SIEMENS

SICAM
SICAM SCC
Bedien- und Beobachtungssystem

V9.04

Manual

E50417-H8900-C501-B3

Preface

Open Source Software

Table of Contents

Product Overview 1

Installation and Uninstallation 2

Working with SICAM SCC 3

Graphic Objects 4

Topological Coloring 5

SICAM Add-In 6

Components and Functions 7

Client-Server Systems 8

Redundancy 9

Different SICAM PAS Versions 10

WinCC Web Navigator 11

System Time 12

Converting Projects from Previous Versions 13

Components and Functions of Earlier SICAM PAS CC/SCC Versions 14

Appendix A

Literature

Index

NOTE

For your own safety, observe the warnings and safety instructions contained in this document, if available.

Disclaimer of Liability

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Preface

Purpose of the Manual

This document provides all necessary information for installation, for commissioning, as well as details regarding the functionality of SICAM SCC.

Target Audience

This manual is mainly intended for commissioning engineers, programmers and users of SICAM SCC. Basic knowledge of SIMATIC WinCC is required.

Scope

This manual is valid for SICAM SCC V9.04.

Standards

SICAM SCC has been developed in compliance with ISO 9001:2008 standard.

Additional Support

For questions about the system, please contact your Siemens sales partner.

Support

Our Customer Support Center provides a 24-hour service.

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Notes on Safety

This document is not a complete index of all safety measures required for operation of the equipment (module or device). However, it comprises important information that must be followed for personal safety, as well as to avoid material damage. Information is highlighted and illustrated as follows according to the degree of danger:

DANGER

DANGER means that death or severe injury **will** result if the measures specified are not taken.

✧ Comply with all instructions, in order to avoid death or severe injuries.

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WARNING means that death or severe injury **may** result if the measures specified are not taken.

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NOTICE means that property damage **can** result if the measures specified are not taken.

✧ Comply with all instructions, in order to avoid property damage.

NOTE

Important information about the product, product handling or a certain section of the documentation which must be given particular attention.

Qualified Electrical Engineering Personnel

Only qualified electrical engineering personnel may commission and operate the equipment (module, device) described in this document. Qualified electrical engineering personnel in the sense of this manual are people who can demonstrate technical qualifications as electrical technicians. These persons may commission, isolate, ground and label devices, systems and circuits according to the standards of safety engineering.

Proper Use

The equipment (device, module) may be used only for such applications as set out in the catalogs and the technical description, and only in combination with third-party equipment recommended and approved by Siemens.

Problem-free and safe operation of the product depends on the following:

- Proper transport
- Proper storage, setup and installation
- Proper operation and maintenance

When electrical equipment is operated, hazardous voltages are inevitably present in certain parts. If proper action is not taken, death, severe injury or property damage can result:

- The equipment must be grounded at the grounding terminal before any connections are made.
- All circuit components connected to the power supply may be subject to dangerous voltage.

- Hazardous voltages may be present in equipment even after the supply voltage has been disconnected (capacitors can still be charged).
- Operation of equipment with exposed current-transformer circuits is prohibited. Before disconnecting the equipment, ensure that the current-transformer circuits are short-circuited.
- The limiting values stated in the document must not be exceeded. This must also be considered during testing and commissioning.

Open Source Software

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Table of Contents

Preface **3**

Open Source Software **7**

1 Product Overview **17**

2 Installation and Uninstallation **21**

2.1 Installation Requirements 22
2.2 Installing SIMATIC WinCC 25
2.2.1 Installation 25
2.2.2 Licensing 25
2.3 Installing SICAM SCC Components 26
2.3.1 Design Variants 26
2.3.2 Installation 27
2.3.3 Licensing 28
2.3.4 Automated Installation 28
2.4 Uninstalling SICAM SCC Components 30
2.4.1 Removing the license 30
2.4.2 Uninstallation 30
2.4.3 Protection against data loss 30
2.5 Uninstalling SIMATIC WinCC 31
2.5.1 Removing the License 31
2.5.2 Uninstallation 31
2.5.3 Protection against data loss 31
2.5.4 Virtualization 31

3 Working with SICAM SCC **33**

3.1 Demo Project 34
3.2 Creating a New Project 35
3.2.1 Creating a New WinCC Project 35
3.2.2 Defining Project Properties 36
3.2.3 Defining Computer Properties 37
3.2.4 Initializing a WinCC Project 43
3.2.4.1 SICAM PAS Station 44
3.2.4.2 SICAM RTUs 48
3.2.4.3 IEC 60870-5-104 Devices 51
3.2.4.4 IEC 61850 Devices 61
3.2.4.5 SICAM PAS/PQS and SITIPE 74
3.2.5 Connection Parameters 75
3.3 Creating a Control Diagram 78
3.3.1 Creating a New Diagram 79

3.3.2 Using SICAM Switch Controls ... 82
3.3.3 Using Connectors and Nodes ... 84
3.3.4 Displaying a Measured Value ... 85
3.3.5 Inserting an Acknowledge button ... 86
3.4 Creating an overview diagram ... 90
3.5 Creating a List View ... 95
3.6 Creating a Button Bar ... 97
3.6.1 Inserting an Event List Button ... 97
3.6.2 SInserting a Quit Button ... 99
3.7 Creating a Start Screen ... 100
3.8 Setting up User Authorizations ... 103

4 Graphic Objects ... 107

4.1 Overview ... 108
4.2 Design of Graphic Objects ... 109
4.2.1 SICAM Graphic Objects ... 109
4.2.2 ActiveX Controls ... 109
4.3 Using Graphic Objects ... 111
4.4 SICAM Switch Controls ... 112
4.4.1 Representation Style of SICAM Switch Controls ... 113
4.4.2 Process Connection of SICAM Switch Controls ... 114
4.4.3 Advanced Properties of SICAM Switch Controls ... 117
4.4.4 Colors of SICAM Switch Controls ... 119
4.4.5 Picture of SICAM Switch Controls ... 121
4.4.6 Runtime Dialogs of SICAM Switch Controls ... 122
4.4.7 Substituting the Switch Position ... 130
4.4.8 Defining Object Properties ... 132
4.4.9 Operation with Self-Created Dialogs ... 136
4.4.10 Operation via Keyboard ... 138
4.4.11 Interfaces for Project-Specific Dialogs ... 142
4.4.11.1 SetControlCommand Function ... 142
4.4.11.2 GetControlState Function ... 143
4.4.11.3 Event OnProcDataChange ... 144
4.5 Anwendungsbeispiele für die Funktionen ... 145
4.5.1 Script for Event OnProcDataChange ... 145
4.6 SICAM Electrical Device Control ... 147
4.7 SICAM Bay Overview ... 148
4.7.1 Representation Style of Bay Overview ... 151
4.7.2 Tag Connection to Bay Overview ... 152
4.7.3 Colors of Bay Overview ... 153
4.7.4 Picture of Bay Overview ... 155
4.8 Measured/Metered Value Display ... 156
4.8.1 Style of the Numeric Display ... 156
4.8.2 Tag Connection of the Numeric Display ... 158
4.8.3 Advanced Properties of the Numeric Display ... 159
4.8.4 Limit Values of the Numeric Display ... 160
4.8.5 Color of the Numeric Display ... 161

4.8.6 Font of the Numeric Display....163
4.8.7 Runtime Dialogs of the Numeric Display....164
4.8.8 Representing Measured Values for the Invalid State....166

5 Topological Coloring....167
5.1 Introduction....168
5.2 Topological Elements....170
5.2.1 General....170
5.2.2 SICAM Electrical Device Control....171
5.2.2.1 Description of functions....171
5.2.2.2 Graphical representation....172
5.2.2.3 Properties of SICAM Electrical Device Controls....173
5.2.2.4 Tag connection of the feeder....177
5.2.2.5 Creating Structure Tags....180
5.2.3 SICAM Switch Controls....181
5.2.4 SICAM Bay Overview....182
5.2.5 Connector....182
5.2.6 Node....182
5.3 Parameterization....183
5.3.1 Data Analysis....183
5.3.2 Data Model....183
5.3.3 Settings....186
5.3.4 Parameterizing Elements and Symbols....188
5.3.5 Notes on Configuration....188
5.4 Cross-Picture References....190
5.5 Using Topological Coloring....191
5.6 Using Picture Windows....196
5.7 Debugging....198
5.7.1 General Information....198
5.7.2 Error Messages....198
5.8 Application Examples....200
5.8.1 Switchgear trucks....200

6 SICAM Add-In....203
6.1 Overview....204
6.2 SICAM Menu....205
6.3 SICAM Toolbar....207
6.4 Performing Settings....208
6.4.1 General Information....208
6.4.2 Tasks....209
6.5 Predefined Tasks....211
6.6 Creating User-Defined Tasks....214
6.6.1 Upgrade V5.1 Measured Value Objects....214
6.6.2 Upgrade of V5.10 Controls....218
6.6.3 Edit Items of a Listbox or Combobox....224
6.7 Replacing a Graphic Object in the Library....230

7 Components and Functions 233

7.1 System Overview 234
7.1.1 Connection to SICAM PAS/PQS 234
7.1.2 Connection to SICAM RTUs or IEC 61850/IEC 60870-5-104 236
7.2 Data Import 239
7.2.1 SICAM Wizard 239
7.2.2 Configuring an IEC 60870-5-104 Connection During Runtime 248
7.2.3 SICAM IEC 104 XML Creator 249
7.2.3.1 General Procedure 249
7.2.3.2 Parameters and Data Types 250
7.2.3.3 Creating a Parameter File 252
7.3 SICAM Communication Connection - Tag Management 254
7.3.1 SICAM Communication Connection - Tag Management 254
7.3.2 SICAM PAS PROTOCOL SUITE 254
7.3.3 SICAM IEC COMMUNICATION SUITE 256
7.4 Alarm Logging 259
7.4.1 Alarm Logging System 259
7.4.2 SICAM Normalization DLL 259
7.4.3 Using the Alarm Logging Extension 261
7.4.4 Value Texts 262
7.4.5 Message Coloring 263
7.4.6 Flexible Configuration of the Alarm Logging System 267
7.5 Dynamic Alarm Filter (DAF) 269
7.5.1 Overview 269
7.5.2 Starting the Dynamic Alarm Filter Function 270
7.5.3 Configuration 271
7.5.4 Mapping 277
7.5.5 Assignment Tables 279
7.6 SICAM Functions 281
7.6.1 Commands 281
7.6.1.1 Command for Floating Point Values 281
7.6.1.2 Command for Digital Values 282
7.6.1.3 Command Execute 282
7.6.2 Substituting Values 283
7.6.2.1 Overview 283
7.6.2.2 Substituting Floating Point Values 284
7.6.2.3 Substituting Digital Values 285
7.6.3 Object-Specific Blocking 285
7.6.4 Functions for Processing of Messages 286
7.6.4.1 Overview 286
7.6.4.2 Creating a Message - Text from the Text Library 286
7.6.4.3 Creating a Message - with Text Transfer 286
7.6.4.4 Acknowledging A Message in the Warning Message List 286
7.6.5 Function for Copying Tag Values 287
7.6.6 Using SICAM Functions 287
7.6.7 Global Actions 287
7.6.8 Testing SICAM Functions 288
7.6.9 Calling the SICAM PQ Analyzer 291
7.6.9.1 Call from a Diagram 292

7.6.9.2 Call from the Event List ... 295
7.7 System Control ... 298
7.7.1 Administrative Tags ... 298
7.7.2 Initiator Category ... 299
7.7.3 Message List Filter ... 300
7.7.4 Switching Authority ... 304
7.7.5 Bay/Telecontrol Blocking ... 306
7.7.5.1 Device-Specific Blocking ... 306
7.7.5.2 Object-Specific Blocking ... 308
7.7.5.3 Ignoring Bay Blocking ... 308
7.7.6 Triggering a General Interrogation in Case of IEC 61850 Connection ... 308
7.7.7 Changing Device Parameters via IEC 61850 ... 309
7.7.7.1 Switching the Parameter Groups ... 309
7.7.7.2 Modifying Individual Device Parameters/Settings Online ... 309
7.8 SICAM SCC Runtime Data Server ... 311
7.9 Language Settings ... 312
7.9.1 Language Setting for SICAM Graphic Objects ... 312
7.9.2 Switching the Language During Runtime ... 314
7.10 Communication with SICAM DISTO ... 316
7.11 SNMP – SICAM Network Manager (NWM) ... 318
7.11.1 Introduction ... 318
7.11.2 SICAM Network Manager – Dialog ... 319
7.11.3 SNMPv3 ... 325
7.11.4 Extending the MIB Container ... 327
7.11.5 Separate Network Card for SNMP ... 330
7.11.6 Configuring SNMP (Example) ... 332
7.11.6.1 Defining Agents ... 332
7.11.6.2 Configuring MIB Objects ... 335
7.11.6.3 Creating Linked Variables ... 338
7.11.6.4 Starting the Runtime and Opening the Tag Management ... 341

8 Client-Server Systems ... 343
8.1 Configuration of the Graphic Objects ... 344
8.2 Configuration of the Functions ... 345
8.3 Configuration of the SIMATIC WinCC Components ... 346

9 Redundancy ... 349
9.1 Overview ... 350
9.2 Redundancy with a SICAM PAS System ... 352
9.2.1 Connection to 2 SICAM PAS Systems ... 352
9.2.2 Redundant SICAM SCC System ... 353
9.3 Redundancy with SICAM RTUs ... 358
9.3.1 Connection to Redundant SICAM RTU Substation Controllers ... 358
9.3.2 Redundant SICAM SCC System ... 358

10 Different SICAM PAS Versions ... 361
10.1 Overview ... 362
10.2 Introduction ... 363
10.3 Use Cases from Daily Practice ... 364

11 WinCC Web Navigator ... 367
11.1 Overview ... 368
11.2 Prerequisites ... 369
11.3 WinCC Web Navigator with SICAM SCC ... 370
11.3.1 Making SICAM SCC Plug-Ins Available ... 370
11.3.2 Publishing Process Diagrams ... 370
11.3.3 Installing Users for the WinCC Web Navigator ... 372
11.3.4 Configuring the WinCC Web Navigator Server ... 373
11.3.5 Configuring the WinCC Web Navigator Client ... 374

12 System Time ... 377
12.1 Overview ... 378
12.2 Updating Time Zones ... 379
12.3 Time Synchronization ... 380
12.3.1 Network Time Protocol Daemon ... 380
12.3.2 Configuration File for NTPD ... 381
12.3.3 Clock Driver for Telecontrol Protocols (Shared Memory Clock Driver) ... 384
12.3.4 Example – External Radio Clock as Timer ... 386

13 Converting Projects from Previous Versions ... 393
13.1 Converting Projects Independently of the Version ... 394
13.2 Making Adjustments for V9.04 ... 395
13.3 Converting Topology, V9.00 ... 396
13.4 Converting Projects, V8.04 ... 397
13.5 Converting Projects, V8.03 ... 398
13.6 Converting Projects, V8.02 ... 399
13.7 Converting Projects, V8.01 ... 400
13.8 Converting Projects, V8.00 or Earlier ... 401
13.9 Converting SICAM PAS/PAS CC Projects, V5.0 and V6.0 ... 402
13.10 Converting Projects, V6.0x ... 403
13.11 Converting Projects, V5.11 ... 404
13.12 Converting Projects, V5.10 or later ... 405
13.13 Converting Projects, V5.10 or earlier ... 406
13.14 Converting a SICAM WinCC Project ... 407

14 Components and Functions of Earlier SICAM PAS CC/SCC Versions ... 409
14.1 Double/Redundant Configuration in V5/V6 Projects ... 410
14.1.1 Connection to 2 SICAM PAS Systems ... 410
14.1.2 Redundant SICAM SCC System ... 413
14.2 Circuit Breaker and Disconnector ... 420
14.2.1 Graphical Representation of Circuit Breakers and Disconnectors ... 421
14.2.2 Tag Connection of the Circuit Breakers and Disconnectors ... 422
14.2.3 Colors of Circuit Breaker and Disconnector ... 423
14.2.4 Advanced Properties of the Circuit Breaker and Disconnector ... 425
14.2.5 Controlling Synchronized Switching for the SICAM PAS Connection ... 427
14.2.6 Synchronized Switching for Direct Connection of Devices ... 429
14.2.7 Runtime Dialogs of Circuit Breakers and Disconnectors ... 430

14.2.8 Substituting the Switch Position....438
14.2.9 Defining Object Properties....438
14.2.10 Circuit Breaker/Disconnector with C Script....441
14.2.11 Indirect Addressing....442
14.2.12 Addressing Using Tag and Server Prefixes....444
14.2.13 Operation via Keyboard....447
14.2.14 Controlling Runtime Dialogs for Controls (Switching Device Objects)....450
14.2.15 Response to the Change of the CommandID Attribute....452
14.3 Bay Overview....454
14.3.1 Properties of the Bay Overview....455
14.3.2 Tag Connection to Bay Overview....456
14.4 Showing Texts in Runtime Dialogs....459
14.4.1 Showing Static Texts....459
14.4.2 Showing Dynamic Texts....460
14.5 IX State Sync Application....464
14.6 Measured-Value Display Using the Script/Project Function....469
14.6.1 Defining the Measured-Value Output....469
14.6.2 Substitute Functionality....471
14.7 Introduction to the SIMATIC WinCC Configuration Tool....473
14.7.1 Installing the SIMATIC WinCC Configuration Tool....473
14.7.2 Creating an Excel Project Folder....474
14.7.2.1 Project Folder with Connection to an Existing SIMATIC WinCC Project....476
14.7.2.2 Project Folder without Connection to an Existing SIMATIC WinCC Project....480
14.7.2.3 Project Folder with Connection to a New SIMATIC WinCC Project....482
14.8 Working with the SIMATIC WinCC Configuration Tool....483
14.8.1 Modifying the Channel Version....483
14.8.1.1 Creating a Project Folder....484
14.8.1.2 Selecting a Channel....484
14.8.1.3 Writing Connections Back into the SIMATIC WinCC Project....489
14.8.2 Editing Structure Types....491
14.8.2.1 Modifying Structure Types....495
14.8.2.2 Deleting Structure Types/Tags....496

A Appendix....499
A.1 Structures....500
A.2 Quality Codes of Variables....509
A.3 Character Conversion....510
A.4 Additional Information in Message Lists....514

Literature....521

Index....523

1 Product Overview

What is SICAM SCC?

SICAM SCC (SICAM Station Control Center) is the Human-Machine Interface (HMI) for the following power automation systems:

- SICAM PAS/PQS
- SICAM RTUs
- IEC 61850 devices
- IEC 60870-5-104 devices
- SICAM SAS

SICAM SAS comprises:

- SIMATIC WinCC process visualization system
- SICAM SCC components

SIMATIC WinCC provides standard function modules for the display of graphic diagrams and views for alarms, archiving and logging. Based on its powerful process interface, fast display refresh rates and safe data archiving functions, it provides for high availability.

SICAM SCC Components

SICAM SCC comprises the following components:

- SICAM graphic object library
- Alarm system extension
- SICAM PAS Wizard, SICAM IEC Wizard, SICAM TEA-X Wizard and SICAM Global Wizard
- SICAM Functions
- SICAM Normalization DLLs
- SICAM PAS PROTOCOL SUITE and SICAM IEC COMMUNICATION SUITE
- SICAM Valpro (evaluation of archives for measured and metered values)

SICAM graphic object library

The SICAM graphic object library includes objects for the representation of typical substation control and protection equipment (e. g. switchgears). These graphic objects are used for the creation of station diagrams.

The SICAM graphic object library includes e.g. several typical graphic objects for switchgears.

Graphic objects can be dragged and dropped from the library to a station diagram.

They already include dynamic display properties. For example, a circuit breaker provides all dynamic features required for the representation of the process states ON, OFF, Intermediate Position, Fault Position, Not Topical, PAS not OK, Bay Blocking, Substituted and Telecontrol Blocking.

You can quickly and efficiently define the topology parameters of your system in the Graphics Designer.

Alarm system extension

The alarm system extension ensures that data is logged and archived in correct chronological order.

The SICAM PAS normalization DLL evaluates the data and assigns it related items of process information.
In order to assign process information, the normalization DLL accesses the SIMATIC WinCC text library.
Texts can be customized in the text library to meet individual requirements.
The information in the event list is of great significance.

SICAM Wizard

The SICAM Wizard supports you in the creation of a new project or in updating an existing WinCC project. The following wizards are available:

- SICAM PAS Wizard for the connection of SICAM PAS
- SICAM IEC Wizard for the connection of SICAM RTUs, IEC 61850 and IEC 61870-5-104 devices
- SICAM Global Wizard for the connection of SICAM SAS

You can perform the following tasks using the SICAM Wizard:

- Creating the SICAM-specific structure types
  You can create the structure types required in a SICAM system for structured tags.
  These structure types are required for data exchange with SICAM PAS, SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices.
- Importing the tags from SICAM PAS, SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices
  You transfer the information to SICAM SCC.
  This enables you to visualize items of information from these systems under SICAM SCC, i. e. for use in process diagrams.
- Creating administrative tags for SICAM PAS
  Creating the SICAM-specific Alarm Logging system
  You create a SICAM-specific Alarm Logging system in SICAM SCC.
  The SICAM graphic object library provides objects for the following lists:
  - Event list
  - Warning message list
  - Protection message list

  These SICAM-specific lists are stored in the SICAM graphic object library.
  You can configure messages in this Alarm Logging system.
- Importing messages from the import files
  This enables you to visualize messages in SICAM SCC in the Alarm Logging system.
- IImporting the SICAM graphic object library into the project
  Load the SICAM graphic object library into your current project.
  Use the SICAM graphic object library for visualizing station diagrams under SICAM SCC.
- Creating the measured-value and metered-value archives for process data
  Create a Tag Logging system under SICAM SCC.
  The SICAM SCC Tag Logging system comprises:
  - a measured-value archive
  - a metered-value archive

  You can import metered and measured value tags into this Tag Logging system.
- Adding a communication driver
  You can add a communication driver and thus define the transmission path to SICAM PAS, SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices, or SICAM SAS.

SICAM functions

The SICAM functions (VB or C scripts) complement the library of SIMATIC WinCC functions. They are available as project-specific functions in the corresponding folders.

Use the SICAM functions in station diagrams. For example, you can execute commands via these actions.

SICAM Graphics Designer Extension

The Graphics Designer enables you to define several graphic objects simultaneously by means of defined tasks. Predefined tasks are available.

SICAM Valpro

SICAM Valpro has been designed for the processing, display and printing of archived measured and metered values.

SICAM Valpro interacts with the SICAM SCC Tag Logging system.

SICAM Valpro can be used independently of SICAM SCC.

For a more detailed description regarding SICAM Valpro, refer to */5/ SICAM Valpro, Measured/Metered Value Processing Utility SICAM Valpro*.

Redundant system

To provide fail safety, a SICAM SCC system can be implemented in redundant configuration.

If one of the two SICAM SCC servers fails, the client computers automatically switch over from the failed server to the active SICAM SCC server. Based on this concept, proper process monitoring and operation is always ensured.

A redundant SICAM PAS system or SICAM RTUs are supported.

2 Installation and Uninstallation

2.1	Installation Requirements	22
2.2	Installing SIMATIC WinCC	25
2.3	Installing SICAM SCC Components	26
2.4	Uninstalling SICAM SCC Components	30
2.5	Uninstalling SIMATIC WinCC	31

2.1 Installation Requirements

Operating System and SIMATIC WinCC

SICAM SCC V9.04 is a 32-bit-application. The table below indicates possible combinations of the operating system and SIMATIC WinCC.

Windows	SIMATIC WinCC		
	V7.3	V7.4 SP1	V7.5
7 Professional 32-bit SP1[1] 7 Ultimate 32-bit SP1[1] 7 Enterprise 32-bit SP1[1]	x	x	
7 Professional 64-bit[1] 7 Ultimate 64-bit SP1[1] 7 Enterprise 64-bit SP1[1]	x	x	
8.1 Professional 32-bit[1] 8.1 Enterprise 32-bit	x	x	
8.1 Professional 64-bit[1] 8.1 Enterprise 64-bit[1]	x	x	
10 Professional 64-bit[1] 10 Enterprise 64-bit[1] 10 IoT Enterprise LTSB 64-bit[1]		x	x
2003 Server SP2			
2003 Server R2 SP2			
2008 Server SP2 32-bit[1]	x	x	
2008 Server R2 SP1 64-bit[1]	x	x	
2012 Server R2 64-bit	x	x	x
2016 Server 64-bit		x	x

SIMATIC WinCC must be licensed and the latest hotfix for the installed WinCC version must be installed. The SIMATIC WinCC hotfixes are available on the DVD for SICAM SCC. For a list of the hotfixes required, refer to the Readme file.

Microsoft .NET Framework

Before installing WinCC, make sure that.NET Framework is installed in the correct version depending on the operating system:

- Windows 10
  Microsoft .NET Framework 3.5 is required in order to be able to install SQL Management Studio
- Windows Server 2012 R2
  Microsoft .NET Framework 4.6.1 (install this version subsequently, if required)
- Windows 10 / Windows Server 2016
  Microsoft .NET Framework 4.7

1 These operating systems can be installed as standard version or as MUI version.

Basic Hardware

CPU

Windows 7	Client	3 GHz/Multi Core
	Single-user system:	3.5 GHz/Multi Core
Windows 8.1	Client	3 GHz/Multi Core
Windows 10	Single-user system:	3.5 GHz/Multi Core
Windows Server 2003	Single-user system:	3 GHz
	Server:	3 GHz
Windows Server 2008 R2	Single-user system:	3.5 GHz/Multi Core
Windows Server 2012 R2	Server:	3.5 GHz/Multi Core
Windows Server 2016		

Primary storage

Windows 7	Client	32-bit: 2 GB, 64-bit: 4 GB
	Single-user system:	32-bit: 2 GB, 64-bit: 4 GB
Windows 8.1	Client	32-bit: 2 GB, 64-bit: 4 GB
	Single-user system:	32-bit: 2 GB, 64-bit: 4 GB
Windows 10 (64-bit)	Client	4 GB
	Single-user system:	4 GB
Windows Server 2003	Single-user system:	32-bit: 2 GB, 64-bit: 4 GB
	Server:	32-bit: 2 GB, 64-bit: 4 GB
Windows Server 2008 R2	Single-user system:	8 GB
Windows Server 2012 R2	Server:	8 GB
Windows Server 2016		

Hard disk capacity

Client:	1.5 GB
Server:	10 GB

Virtual primary storage

1.5 times primary storage

Primary storage for Windows printer spooler

100 MB

Graphics card

32 MB, True Color (32 Bit), 1024 x 768 or 1366x768
recommended for FullHD (1980x1080) or later

Miscellaneous

Monitor suitable for graphics card
Dual-layer DVD drive
USB port for licensing
Keyboard
Mouse

Sequence of Installation

SICAM SCC comprises the following two software packages:

- SIMATIC WinCC
- SICAM SCC components

Install the two software packages one after the other. Hotfixes and Service Packs are available on the SICAM SCC DVD.

The components must be installed in the following order:

- ✧ Install the SIMATIC WinCC process visualization system.
- ✧ License SIMATIC WinCC to make the program executable.
- ✧ Install the SICAM SCC components.
- ✧ License the SICAM SCC components to make them executable.

NOTE

To ensure that all the components function correctly, they must be installed in the following order:

- Install the program package using the setup routine. Exit it as soon as the package has been completely installed.
- Next, license the program components.

2.2 Installing SIMATIC WinCC

Install SIMATIC WinCC on your computer using a setup routine.

Local administrator rights are required to perform the installation.

Following installation, SIMATIC WinCC must be licensed in order to make the software executable.

NOTE

On a computer with installed licenses, do not run any routines which would modify the partitioning or the structure of the hard disk(s).

Hard-disk maintenance routines, e. g. routines for the repair, defragmentation or partitioning of your hard disk, must be avoided. If you use routines of this type, you run the risk of losing your license!

Make sure you temporarily transfer your license back to the license USB stick prior to running a hard disk maintenance routine.

2.2.1 Installation

Before installing SIMATIC WinCC, you must install MS Message Queuing. To install this component, follow the instructions on the SIMATIC WinCC installation DVD.

To install SIMATIC WinCC, proceed as follows:

- ✧ Insert the DVD with SIMATIC WinCC into your DVD drive.
- ✧ Select **Start > Run**.
- ✧ Enter **X:\Start**. In this input sequence, **X** is the letter of your DVD drive.
- ✧ Click **OK**.
- ✧ Select **Install SIMATIC WinCC**.
- ✧ Follow the installation instructions until the **Installation type** dialog opens. Select the **Package installation** and click **Next >**.
- ✧ In the **Program packages** dialog, select the **WinCC Installation** and click **Next >**.
- ✧ Continue to follow the instructions until the setup routine requests your license.
- ✧ Answer the question whether the license shall be installed during the installation procedure with **No**. The setup routine skips the licensing.
- ✧ Restart the computer after the installation is completed.

2.2.2 Licensing

You license the product by transferring the license from the license USB stick to your computer.

To install your SIMATIC WinCC license, proceed as follows:

- ✧ Plug the license USB stick included in the scope of delivery into the USB interface.
- ✧ Start the **Automation License Manager**.
- ✧ Transfer the license from the license USB stick to your hard disk.

2.3 Installing SICAM SCC Components

You can install SICAM SCC components on your computer by means of a setup routine.

During the installation procedure, the setup routine transfers all the necessary data to your computer.

Following installation, the SICAM SCC components must be licensed in order to make them executable.

NOTE

On a computer with installed licenses, do not run any routines which would modify the partitioning or the structure of the hard disk(s).

Hard-disk maintenance routines, e. g. routines for the repair, defragmentation or partitioning of your hard disk, must be avoided. If you use routines of this type, you run the risk of losing your license!

Make sure you temporarily transfer your license back to the license USB stick prior to running a hard disk maintenance routine.

2.3.1 Design Variants

To execute the SICAM SCC components you can choose between the following options:

- Demo Mode
- Trial Mode
- Licensed Version

In order to be able to execute all these variants, both SIMATIC WinCC and the SICAM SCC components must be installed. The decision as to which variant you want to use must be made upon the licensing of the SICAM SCC components.

NOTE

If SIMATIC WinCC is not licensed, the restrictions for the non-licensed SIMATIC WinCC apply in addition to the restrictions for non-licensed SICAM SCC components, see SIMATIC WinCC Information System.

Demo Mode

No license for the SICAM SCC components is required for using the Demo mode. The Demo mode is only available for SICAM SCC V8 components (or higher). Components of older SICAM SCC versions, which are still included in the scope of delivery for compatibility reasons, do not support this mode.

The following restrictions apply in Demo mode:

- Configuration
  - A note pops up in Demo mode 30 minutes after the start of configuration in the Graphics Designer. You can save your picture or exit the Graphics Designer without saving. You must restart the Graphics Designer in order to be able to carry out configuration steps during another 30 minutes.
  - A note concerning the use of the Demo mode pops up in the Graphics Designer before saving pictures. This note disappears after 30 seconds and the picture is saved.
  - When calling up a wizard, a note informs you that the license is missing. You have the option to activate the **trial license**. The **Demo mode** is activated if you click **Skip** to reject the license. The wizards cannot be started in Demo mode.
  - You can also operate the SNMP functions (SICAM Network Manager) using the **Trial license** or operate them for 30 minutes in **Demo mode**.

- Runtime
  - When starting the runtime, a note pops up to inform you that the license is missing. You have the option to activate the **Trial license**. The **Demo mode** is activated if you click **Skip** to reject the license. A note pops up to inform you that the software is running in Demo mode.
  - In the Alarm Logging lists, all the logged alarms in the **Status** and **Cause** columns are additionally marked with the **Demo mode** attribute.
  - After using a switching device object, a note is shown every 5 minutes to inform you that you are working in Demo mode. In order to be able to continue operation within the picture, you must click **OK** to close this note.

Trial Mode

If no applicable license could be found on your computer when starting a SICAM SCC component such as the SICAM PAS Wizard, SICAM SCC offers a trial mode license via the **Automation License Manager**. If you activate this trial mode license, you can use the SICAM SCC component for 14 days. The trial mode license expires after this period. In order to continue to use the full scope of SICAM SCC, you must transfer a standard license without a time limit for the SICAM SCC components, see *2.3.3 Licensing*. The trial mode license can only be activated once. The SICAM SCC components change over to Demo mode assoon as the Trial mode period has expired. The SICAM Wizard cannot be started in Demo mode.

Licensed Version

In order to be able to use the **licensed version**, the licenses for the SICAM SCC components must be transferred to your computer, see *2.3.3 Licensing*.

2.3.2 Installation

NOTE

Before installing the SICAM SCC components, you must install the SIMATIC WinCC updates. The SIMATIC WinCC updates are available on the SICAM SCC DVD. A list of the updates required is provided in the corresponding Readme file.

To install the SICAM SCC components:

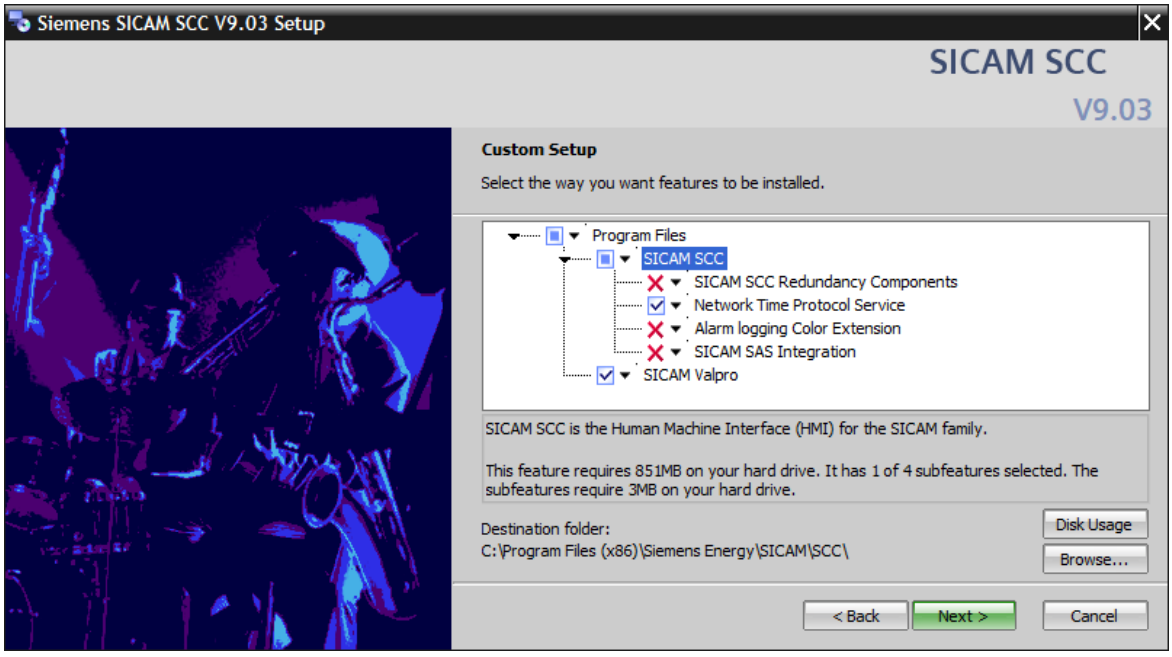
✧ Insert the SICAM SCC DVD into your DVD drive.

✧ Click **Start > Run**.

✧ Enter **X:\Setup**. In this input sequence, **X** is the letter of your DVD drive.

✧ Click **OK**.
You can select the appropriate components during the custom setup procedure.

✧ Follow the installation instructions.



[Installation_Userdefined, 2, en_US]

Figure 2-1 Custom Setup

NOTE

To install only the SICAM Valpro SICAM SCC component on a computer, SIMATIC WinCC does not need to be installed on this computer. During the installation, select only the **Valpro** component.

2.3.3 Licensing

To install the license for your SICAM SCC components:

- ✧ Plug the license USB stick included in the scope of delivery into the USB interface.
- ✧ Start the **Automation License Manager**.
- ✧ Transfer the license from the license USB stick to your hard disk.

2.3.4 Automated Installation

The SICAM SCC setup also provides (in addition to the standard installation) an automated installation via installation scripts or batch files. The default installation is installed if you choose the automated installation process.

To install SICAM SCC unattended and without user interaction, the following commands are supported:

- Installation:
  `<Installation medium>\Setup.exe /si`
  With changed installation path:
  `<Installation medium>\Setup.exe /si "INSTALLDIR=D:\Siemens\...\SCC"`
- Uninstallation:
  `<Installation medium>\Setup.exe /sx`
  `<SICAM installation directory>\SCC\Setup\Setup.exe /arp /sx`

The default setting for the SICAM installation directory is:
`%Program-Files(x86)%\Siemens Energy\SICAM`

e.g. under Windows 7 (64-bit): `C:\Program Files (x86)\Siemens Energy\SICAM`

You can use the environment variable **%ProgramFiles%** or **%ProgramFiles(x86)%** instead of the textual path and enter it e.g. directly in the address bar of the Windows Explorer or use it in the Windows command line. The variable is automatically translated into the actual path by the system.

You can modify the SICAM SCC installation directory, if required.

NOTE

C:\Program Files (x86) or **C:\Program Files** must be used depending on the operating system (64-bit or 32-bit). The setup uses the registered directory name.

NOTE

Uninstallation via command line is only available if SICAM SCC has also been installed in this mode.

During automated installation, the setup does not check if SIMATIC WinCC is installed. Ensure that a SIMATIC WinCC version is installed which is approved for SICAM SCC.

NOTE

Installation via command line installs the standard scope. Adding further components by changing the installation is not possible. In this case, uninstall SICAM SCC and re-install it in normal mode.

2.4 Uninstalling SICAM SCC Components

You can remove the SICAM SCC components from your computer using the uninstall routine.
All data installed by the SICAM SCC setup routine will be deleted during uninstallation.
You can remove the license for SICAM SCC without using the uninstall routine.

2.4.1 Removing the license

Durch die Übertragung der Lizenz von Ihrem Rechner auf den Lizenz-USB-Stick entfernen Sie die Lizenzierung.

NOTE

The license can also be transferred to another removable medium, e. g. a memory stick.

To remove the license of your SICAM SCC components:

- ✧ Plug the license USB stick included in the scope of delivery into the USB interface.
- ✧ Start the **Automation License Manager**.
- ✧ Transfer the license from the hard disk to the license USB stick.

2.4.2 Uninstallation

To uninstall the SICAM SCC components:

- ✧ Click **Start > Settings > Control Panels > Add/Remove Programs**.
- ✧ Select **SICAM SCC** in the list of programs.
- ✧ Click **Remove** to start the uninstall routine.
- ✧ Follow the uninstallation instructions.

2.4.3 Protection against data loss

The uninstallation routine does not remove any files created by the user. Directories including such data are therefore not removed.

2.5 Uninstalling SIMATIC WinCC

SIMATIC WinCC can be removed from your computer using the uninstall routine.
During this procedure, all data installed by the setup routine of SIMATIC WinCC will be deleted.

2.5.1 Removing the License

You remove the licensing by transferring the license from your computer to the license USB stick.
To remove the license for SIMATIC WinCC, proceed as follows:

- ✧ Plug the license USB stick included in the scope of delivery into the USB interface.
- ✧ Start the **Automation License Manager**.
- ✧ Transfer the license from the hard disk to the license USB stick.

2.5.2 Uninstallation

There are 2 options to uninstall WinCC V7.4:
Via the **WinCC product DVD** or via the **Windows Control Panel**.

To uninstall WinCC V7.4 via the product DVD, proceed as follows:

- ✧ Start the WinCC product DVD.
- ✧ If the autorun function of the operating system is enabled, the DVD is started automatically. If the autorun function is not enabled, start the **Setup.exe** program on the DVD.
- ✧ Follow the on-screen instructions.
- ✧ Select the setup type **Uninstall**.
- ✧ Select the components to be uninstalled.

To uninstall WinCC V7.4 via the Control Panel (alternative), proceed as follows:

- ✧ Open the Windows **Control Panel** via the Start menu.
- ✧ Double-click **Add/Remove Programs**.
- ✧ Click **Modify or Remove Programs**.
- ✧ Select the desired entry and click **Remove** or **Modify**.
  The names of all the WinCC components installed start with "SIMATIC WinCC".
- ✧ If WinCC options are installed, uninstall these options first and then uninstall the WinCC version.

Uninstalling Microsoft SQL Server 2014

After uninstalling WinCC you must uninstall the SQL Server instance "WinCC".

- ✧ Click **Control Panel > Programs and Features** and select **Microsoft SQL Server 2014** for uninstallation.

2.5.3 Protection against data loss

The uninstallation routine does not remove any files created by the user. Directories including such data are therefore not removed.

2.5.4 Virtualization

SICAM SCC supports virtualization with VMWare®.

3 Working with SICAM SCC

3.1	Demo Project	34
3.2	Creating a New Project	35
3.3	Creating a Control Diagram	78
3.4	Creating an overview diagram	90
3.5	Creating a List View	95
3.6	Creating a Button Bar	97
3.7	Creating a Start Screen	100
3.8	Setting up User Authorizations	103

3.1 Demo Project

As soon as SICAM SCC has been installed, a WinCC demo project is available under **...\SICAM\SCC\Samples**. All the major functions of SICAM SCC are implemented in this demo project.

In addition, the demo project includes sample configurations for the functionalities described in this manual. You can simply transfer these sample configurations for use in your projects.

This paragraph provides an example for the implementation of certain functions from the demo project.

The demo project provides the following options:

- The demo project is fully dynamized.
- Tags can be modified using the SIMATIC WinCC tag simulation.
- Switch statuses can be simulated in a SICAM structure tag window.
- A field is executable together with the data of the SICAM PAS V8.0 demo project.

NOTE

The demo project is executable with SIMATIC WinCC V7.4 and must neither be edited nor started with an older SIMATIC WinCC version. Read the notes in the file **How to use the demo project.pdf** (in the **DemoSCC** folder).

3.2 Creating a New Project

For each new WinCC project, you must perform frequently repeated operator actions. These actions must be performed in the correct order, because each step is based on the previous one.

If SICAM PAS is mentioned in this section, the same applies to SICAM RTUs and to IEC 61850 and IEC 60870-5-104 devices. Differences will be pointed out.

How to proceed

To create a new WinCC project, you must execute the following steps one after the other:

- Creating a new WinCC project
- Defining computer properties

  Select the WinCC components to be started during runtime. Select the desired runtime language. During the import process, the data is imported in the runtime language defined.
- Starting the SICAM Wizard

  (SICAM PAS Wizard, SICAM IEC Wizard, TEA-X Wizard, or SICAM Global Wizard)

  The SICAM Wizard supports you in creating a WinCC project by importing configuration data from the target systems. You can visualize items of information from the target systems under SICAM SCC, i. e. for use in process diagrams. In addition to this, it integrates the SICAM-specific extensions into the new WinCC project.

NOTE

If you use the TEA-X Wizard, you must not use one of the other Wizards additionally - and vice versa. Otherwise the project could be damaged.

NOTE

The SICAM Wizard supports you in creating a new WinCC project. This wizard is an autonomous application started via the WinCC Explorer.

To start the SICAM Wizard:

- To open the **WinCC Explorer**, click **Start > Siemens Energy > SICAM > SCC > SCC**.
- In the **WinCC Explorer**, double-click the **SICAM Wizard** for the desired target system, e.g. SICAM PAS Wizard for the target system SICAM PAS.

NOTE

The configuration of the SICAM TOOLBOX II and the SCD/ICD/CID files must not include special characters such as ä, ö, ü or ß.

If special characters are included, you must modify the coding of the XML file.

Change the entry **<?xml version="1.0" encoding="UTF-8"?>** in the first line as follows:

<?xml version="1.0" encoding="iso8859-1"?>

3.2.1 Creating a New WinCC Project

How to proceed

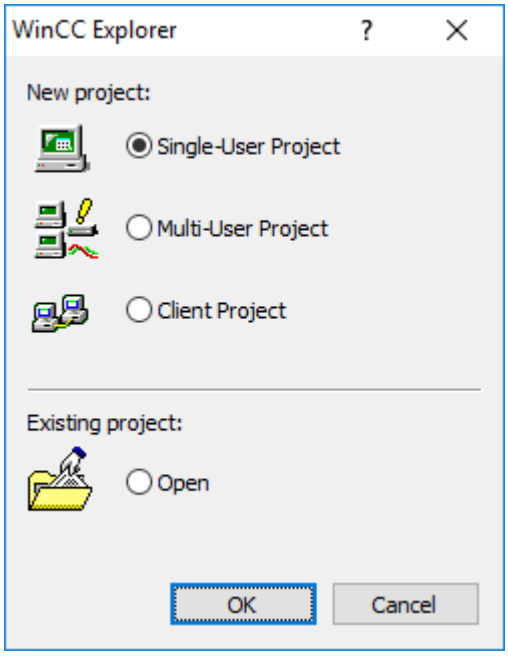
To create a new WinCC project, click **File > New** in the WinCC Explorer.

Creating a new project

To create a new project, proceed as follows:

✧ Click **File > New** in the WinCC Explorer.

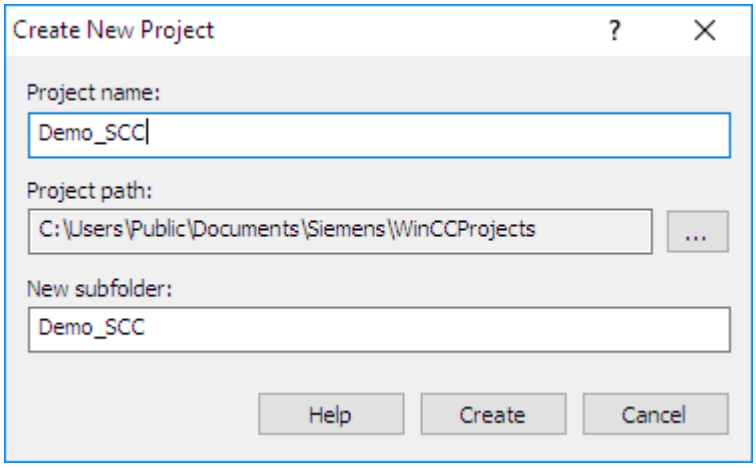
✧ Select your project type from the **WinCC Explorer** dialog, e.g. **single-user project**, and then click **OK** to confirm.



[pascc301, 1, en_US]

Figure 3-1 Selecting a single-user project

✧ The **Create a new project** dialog opens. Specify a **project path** and enter the project name.



