setpoints of the relevant process variables and product quantities but also describe the method or procedure used to make the product.

In a continuous process, the sections of plant are specialized for their particular task.

In a batch process, the same section of plant can be used more than once by different batches (shared resources).

Quite often, you will find a mixture of these two processes in which continuous and batch processes are linked together or in which smaller sections of a batch process are handled by an intermediate stage operating continuously.

1.3 Practice: Where is this Used?



The production sequences are described in recipes that reflect the manufacturing process. In contrast to typical continuous applications or production engineering applications, the production sequence is not expressed in the automation solution but is described in a "Recipe".

The production sequences can be adjusted to new products. It is by no means the case that automated production always produces the same thing; various end products can be produced whose manufacturing processes are specified in different recipes. These are constantly optimized both in terms of parameter settings and the production sequences themselves.

In production, it is often vital that the sequences can be documented to allow them to be reconstructed. This is important for quality assurance and to identify defects.

For many end customers it is decisive that they can adapt the production sequences themselves to different products allowing them to introduce new products or to modify existing workflow sequences.

This should be possible for the operating personnel without needing to call in system specialists. It should not be necessary to make changes to the programmable controller itself but rather in the recipes describing the manufacturing process.

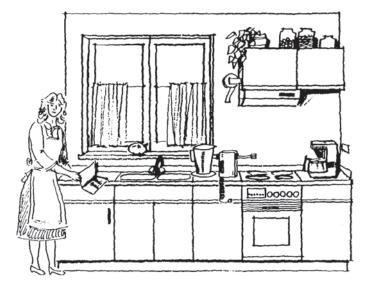
During actual production as described in a recipe, the following question often arises: "Where will production take place?". Generally there is more than one production facility capable of performing the same production sequence (for example several production lines). It should therefore be possible to assign the production sequences to different production facilities. This ability must also be included in the system functionality and must not require modifications to the automation program.

1.4 Branches for SIMATIC BATCH



Typical branches that use batch processes are listed above. One example is the production of beer in the foodstuffs and luxuries industries.

1.5 Origins of Batch Production: The Kitchen



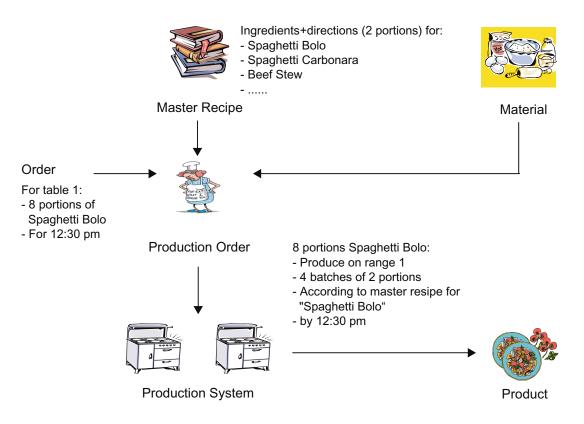
The best example from daily life is the "Kitchen" production plant.

Various products are created here. The production method is described in recipes. These can be constantly optimized and improved and completely new recipes are added. The chef is perfectly capable of doing this alone without help from the kitchen manufacturer. The recipe is often "secret" and contains the know-how for the production of a dish.

When cooking, cooks want to be able to decide which equipment will be used to implement a recipe. If there are several kitchens (for example in an industrial kitchen), the user can decide which kitchen will be used to make the recipe. Regardless of the kitchen selected, the same product should result and the actual production location should only be decided during production scheduling.

It may also be important to document the production sequences (for example, for quality assurance for the health authorities and for guests who want to know how the product they are consuming was actually produced).

1.6 The Cook - Working Environment and Working Procedures



The working environment of a cook is as follows. The cook has recipes available containing both the instructions as well as the required ingredients and quantities. These recipes are known as master recipes.

To produce the product, materials are required that will be used during production.

Before production can be started, an order is necessary. This contains at least the information about what should be created in which quantity and by when.

To deal with the order, the cook works according to the relevant recipe. The cook must also decide where (for example on which stove) the dish will be cooked. Normally, several orders are being processed at the same time so that some production process cells are in use and not currently available.

The result is the finished product.

1.7 Batch Terminology

- Master recipe Recipe level that takes into account the capabilities of the equipment and contains information specific to the process cell.
- Control recipe
 A type of recipe which, through its execution, defines the manufacture of a single batch of a specific product.
 - Batch Apparatus-dependent quantity of a product, which is manufactured discontinuously in a defined production cycle.
- Process

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

Up to now, we have used terms taken from everyday language. Such terms are, however, liable to subjective interpretation. The same word may mean different things to different people. This is particularly the case when people with different occupations talk to each other (for example system engineers, chemists, production engineers). A chemist might understand a recipe to be the chemical composition of a product (which should not be revealed at any cost) whereas the system engineer considers it to be an automated sequence (for example a sequencer).

To create a production facility that operates as desired, people from various walks of life must be able to work together. It is therefore important that everyone speaks the same "language". Definition and unification of the terminology was the aim of NAMUR and ISA SP88.

We will gradually replace everyday language with the terminology from the standard.

In our kitchen, we will therefore be able to derive a control recipe from the "Spaghetti" recipe for Fred's kitchen that will decide the production sequences and that will produce a batch of spaghetti after it has been processed.

This illustrates that the control recipe derived from the master is responsible for production. The control recipe must therefore know which production facilities it will be using while the master recipe remains neutral in this respect.

1.8 The Kitchen: Master Recipes – Header Data

Language of the Cook		S88 Terms	
Meal	Spaghetti Bolognese	Product	
Number of persons	4 (standard servings)	Reference quantity	
Ingredients	1 kg ground beef 100 g champignons 1 kg noodles pinch of salt 1 onions 4 tomatoes : :	Input materials	

What do master recipes contain in detail? Typically, they contain two parts:

A recipe header with general information on the product (name, reference quantity, ingredients, quantities).

In addition, a recipe must also include instructions or procedural rules for production.

This is known as a recipe procedure.

This does not yet contain any information about the equipment that will be used for production.

1.9 The Kitchen: Master Recipes – Procedure (procedural rules)

Instructions		Procedural Rules
1. Make Bolognese		Unit recipe 1
	Chop onions and tomatoes, place in pan, weigh the ground meat and add	ROP 1: Preparation
		ROP 2: Heating
	Heat pan with level 6	
		ROP 3: Simmer
	Simmer for 1 hour with lid on pan	
2. Cook pasta		Unit recipe 2
3. Spice	Pot	Unit recipe 3
4. Taste	Pan	Sample

The recipe procedure forms the instructions for production. It is divided into various sections (unit recipes). The unit recipes themselves are made up of recipe operations (ROPs).

We could, for example describe the production of Bolognese sauce required to produce Spaghetti Bolognese in a unit recipe for Bolognese. We can further refine this procedure by detailing the steps in recipe operations. In the unit recipe for Bolognese sauce, would therefore start with the "Prepare" recipe operation. During the preparation, the input materials onions and tomatoes are chopped, ground meat is weighed and put in a pan.

At this stage, use of the term pan or pot is still generalized. These are references to the production facilities that will be required. In the language of the standard, these are known as unit classes. The master recipe itself is nevertheless "neutral" in terms of the units; in other words there is still no mention of the unit that will actually be used for production (for example Fred's kitchen and, Fred's favorite pot).

1.10 The Kitchen: What is Required of the Automation

are written in "Recipes"	Recipes for spaghetti, etc.
can be modified for new products	The chef must create new dishes
are continuously optimized	Refinements, recipe modifications
Production processes are logged	Dish production should be recorded and be able to be traced
are created / modified by authorized personnel	Recipes are made by the chef, not by the appliance supplier
can run on different units	Recipes can be used in different kitchens
manage various products (in the same process cell)	Spaghetti, schnitzel, baked potatoes, etc.

The "Kitchen" example is an analogy for the characteristics of batch processes. When automating such processes, the above requirements must therefore be met.

1.11 The Kitchen: Automation Concept

are written in "Recipes"	Possible with AWL, SCL, SFCs, WinCC, though sometimes highly complex
can be modified for new products	AWL, SCL, SFCs can be modified
are continuously optimized	AWL, SCL, SFCs can be modified
Production processes are logged	AWL, SCL, SFCs can be modified
are created / modified by operating personnel	No longer possible
can run in different process cells or units	No longer possible
manage various products (in the same process cell)	Possible with AWL, SCL, SFCs, WinCC, though sometimes highly complex

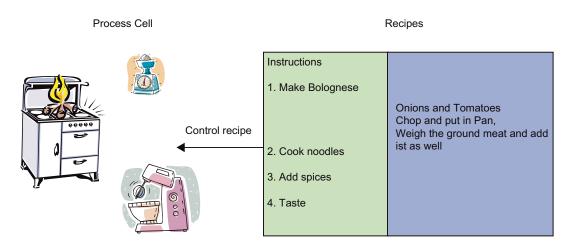
What do these requirements mean when formulating an automation concept? We can think of PCS 7 $\,$

as a system platform. How can we describe the production sequences in recipes ? – It is conceivable to structure all possible sequences using CFC and SFC and to map these to "recipes" using parameters stored on the OS. Structuring the sequences could, however, be extremely complex since all possibilities must be taken into account. It should also be possible to modify the recipes or to create new recipes. This could mean that the automation program (CFC, SFC) would have to be changed. The operating personnel would not be capable of doing this and the automation technician would have to be called in.

It would be possible to log the sequences using messages output on the OS in the form of reports. This would have to be implemented separately for each specific project. New and modified recipes would once again cause problems.

The complexity of the automation solution increases yet again if the sequences also need to be adapted for various units. This would mean that the SFCs would also have determine which units are to be used.

1.12 Automation Concept- New Approach



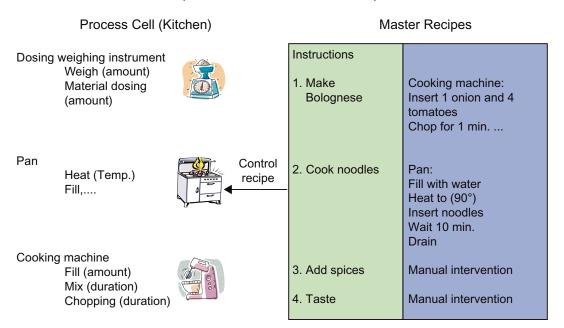
Separation of Automation and Recipe

A new approach is required to reduce the complexity, and this is achieved by separating the automation level from the recipe level.

We assume that the physical structure of the process cell remains the same and that only the sequences change. We can therefore implement the process cell-specific parts in the program or controller and map the sequences in a "recipe system" that can be manipulated during operation. This is where the master recipes are created and maintained.

Control recipes are derived from the master recipes and these access the programmable controller.

1.13 Separation of the Automation Level and Recipe Level



Separation of Automation and Recipe

In the process cell, we can create a structure consisting of units (scales, pan, mixer,..). These, in turn, have equipment phases such as weighing, dosing etc.

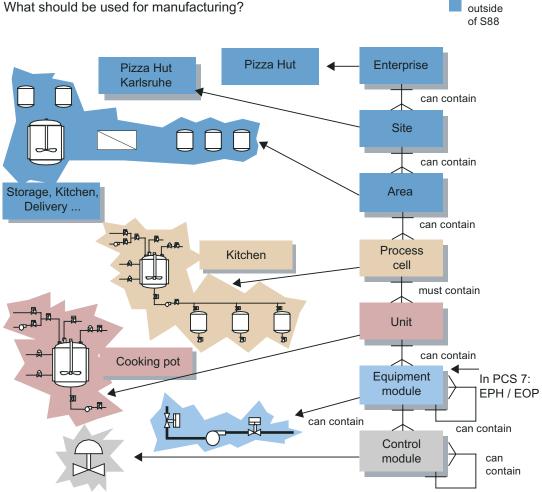
The phases can have parameters such as the quantity parameter of the dosing equipment phase.

This is all mapped in the programmable controller. Here, the term process cell model is used. This represents the "tool box" for the author of the master recipe.

In the master recipe, these units with their equipment phases are used to compose the sequence.

Based on the example of Bolognese sauce, this means that the mixer is needed. This provides the equipment phases filling, mixing, chopping. The first step is to put an onion into the machine. The 4 tomatoes are added and then minced for 1 minute, etc.

1.14 ISA S88.01 - Physical Model



What should be used for manufacturing?

The hierarchical structure is shown once again in the figure above.

The model has seven levels. The top three levels are not dealt with in the standard since these go beyond the framework of batch control.

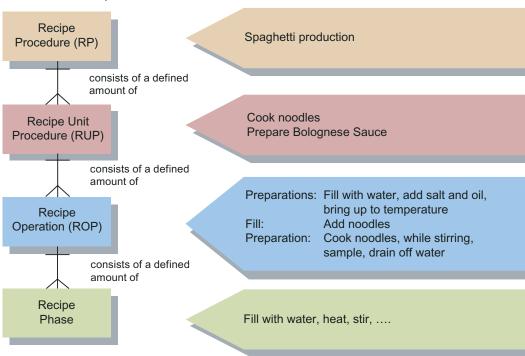
The lower four levels are also known as the process cell model.

The term "equipment module" here means the "equipment phase" (dosing, weighing, etc.).

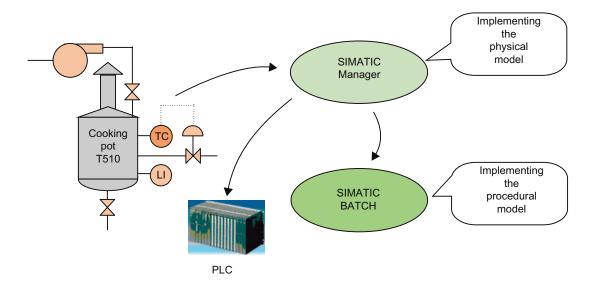
In the PCS 7 environment, the term "EPH (equipment phase)" is used. All three terms mean the same.

1.15 Procedural Control Model

In keeping with the physical model, a hierarchical model to describe the procedures is specified.



How should it be produced?

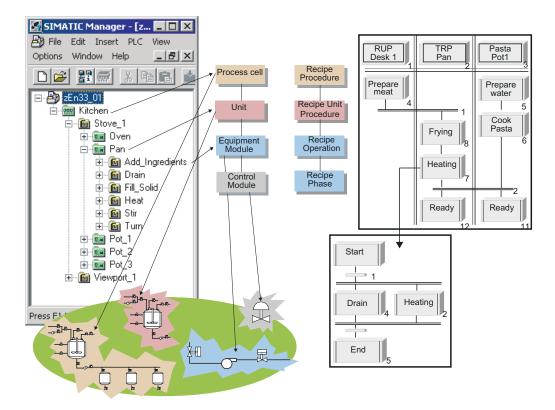


1.16 Implementation – Physical and Procedural Model

The two models are mapped in the architecture of PCS 7 as shown in the picture. The physical model is implemented in the PCS 7 ES. The program structures produced run on the AS.

The procedural model is implemented in SIMATIC BATCH. The control recipes run in SIMATIC BATCH and in the program structures in the AS.

1.17 S88.01 Model – PCS 7



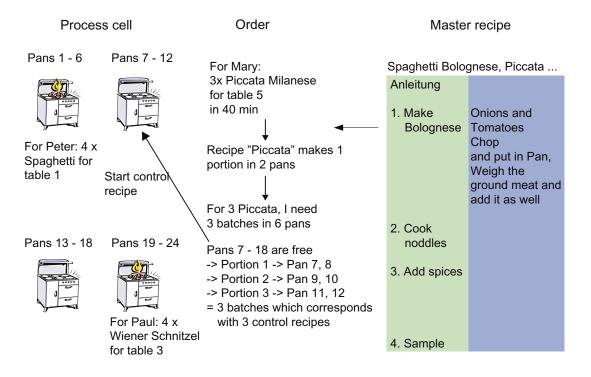
ISA S88.01 describes various models that can be fully covered with PCS 7 and SIMATIC BATCH.

The process cell model describes the process cell, unit, equipment module and control module level that is mapped using the plant hierarchy in the Plant view of the SIMATIC Manager.

The process cell model is prepared for SIMATIC BATCH so that the procedural model in the form of recipes can be mapped on it.

- A recipe procedure runs on a process cell to control a process and to create a batch of a product.
- A recipe unit procedure runs on a unit to control a recipe stage. A unit can only be allocated to one batch at any one time.
- A recipe operation or a recipe phase runs on an equipment module to perform an industrial process task or function.
- The device control level is not within the framework of the Batch system and is addressed over the equipment module. The device control level is located completely within the AS system.

1.18 Workflow in the Kitchen: Order - Master Recipe -Process Cell



Mary puts in an order for three portions of Piccata Milanese. The order is for table 5 and should be ready in 40 minutes.

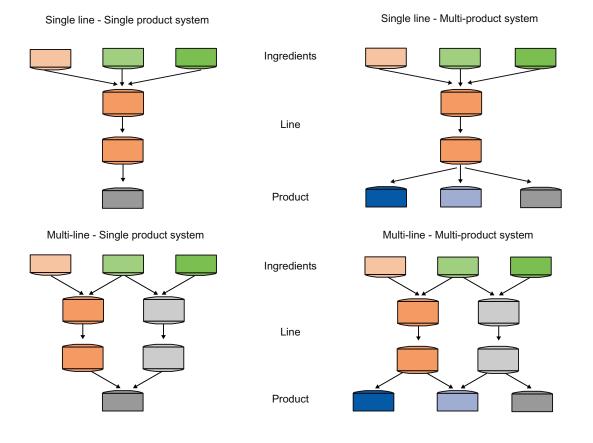
The master recipe "Piccata" is available for production. It describes the process for one portion.

Two pans are required. To create three portions at the same time, six pans are therefore needed. This means that three control recipes must be created (each occupying two pans). Each control recipe produces one batch of Piccata.

If six pans are free, the chef can start the three control recipes at the same time (as shown in the picture).

If only two pans are free, the three batches can only be produced in sequence, one after the other.

1.19 Classification of Batch Process Cells

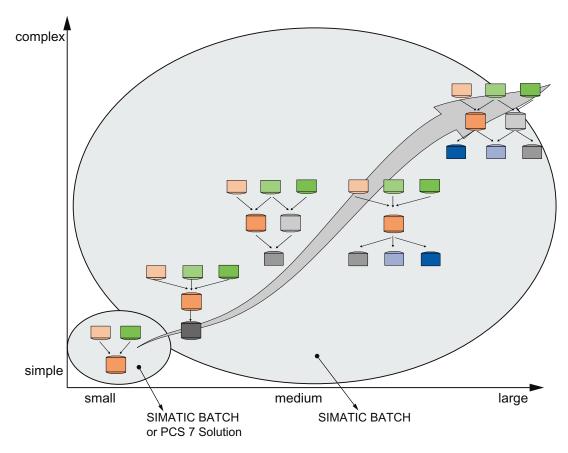


The first criterion in the categorization is the number of products being produced in the process cell:

- Single-product process cells
- Multi-product process cells

The second criterion is the number of production lines allowing simultaneous product flow.

- Single-line structure
- Multi-line structure
- Network structure (all paths fully flexible)



With its scalability, SIMATIC BATCH is suitable both for smaller plants as well as for large complexes that are now possible with V6. With V6, you can now use up to 11 OS servers.

The complexity increases with the number of products and the number of lines. With SIMATIC BATCH, you can automate multi-line, multi-product plants.

For small plants, in which few products or lines are needed, your basic considerations are the licensing costs and the amount of engineering involved to create a solution with SIMATIC BATCH.

1.20 SIMATIC BATCH: Customer Benefits

- The production sequences are described in master recipes that can be created/modified by the operating personnel at any time.
- Greater production flexibility, reduced "Time to market"
- Unit allocation can be planned. The allocation planning can be changed right up to the actual allocation. SIMATIC BATCH supports automatic unit selection.
- Improved utilization efficiency
- Production sequences are documented in a batch log (paper or electronic). The production sequences can be reproduced using recipes.
- Easy quality management
- With compulsory validation / FDA is especially interesting.
 Version control, access control, audit trails (21CFR Part11) are supported.
- Low validation-/compliance costs, traceable recipe changes
- Utilization of a standard Siemens product
- Reduced operation and life-cycle costs

2 Part 2: Quick Start

2.1 Basics for Projecting

2.1.1 Quick Start Configuration Overview

Working in the SIMATIC Manager

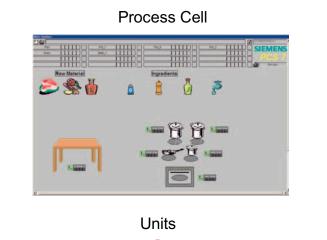
- 1. Retrieving the Project
- 2. Configuring the BATCH Server and BATCH Client
- 3. Opening the Plant View
- 4. Creating the Batch Process Cell
- 5. Type Definition of the Plant Hierarchy According to ISA S88.01
- 6. Assigning the "EPH" Batch Category
- 7. Generating the Type Description in the Batch Types
- 8. Compiling and Downloading the AS, OS and Batch Process Cell Data
- 9. Downloading the Batch Process Cell Data
- 10. Downloading the AS in PLCSim
- 11. Starting the OS
- 12. Starting the BATCH Start Coordinator

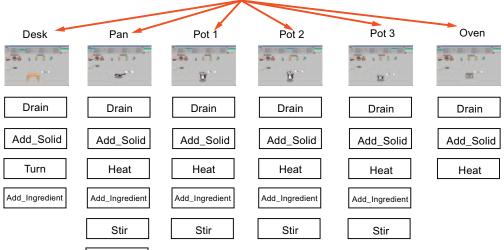
Working in the BATCH Control Center (BatchCC) and Recipe Editor (RE)

- 1. Loading the Supplied Recipes and Materials
- 2. Updating the Loaded Batch Process Cell Data
- 3. The Recipe for Piccata Milanese Pasta
- 4. Creating an Output Material
- 5. Creating a Master Recipe in the BatchCC
- 6. Creating the Recipe Structure in the Recipe Editor
- 7. Releasing the Master Recipe for Production
- 8. Creating an Order (Batch)
- 9. Releasing and Starting a Batch (Control Recipe)

2.1.2 Description of the Model

Turn





2.1.3 PH View in the SIMATIC Manager

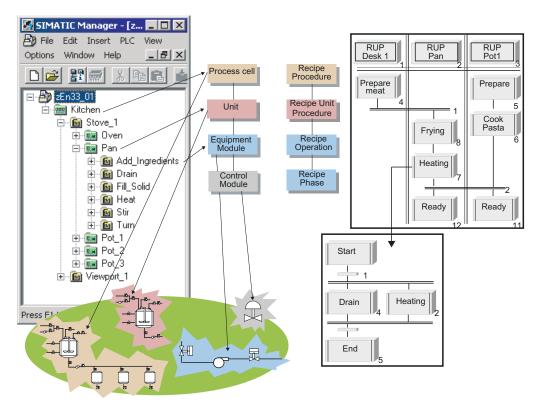
The process cell model in SIMATIC BATCH is used to represent the procedural model of the recipe.