[pascc302, 1, en_US]

Figure 3-2 Creating a new project

✧ Click **Create** to create the new project.

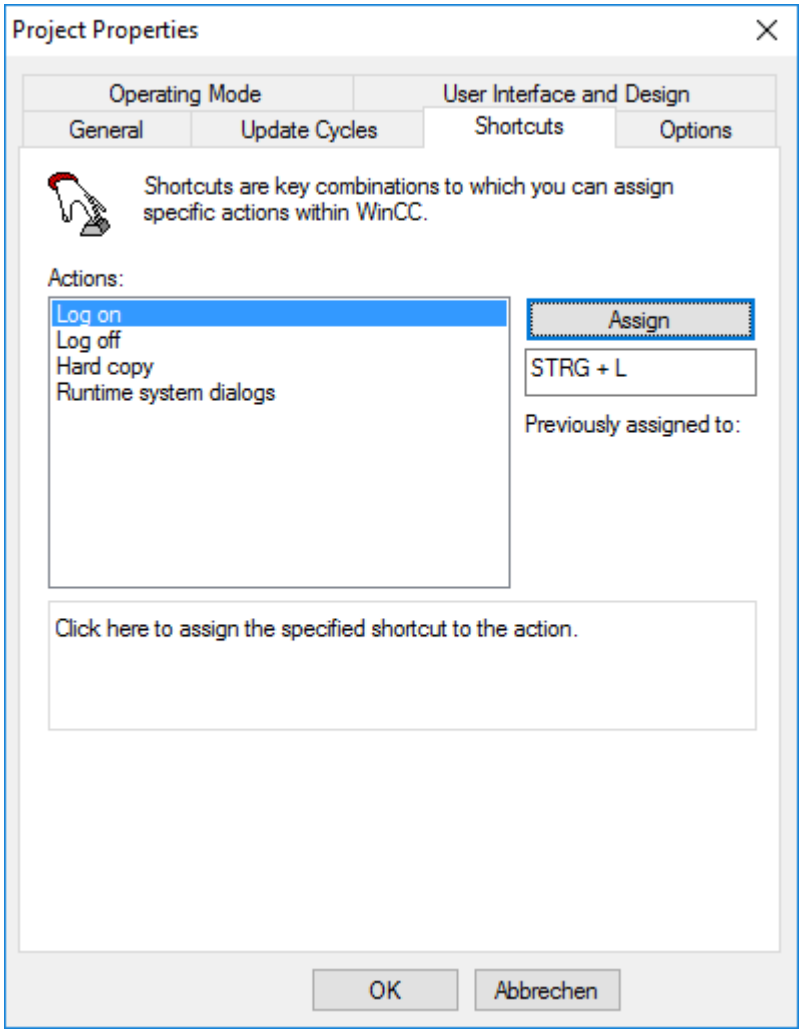
3.2.2 Defining Project Properties

In the project properties you define e.g. the operating mode, the design and the hotkeys. You can define **Logon** and **Logoff** hotkeys for your project.

- Logon: Opens a window for logging on a user during Runtime
- Logoff: Opens a window for logging off a user during Runtime

To open the **Project Properties** dialog:

- ✧ Right-click the project in the WinCC Explorer.
- ✧ Select **Properties** in the context menu.



[pascc302a, 1, en_US]

Figure 3-3 Example, assigning hotkeys

- ✧ For example, you can assign hotkeys for the **Logon** and **Logoff** actions.
- ✧ Click **OK** to close the dialog.

3.2.3 Defining Computer Properties

How to proceed

To define the computer properties:

- ✧ Open the **Computer properties** dialog in the WinCC Explorer.
- ✧ Check the computer name in the **General** tab.
- ✧ Activate the required runtime components in the **Startup** tab.
- ✧ Select the language of the runtime system in the **Parameters** tab.
- ✧ Set the desired parameters in the **Graphics Runtime** tab.

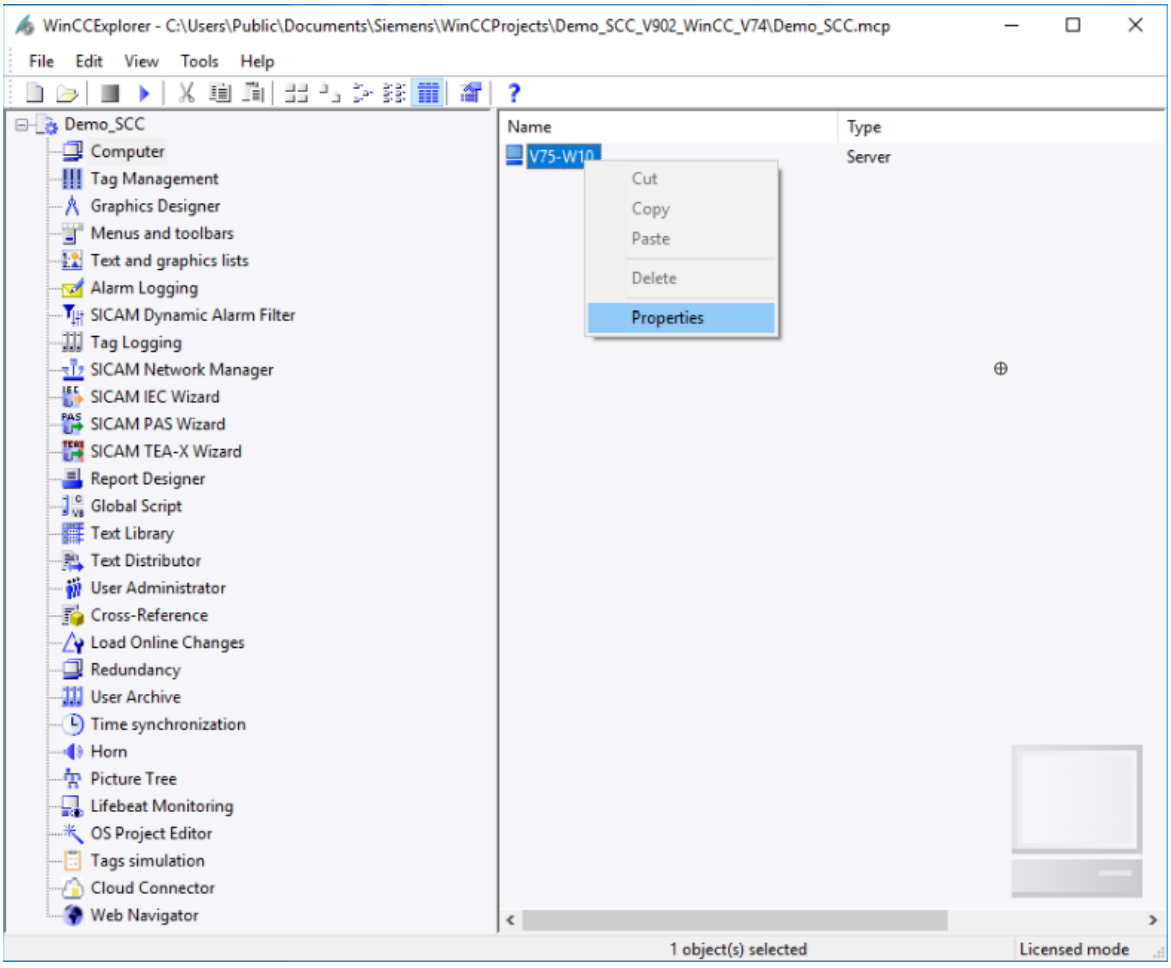
Opening the Computer properties Dialog

To open the **Computer properties** dialog:

✧ Select the **Computer** level in the WinCC Explorer.

✧ Right-click the name of the computer.

✧ Select **Properties** in the context menu.



[pascc303, 2, en_US]

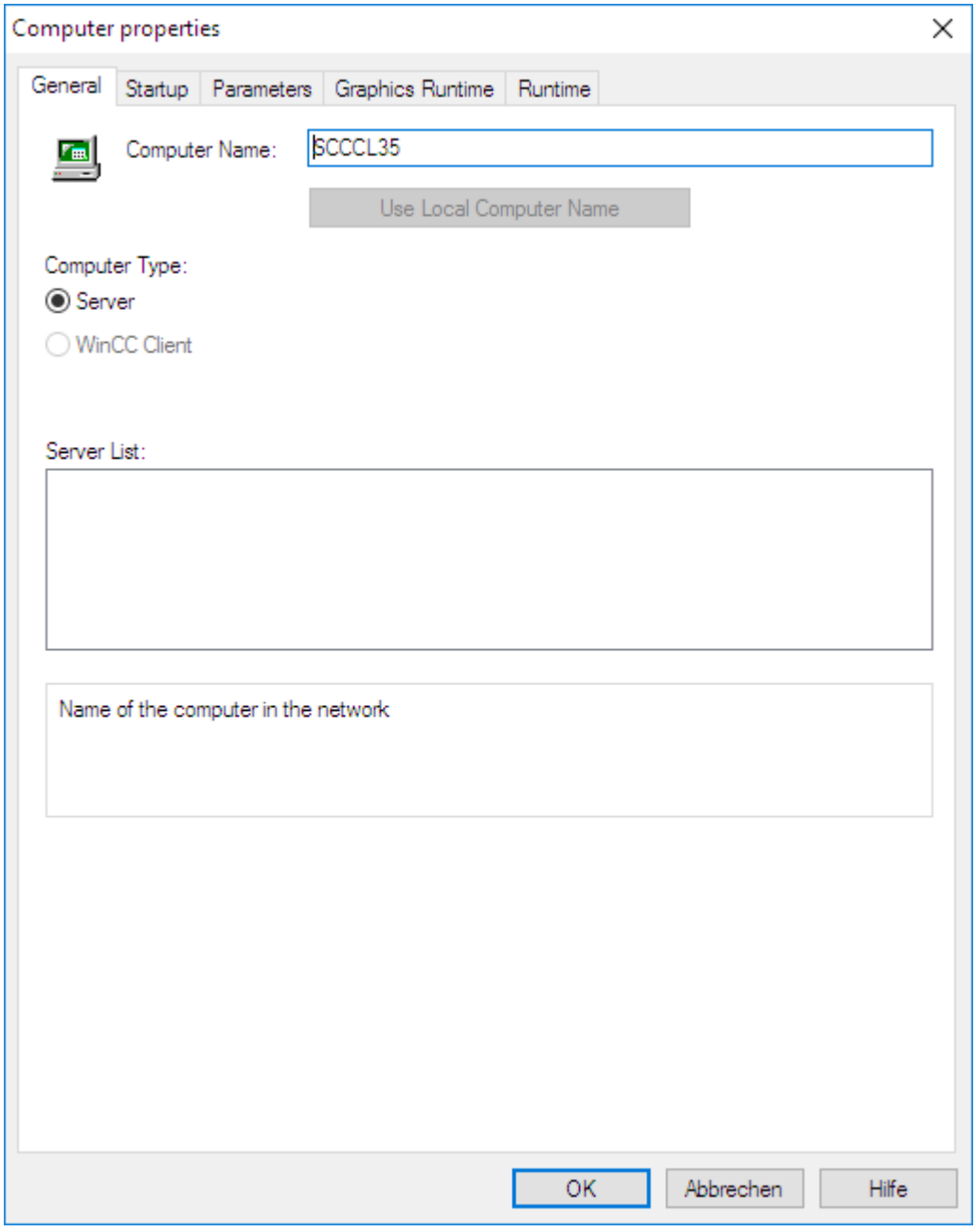
Figure 3-4 Opening the **Computer properties** Dialog

Checking the Computer Name

✧ In the **Computer properties** dialog, click the **General** tab. Next, check whether the correct name of your computer is indicated in the **Computer name** entry field.

The computer name is entered automatically when creating a new WinCC project.

✧ Enter the name of your computer unless the name has already been entered automatically.



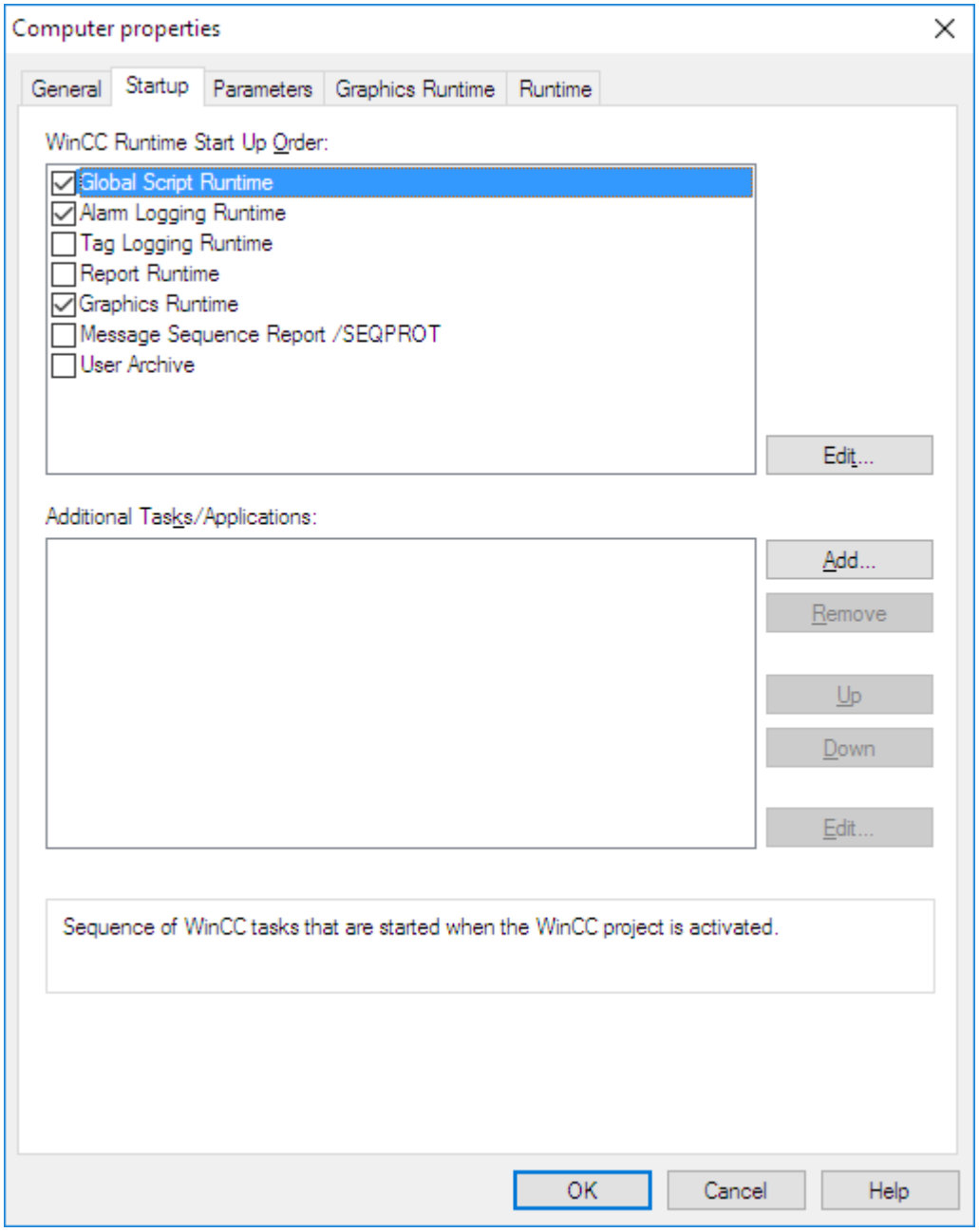
[pascc304, 1, en_US]

Figure 3-5 Checking the Computer Name

Activating Runtime Components

To activate the runtime components:

- ✧ In the **Computer properties** dialog, click the **Startup** tab.
- ✧ In the **WinCC Runtime Start Up Order** section, you can select each runtime component by clicking on the corresponding checkbox. Select further components (if required).



[pascc305, 1, en_US]

Figure 3-6 Activating All Runtime Components

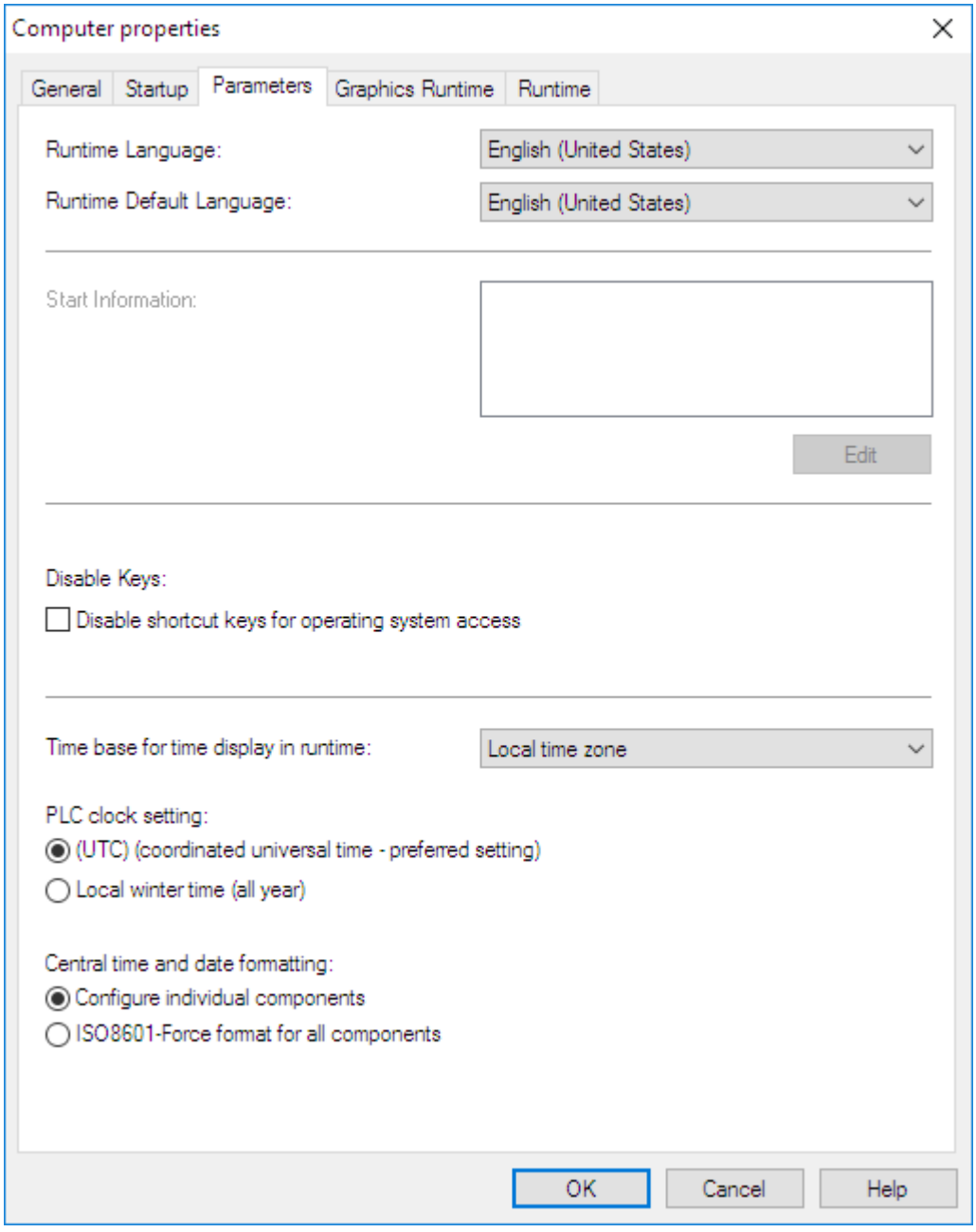
Defining the Runtime Language

It is important to define the runtime language before starting the SICAM Wizard. You specify in which language column of the text library the message texts will be arranged and in which language e.g. the message classes will be created.

To define the runtime language:

✧ In the **Computer properties** dialog click the **Parameters** tab.

✧ Select the desired language from the **Runtime Default Language** drop-down list box.



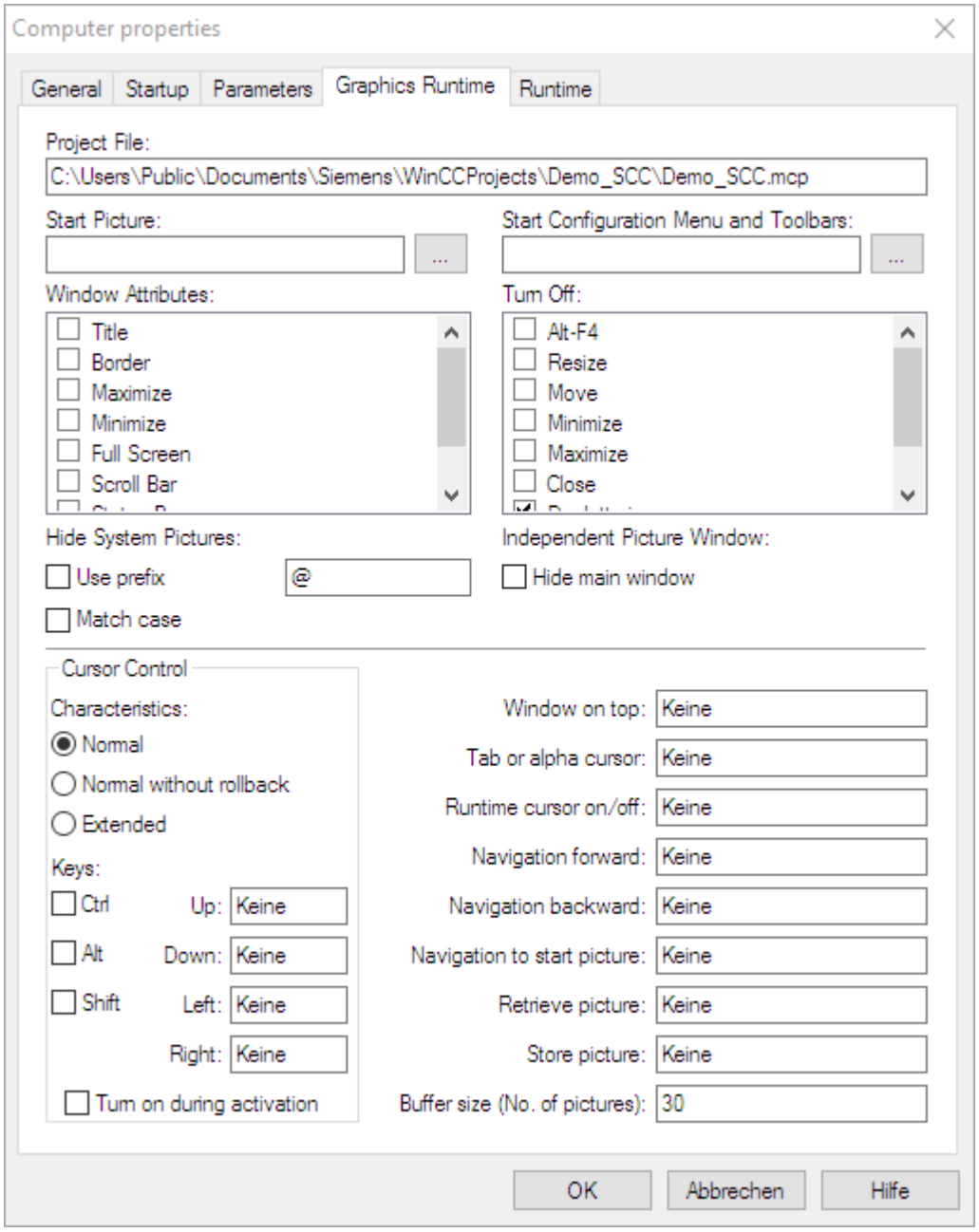
[pascc365, 1, en_US]

Figure 3-7 Defining the Runtime Language

Setting the Graphics Runtime Parameters

To set the parameters of the graphics runtime:

✧ In the **Computer properties** dialog, click the **Graphics Runtime** tab.



[pascc306, 1, en_US]

Figure 3-8 Setting the **Graphics Runtime** Parameters

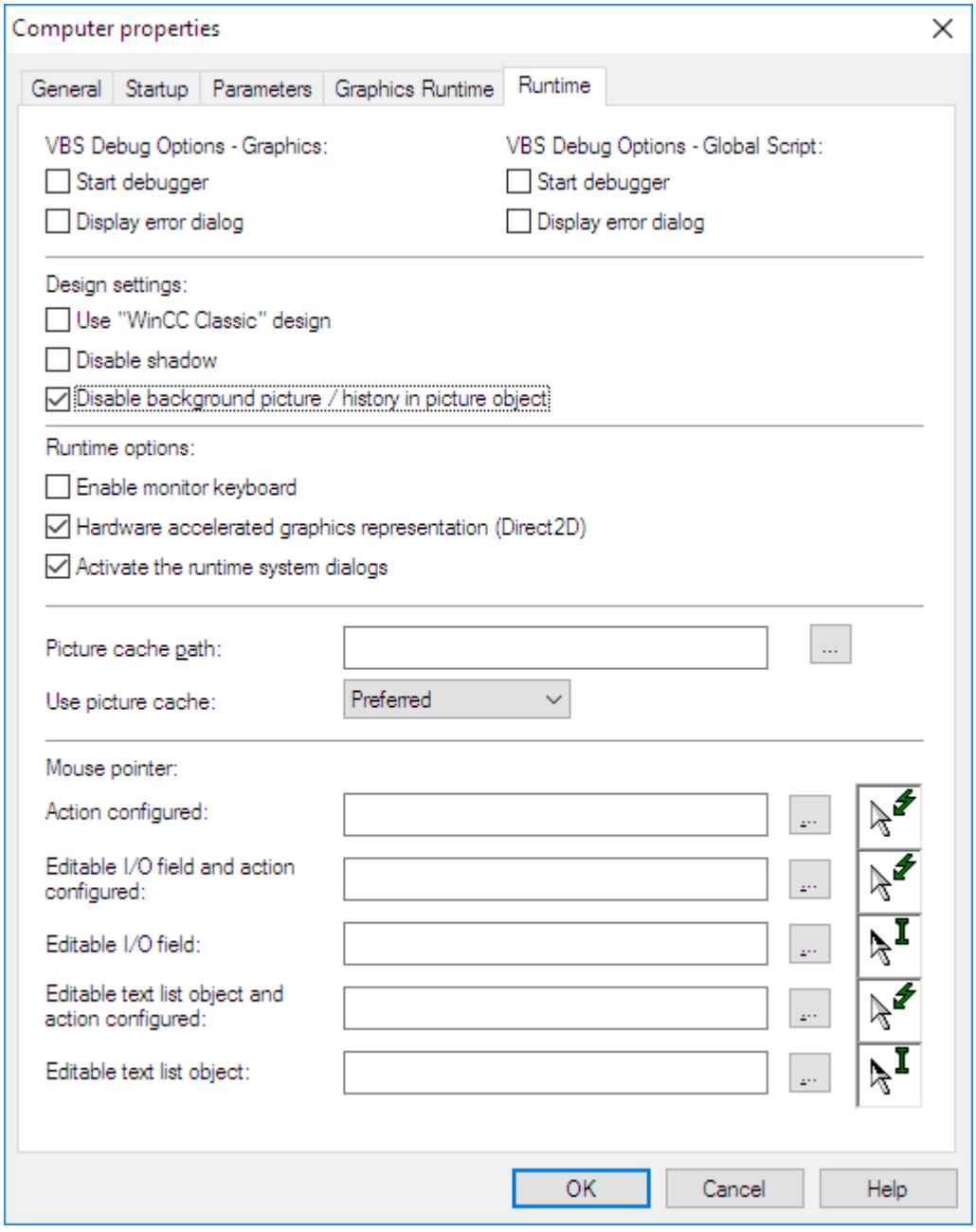
NOTE

After you have created a start screen in the Graphics Designer, enter its name (e.g. start.PDL) in the **Start screen** entry field of the **Graphics Runtime** tab.

Setting Runtime Parameters

To set the parameters of the graphics runtime:

✧ In the **Computer properties** dialog, click the **Runtime** tab.



[sc_prop_runtime, 1, en_US]

Figure 3-9 Setting the **Runtime** Parameters

✧ Click **OK** to close the dialog.

3.2.4 Initializing a WinCC Project

To initialize the new WinCC project, you can use the SICAM Wizard. Be aware of the **station type** which you want to connect to SICAM SCC. The procedures are almost identical and only differ with regard to certain points. The following station types are possible:

- SICAM PAS station, initialization using the SICAM PAS Wizard, see *3.2.4.1 SICAM PAS Station*
- SICAM PAS/PQS station or SITIPE, initialization using the SICAM TEA-X Wizard, see *3.2.4.5 SICAM PAS/PQS and SITIPE*

- SICAM RTUs, initialization using the SICAM IEC Wizard, see *3.2.4.2 SICAM RTUs*
- IEC 60870-5-104 devices, initialization using the SICAM IEC Wizard, see*3.2.4.3 IEC 60870-5-104 Devices*
- IEC 61850 devices, initialization using the SICAM IEC Wizard,see*3.2.4.4 IEC 61850 Devices*
- SICAM SAS station, initialization using the SICAM Global Wizard, see */10/ SICAM SCC for SICAM SAS*.

The following section describes details of and differences between the procedures to be applied for the individual station types. For more detailed information on the **SICAM PAS Wizard** refer to *7.2.1 SICAM Wizard* .

The wizards must**not** be started in the Runtime mode of SIMATIC WinCC. SIMATIC WinCC editors must neither be started nor exited while a wizard is active. They interrupt the interfacing of the wizard, and changes cannot be performed.

The task of the wizard is to import configuration data into a SIMATIC WinCC project and update this data. The update function cannot be used in order to replace existing station data in a SIMATIC WinCC project by completely different data. This also refers to deleted or newly created devices in SICAM PAS or TOOLBOX II projects and SCD files. In these cases you must delete and re-import the imported data using the corresponding wizard.

The **Create SICAM Alarm Logging System** option on pages 4/5 should only be selected to re-create the SICAM Alarm Logging System. To do this, the Alarm Logging message blocks must be removed first. Otherwise, the column headers in the alarm lists may disappear.

Volume Requirements

You can use 8 different IEC 61850 imports as well as 8 T104 imports.

You can execute

- 8 different IEC 61850 imports as well as
- 8 IEC 60870-5-104 imports.

1 Import corresponds to:

- 1 SXD file,
- 1 SCL-compliant file (SCD, ICD, CID, or IID) or
- 1 folder with XML files (max. 255)

ProjectIDs are assigned automatically during import, starting with 10.

For SICAM PAS the following applies: 1 import = 1 station. Thus, for mixed operation 9 PAS stations can be imported (max. 25 with PXD import only). For PAS connections the ProjectID is assigned manually in PAS Config.

Hence a maximum of 25 stations (import datasets) can be imported.

The ProjectIDs must be different (they are configured in SICAM PAS). For mixed import with IEC 61850/ IEC 60870-5-104 stations you have to ensure that the ProjectIDs are unique.

NOTE

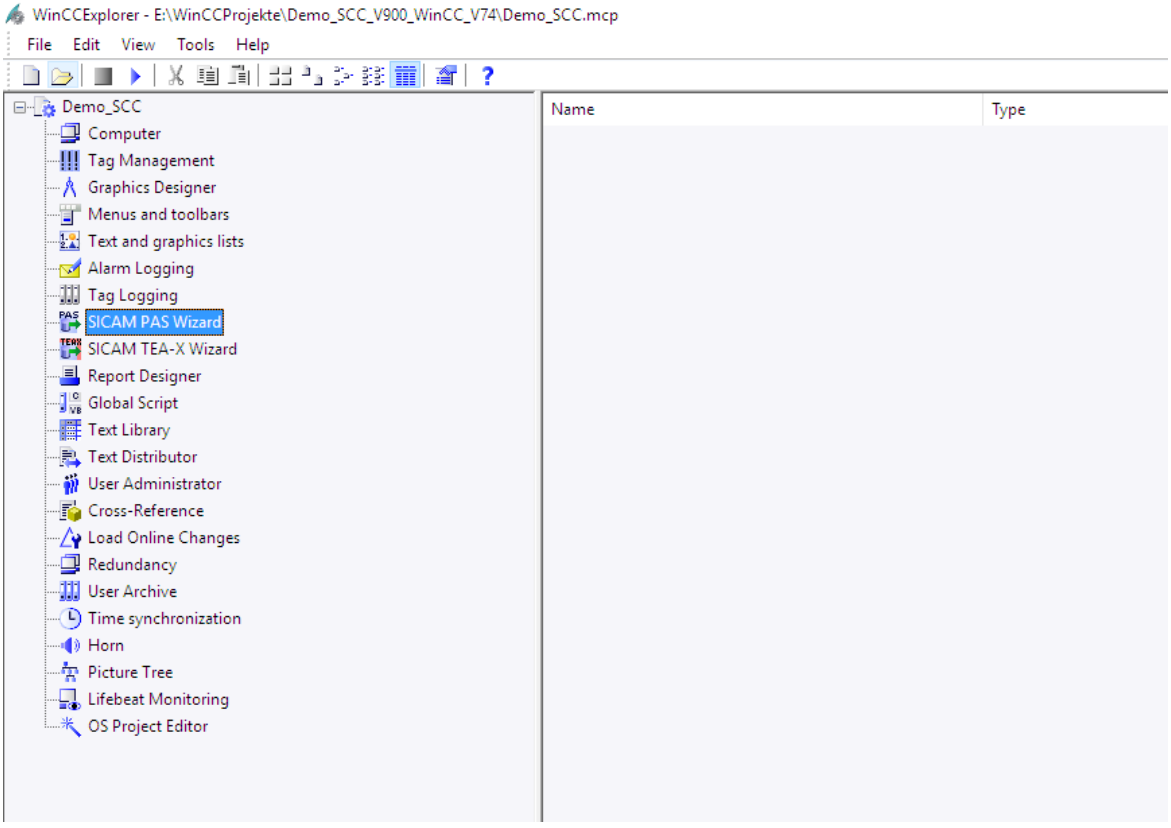
For IEC 61850 and IEC 60870-5-104 there is a limit of 255 devices per import (station).

3.2.4.1 SICAM PAS Station

Starting the SICAM PAS Wizard

To start the SICAM PAS Wizard:

✧ In the **WinCC Explorer**, double-click **SICAM PAS Wizard**. The SICAM PAS Wizard starts.



[pascc310, 1, en_US]

Figure 3-10 Calling up the SICAM PAS Wizard

✧ Click **Next** in the subsequent dialog.

Entering Station Names and Selecting Parameters

✧ In the **1/5** dialog, enter a **name** for the new station and select the **parameters**.

✧ Click Next.

Importing Station Data and Selecting Functions

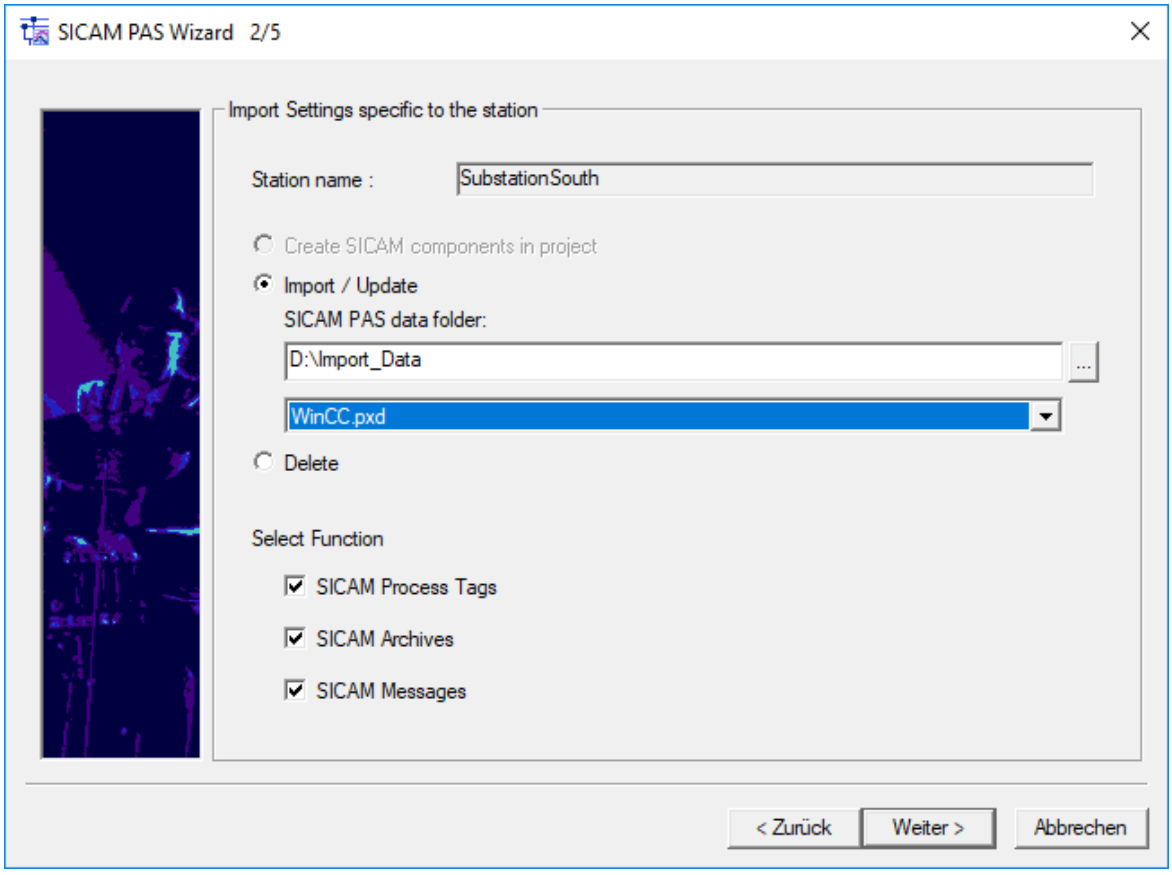
In the **2/5** dialog, enter the components to be imported into the SICAM SCC project using the SICAM PAS Wizard.

✧ Select the **Import/Update** option.

✧ Select the path of the SICAM PAS data directory.

✧ From the selection list, select the file (e.g. station1.PXD) which includes the corresponding **SICAM process tags**.

✧ Select the **functions**.



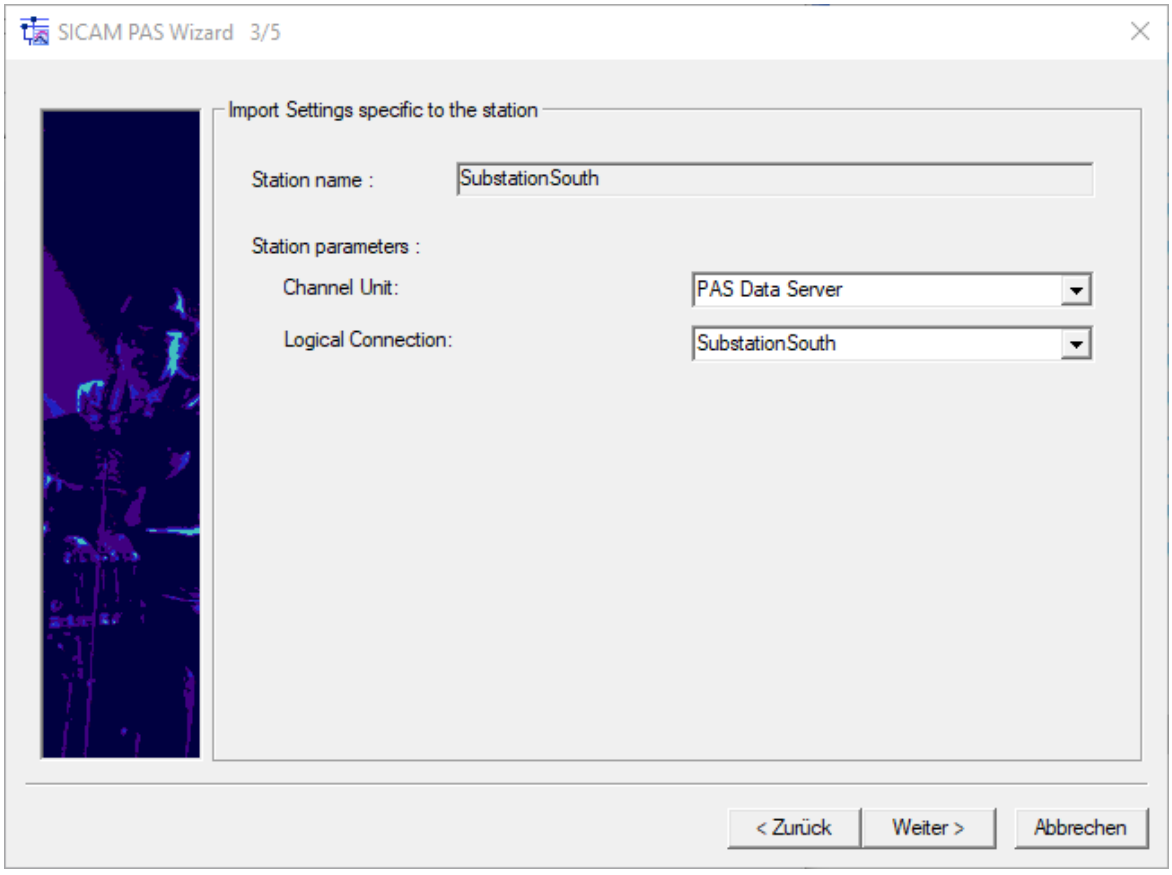
[pascc313, 2, en_US]

Figure 3-11 Defining the Path and the Name of the Import Components

✧ Click **Next**.

Setting Station Parameters

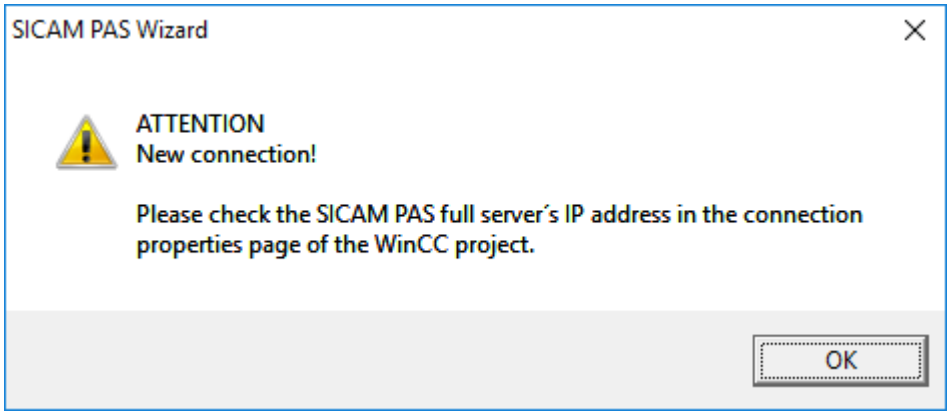
✧ Define the station parameters in the **3/5** dialog.



[pascc314, 1, en_US]

Figure 3-12 Defining Station Parameters for SICAM PAS

✧ Click **Next**.



[pascc320, 1, en_US]

Figure 3-13 Note Regarding Connection Parameters

Check the connection parameters after terminating the SICAM PAS Wizard – see *3.2.5 Connection Parameters*.

Initializing the Project

✧ Define the **project-specific settings** in the **4/5** dialog.

✧ Click **Next**.

✧ In the **5/5** dialog, click **Finish**.

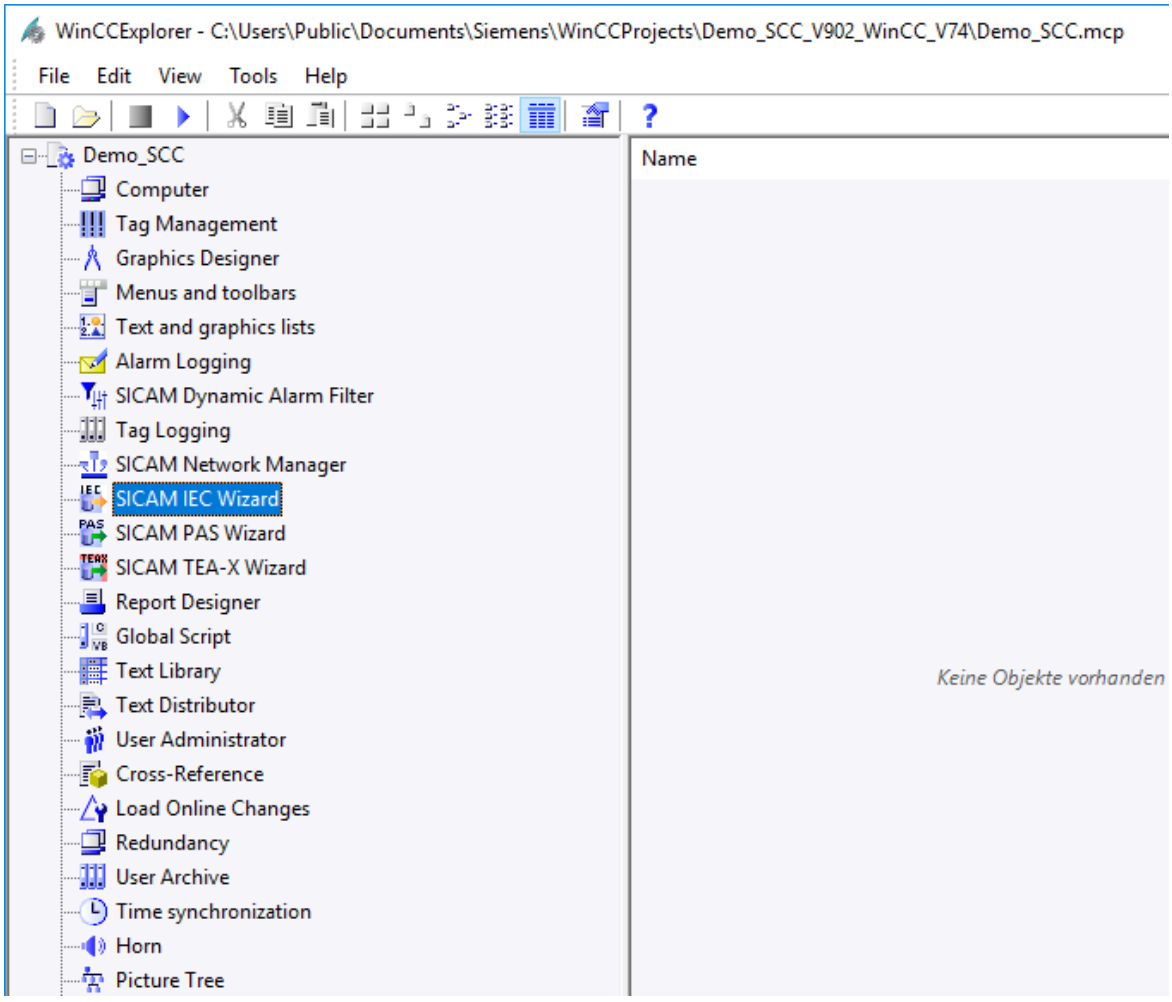
✧ Continue as described in *3.2.5 Connection Parameters*.

3.2.4.2 SICAM RTUs

Starting the SICAM IEC Wizard

To start the SICAM IEC Wizard:

✧ In the **WinCC Explorer**, double-click **SICAM IEC Wizard**. The SICAM IEC Wizard starts.

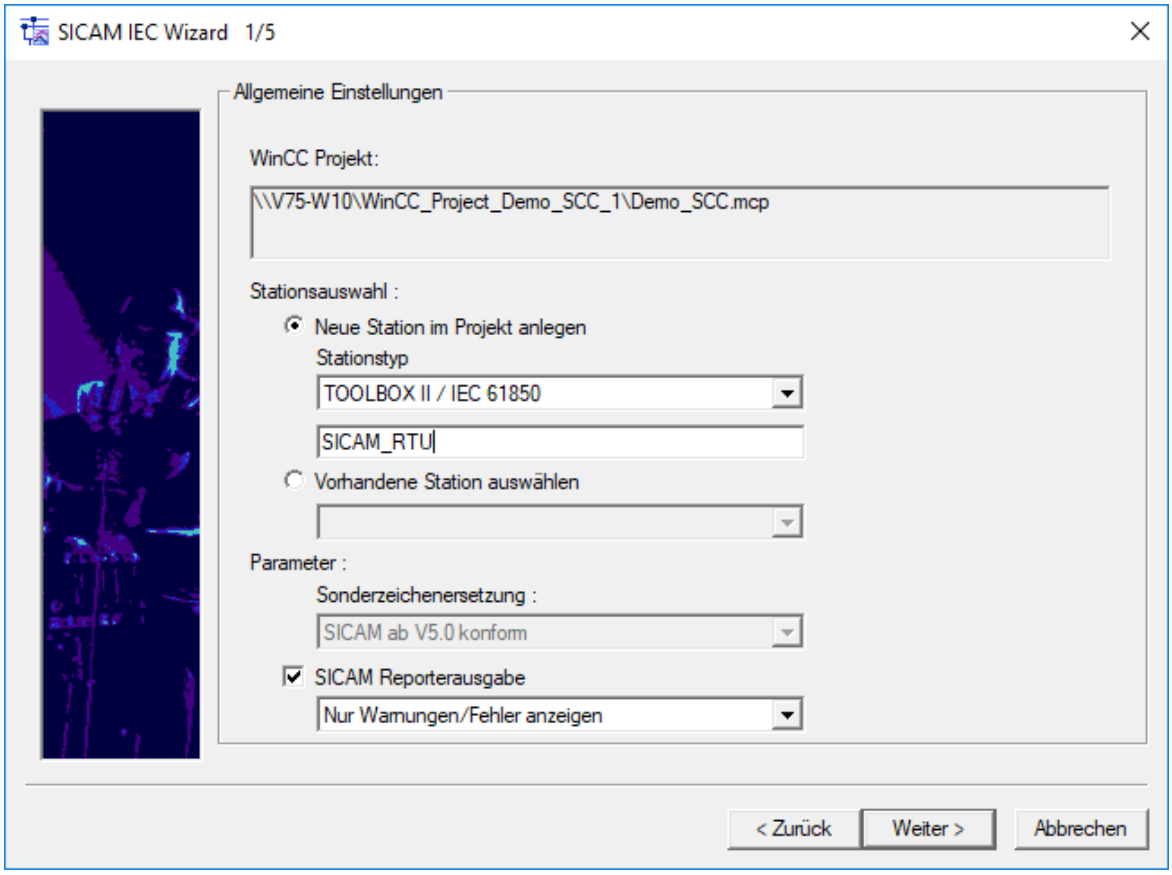


[pascc310_1703, 1, en_US]

Figure 3-14 Calling up the **SICAM IEC Wizard**

✧ Click **Next** in the subsequent dialog.

Selecting the Station and Parameters



[pascc311_1703, 1, en_US]

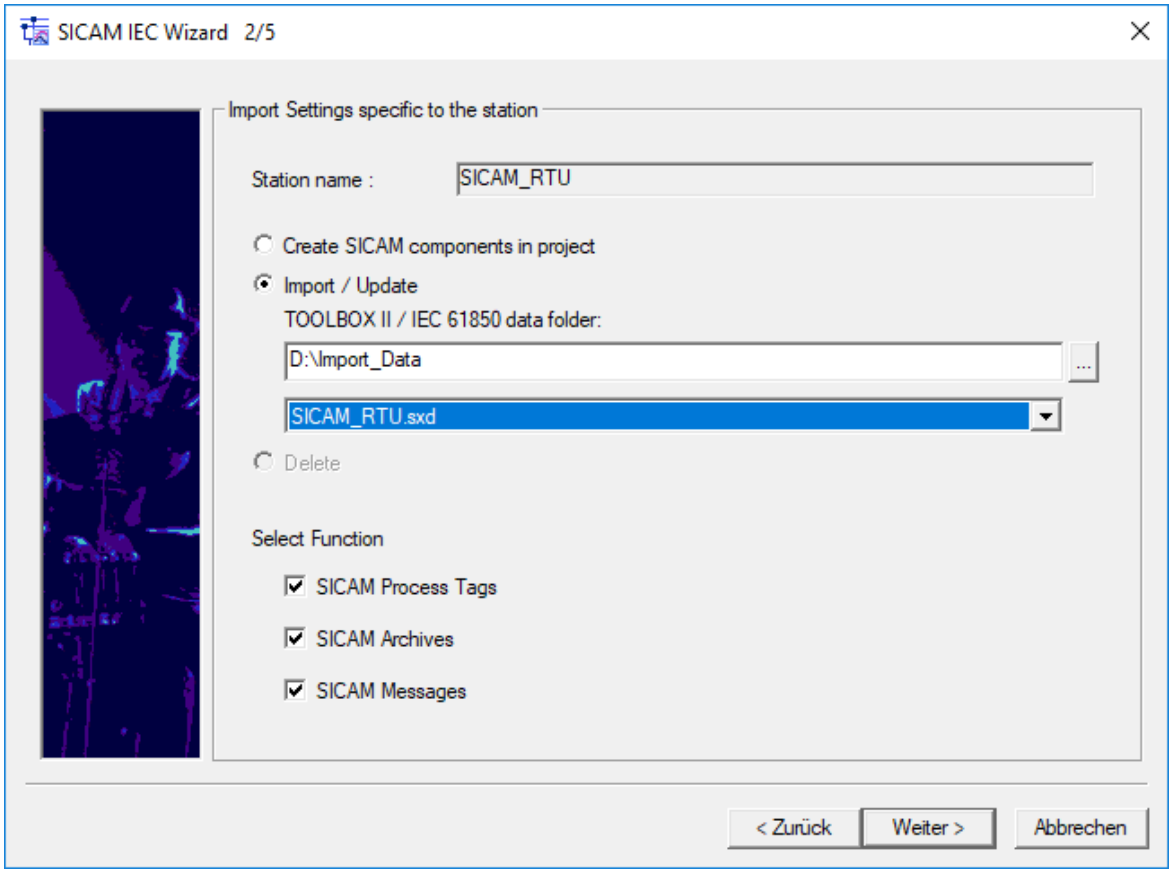
Figure 3-15 Selecting the Station and Parameters

- ✧ In the **1/5** dialog, select the **Station type** (type of the file to be imported).
  · TOOLBOX II / IEC 61850
  Import of an *.sxd file with IEC 61850 data from a SICAM TOOLBOX II.
  · TOOLBOX II / IEC 60870-5-104
  Import of an *.sxd file with IEC 60870-5-104 data from a SICAM TOOLBOX II.
- ✧ Enter a name for the new station.
- ✧ Select the **Parameters**.
- ✧ Click **Next**.

Importing Station Data and Selecting Functions

In the **2/5** dialog, enter the components to be imported into the SICAM SCC project using the SICAM IEC Wizard.

- ✧ Select the **Import/Update** option.
- ✧ Select the path of the data directory.
- ✧ From the selection list, select the file (e.g. station1.SXD) which includes the corresponding **SICAM process tags**.
- ✧ Select the **functions**.



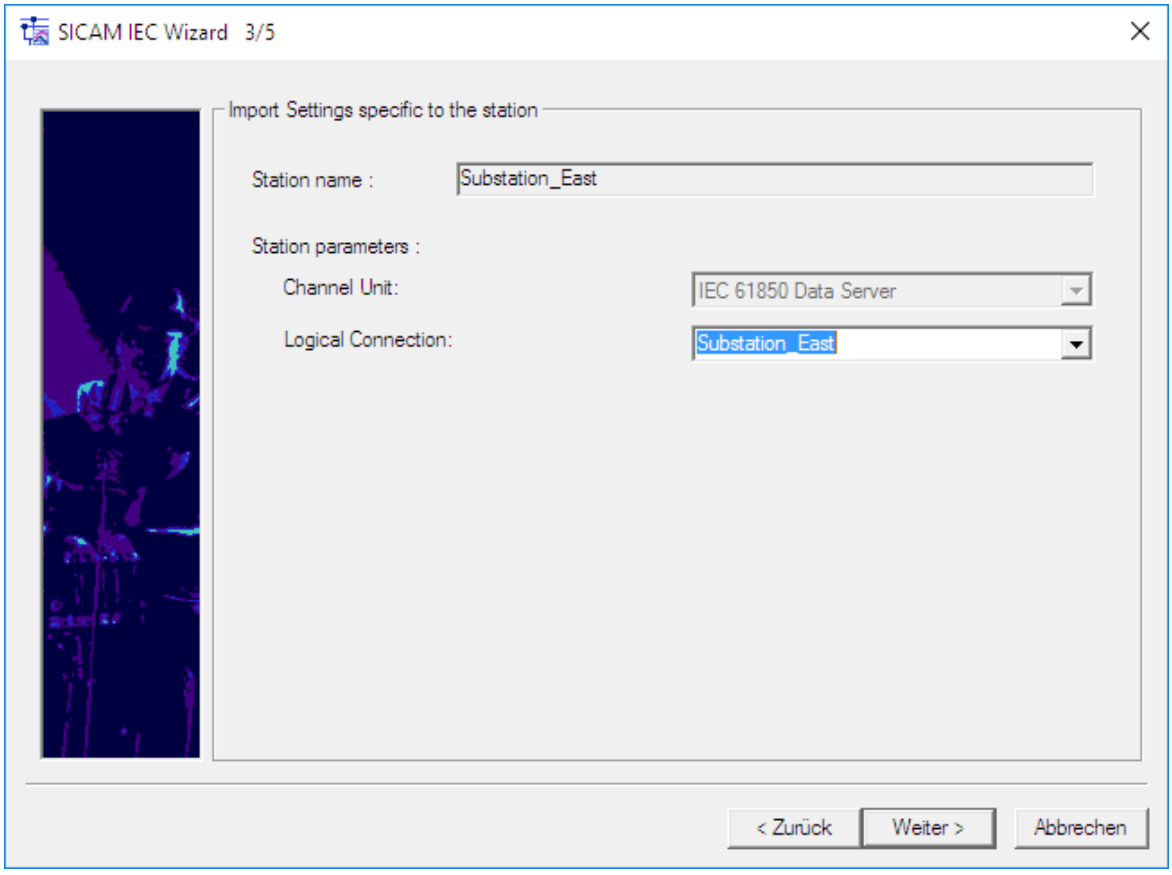
[pascc311_1703_2, 1, en_US]

Figure 3-16 Defining the Path and the Name of the Import Components

✧ Click **Next**.

Defining Station Parameters

✧ Define the station parameters in the **3/5** dialog.



[pascc314_1703, 1, en_US]

Figure 3-17 Defining Station Parameters for SICAM RTUs

The **Channel Unit** is pre-selected according to the selected **Station type**.

When importing TOOLBOX II data (*.sxd) only information for the selected protocol is imported.

✧ Click **Next**.

To connect SICAM RTUs, no connection parameters need to be configured. These parameters are included in the SXD file and are stored in a configuration data record for the channel.

Initializing the Project

✧ Define the **project-specific settings** in the **4/5** dialog.

✧ Click **Next**.

✧ In the **5/5** dialog, click **Finish**.

✧ Continue as described in *3.2.5 Connection Parameters*.

3.2.4.3 IEC 60870-5-104 Devices

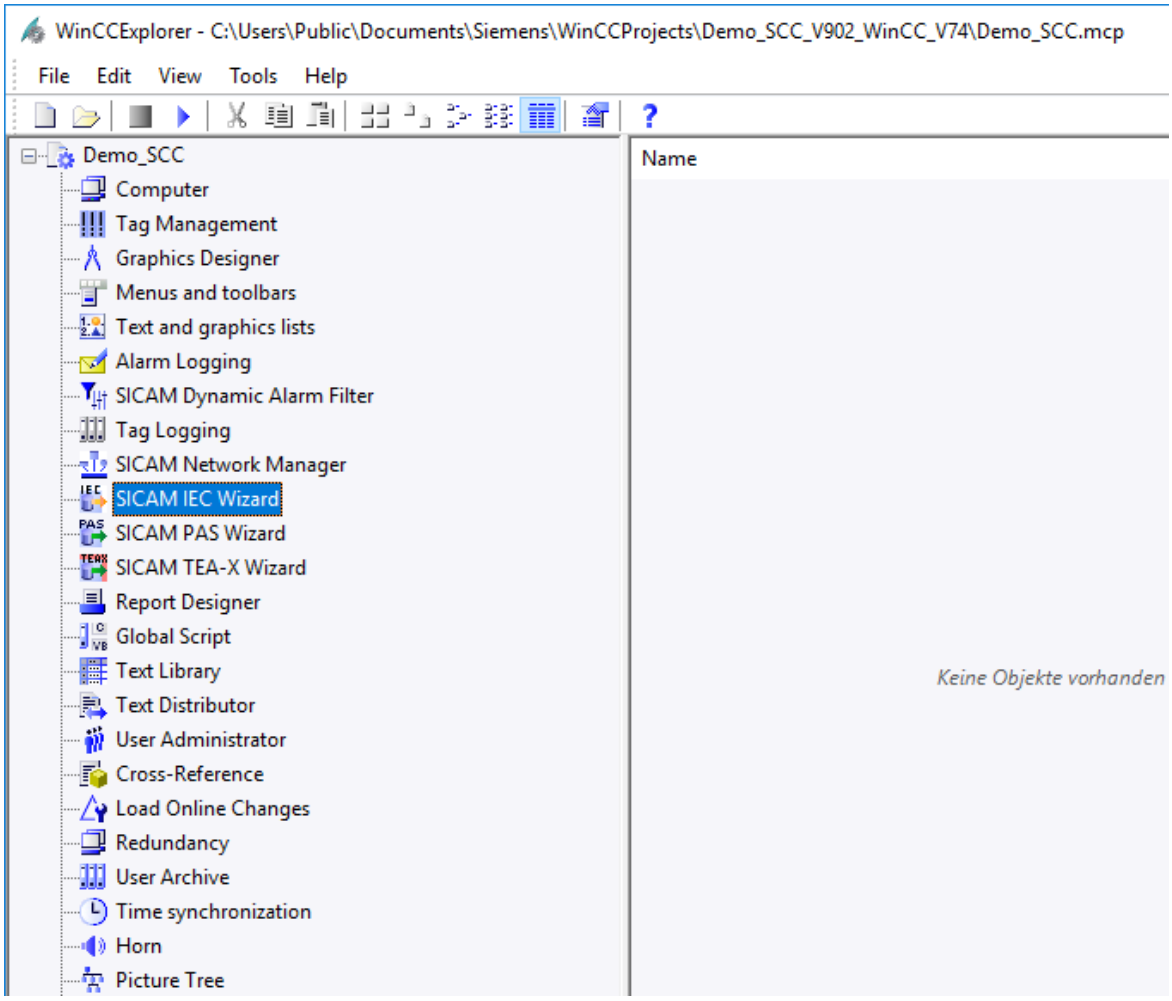
NOTE

For importing IEC 60870-5-104 data from a DIGSI/XML file, you require the separate **SCC IEC 60870-5-104 data import** license.

Starting the SICAM IEC Wizard

To start the SICAM IEC Wizard:

✧ In the **WinCC Explorer**, double-click **SICAM IEC Wizard**.
The SICAM IEC Wizard starts.

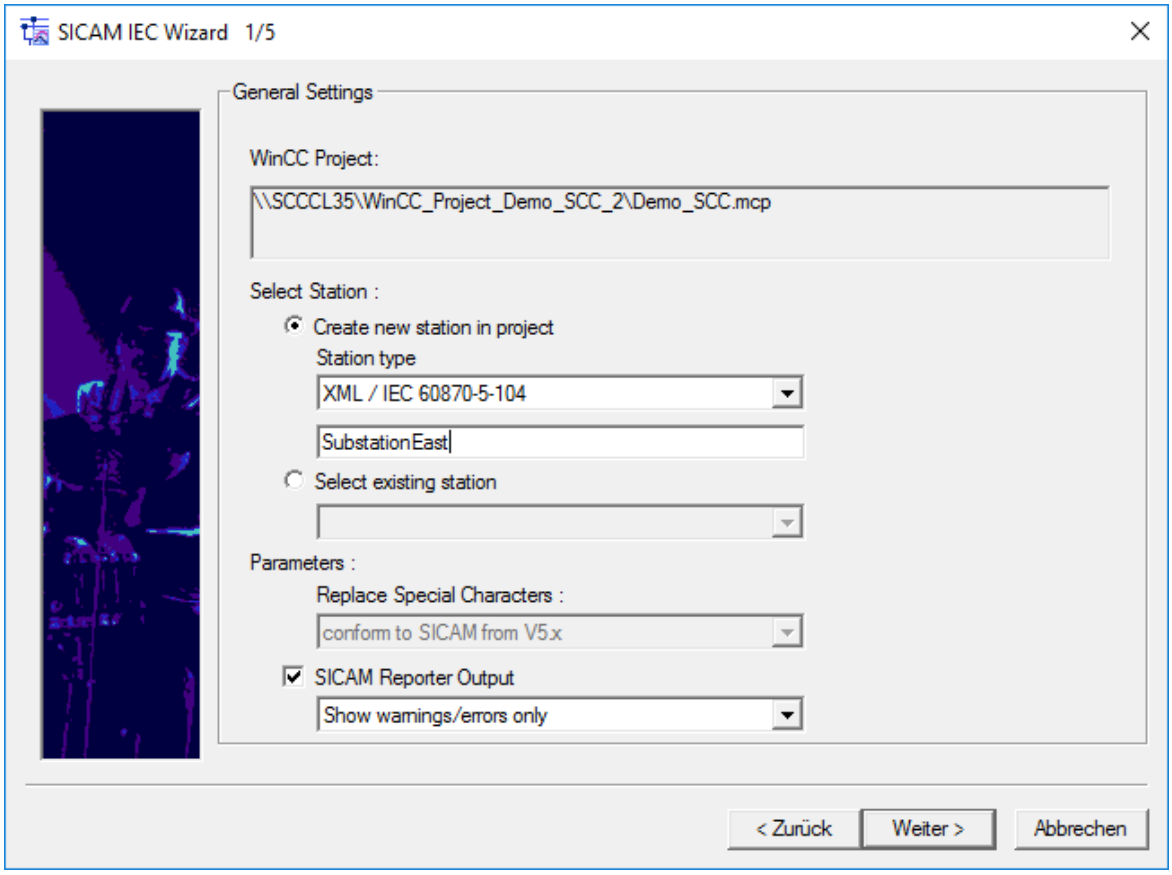


[pascc310_1703, 1, en_US]

Figure 3-18 Calling up the SICAM IEC Wizard

✧ Click **Next** in the subsequent dialog.

Selecting the Station and Parameters



[scc_104_02, 2, en_US]

Figure 3-19 Selecting the Station and Parameters

- ✧ In the **1/5** dialog, select the **Station type** (type of the file to be imported).
  · XML / IEC 60870-5-104
  Importing *.xml files from DIGSI
- ✧ Enter a **name** for the new station.
- ✧ Select the **Parameters**.
- ✧ Click **Next**.

Importing Station Data and Selecting Functions

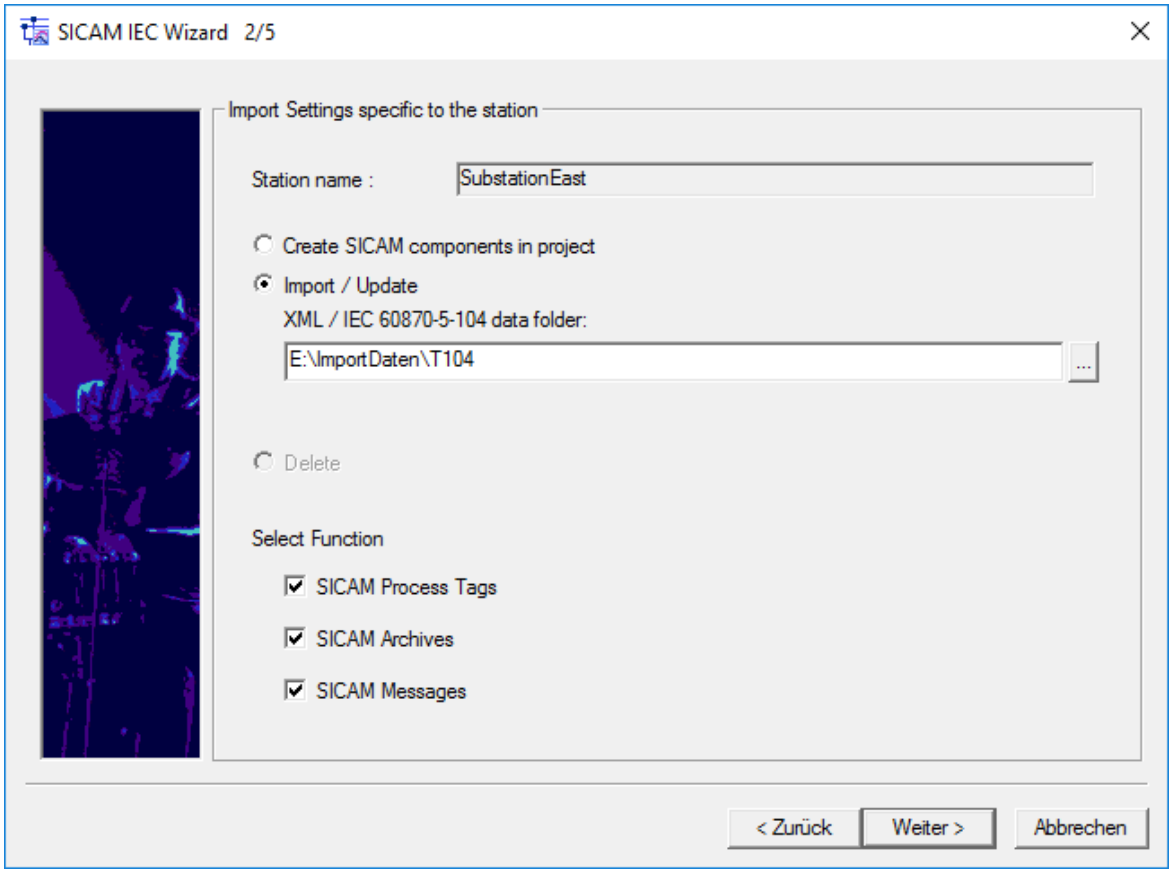
In the **2/5** dialog, enter the components to be imported into the SICAM SCC project using the SICAM IEC Wizard.

- ✧ Select the **Import/Update** option.
- ✧ Store the XML files for each IEC 60870-5-104 station in a separate subdirectory.
  Select the path where the XML files of the station to be imported are stored.

NOTE

If more than 255 XML files are stored in the specified path, only the first 255 files are imported.

- ✧ Select the **functions**.



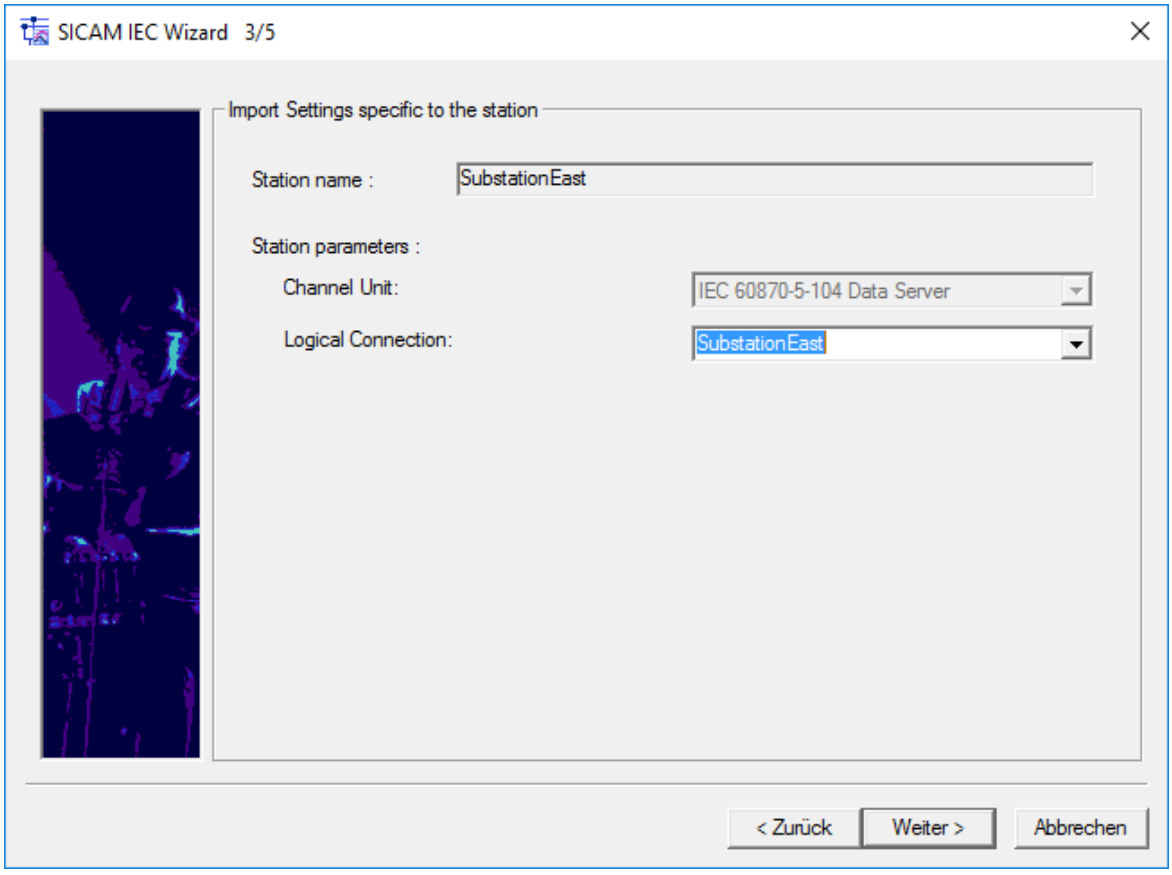
[scc_104_03, 2, en_US]

Figure 3-20 Defining the Path of the Import File

✧ Click **Next**.

Defining Station Parameters

✧ Define the station parameters in the **3/5** dialog.



[scc_104_04, 2, en_US]

Figure 3-21 Defining Station Parameters for IEC 60870-5-104 Devices

The **Channel Unit** is pre-selected according to the selected **Station type**.

The **Logical Connection** is derived from the station name when setting up a new station. It only may be adjusted before the first import.

✧ Click **Next**.

Initializing the Project

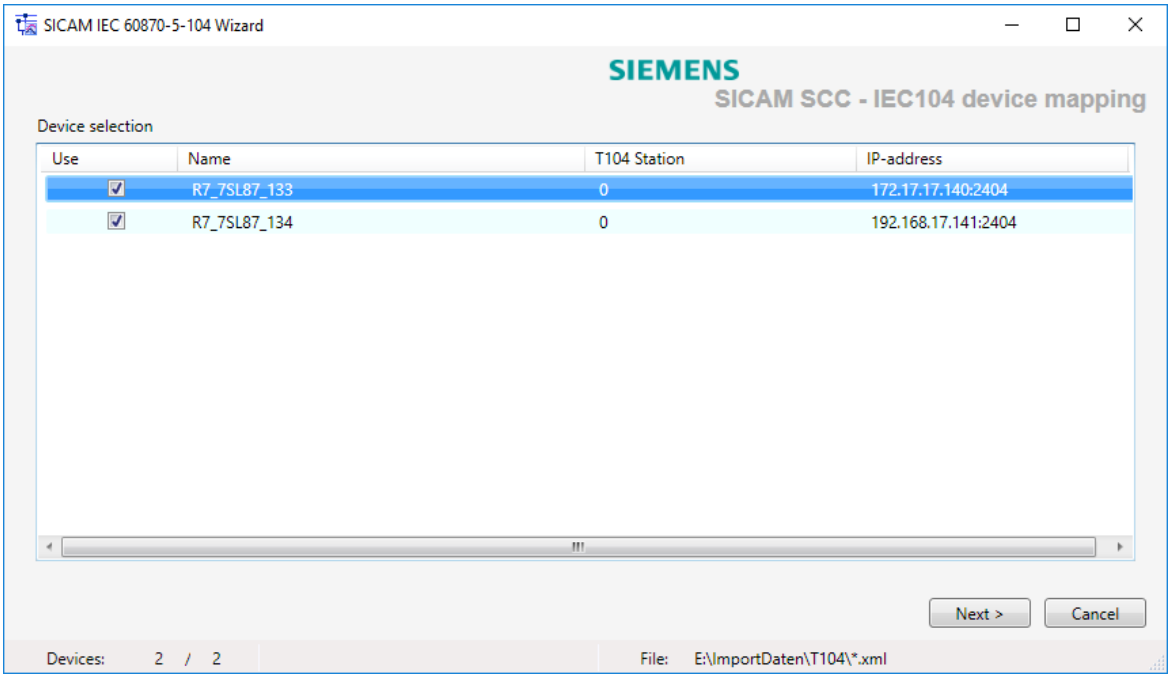
✧ Define the **project-specific settings** in the **4/5** dialog.

✧ Click **Next**.

✧ In the **5/5** dialog, click **Finish**.
The **SICAM IEC 60870-5-104** Wizard starts.

Editing Device Data

The **SICAM IEC 60870-5-104 Wizard** provides a mapping interface for the DIGSI/XML import where you can select the information to be created in SICAM SCC. In addition, you can configure device and connection parameters in the Expert view.



[scc_104_05, 2, en_US]

Figure 3-22 SICAM IEC 60870-5-104 Wizard, Selecting Devices

NOTE

For the first import all devices from the import directory are displayed. You can only select devices with the same station number. When updating the station, only devices with this station number are displayed.

If only 1 **XML** file is available in the directory, no device selection is displayed.

- ✧ Select the devices whose data you want to import with the SICAM IEC Wizard.
- ✧ Click **Next**.
  The next dialog opens.
- ✧ Select the **Mapping** tab.

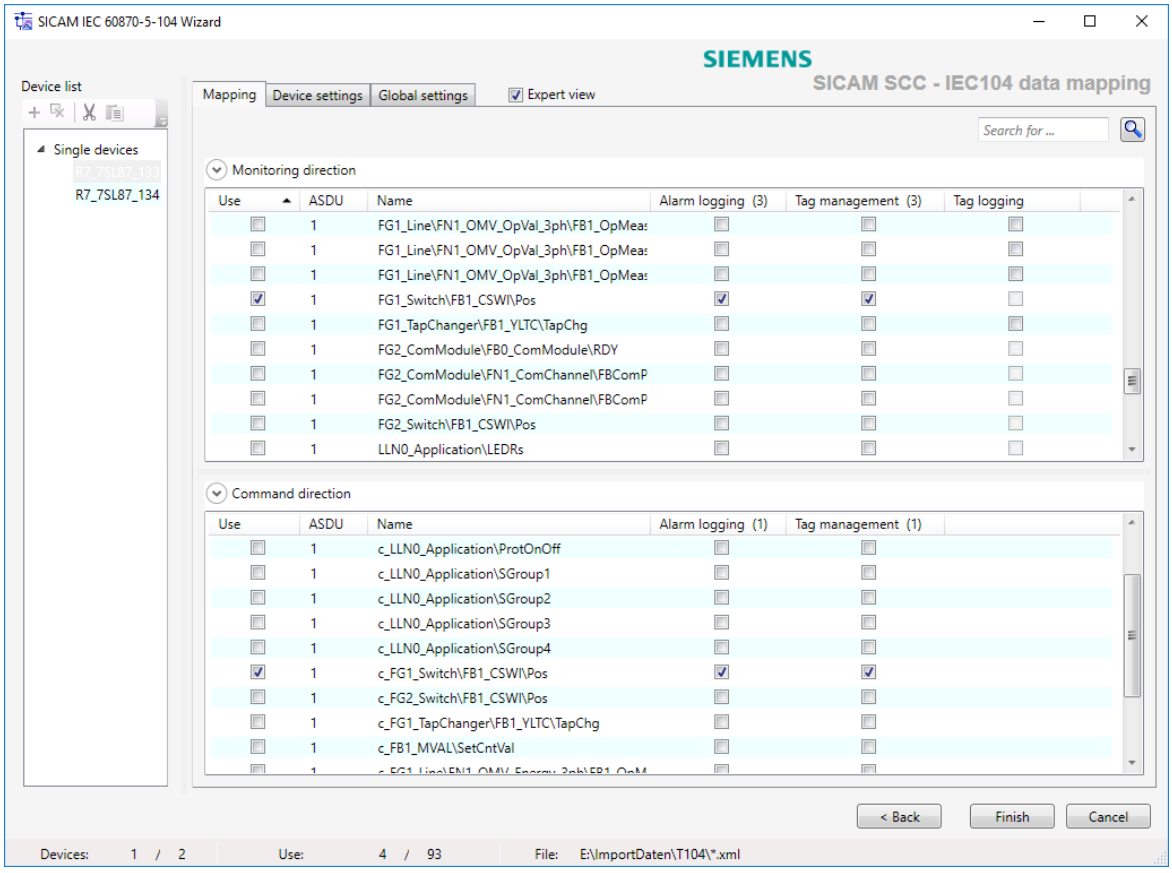
In the Mapping tab, all the tags from the imported XML files are displayed device-specifically.

NOTE

Updating a Device or the Station

To perform an update of already imported devices or of the complete station with changed device address parameters (XML section **[LANConnection]**), you have to manually adjust the address parameters in the Wizard UI; alternatively, you delete the corresponding devices or the complete station with the Wizard and re-import them before the update.

Since the device address parameters can be adjusted in the Wizard UI, they are stored persistently after the import and considered as reference. Thus, they are not overwritten when import files are changed.



[scc_104_06, 2, en_US]

Figure 3-23 SICAM IEC 60870-5-104 Wizard, Selecting Tags

The device list on the left-hand side of the dialog shows all the devices which have been selected in the Use column of the device selection.

NOTE

You can combine devices to groups in order to be able to select several devices at the same time, see *Figure 3-27*.

✧ Select a device.
The tags of this device are shown in a list on the right-hand side of the window.

✧ In the **Alarm logging**, **Tag Management**, and **Tag logging** columns, select the WinCC components, or in the Use column select the process tags that you want to import with the SICAM IEC Wizard.

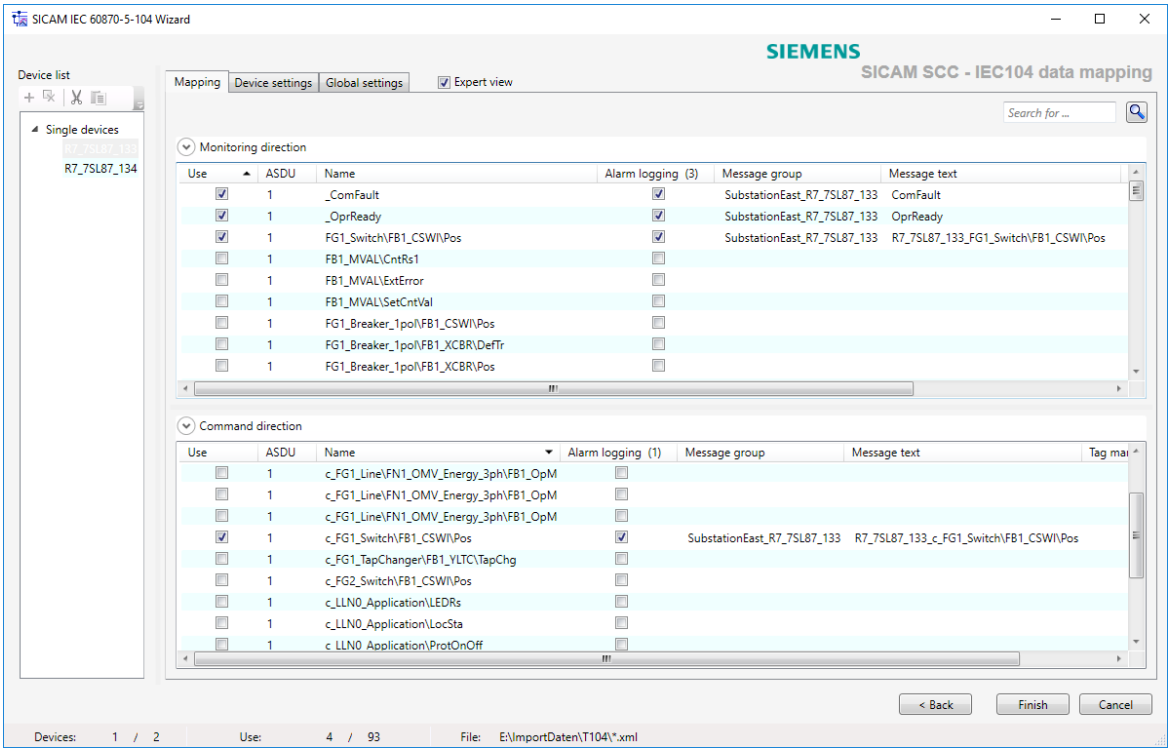
Right-clicking the column heading of the **Monitoring direction** or **Command direction** lists opens a context menu. This allows you to show additional columns in the lists in order to display the names modified for SIMATIC WinCC.

By clicking **Additional columns** you can show or hide all columns at once.

The additional columns are:

- For **Alarm Logging:** the **Message Group** and **Message Text** columns.
- For **Tag Management:** the columns **Variable group** and **Process information**.
- For **Tag Logging:** the **Tag logging hierarchy** and **Tag logging information** columns.

The texts for these columns are created when selecting a process tag for the tags (components).



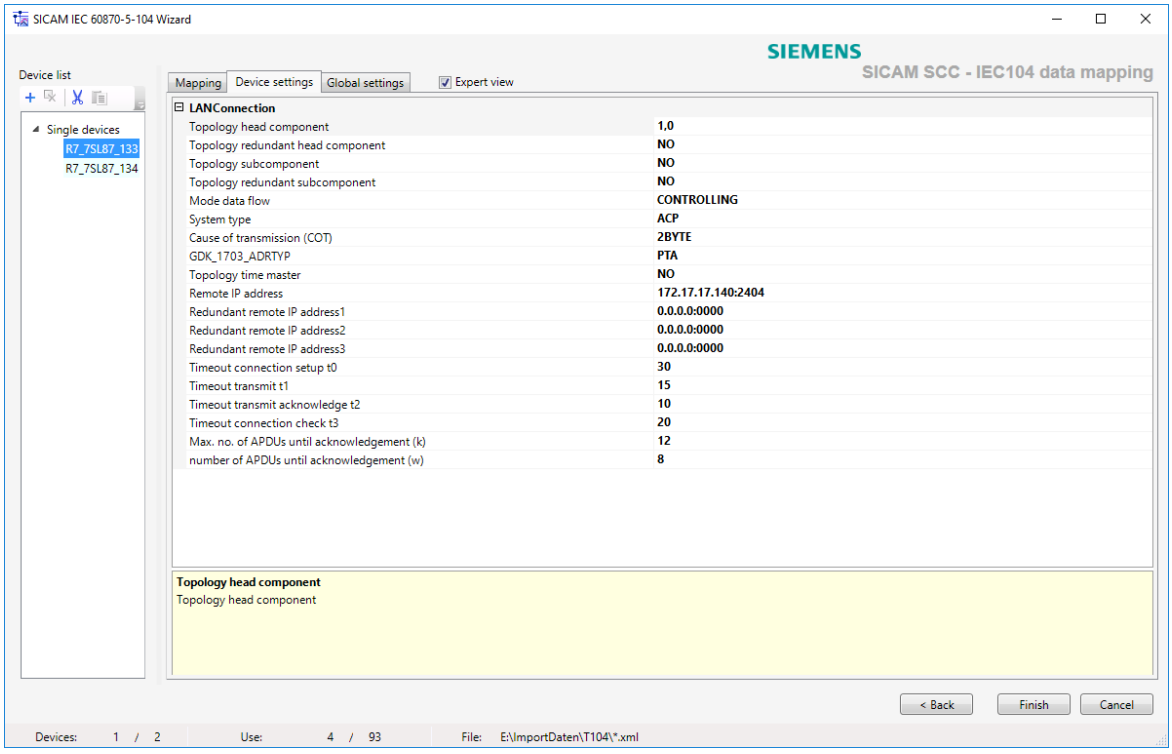
[scc_104_08, 2, en_US]

Figure 3-24 SICAM IEC 60870-5-104 Wizard, Showing Additional Columns

✧ Activate the **Expert view** in order to select the **Device Settings** and **Global settings** tabs.

Device- and Driver-Specific Settings

✧ Select the **Device settings** tab.

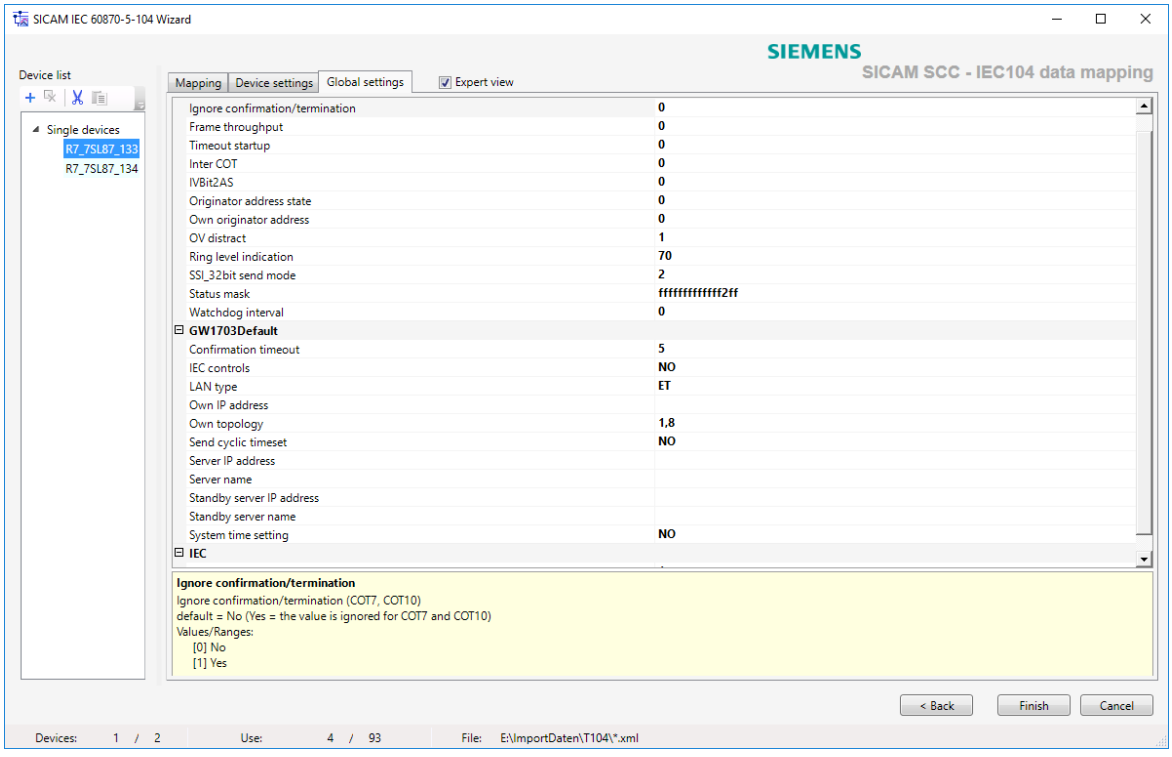


[scc_104_10, 2, en_US]

Figure 3-25 SICAM IEC 60870-5-104 Wizard, Showing Device Settings

The settings of the selected device are displayed. They correspond to the parameters in the XML file.

✧ Select the **Global Settings** tab.



[scc_104_11, 2, en_US]

Figure 3-26 SICAM IEC 60870-5-104 Wizard, Showing Global Settings

The general, device-independent settings are displayed.

You can only define these parameters in the first station imported into your project. They are valid for all the IEC 60870-5-104 stations of this project. Changes in other stations are ignored.

NOTE

The significance of these parameters corresponds to the significance of the parameters in the SICAM TOOLBOX II. No settings are required.