A recipe procedure controls a process in a process cell to create a batch of a product.

A recipe unit procedure runs on a unit to control a recipe stage. To avoid collisions, a unit can only be allocated to one batch at any one time.

A recipe operation or a recipe phase performs an industrial process task or function in an equipment module.

The device control level is not within the focus of the Batch system and is addressed over the equipment module. The device control level is located completely within the AS system.



2.1.4 Software Requirements

Basic Installation of PCS 7 V7.0

- + BATCH server
- + BATCH client
- + Batch Engineering
- + PLCSim
- One network adapter

Note:

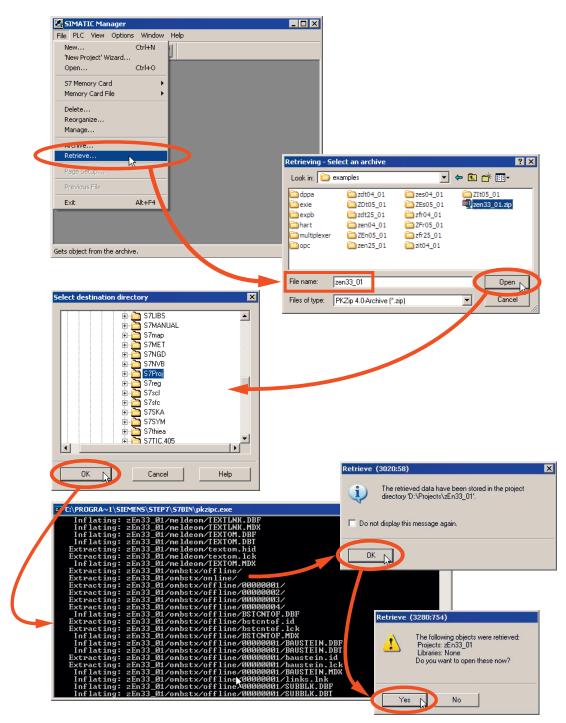
If SIMATIC Logon is installed, role management must be configured and you have to log on every time SIMATIC Batch is started.

The use of SIMATIC Logon is not described in this document.

2.2 Projecting

2.2.1 Chapter 1 Retrieving the Project

1. Retrieve the project (the archive project is called zen33_01.zip located under ..\Siemens\STEP7\examples) and store the project, for example, under ..\Siemens\STEP7\S7Proj.

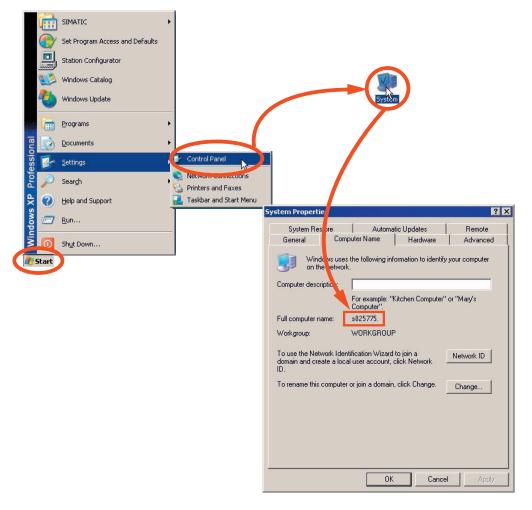


2. Select the PC station in the Component view and open the object properties. Enter the actual name of your computer under "Computer name".

Note:

Only use capital letters, even if your computer name contains small letters!

You can determine the name of your computer as follows:



The batch process cell data generated on the ES will be loaded later on this computer.

Note:

Ensure that the interface in the lower field is set to "PC internal (local)" in the SIMATIC Manager!

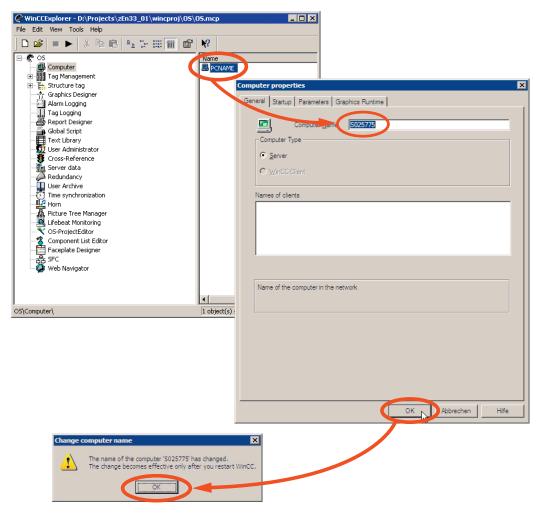
If it is not, set the interface to "PC internal (local)" with the menu command Options > Set PG/PC Interface....

Edit to		Options Window	Teib						
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zEn33_01		Object name		ymbolic name		Туре	P	-	
AS1	PU 417-4 AS1_Program Sources Blocks Charts	WinCC Application	-	•			configuration likation		
	Open Object	Ctrl+Alt+O	1						
📄 Shar	Cut Copy Paste	Ctrl+X Ctrl+C Ctrl+V							
	Delete	Del							
	PLC	•							
	Print	•	-				<u></u>	1	
to get H	SIMATIC BATCH			1	PC intern	al (local)		11.	
d	Object Properties	s Nt+Return	D						
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After confirming with "OK", the icon for the PC station changes and is shown with a yellow arrow in the Component view.

⊡-(⊡ ⊉ S02 ⊡ ■		s7omwir	The configured server is not available. Do you want to open the project with the local computer as server?
<	Open Object	Ctrl+Alt+O Ctrl+X Ctrl+C	
	Paste	Ctrl+V	
	Delete	Del	
	Insert New Object PLC) 	
	Compile	Ctrl+B	
	Display compilation log. Display load log Generate server data Assign OS server Start OS simulation Import WinCC objects		
	Print	•	
	Plant Hierarchy	•	
	SIMATIC BATCH		
	Rename Object Properties	F2 Alt+Return	

3. Open the WinCC Explorer on the OS.



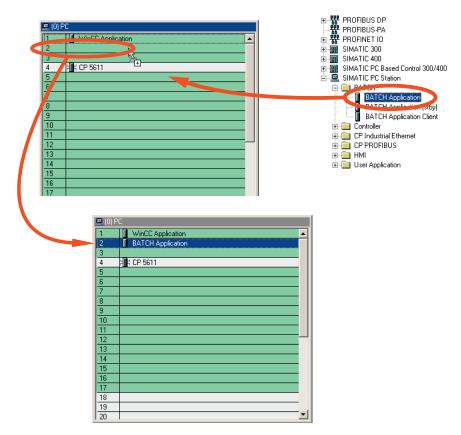
4. Change the computer name in the WinCC Explorer to the name of your computer.

5. Close the WinCC Explorer.

2.2.2 Chapter 2 Configuring the BATCH Server and BATCH Client

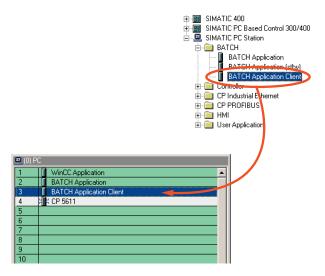
- A SIMATIC PC station must be configured with a "BATCH application" in HW Config for every computer on which a BATCH server application runs.
- If you want to work locally on the ES computer with BATCH server/clients (single project engineering), only **one** PC station with a server and client application needs to be set up. In this case, the runtime computer name remains empty (or the local computer name is entered).
- BATCH clients can also run on PC stations on which no OS client is installed.
- 1. Select the PC station in the Component view and open its configuration.

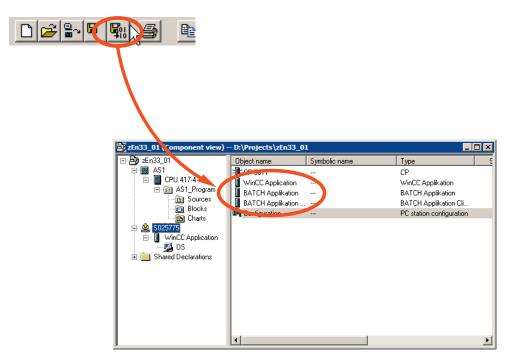
🗃 zEn33_01 ⊡ 🎆 AS1					
	Object name	Symbolic name	Туре	9	
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🖻 🛐 AS1_Program	Dpen Object	trl+Alt+O	CP		
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2. Select the "BATCH Application" and drag it to or insert it at position 2.

3. Select the "BATCH Application Client" and drag it to or insert it at position 3.



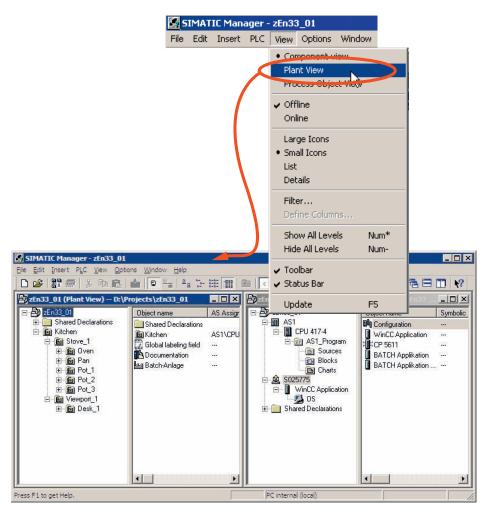


4. Save and compile the hardware configuration of your PC station with the newly added BATCH applications.

5. Close HW Config.

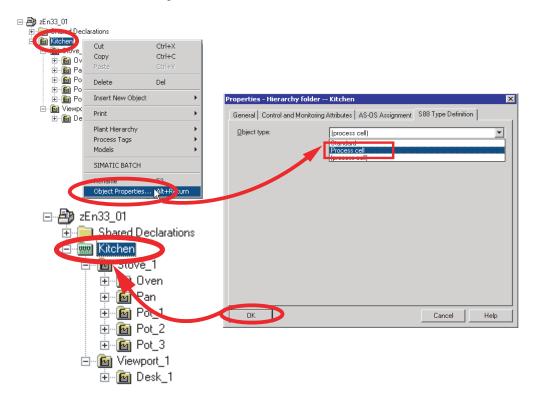
2.2.3 Chapter 3 Opening the Plant View

1. Open the Plant view of the project in the SIMATIC Manager and place the views side-by-side.



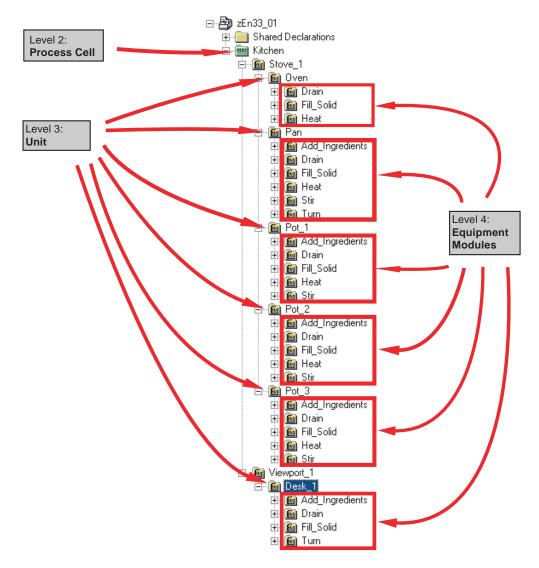
2.2.4 Chapter 4 Creating the Batch Process Cell

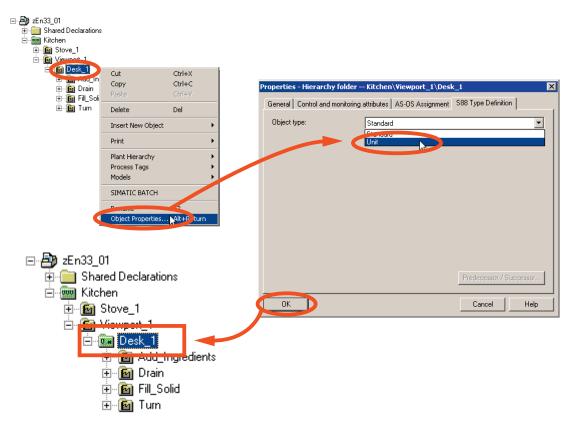
1. Assign the "process cell" S88 type definition to the "Kitchen" hierarchy folder. The "Kitchen" folder then becomes green and has the "process cell" type according to ISA S88.



2.2.5 Chapter 5 Type Definition of the Plant Hierarchy According to ISA S88.01

1. Assign the S88 type definition "Unit" and "Equipment module" to the existing hierarchy folders as described in the following four steps.

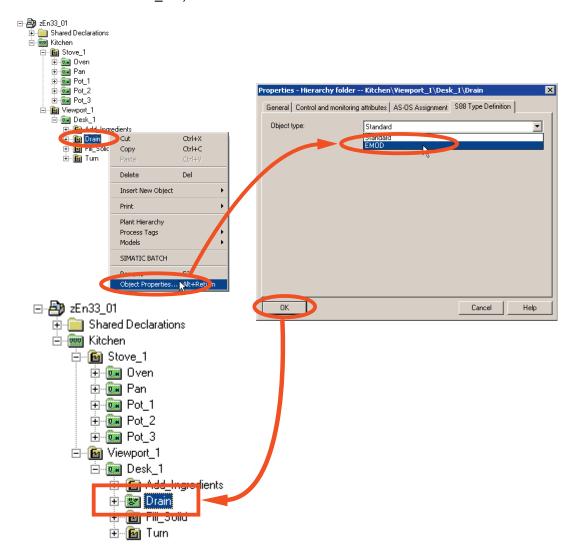




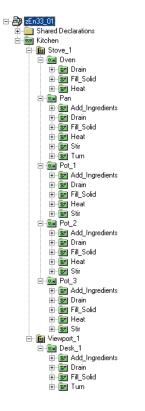
2. Assign the "Desk_1" hierarchy folder the object type "Unit" in the S88 type definition. The "Desk_1" folder is then displayed green identifying it as a unit according to the ISA S88.01 standard.

- 3. Assign the "Unit" object type to the hierarchy folders "Oven", "Pan", "Pot_1", "Pot_2" and "Pot_3", as described in step 1 of S88 type definition.
- ZEn33_01
 Shared Declarations
 Grow Kitchen
 Grow Stove 1
 Grow Pan
 Grow Pot_1
 Grow Pot_2
 Grow Pot_3
 Grow Desk_1

4. Assign the object type "Equipment module" to the "Drain" hierarchy folder below Kitchen/Stove_1/Oven in S88 type definition. The "Drain" folder is then displayed green and identified as an equipment module according to the ISA S88.01 standard. At the level of the equipment modules, you will find the instances of the SFC types and/or the Batch interface blocks (IEPH, IEPO, IEPAR_xxx).



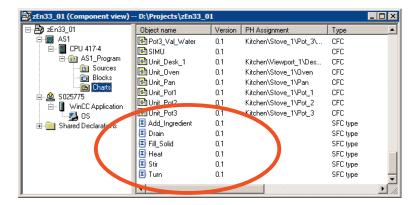
5. Assign the object type "Equipment module" to the hierarchy folders shown at the beginning of this chapter as equipment modules in the SS type definition as described in step 4.



2.2.6 Chapter 6 Assigning the "EPH" Batch Category

Assign the "EPH" Batch category to the existing SFC types. As a result, the information relevant to S88.01 is created automatically during subsequent type generation.

You will find the existing SFC types (Heat, Stir, Drain, Fill_Solid, Turn and Add_Ingredient) in the Component view in the chart folder of the AS.



1. Open the object properties of the SFC type "Heat" and assign it the "EPH" batch category.

📴 Unit_Pan_2	0.1	Kitchen\Stove_1\Pan_2	CFC	16.0
📴 Unit_Pot1	0.1	Kitchen\Stove_1\Pot_1	CFC	26.0
📴 Unit_Pot2	0.1	Kitchen\Stove_1\Pot_2	CFC	26.0
📴 Unit_Pot3	0.1	Kitchen\Stove_1\Pot_3	CFC	26.0
Add_Ingredient	0.1		SFC type	16.0
🔳 Drain	0.1		SFC type	16.0
Fill Solid	0.1		SFC type	16.0
Heat	Open Object	Ctrl+Alt+O	SFC type SFC type	16.0 16.0
I Turn	Cut	Ctrl+X	SFC type	16.0
	Сору	Ctrl+C		
	Paste	Ctrl+V		
			P	roperties SFC type
	Delete	Del		
	Insert New C)bject 🕨		General CPU Operating Parameters Options Version
	PLC	· · · ·		
	Print	•		Category None V
	Charts	•		Allow operator Poper
	SIMATIC BAT	гсн		EPH
	Dene	52		Portuge strategy selection
	Object Prope	erties Alt+Retur		
	Special Office	+ Duran ukr		
				OK Cancel Help
				Curicer Help

2. In the same manner, assign the "EPH" batch category for the remaining SFC types "Stir", "Drain", "Fill_Solid", "Turn" and "Add_Ingredient".

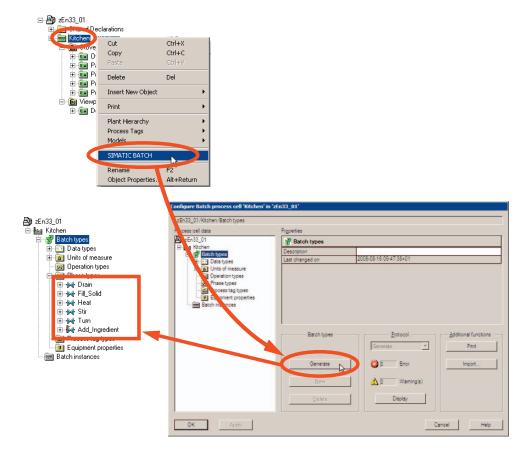
2.2.7 Chapter 7 Generating the Type Description in the Batch Types

As the basis for creating recipes in SIMATIC BATCH, the type description of the process cell must be generated and synchronized with the block instances of the CFC charts.

Type Description of a Process Cell

Туре	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 your own data types and modify their properties.
Units of measure	You can create new units of measure and change their properties.
Operation types, phase types and process tag	To allow recipe creation purely on the basis of types, types must be specified without their block instances existing.
types	1st Operation types: Type information of the equipment operations (EOP)
	2nd Phase types: Type information of the equipment phases (EPH)
	3rd Process tag types: Type information of the TAG_Coll blocks
	Operation types, phase types and process tag types can be assigned control strategy parameters.
Equipment properties	In the "Equipment properties" folder, create a new equipment property, such as the size of the unit (capacity of a silo), or material characteristic of the silo shell. The unit is assigned the equipment properties during the configuration on the ES, and these are queried as conditions when the recipe is created.

1. Open SIMATIC BATCH and select "Batch types". Then generate the batch types and exit the window with "OK".

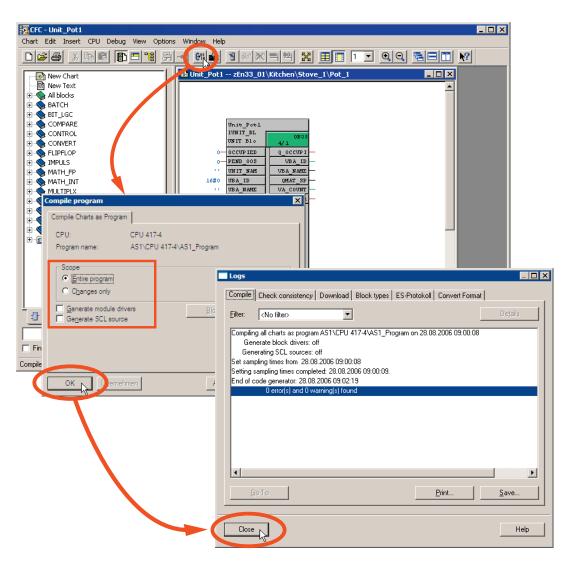


2.2.8 Chapter 8 Compiling and Downloading the AS, OS and Batch Process Cell Data

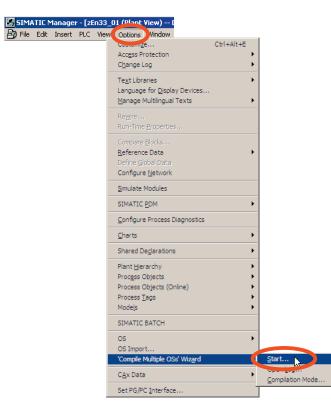
1. Open any CFC chart and compile the entire program for the AS.

Note:

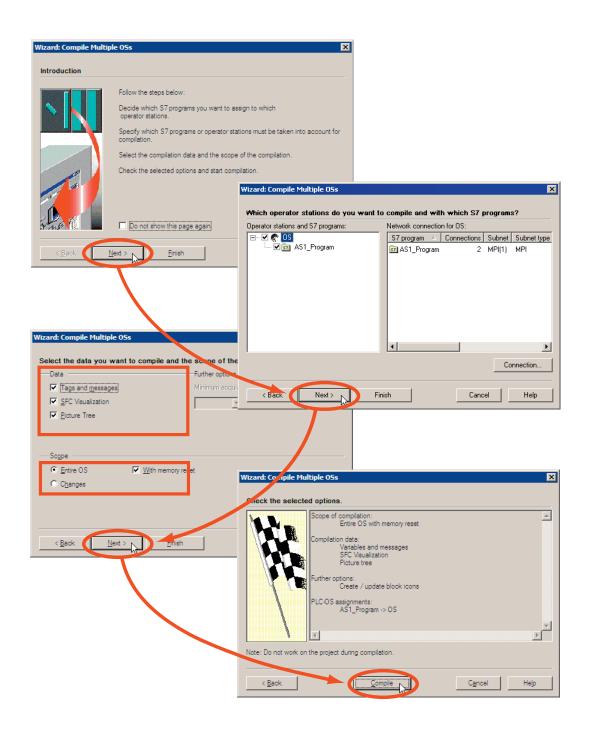
To avoid warning during the compiling, increase the number of inserted blocks per runtime group or OB to 100 in the CFC Editor under **Options > Settings > Compile/Download**.



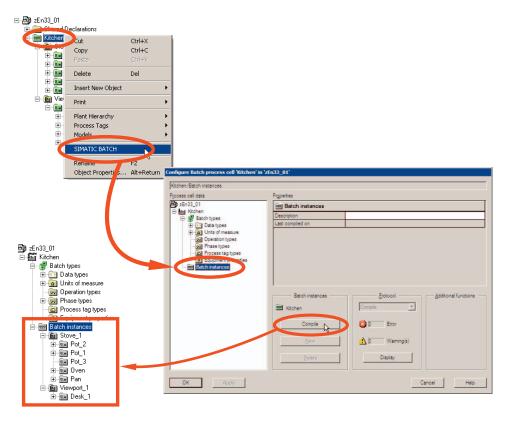
2. Close the CFC Editor.



3. Compile the entire OS with memory reset.



4. Compile the Batch process cell data. Select your project (Kitchen) in the Plant view and select **SIMATIC BATCH > Batch Instances > Compile**.



Configure Batch process cell 'Kitchen' in 'z	n33_01'	
zEn33_01		
Processitation	Properties	
En33_01		
Bing Batch types Bing Batch instances	Description Settings Settings Distribution OS objects System characteristics Message Name Target system Symbolic computer Create/(updat	e archive tags
OK Apply		
		Cancel Help

5. Update the status of the entire process cell with the menu command Settings
 > OS Objects > Update and then exit the window with "OK".

2.2.9 Chapter 9 Downloading the Batch Process Cell Data

1. Transfer the batch-relevant data (ISA S88.01) to the OS. The compilation of the Batch data can take several minutes because the Batch OS messages are generated and transferred.

shen		
cess cell data	Properties	
5.00.01	Kitchen	
Kitchen 20 Fordin types	Description	
E Batch instances	Process cell component grouping	
	Batch process cell Brotocol -	Additional functions
	Check validity Validation	
	Download. Download. Wamin	ng(s)
	Display	-
OK Apply		Cancel Help
	Transfe	r messages to '05'
	The m	essages may not have been transferred
		er now?
		<u>Ja</u> <u>N</u> ein
isfer messages to '05'		Protocol
insfer in progress		Transfer messages 💌
insiel in progress		🔁 🛛 Error
		🔥 🛛 Waming(s)

2. Download the generated Batch process cell data to the BATCH server and BATCH client. In your case, the BATCH server and BATCH client are on the same computer.

essages	Component	τ	PC station	Target	system Ve	erify S	Status
	🗍 Batch Datal	base Server					
		🧕 Project 🛛 zEn	33_01\Server	📇 {local}		Not up to	o date 🛛 🌔
ad	🔽 Master 💂	🛾 Offline zEn	33_01\Server	🔜 (local)		Not up to	o date 🛛 🌔
ACC.		👔 Online 🛛 zEn	33_01\Server	📇 {local}		Not up to	o date 🛛 🌔
		Project					(
	🔲 Standby 🛓) Offline					(
		🕽 Online					(
	📳 Batch Serve	er					
	Master	zEn	33_01\Server	📇 {local}		Not up to	o date 🛛 🌔
	Standby						1
	😨 Batch Client	; t				<u>.</u>	
			33_01\Server	📇 {local}		Not dow	nloaded
		·····					
wnloading Batch proce	ess cell 'zEn33_01'						
introducing baccin proc							
Component	PC station	Ta	rget system	Verify Sta	itus		
Component Batch Database Serv	PC station	Та	rget system	Verify Sta	tus		
Component Batch Database Serv	PC station /er t zEn33_01\Server		cal}	Downloade	d 🔽		
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Component Batch Database Serv Master Offine Offine Offine Offine Offine Offine Offine	PC station ver zEn33_01\Server zEn33_01\Server zEn33_01\Server		cal}	Downloade	d O		
Component Batch Database Serv Master 2017 Offine	Ver zEn33_01\Server zEn33_01\Server zEn33_01\Server zEn33_01\Server	문 (lo	cal}	Downloade	d O		
Component Batch Database Serv Master Project Offline Offline Project Standby Offline	PC station ref 2En33_01\Server zEn33_01\Server zEn33_01\Server t	문 (lo	cal}	Downloade	d O		
Component Batch Database Serv Master 2 Offine Offine Online Standby Offine	PC station ref 2En33_01\Server zEn33_01\Server zEn33_01\Server t	문 (lo	cal}	Downloade	d O		
Component Batch Database Serv Master Standby Cliffine Diffine Diffine Diffine Diffine Diffine	PC station ref 2En33_01\Server zEn33_01\Server zEn33_01\Server t	문 (lo	cal}	Downloade	d O		
Component Batch Database Serv Master Di Online Standby Standby Batch Server	PC station ref 2En33_01\Server zEn33_01\Server zEn33_01\Server t	문 (lo	cal} cal} cal}	Downloade			
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Component Batch Database Server Master Master Standby Batch Server Master Standby	PC station ref 2 En33_01\Server 2En33_01\Server 2En33_01\Server 8	목 (lor 목 (lor 목 (lor	cal} cal} cal}	Downloade Downloade Downloade			
Component Batch Database Serv Master Project Offline Standby Project Batch Server Offline Batch Server Offline Standby Standby Batch Client Standby	PC station Ver zEn33_01\Server zEn33_01\Server zEn33_01\Server zEn33_01\Server	말 ()o 및 ()o 및 ()o	cal} cal} cal} cal}	Downloade Downloade Downloade			<u>P</u> r
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Component Batch Database Server Master Online Standby Batch Client	PC station Ver zEn33_01\Server zEn33_01\Server zEn33_01\Server zEn33_01\Server	말 ()o 및 ()o 및 ()o	cal} cal} cal} cal}	Downloade Downloade Downloade			
Component Batch Database Serv Master Project Offline Standby Project Batch Server Offline Master Offline Standby Standby Batch Server Master Standby Standby Batch Client Standby	PC station Ver zEn33_01\Server zEn33_01\Server zEn33_01\Server zEn33_01\Server	말 ()o 및 ()o 및 ()o	cal} cal} cal} cal}	Downloade Downloade Downloade			Download
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Component Batch Database Server Master Project Standby Project Standby Project Batch Server Master Standby Standby Batch Client Batch Server	PC station Ver zEn33_01\Server zEn33_01\Server zEn33_01\Server zEn33_01\Server	말 ()o 및 ()o 및 ()o	cal} cal} cal} cal}	Downloade Downloade Downloade			Download

3. Exit the "Configure Batch process cell" dialog with "OK".

2.2.10 Chapter 10 Downloading the AS to PLCSim

Download the AS data compiled in the SIMATIC Manager to the "PLCSim" simulation program.

1. Open PLCSim in the SIMATIC Manager.

🗑 S7-PLCSIM - SimView1
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Press F1 to get Help.

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i⊖- M AS1 i⊖- N CPU 417-4	CPU 417 Op	en Object 📐 Ctrl+A		tation configurat	ion			
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🖻 🔔 S025775	De	lete Del						
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I HW Config - AS1	- Re	nome 12						_ 🗆 X
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3 SCPU 417-4						⊡ ₩	PROFIBUS DP	
			Select Node Ad	dress				×
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6			Slot:	3 2				
7		-1		<u> </u>				
			Target Station:	🖲 Local				
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			Enter connect	ion to target stati	ion:			
Select Target Module		×	MPI address	Module type CPU841-0	Station name	CPU name Pla	ant designation	
Target modules:			-	CF0041-0				
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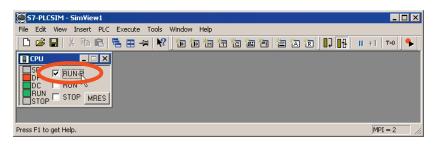
2. Download the hardware configuration to PLCSIM.

3. Close HW Config.

CFC - Pot1_Heat	
Chart Edit Insert CPU Debug View Options Window Help	Download 🔀
	S7 Download
New Chart Pot1_He t zEn33_01\Kite	CPU: CPU 417-4
New Text All blocks	Program name: AS1\CPU 417-4\AS1_Program
BATCH	- Scope
BIT_LGC	Entire program
	C Changes only C Download to test CPU (entire program)
Download to CPU (entire program)	Include user data blocks
Download to the CPU	Before downloading the entire program, the CPU is set to STOP and all blocks are deleted. Do you want to download the S7 program?
AS1\CPU 417-4\AS1_Program	
Completed: 17%	Read the notes in the online help about possible effects
Cancel	OK Apply Cancel Help
Logs	
Compile Check	consistency Download Block types ES-Protokoll Convert Format
Blocks Charts II Libr	ter>
W: The system	J AS1\CPU 417-4\AS1_Program on 23.08.2006 10:50:31 (entire program) n blocks SFC78 used in the program does not exist in the operating system of the CPU.
	ting system version of your CPU does not support all system functions. In some cases the at eted on 23.08,2006 10:50:58
	or(s) and 2 warning(s) found
<u><u>G</u>o To</u>	<u>Print</u> <u>S</u> ave
Close	Help

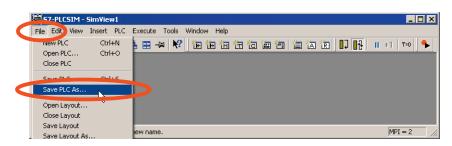
4. Open a CFC chart from the project and download the charts to PLCSim.

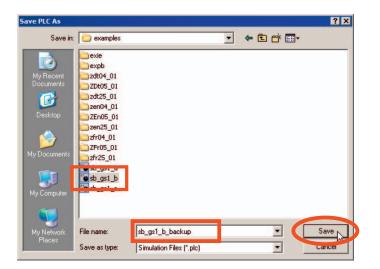
- 5. Close the CFC Editor.
- 6. Start PLCSim with "RUN-P".



7. Save the simulation you have downloaded so that it is not lost when you close PLCSim.

If you close PLCSim without saving, you must repeat steps 1 to 5 the next time you work with PLCSim. Saved PLCSim data can be put directly into Run by opening the saved file.



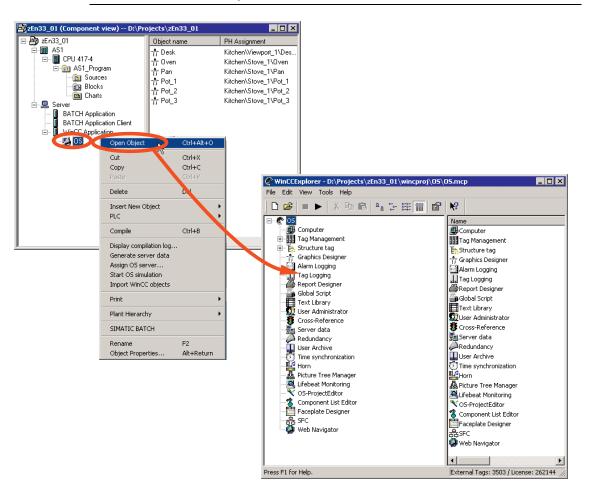


2.2.11 Chapter 11 Starting the OS

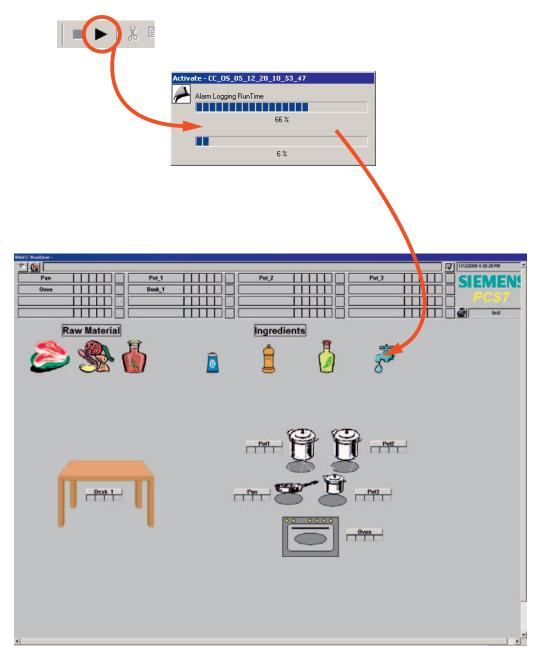
1. Open the WinCC Explorer of the OS. Create a user with full rights in the User Administrator.

Note:

Open the OS project editor and click "OK". This configures the WinCC runtime interface and the alarm system.



2. Put the OS in runtime; the first startup can take several minutes. Log on with the logon information of user you have just created.



2.2.12 Chapter 12 Starting the BATCH Start Coordinator

The BATCH Start Coordinator starts automatically when you log in. It does not have its own graphic user interface that is visible at the lower right in the taskbar as an icon.

If the BATCH Start Coordinator has been closed, you can start it from the Windows Start menu with **Start > Simatic > BATCH > BATCH Launch Coordinator**.

Starting the BATCH Start Coordinator also starts the Batch Control Server (BCS) and the Batch Data Management (CDV) and these change to the "Ready" status.

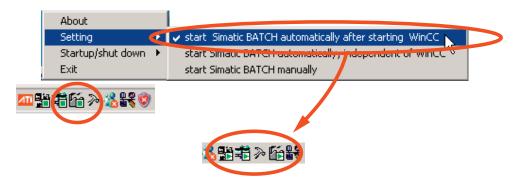
	6	SIMATIC	۱, (_	@PCS7	16	PATCH Consideration
					BATCH	16	BATCH Launch Coordinator
	\bigcirc	Set Program Access and Defaults			Documentation	11	Reupo Lakor
		Station Configurator			Information	14	§ SBReport
	inni	Station Configuration			License Management	۲Ť	
		Windows Catalog			SIMATIC NET	+	
	Au				STEP 7	+	
		Windows Update			WinCC	+	
	\sim			-	SIMATIC Manager		
		Programs	- T				
lal		Documents	+				
Professional		Settings					
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Pro	\rightarrow	Search	+				
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Windows XP	0	Shut Down					
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Using the taskbar icon, you can configure the startup characteristics of SIMATIC BATCH.

There are three different startup options for the Batch Start Coordinator (right-click on the Start Coordinator):

- "Start SIMATIC BATCH automatically after starting WinCC"
- "Start SIMATIC BATCH automatically, independent of WinCC"
- "Start SIMATIC BATCH manually"

 Select the "start SIMATIC BATCH automatically after starting WinCC" option. The BATCH applications (BCS and CDV) start up automatically after WinCC starts and they change to the "Running" status. You can only change the settings for a limited time after the start. If the buttons are disabled, close the BATCH Start Coordinator and open it again.



You set the default startup characteristics as follows:

Configure Batch process cell 'Kitchen' in '	2En33_01'	
zEn33_01 Process cell data	Properties	
	En33_01	
ZEn33_01	Description	
P ng Batch types	Settings	
Settings		
DK Startup re		
- Startup	coordinatorRedundancy - general	
• aft	er WinCC used COM Port (ACE communication)	
	ependent of WinCC C Part 1 C Part 2	
Times	Redundancy - Batch used IP addresses for replication communi	cation
Startu	p (s) 300 Master IP address	
Exit (s		
		Cancel Help

2.2.13 Chapter 13 Loading the Supplied Recipes and Materials

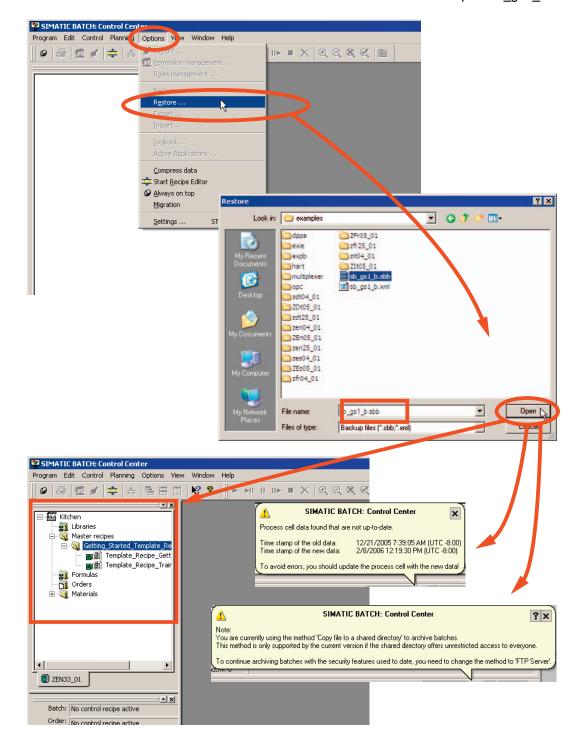
Load the supplied recipe database for this project.

1. Open the Batch Control Center (BatchCC).

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Windows XP Professional	Run Shut Down		
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			Operation
	[] [2/9/2004		10 250 PM

The Batch Control Center is the central component for

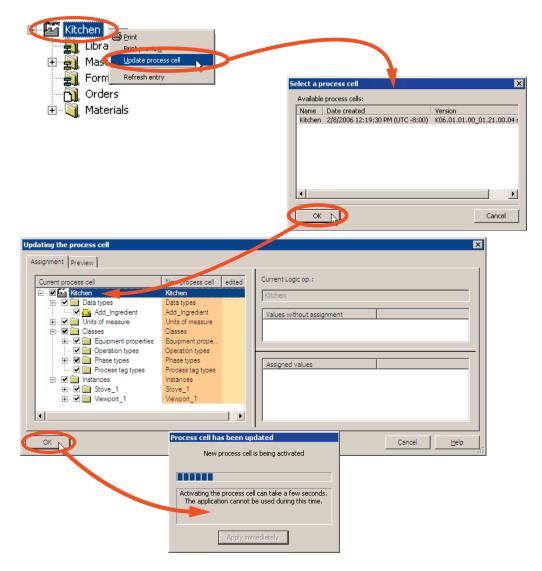
- Batch scheduling
- Batch control
- Management of all batch-relevant data
- (libraries, master recipes, formulas, materials, permission management)



In Batch Control Center, perform a restore using the supplied SBB file.
 You can find the SBB file under ..\Siemens\STEP7\examples\sb_gs1_b.sbb.

2.2.14 Chapter 14 Updating the Loaded Batch Process Cell Data

1. Update the Batch process cell data you loaded in the Batch Control Center.



2.2.15 Chapter 15 The Recipe for Piccata Milanese Pasta

Meal	Piccata Mila	Piccata Milanese		
Quantity	2.9 Kg (refe	2.9 Kg (reference quantity)		
Ingredients	100 ml	oil		
	1.9 Kg	noodles		
	50 g	salt		
	1 liter	tomato sauce		

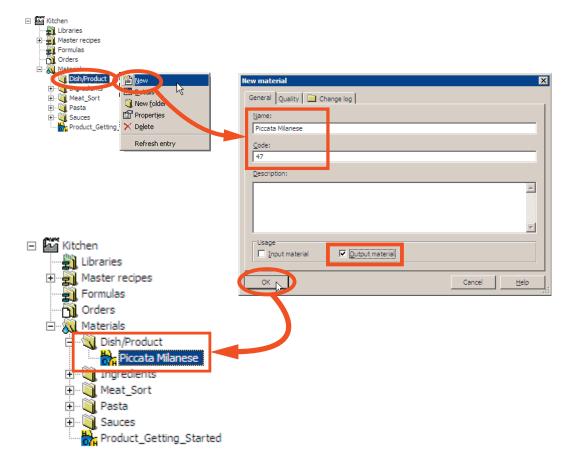
Instructions	Editing Options and Results
1st Prepare water	Fill a pot with 3 liters of water, add 100 ml of oil and a pinch of salt, heat to 100° C
2nd Cook pasta	Put 1.9 kg of pasta in the boiling water and cook for 6 minutes
3rd Prepare sauce (while cooking	Pour 1 liter of tomato sauce in a pot Heat for 5 min. at 40° C while stirring.
pasta)	Add salt and/or pepper to flavor
	Serve pasta and sauce
4th Completed	

2.2.16 Chapter 16 Creating an Output Material

At the beginning, you must define the materials and as an option the qualities for input materials/output material for SIMATIC BATCH once.