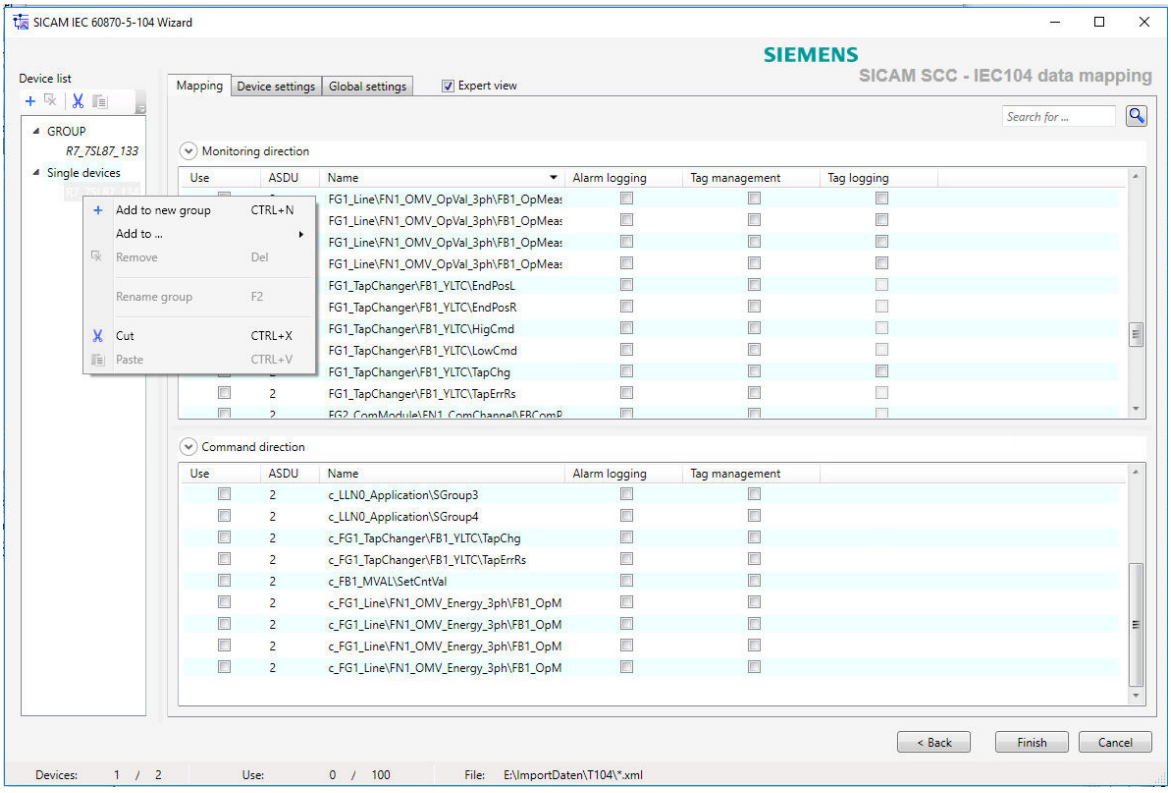
✧ Click **Finish** to close the dialog.
This starts the device data import.

Combining Devices into Groups

After the first start of the SICAM IEC 60870-5-104 Wizard, all previously selected devices (Figure 3-21) are listed in the device list under **Single Devices**. You can now combine devices into groups and then select tags for several devices at the same time.

The settings of the first device of the group are transferred automatically to the devices which are subsequently added to the group.

To combine devices into groups, use the context menu, the Drag&Drop function or the toolbar. Make sure that you only combine devices of the same type and with the same data points. Each device group must be assigned a unique name.



[scc_104_12, 2, en_US]

Figure 3-27 SICAM IEC 60870-5-104 Wizard, Combining Devices into Groups

NOTE

The handling of the SICAM IEC 60870-5-104 Wizard is similar to the handling of the Windows Explorer

To edit a device group:

✧ Select the device group.
The data points of the devices in the group are displayed.

✧ In the **Alarm Logging**, **Tag Management**, and **Tag Logging** columns, select the tags to be imported using the SICAM IEC Wizard.
The selection applies to all the devices in the group.

The devices of a group cannot be edited individually. If you remove a device from the group, it is displayed under **Single Devices** once again and can be edited separately. The device maintains the current parameter settings.

3.2.4.4 IEC 61850 Devices

NOTE

For importing IEC 61850 data from an ICD/IID/CID/SCD file, you require the separate **SCD import for IEC 61850 communication** license.

NOTE

When importing an IEC 61850-SCL file, up to 50 reports per device can be included.

NOTE

If static data records are used in your protection device connected via IEC 61850, you must make sure that all the information defined in SICAM SCC is also defined in the parameters of the static data record of your device. If information is missing, the driver switches to cyclic polling. In this case, the correct logging of information in your message lists cannot be ensured.

NOTE

For **IEC 61850 tools** such as the **SysCon**, Client ICD files for SICAM SCC are included on the DVD (directory: ProductEnhancements\IEC61850).

These files can be imported into the SysCon. When assigning information to a SICAM SCC, you can select **SCC-relevant** during the SCD import. This ensures that only the information assigned in SysCon is imported.

Special Treatment for Enumerated CDC Types

When importing an ENUM tag, a special message is created in the AlarmLogging for each ENUM value. The description of the ENUM value is integrated in the message text. One message of the current ENUM value each is logged as raised, and the previous message is logged as cleared. Enumerated CDCs are e.g. the direction information of a general pickup.

If a general pickup is triggered during operation, all the messages are transmitted to SICAM SCC and are entered in the message lists in case of status changes (e.g. interruption of connection).

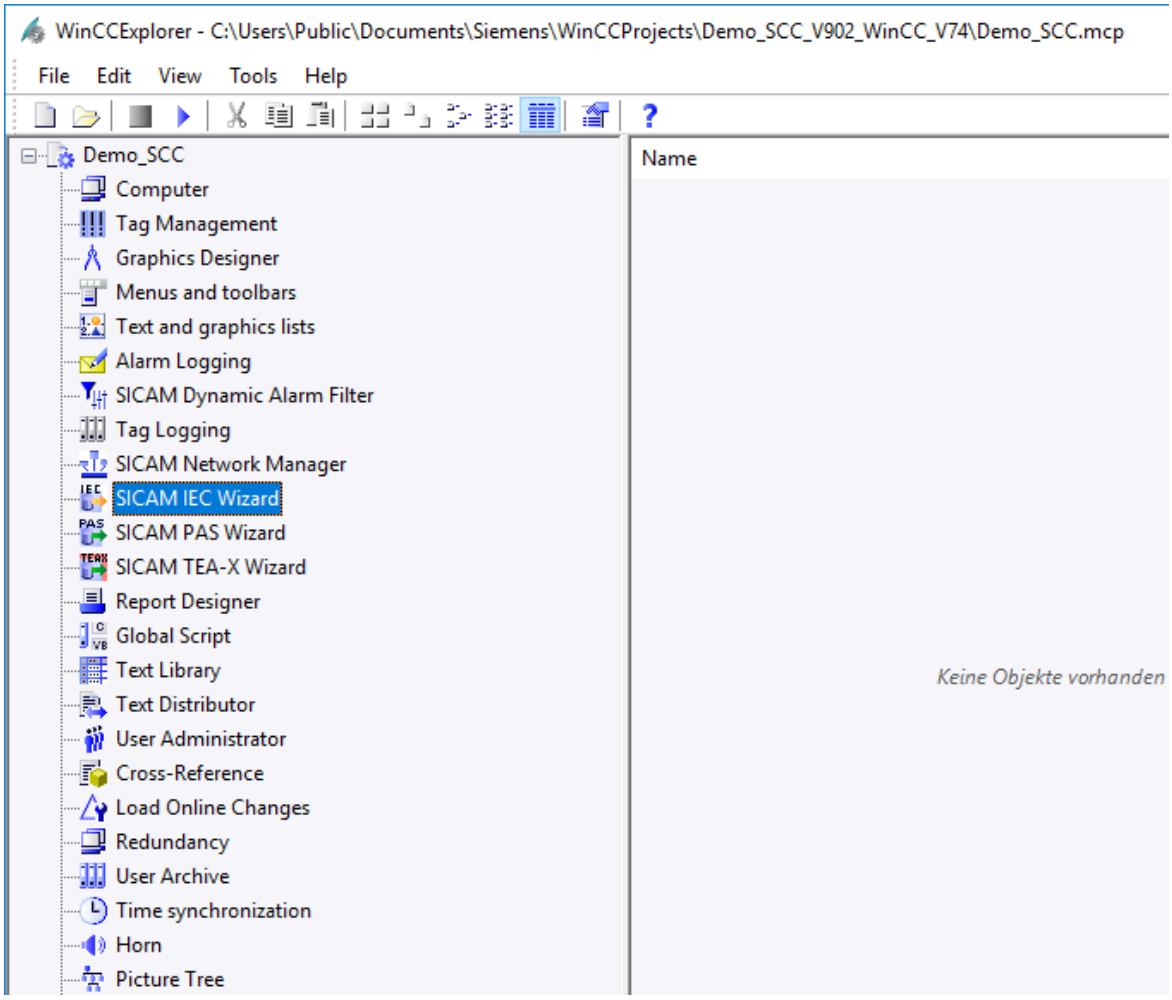
Only one single tag is created in the Tag Management. Its runtime value corresponds to the ENUM value.

The significance is defined in the device configuration, e.g. in DIGSI, from where it can be transmitted. The ENUMs are also described in the SCL import file.

Starting the SICAM IEC Wizard

To start the SICAM IEC Wizard:

✧ In the **WinCC Explorer**, double-click **SICAM IEC Wizard**. The SICAM IEC Wizard starts.

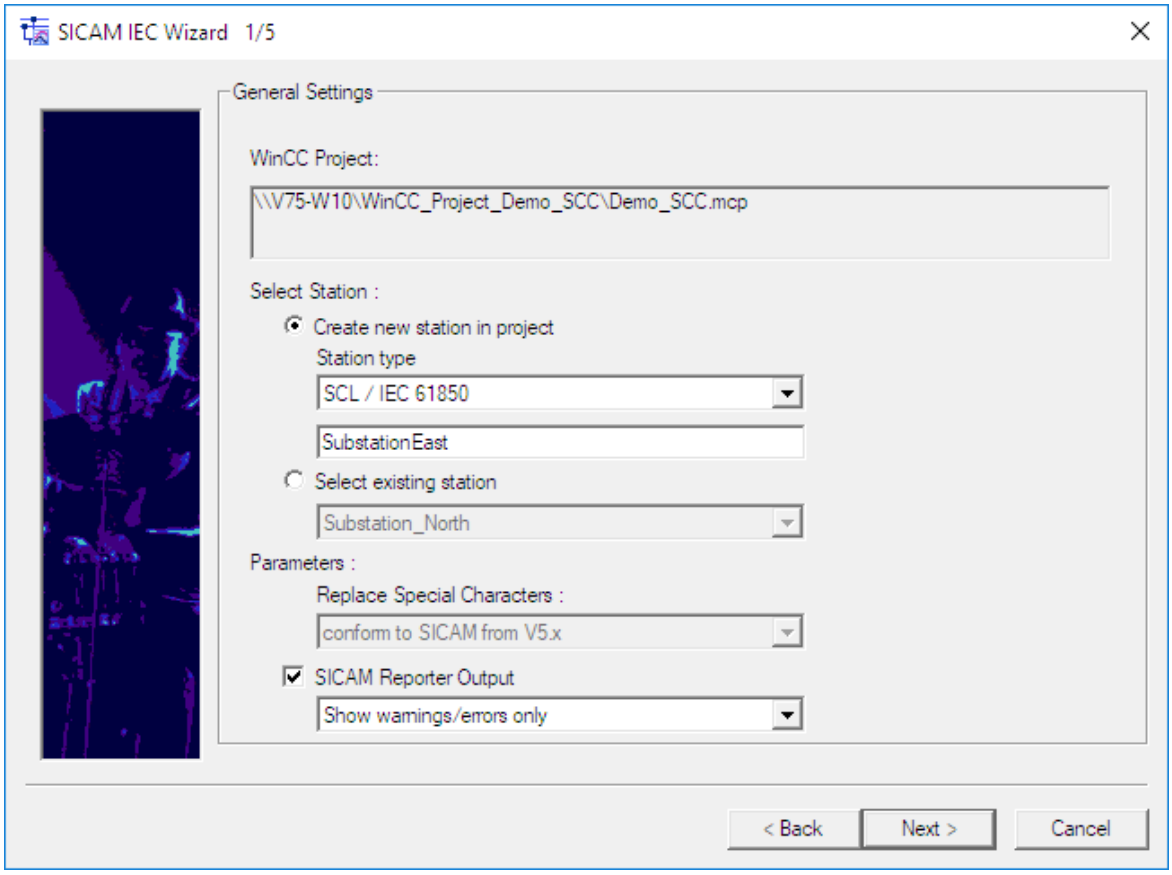


[pascc310_1703, 1, en_US]

Figure 3-28 Calling up the SICAM IEC Wizard

✧ Click **Next**.

Selecting the Station and Parameters



[scc_61850_02, 2, en_US]

Figure 3-29 Selecting the Station and Parameters

- ✧ In the **1/5** dialog, select the **Station type** (type of the file to be imported).
  · SCL / IEC 61850
  Import of SCL-compliant files (*.scd,*.icd,*.cid,*.iid).
- ✧ Enter a **name** for the new station.
- ✧ Select the **Parameters**.
- ✧ Click **Next**.

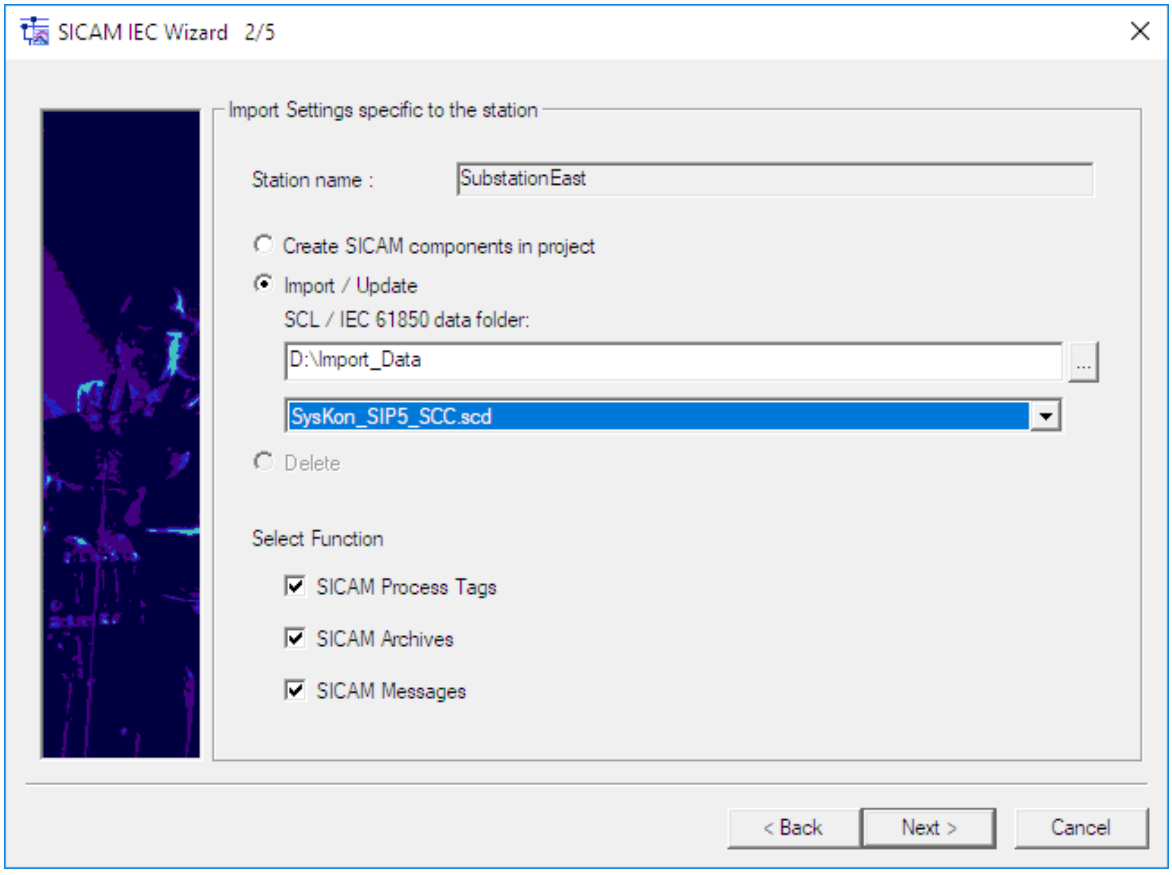
Importing Station Data and Selecting Functions

In the **2/5** dialog, enter the components to be imported into the SICAM SCC project using the SICAM IEC Wizard.

- ✧ Select the **Import/Update** option.
- ✧ Select the path under which the ICD/IID/CID/SCD file is stored.

An ICD/CID file includes the data of **one** IEC 61850 device; an SCD file includes the data of one or **several** IEC 61850 devices.

- ✧ Select the file to be imported.
- ✧ Select the **functions**.



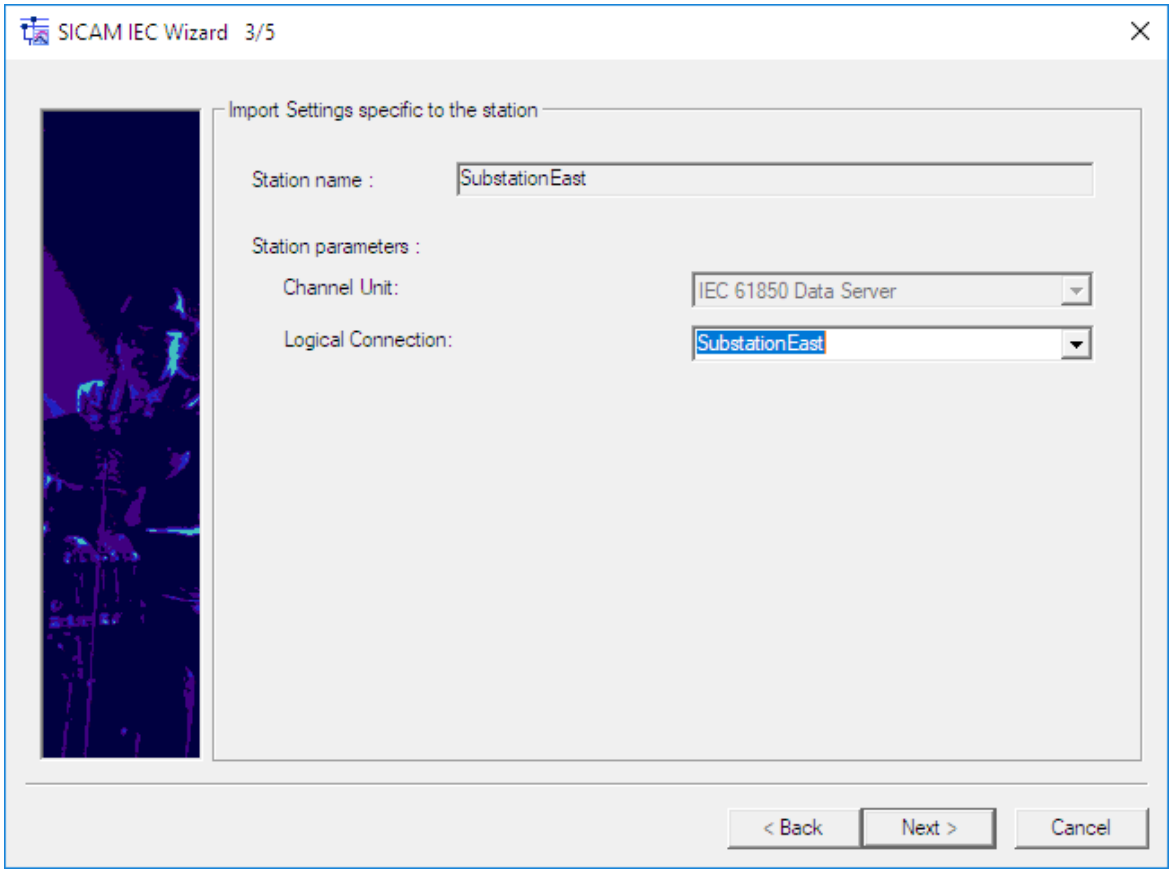
[scc_61850_03, 2, en_US]

Figure 3-30 Defining the Path and the Name of the Import Components

✧ Click **Next**.

Defining Station Parameters

✧ Define the station parameters in the 3/5 dialog.



[scc_61850_04, 1, en_US]

Figure 3-31 Defining Parameters for IEC 61850 Devices

The **Channel Unit** is pre-selected according to the selected **Station type**.

The **Logical Connection** is derived from the station name when setting up a new station. It only may be adjusted before the first import.

✧ Click **Next**.

To connect IEC 61850 devices, set the connection parameters (when importing an ICD file) in the SICAM IEC61850 Wizard, if required. The connection parameters are included in the CID/SCD file and are applied by the SICAM IEC61850 Wizard.

Initializing the Project

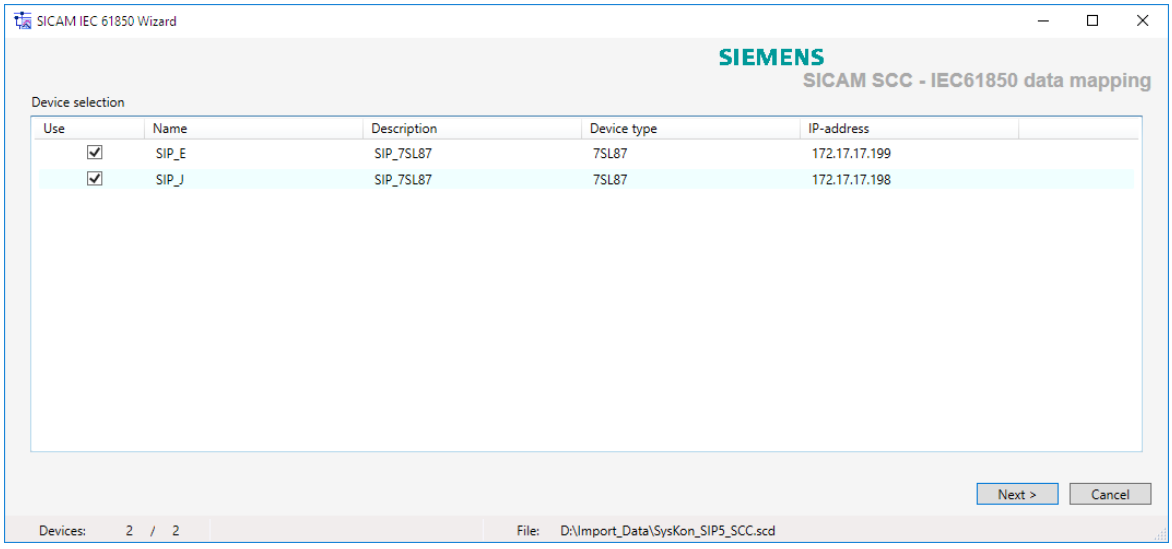
✧ Define the **project-specific settings** in the **4/5** dialog.

✧ Click **Next**.

✧ In the **5/5** dialog, click **Finish**.
The **SICAM IEC61850 Wizard** starts.

Editing Device Data

The **SICAM IEC61850 Wizard** provides an SCD import mapping interface where you can select the information to be created in SICAM SCC. In addition, you can configure device and connection parameters in the Expert view.



[scc_61850_05, 1, en_US]

Figure 3-32 SICAM IEC61850 Wizard, Selecting Devices

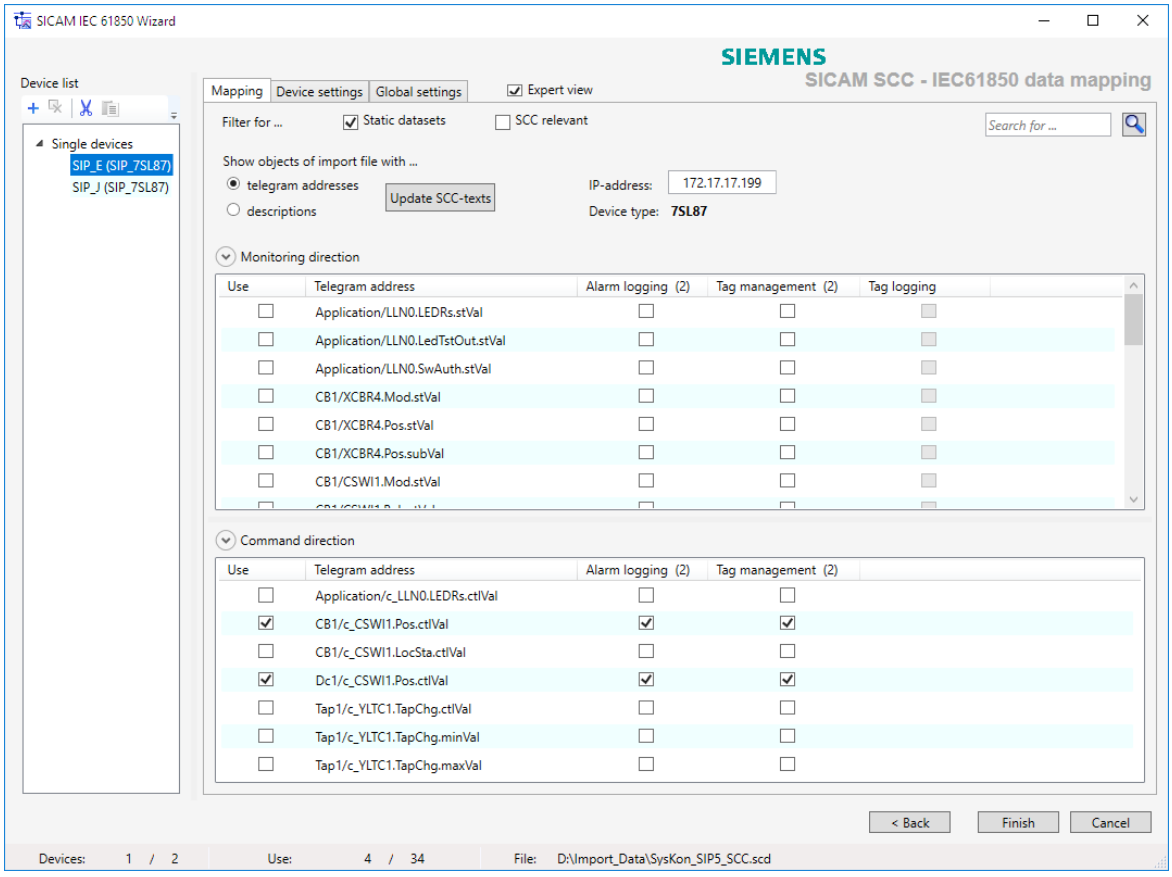
If the imported file only contains 1 device the device selection is not displayed.

✧ Click **Next**.
The next dialog opens.

✧ To view all information, activate the **Expert view**.

✧ Select the **Mapping** tab.

With the options **Telegram addresses** and **Descriptions** you can define the display of the second column. The texts shown for the process tags are transferred from the ICD/SCD file.



[scc_61850_06, 1, en_US]

Figure 3-33 SICAM IEC61850 Wizard, Selecting Tags

A list of all the previously selected devices is shown on the left-hand side in the window.

NOTE

You can combine devices into groups in order to be able to select several devices at the same time, see *Figure 3-39*.

Static Datasets

If you activate this option, only the information points are shown that are available via static datasets in the SCD file.

If a device does not support dynamic datasets, you can only select the data for import which are defined in the static datasets. In this case, you cannot deactivate this option.

SCC relevant

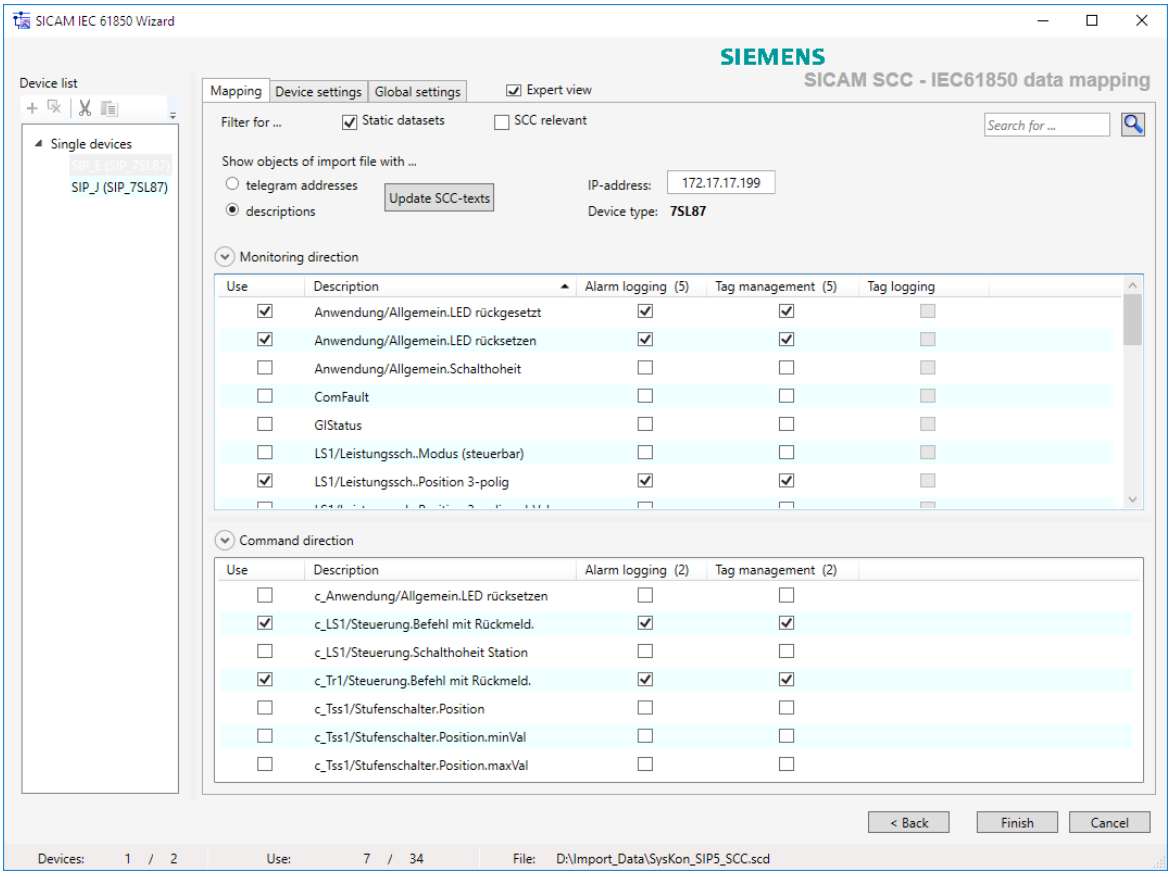
If you activate this option, only the information points are shown that have been assigned to one or more clients in SYSCON.

If this option is active, the **Static Datasets** option will not be considered.

✧ Select a device.

The tags of this device are shown in a list on the right-hand side in the window.

✧ In the **Alarm logging**, **Tag Management** and **Tag logging** columns, select the WinCC components, or in the **Use** column, select the process tags which you want to import with the SICAM IEC Wizard.



[scc_61850_07, 1, en_US]

Figure 3-34 SICAM SCD Wizard, Showing Descriptions

Right-clicking the column heading of the **Monitoring direction** or **Command direction** lists opens a context menu. This allows you to show additional columns in the lists in order to display the names modified for SIMATIC WinCC.

By clicking **Additional columns** you can show or hide all the columns simultaneously.

The additional columns are:

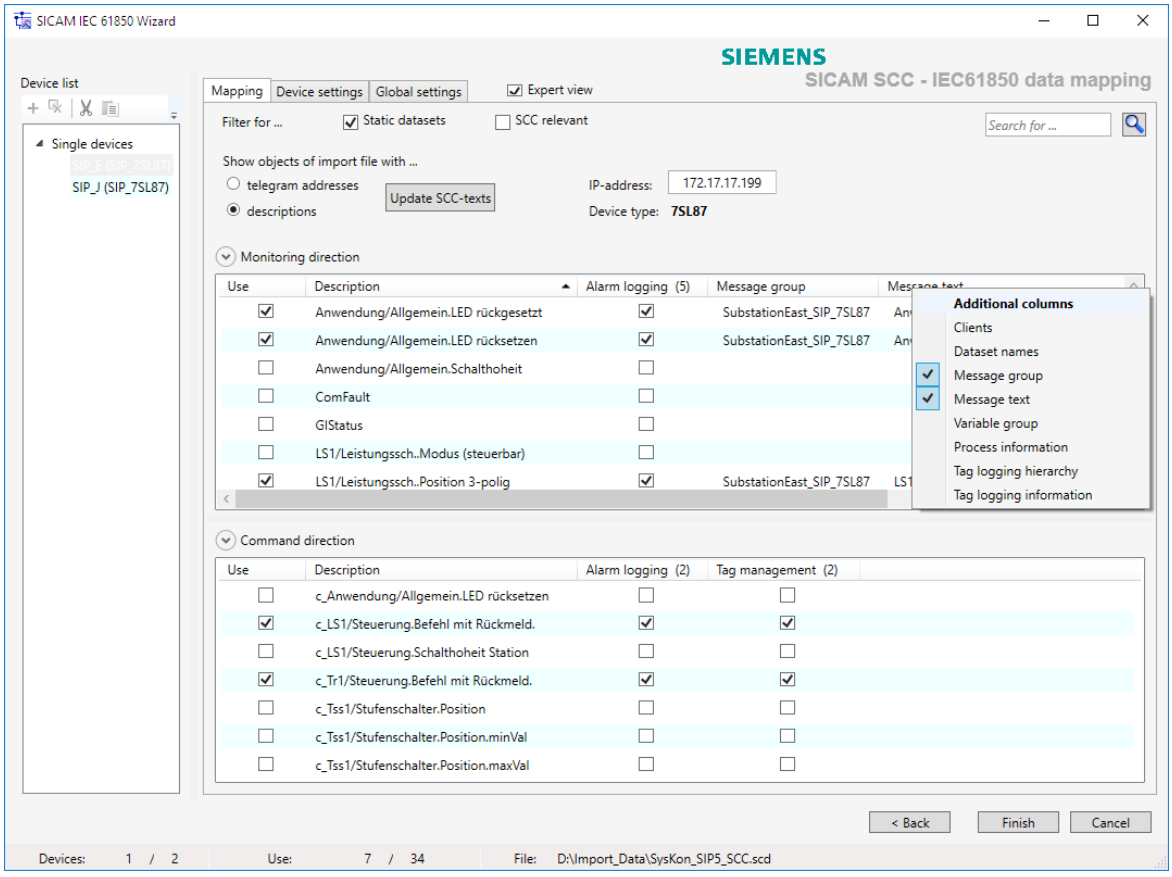
- **Clients**: This column shows the name of the Client to which the corresponding information points are assigned.
- **Names of the dataset**: This column shows the name of the data set to which the corresponding information points are assigned.
- For **Alarm logging**: the **Message Group** and **Message Text** columns.
- For **Tag management**: the **Variable group** and **Process information** columns.
- For **Tag logging**: the **Tag logging hierarchy** and **Tag logging information** columns.

The texts for these columns are created when selecting a process tag for the tags (components).

✧ With **Update SCC texts** you re-transfer the currently displayed texts for the selected devices of column 2 to the additional text columns.
This overwrites previously edited texts.

NOTE

Please note that dynamic display features in WinCC diagrams do not work anymore after changing a tag name.

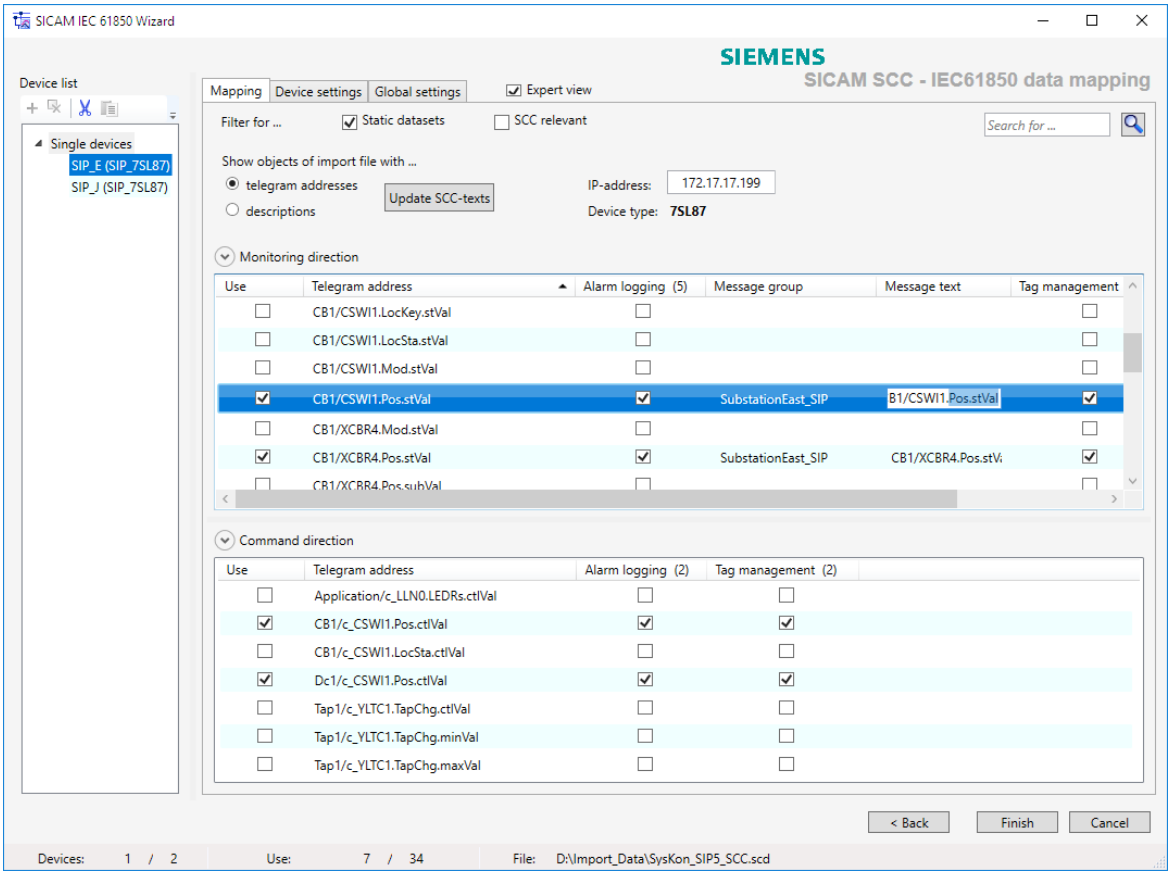


[scc_61850_08, 1, en_US]

Figure 3-35 SICAM SCD Wizard, Showing Additional Columns

Texts can only be edited for selected tags.

✧ Double-click the desired cell to edit the text. The tag is displayed later with this text in SIMATIC WinCC, e.g. in the Alarm Logging system.



[scc_61850_09, 1, en_US]

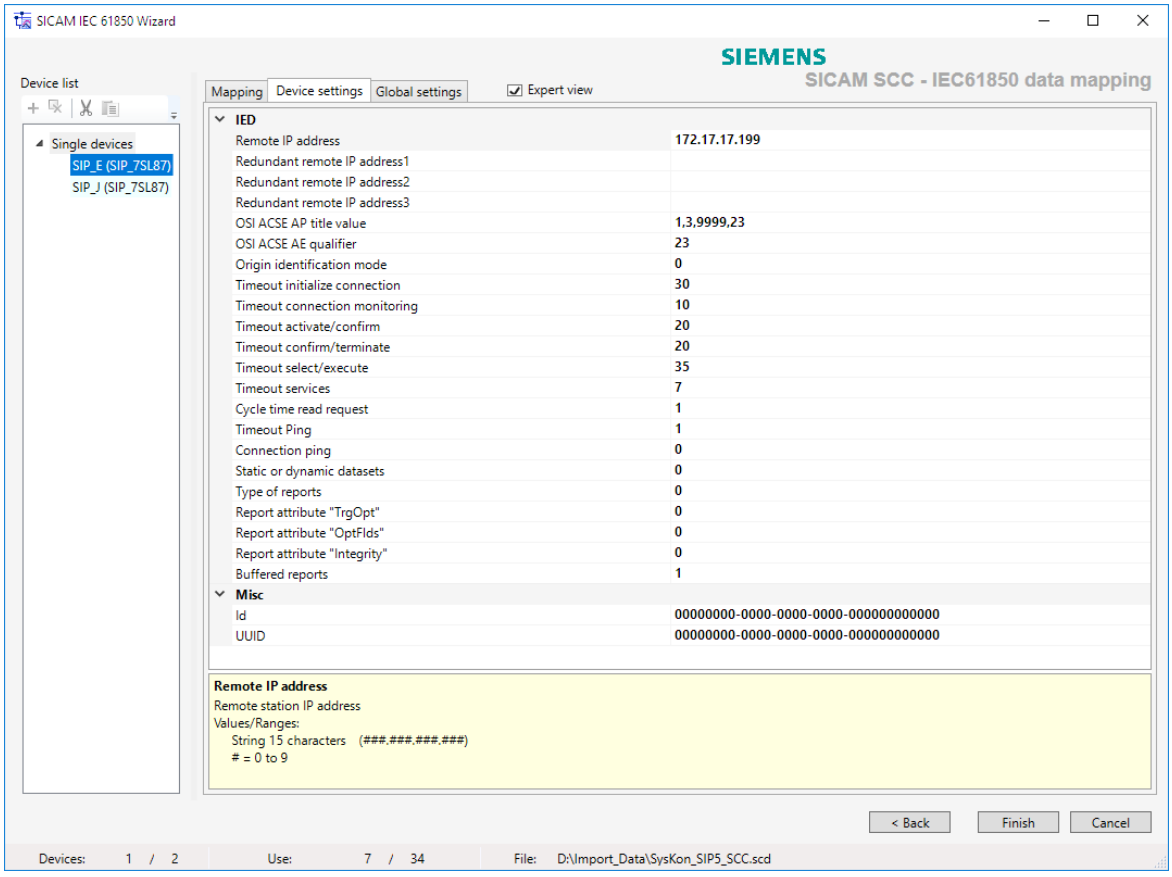
Figure 3-36 SICAM IEC61850 Wizard, Editing Texts

✧ Select the tags for the other devices.

✧ Activate the **Expert view** in order to select the **Device Settings** and **Global settings** tabs.

Device- and Driver-Specific Settings

✧ Select the **Device settings** tab.



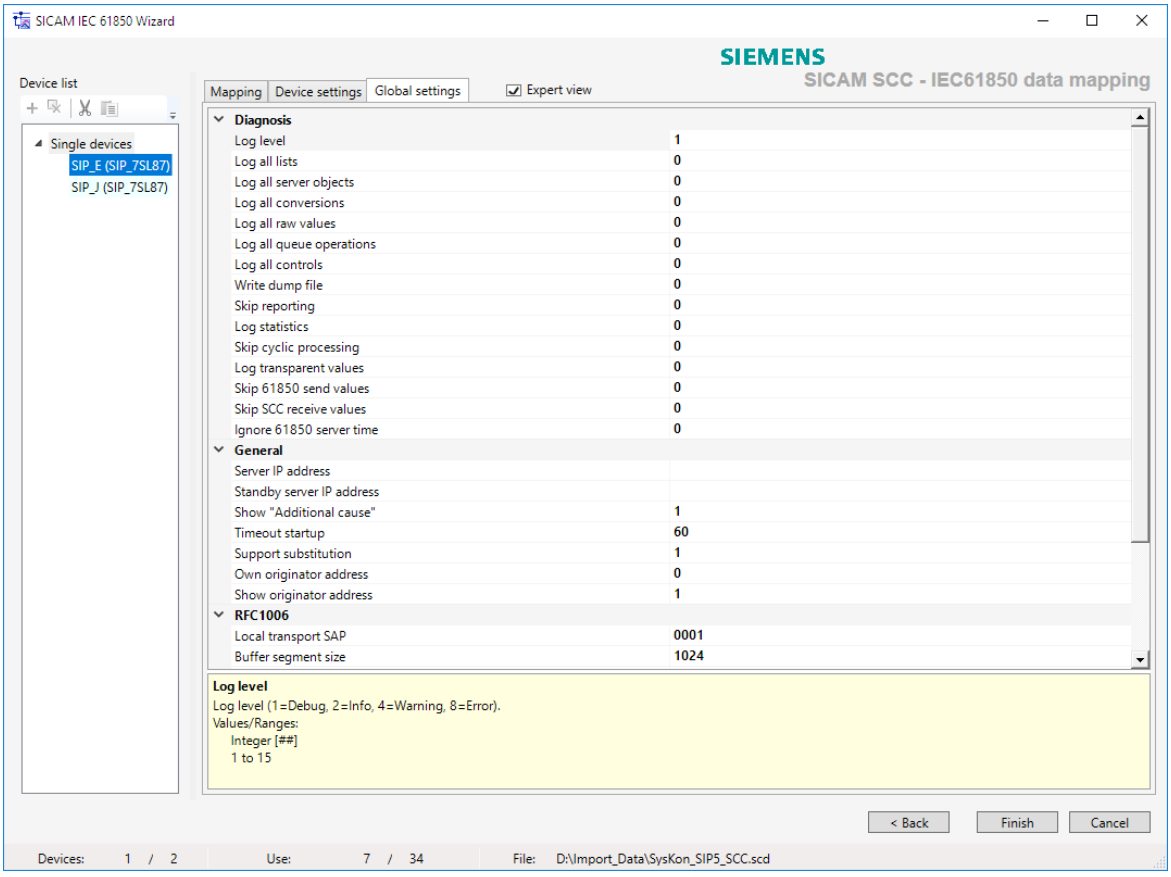
[scc_61850_10, 1, en_US]

Figure 3-37 SICAM IEC61850 Wizard, Showing Device Settings

The settings of the selected device are displayed. They correspond to the parameters in the SICAM TOOLBOX II.

When importing from an ICD file, the IP address of the IEC 61850 device is not imported. You must enter it under **Remote IP** address. No further settings are required.

✧ Select the **Global Settings** tab.



[scc_61850_11, 1, en_US]

Figure 3-38 SICAM IEC61850 Wizard, Showing Global Settings

The general, device-independent settings are displayed.

You can only define these parameters in the first station imported into your project. They are valid for all stations of this project. Changes in other stations are ignored.

If your system contains several network cards it may be necessary to configure the server IP address. A value of **0.0.0.0** switches the IEC 61850 driver to automatic mode. The routing is handled by Windows. This mode is required if you want to connect several networks simultaneously.

In order to route all connections over 1 network, enter the IP address of the corresponding network connection.

If no IP address is configured, the entire traffic is routed over the first network in the system.