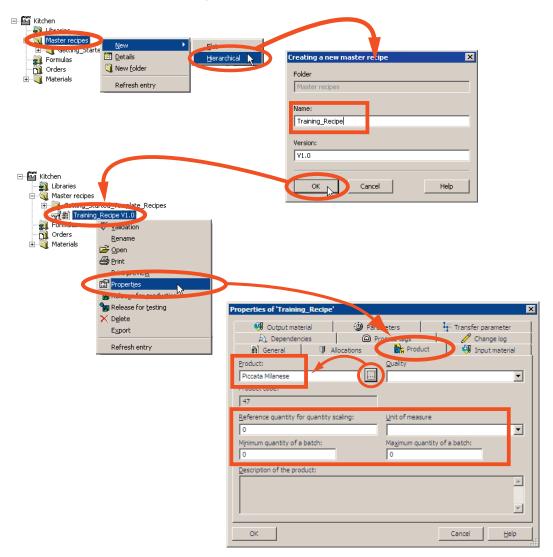
You define the materials in the list boxes displayed in the subsequent dialogs for recipe creation and batch planning. Materials and qualities must also be assigned a unique code (for example an internal company code). This code can, for example, be used to specify setpoint output and process value input at the interface blocks or SFC types to identify the material or product. In order to write recipes, material information needs to be defined. Input and output materials with various qualities can be created. These are created in the BatchCC in the Materials folder in the process cell you have loaded.

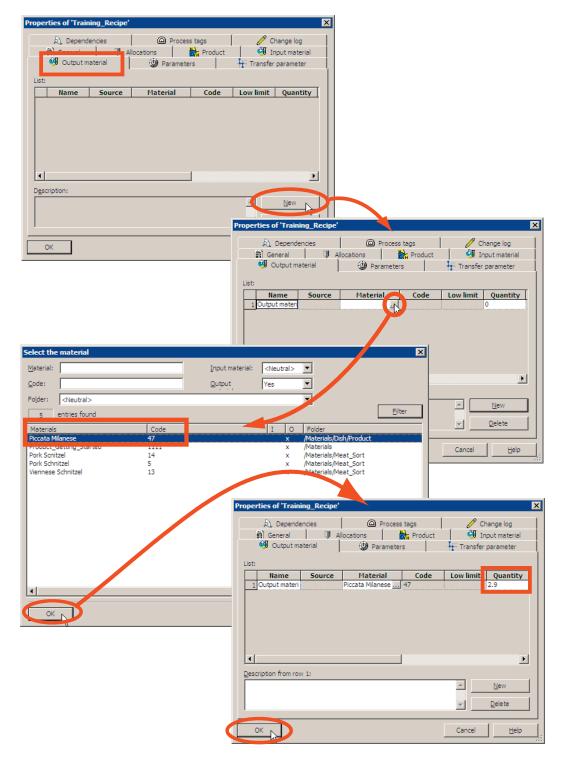
1. Create a new output material with the name "Piccata Milanese" and the material code "47" and place it in the "Dish/Product" folder.



2.2.17 Chapter 17 Creating a Master Recipe in the BatchCC

1. Create a new hierarchical master recipe with the name "Training_Recipe" for the product "Piccata Milanese" with the reference quantity 2.9 kg (all other information in the recipe for "Piccata Milanese" refers to this amount). The minimum quantity for production is 1 kg and the maximum quantity 10 kg (maximum and minimum quantity that can be cooked in this process cell, in our case the kitchen).



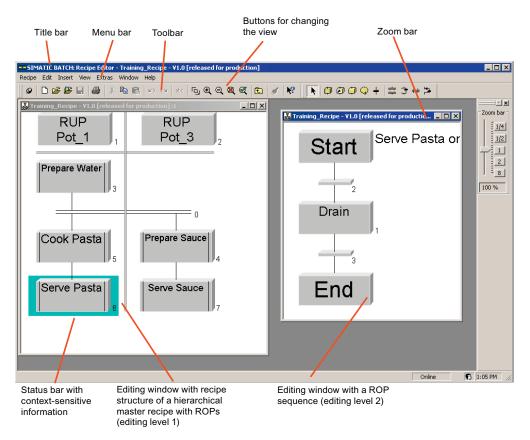


2. Define the main product (here Piccata Milanese) as output material

2.2.18 Chapter 18 Creating the Recipe Structure in the Recipe Editor

Layout of the Main Window in the Recipe Editor

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.



Basic Representation of the Hierarchy in the BATCH Recipe Editor

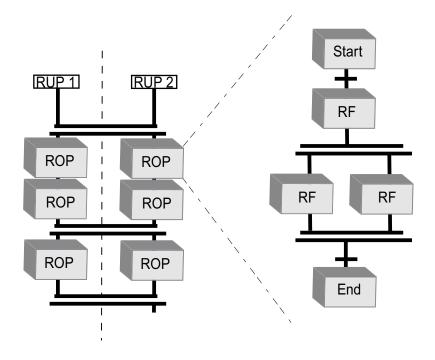
The schematic below shows the basic representation of the hierarchical structure when editing with the BATCH Recipe Editor. The structure of a hierarchical recipe is edited at two levels (editing level 1 and 2).

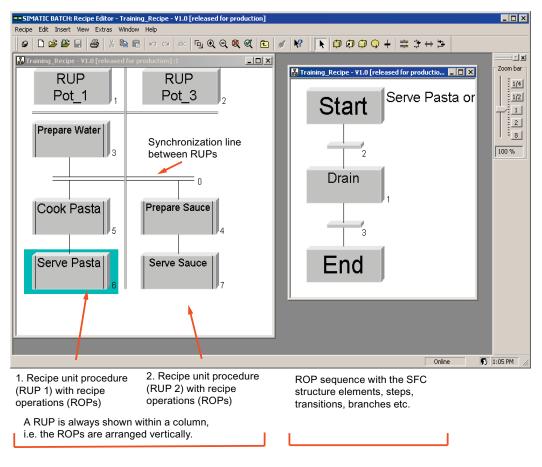
Editing Level 1

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.

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

Editing level 1

Editing level 2

= SIMATIC BATCH: Recipe Editor - Training_Recipe - V1.0 [released for produ Recipe Edit Insert View Extras Window Help	iction]	
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Image: Property of the production	Recipe procedural element Create library reference Insert Recipe phase/oper Insert operator instruction Insert transition Insert simultaneous sequence Insert alternative sequence Insert synchronization Insert loop	Image: Second secon
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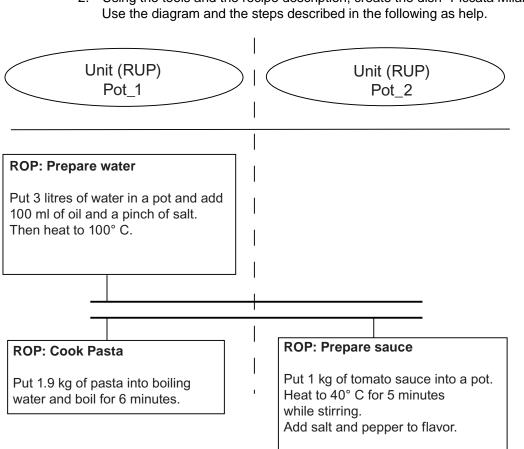
Tools for Creating the Recipe Structure

The recipe editor has tools for the simple creation of recipe structures such as:

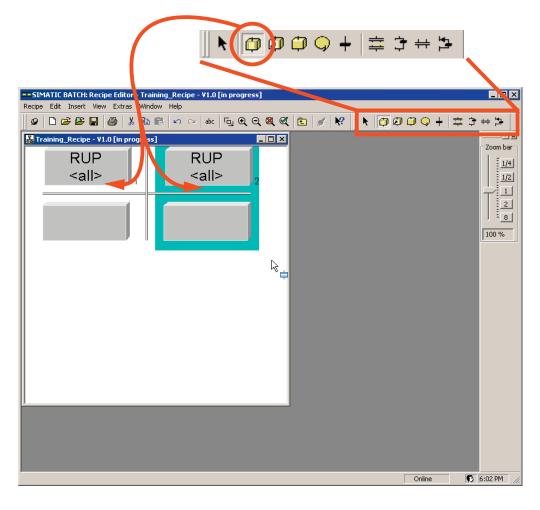
- 1. Inserting S88 procedure elements such as recipe unit procedures (**RUP**), recipe operations (**ROP**) and recipe phases (**RPH**)
- 2. Instead of a recipe operation, a referenced library operation (Lib-ROP) can also be inserted
- 3. Inserting operator instructions or operator dialogs
- 4. Inserting transitions
- 5. Inserting **simultaneous branches**
- 6. Inserting alternative branches
- 7. Inserting synchronization lines
- 8. Inserting loops

Creating the Recipe Structure in the Recipe Editor According to the Description in the Recipe

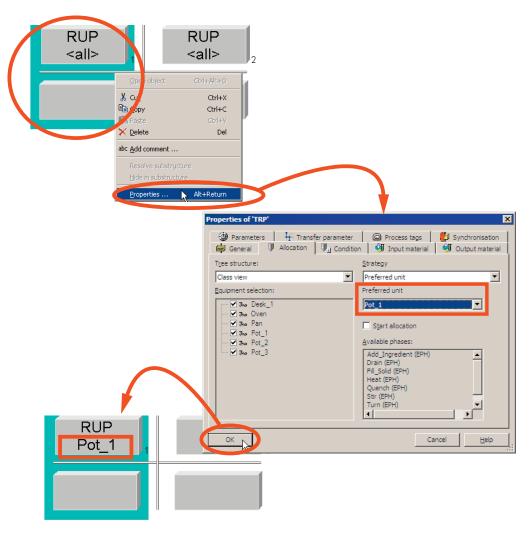
- 🖃 🎬 Kitchen Master recipes
 Maste 避 Open Print preview Properties 🦟 Unlock SIMATIC BATCH: Recipe Editor - Training_Recipe - ¥1.0 [in progress] _ 🗆 🗙 Export Recipe Edit Insert View Extras Window Help v 🗅 🖆 🔐 🚇 👗 ங 🕞 🗢 💀 🗓 🔍 🔍 🔍 🔍 🔍 🔪 🚺 💭 💭 🔶 🕂 🛱 🔆 🕂 Refresh entry - X 👪 Training_Recipe - ¥1.0 [in progress] - 🗆 🗙 Zoom bar 1/4 1/2 1
 2
 8 100 % 🚯 6:02 PM Online
- 1. Open the Recipe Editor with your master recipe "Training_Recipe".



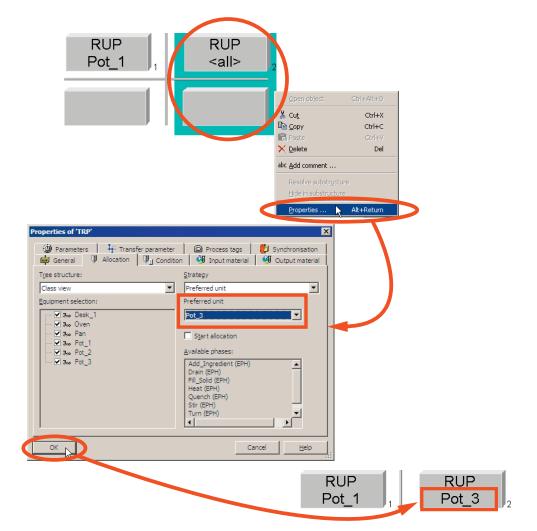
2. Using the tools and the recipe description, create the dish "Piccata Milanese".



3. Create two RUPs (recipe unit procedures).

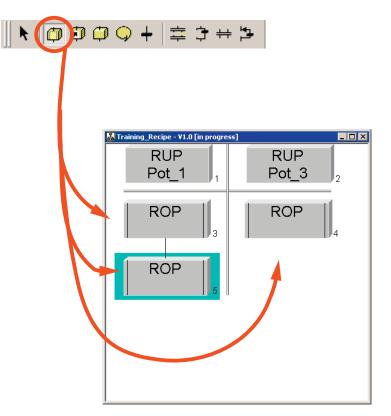


4. Assign the "Pot_1" unit and the "Preferred unit" strategy to the left RUP.



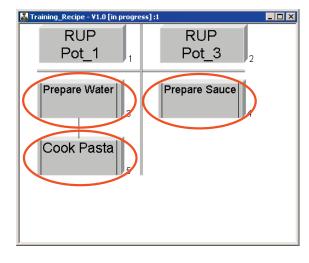
5. Assign the "Pot_3" unit and the "Preferred unit" strategy to the right RUP.

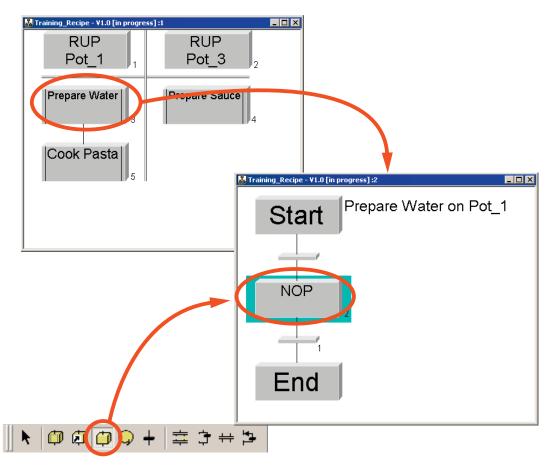
6. Insert the relevant ROPs (recipe operations).



💑 Training_Recipe - ¥1.0 [in progres	55]				
RUP Pot_1	RUP Pot_3	2			
ROP	ROP Ctrl+Alt+0	4			
R(Copy Poste X Delete	Ctrl+X Ctrl+C Ctrl+C Ctrl+Y Del	General	fer parameter 🖓 Input n		X 🎲 Synchronisation material
abc <u>A</u> dd comment Resolve substruct Hirde in substruct Properties	ure Alt+Return	Prepare Wate Unit glass: <all> <all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all></all>	r	Preferred uni	b
		00 Sec Description:			X
					Cancel Help

7. Assign the texts "Prepare Water", "Cook Pasta" and "Prepare Sauce" to the ROPs (recipe operations).





8. Double-click on the "Prepare Water" ROP to insert a recipe phase.

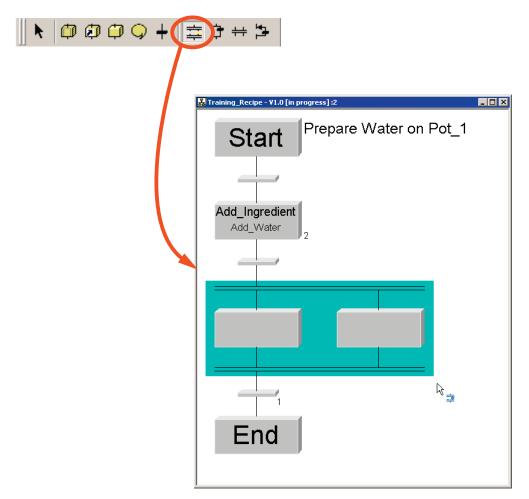
9. Assign the "Add_Ingredient" phase and the "Add_Water" control strategy to recipe phase.

🛃 Training_Recipe - ¥1.0 [in progress] :2		
Start Prepare Water on	Pot_1	
NOP ©pen object Ctrl+Alt+O % Cut Ctrl+X © popy Ctrl+X		
1 Ctrl+V X Delete Del		
End Add comment Resolve substructure Hide in substructure		
Properties Alt+Retur		
	Properties of 'Add Ingredient'	×
		Description Control Contro Control Control Control Control Control Control Control Control Co
	Phase: Add_Ingredient (EPH)	Control strategy:
	Unit dass:	Prgferred unit: Pot_1
	Run time: Monitoring time: 00 Sec Sec	Run time scaling:
	Description of the phase:	Continue
	OK	Cancel Help

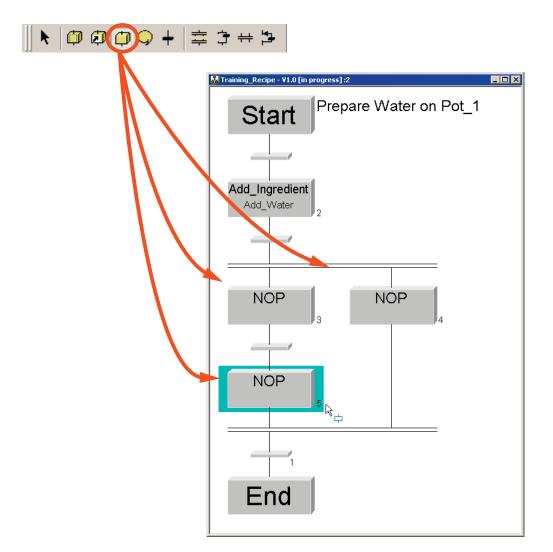
10. Define the input materials and parameters of the "Add_Ingredient" phase. The input material "Li_quantity" must be assigned the material (Water) and the amount to be filled, here 3 I.

Note: Here, and in all the phases, the "Simutime" parameter is used for simulation. In a real plant, the runtime may change due external events.

Properties of 'Add_Ingredient'	
Transfer parameter All Description Parameter Imput material Imput material Imput material	
List: Name Data type Sourc Low limit Value High limit Unit of 1 Simutme Floating-point numbe 5 5 100 isec	
Properties of 'Add_Ingredient'	
Transference 👫 Description 👘 Synchronisation	
Liet	
Name Source Material Code Low limit Quantit High limit Unit of Description: 1 U_quantity 0 0 100 0	
Select the material	×
Material: Input material: Yes	
OK Qutput	
Folder: Veutral> Elter	וו
Description fr 16 entries found Litter	-
Oi 3 x Materials/Ingredients Pepper 2 x Materials/Ingredients	
1 x Materials/Ingredients Water 4 x Materials/Ingredients	
OK Tomato Sauce piq. Properties of 'Add_Ingredient'	
Veal Instantiar All Description	
Penne 📾 General 🖓 Input material 🖓 Output material 🕲 Parameters	
Penne spicy Penne hot List:	
Penne piquant Spaghetti piquant Unit of Unit o	
Spaghetti spicy Tomate Saure	
	4
].
Description from row 1:	***
OK D Cancel Heb	



11. Insert a simultaneous branch and 3 NOPs.



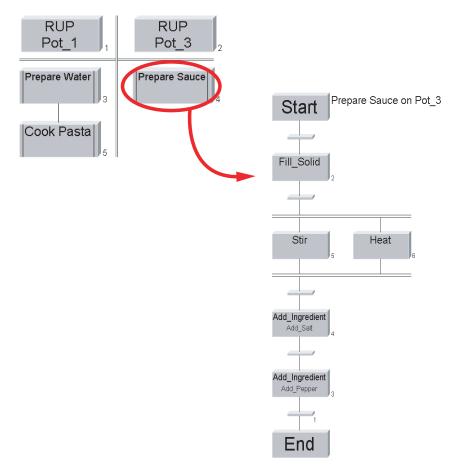
- Add the "Add_Ingredient" recipe phase with the "Add_Oil" control strategy and assign the "Oil" material to the "Li_quantity" input material and a quantity of "0.1 I". For the simulation time, specify a value of "5" sec.
- 13. Add the "Heat" recipe phase and assign the value "100° C" to the "Temp" parameter. Set the runtime to the value "300 sec".

14. Within the simultaneous branch, and a further "Add_Ingredient" recipe phase with the "Add_Salt" control strategy below the "Add_Ingredient" recipe phase and assign the material "Salt" and the quantity "0.01 kg" to the "Li_quantity" input material. For the simulation time, specify a value of "5" sec.

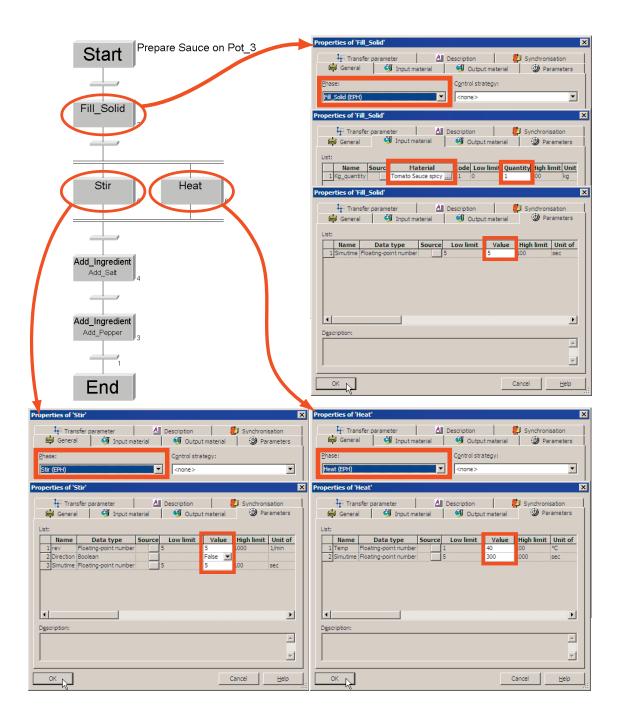
🛃 Training_Recipe - ¥1.0 [in progress] :2	Properties of 'Heat'
Start Prepare Water on Pot_1	Transfer parameter Description Synchronisation General Input material Output material Parameters Phase: Control strategy:
5	Heat (EPH)
Add_Ingredient	Properties of 'Heat'
Add_Water 1	General Input material Output material Departmenters
	Ist: Name Data type Source Low limit Value High limit Unit of 1 Temp Floating-point numbe 1 100 100 °C 2 Simutime Floating-point numbe 5 300 1000 sec
Add_Ingredient Heat Add_Oii	
Add_Ingredient Add_Sait	
	OK Cancel Help
8 Properties of 'Add_Ingredient'	Properties of 'Add Ingredient'
Transfer parameter Al Description Synchronisation General Al Input material Al Output material Arameters Phase: Control strategy:	Image: Transfer parameter Image: Description Image: Synchronisation Image: General Image: Description Image: Description Image: Description Image: General Image: Description Image: Description Image: Description Image: Description Image: Description Image: Description Image: Description Image: Description Image: Description Image: Description
Add_Ingredient (EPH)	Add_Ingredient (SPH)
Properties of 'Add_Ingredient'	Properties of 'Add_Ingredient'
📾 General 🖓 Input material 🖓 Output material 🎯 Parameters	📾 General 🖓 Input material 🖓 Output material 🎯 Parameters
List: Name Source Material Code Low limit Quantity High limit Unit of 1_U_quantity Oil	List: Name Source Material Code Low limit Quantity High limit Unit of Kg_quantity Salt 1 0 0.01 100 kg
Properties of 'Add_Ingredient'	Properties of 'Add_Ingredient'
📾 General 🖓 Input material 🖓 Output material 🥨 Parameters	📾 General 🖓 Input material 🖓 Output material 🥨 Parameters
List: Name Data type Sourc Low limit Value High limit Unit of 1 Simutime Floating-point numbe 5 5 100 sec	List: Name Data type Source Low limit Value High limit Unit of 1 Simutime Floating-point number 5 5 100 sec
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Description:	Description:
	, i i i i i i i i i i i i i i i i i i i
OK Cancel Help	OK Cancel Help

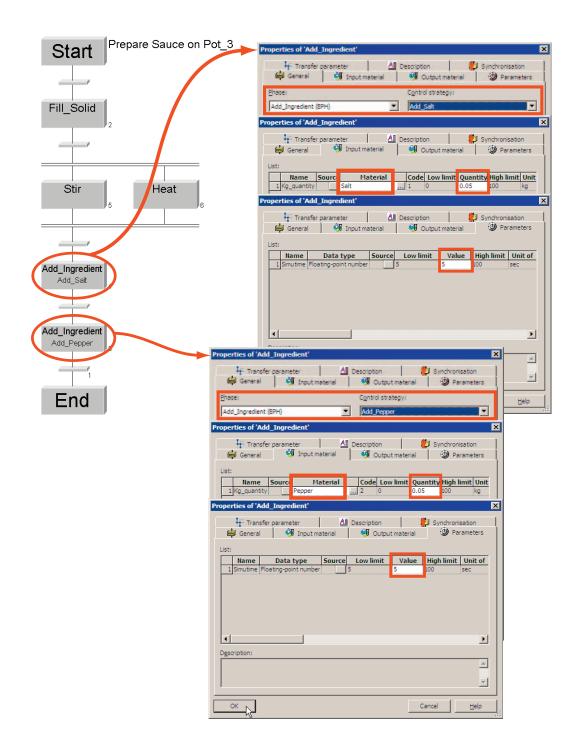
15. Complete the "Prepare Pasta" ROP according to the recipe description for "Piccata Milanese".

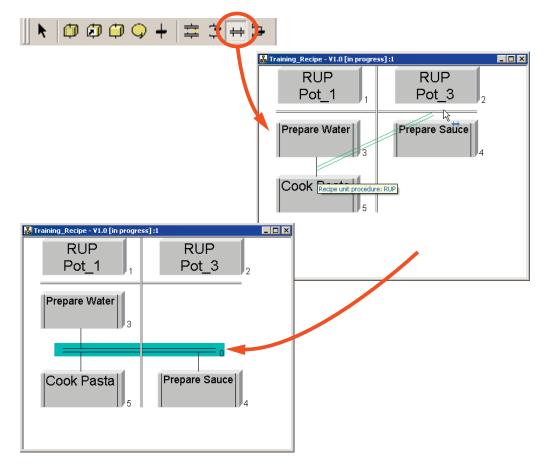
RUP RUP	Properties of 'Fill_Solid'		V
Pot 1 Pot 3			X
	🕂 Transfer parameter		Synchronisation aterial
Prepare Water	Phase:	Control strateg	· - 1
3	Fill_Solid (EPH)	Control strategy	
1 1/3	Properties of 'Fill_Solid'	Chones	
Cook Pasta			
	🕂 Transfer parameter 👜 General 🛛 🖓 Input m		Synchronisation
	List:		atenar granametera
🛃 Training_Recipe - 📢 0 [in progre s] :2		rial Code Low limit	Quantity High limit Unit of
st training_kecipe - the [in progres]:2	1 Kg_quantity Spaghett		1.9 100 kg
Ctort Cook Pasta on Pot_1	Properties of 'Fill_Solid'		×
Start Cook Pasta on Pot_1	Transfer parameter		Synchronisation
	🖨 General 🛛 🖓 Input ma	aterial 🛛 🧐 Output m	aterial 😟 Parameters
4	List:		
Eill Solid	Name Data type 1 Simutime Floating-point number		Value High limit Unit of 00 sec
Fill_Solid			
Heat			Þ
	Description:		
			<u> </u>
			<u> </u>
			Cancel <u>H</u> elp
End End			
		-	
Properties of 'Heat'	í <i>4</i>	×	
	iption 👘 Synchronisation Output material 💮 Parameter	s	
	ntrol strategy:		
		-	
Properties of 'Heat'	1 4		
🕂 Transfer parameter 🛛 🚈 Descri 📾 General 🖓 Input material 💜		s I I	
List:			
Name Data type Source Low	/limit Value High limit Unit o	of I	
1 Temp Floating-point number 1 2 Simutime Floating-point number 5	100 100 °C 360 1000 sec		
Description:			
- Sankau			
		-	
OK K	Cancel <u>H</u> elp		



16. Complete the "Prepare Sauce" ROP according to the recipe description for "Piccata Milanese".

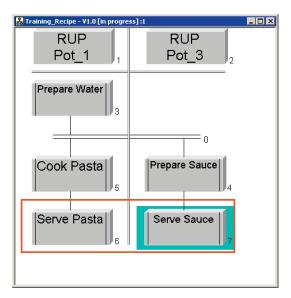


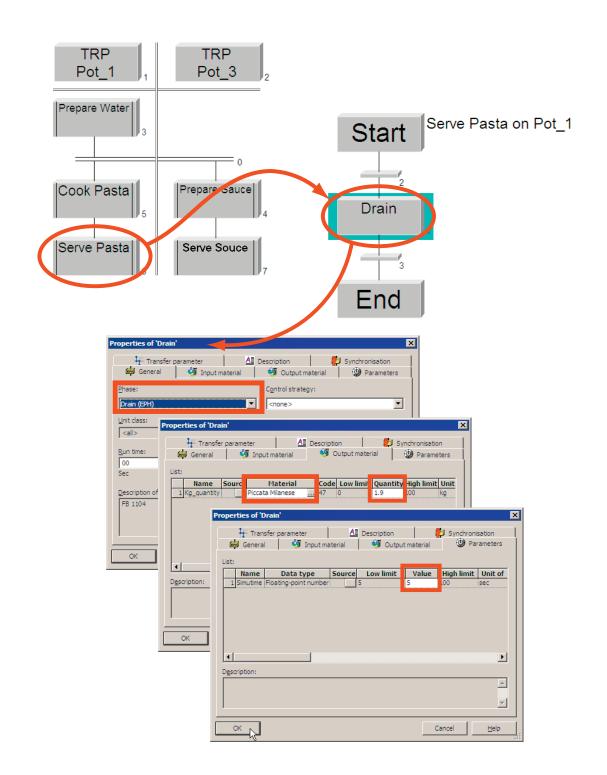


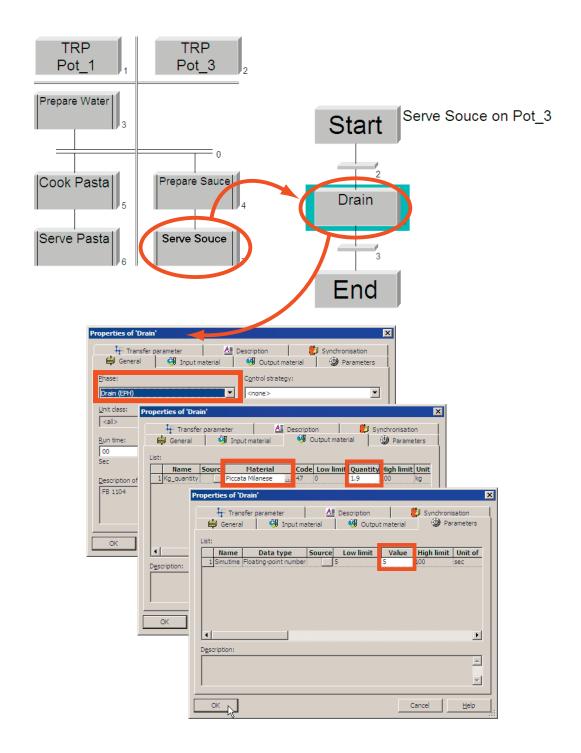


17. Insert a synchronization line by pressing the left mouse button and drawing a line between the left and right columns.

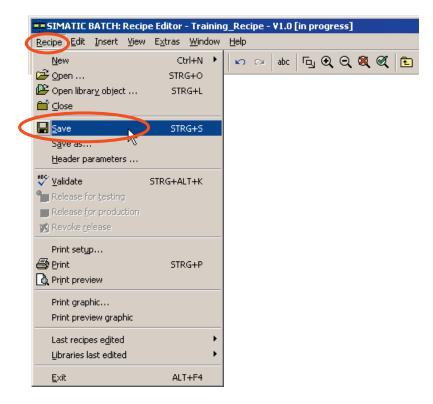
18. Add the "Serve Pasta" and "Serve Sauce" ROPs (recipe operations) and complete them according to the recipe description for "Piccata Milanese".



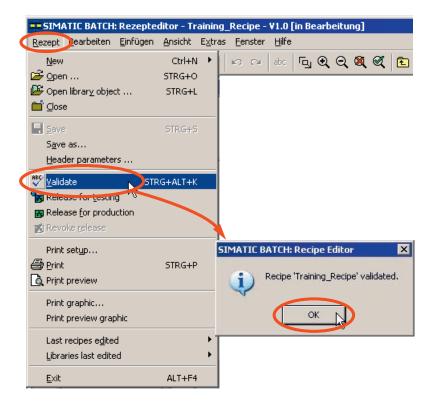




19. Save the master recipe you have created.



20. Validate the recipe.

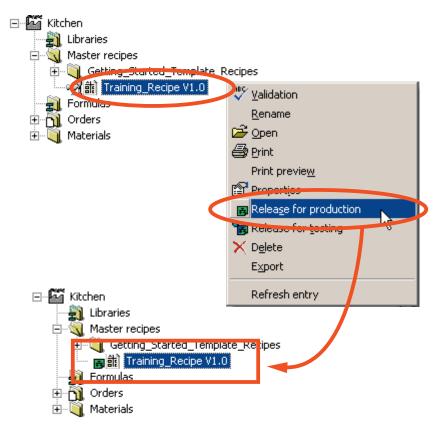


21. Close the Recipe Editor.

2.2.19 Chapter 19 Releasing the Master Recipe for Production

Before you can use your master recipe "Training_Recipe V1.0" to create a batch, the recipe must be released for production or testing.

1. Release your recipe for production.



Note:

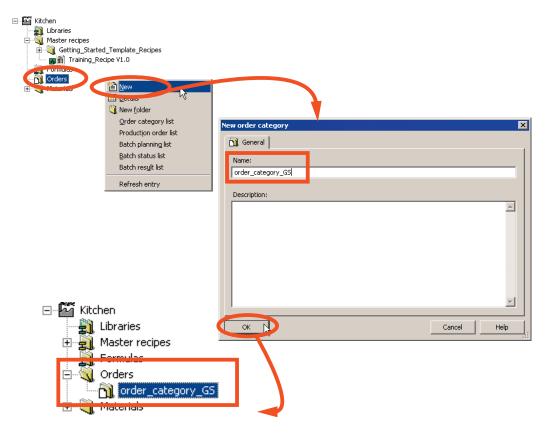
To be able to edit recipes that have already been released, the release has to be revoked. To do this, open the properties dialog in the BATCH Control Center with the menu command **Options > Settings > Project Settings**, activate the check box "Allow editing of recipes with 'Release revoked' status" and ensure that the "Unit selection according to conditions" check box is activated.

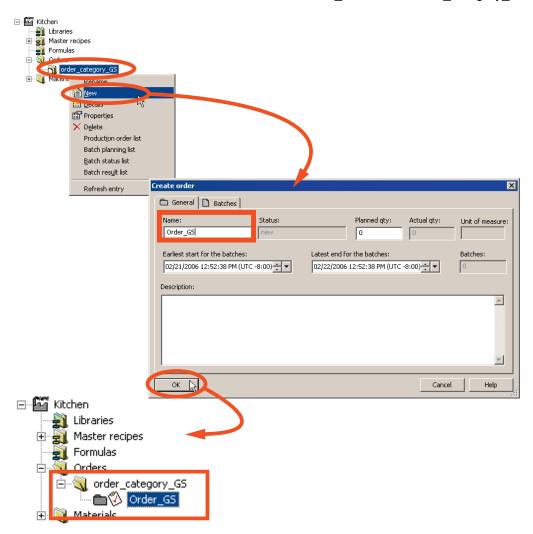
F

SIMATIC BATCH: Control Cer		
Program Edit Control Plannin	Options yew Window Help	
🛛 🥥 🌆 👷 💋 🚓	Set and	
	👷 <u>Permission management</u>	
	R <u>o</u> les management	
	Backup	
	Restore	
	Export	
	Import	
	Logbook	
	Active Applications	
	Compress data	
	Start Recipe Editor	
	Always on top	
	Migration •	
	Settings	Project settings F8
		L'accettines ht
Project settings for 'ZEN33_01'	× -	
General Color Font Archive Versioning I	Jsed Plug-in Modules	
	-	
Max, number of substructure		
Warning from <u>b</u> atches per order: 1000	<u></u>	
Warning from database size: 4000	(in MB)	
Automatically resolve excess substructures		
Allow parallel ROPs		
Validation: always show warnings		
Allow editing of recipes with "Release revoke	d" status	
Allow online setpoint change		
Unit selection according to conditions		
 Allow the creation of materials Display indexes chronologically 		
OK Default	Cancel <u>H</u> elp	

2.2.20 Chapter 20 Creating an Order (Batch)

1. Create an order category with the name "order_category_GS".





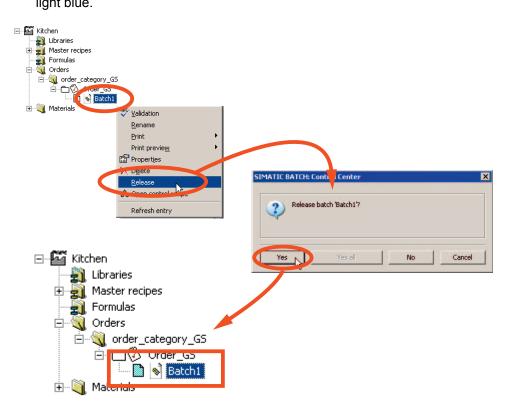
2. Create an order with the name "Order_GS" under "order_category_GS".

E- 🏧 Kitchen	A 4 4 4	14.2					
🚽 🚽 Libraries	Add bat	cn(es)					X
🛨 🖣 Master recipes	🗋 Ma	ain characteri	stics				
Formulas	List:						
Green Corders	LISC:	Neers		Chabura	Mada	Chart	Min Du
		Name		Status	Mode	Start	Min Qu
. Material Material							
New							
Properties							
× Delete							
Batch planning list				-1			
Batch status list							F
Batch res <u>u</u> lt list	Descrip	ption:					
Refresh entry					A	Copy	New D
Kenesirendy						amatic 1	Delete
Select formula				×	L _ Aut	omatic	Delete
Recipe/Formula Product	Formula o					Cancel	Help
Enter text here	Enter tex	t here		7			
Template, Decipe_Getting_Started V1.0 Product_Getting_Started							
Image: Training Control of Contr							
3 entries found							
			<u>C</u> ancel	Help			
Add batch(es)							X
Main characteristics							
							1
List:							
	art		in Quantit		roduct	Recipe/Form	
1 Batch1 Parameter undefin Operator 💌 02/21/2006 12:56:	39 PM (UT(1 2	9 10 Piccata	Milanese	Fraining_Recipe V	
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OK CK CK CK CK CK CK CK CK CK C					Copy	New Delete	
OK CK CK CK CK CK CK CK CK CK C					Copy	New Delete	
OK CK Kitchen Kitchen Kitchen Kitchen Master recipes Formulas Orders Orders Order category_GS Order sa					Copy	New Delete	
OK CK Kitchen Master recipes Formulas					Copy	New Delete	

3. Create a batch (e.g. Batch1) for "Order_GS" with the master recipe "Training_Recipe V1.0".

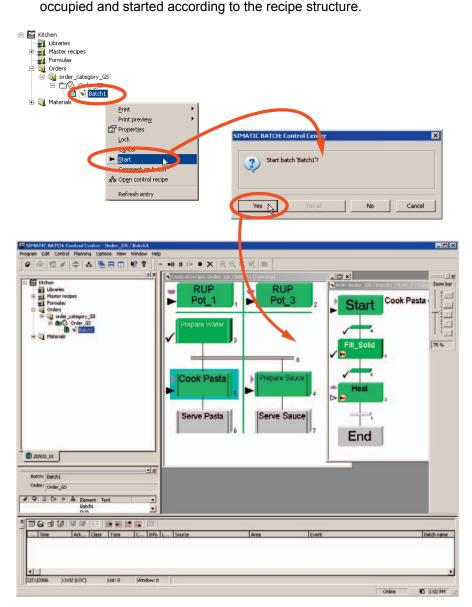
Chapter 21 Releasing and Starting a Batch (Control Recipe) 2.2.21

- Validation <u>R</u>ename Print Print previe<u>w</u> Sontrol recipe: Order_G5 / Batch1 [planned] _ 🗆 🗙 Properties 🗙 D<u>e</u>lete RUP RUP Pot 3 Pot 1 ई Op<u>e</u>n d ontrol recipe 2 Refresh enur Prepare Water 3 = 0 Prepare Sauce Cook Pasta Serve Sauce Serve Pasta 7
- 1. Open the batch (control recipe) "Batch1".



2. Release the "Batch1" control recipe. The icon of the control recipe becomes light blue.

3. Start the released control recipe. The icon changes to green and the units are occupied and started according to the recipe structure.



4. Close the SIMATIC BATCH Control Center and close WinCC Runtime.

3 Part 3: Creating an Equipment Phase with SFC and BATCH Interface Blocks

3.1 Overview

Working in the SIMATIC Manager

- 1. Task Definition and Implementation Concept
- 2. Expanding the Plant Hierarchy
- 3. Configuring the Control Module Level (Valve V1)
- 4. Configuring BATCH Interface Blocks for the Control Commands and Process Value Transfer
- 5. Creating an SFC
- 6. Connecting the Batch Control Commands with the SFC
- 7. Compiling and Downloading the AS and OS
- 8. Generating Batch Types
- 9. Compiling, Transferring the OS and Downloading Batch
- 10. Expanding a Recipe

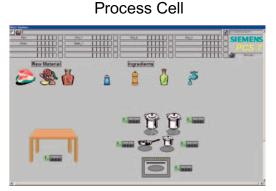
3.2 Projecting

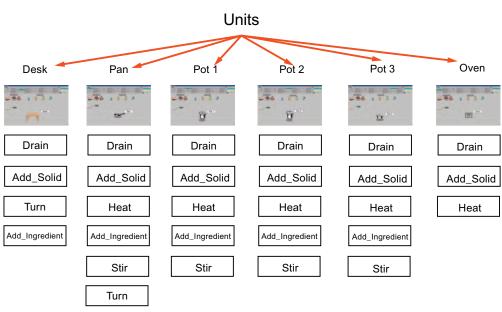
3.2.1 Chapter 1 Task Definition and Implementation Concept

An additional equipment phase is required for the pan: It must be extended by adding the "Quench" phase. A selectable quantity of a material (for example, red wine) will be added via a quench valve.

To simplify matters, the process of reaching the set quantity will be simulated by a selectable time. If the batch is held or aborted, the valve will close.

To implement the equipment phase, you select blocks from the Batch library.





Quench

Process values

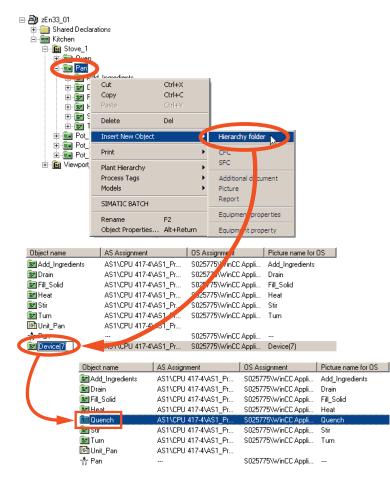
Process value name	Block	Data type	Comment
Quantity	IEPAR_PI	string	
		REAL	
Duration	IEPAR_REAL	REAL	

Block contacts

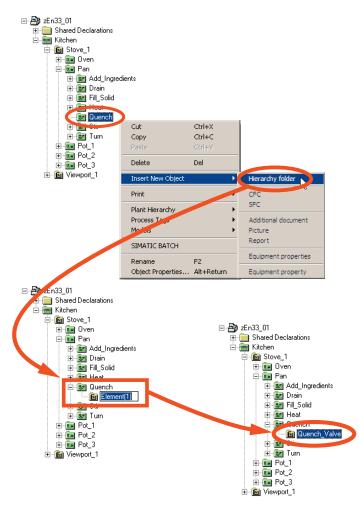
Block name	Block	Comment
V1	IEPAR_PI	

3.2.2 Chapter 2 Expanding the Plant Hierarchy

- 1. Open your edited SIMATIC BATCH Getting Started "Quick Start".
- 2. Expand the "Pan" unit by adding a hierarchy folder with the name "Quench". The newly added hierarchy folder is automatically declared as an equipment module and therefore also as batch-relevant (folder is green).