NOTE

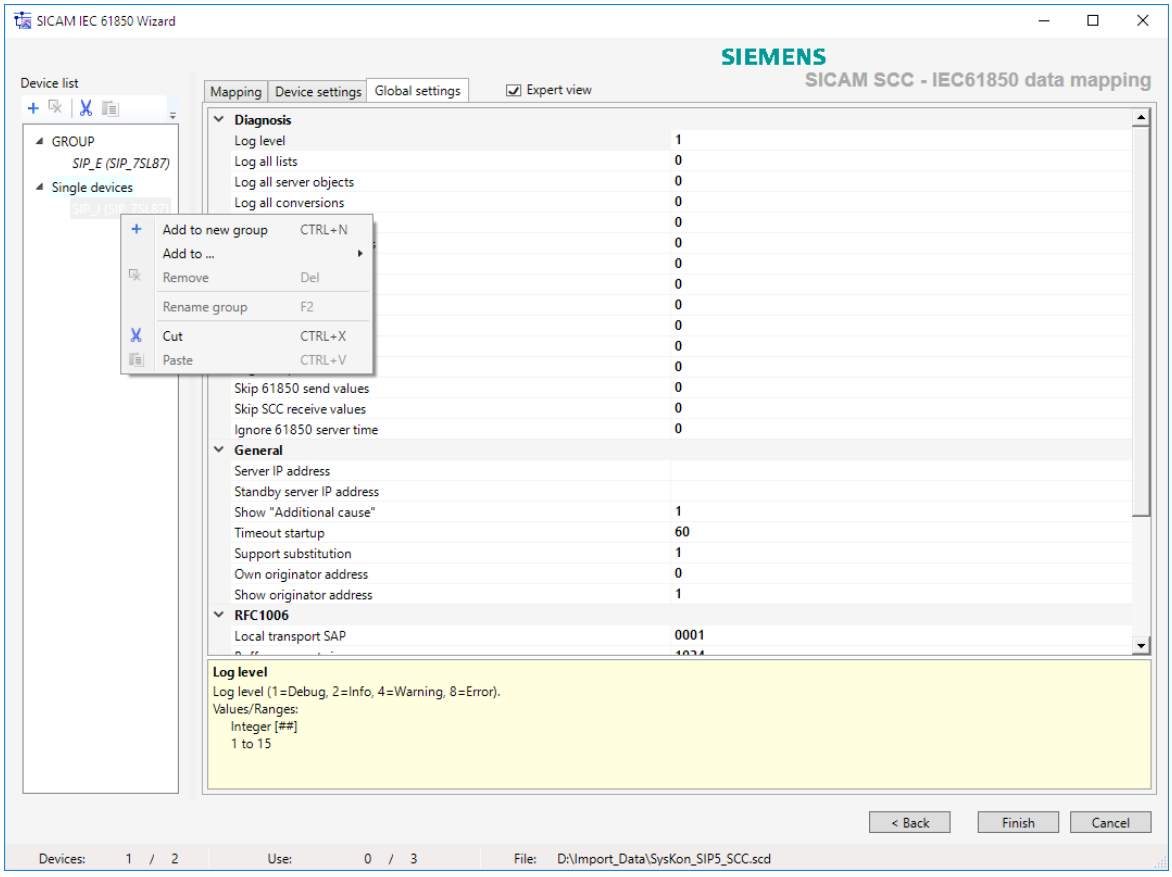
The significance of these parameters corresponds to the significance of the parameters in the SICAM TOOLBOX II. No settings are required.

✧ Click **Finish** to close the dialog.
This starts the device data import.

Combining Devices into Groups

After the first of the SICAM IEC61850 Wizard, all the previously selected devices (Figure 3-31) are listed in the device list under **Single Devices**. You can now combine devices into groups and then select tags for several devices at the same time.

To combine devices into groups, use the context menu, the Drag&Drop function or the toolbar. Make sure that you only combine devices of the same type and with the same data points. Each device group must be assigned a unique name.



[scc_61850_12, 1, en_US]

Figure 3-39 SICAM IEC61850 Wizard, Combining Devices into Groups

To edit a device group:

✧ Select the device group.
The data points of the devices in the group are displayed.

✧ In the **Alarm Logging**, **Tag Management**, and **Tag Logging** columns, select the tags to be imported using the SICAM IEC Wizard.
The selection applies to all devices in the group.

The devices of a group cannot be edited individually. If you remove a device from the group, it is displayed under **Single Devices** once again and can be edited separately. The device maintains the current parameter settings.

NOTE

The table always displays the information of the first device of the group.
All the devices must be configured identically:

- Information that is not provided by all devices will not be displayed.
- You cannot filter for datasets that are not available in the first device.

Using the Originator Address for Checking the Switching Authority

For SIPROTEC 5 IEC 61850 devices you can use the originator address for a switching authority check. To do this, change the value of the **Originator addresses** to 1 in the settings of the corresponding device using the SICAM IEC 61850 Wizard.

- ✧ Send Direction
  Define your HMI's own originator address in the **Own originator address** parameter in the **Global settings** tab.
- ✧ Receive Direction
  To show the originator address of a command in your message list, set the **Show originator address** parameter to **1** in the **Global settings** tab.

The texts are assigned values in the **PasNorm.ini** file. A template for this INI file is available in the **misc** directory of the SICAM SCC installation. Copy this **PasNorm.ini** file into your project directory.

Before creating your project you can define up to 30 user-specific texts in the text library. Enter these texts in the **sicam_messagetext.txt** file, from TextID 1770 onwards.

The defined texts are assigned to the corresponding originator address via the **PasNorm.ini** file. You can assign several originator addresses the same TextID.

When receiving changed information with an originator address set, your defined text is shown in the **Location** message list column instead of the standard texts **NEAR**, **REMOTE** and **LOCAL**.

3.2.4.5 SICAM PAS/PQS and SITIPE

Import

Use the **TEA-X Wizard** in order to import TEA-X export files from SICAM PAS/PQS or SITIPE. The functions of the TEA-X Wizard are to a large extent identical with those of other wizards.

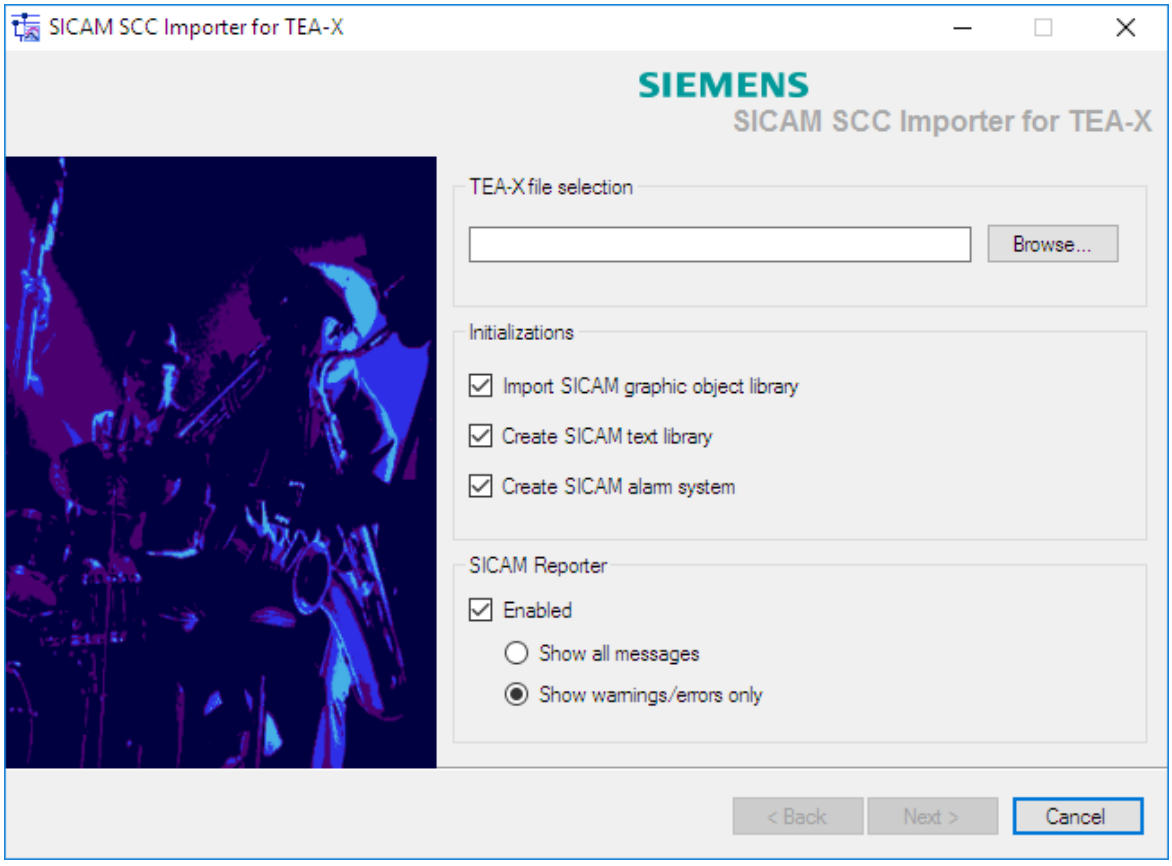
Several TEA-X files of different SICAM PAS/PQS projects can be imported.

The Wizard automatically realizes if there is an update of an existing project or an import of an additional station.

Restrictions

Consider the following when using the TEA-X Wizard together with other Wizards in a project:

- When creating a new project, first execute an import or use the **Create SICAM components in project** option with one of the other Wizards.
  The reversed order causes problems. The other Wizards cannot recognize if the TEA-X Wizard has already been initialized in a project.
- Neither a plausibility check nor a data synchronization is performed between the TEA-X Wizard and other wizards. This means that e.g. identical project IDs might be imported, which can result in an inconsistency of the project.
- An imported station cannot be deleted.
- The user interface is only available in English.



[sc_tea-x_wizard, 1, en_US]

Figure 3-40 SICAM TEA-X Wizard

Export

The TEA-X Wizard can export single stations from SICAM SCC to a TEA-X file. This file can be edited and also imported afterwards into a new project.

3.2.5 Connection Parameters

The steps to be performed for the configuration of the connection parameters depend on the station or device connected to SICAM SCC in the individual case.

- **SICAM PAS**
  No connection parameters need to be defined when connecting a **SICAM PAS** station Version 8.00 or later. The connection parameters are transferred from the SICAM PAS import file.
  The connection parameters for older versions of SICAM PAS are pre-assigned with default values.
  The connection parameters must correspond to the values defined in SICAM PAS. Check the connection parameters as described below.
- **SICAM RTUs**
  No connection parameters need to be configured for the connection of **SICAM RTUs**. The connection parameters, and also the redundancy setting, are included in the **SXD** file. You can check the settings in your SICAM TOOLBOX II project.
- **SCD/CID Files**
  No connection parameters need to be configured for importing **SCD** and **CID** files. All relevant parameters are included in these files.

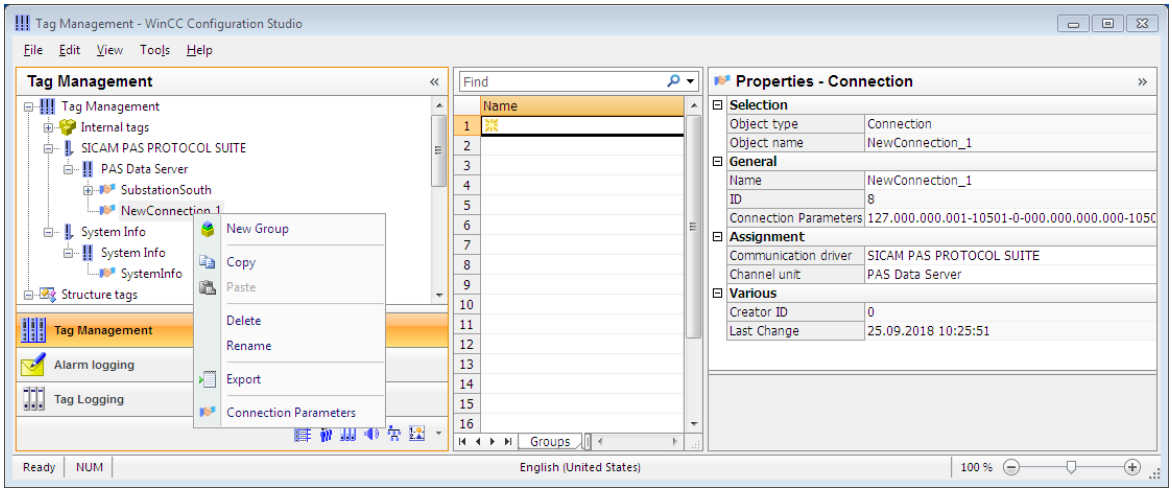
- **XML Files**
  To import **XML** files, the connection parameters must be defined using the **SICAM IEC 60870-5-104 Wizard**, see *3.2.4.3 IEC 60870-5-104 Devices*.
- **ICD Files**
  To import **ICD** files, the connection parameters must be defined using the **SICAM IEC61850 Wizard**, see *3.2.4.4 IEC 61850 Devices*.

NOTE

During a data import using the SICAM Wizard, the manually changed connection parameters are overwritten with the parameters from the import file. For this reason, the connection parameters must be checked after the data import.

To check the parameters for the connection to the SICAM PAS station:

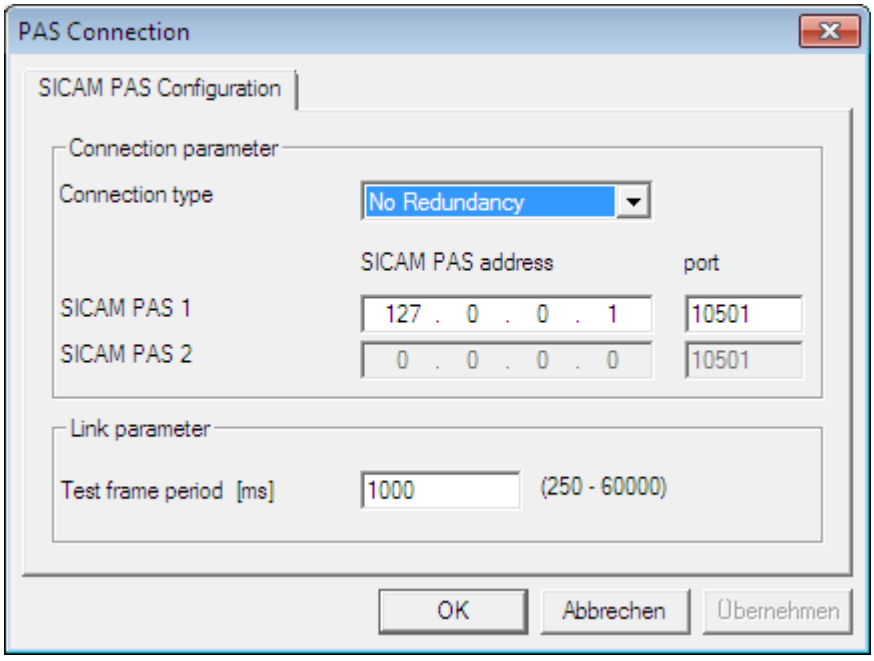
✧ Click the desired station in the **Tag Management** under **PAS Data Server**.



[pascc321, 1, en_US]

Figure 3-41 Station, Properties – Connection

✧ Click ... to define the IP address of the corresponding SICAM PAS system. The **PAS Connection** dialog opens.



[pascc322, 1, en_US]

Figure 3-42 Entering the IP Address

✧ Enter the IP address of the SICAM PAS system.

✧ Click **OK** to confirm your settings.

3.3 Creating a Control Diagram

Purpose

The control diagram serves for displaying detailed information concerning the individual station sections to be controlled. For this purpose, you use the graphic objects from the graphic object library in order to represent color changes, blinking, etc.

DThe configured switching operation must be performed as follows:

- Select a switch
  Click the switch icon to open the dialog for selecting the switching direction.
- Select the switching direction
  To select the switching direction, click the corresponding button in the dialog in order to create the command and to display the buttons for issuing or canceling the command.
- Issue the command. Click the Acknowledge button in the dialog to issue the command.

The dialog closes if no additional operator action is performed within 30 seconds of clicking on a switch object.

Besides the two-step switching operation described above, two-step and synchronized switching is also possible (see *4.3 Using Graphic Objects*).

The different states of a switch are indicated by small, colored rectangles. A specific color can be selected for the following states:

- Not current
- PAS not OK
- Bay Blocking
- Substituted
- Telecontrol blocking

The switch object **blinks spontaneously** spontaneously if the value of the assigned tag changes and if **spontaneous** was entered as the cause.

When the command is issued, the switch object starts to **blink** in the set status as soon as the target switching direction (ON or OFF) has been selected. It stops blinking when the command has been completely executed or aborted.

In the target status, the blinking frequency is half the frequency for a spontaneous cause.

NOTE

For connections via IEC 60870-5-104 and IEC 61850, the blocking state is represented as Not topical..

Switching device objects

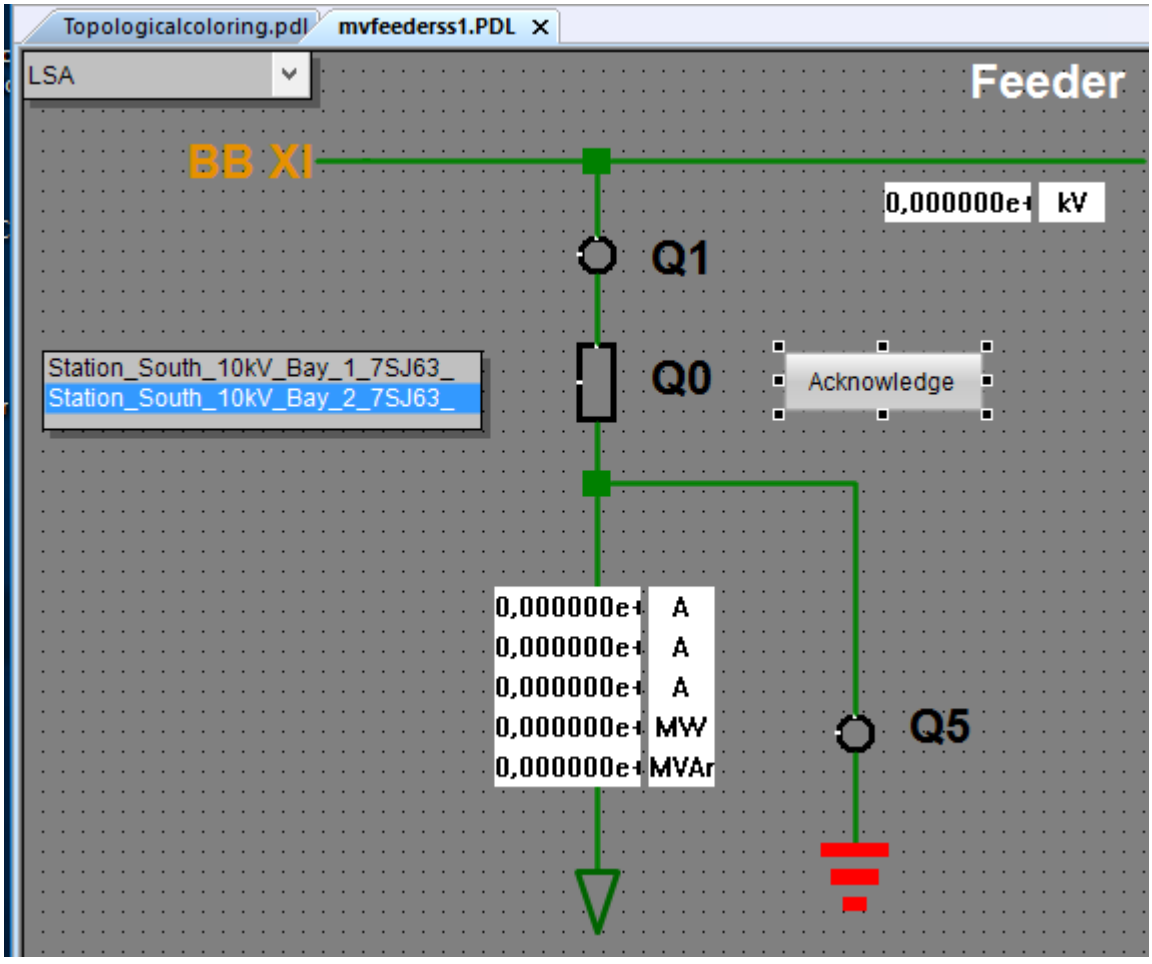
Use ActiveX Controls from the SICAM graphic object library as a circuit breaker or disconnector objects. Since the above-mentioned functions are already integrated in these controls, you can create a fully functional user interface within a short time.

Ground disconnectors and feeders

To perform the **topological coloring**, use ActiveX Controls from the SICAM graphic object library as ground disconnectors/feeders.

Connector and node

To realize the topological coloring, use connectors and nodes from the SICAM graphic object library.



[Detail1, 1, en_US]

Figure 3-43 Control diagram with circuit breaker and indicator

How to proceed

To create the control diagram:

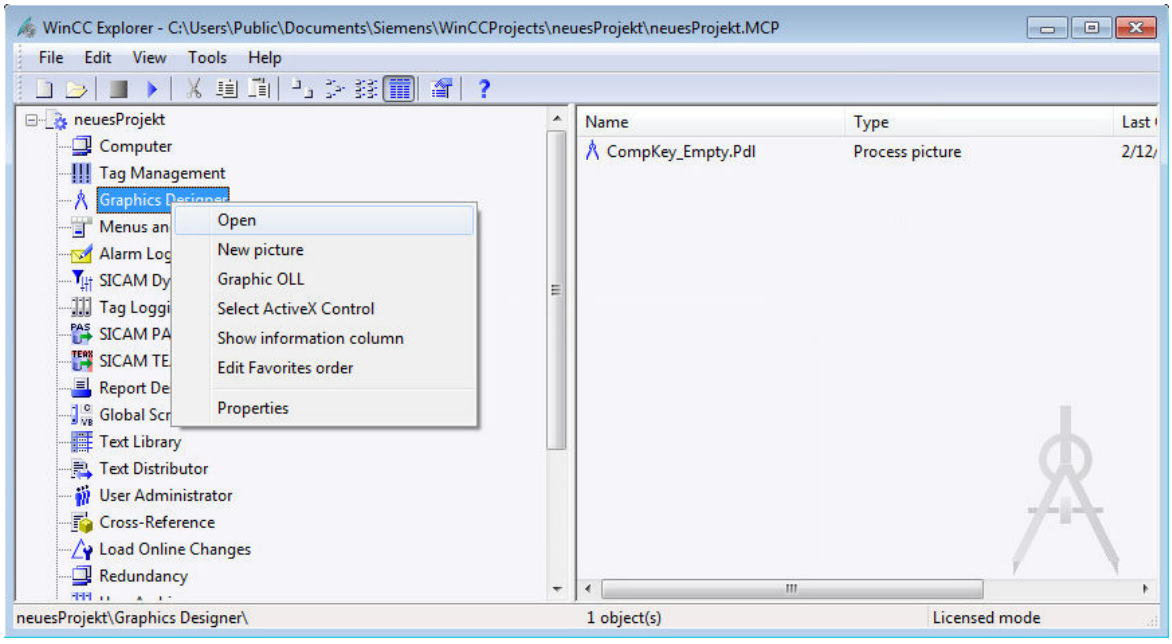
- Create a new diagram under the name **Detail_E01.PDL**.
- To do this, insert the objects from the SICAM graphic object library.

To control and show objects in the control diagram, the individual objects must be assigned tags.

3.3.1 Creating a New Diagram

To create a new control diagram:

✧ In the WinCC Explorer, double-click **Graphics Designer**.
Alternatively, you can open the **Graphics Designer** via the context menu.



[pascc331, 1, en_US]

Figure 3-44 **Graphics Designer** context menu

- ✧ This opens the Graphics Designer with an empty workspace.
- ✧ To save the diagram, click **File > Save as...**. In the file selection dialog which opens, enter **Detail_E01.PDL** as **file name**.

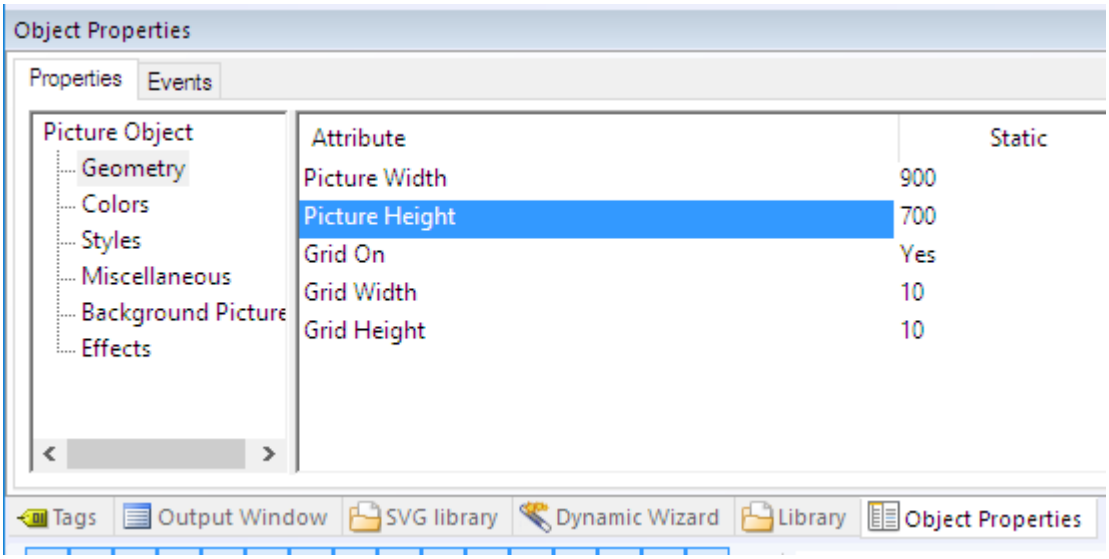
Defining diagram properties

Define the properties of **Detail_E01.PDL**.

- ✧ Right-click the workspace and select **Properties** from the context menu.
  The **Object properties** dialog opens.
- ✧ In the **Properties** tab, select the **Geometry** object property.

To create a diagram with a size of 900 x 700 pixels:

- ✧ Double-click **Picture width** and enter **900** in the dialog. Click **OK** to confirm.
- ✧ Double-click **Picture height** and enter **700** in the dialog. Click OK to confirm.
- ✧ Close the **Object properties** dialog.



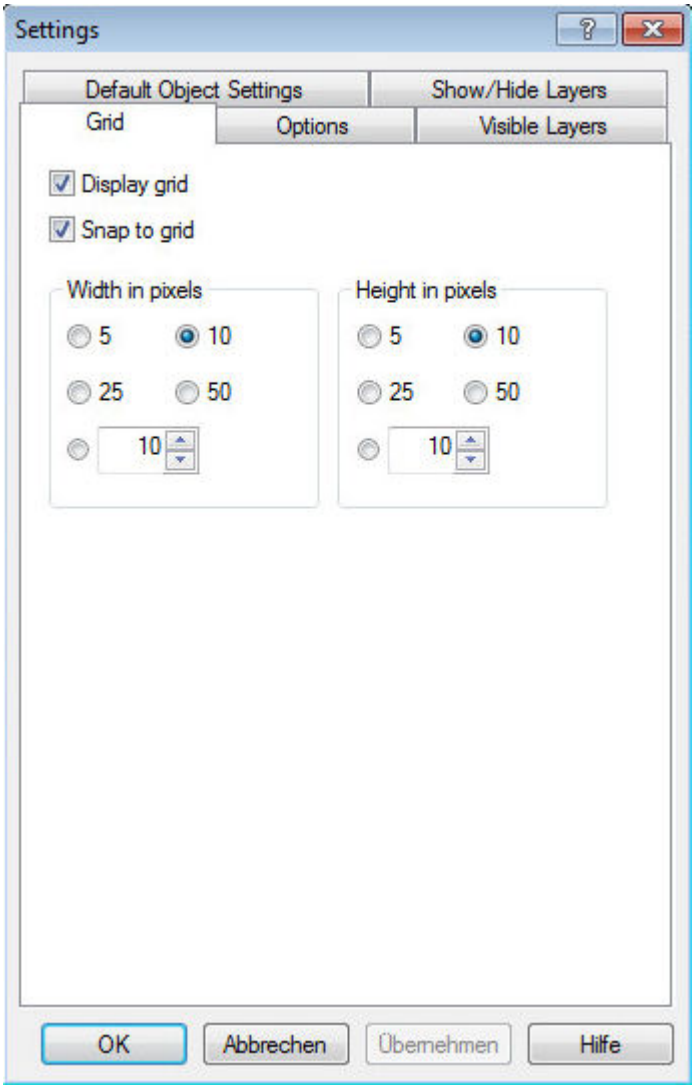
[pascc332, 1, en_US]

Figure 3-45 Defining the diagram size

Setting the grid

To facilitate your work, you should define the grid:

- ✧ To open the **Settings** dialog, click **View > Grid...**.
- ✧ Apply all settings as shown in below.



[pascc333, 1, en_US]

Figure 3-46 Settings of the workspace

3.3.2 Using SICAM Switch Controls

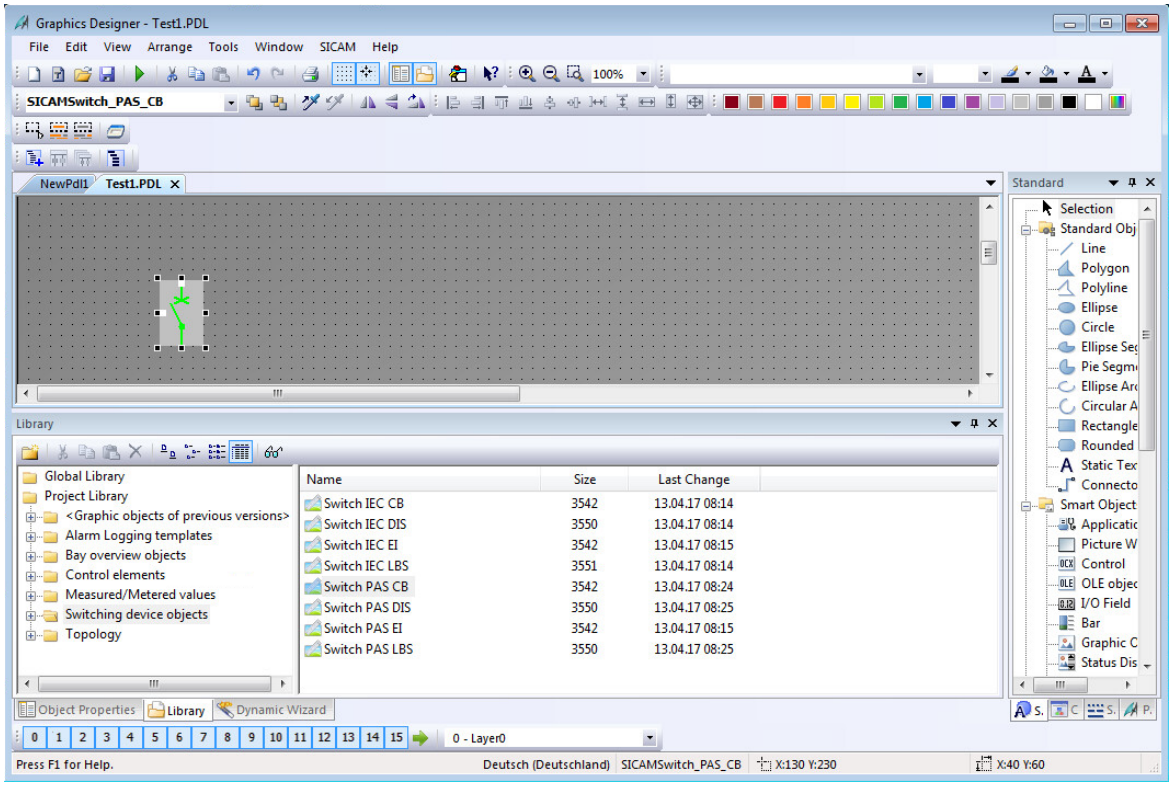
The Circuit breaker, Disconnector, Ground and Feeder control types are **ActiveX Controls**. When creating the picture, insert these controls and link them using lines or connectors.

The **Ground** and **Feeder** types must be positioned analogous to the switch controls. For more detailed information on how to define the necessary parameter settings, refer to *5.2.2 SICAM Electrical Device Control*.

Positioning a Switch Control

To position a SICAM Switch Control from the SICAM graphic object library on the workspace, proceed as follows:

- ✧ To open the **Library**, click **View > Library**.
- ✧ To show a preview of the graphic objects, click **Preview** in the toolbar of the **Library**.
- ✧ Select **SICAM LS** under **Switching devices**.
- ✧ Hold down the mouse button and move the cursor over the workspace until the graphic object has reached the desired position.



[pascc335, 1, en_US]

Figure 3-47 Positioning a graphic object

Setting the parameters of a switch control (switching device object)

To define the properties of your switch controls, open the **SICAM Switch Control Properties** dialog.

✧ To do this, double-click the graphic object.
The **SICAM Switch Control Properties** dialog opens.

The dialog consists of 6 tabs:

- In the **Style** tab you can define the representation style or orientation of the circuit breaker (see *Graphical representation, Page 112*).
- In the **Tag connection 1** and **Tag connection 2** tabs you define the protocol type and the protocol, assign tags to the circuit breaker and enter the tooltip text (see *4.4.2 Process Connection of SICAM Switch Controls*).
- In the **Advanced** tab you can assign further properties for the circuit breaker (see *4.4.3 Advanced Properties of SICAM Switch Controls*).
- In the **Color** tab you can assign specific colors for the switch positions and circuit breaker states (see *4.4.4 Colors of SICAM Switch Controls*).
- In the **Picture** tab you assign pictures for the circuit breaker values (see *4.4.5 Picture of SICAM Switch Controls*). You must only assign a picture to the switch control if you have selected the **Picture** option for **Norm** in the **Style** tab.

✧ Define the parameters and click **OK** to apply the properties.

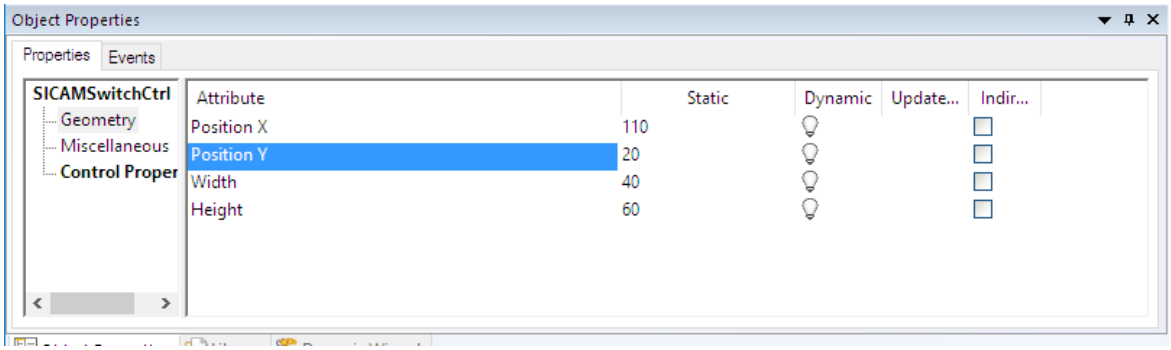
Specifying further properties

Specify further properties of the Circuit breaker and Disconnector objects in the context menu.

✧ Right-click the graphic object and select **Properties** from the context menu.
The **Object properties** dialog opens.

✧ Select the desired object property (e. g. **Geometry**) in the Properties tab.

✧ Double-click the attribute in order to modify the corresponding parameter.



[pascc343, 1, en_US]

Figure 3-48 Specifying object properties

✧ Close the **Object properties** dialog.

3.3.3 Using Connectors and Nodes

Positioning connectors and nodes

After you have added and defined all ActiveX Controls, you can add the lines (connectors and nodes).

Connectors and nodes which support topological coloring are available in the **Topology** folder of the SICAM graphic object library. With these graphic objects, you can show the states of lines in different colors during runtime.

For more detailed information concerning **topological coloring**, refer to*5 Topological Coloring*.

NOTE

You can also use simple lines or rectangles to represent connectors and nodes, but these lines and rectangles do not support topological coloring.

To position connectors and nodes from the SICAM graphic object library on the workspace, proceed as follows:

✧ To open the **Library**, click **View > Library**.

✧ Select a **Connector/node** under **Topology**.

✧ Hold down the mouse button and move the cursor over the workspace until the graphic object has reached the desired position.

After you have linked the graphic objects to the connectors, you must create the event functions and scripts.

✧ Click the **Enable picture for topology calculation** icon:

✧ Click the **Create project** icon:

The entire project, including the connection scripts, is now created. All the pictures changed are opened and generated during this process. If an error occurs when generating a picture (e.g. because a connector has not been connected correctly), the generation process is aborted and the defective, open picture is shown. You can correct the problem immediately.

Furthermore, you can view the progress of the picture generation process in the Report window. For more detailed information concerning error messages, refer to *5.3.5 Notes on Configuration*.

NOTE

The **Check current picture** function only checks the picture. The existing topology does not change as long as the picture has not yet been saved. Scripts are also not written.
As soon as you save the picture, it is highlighted as changed and the project must be created once again.

3.3.4 Displaying a Measured Value

For more detailed information on the measured value object refer to *4.8 Measured/Metered Value Display*.

Purpose

The detailed control diagram serves for displaying a measured value of SICAM PAS.

Inserting a Measured-Value Object

Change to the **Graphics Designer** and insert a measured value object in your control diagram:

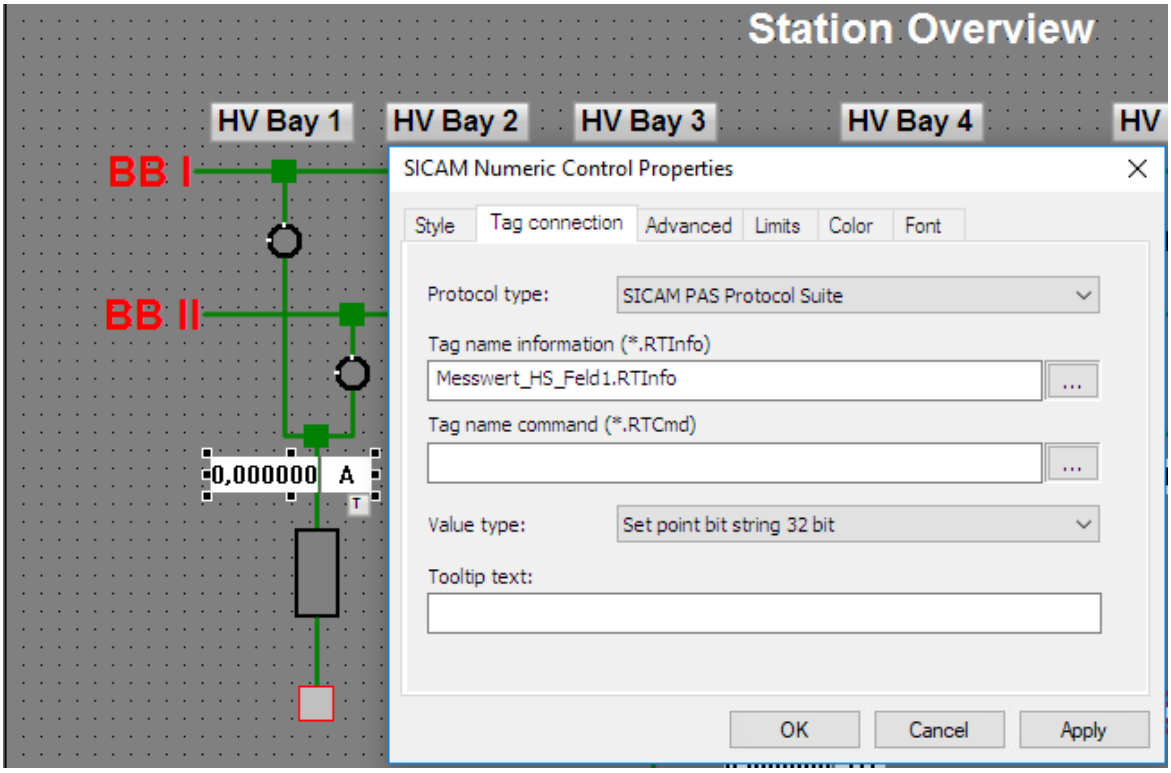
- ✧ To open the **Library**, click **View > Library**.
- ✧ To show a preview of the graphic objects, click **Preview** in the toolbar of the **Library**.
- ✧ Select **SICAM Measured Value** under **Measured/Metered Value**.
- ✧ Hold down the mouse button and move the cursor until the graphic object has reached the desired position.

Connecting a Tag

- ✧ Double-click the measured value object inserted. The **SICAM Numeric Control Properties** dialog opens.
- ✧ Select the **Tag connection** tab.
- ✧ Click ... to the right of the **Tag name information** entry field.
- ✧ In the tag selection dialog which opens, select the desired tag and then click **OK**.

NOTE

Use the Filter field in the tag selection dialog in order to restrict the number of listed tags: Enter e.g. *.RTInfo if you want to show structure elements of the RTInfo type only.



[pascc356, 2, en_US]

Figure 3-49 Connecting a Tag

- ✧ Define further settings (e.g. Unit, Tooltip Text).
- ✧ Close the **SICAM Numeric Control Properties** dialog.

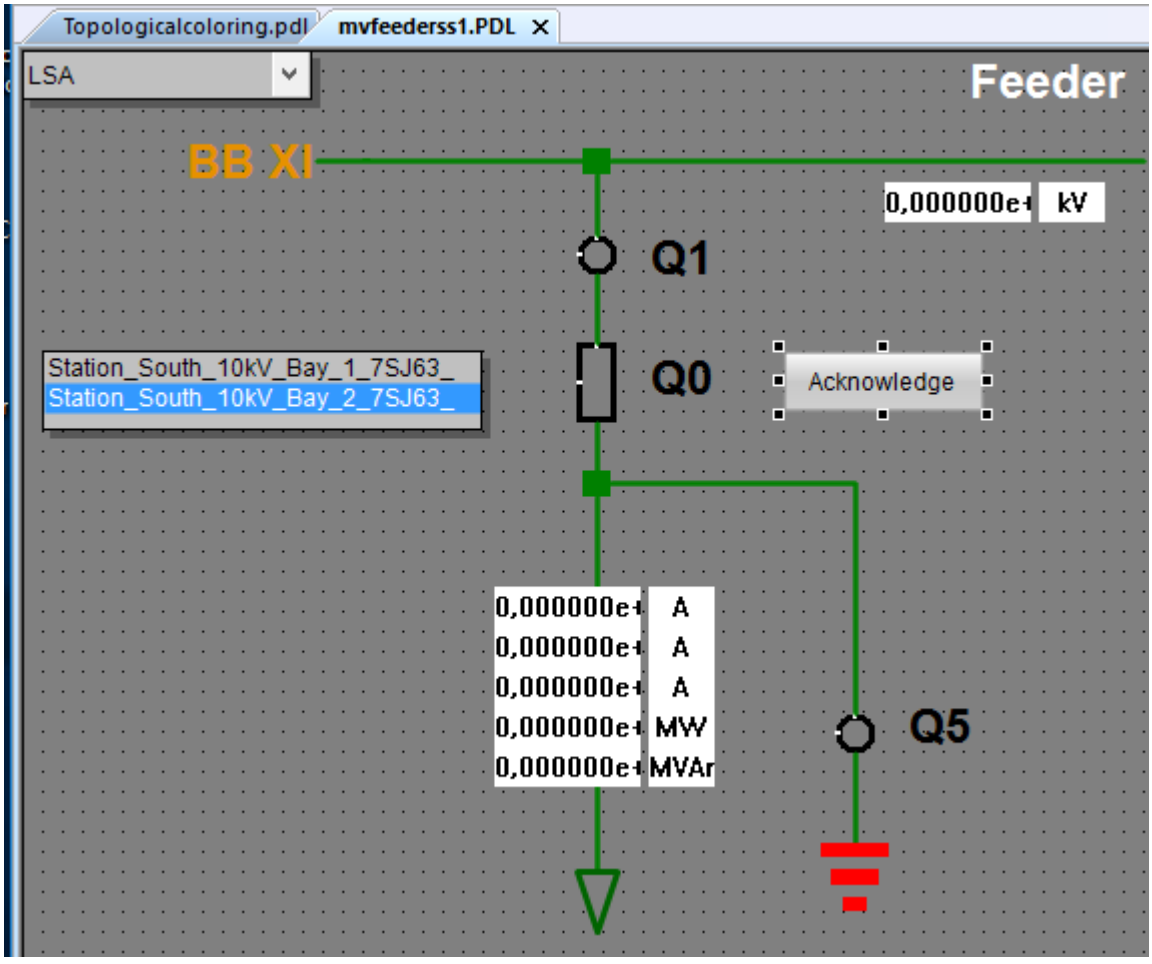
3.3.5 Inserting an Acknowledge button

Inserting an Acknowledge button

The circuit breaker blinks spontaneously when the state of the assigned tag changes in monitoring direction with the cause **Spontaneous**. This spontaneous blinking must be acknowledged.

To acknowledge the blinking of one or several switches, insert a button from the SICAM graphic object library into the diagram.

- ✧ To open the **Library**, click **View > Library**.
- ✧ To show a preview of the graphic objects, click **Preview** in the toolbar of the **Library**.
- ✧ Under **Controls**, select **Button quit blinking**.
- ✧ Hold down the mouse button and move the cursor until the graphic object has reached the desired position.