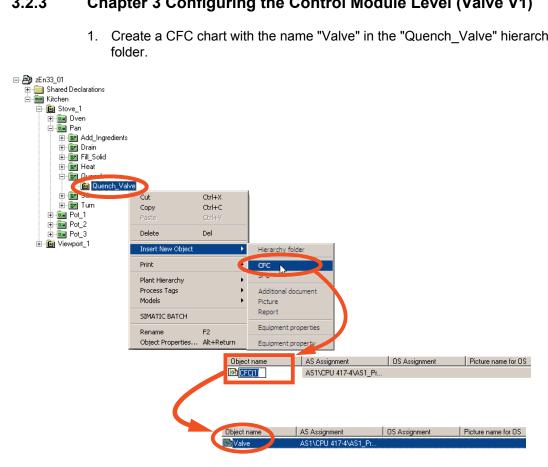


3. Expand the "Quench" hierarchy folder by adding a hierarchy folder with the name "Quench_Valve". This level also contains the control modules (here, the corresponding valve).



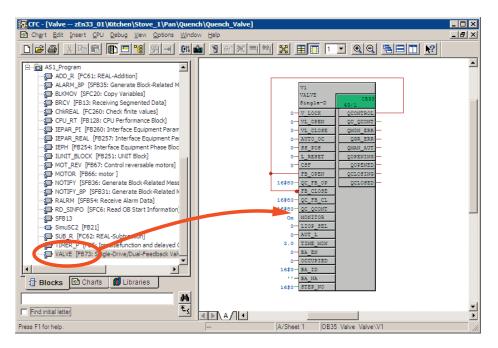
3.2.3 Chapter 3 Configuring the Control Module Level (Valve V1)

1. Create a CFC chart with the name "Valve" in the "Quench Valve" hierarchy



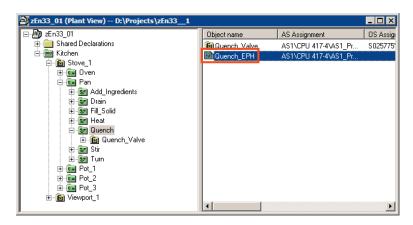
- 2. Open the "Valve" CFC chart and insert a valve block. Give the valve block the block name "V1".
- 3. Make the inputs and outputs "QCONTROL", "BA EN", "BA ID", "OCCUPIED", "BA NA", and "STEP NO" visible.

4. Interconnect the "QCONTROL" output with the "FB_OPEN" and "FB_CLOSE" inputs and invert "FB_CLOSE".

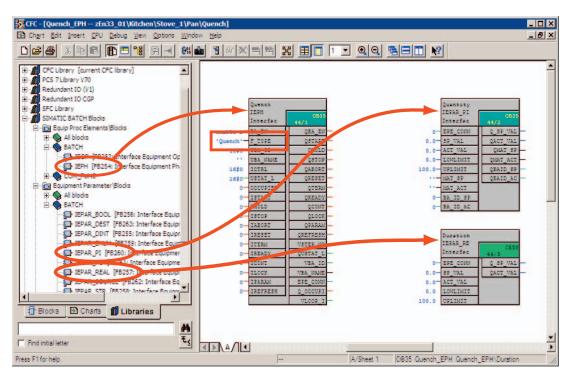


3.2.4 Chapter 4 Configuring BATCH Interface Blocks for the Control Commands and Process Value Transfer

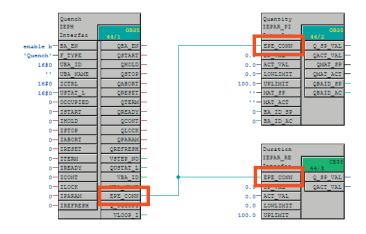
1. Create a CFC chart with the name "Quench_EPH" in the "Quench" hierarchy folder.



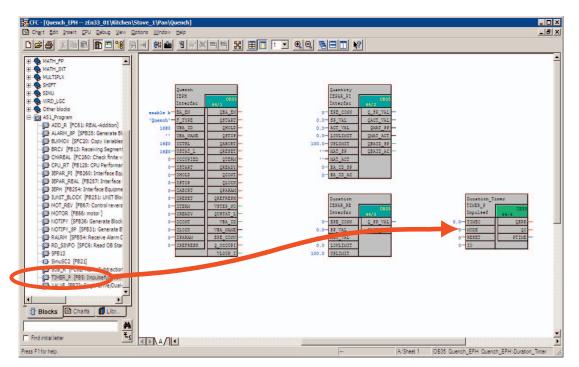
 Open the "Quench_EPH" CFC chart and add the "IEPH", "IEPAR_PI" and "IEPAR_REAL" blocks from the "SIMATIC BATCH Blocks" library. Rename the IEPH block to "Quench". Enter "Quench" too at the "F_TYPE" input as the input value. Assign the name "Quantity" to the IEPAR_PI block and the name "Duration" to the IEPAR_REAL block.



3. Interconnect the "EPE_CONN" output of the IEPH block (Quench) with the "EPE_CONN" inputs of the EPAR blocks (Quantity, Duration).



4. Add a TIMER_P block for the simulation of the "Duration" process value.



 Assign the TIMER_P block the name "Duration_Timer" and set the input MODE to 1. Interconnect the IEPAR_REAL block "Duration" with the TIMER_P block as follows.

Duration / Q_SP_VAL	with	Duration_Timer / TIMER0
Duration_Timer / PTIME	with	Duration / ACT_VAL

Duration			Γ	Duration_T	imer	
IEPAR_RE	0835		- U	TIMER_P	0835	
Interfac	100		. H	Impulsef	44/4	
0.0 SP_VAL	Q_SP_VAL QACT_VAL	- [_	TIME© Mode	QERR QO	_
ACT_VAL				RESET	PTIME	
0.0 LOWLIMIT	- 1		0-	10		
100.0 UPLIMIT						

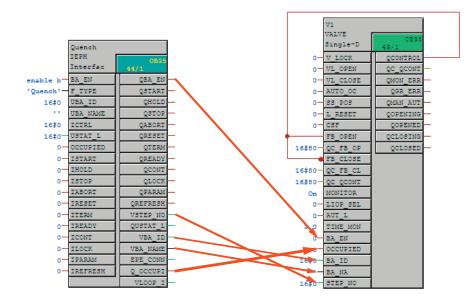
6. Interconnect the IEPAR_PI block "Quantity" to the simulation as follows.

Quantity / Q_SP_VAL	with	Quantity / ACT_VAL
Quantity / QMAT_SP	with	Quantity / MAT_ACT

Quantity	
IEPAR_PI Interfac	0835 44/2
EPE_CONN	Q_SP_VAL
0.0-SP_VAL	QACT_VAL QMAT_SP
0.0-LOWLIMIT	QMAT_ACT
100.0 UPLIMIT	QBAID_SP
MAT_SP MAT_ACT	GBAID_AC
0-BA_ID_SP	
0 BA_ID_AC	

 To have the BATCH name, Batch ID, Batch step number, Batch enable, occupied available at the valve block "V1", the valve block must be interconnected to the Batch control block IEPH "Quench". Make interconnections as shown below.

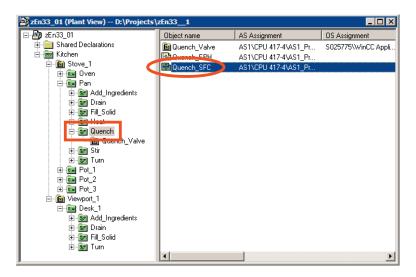
Quench / QBA_EN	to	V1 / BA_EN
Quench / VSTEP_NO	to	V1 / STEP_NO
Quench / VBA_ID	to	V1 / BA_ID
Quench / VBA_NAME	to	V1 / BA_NA
Quench / Q_OCCUPI	to	V1 / OCCUPIED



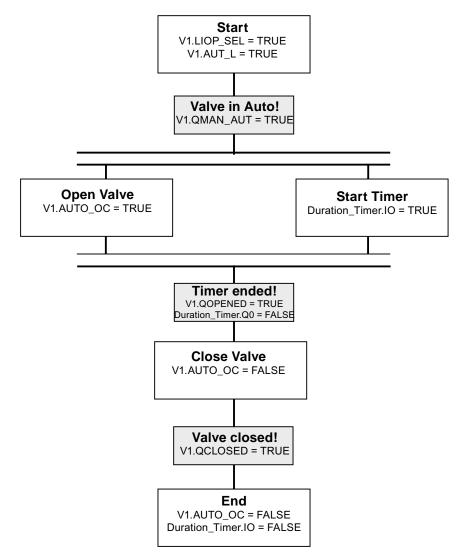
8. Close the CFC Editor.

3.2.5 Chapter 5 Creating a SFC

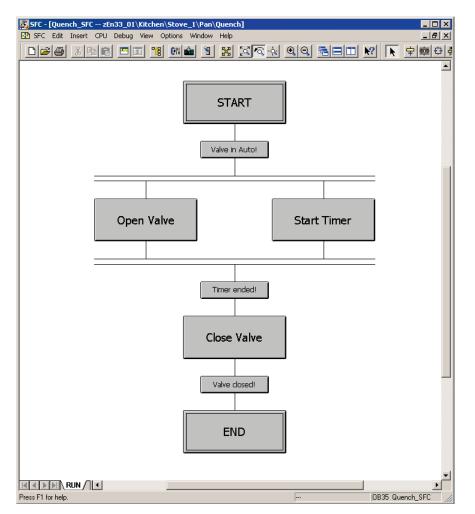
1. Create a SFC chart with the name "Quench_SFC" in the "Quench" hierarchy folder.



2. Open the SFC chart and configure the RUN sequencer. Base you configuration on the following outline. You can find the Duration_Timer block in the Quench_EPH chart and the V1 block in the Valve chart.



Outline for the "RUN" Sequencer (RUN=1)



The completed sequencer appears as follows.

Example for a step and a transition.

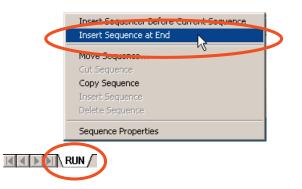
Step: Start Timer

	ties - Start Timer zEn33_01\Kitchen\Stove_1\Pan\Quench\\Quench_SFC ral Initialization Processing Termination	×
1	VQuench\\Quench_EPH\Duration_Timer.I0 := TRUE	
2		-
3		
4		
5		
6		
7		
8		
9		
10		·
Clo	ose Apply + + + + Print Browse Gro to Help	

Transition: Timer ended!

Propert	ies - Timer ended! zEn33_01'	Kitc	nen\Stove_	1\Pan\Quench	\\Quencl	h_SFC 🛛 🛛
Genera	al Condition OS Comment					
1	nch_Valve\\Valve\V1.QOPENED	- 1	TRUE			1
2	\Quench_EPH\Duration_Timer.Q0	- 1	FALSE			
3			-			& _
4			-			
5			-			
6			-			& -
7			-			&
8			-			& "
9			-			
10			-			Ŧ
Clo	se Apply 🖛 🕇 🗸	⇒	Print	Browse	Gio to	Help

3. Insert a new sequencer in "Quench_SFC".



4. Open the properties window of SEQ1 (double-click on the SEQ1 tab). In the "General" tab, enter the name "Abort-Hold-Comp". Then apply the settings.

	Insert Sequencer Before Insert Sequence at End	e Current Sequence		
	Move Sequence Cut Sequence Copy Sequence Insert Sequence Delete Sequence			
	Sequence Properties			
Properties -	SEQ1 zEn33_01\Kitchen\Sto	ve_1, an\Quench\\Que	nch_SFC	×
General Sta	art condition 0S Comment Prepro	cessing Postprocessing		
Name:	Abort-Hold-Comp	Number:	2	
Comment:				×
Priority	1			

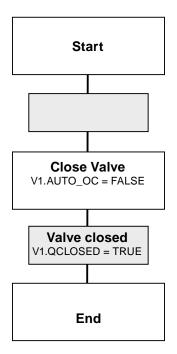
5. Configure the start conditions of the sequencer. Make the "Inputs/Outputs" view visible. Insert the parameters "HOLDING" ,"ABORTING" and "COMPLETING" as start conditions in the "Start condition" tab by dragging them with the mouse (these parameters are located in OUT).

Apply the settings and close the "Properties" window.

	9 11 11 11 11 11 11 11 11 11 11 11 11 11
I/Os to Quench_SFC	Contents Of: 'Interface\OUT'
	Name Data Type Initial Value Comment
ERROR	HOLDING Bool chart holding
HELD_ERROR	Image: Provide and the
TR DECH EDBOR	ERROR Bool chart error
ABORTING	HELD_ERROR Bool chart held error
	ESU_ERROR Bool chart resuming error
	ABORTING Bool chart aborting
	ABORTED Bool chart aborted
	Properties - Abort-Hold-Comp zEn33_01\Kitchen\Stove_1\Pan\Quench\\Quench_SFC Image: Start condition Genera: Start condition DS Comment Preprocessing Postprocessing 1 nch\\Quench_SFC.COMPLETING = Completi Image: Completi
	Qose Apply Bint Browse Go to Help

6. Configure the Abort-Hold-Complete sequencer as described below.

Outline for the "Hold/Abort/Complete" Sequencer (Holding=1 or Aborting=1 or Completing=1)



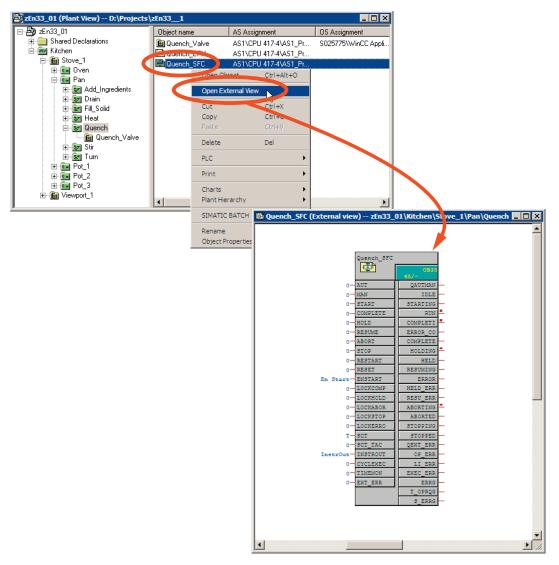
7. Select the "AUTO" mode in the "Quench_SFC" SFC chart.

SFC Edit Insert CPU Debug View Options Open Open Close Cl	Window Help Ctrl+N Ctrl+N Ctrl+O Ctrl+F4
Properties Mesoage Eooters Check Congistency Compile	Properties SFC chart X General CPU Operating Parameters OS Version
<u>Print</u> Print Previe <u>w</u> P <u>ag</u> e Setup	Defaults
1 zEn33_01\AS1\CPU 417-4\\\Ventilate 2 zEn33_01\Vitchen\Stove_1\Pan\Quench\\Quench_EF 3 zEn33_01\Vitchen\Stove_1\Pan\Quench\\Quench_SF	Command output SFC startup after CPU restart Cyclic execution Initialize SFC Ime monitoring Retain SFC state
Exit	Start options

8. Close the SFC Editor.

3.2.6 Chapter 6 Connecting the Batch Control Commands with the SFC

1. Open the external view of the "Quench_SFC" SFC chart.



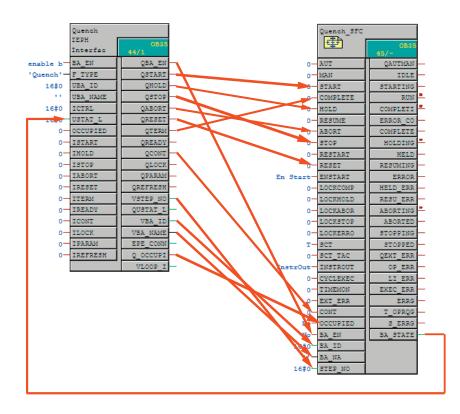
2. Open the "Quench_EPH" CFC chart with the "Quench" interface block.

3. Interconnect the "Quench" interface block with the external view of the "Quench_SFC" SFC chart as follows.

Note:

Set all parameters in the following list to visible at first.

to	Quench_SFC / START
to	Quench_SFC / HOLD
to	Quench_SFC / STOP
to	Quench_SFC / ABORT
to	Quench_SFC / RESET
to	Quench_SFC / COMPLETE
to	Quench_SFC / CONT
to	Quench_SFC / BA_EN
to	Quench_SFC / STEP_NO
to	Quench_SFC / BA_ID
to	Quench_SFC / BA_NA
to	Quench_SFC / OCCUPIED
to	Quench_SFC / BA_STATE
	to to to to to to to to to to

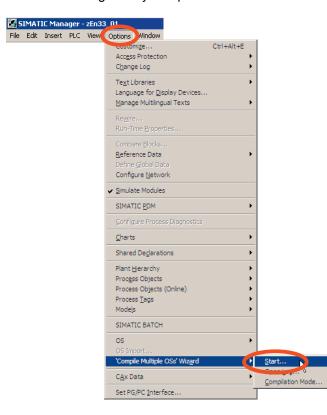


3.2.7 Chapter 7 Compiling and Downloading the AS and OS

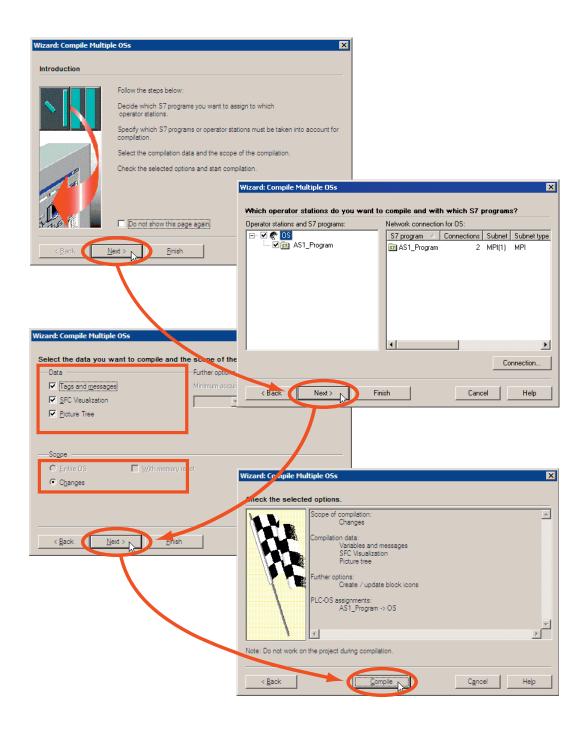
1. Run a changes-only compilation of the AS and then download the newly compiled data to PLCSim with a changes-only download.

🔀 CFC - [Quench_SFC (External view) zEn33_01\Kitchen\Stove_1\Pan\Quench]	
Ed Chart Edit Insert CPU Debug View Options Window Help	N ×
D28 X66 6=** 8- 40 16X=* X 80 1 • 99 5=1 M	
New Chart New Text New Text New Text Second Stress Second Stres Second Stress Second Stress Second St	

When the download is completed, check that the AS in the RUN_P state.



2. Run a changes-only compilation of the OS.



3.2.8 Chapter 8 Generating Batch Types

 Open the "Configure Batch process cell" dialog in the Plant view in your project. Select "Batch types".

clarations		
Cut	Ctrl+X	
Сору	Ctrl+C	
Paste	⊂trl+V	
Delete	Del	
Delete	Dei	
Insert New Object	I	▶
Print	I	•
Plant Hierarchy	1	
Process Tags		•
Models	1	•
CIMATIC DATCH		
SIMATIC BATCH		
Rename	F2	
Object Properties	Alt+Return	
	Cut Copy Paste Delete Insert New Object Print Plant Hierarchy Process Tags Models SIMATIC BATCH Rename	Cut Ctrl+X Copy Ctrl+C Paste Ctrl+V Delete Del Insert New Object Image: Ctrl+V Print Image: Ctrl+V Plant Hierarchy Process Tags Models SIMATIC BATCH

2. Generate the batch types. Your batch data newly configured in the "Quench_EPH" CFC chart is now loaded.

nfigure Batch process cell 'Kitchen' in	'zEn33_01'		
zEn33_01/Kitchen/Batch types			
rocess cell data	Properties		
zEn33_01	Batch types		
a Batch types	Description Last changed on	2006-08-21 09 40 31+01	
Constant Speet Constan	Batch types	Erotocol Generate	Additional Functions - Print Import
OK Apply		Display	Cancel Help
	upes if measure ion types ain _Solid _Solid r r r u d. hoaractien uench		

3.2.9 Chapter 9 Compiling and Downloading Batch Process Cell Data

 Compile the Batch process cell data. To do this, select "Batch instances" and select the "Compile" button.

nfigure Batch process cell 'Kitchen' in 'z	En33_01'	
Kitchen/Batch instances		
tocess cell data	Properties	
2En33_01	Batch instances	
Kitchen	Description	⁴ contraction deter
Batch instances	Last compiled on	2006-08-21 09 37 41+01
Brien Oven ⊡en Pan ⊕ Stad_Ingredients ⊕ Star ⊕ Pot_1 ⊕ En Pot_1 ⊕ En Pot_2 ⊕ En Pot_3 ⊕ En Star ⊕ En Star ⊕ En Star ⊕ Star ⊕ En Star ⊕ En Star ⊕ Star ⊕ Star ⊕ En Star ⊕ Sta	Batch Instances	Erotocol Additional functions -
OK Apply		CancelHelp
	nstances ove_1 Pot_2 Pot_1 Pot_3 Oven	

 Download the Batch process cell data. Select the Batch process cell (in this case, Kitchen) and perform a "Download". Save the changes (confirm the dialog box with Yes). Download the generated Batch process cell data to the BATCH server and BATCH client.