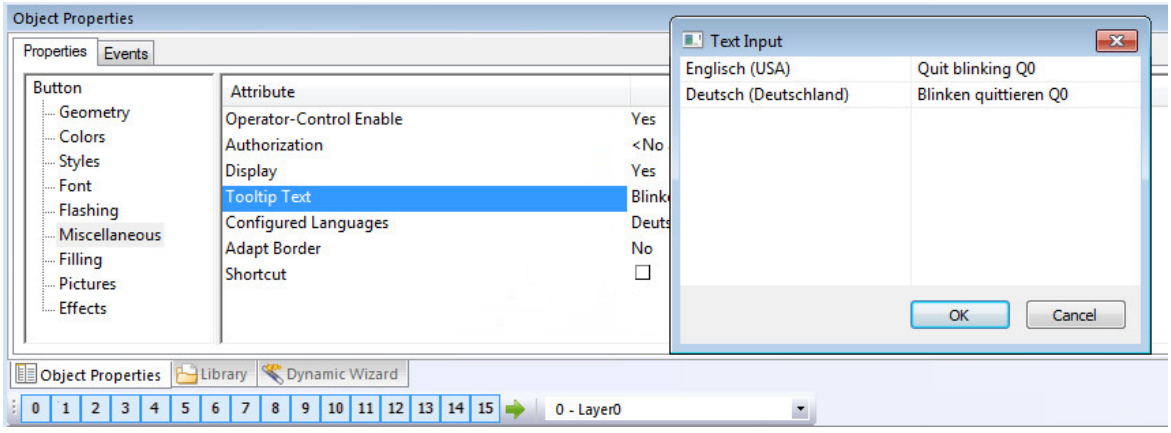
[sc_insert_quit-button, 2, en_US]

Figure 3-50 Inserting an Acknowledge button

Defining a Tooltip Text for a Button

To define a tooltip text for a button, proceed as follows:

- ✧ Right-click the button and select **Properties** from the context menu.
- ✧ Select **Others** in the **Properties** tab.
- ✧ Double-click the **Tooltip text** attribute. The **Text input** dialog opens.
- ✧ Enter the tooltip text into the **Enter a value** entry field and click **OK** to confirm.



[pascc358, 1, en_US]

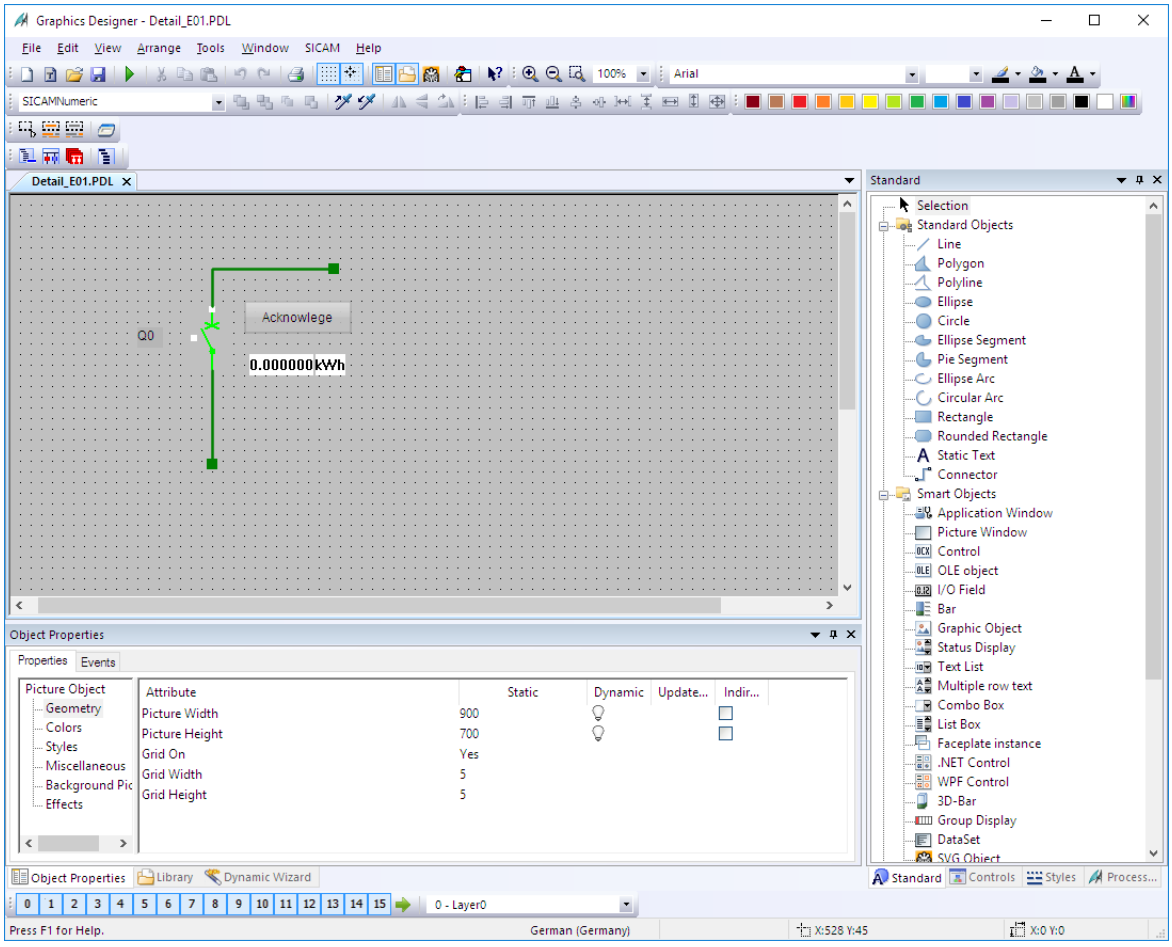
Figure 3-51 Defining a Tooltip Text for a Button

The setting of the button properties ensures that the button can be activated via mouse click or by pressing a key on your keyboard.

Instead of an acknowledge button, you can also use the integrated dialogs of the switching device objects (see *4.4.6 Runtime Dialogs of SICAM Switch Controls*).

Completing the Control Diagram

- ✧ Complete the control diagram. Add e.g. labels.
- ✧ Save the completed diagram.



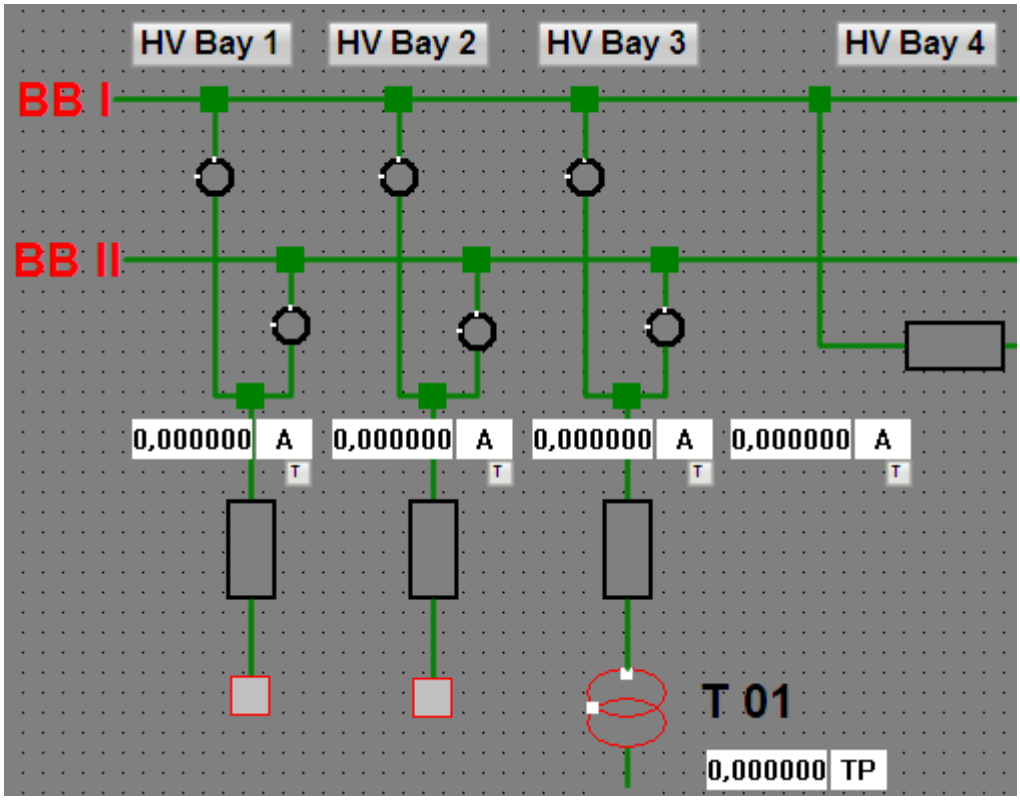
[pascc344, 1, en_US]

Figure 3-52 Control Diagram

3.4 Creating an overview diagram

Overview diagram

The diagram **hv_overview.pdl** shows an overview of your system. Fields which include several circuit breakers and disconnectors are shown with a graphic object.



[sc_overview, 1, en_US]

Figure 3-53 Overview diagram

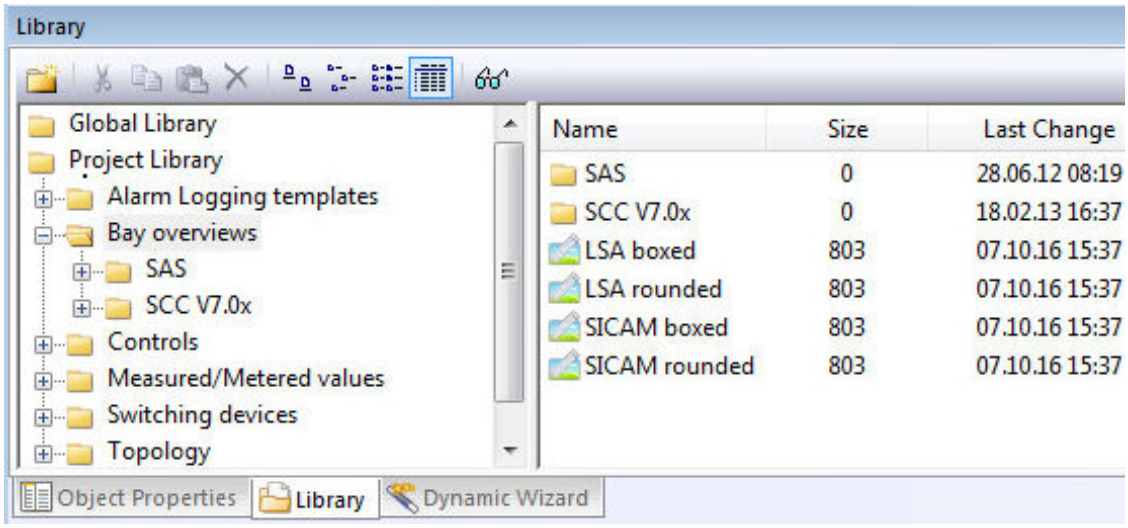
To create the overview diagram, you must

- ✧ create a new diagram **hv_overview.PDL** (width **900** and height **700**),
- ✧ draw the diagram and insert objects and icons, e. g. bay overview objects and labels.

Positioning a bay overview object

To position an SICAM Bay Overview Control from the SICAM graphic object library on the workspace, proceed as follows:

- ✧ To open the **Library**, click **View > Library**.
- ✧ To show a preview of the icons, click **Preview** in the toolbar of the toolbar of the **Library**.
- ✧ Select the graphic object **SICAM boxed** under **Overview objects** in the **project library**.
- ✧ Hold down the mouse button and move the pointer over the workspace until the icon has reached the desired position.



[sc_lib_bay_overview, 1, en_US]

Figure 3-54 Bay overview icons in the SICAM graphic object library

Defining a bay overview object

To define the properties of the bay overview, open the **SICAM Bay Overview Control properties** dialog.

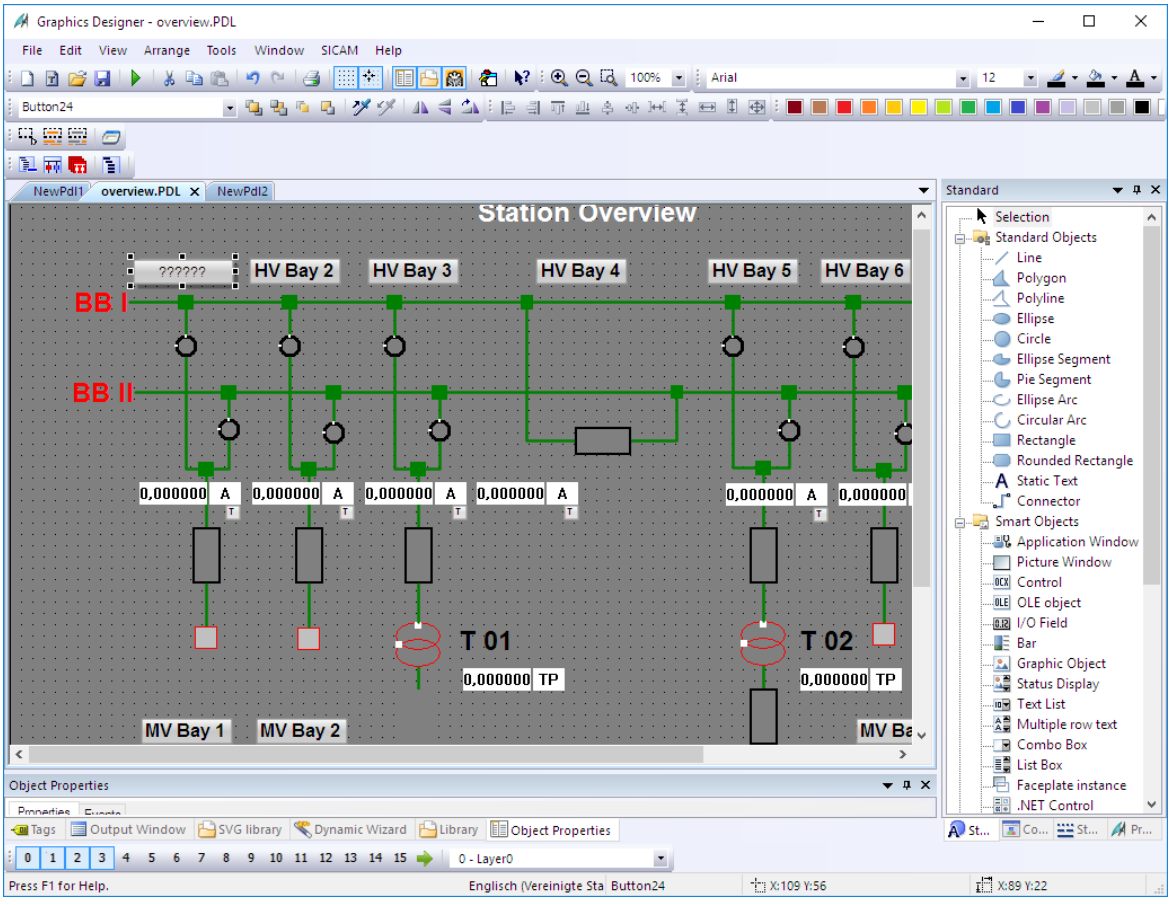
- ✧ Double-click the bay overview icon. The **SICAM Bay Overview Control Properties** dialog opens.
- ✧ Define the **tag connection** (see *4.7.2 Tag Connection to Bay Overview*).
- ✧ **Important**: Delete the default tag link for switchgears which do not actually exist in the bay.
- ✧ Click **OK** to close the dialog.

For more detailed information concerning the Bay overview graphic object, refer to *4.7 SICAM Bay Overview*.

Inserting a button

Insert a **Button** object into the **hv_overview.pdl** diagram. Click this button to show the **detail_E01.pdl** control diagram.

- ✧ Select the **Button** object in the object palette under **Windows objects**.
- ✧ Create the button at the desired position.

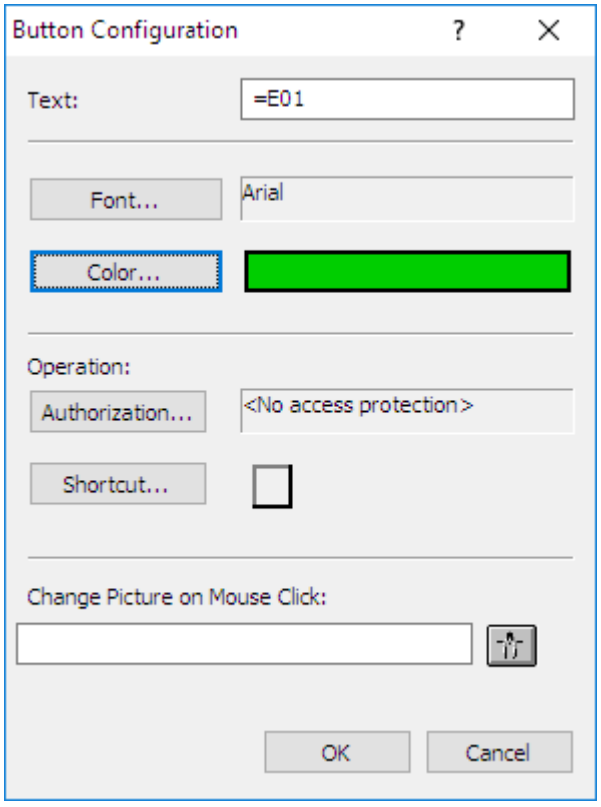


[pascc326, 1, en_US]

Figure 3-55 Inserting a button

Configuring a button

The Button configuration dialog opens.



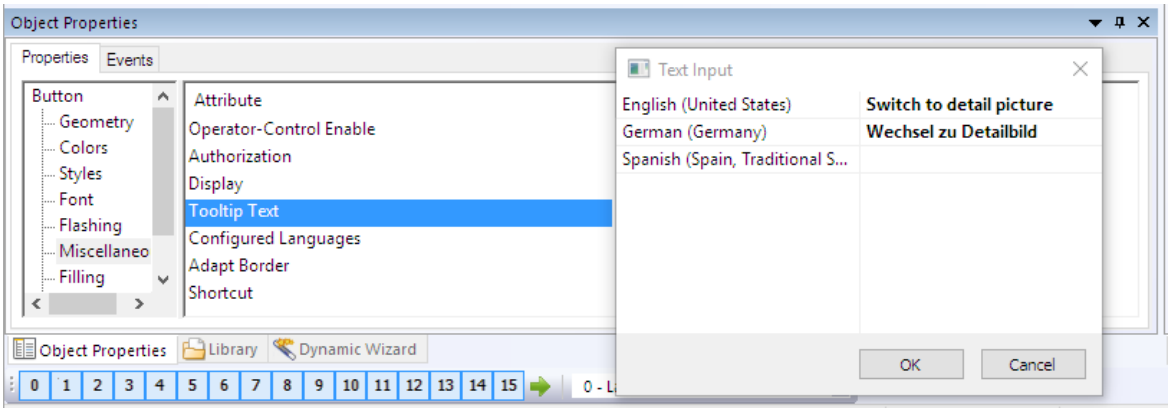
[sc_button_config, 1, en_US]
Figure 3-56 Configuring a button

- ✧ Define the **text**, the **font** and the **color**.
- ✧ Under **Change diagram on mouse click**, select the **detail_E01.PDL** diagram.
- ✧ Click **OK**.

Defining a tooltip text for a button

To define a tooltip text for a button, proceed as follows:

- ✧ Right-click the button and select **Properties** from the context menu.
- ✧ Select **Others** in the **Properties** tab.
- ✧ Double-click the **Tooltip text** attribute.
  The **Text input** dialog opens.
- ✧ Enter the tooltip text into the **Enter a value** entry field and click **OK** to confirm.



[sc_button_tooltip, 1, en_US]

Figure 3-57 Defining a tooltip text for a button

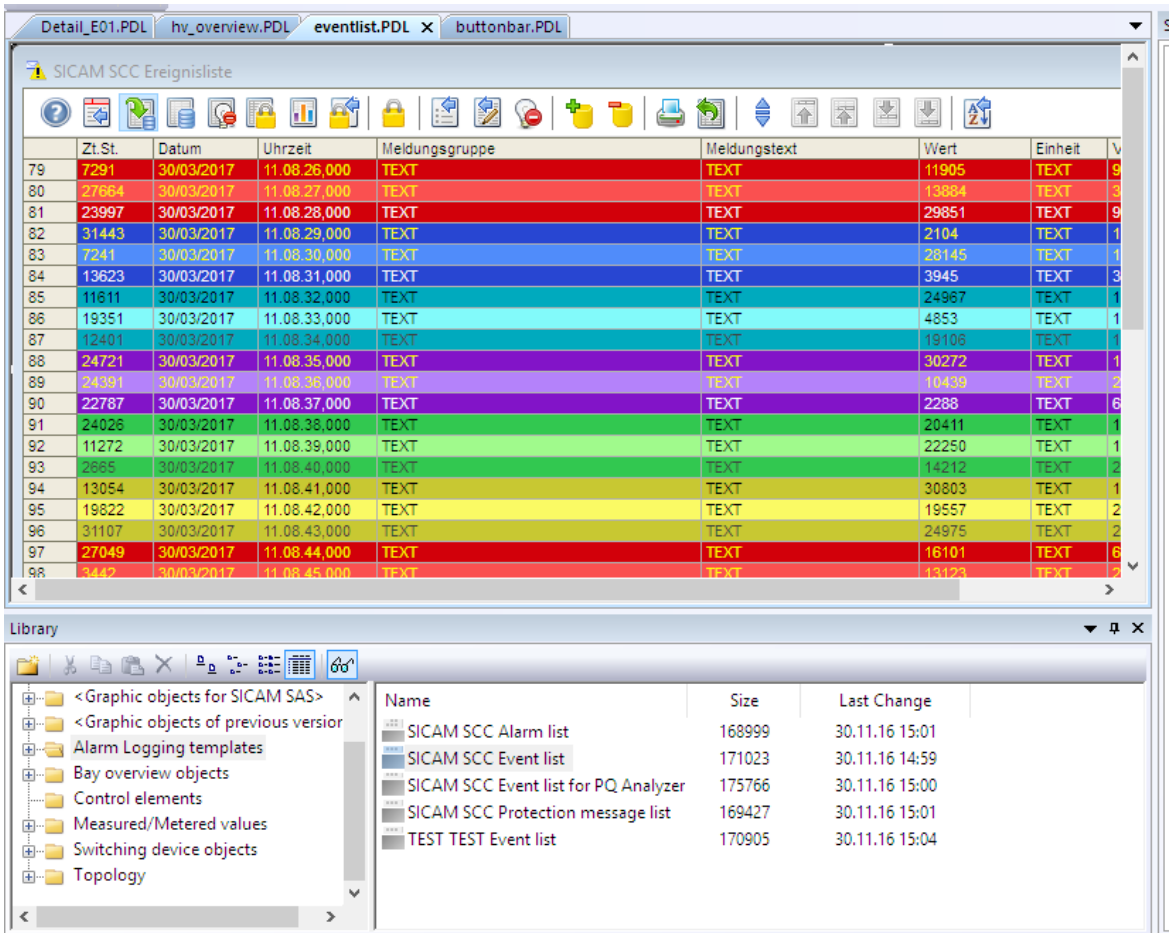
✧ Click **OK**. The settings are applied.

3.5 Creating a List View

You want to define that the event list is displayed after clicking the Event list button. To do this, you must create the eventlist.PDL diagram and insert the SICAM SCC event list object. Later, the buttonbar.PDL file must be completed by the corresponding Button object.

Creating an event list

In the eventlist.pdl diagram, insert a SICAM SCC event list object.



[pascc375, 1, en_US]

Figure 3-58 View showing an event list

To create the event list view, proceed as follows:

- ✧ Create the **eventlist.pdl** view (width **900** and height **700**)
- ✧ and insert the **SICAM SCC event list** object, see below.

Inserting an event list

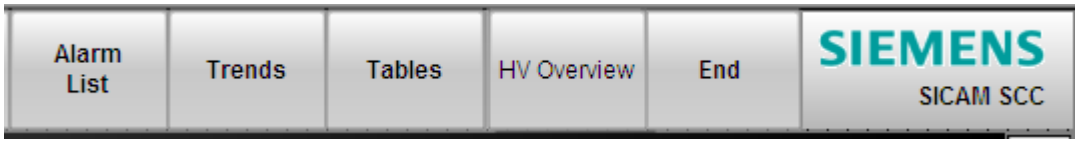
To insert an event list, proceed as follows:

- ✧ To open the **Library**, click **View > Library**.
- ✧ To show a preview of the graphic objects, click **Preview** in the toolbar of the **Library**.
- ✧ Select the **SICAM SCC event list** object under **Alarm Logging templates** in the **project library**.
- ✧ Hold down the mouse button and move the cursor over the workspace until the graphic object has reached the desired position.

✧ Save the view under **eventlist.pdl**.

3.6 Creating a Button Bar

In the button bar, you can arrange all the buttons of the project. These buttons can be used to switch to a different view (e. g. overview diagram, list view) or to quit the runtime system.



[pascc330, 1, en_US]

Figure 3-59 Button bar with various buttons

To create the button bar, proceed as follows:

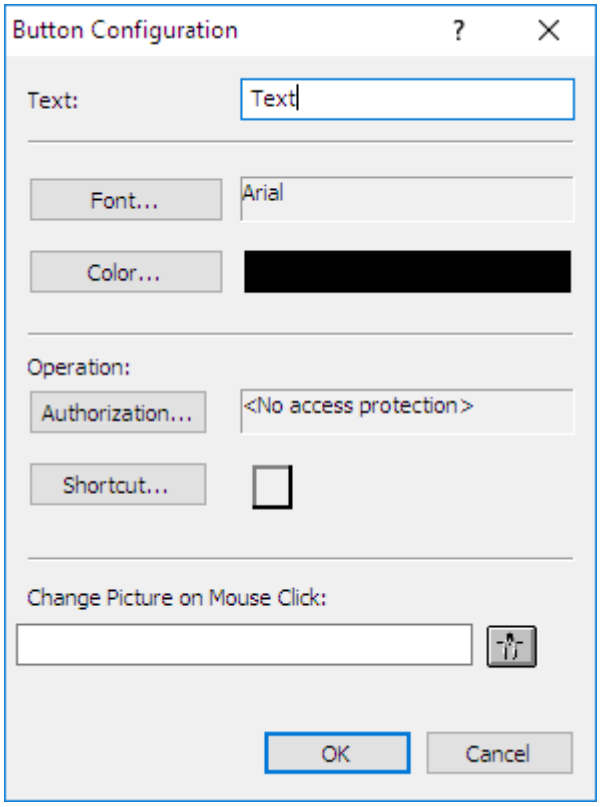
- Create a new view **buttonbar.PDL**.
- Inserting the buttons with their different functions

3.6.1 Inserting an Event List Button

✧ Create a new view named **buttonbar.PDL** (width **900** and height **100**).

✧ Select the **Button** object in the object palette under **Windows objects**.

✧ Create the button at the desired position.
The **Button configuration** dialog opens.



[pascc359, 1, en_US]

Figure 3-60 Configuring a button

✧ Define the object properties (e. g. text, color).

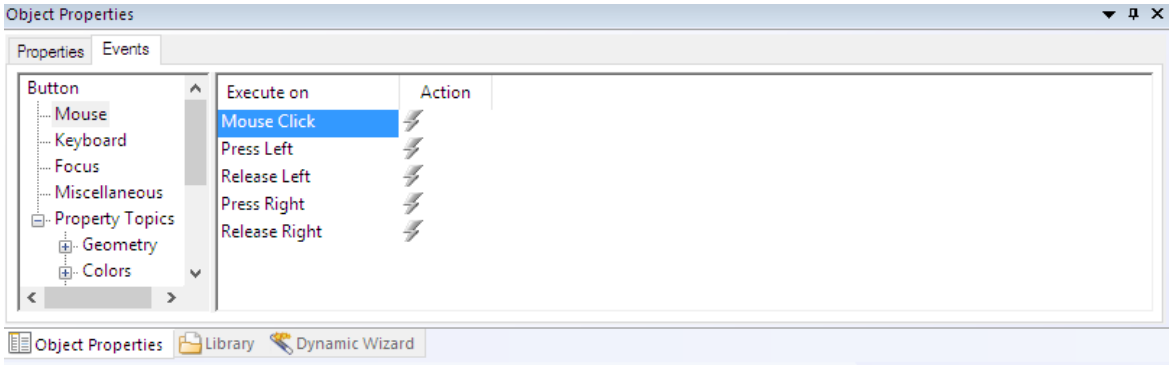
✧ Leave the **Display changeover on mouse click** entry field empty. Afterwards, you must set the switching between different views/diagrams as C action.

✧ Click **OK** to close the dialog.

Defining dynamic display properties

Via the dynamic properties of the button, specify the action for displaying the event list (eventlist.pdl).

✧ Double-click the new button. The **Object properties** dialog opens.



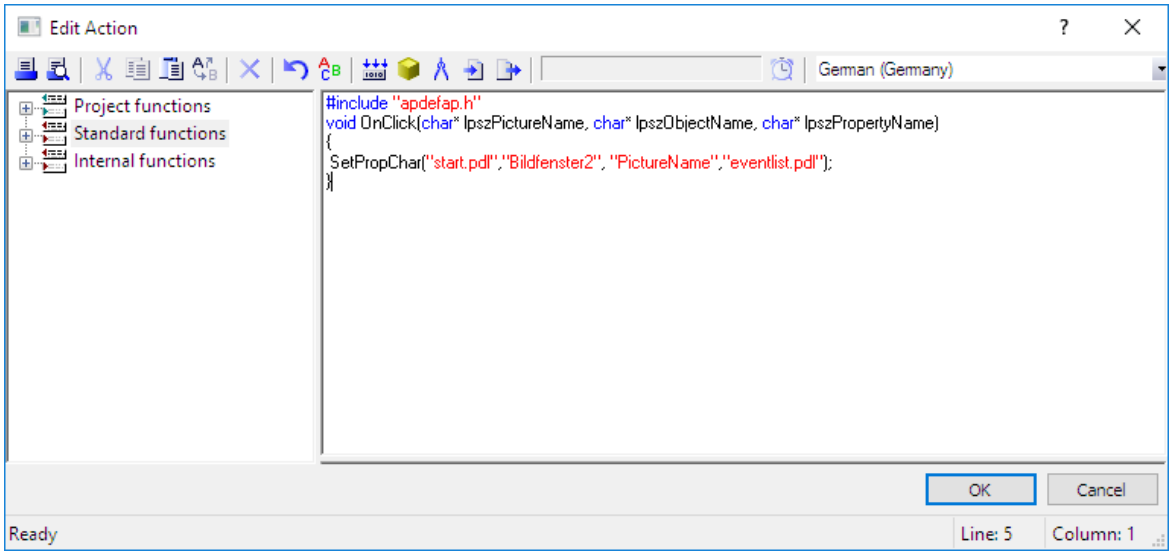
[pascc364, 1, en_US]

Figure 3-61 Defining the object properties

✧ Click the **Events** tab and then click **Mouse**.

✧ Right-click the flash icon next to **Mouse action**.

✧ Select **C Action** from the context menu.
The **Edit action** dialog opens.



[pascc384, 1, en_US]

Figure 3-62 Defining dynamic display properties

✧ In the Edit action dialog, enter the rows **SetPropChar("start.pdl","Bildfenster2", "PictureName","event-list.pdl");** between the curly brackets.

✧ Click **OK**. The settings are applied.

✧ If you are requested to recompile, confirm with **Yes**.

✧ To insert the **HV Overview** button, proceed in the same way as for the Event List button. This button can be used later for showing the diagram **hv_overview.PDL**.

3.6.2 SInserting a Quit Button

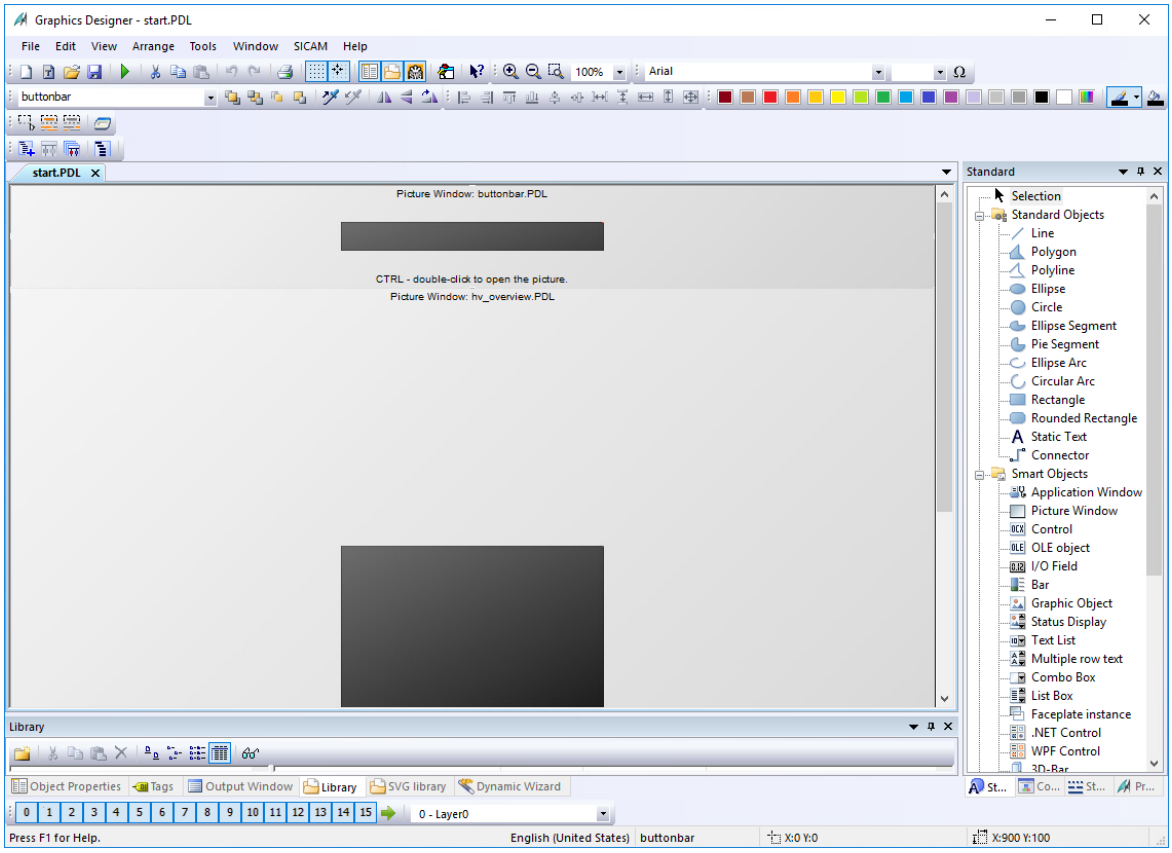
To add the **Quit button** to the button bar, click **Project library > Control elements**. This button serves to deactivate the project.

3.7 Creating a Start Screen

Start Screen

Divide the start screen into two window sections (designated "picture windows"). The upper section shows the **button bar** (buttonbar.PDL). In the lower section, you can switch between the **overview diagram** (hv_overview.PDL), the **control diagram** (detail_E01.PDL) and the **list view** (eventlist.PDL) during runtime.

The start screen is shown during runtime. It is 900 x 800 pixels in size.



[pascc390, 1, en_US]

Figure 3-63 Example of a Start Screen

Overview

To create the start screen:

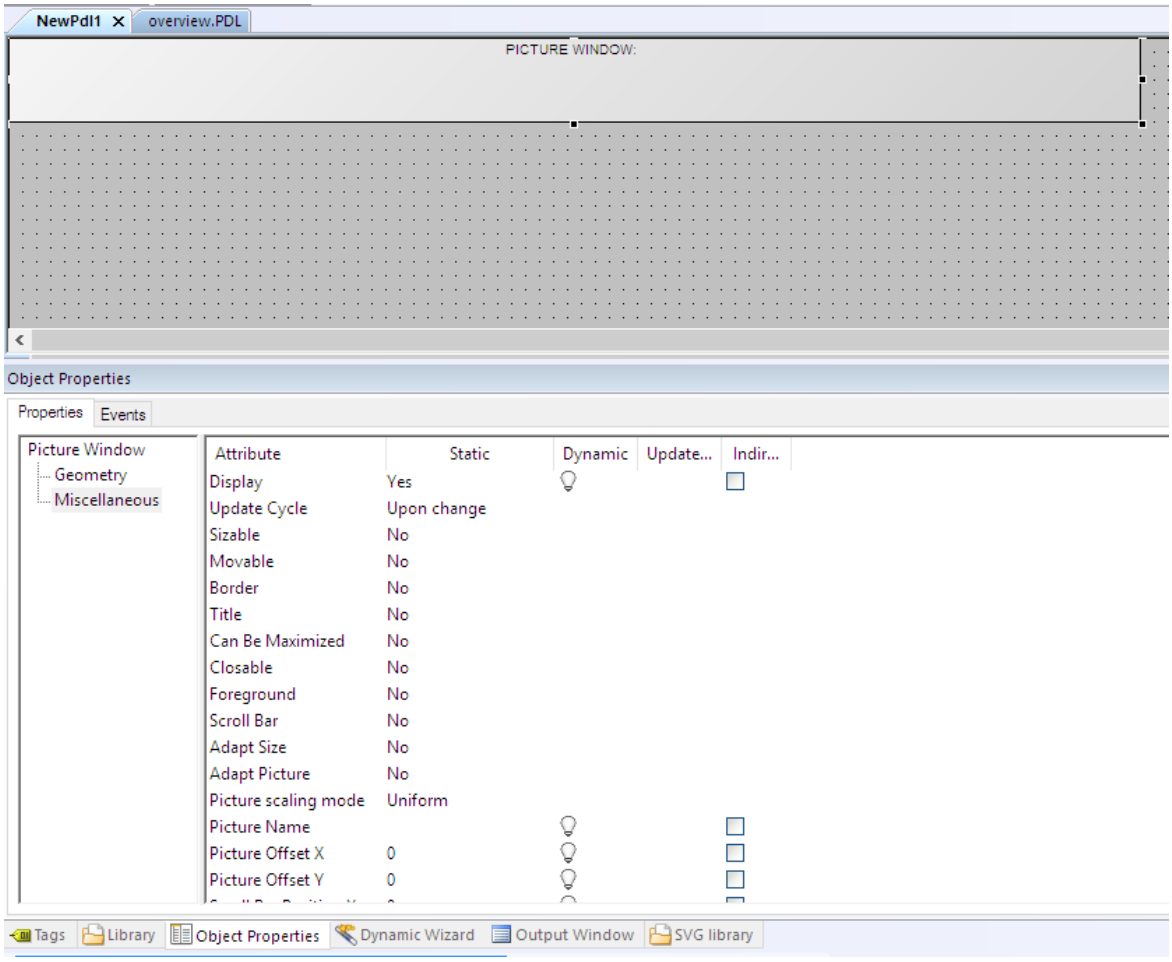
- ✧ Create a new display named **start.PDL** (width **900** and height **800**).
- ✧ Create separate picture windows for buttonbar.PDL (900 x 100) and hv_overview.PDL (900 x 700).

Positioning Picture Windows

To position a picture window:

- ✧ Select **Picture window** under **Smart objects** in the **Object palette**.

  As soon as you move your cursor over the workspace, it changes its shape to a cross-hair with an object icon appended.
- ✧ At the desired position, drag the mouse cursor while holding down the mouse button until the **Picture window** object has reached the desired size.



[pascc391, 1, en_US]

Figure 3-64 Inserting a Picture Window

Setting the Parameters of a Picture Window

To set the parameters of a picture window:

✧ Right-click the picture window and select **Properties** from the context menu.
The **Object properties** dialog opens.

NOTE

In the text box, you can view the picture name (e.g. PictureWindow1 or PictureWindow2) which has been automatically assigned by SIMATIC WinCC.

Specifying the Picture to be Displayed on Screen

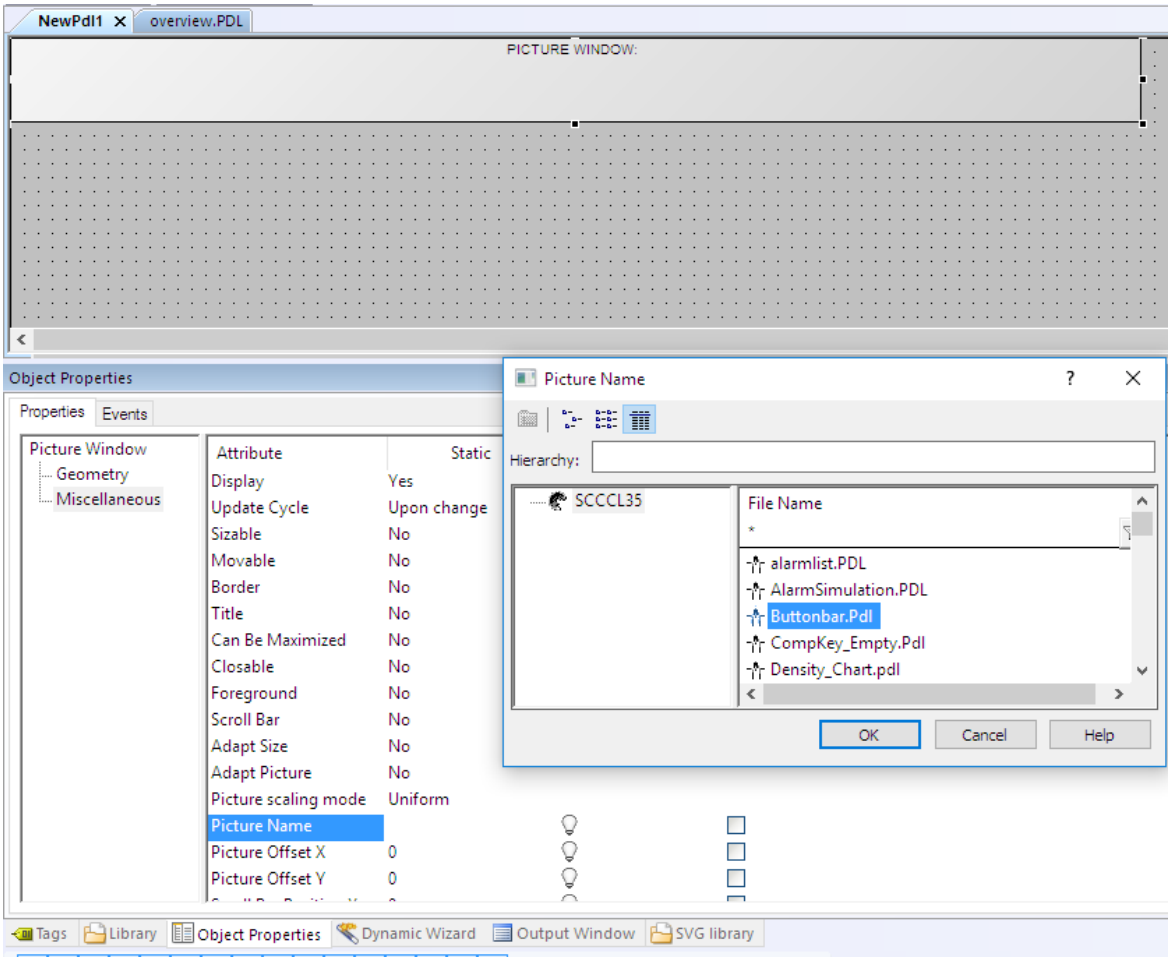
To specify which picture is shown on screen:

✧ Right-click the picture window and select **Properties** from the context menu.
The **Object properties** dialog opens.

✧ Select **Others** in the **Properties** tab.

✧ Double-click the attribute to be changed, i.e. **Picture name**.
A file selection window opens and shows the names of all the pictures in the project.

✧ Select **buttonbar.pdl** and click **OK** to confirm.



[pascc392, 1, en_US]

Figure 3-65 Defining the Picture to be Displayed on Screen

- ✧ In order to ensure that the picture window remains open, set the **Display** attribute to **Yes**.
- ✧ To apply all parameters, close the **Object properties** dialog.

Second Picture Window

- ✧ Create the second picture window.
- ✧ Assign **hv_overview.pdl** to **PictureWindow2**.

Defining WinCC Runtime Start Screen

To open the Computer properties dialog:

- ✧ Select the **Graphics Designer** level in the WinCC Explorer.
  The screens are shown in a list.
- ✧ Right-click the **start.pdl screen**.
- ✧ Select **Define screen as start screen** from the context menu.

Activating the Project

- ✧ To activate the project you created, select **File > Activate**.

You can now check whether the configured user interface meets your requirements.

3.8 Setting up User Authorizations

The **User Administrator** editor serves to specify user groups and users and to assign them user authorizations. If a registered user calls up a function, the User Administrator checks whether the user has been assigned the required user rights. If this is not the case, it prevents access to the function concerned. User authorization is a feature of SIMATIC WinCC.

Calling up the user administrator

Open the User Administrator to set up a new user group or a new user.

✧ In the WinCC Explorer, double-click the **User Administrator** level.

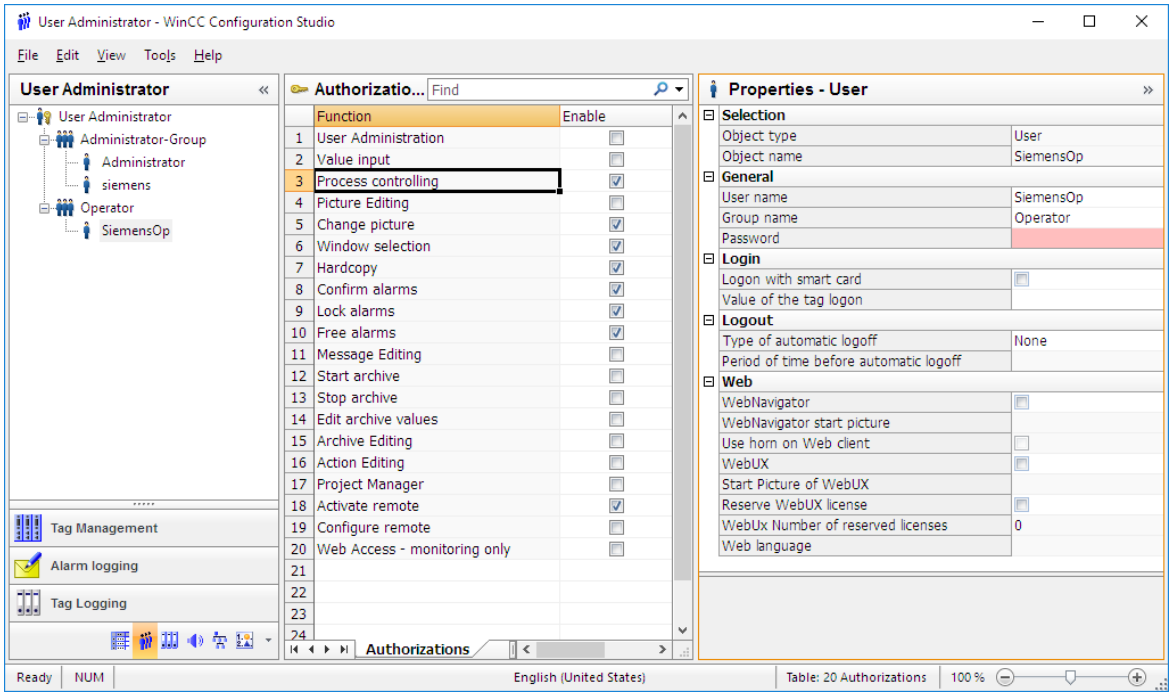
Creating a user group

When creating a new project, the **Administrator group** is automatically created with the **Administrator** user. Create a new user group and assign the required rights. The rights of the group apply for all users belonging to the corresponding group.

✧ Select **User > Add group**.

✧ Enter the name of the new user group (e.g. **Group 1**).

✧ Assign the group rights by double-clicking on the desired row in the **Authorization** column.



[pascc380, 1, en_US]

Figure 3-66 Assigning group rights

Setting up a user

Set up a user in the new group and assign him specific rights.

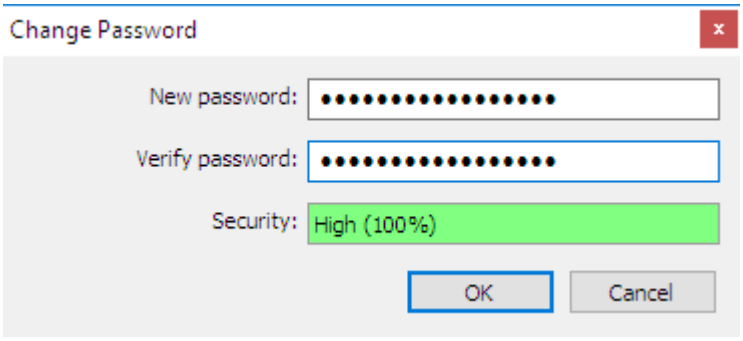
✧ Select the new group.

✧ Select **User > Add user**. The **Add a new user** dialog opens.

✧ In the **Login** entry field, enter the user name (e. g. **User 1**).

✧ Enter a password and repeat it.

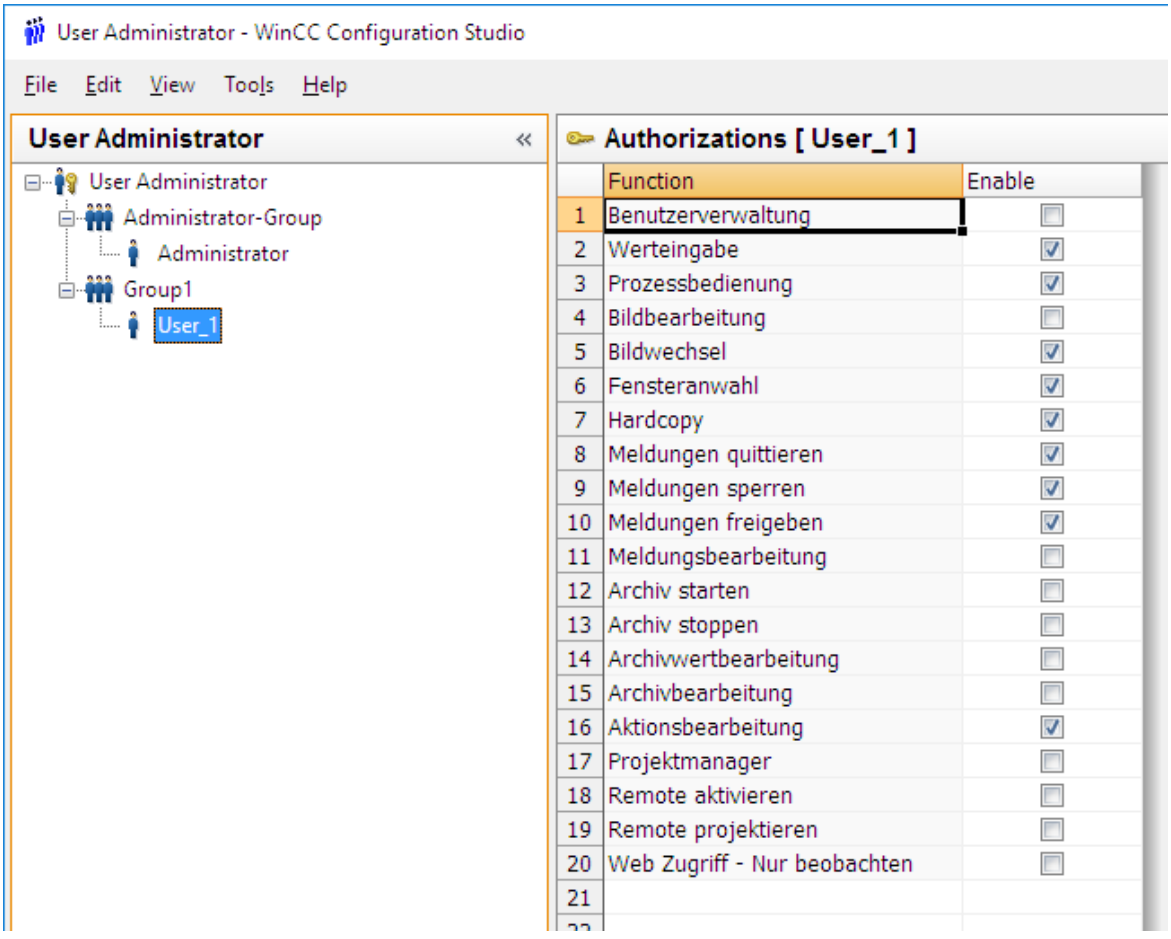
✧ Select **Copy group settings also** to assign the user all rights of the corresponding group.



[pascc381, 1, en_US]

Figure 3-67 Setting up a user

✧ Assign the user additional, individual rights (e.g. **Action Editing**).



[pascc382, 1, en_US]

Figure 3-68 Assigning user rights

Assigning an authorization for a circuit breaker

You can assign authorizations for various different objects, such as circuit breakers and buttons, in the Object Properties window.

Proceed as follows to assign an authorization for a **circuit breaker**:

✧ Double-click the circuit breaker in the Graphics Designer.
The **SICAM Switch Control Properties** dialog opens.

✧ Select the **Advanced** tab.

✧ Click the **...** Button to the right of the **Operator authorization** field and select the desired authorization.
The <No access-protection> entry corresponds to the value 0.

Assigning an authorization for a button

Proceed as follows to assign an authorization for a **Button**:

✧ In the Graphics Designer, right-click the corresponding button.

✧ Select **Properties** in the context menu.

✧ Click the **Others** level in the **Properties** tab.

✧ Double-click **Authorization** and select an entry.
The <No access-protection> entry corresponds to the value 0.

4 Graphic Objects

4.1	Overview	108
4.2	Design of Graphic Objects	109
4.3	Using Graphic Objects	111
4.4	SICAM Switch Controls	112
4.5	Anwendungsbeispiele für die Funktionen	145
4.6	SICAM Electrical Device Control	147
4.7	SICAM Bay Overview	148
4.8	Measured/Metered Value Display	156

4.1 Overview

The SICAM graphic object library includes graphic objects for the representation of typical **substation control and protection equipment** (e.g. switchgears, displays). Additionally, graphic objects are available for **topological coloring**. You can use these graphic objects to create station diagrams in the Graphics Designer.

This section describes objects and functions that can be used with the target systems **SICAM PAS, SICAM RTUs** , and **directly connected IEC 61850/IEC 60870-5-104 devices**.

They must not be used with the target system **SICAM SAS**. With SICAM SAS the objects and functions described in the manual SICAM SCC for SICAM SAS /10/ must be used.

This chapter describes the SICAM graphic objects **Circuit Breaker**, **Disconnector** and **Bay Overview** SICAM SCC V8.00 or later. Older SICAM graphic objects can still be used - for a description refer to *14 Components and Functions of Earlier SICAM PAS CC/SCC Versions*.

4.2 Design of Graphic Objects

The SICAM graphic object library provides graphic objects for the representation of the components of a power network. You require these graphic objects for creating station diagrams. The ActiveX Controls are a special kind of graphic objects.

4.2.1 SICAM Graphic Objects

Structure

A SICAM graphic object serves for the graphical representation of electrical equipment using dynamic display features.

Graphical representation

The graphical representation of the SICAM graphic objects (e. g. circuit breaker) is based on the ANSI/IEEE 315 1975 (R1995) and ANSI/IEEE 315A 1986 (R1995) standards.

The SICAM graphic object library provides several typical graphic objects for each element.

Dynamic display properties

Some graphic objects already include dynamic display properties.

With the dynamization you can visualize the station status in control and monitoring direction.

The typical dynamic display properties of a graphic object are defined by default. Finally, you only have to link the dynamic properties to the process via tags.

There are 3 different ways to set the parameters for dynamic display properties:

- via the Dynamic dialog
- via a C action or
- via a VBS action (Visual Basic action)

Dynamic Dialog

In the Dynamic dialog, you can specify the dynamic display properties and thus the process interfacing (referred to as "tag connection").

To do this, you insert the available dynamicdisplay properties into a predefined frame.

C Action

The C action offers you more flexibility in Dynamization than the Dynamic Dialog.

You can use all functions provided by SIMATIC WinCC, including SICAM PAS processing functions.

SICAM graphic object library

In the SICAM graphic object library, some dynamic display properties of graphic objects are defined via the Dynamic dialog; others are defined via the C action. You can use the corresponding graphic objects alternatively.

4.2.2 ActiveX Controls

The following graphic objects are implemented as ActiveX Controls:

- Circuit Breaker, Disconnector, Load Break Switch, and Earth Isolator as SICAM Switch Control
- Bay Overview as SICAM Bay Overview Control
- Measured value object as SICAM Numeric Control
- Feeder, Ground Disconnector, Transformer, and Termination as SICAM Electrical Device Control

These ActiveX Controls in the Graphics Designer are available in both the SICAM graphic object library and the object palette.

Structure

An ActiveX Control is a Windows control element whose properties (e. g. graphical representation, tag connection) can be defined via a dialog.

Graphical representation

An ActiveX Control (e. g. a circuit breaker) can be graphically represented in various different manners. The form, line width and orientation of the graphic object can be specified by the user. 3-D representation is possible. Dialogs can be anchored at any position on the diagram.

The colors for the representation of the value and the status are selectable. Furthermore, the graphic object can be individually designed.

Tag connection

The protocol type can be selected. Depending on the protocol type, the process interfacing of the ActiveX Controls can be performed using tags.

A tooltip text can be entered.

Further setting options

The Synchronized/Not Synchronized Switching and Interlocked/Non-Interlocked Switching functions can be parameterized. Spontaneous Blinking, Setpoint Blinking and SET = ACTUAL Switching can be admitted. A twostep switching operation and Blinking with Negative Command Feedback can be parameterized. The command execution timeout can be defined and the user authorization can be selected.

4.3 Using Graphic Objects

To use graphic objects from the SICAM graphic object library in your project, you must link the SICAM graphic object library to the project first.

Afterwards only, you can position graphic objects in station diagrams and set parameters for dynamic display properties in order to visualize the different states of the station.

SICAM graphic object library

Use the SICAM PAS Wizard to integrate the **SICAM graphic object library** into the current project.

Displaying the SICAM graphic object library

To display the SICAM graphic object library, select **View>Library**. The SICAM graphic objects are available under **Project Library**.

Positioning graphic objects

Using the Graphics Designer of SIMATIC WinCC, you can copy graphic objects via Drag & Drop from the library into a station diagram.

Defining graphic objects

Link graphic objects to the related process tags using the SIMATIC WinCC Graphics Designer.

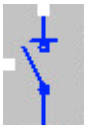
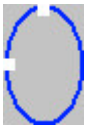
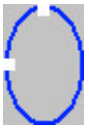
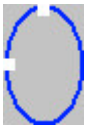
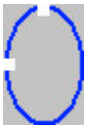
4.4 SICAM Switch Controls

The **C**ircuit **B**reaker, the **Dis**connector, the Load Break Switch, and the Earth Isolator are available as switching devices. They are stored in the**Switching devices** folder as **SICAM Switch Control** in the SICAM graphic object library. These ActiveX Controls already include typical functions.

Graphical representation

The SICAM graphic object library provides the SICAM Switch Controls in 5 different representation styles:

Table 4-1 Graphical representation of SICAM Switch Controls

View	Circuit Breaker	Disconnector	Load Break Switch	Earth Isolator
SICAM style				
based on DIN 42200				
based on IEC 445				
based on LSA				
based on LSA (alternative; LSA-2)				

NOTE

Additionally, you can assign your own individual image files to the objects.

NOTE

To avoid errors in the topology calculation, the Earth isolator has to be rotated (if required) via its inbuilt dialog, not via the generic object properties dialog.

Connecting points

The points highlighted with a square are the left-hand/top connecting points (below called **left-hand connection points**); the points (without a square) on the opposite side are the right-hand/bottom connecting points (below called **right-hand connection points**). See also *1- and 2-pole elements , Page 185*.

NOTE

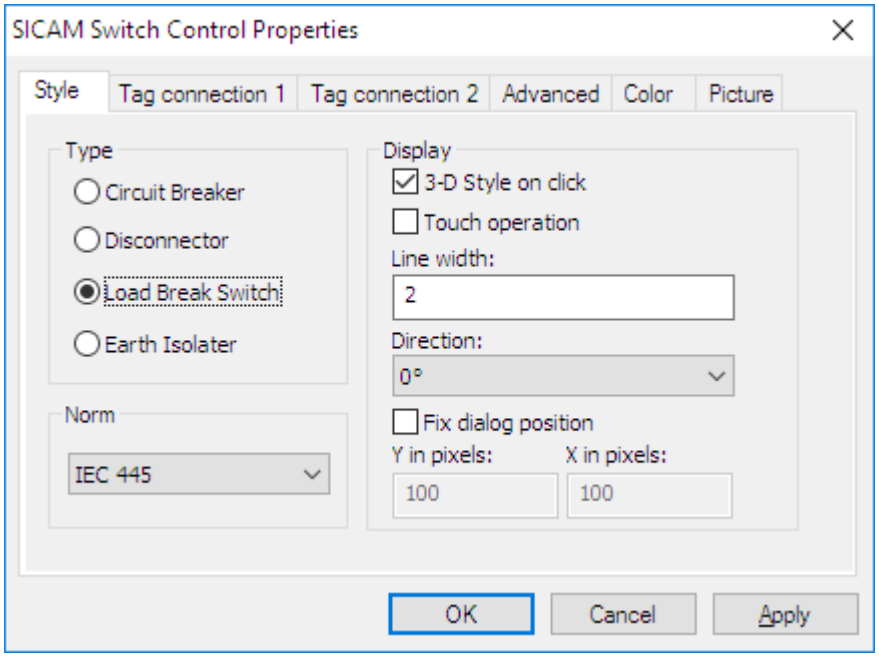
The squares always indicate the left-hand/top connecting points independently of the rotation of the object.

4.4.1 Representation Style of SICAM Switch Controls

Each circuit breaker, each disconnector etc. must be assigned a certain number of properties.

✧ Double-click the graphic object.
The **SICAM Switch Control Properties** dialog opens.

✧ Select the **Style** tab.



[sc_style_switch_control, 1, en_US]

Figure 4-1 Defining the style

Type

The following graphic object types can be selected: **Circuit Breaker**, **Disconnector**, **Load Break Switch**, or **Earth Isolator**.

Norm

The following 6 options are available for the graphical representation of the graphic object:

- SICAM
- DIN 42200
- IEC 445
- LSA
- LSA-2
- Picture

Depending on the switch position, individual pictures can be displayed for the **Picture** style. In the **Picture** tab, the individual pictures must be assigned switch positions, see *4.4.5 Picture of SICAM Switch Controls*.

3-D style on click

If this checkbox is activated, circuit breakers and disconnectors are represented with a three-dimensional effect when clicking with the mouse.

Line width

You can select a value between 1 and 11 in order to define the **Line width** of the graphic objects. Level 1 corresponds to the smallest line width.
The line width can be entered in representation styles in accordance with DIN 42200, IEC 445 and LSA.

Direction

Orientation is possible in the 0°, 90°, 180° and 270° angles in all representation styles apart from Picture.

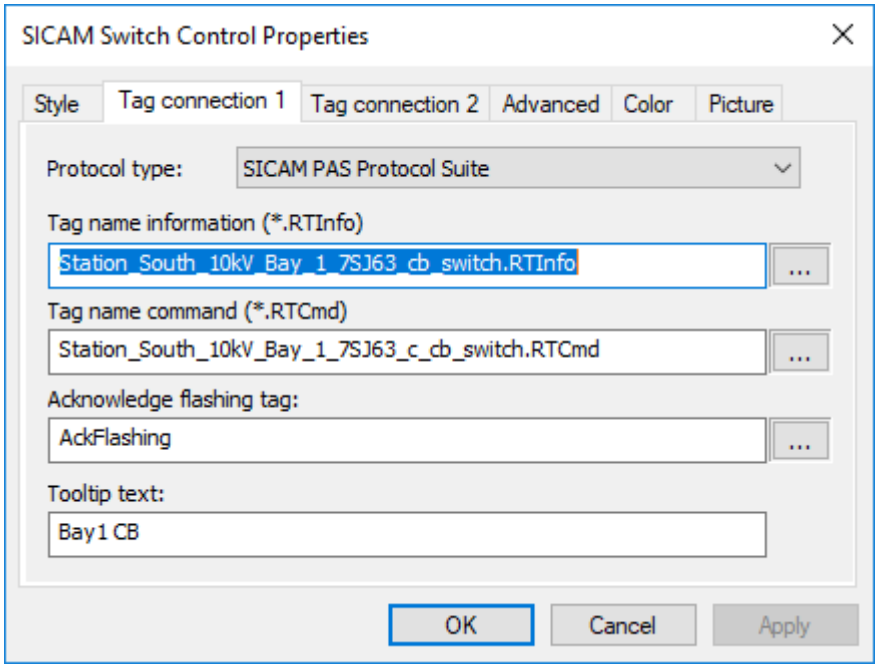
Fix dialog position

The Runtime dialogs can be anchored at a fixed position in the picture.

4.4.2 Process Connection of SICAM Switch Controls

Each circuit breaker, each disconnector etc. must be assigned tags. The assignment options depend on the protocol type.
You can assign tags in the **Tag connection 1** and **Tag connection 2** tabs.

✧ Double-click the graphic object.
The **SICAM Switch Control Properties** dialog opens.
✧ Select the **Tag connection 1** tab.



[sc_switch_process1, 1, en_US]
Figure 4-2 Tag connection, Part 1

Protocol type

Select the desired protocol type from the drop-down list box. The following protocol types are available for selection:

- **SICAM PAS Protocol Suite**
  for connection to **SICAM PAS-Stationen**
- **SICAM IEC Communication Suite**
  for connection to **SICAM RTUs** or **IEC 61850/IEC 60870-5-104 devices**

Information tag

Click the button to the right of the entry field. The **Tags** dialog opens. Select the corresponding tag from the list and click **OK** to confirm.

Command tag

If a command tag for a related information tag is specified in the SICAM PAS import data record, the command tag is determined automatically when selecting the information tag and entered in the **Command tag** entry field.

To manually select a tag, proceed as described in the paragraph Information Tag.

NOTE

Delete the predefined tag if you do not want to use the stored functionality in command direction.

Acknowledge flashing tag

You can assign a tag, e.g. the **AckFlashing** tag, for several switching device objects in order to form a group. In this case, you can acknowledge spontaneous flashing for all switching device objects of the group at the same time by clicking the **All** button.

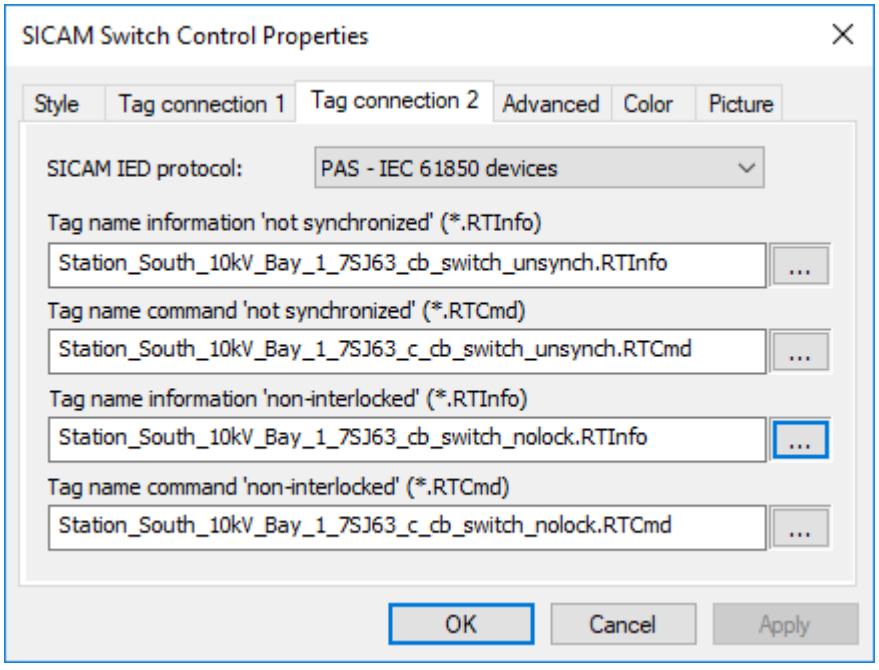
To define acknowledgement groups, you can maintain the predefined **AckFlashing** tag or create a new tag.

To select another tag, click the button to the right of the entry field. The **Tags** dialog opens. Select the corresponding tag from the list and click **OK** to confirm.

Tooltip text

Enter a text in the entry field. This text is displayed as **Tooltip** in the active project.

✧ Select the **Tag connection 2** tab.



[sc_switch_process2, 1, en_US]

Figure 4-3 Tag connection, Part 2

In the **Tag connection 2** tab, you can configure tags for the advanced control of synchronization and interlocking functions during command output.

You can only assign tags in this tab if the **SICAM PAS Protocol Suite** protocol type has been selected in the **Tag connection 1** tab, i.e. if the devices are connected via SICAM PAS.

SICAM PAS IED protocol

Select the desired IED protocol from the list. The following setting options are available:

- **Not specified**
  Select this setting if you do not require the switchover of the synchronization or interlocking function during runtime.
  With this setting you cannot assign tags.
- **PAS - IEC 61850 devices**
  Select this setting if devices are connected to SICAM PAS via IEC 61850. With this setting you can assign tags for controlling the Synchronized/Not Synchronized and Interlocked/ Non-Interlocked switching functions.
- **PAS - ILSA devices**
  Select this setting if devices are connected to SICAM PAS via ILSA. With this setting you can assign the command tags for unsynchronized switching and for a measurement interrogation.

Table 4-2 Process tag connection depending on the target system and the device type

Protocol type	IED protocol	Attribute	Meaning
SICAM IEC Communication Suite or SICAM PAS Protocol Suite	N/A None	RTInfo	<Information tag name>.RTInfo
		RTCmd	<Command tag name>.RTCmd
SICAM PAS Protocol Suite	IEC 61850 devices	RTInfo	<Information tag name>.RTInfo
		RTCmd	<Command tag name>.RTCmd
		AddRTInfo1	<Information tag name-NotSynchronized>.RTInfo
		AddRTCmd1	<Command tag name-NotSynchronized>.RTCmd
		AddRTInfo2	<Information tag name-NonInterlocked>.RTInfo
		AddRTCmd2	<Command tag name-NonInterlocked>.RTCmd
	ILSA devices	RTInfo	<Information tag name>.RTInfo
		RTCmd	<Command tag name>.RTCmd
		AddRTCmd1	<Command tag name-NotSynchronized>.RTInfo
		AddRTCmd2	<Command tag name-MeasurementInterrogation>.RTCmd

Information tag

Click the button to the right of the entry field. The **Tags** dialog opens. Select the corresponding tag from the list and click **OK** to confirm.

Command tag

If a command tag is specified for an information tag in the SICAM PAS import data record, the command tag is determined automatically when selecting the information tag and entered in the **Runtime command tag** editing field.

To manually select a tag, proceed as described in the paragraph Information Tag.

NOTE

The descriptions of SIMATIC WinCC apply to the use of tag and server prefixes and indirect addressing. SICAM-specific processing is not necessary.

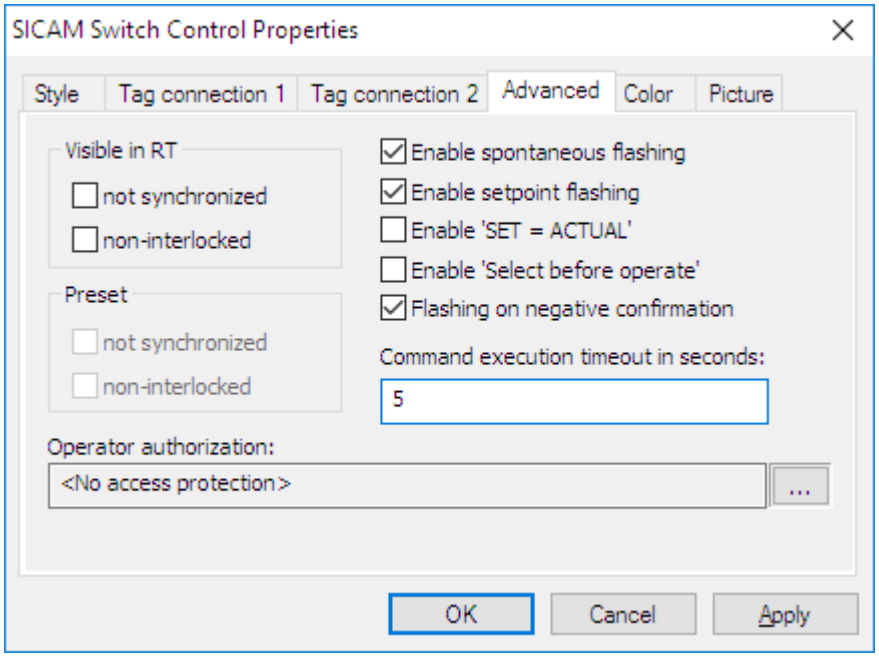
For more detailed information concerning the use of the acknowledgment tag without prefix, e.g. in picture windows, refer to the configuration information in the **SIMATIC WinCC Information System**, **Using a Tag Prefix and a Server Prefix**. A preceding **@NOTP**, for example, disables the use of the tag prefix.

4.4.3 Advanced Properties of SICAM Switch Controls

In the Advanced tab, you can assign the SICAM Switch Controls additional properties.

✧ Double-click the graphic object.
The **SICAM Switch Control Properties** dialog opens.

✧ Select the **Advanced** tab.



[sc_switch_advanced, 1, en_US]

Figure 4-4 Advanced properties

For the connection to **SICAM RTUs** or **IEC 61850/IEC 60870-5-104 devices**, the command mode (Qualifier of Command, QoC) for command output must be transmitted with the command.

Visible in RT

Under **Visible in RT**, activate the checkboxes for the options you want to show additionally during runtime in the switching dialog and which can be modified.

Preset

Under **Preset**, activate all values to be transmitted as qualifiers of command (QoC). If the **Visible in RT** option is activated, you can define here the pre-assignment in the runtime dialogs. The checkboxes under **Preset** can only be activated if the **SICAM IEC Communication Suite** protocol type has been selected in the **Tag connection 1** tab.

Table 4-3 Configuration with different protocol types

Protocol type	Activated fields	Attribute	Effect
SICAM PAS Protocol Suite	Visible in RT	Unsynchronized	Shown in the switching dialog during runtime.
		Non-interlocked	Shown in the switching dialog during runtime.
SICAM IEC Communication Suite	Visible in RT	Unsynchronized	Shown in the switching dialog during runtime.
		Non-interlocked	Shown in the switching dialog during runtime.
	Specification	Unsynchronized	Pre-assignment of the value sent as QoC as part of the command (synchronized/ unsynchronized switching)
		Non-interlocked	Pre-assignment of the value sent as QoC as part of the command (synchronized/ unsynchronized switching)

Enable spontaneous flashing

Spontaneous flashing can be enabled or disabled.

If the value of the assigned tag has changed and if **spontaneous** has been entered as cause, the Circuit Breaker or the Disconnector flashes spontaneously.

Enable setpoint flashing

Setpoint flashing can be enabled or disabled.

During command output the graphic object starts **flashing** in its SET state when the SET switching direction (ON or OFF) has been selected. It stops flashing as soon as the command has been terminated or aborted, i.e. in the following cases:

- After a command output has been aborted
- On expiry of the command output monitoring time
- If **Command Termination** is entered as cause in the command confirmation

Enable SET = ACTUAL

Switching over to the represented actual state can be enabled or disabled. Activate this checkbox in order to enable the switching direction independently of the switch position. This ensures e.g. that another switch-on command can be issued for a switched-on switch.

Enable Select before operate

A Select command is issued before the actual switching command. The switching command can only be issued after the Select command has been positively acknowledged.

Flashing on negative confirmation

If a switching command is not successful, i.e. if CO-, COE-, Select, Command Monitoring Time Expired is returned, the switching device object changes from slow command blinking to fast blinking in order to indicate that an abnormal event has occurred.

There is no fast blinking if this option has been deactivated. The switching device object changes to the actual position after a negative acknowledgment; command blinking is terminated.

Command execution timeout

In the **command execution timeout** field, enter the maximum delay time in seconds until successful command execution. As soon as this time has expired, the command process is terminated and a negative command termination is entered in the log.

NOTE

For IEC connections, the **command execution timeout** only affects the switching object. The command itself only gets affected with SICAM PAS connections.

Operator authorization

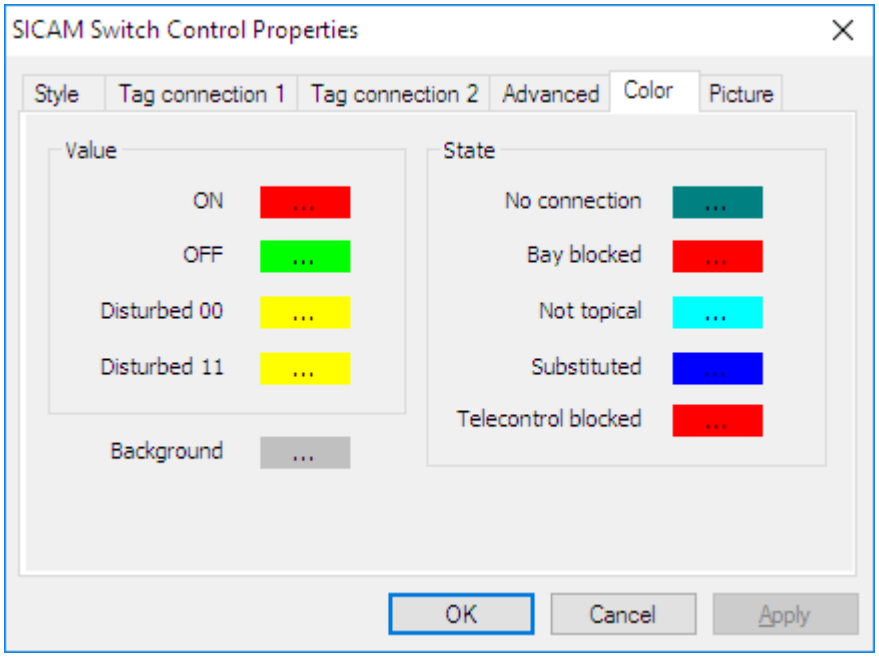
Select the desired **operator authorization**. For more detailed information on the setting and assignment of operator authorizations, refer to *3.8 Setting up User Authorizations*.

4.4.4 Colors of SICAM Switch Controls

The color of the graphic object in normal state depends on its value. A specific color is set by default for each individual value. However, the color can also be freely selected from a color palette.

In the **Color** tab, you can assign colors for the individual switch positions and states of the SICAM Switch Control.

- ✧ Double-click the graphic object.
  The **SICAM Switch Control Properties** dialog opens.
- ✧ Select the **Color** tab.



[sc_switch_color, 1, en_US]

Figure 4-5 Assigning colors

Value

The following colors are predefined for the graphic object:

Table 4-4 Switch position

Value	Color
ON 10, value = 2	Red
OFF 01, value = 1	Green
Intermediate position 00, value = 0	Yellow
Disturbed 11, value = 3	Yellow

The form of the graphic object in representation styles in accordance with **DIN 42200**, **IEC 445**, and **LSA** depends on the value.

Table 4-5 Predefined forms according to DIN 42200 and IEC 445

Value	Form
ON 10, Value = 2	Switch closed
OFF 01, Value = 1	Switch open
Intermediate position 00, Value = 0	Switch on/off dashed
Disturbed 11, Value = 3	Switch on/off dashed

Table 4-6 Predefined forms according to LSA

Value	Form
ON 10, Value = 2	Filled
OFF 01, Value = 1	Not filled
Intermediate position 00, Value = 0	Half filled
Disturbed 11, Value = 3	Half filled

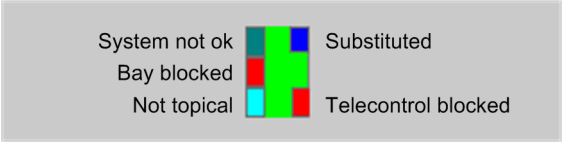
A red cross is indicated for values which are not indicated in the tables (e.g. Value=4).

Background

The background color of the graphic object can be individually defined. Gray is the default color.

State

The switch status is represented with small, colored rectangles next to the switch. A default color is predefined for each status. The color can also be freely selected from a color palette.



[dw_cb_states, 1, en_US]

Figure 4-6 Switch with switch status

The predefined colors of the rectangles depend on the status:

Table 4-7 Switch status

Status	Color	Explanation
System not ok	Dark cyan (teal)	Connection between SICAM SCC and the automation system/ device.
Bay blocked	Red	Messages from this bay are no longer transmitted to the automation system/device.
Not topical	Cyan (turquoise)	The device state is not topical.

Status	Color	Explanation
Substituted	Blue	The switch position was set manually because there is no connection to the primary system.
Telecontrol blocked	Red	Messages from this bay are no longer transmitted to the telecontrol center.

4.4.5 Picture of SICAM Switch Controls

The values of a SICAM Switch Control (switch positions) can be assigned to individual pictures. In order to ensure that these pictures are displayed during runtime, the **Picture** option must be activated in the **Style** tab under **Norm**, see *4.4.1 Representation Style of SICAM Switch Controls*.

The following picture formats are possible:

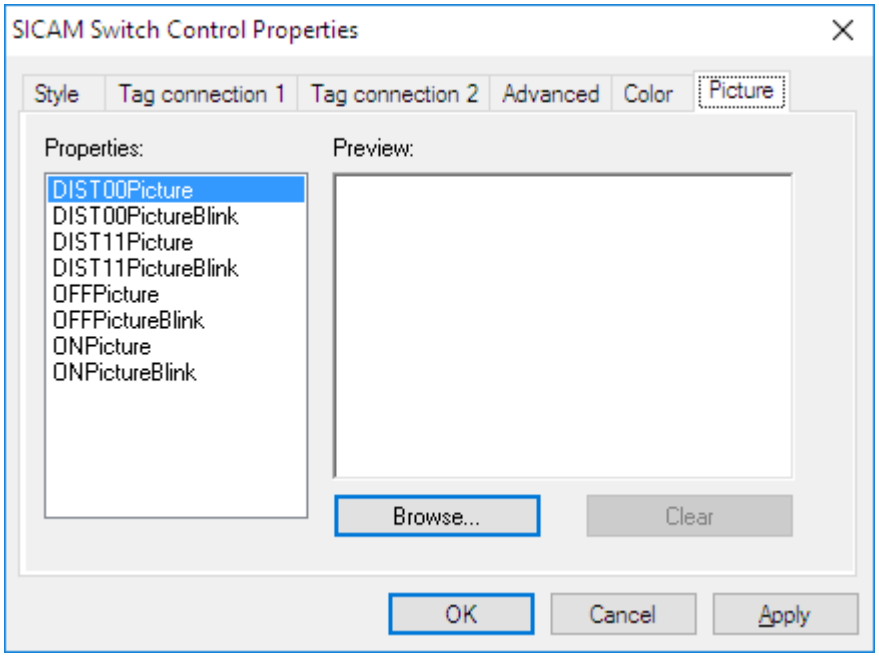
- BMP
- EMF
- JPG
- GIF

NOTE

If, in the **Style** tab under **Norm**, the **Picture** option is active, you have to assign pictures to the values. Otherwise no switching object will be displayed.

To apply values to the pictures follow these steps:

✧ Double-click the graphic object.
The **SICAM Switch Control Properties** dialog opens.
✧ Select the **Picture** tab.



[sc_switch_picture, 1, en_US]

Figure 4-7 Assigning pictures

Properties

The values of the Circuit Breaker/Disconnector are listed under **Properties**. You can assign a picture and a **blink picture** to each value. During runtime, the following representations result for a switching object:

- **No blink picture assigned**
  The display switches between picture and background color.
- **Blink picture assigned**
  The display switches between picture and blink picture.

Highlight a value and click **Browse** to assign the value a picture. Pictures are stored in the WinCC project in the **\GraCS\SicamIXPics** directory. You can assign these pictures or individual pictures.

- **DIST00Picture**
  Picture for the representation of Value 0 - Intermediate position
- **DIST00PictureBlink**
  Blink picture for the representation of Value 0 - Intermediate position
- **DIST11Picture**
  Picture for the representation of Value 3 - Disturbed
- **DIST11PictureBlink**
  Blink picture for the representation of Value 3 - Disturbed
- **OFFPicture**
  Picture for the representation of Value 1 - OFF
- **OFFPictureBlink**
  Blink picture for the representation of Value 1 - OFF
- **ONPicture**
  Picture for the representation of Value 2 - ON
- **ONPictureBlink**
  Blink picture for the representation of Value 2 - ON

Preview

The assigned picture is shown in a preview.

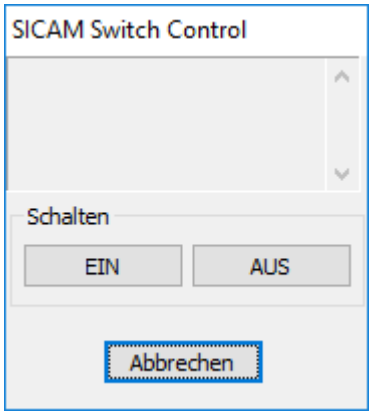
4.4.6 Runtime Dialogs of SICAM Switch Controls

Dialogs are available for performing switching operations, for status display, to acknowledge blinking and for synchronization.

To call up these dialogs during runtime, click the graphic object.

2-Step Switching Operation

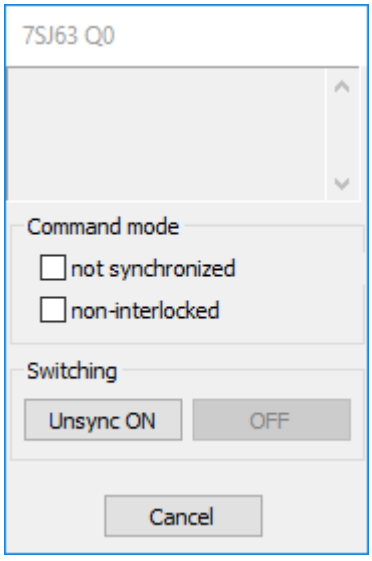
Click the graphic object to open the dialog for a switching operation.



[SCC_RT_401, 1, en_US]

Figure 4-8 Switching Dialog without Command Mode

Use the following dialog for switching operations with SICAM RTUs and IEC 61850/IEC 60870-5-104 devices. Controlling is performed via the SICAM IEC COMMUNICATION SUITE with the IEC 61850/IEC 60870-5-104 communication protocol.



[SCC_RT_402, 1, en_US]

Figure 4-9 Switching Dialog with Command Mode

This dialog is extended by 2 setting options for the selection of the command mode (Qualifier of Command, QoC).

The command mode can be defined with the following object properties in the object properties of the switching devices:

- **Visible in RT**

  Under **Visible in RT**, activate the checkboxes for the options you want to show additionally during runtime in the switching dialog and which can be modified.

- **Preset**

  Under **Preset**, activate the values to be transmitted.

  If the **Visible in RT** option is activated, you can define the pre-assignment in the runtime dialogs. The checkboxes under **Preset** can only be activated if the **SICAM IEC Communication Suite** protocol type has been selected in the **Tag connection 1** tab.

Table 4-8 Configuration with Different Protocol Types

Protocol type	Attribute	Effect if activated
SICAM PAS Protocol Suite	Not synchronized	Sends a marker command for unsynchronized switching to SICAM PAS. This is indicated in the check box with return of this marker command.
	Non-interlocked	Sends a marker command for non-interlocked switching to SICAM PAS. This is indicated in the check box with return of this marker command.
SICAM IEC Communication Suite	Not synchronized	Sends the Not synchronized Switching qualifier of command with the switching command in the command value.
	Non-interlocked	Sends the Non-Interlocked Switching qualifier of command with the switching command in the command value.

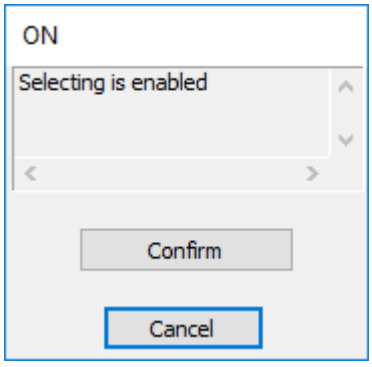
You can define the parameters of the **Select before operate** function via the properties of the control in the Graphics Designer, see *4.4.3 Advanced Properties of SICAM Switch Controls*.

After clicking **ON** or **OFF**, the Select command is transmitted if the bay devices are connected via IEC 61850. The **ON** and **OFF** buttons are disabled until a confirmation has been received. If the Select command has been successful, the Confirm dialog (see *Figure 4-11*) opens directly.

[SCC_RT_403, 1, en_US]

Figure 4-10 Switching Dialog, Select Command Is Running

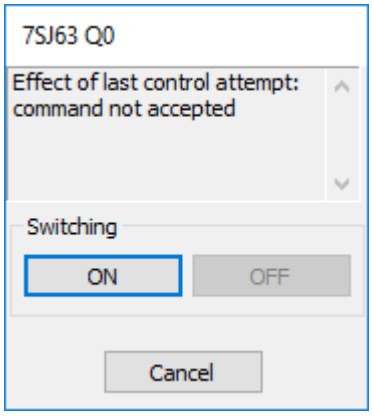
The select command can receive a positive or negative acknowledgment. Depending on the acknowledgment, one of the following dialogs opens.



[SCC_RT_404, 1, en_US]

Figure 4-11 Switching Dialog, Selection Is Active

The check resulted in a positive acknowledgment. The actual switching command can be issued by clicking the **Confirm** button.



[SCC_RT_405, 1, en_US]

Figure 4-12 Switching Dialog, Selection Rejected

The actual switching command cannot be issued. The switching operation must be aborted.

Synchronized/Not Synchronized and Interlocked/Non-Interlocked Switching

For the connection of devices to SICAM PAS via the **IEC 61850** and **SINAUT LSA ILSA** communication protocols, switching is possible by means of dialog extensions, **Command mode** dialog field. The following options can be selected by means of the dialog extensions:

- Synchronized or Not Synchronized switching
- Interlocked or Non-interlocked switching

The sequence of the advanced switching operation during runtime depends on the **IEC 61850** or **SINAUT LSA ILSA** communication protocol. For this reason, a distinction is made between the communication protocols in the paragraphs below.

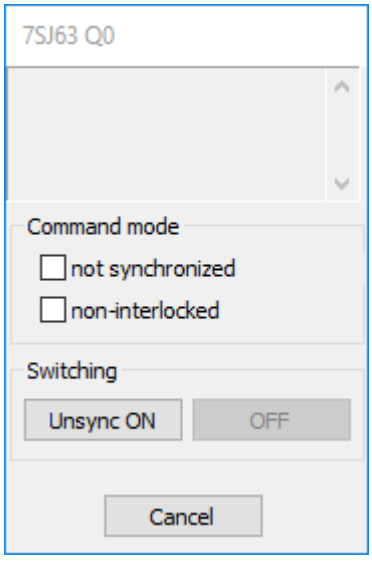
Synchronized/interlocked switching is supported by further communication protocols (e.g. IEC 60870-5-101-Master). In this context, however, the dialog extensions are not used.

The dialog extensions for synchronization and interlocking are only displayed if you have activated the corresponding option in the **SICAM Switch Control Properties**, **Advanced** tab under **Visible in RT**, see *4.4.3 Advanced Properties of SICAM Switch Controls*.

IEC 61850 Communication Protocol

This section describes the sequence of an advanced switching operation for the connection of devices to SICAM PAS via the IEC 61850 communication protocol.

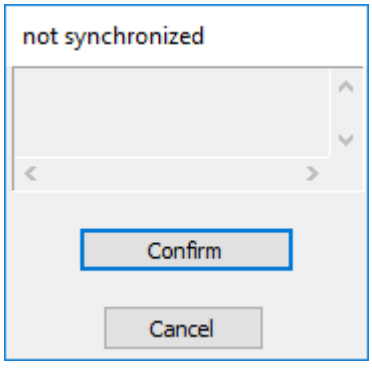
Click the graphic object to open the dialog window for an advanced switching operation.



[SCC_RT_402, 1, en_US]

Figure 4-13 Switching Dialog with Dialog Extensions

A confirmation dialog opens if you activate the **Not synchronized** or **Non-interlocked** checkbox.

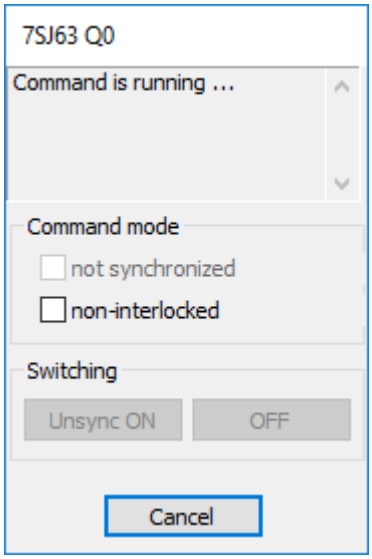


[SCC_RT_406, 1, en_US]

Figure 4-14 Confirmation Dialog

Click **Confirm** to issue a single command with the value **OFF** to the **Sync not effective** or **Non-interlocked** command tag.

At the same time, all the buttons are deactivated until a command feedback is received.