In this case, the BATCH server and BATCH client are on the same computer.

and a second s				
ocess cell data	Pr <u>o</u> perties			100
	Kitchen			
Kitchen	Description			
E Batch instances	Process cell component grouping	6		-
	Batch process cell Check validity Transfer messages Download	Protocol Validation Image: Error Image: Image: Imag		ctions
OK Apply		i) You	have to save changes before now?	ore downloading!
Noading Batch process cell '2En33 Component PC st. Batch Database Server Project 2En33_01\Server Master 10ffine 2En33_01\Server Offine 2En33_01\Server 10Server Offine 2En33_01\Server 10Server	tion Target system	Verify Status Downloaded Not up to date Not up to date	e now?	ore downloading!
Noading Batch process cell '2En33 Component PC st. Batch Database Server Image: Colspan="2">Master Image: Colspan="2">Master Image: Colspan="2">Offline Image: Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2"Colspan=	tion Target system	Verify Status Downloaded Not up to date Not up to date	e now?	ore downloading!
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Noading Batch process cell 'zEn33_ Component PC st. Batch Database Server Master 2 Project zEn33_01\Server Master 0 Online zEn33_01\Server Standby 0 Online zEn33_01\Server Batch Server 2 ZEn33_01\Server Master 2 ZEn33_01\Server	tion Target system	Verify Status Verify Status Downloaded Not up to date Not up to date Not up to date Occess cell 'zEn33_01 PC station etver et zEn33_01 Server ne	Yes No Yes No Target system	Verify Statu
Noading Batch process cell '2En33_ Component PC st. Batch Database Server Master 2 Project 2En33_01\Server Master 0 Online 2En33_01\Server Standby 0 Online 2En33_01\Server Batch Server 2 Project 2En33_01\Server Master 2 Project 2En33_01\Server Batch Server 2 Zen33_01\Server Batch Client 2 Zen33_01\Server	tion Target system T	Verify Status Verify Status Downloaded Not up to date Not up to date Not up to date Occess cell 'zEn33_01 PC station etver et zEn33_01 Server ne	Yes No Yes No Target system	Verify Statu
Islanding Batch process cell '2En33 Component PC st. Batch Database Server Image: Project 2En33_01\Server Master Image: Project 2En33_01\Server Image: Project 2En33_01\Server Image: Project 2En33_01\Server Standby Image: Project 2En33_01\Server Batch Server Image: Project 2En33_01\Server Master Image: Project 2En33_01\Server Batch Client Image: Project 2En33_01\Server	tion Target system T	Verify Status Downloaded Not up to date Not up to date Not up to date Not up to date Terrer terrer	Yes No Yes No Target system	Verify Statu Downloaded Downloaded Downloaded
Picture Picture Batch Database Server Batch Database Server Master Offline Zhn32 Offline Standby Batch Client	tion Target system	Verify Status Downloaded Not up to date Not up to date Not up to date Not up to date Terrer terrer	Yes No Yes No Target system	Verify Statu Downloaded Downloaded Downloaded

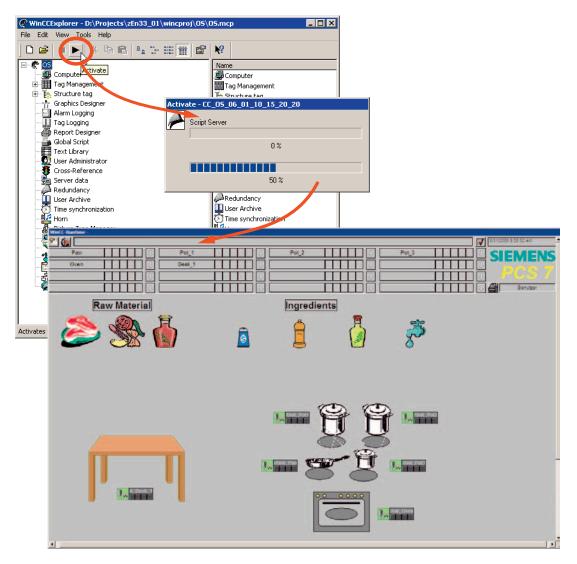
3. Close the dialog.

Configure Batch process cell 'Kitchen' in 'zEn33_01'				
Kitchen/Batch instances				
Process cell data Properties				
zEn33_01	Batch instances			
🖻 🏧 Kitchen	Description			
	Last compiled on	2006-02-22 19:05:08-08		
	Batch instances	Protocol Additional functions		
	📟 Kitchen	Compile		
	Compile	🔁 🖸 Error		
	New	<u> 0</u> Warning(s)		
	Delete	Display		
OK Apply		Cancel Help		

4. Close the "Configure Batch process cell" dialog.

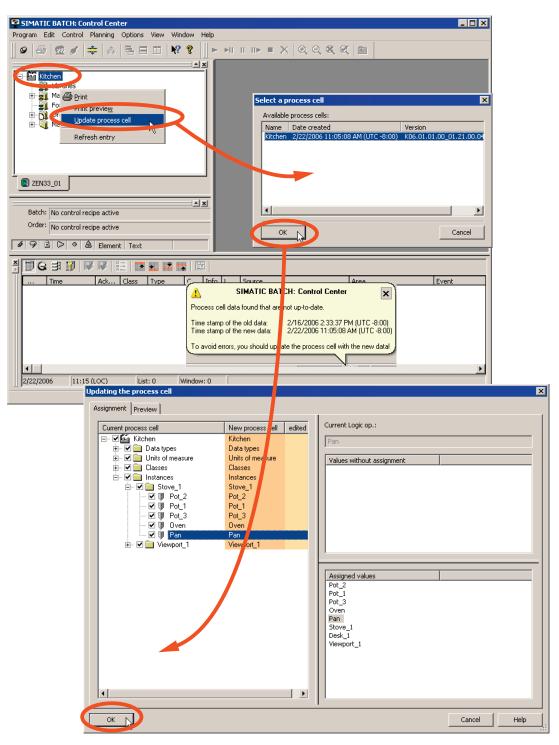
3.2.10 Chapter 10 Expanding a Recipe

1. Start Runtime on the OS.



2. The Start Coordinator starts automatically as soon as your WinCC project is in runtime. Wait until it has started all applications completely (BCS and CDV).

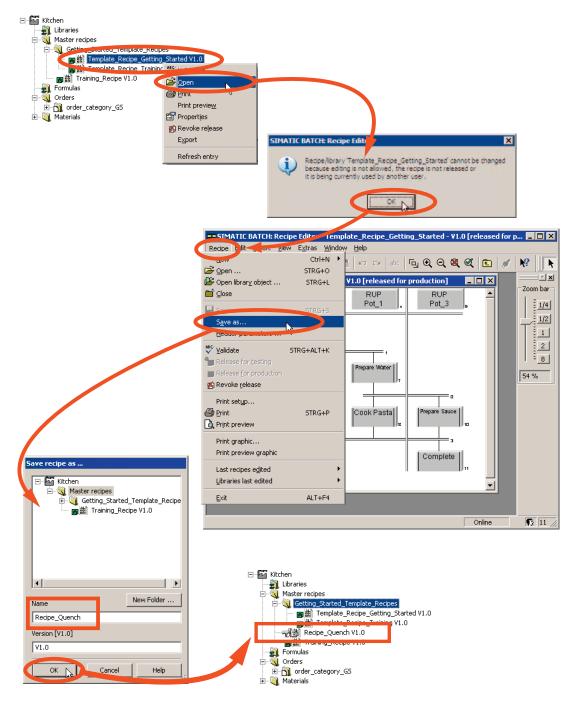


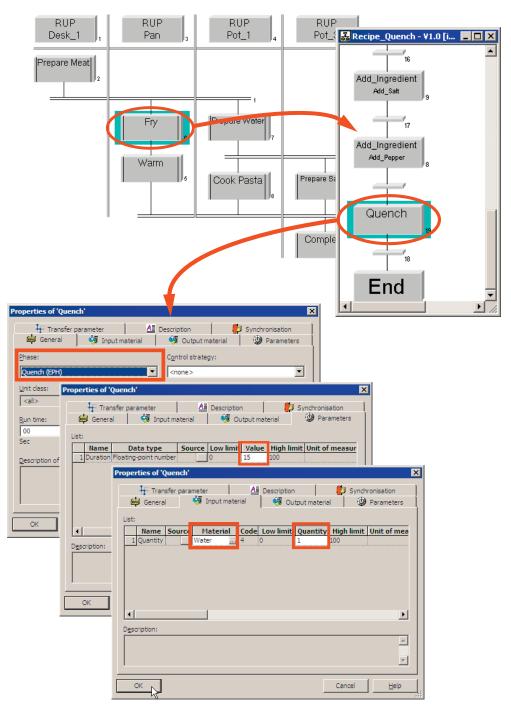


3. Start the Batch Control Center and update the newly downloaded Batch process cell data.

After the update, your newly configured "Quench" phase for the "Pan" unit is available for recipe creation.

4. Open the "Template_Recipe_Getting_Started" master recipe and save it with the name "Recipe_Quench".

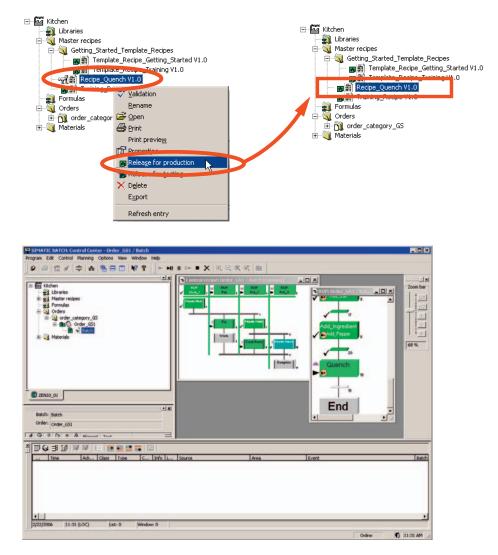




5. In the "Recipe_Quench" recipe you have just created, insert the newly configured "Quench" phase.

- SIMATIC BATCH: Recipe Editor Recipe_Quench ¥1.0 [in progress] Recipe Edit Insert View Extras Window Help Ctrl+N + New 🗃 Open ... STRG+0 Dpen library object ... STRG+L 🖆 Close Save Save as... Header parameters ₩ Validate STRG+ALT+K - Release <u>for production</u> K Revoke release SIMATIC BATCH: Recipe Editor × Print set<u>u</u>p... 🖨 Print STRG+P Recipe 'Recipe_Quench' validated. Print preview **i**) Print graphic... OK R Print preview graphic Last recipes edited , • Libraries last edited ALT+F4 <u>E</u>xit
- 6. Save the recipe and validate it. Then close the Recipe Editor.

7. Release the recipe for production. Then create a new batch with the "Recipe_Quench" recipe, release and start it.



8. Close the SIMATIC BATCH Control Center and close WinCC Runtime.

4 Part 4: Creating an Equipment Phase with a SFC-Type

4.1 Overview

Working in the SIMATIC Manager

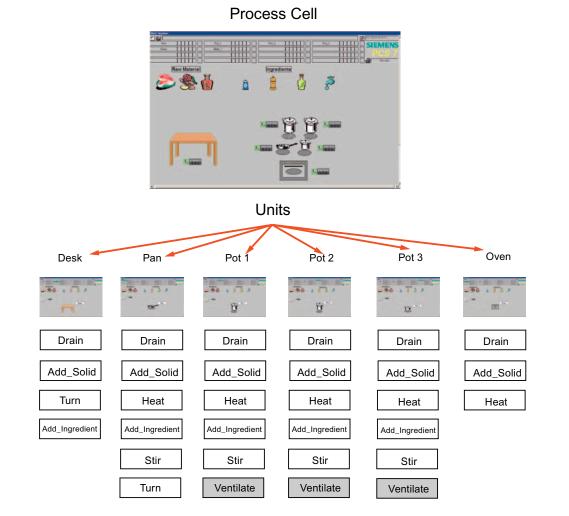
- 1. Task Definition and Implementation Concept for "Ventilate"
- 2. Creating SFC Type "Ventilate"
- 3. Creating Sequencers
- 4. Expanding the Plant Hierarchy
- 5. Creating Instances of the SFC Type "Ventilate" for Pot_1
- 6. Compiling and Downloading AS, OS, and Batch
- 7. Expanding a Recipe

4.2 Projecting

4.2.1 Chapter 1 Task Definition and Implementation Concept for "Ventilate"

An additional equipment phase is required for the pots: It needs to be extended by adding the "Ventilate" phase. A ventilation valve must be opened for a selectable time. If the batch is held or aborted, the valve will close.

Since the same phase is necessary for Pots 1-3, select the SFC type to implement it.



Implementation Concept for SFC Type "Ventilate"

Control strategies

Control strategy name	Comment
Ventilate	First control strategy, QCS=1

Setpoints

Setpoint name	Data type	Comment
Duration		Unit of measure seconds

Process values

Process value name	Data type	Comment
None		

Times

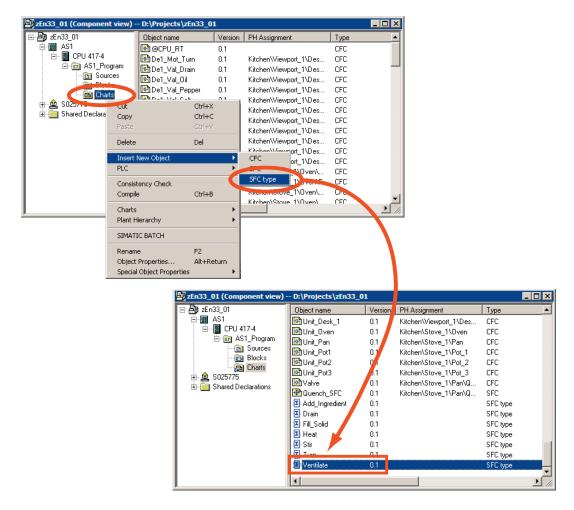
Name	Data type	Comment
T_Duration	Time	Timer for setpoint "Duration", Mode=1

Block contacts

Block name	Data type	Comment
V1	VALVE	Ventilation valve

4.2.2 Chapter 2 Creating SFC Type "Ventilate"

1. Open the Component view and insert the new SFC type "Ventilate".



 Open the characteristics dialog of the "Ventilate" SFC type shown below by double-clicking on it. Select the "Characteristics" menu.

SFC - [Ventilate zEn33_01\A51\CPU 417-4\]	
SFC Edit Insert CPU Debug View Options Window Help	
i dee xre (t): «M I X X	a 🔄 🖳 🔚 🖿 💽 🕨 车 👳
Characteristics for Ventilate Contents Of: 'Characteristics'	
Characteristics A Characteristics A Control strategies Control strategies	^ _
Setpoints	
Process values	
Control values	
Parameters Rit memory	
Bit memory	
Timers I Knote texts	_
	<u> </u>
START	
END	
Press F1 for help.	OB35 Quench_SFC //

3. Select the "Control strategy" characteristic and enter the name "Ventilate" in the right box.

Characteristics to Ventilate	Con	tents Of: 'Characte	ristics\Control stra	ategies'				
Characteristics			Display name	Number	Default	Comment	<duration></duration>	
Control strategies		🖬 Ventilate	Ventilate		 Image: A start of the start of			✓
- Setponts		2		-				
Process values								
Control values								
- Parameters								
- Bit memory								
Timers	Ţ							

4. Now select the "Setpoints" characteristic and enter the setpoint name "Duration" in the right box. Select "REAL" as the data type for Duration. Enter "sec" as the unit of measure for Duration.

Characteristics to Ventilate	Cont	ents Of: 'Characte	ristics\Setpoints							
Characteristics	- L	Name	Data type	I/O name	Co Low limit	Initial value	High limit	Te Precision	Unit	Text0
Control strategies	٦	Duration	REAL	Duration	0.0	0.0	100.0	2	sec	
Seponts Froces values Granders values Granders Froces values Granders Frances Bit memory Granders Timers										Þ

 Now define the timer. To do this, select the "Timers" characteristic. Enter the name "T_Duration" in the right box. The timers that are used in this way within SFC types, have characteristics similar to the standard "Timer_P" block from the PCS 7 library.

Note:

A pop-up window appears informing you that the TIMER_P block or object "FB5" already exists.

Confirm you entry with "YES".

Characteristics to Ventilate	Conter	nts Of: 'Characte	eristics\Timers'			
Process values		Name	I/O name	Comment	Initial value	
Control values	_ D	T_Duration	T_Duration		0.0	
- Parameters	<mark>_</mark>					•
Bit memory Timers Timers						
Block contacts	_					

6. In the final step, you will create the valve. Select the "Block contacts" characteristic and enter the name "V1" in the right box. Select the corresponding block types, in this case "VALVE", in the "Block" column.

Characteristics to Ventilate	Cont	ents Of: 'Chara	cteristics\Block (contacts'		
Process values		Name	Block	I/O name	Comment	
Control values	٣	V 1	VALVE	V1		
- Parameters	P	J [
Bit memory						
🕀 Timers						
Note texts	_					
- Block contacts						
Position texts						

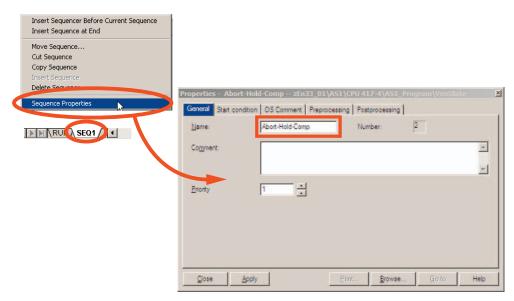
You have now specified all the characteristics required for the "Ventilate" example. The sequencers must now be created and configured.

4.2.3 Chapter 3 Creating Sequencers

The Run sequence path that is processed in the "Run" status has already been created. The sequencer that is processed in the "Holding" "Aborting" "Completing" statuses does not yet exist. Since the content is the same in all three sequencers in this case, you only need to create one sequencer and name it "Abort-Hold-Comp".

Move Sequence	
Copy Sequence	
Insert Sequence	
Delete Sequence	

- 1. To insert a new sequencer, open the "RUN" tab on the right. Select "Insert Sequence at End".
- 2. A new tab is created called "SEQ1". Set the properties of SEQ1. In the general properties, enter the name Abort-Hold-Comp.



- 3. We now configure the start conditions of the sequencer in the properties. The start condition is:
 - Aborting=True or Holding=True or Completing=True.
 - Change to the "Inputs/Outputs" view. The I/Os Aborting, Holding and Completing are located in "OUT".
 - Drag the I/Os from the upper section to the dialog for configuring the start condition.

Apply the changes and then close the properties window.

SFC - [Ventilate zEn33_01\AS1\Cl	PU 417-4\]			
SFC Edit Insert CPU Debug View	w Options Window	/ Help	_ B ×	
Dee Xri (E)	<u>• • • • • • • • • • • • • • • • • • • </u>	X 3994 9	.9. 580 M 🕨 主	
I/Os to Ventilate	tents Of "Interface"	т'		
Interface Interface	STARTING Bool RUN Bool READY_TC Bool COMPLETING Bool ERROR_COM Bool COMPLETED Bool HOLDING Bool		Comment Starting "operating state "Active" operating state "Active" operating state "Completing" operating state "Error completing" operating state "Complete" operating state "Holding" operating state "Holding" operating state "Holding" operating state "	
	HELD Bool		"Held" operating state	
	Gener 1 2		AS1\CPU 417-4\AS1_Program\Ventil ment Preprocessing Postprocessing	ate ×
Press F1 for help.		ose Apply	Print Browse	Gio to Help

4. The next step is to configure the "RUN" sequencer. Remain in the "Inputs/Outputs" view.

SFC - [Ventilate zEn33_01\AS1\CPU 417-4\]									
Image: Specific Edit Insert CPU Debug View Options Window Help									
D 2 2 X B B B 1 M 1 1 1 X X X A Q Q B B D M									
▶ 中韓 다 타 \$2 abl									
I/Os to Ventilate	Contents Of: 'Interf	face \OUT'							
Interface	Name	Data Type	Initial Value	Comment					
	a QAUTMAN	Bool		Current operating mode					
	QENAUT	Bool		Enable switching to operating mo					
IN OUT	QENMAN	Bool		Enable switching to operating mo					
	QFORCEMAN	Bool		Unconditional switch to operating					
	IDLE	Bool		"Idle" operating state					
	I STARTING	Bool		"Starting" operating state					
	🖭 RUN	Bool		"Run" operating state					
	READY_TC	Bool		"Ready to complete" state	-				
	(1							
		START							
	ſ	<u> </u>							
END									
Abort-Hold-Comp									
Press F1 for help.		Press F1 for help							

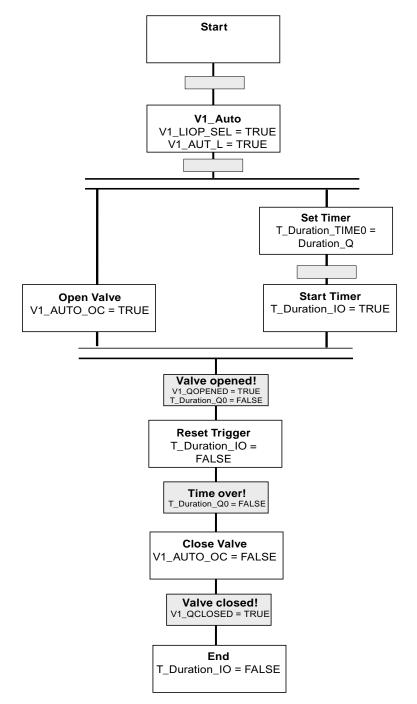
In the left section of the window, you will see the I/Os of the "Ventilate" SFC type grouped according to inputs, outputs and in_outs. In the right section, you see the list of corresponding I/Os.

The control outputs for the V1 valve or the T-Duration timer are located under "OUT".

The feedback messages of the V1 valve are created under "IN".

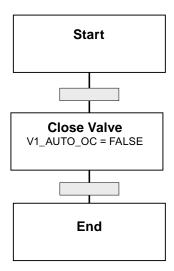
5. Drag the I/Os from the upper part to the dialog for configuring the steps/transitions. The Run and the Abort-Hold-Complete sequencers are structured as shown in Chapter 1. Uses the outlines on the following pages to correctly configure all steps and transitions.

SFC - [Ventilate zEn33_01\AS		
I/Os to Ventilate	Contents Of: 'Interface\OUT'	
E-B Interface	Name Data Type Initial Value Image: T_Duration_Q0_Bool Total Description Description	
	T_Duration_QU Bool	output pulse
	V1_AUTO_OC Bool	AUTO Mode:1=Open, 0=Close
	V1_L_RESET Bool	Linkable Input RESET
	Ta V1_AUT_L Bool	Select: 1=Linking, 0=Operator Active Linkable Input for MANUAL/AUTO Mode
		T
		3 01\AS1\CPU 417-4\AS1 Program\Ventilate
	General Initialization Proces	sing Termination
	1 V1_LIOP_SEL	;= TRUE
	2 V1_AUT_L	:= TRUE
	3 🔽	
	4 🔽	:=
	5 🔽	:=
		.=
	9 🔽	
	10 🔽	=
RUN Abort-Hold-Co	mp / I Close Apply	⊢ ↑ ↓ → Print Browse Go to Help ▼
Press F1 for help.		DB35 Quench_SFC //



Outline for the "Run" Sequencer (Run=1) for the "Ventilate" Control Strategy (QCS=1)

Outline for the "Hold/Abort/Complete" Sequencer (Holding=1 or Aborting=1 or Completing=1)



1. Set the start value for the timer mode used to "1" (extended pulse).

I/Os to Ventilate	Cor	Contents Of: 'Interface\IN'					
🖃 🎒 Interface		Name	Data Type	Initial Value	Comment		
±∎- IN	12	Duration_LL	Real	0.0	Lower Limit		_
	1	Duration	Real	0.0	Automatic Process Value		
	350	Duration AI	Real	0.0	Actual Value Input		
	1	T_Duration_MODE	Int	1	operating mode		
	1	VI_QGK_EKK	DUUI	FALSE	1=Group Error		
	12	V1_QMAN_AUT	Bool	FALSE	1=AUTO, 0=MANUAL Mode		
	2	V1_QOPENED	Bool	FALSE	1=Valve is OPEN		
		V1_QCLOSED	Bool	FALSE	1=Valve is CLOSED		-

2. Set the start value for the CS parameter (control strategy) to the value 1.

I/Os to Ventilate	Con	Contents Of: 'Interface\IN'					
🖃 🎒 Interface		Name		Initial Value			
		SELCS	DWard	16 #00000001	Enable control strategies		
		CS	Int	1	AUTO: Prepared control strategy (apply at next "Start")		
🗄 🖽 IN OUT			2110	•	concorperatogy high inne	-	
	12	CS_LL	Int	1	Control strategy "Low limit"		
	1	SCT	Bool	TRUE	AUTO: Step control mode by transition		
	1	SCT_TAC	Bool	FALSE	AUTO: Step control mode by transition/transition and confirmation		
	1	RUNHOLD	Bool	FALSE	Response of the RUN-Seq to the "Hold" command: 0: Hold/1: Abort		
		SELFCOMP	Bool	TRUE	Self "Complete"	•	

C Dit Insert CPU Debug View Options (Tew	Ctrl+N
Open Glose	Ctrl+0 Ctrl+F4
Propertjes	
Message	
Check Congistency Compile	Ctrl+Alt+K Ctrl+B
<u>Print</u> Print Previe <u>w</u>	Ctrl+P
Page Setup	Properties SFC type
1 zEn33_01/kitchen\Stove_1\Pan\Quench\\Quench 2 zEn33_01\AS1\CPU 417-4\\Ventilate 3 zEn33_01/kitchen\Stove_1\Pan\Quench\\Quench	General CPU Operating Parameters Options Version
E <u>x</u> it	Category EPH
	Allow operator
	ESrelevant
	Control strategy selection
	V entilate
	OK Cancel Help
Properties SFC type	
General CPU Operating Para	Imeters Options Version
Defaults	Operating mode:
Step control mode:	
	- SFC startup after CPU restart
Command output	 Initialize SFC
Cyclic execution	Initialize SFC C Retain SFC state
Cyclic execution	C' Retain SFC state
Cyclic execution	C' Retain SFC state
Cyclic execution	C' Retain SFC state

3. Select the SIMATIC BATCH category "EPH".

- 4. Set the AS operating parameter to "Auto" as the default mode. This completes all the steps for configuring the "Ventilate" type.
- 5. Exit the SFC Editor.

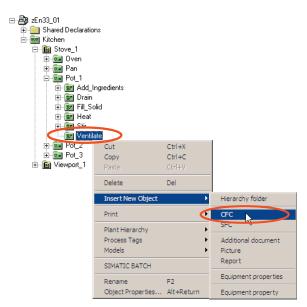
4.2.4 Chapter 4 Expanding the Plant Hierarchy

1. Open the Plant view of the project in the SIMATIC Manager. A new "Ventilate" equipment phase needs to be inserted for Pot_1. Create a new hierarchy folder.

Name the folder "Ventilate".

zEn33_01 (Plant View	w) D:\Projec	ts\zEn33_01		_ 🗆 🗵
🖃 🎒 zEn33_01		Object name	AS Assignment	OS Assignment F
🗄 📄 Shared Declar	ations	Add_Ingredients	AS1\CPU 417-4\AS1_Pr	S025775\WinCC Appli /
🖻 Kitchen		📴 Drain	AS1\CPU 417-4\AS1_Pr	S025775\WinCC Appli [
E-E Stove_1		📴 Fill_Solid	AS1\CPU 417-4\AS1_Pr	S025775\WinCC Appli F
. E Oven		🐷 Heat	AS1\CPU 417-4\AS1_Pr	S025775\WinCC Appli +
E- 02 Pot 1		📴 Stir	AS1\CPU 417-4\AS1_Pr	S025775\WinCC Appli \$
	Cut	Ctrl+X	AS1\CPU 417-4\AS1_Pr	
E ST Di	Copy	Ctrl+C		S025775\WinCC Appli •
	Paste	Ctrl+V		
		CUITY		
🗄 👿 St		Del		
	Insert New Ol	oject 🔰	Hierarchy folder	
	Print	•	CFC SEC	
	Plant Hierarch	y 🕨	SFC	
	Process Tags	+	Additional document	
	Models	•	Picture	Þ
	SIMATIC BAT	сн	Report	
	Rename		Equipment properties	
	Object Proper	ties Alt+Return	Equipment property	

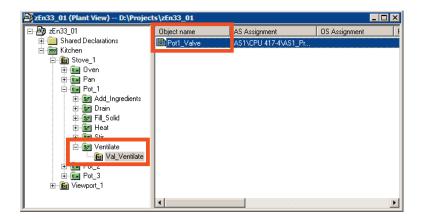
2. Create a CFC chart in the "Ventilate" hierarchy folder. This "Ventilate_Pot1" chart is required for the instance of the SFC type. Now create a "Val_Ventilate" folder in the "Ventilate" folder.



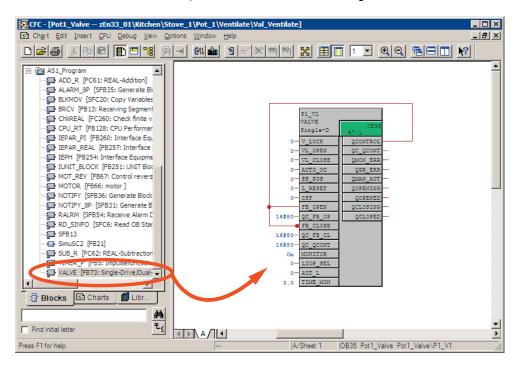
zEn33_01 (Plant View) -- D:\Projects\zEn33_01 _ 🗆 🗡 En33_01 ⊕-⊖ Shared Declarations ⊡- Kitchen Object name AS Assignment OS Assignment Mal_Ventilate AS1\CPU 417-4\AS1_Pr.. S025775\WinCC Appli. AS1\CPU 417-4\AS1_Pr... Stove_1 -- 6 Stove_1 -- 6 Oven -- 6 Pan -- 6 Pot_1 Foc_l
 Add_Ingredients
 Government
 Foc_l
 Solid
 Foc_l
 Foc_l └──<mark>III Ventilate</mark> └──**III** Val_Ventilate Ē. ⊕ 🚾 Pot_3 iewport_1 4

You then have the following screen:

3. Create the CFC chart "Pot1_Valve" in the "Val_Ventilate" subfolder. In this CFC chart, you configure the valve required to ventilate Pot_1.

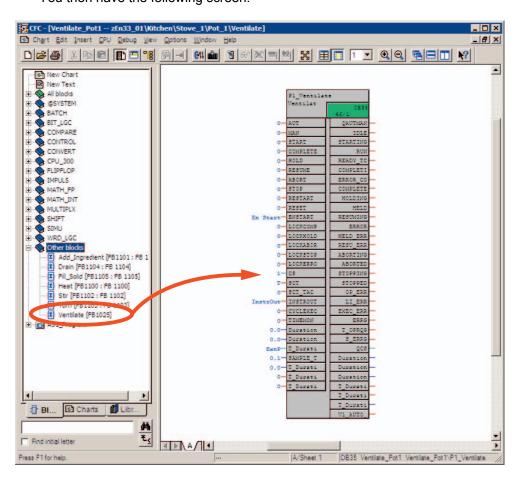


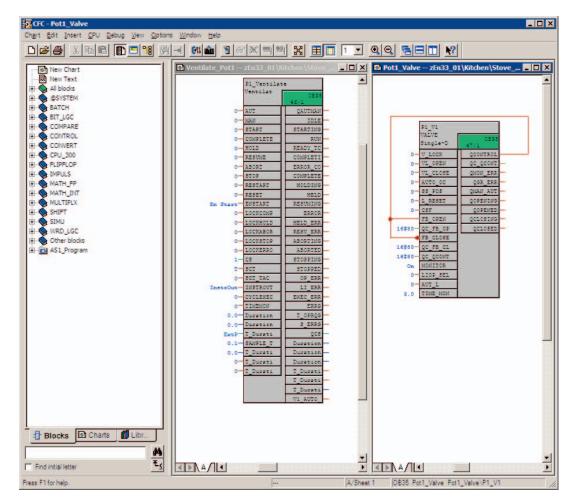
4. Open the CFC chart "Pot1_Valve". Insert a VALVE block with the name P1_V1. To simulate the feedback messages, interconnect the QCONTROL output with the FB_OPEN input and invert the FB_CLOSE input (QCONTROL must first be made visible). You then have the following screen:



4.2.5 Chapter 5 Creating Instances of the SFC Type "Ventilate" for Pot_1

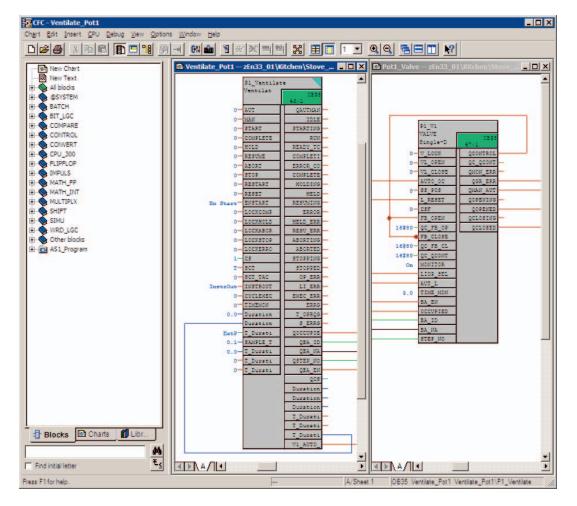
 Open the CFC chart "Ventilate_Pot1". You will find the previously created type in Catalog/Blocks/Other blocks. Insert a block with the name "P1_Ventilate" of the type "Ventilate" in the chart. You then have the following screen:





2. Now open the CFC chart "Pot1_Valve" as well and arrange the two windows side-by-side as shown below.

- 3. The valve P1_V1 must now be interconnected to P1_Ventilate.
 - Select the V1_AUTO_OC output of P1_Ventilate. Select the corresponding valve input AUTO_OC of the P1_V1 valve. All the relevant interconnections to the valve are now created automatically (eight in total).
 - So that all the batch-relevant information that SIMATIC BATCH writes to the block instance of "Ventilate" also arrives at the corresponding valve, the batch-relevant outputs must also be interconnected with the valve. First, the following parameters must be set to visible:
 - On the valve P1_V1: BA_EN, BA_ID, BA_NA, STEP_NO, OCCUPIED
 - On the "Ventilate" P1_Ventilate phase: QBA_EN, QBA_ID, QBA_NA, QSTEP_NO, QOCCUPIED
 - Interconnect the five outputs of P1_Ventilate (QBA_EN, QBA_ID, QBA_NA, QSTEP_NO, QOCCUPIED) to the inputs of the valves P1_V1 (BA_EN, BA_ID, BA_NA, STEP_NO,OCCUPIED).
 - Interconnect the "T_Duration_PTIME" output to the "Duration_Al" input. This is important for display in the OS faceplate and for reading the process values by SIMATIC BATCH. The process value input on "P1_Ventilate" is called "Duration_Al" (Actual Value Input).



Check the interconnection based on the following screen.

Note about creating instances of the "Ventilate" SFC type at Pot_2 and 3: The "Ventilate" equipment phase is inserted at Pots 2 and 3. The procedure is the same as that for Pot 1. Start again at Chapter 4. Create a new "Ventilate" hierarchy folder under the Pot_X hierarchy folder. Continue with Chapter 5. Then the same equipment phase is inserted at Pots 2 and 3. The "Ventilate" type is only defined once, however.

4.2.6 Chapter 6 Compiling and Downloading AS, OS and Batch

Run a changes-only compilation of the AS and then download the newly compiled data to PLCSim with a "changes-only" download.

Note:

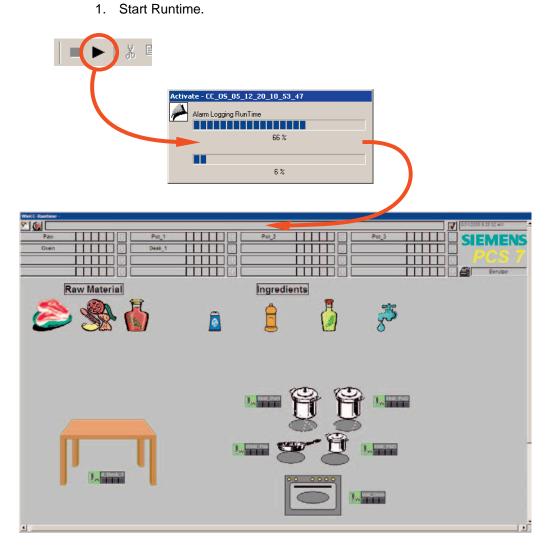
You can only do this after the runtime OS has ended.

Then run a changes-only compilation of the OS.

Open the "Configure Batch process cell" dialog in the Plant view in your project.

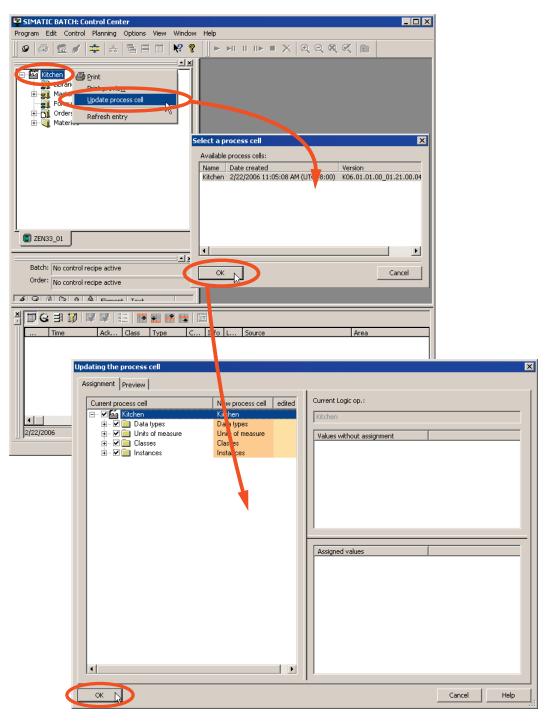
Select "Batch types". Generate the batch types, compile the batch instances and download the process cell.

4.2.7 Chapter 7 Expanding a Recipe



2. The Start Coordinator starts automatically as soon as your WinCC project is in runtime. Wait until it has started all applications completely (BCS and CDV).





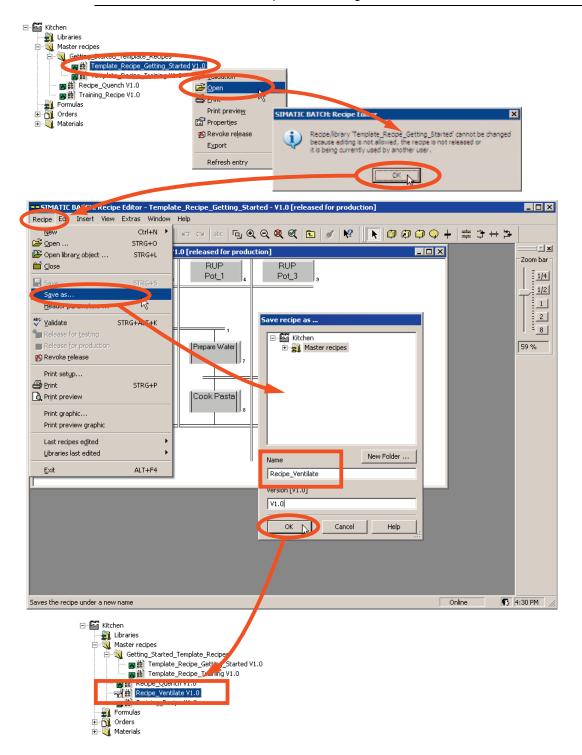
3. Start the Batch Control Center and update the Batch process cell data.

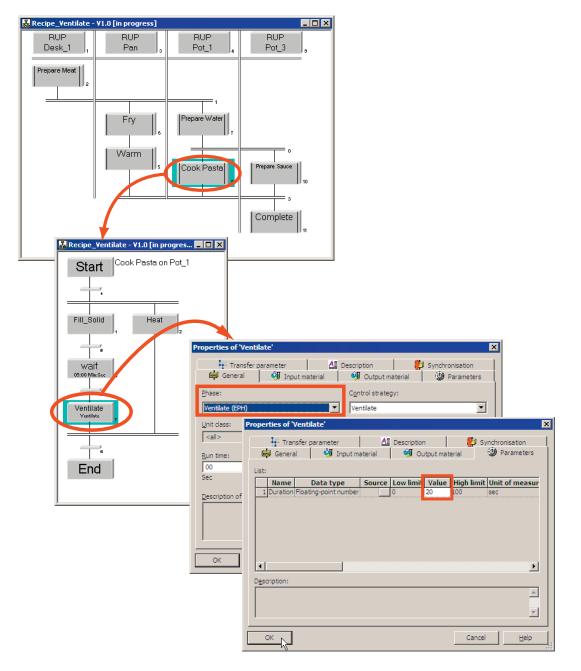
4. After updating, your newly configured "Ventilate" phase is available in the "Pot1" unit.

5. Open the "Template_Recipe_Getting_Started" master recipe and save it with the name "Recipe_Quench".

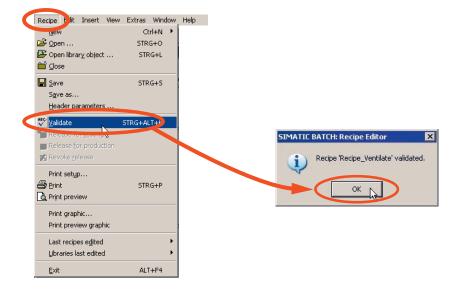
Note:

If you cannot modify the recipe, select the option "Allow editing of recipes in the "Release revoked" status in Options - Settings in the Batch Control Center.



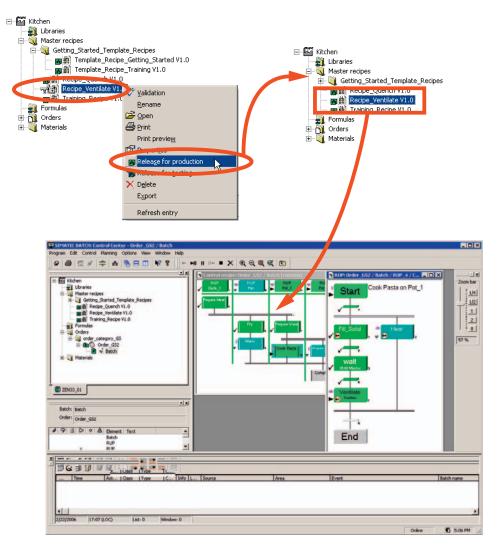


6. Open the "Recipe_Ventilate" recipe you have just created and insert the newly configured "Ventilate" phase in the recipe.



7. Save the recipe and validate it. Then close the Recipe Editor.

8. Release the recipe for production. Then create a new batch with the "Recipe_Ventilate" recipe, release and start it.



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