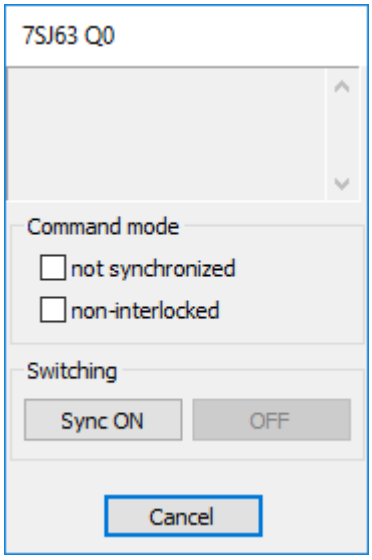


[SCC_RT_407, 1, en_US]

Figure 4-15 Advanced Switching Dialog for Synchronized Switching, Buttons Deactivated

As soon as a message has arrived via the **Sync not effective** information tag, the **Sync ON** button is activated and can be clicked.

The same procedure applies to non-interlocked switching.



[SCC_RT_408, 1, en_US]

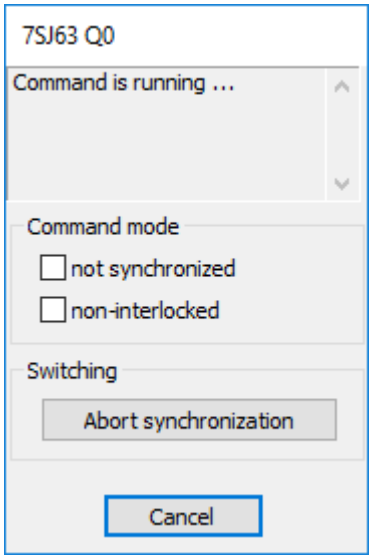
Figure 4-16 Advanced Switching Dialog for Synchronized Switching, Sync ON Button Activated

The **Sync ON** button can only be used for synchronized switching. The switching command is issued as usual:

- ✧ Click **Sync ON**.
  The control blinks in the setpoint status and the confirmation dialog opens.
- ✧ Click **Confirm**.
  The command is issued.

As long as the synchronized switching command is running, you can still abort the synchronization.

- ✧ To abort the synchronization, click the graphic object.
  The switching dialog with the **Abort synchronization** button opens.



[SCC_RT_413, 1, en_US]

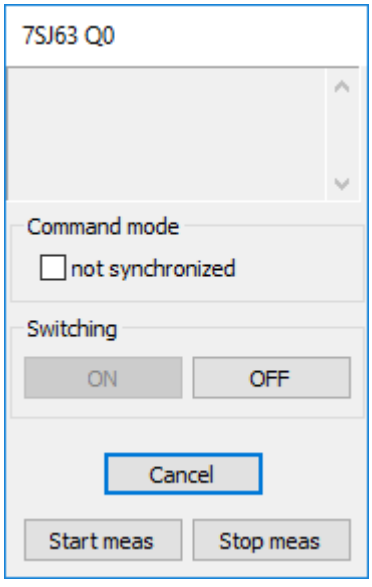
Figure 4-17 Aborting the Switching Dialog for Synchronized Switching

✧ Click **Abort synchronization**.
Synchronized switching is aborted.

SINAUT LSA ILSA Communication Protocol

This section describes the sequence of the advanced switching operation for the connection of devices to SICAM PAS using the SINAUT LSA ILSA communication protocol.

Click the graphic object to open the dialog window for an advanced switching operation.



[SCC_RT_409, 1, en_US]

Figure 4-18 Switching Dialog for Synchronized/Not Synchronized Switching

If the **Not synchronized** checkbox has been activated, the command tag for Not synchronized switching is used for the subsequent command output. The inscription on the button changes from **Sync ON** to **Unsync ON**.

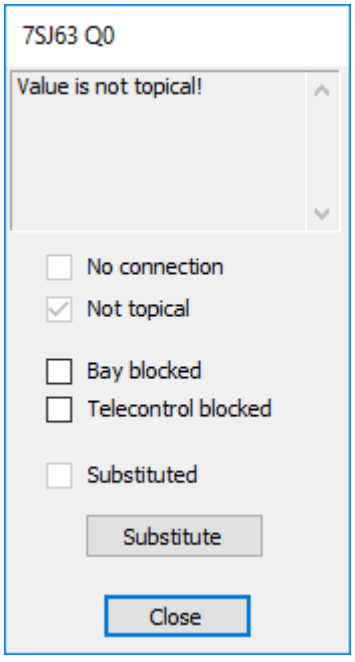
Click the **Sync ON** button to send a Synchronized Switching command with the normal command tag (Tag connection 1). The switching command is issued as usual:

✧ Click **Sync ON**.
The control blinks in the setpoint status and the confirmation dialog opens.
✧ Click **Confirm**.
The command is issued.

Click **Start Meas** to issue a measurement trigger to the synchronization unit. The measured values are updated without performing a switching operation.

Status

The status dialog can be opened by clicking with the right mouse button, provided that the status display has been activated in the Properties dialog.
An information-specific block can be defined for the information of the SICAM PAS target system in combination with SICAM PAS/PQS V8.01 or later. This means that the process value update can be blocked for individual information objects, here: Double-point indication. You can set/undo the bay blocking/telecontrol blocking in the status dialog of the switching device objects. To do this, activate the corresponding function.

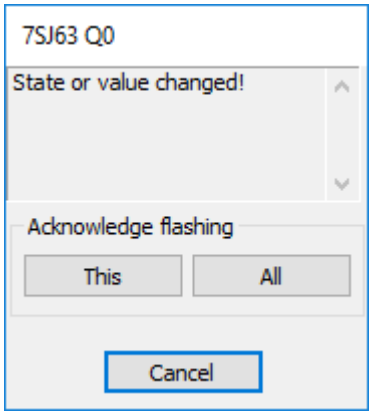


[SCC_RT_410, 1, en_US]
Figure 4-19 Status Dialog

The current status is also indicated by a tick in the corresponding checkbox in the status dialog; the switch is marked with a colored rectangle, see switching status in *Figure 4-6*.
If **Bay blocked** is activated, the switch position can be substituted by clicking **Substitute**. The dialog for substituting a switch position opens, see *4.4.7 Substituting the Switch Position*.

Acknowledge Blinking

Click a blinking graphic object to open the **Acknowledging blinking** dialog.



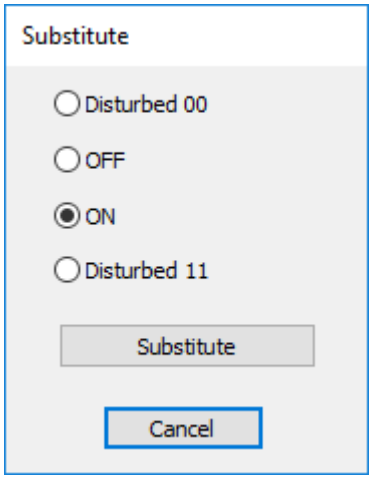
[SCC_RT_411, 1, en_US]
Figure 4-20 Acknowledge Blinking

Click **This** to acknowledge a status change or a spontaneous alarm for this switch.
Click **All** to use the tag entered in the properties under
Tag name acknowledgement tag for spontaneous flashing for acknowledging. All ActiveX Controls currently displayed in the diagram and connected to this tag are acknowledged at the same time.

NOTE

To enter a new command, the flashing must be acknowledged first.

4.4.7 Substituting the Switch Position

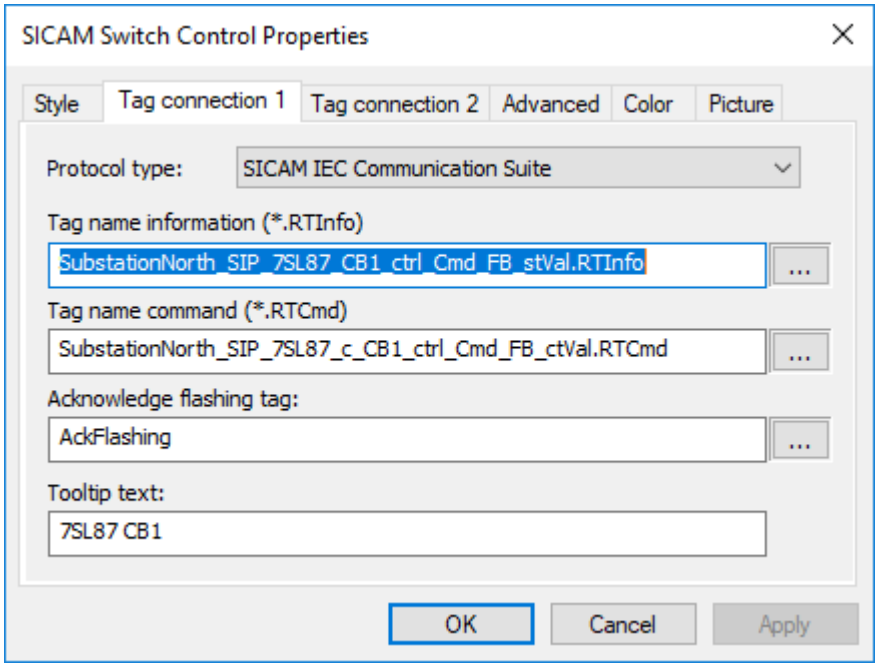


[SCC_RT_412, 1, en_US]
Figure 4-21 Substituting the Switch Position

In this dialog, you specify how the switch position is to be substituted. Click **Substitute** in order to open the Confirm dialog. Click the **Confirm** button to execute the substitution.

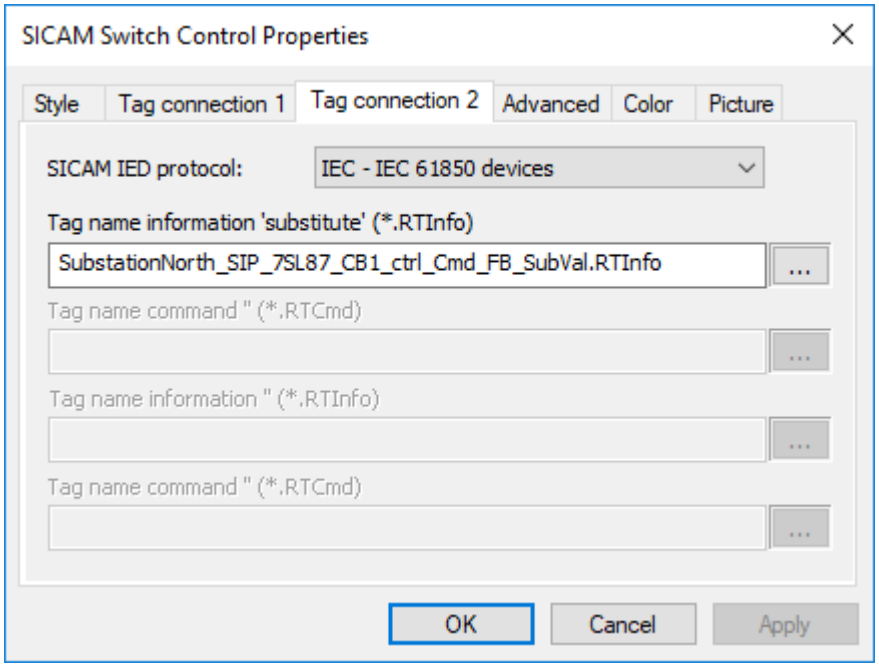
Substituting Switch Positions for IEC 61850 Devices

To substitute switch positions for IEC 61850 devices, the SICAM IED protocol **SICAM PAS – IEC 61850 devices** must be selected in the SICAM Switch Control Properties, **Tag connection 2** tab. Furthermore, the tag to be substituted must be selected from the drop-down list below.



[sc_prop_switch_control_2, 1, en_US]

Figure 4-22 Defining SICAM Switch Control Properties – Tag connection 1



[sc_prop_switch_control, 2, en_US]

Figure 4-23 Defining SICAM Switch Control Properties – Tag connection 2

NOTE

Substituting is only possible on IEC 61850 data points with Functional Constraint (FC) SV, e.g. SubVal. For IEC 61850 devices, substitution is usually performed to the XCBR or XCSWI data point.

Alternatively, you can create a new **SubVal2IED = 1** in the 61850.ini file under [GENERAL]; in this case, the .stVal can be used directly for substitution.

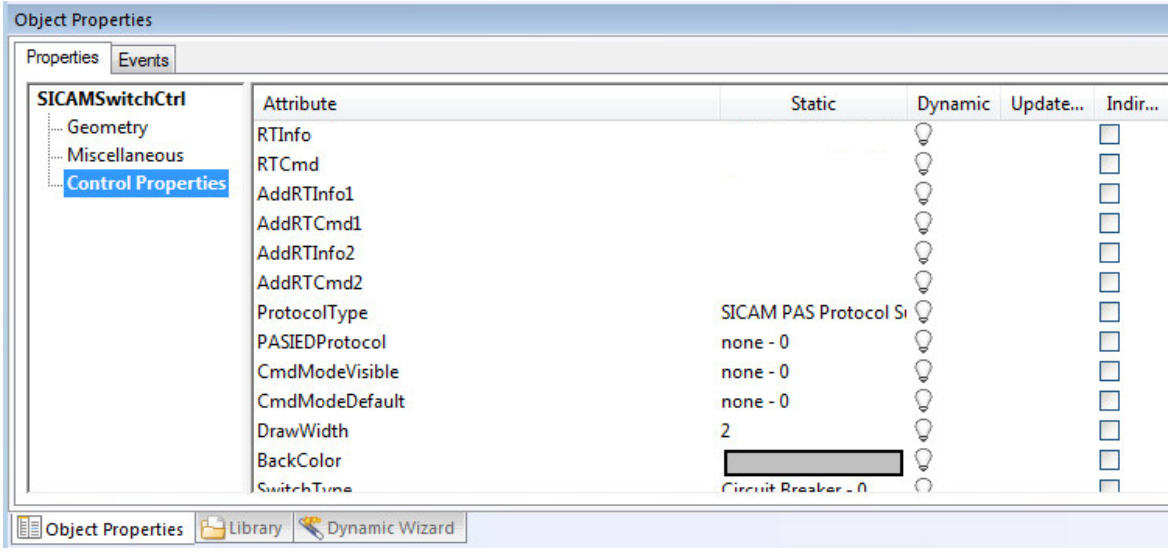
4.4.8 Defining Object Properties

The Object properties dialog consists of the **Properties** and **Events** tabs. The following section describes certain parameters from these tabs.

Proceed as follows to open the **Object properties** dialog:

- ✧ Right-click the graphic object.
- ✧ Select **Properties** in the context menu.
  The **Object properties** dialog opens.

Properties tab



[sc_switchcontrol_props, 1, en_US]

Figure 4-24 Object properties, Properties tab

The following table provides a list of certain important object properties of the circuit breakers/disconnectors.

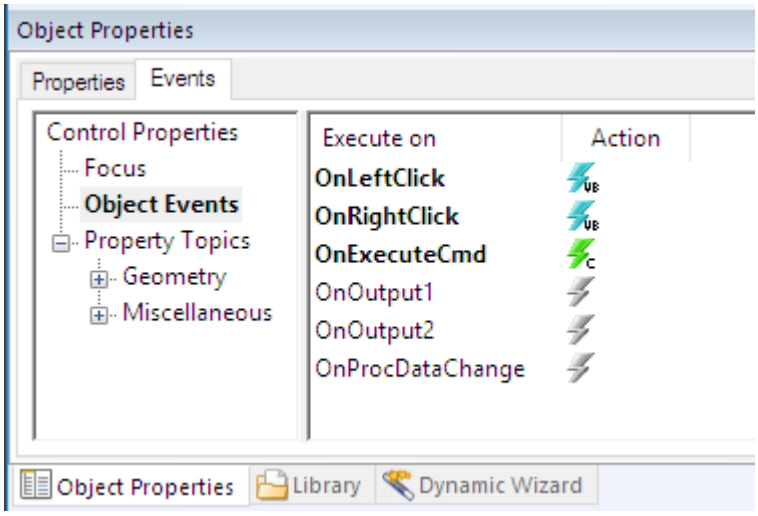
Table 4-9 Object properties

Object properties	Meaning
Operator control enable	The user can define for the SICAM Switch Control whether or not the object can be operated during runtime. In order to be able to operate an object, the user must have the corresponding authorization.
DrawWidth	Drawing width in dots. The drawing width of the graphic object can be defined in steps from 1 to 11. Step 1 represents the smallest line width. The adjustment of the line width is possible for all representation styles according to DIN 42200, IEC 445 and LSA.
BackColor	Background color of the control. This color is displayed when the control blinks.
SwitchType	Type of control, circuit breaker or disconnector.
Norm	Graphical representation style of the SICAM Switch Control. For a list of possible styles, refer to *Graphical representation, Page 112*

Object properties	Meaning
Direction	Picture rotation in degrees: • 0 • 90 • 180 • 270
Style3D	3D representation: • Yes • No The 3D style illustrates the view of the selected object.
DialogPosLeft	This property defines the position of the left-hand edge of the Runtime dialog.
DialogPosTop	This property defines the position of the upper edge of the Runtime dialog.
FixDialogPosition	This property defines whether the dialog shall be opened next to the object or next to the defined position.
ToolTipText	This property defines a tooltip text in the picture.
ONPicture	If the **Picture** setting is defined in the Properties dialog, **Style > Norm** tab, the picture configured under **ONPicture** (**Picture** tab) is shown for the ON (2) status. ⇒ The **ActiveX properties** dialog opens.
OFFPicture	If the **Picture** setting is defined in the Properties dialog, **Style > Norm** tab, the picture configured under **OFFPicture** (**Picture** tab) is shown for the OFF (1) status. ⇒ The **ActiveX properties** dialog opens.
DIST00Picture	If the **Picture** setting is defined in the Properties dialog, **Style > Norm** tab, the picture configured under **DIST00Picture** (**Picture** tab) is shown for the Intermediate Position (0) state. ⇒ The **ActiveX properties** dialog opens.
DIST11Picture	If the **Picture** setting is defined in the Properties dialog, **Style > Norm** tab, the picture configured under **DIST11Picture** (**Picture** tab), is shown for the fault position (3) state. ⇒ The **ActiveX properties** dialog opens.
ONColor	With this property you define the color for the ON state.
OFFColor	With this property you define the color for the OFF state.
DIST00Color	With this property you define the color for the Intermediate Position with the value 0.
DIST11Color	With this property you define the color for the fault position with the value 3.
NotTopicalColor	With this property you define the color for the **Not topical** status of the device information. The device is switched off or cannot be contacted.
PASNotOKColor	With this property you define the color for the **PAS not OK** status. There is no connection to the target system.
BayBlockedColor	With this property you define the color for the bay block defined.
SubstitutedColor	With this property you define the color for substituted values.
TeleBlockedColor	With this property you define the color for the telecontrol block defined.

Object properties	Meaning
StateColorVisibleFlag	With this property you define the display of the following statuses: • 0x0100: Bay blocking • 0x0400: Not topical • 0x0800: Substituted value • 0x2000: Telecontrol blocking • 0x0008: No connection to the target system The default value is 0x0100 | 0x0400 | 0x0800 | 0x2000 | 0x0008 = 11528: All statuses are shown.
CommandTimeout	The command execution is canceled by SICAM PAS if there is no feedback from the process. This value can also be modified in the **Advanced** tab. The control switches to normal state or to **Spontaneous flashing**.
EnableSpontaneous-Flashing	With this property you enable spontaneous flashing in case of spontaneous messages.
EnableSetPointFlashing	With this property you enable spontaneous flashing when selecting the switching direction in the Command dialog.
EnableFlashingOn-NegConfirm	With this property you enable spontaneous flashing in case of a negative command acknowledgement. Flashing is only enabled for the control which has been operated. Other controls with the same tag connection or controls on a redundant system do not flash.
EnableSETIsACTUAL	With this property you enable switching to the ACTUAL state of the switching device, e.g. sending an ON command if the device is already in ON state.
Authorization	With this property you assign authorizations. 0 = without authorization check The authorizations of the User administrator settings are checked.
AckSpontanFlashing	With this property you enable the simultaneous acknowledgement of several controls in a group.
InputValue1 InputValue2	Input points for topological coloring.
TOPOColorINVALID	This value defines the default color for lines in the INVALID state. It is forwarded to the related connectors if the graphic object is in the INVALIFD state.
TOPOColorOFF	Default value for defining the color in case of topological coloring. This value is transferred to the corresponding connectors if the graphic object is in the OFF status.
ConnectorAttributes	see *Settings for working area, Page 187*
ColorUse	see *Settings for working area, Page 187*

Events tab



[sc_switchcontrol_event, 1, en_US]

Figure 4-25 Object properties, Events tab

- **OnLeftClick**
  The switching dialog is opened by default via the **OnLeftClick** event.
- **OnRightClick**
  The status dialog is opened by default via the **OnRightClick** event.
- **OnExecuteCmd**
  The command type (internal) and the command value are transferred to the **OnExecuteCmd_V800(...)** C script via the **OnExecuteCmd** event.

The switching dialog and the status dialog are opened by default in the **OnLeftClick** and **OnRightClick** events. You can adapt the scripts of these events to your specific requirements.

In the **OnExecuteCmd** event, the **PAS_CommandExecute_V800** command output script is called up. The command type and the command value are transferred to this script.

You can complement these events in order to adapt the integrated command output mechanism to your specific requirements.

The C script of the **OnExecuteCmd** event is shown in the screenshot below. Insert your script lines before calling up **PAS_CommandExecute_V800**.

```
#include "apdefap.h"
void OnExecuteCmd(char* lpszPictureName, char* lpszObjectName , char * lpszPropertyName, short cmdtype, long cmdvalue, long timeout)
{
// WINCC:TAGNAME_SECTION_START
// syntax: #define TagNameInAction "DMTagName"
// next TagID : 1
// WINCC:TAGNAME_SECTION_END

// WINCC:PICNAME_SECTION_START
// syntax: #define PicNameInAction "PictureName"
// next PicID : 1
// WINCC:PICNAME_SECTION_END

  "    Fügen Sie Ihren individuell angepassten Code ein.    "

  SCC_SwitchControl_Command(lpszPictureName, lpszObjectName, lpszPropertyName, cmdtype, cmdvalue, timeout);     //Return-Type: void
}
```

[SICAMSwitch_Script, 1, --_--]

Figure 4-26 OnExecuteCmd C script, SICAM Switch Control graphic object

The information required for command output using the SICAM Switch Control graphic object and the processing of the SICAM SCC Runtime Data Server tags in C scripts is available in the **SCC_Def.h** file. Integrate this header file into the C script.

The values and meanings of the **cmdtype** and **cmdvalue** tags are listed in the tables below.

Table 4-10 Command types and related values in the cmdtype tag

Command type	Enum tag	Value
Information-specific block	Command_Set_Blockstate	-3
Substitute	Command_Substitute	-2
Acknowledge flashing	Command_Acknowledge	-1
Switching	Command_Switch	1
Set point	Command_Setpoint	2
Select	Command_Select	3
Abortion	Command_Abort	4

The **Switch** command type is also used for the output of the **Not synchronized** and **Non-interlocked** options.

Table 4-11 Command values in the cmdvalue tag and their meaning

Valid for command types	Meaning	Constant	Value
Substitute, Switch, Select and Not Synchronized, Non-Interlocked changeover	Switch position Intermediate position	VALUE_SWITCH_DIST00	0
	Switch position OFF	VALUE_SWITCH_OFF	1
	Switch position ON	VALUE_SWITCH_ON	2
	Switch position disturbed	VALUE_SWITCH_DIST11	3
Acknowledge flashing	One object	VALUE_ACKNOWLEDGE_THIS	1
	All objects (depending on the Acknowledge tag)	VALUE_ACKNOWLEDGE_ALL	2

4.4.9 Operation with Self-Created Dialogs

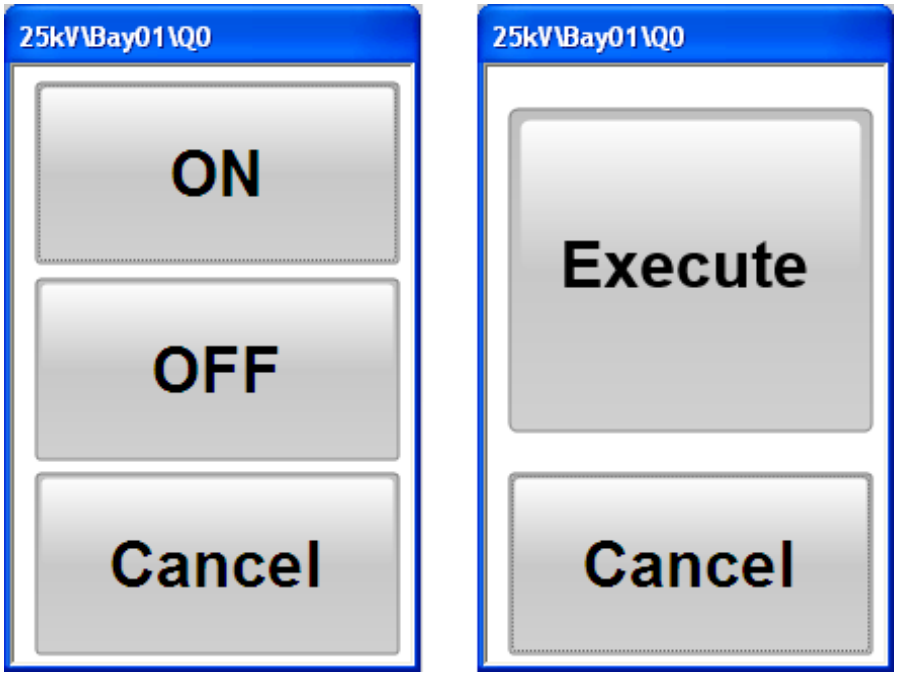
If it is not sufficient to adapt the event scripts to normal dialog control, you can replace the default dialogs by customized dialogs. To do this, you must edit the scripts which open the switching dialog and save them under a new name.

Example of a self-created switching dialog: When clicking on the switching device objects with the left mouse button, the command tag name is written in a text tag, and the self-created switching dialog opens.

In your switching dialog you can use the **ON** or **OFF** button and the intermediately stored command tag name to call up a command output script, e.g. SCC_Command. To implement a two-stage command output, you can comment the increase of the counter tag in this script at the point described (// start: execute the command).

Rename the script, e.g. void SCC_Command_NoExecute(), and save it under this name. Use the SCC_CommandExecute_V500 script to send the command.

This screenshot provides an example of self-created dialogs with large touch operation buttons:



[scc439, 1, en_US]

Figure 4-27 Example, self-created dialogs

Authorization Check

To also enable a check of the **Authorization level** with self-created dialogs, insert an authorization check in the **OnLeftClick**/**OnRightClick** events that you use.

```
#include "apdefap.h"
void OnRightClick(char* lpszPictureName, char* lpszObjectName )
{
// WINCC:TAGNAME_SECTION_START
// syntax: #define TagNameInAction "DMTagName"
// next TagID : 1
// WINCC:TAGNAME_SECTION_END

// WINCC:PICNAME_SECTION_START
// syntax: #define PicNameInAction "PictureName"
// next PicID : 1
// WINCC:PICNAME_SECTION_END

#pragma code ("useadmin.dll")
#include "PWRT_api.h"
#pragma code()

BOOL bPermission = FALSE;
long int iPermissionLevel = 0;

// ########## Debug Switch ###############
          extern BOOL     g_debug;
// ########################################

   iPermissionLevel = GetPropWord(lpszPictureName,lpszObjectName, "Authorization");          //Return-Type: long int
   if (g_debug)
      { printf ("Authorization level: %d\n", iPermissionLevel);}

   bPermission = PWRTCheckPermission ( (DWORD) iPermissionLevel, FALSE);    // To suppress WinCC Message
Box set: False to TRUE

   if ( !bPermission )
   {
      if (g_debug)
         {  printf ("PWRTCheckPermission: No Permission\n");}
   }
   else
   {
      if (g_debug)
         {  printf ("PWRTCheckPermission: Permission OK\n");}

      // Add your script code here
      // ..........
   }
}
```

[sc_authorization_check, 1, --_--]

4.4.10 Operation via Keyboard

The **SICAM Switch Controls** graphic objects can be operated via the mouse or using the **keyboard**.

To initiate a switching operation using the keyboard, **buttons** must be inserted into the display, and a **hotkey** must be configured for each button.

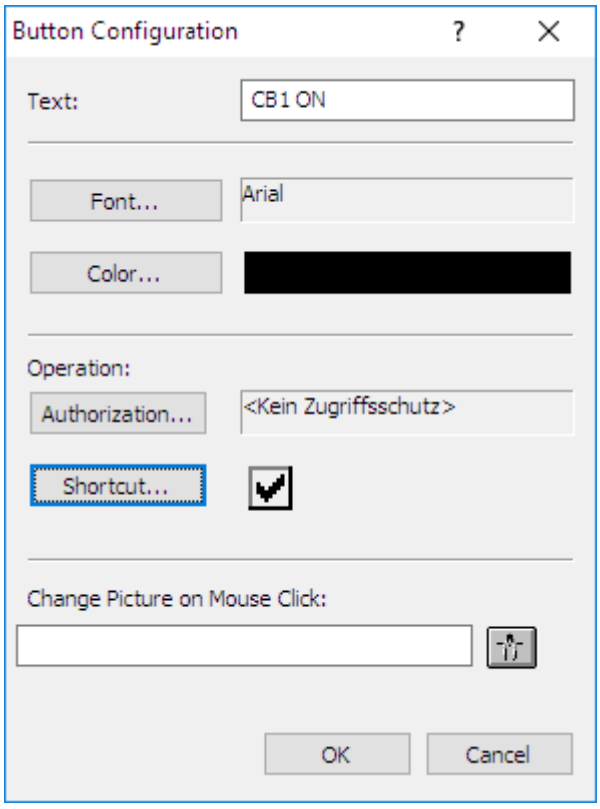
The switching operation is initiated by pressing the configured key or key combination during runtime. Additionally, a user right can be assigned for the operation of the button.

The **runtime dialogs** of switching device objects are not displayed for operation via keyboard/buttons.

An **ordinary PC keyboard** or a **special function keyboard** can be used. To use a function keyboard, the PC keyboard must be removed from the computer and the function keyboard must be plugged in instead.

Configuring a button

A specific button for each action must be inserted into the diagram (**Object palette > Windows object**). The **Button Configuration** dialog opens as soon as the button has been inserted.



[pascc440, 1, en_US]

Figure 4-28 Configuring a button

- ✧ Enter the button text into the Text entry field.
- ✧ Next, click **Hotkey...** to define a hotkey for the button.
- ✧ Click **OK** to close the dialog.

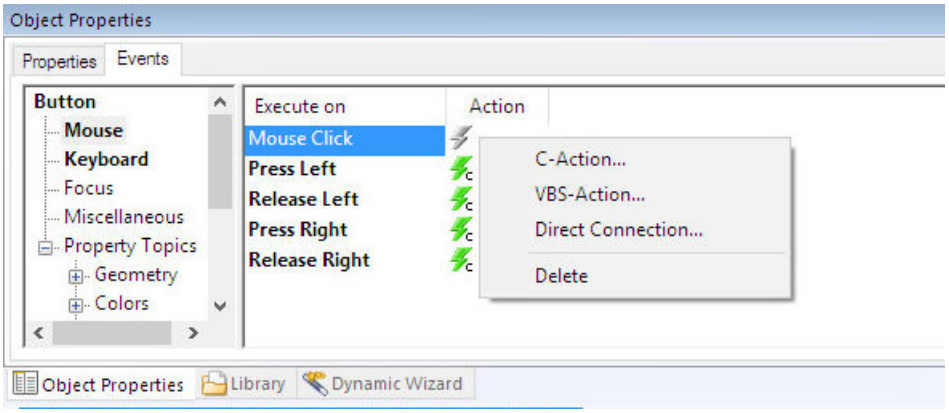
For more detailed information regarding the configuration of a button, refer to the WinCC Information System.

Defining a C script

In order to be able to initiate an action via a button for **SICAM Switch Controls**, a C script has to be defined for the button. When clicking this button, the C script executes the **SCC_Command** function. This function transfers the object name, the command type, and the command value.

In the following example an **ON** Select command shall be transmitted for a switching object.

- ✧ Open the **Object properties** of the button.
- ✧ Select the **Miscellaneous** entry in the **Properties** tab.
- ✧ For the Hotkey attribute, configure a function key to which the button shall respond.
- ✧ Select **Mouse** in the **Event** tab.



[pascc441, 1, en_US]

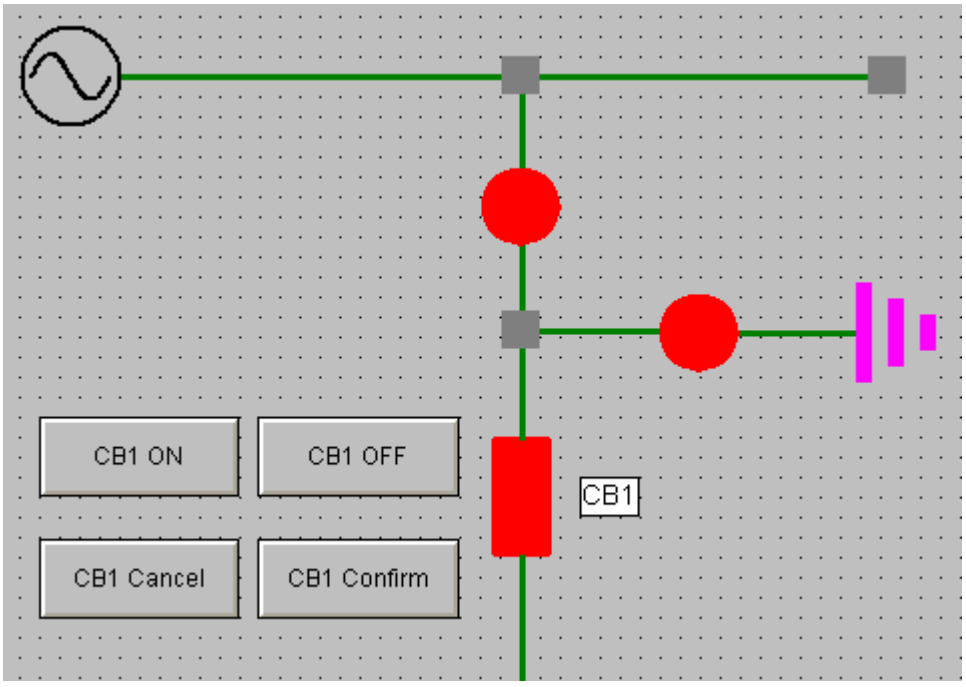
Figure 4-29 Opening the editor

- ✧ Right-click Mouse Action in the Action column.
- ✧ Select **C Action** from the context menu.
  The editor opens and the C script is displayed.

The name of the selected control can be dynamically determined in the C script using the **Get_Focus** function.

- ✧ Edit the C script.
- ✧ Compile the C script and click **OK** to close the editor.

You can now add further buttons for **deactivating**, **confirming**, and **canceling** the switching operation and configure these buttons accordingly. In this case, the diagram looks as shown below.



[pascc443, 1, en_US]

Figure 4-30 Diagram with buttons for a switching operation

Define the **TAB order** in the Graphics Designer in order to be able to select the controls using the keyboard. Afterwards, you can select the controls using the Tab key on the keyboard during runtime.

Switching operation during runtime

During runtime, a switching operation (OFF > ON) would be executed as follows:

- The switch is in **OFF** state. You press the **CB1 ON** hotkey on the keyboard.
- The switching device object starts blinking in setpoint state.
- You press the **CB1 Confirm** hotkey on the keyboard. The switching command is executed.
- The switching device object switches to the **ON** state. The switching operation is completed.

Feedback messages regarding the switching operation are shown in the **event list**.

4.4.11 Interfaces for Project-Specific Dialogs

The **SICAMSwitch.dll** has been extended by several interfaces which enable the communication of self-created dialogs with the SICAM Switch Control in the same way as for the integrated dialogs.

4.4.11.1 SetControlCommand Function

This functions allows the user to transmit all operations of the intergrated dialog from the outside to the SICAM Switch Control.

Command

```
SetControlCommand (LONG CmdType, LONG ButtonID, LONG ButtonStates)
```

Parameter

CmdType transfers the command type.

Information-specific block	Command_Set_Blockstate	-3
Substitute	Command_Substitute	-2
Acknowledge flashing	Command_Acknowledge	-1
Switching	Command_Switch	1
Set point	Command_Setpoint	2
Select	Command_Select	3
Abortion	Command_Abort	4

ButtonID transfers the ID of the actuated button.

ButtonStates defines the button mask, i.e. the IDs of the buttons actuated are linked via an OR operation and transferred.

```
enum ButtonID {
      sccds_Btn_Diff          = 0x0001,
      sccds_Btn_Off           = 0x0002,
      sccds_Btn_On            = 0x0004,
      sccds_Btn_Stoer         = 0x0008,
      sccds_Btn_WithLock      = 0x0010,
      sccds_Btn_NoLock        = 0x0020,
      sccds_Btn_WithSynch     = 0x0040,  /* with PSG */
      sccds_Btn_NoSynch       = 0x0080,  /* without PSG */
      sccds_Btn_CancelSynch   = 0x0100,  /* cancel PSG */
      sccds_Btn_Select        = 0x0200,
      sccds_Btn_Execute       = 0x0400,
      sccds_Btn_Cancel        = 0x0800,
      sccds_Btn_ACK_THIS      = 0x1000,
      sccds_Btn_ACK_ALL       = 0x2000
```

[sc_fct_1, 1, --_--]

4.4.11.2 GetControlState Function

This function is used to read out the current status of the SICAM Switch Control. The **enum** value is transferred upon the call; afterwards the return value is indicated here.t.

Command

```
GetControlState ( VARIANT* pVal)
```

```
enum GetControlState {
      gcs_Version = 1,              // 01
      gcs_get_Value,                // 02
      gcs_get_Cause,                // 03
      gcs_get_AddCause,             // 04
      gcs_get_QualityCode,          // 05
      gcs_get_VarType,              // 06

      gcs_IsDataValid,              // 07
      gcs_IsHeld,                   // 08
      gcs_IsOverflowed,             // 09
      gcs_IsBayBlocked,             // 10
      gcs_IsRemoteBlocked,          // 11
      gcs_IsSubstituted,            // 12
      gcs_IsDataServerNotOK,        // 13
      gcs_IsNoVar,                  // 14
      gcs_IsDemoMode,               // 15
      gcs_IsDemoModeExpired,        // 16
      gcs_IsNotTopical,             // 17
      gcs_IsSubstitutionEnabled,    // 18
      gcs_IsSpontaneousFlashing,    // 19
      gcs_IsSwitchEnabled,          // 20
      gcs_getControlCommandState,   // 21
      gcs_get_Cmd_Value,            // 22
      gcs_get_Cmd_Cause,            // 23
      gcs_get_Cmd_AddCause,         // 24
      gcs_Cmd_IsDataValid,          // 25
      gcs_get_Cmd_ValueType,        // 26
      gcs_set_Cmd_ValueType,        // 27
      gcs_get_LimitStates           // 28
};
```

[sc_fct_2, 2, --_--]

`gcs_get_LimitStates` return values:

- Bit 0: Command Timer Timeout
- Bit 1: Setpoint Flashing
- Bit 2: Spontaneous Flashing

4.4.11.3 Event OnProcDataChange

The event is triggered by SICAMSwitch if the object status changes.

```
void OnProcDataChange(char* lpszPictureName, char* lpszObjectName ,  long opdcEvent,  long value)
{…}

opdcEvent:
enum OnProcDataChange {
      opdc_Select           = eSelect,           // 16
      opdc_SelectConfPos    = eSelectConfPos,    // 17
      opdc_SelectConfNeg    = eSelectConfNeg,    // 18
      opdc_Command          = eCommand,          // 19
      opdc_CommandConfPos   = eCommandConfPos,   // 20
      opdc_CommandConfNeg   = eCommandConfNeg,   // 21
      opdc_Abort            = eAbort,            // # 25
      opdc_AbortConfPos     = eAbortConfPos,     // 26
      opdc_AbortConfNeg     = eAbortConfNeg,     // 27
      opdc_CommandTermPos   = eCommandTermPos,   // # 35
      opdc_CommandTermNeg   = eCommandTermNeg,   // 36
      opdc_AbortTermPos     = eAbortTermPos,     // 37
      opdc_AbortTermNeg     = eAbortTermNeg,     // 38
      opdc_SelectTermPos    = eSelectTermPos,    // 39
      opdc_SelectTermNeg    = eSelectTermNeg,    // 40
      opdc_newValue = 100,                       // # 100
      opdc_TimeOutSelect,                        // 101
      opdc_TimeOutSelected,                      // 102
      opdc_TimeOutExecute                        // 103
      opdc_new_lValue = 110,                     // # 110, long
      opdc_new_ulValue,                          // 111, unsigned long
      opdc_new_fValue                            // 112, float
   };
```

[sc_fct_3, 2, --_--]

The **value** parameter indicates the value, e.g. the switching direction in case of commands or the new status in case of a process value change.

4.5 Anwendungsbeispiele für die Funktionen

4.5.1 Script for Event OnProcDataChange

This script sets the **QuitBlinking** variable at event **OnProcDataChange** of the SICAM Switch Control in the same way as the Switch Control object for SICAM SCC V7 or earlier versions:

- Checking the switch for spontaneous flashing
- Setting iSwitchState for the call to gcs_IsSpontaneousFlashing
- The return value in iSwitchState is a Boolean value (Yes/No)
- bReturn is only required for VBS, does not include information

```
Sub OnProcDataChange(ByVal Item,  ByVal opdcEvent,  ByVal Value)

  ' ----------- event identifier of SICAMSwitch on process data changes --------
  '
  ' OnProcDataChange  Event On Process Data Change

      Const         con_opdc_Select           =  16
      Const         con_opdc_SelectConfPos    =  17
      Const         con_opdc_SelectConfNeg    =  18
      Const         con_opdc_Command          =  19
      Const         con_opdc_CommandConfPos   =  20
      Const         con_opdc_CommandConfNeg   =  21
      Const         con_opdc_Abort            =  25
      Const         con_opdc_AbortConfPos     =  26
      Const         con_opdc_AbortConfNeg     =  27
      Const         con_opdc_CommandTermPos   =  35
      Const         con_opdc_CommandTermNeg   =  36
      Const         con_opdc_AbortTermPos     =  37
      Const         con_opdc_AbortTermNeg     =  38
      Const         con_opdc_SelectTermPos    =  39
      Const         con_opdc_SelectTermNeg    =  40
      Const         con_opdc_newValue         = 100
      Const         con_opdc_TimeOutSelect    = 101
      Const         con_opdc_TimeOutSelected  = 102
      Const         con_opdc_TimeOutExecute   = 103

  ' ----------- call parameter identifier for reading switch state ------------
  '
  ' GetControlState GCS

      Const         con_gcs_Version                 = 01
      Const         con_gcs_Value                   = 02
      Const         con_gcs_Cause                   = 03
      Const         con_gcs_AddCause                = 04
      Const         con_gcs_QualityCode             = 05
      Const         con_gcs_VarType                 = 06

      Const         con_gcs_IsDataValid             = 07
      Const         con_gcs_IsHeld                  = 08
      Const         con_gcs_IsOverflowed            = 09
      Const         con_gcs_IsBayBlocked            = 10
      Const         con_gcs_IsRemoteBlocked         = 11
      Const         con_gcs_IsSubstituted           = 12
      Const         con_gcs_IsDataServerNotOK       = 13
      Const         con_gcs_IsNoVar                 = 14
      Const         con_gcs_IsDemoMode              = 15
      Const         con_gcs_IsDemoModeExpired       = 16
      Const         con_gcs_IsNotTopical            = 17
      Const         con_gcs_IsSubstitutionEnabled   = 18
```

[sc_func_ex_1p1, 1, --_--]

```
Const         con_gcs_IsSpontaneousFlashing    = 19
Const         con_gcs_IsSwitchEnabled          = 20
Const         con_gcs_GetControlCommand        = 21
Const         con_gcs_IsSpontaneousFlashing    = 19
Const         con_gcs_IsSwitchEnabled          = 20
Const         con_gcs_GetControlCommand        = 21
Const         con_gcs_GetCommandValue          = 22
Const         con_gcs_GetCommandCause          = 23
Const         con_gcs_GetCommandAddCause       = 24
Const         con_gcs_CmdIsDataValid           = 25
Const         con_gcs_GetCommandValueType      = 26
Const         con_gcs_SetCommandValueType      = 27
Const         con_gcs_get_LimitStates          = 28

' gcs_get_LimitStates returns:
' - Bit 0: Command Timer Timeout
' - Bit 1: Set point Flashing
' - Bit 2: Spontaneous Flashing

'Variable declaration
Dim iSwitchState
Dim bReturn

'Script code
HMIRuntime.Trace "OnProcDatachange - Event: " & opdcEvent & vbNewline

If con_opdc_newValue = opdcEvent Then
      iSwitchState  = con_gcs_IsSpontaneousFlashing
      bReturn = Item.GetControlState(iSwitchState )

      HMIRuntime.Trace "GetControlState(con_gcs_IsSpontaneousFlashing) = "
                       & iSwitchState  & vbNewline

      If 1 = iSwitchState Then
            HMIRuntime.Tags("QuitBlinking").Write 1
      End If
End If

HMIRuntime.Trace "PictureName: " & HMIRuntime.ActiveScreen.ObjectName & vbNewline
HMIRuntime.Tags("LastAlarmPicName").Write HMIRuntime.ActiveScreen.ObjectName

End Sub
```

[sc_func_ex_1p2, 1, --_--]

4.6 SICAM Electrical Device Control

The following SICAM Electrical Device Control types are available: Feeder, Ground, Transformer (additionally: Auto transformer 1-phase and Auto transformer 3-phase) and Termination. These control types are included in the **Topology** folder of the SICAM graphic object library.

See *5.2 Topological Elements*.

4.7 SICAM Bay Overview

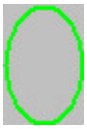
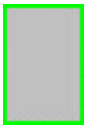
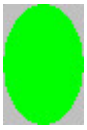
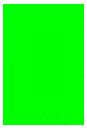
The **Overview** folder in the SICAM graphic object library includes the SICAM Bay Overview user object. It is implemented as an ActiveX Control and already contains typical functions.

You can use a bay overview to show the status of an entire bay by means of a single graphic object.

Graphical representation

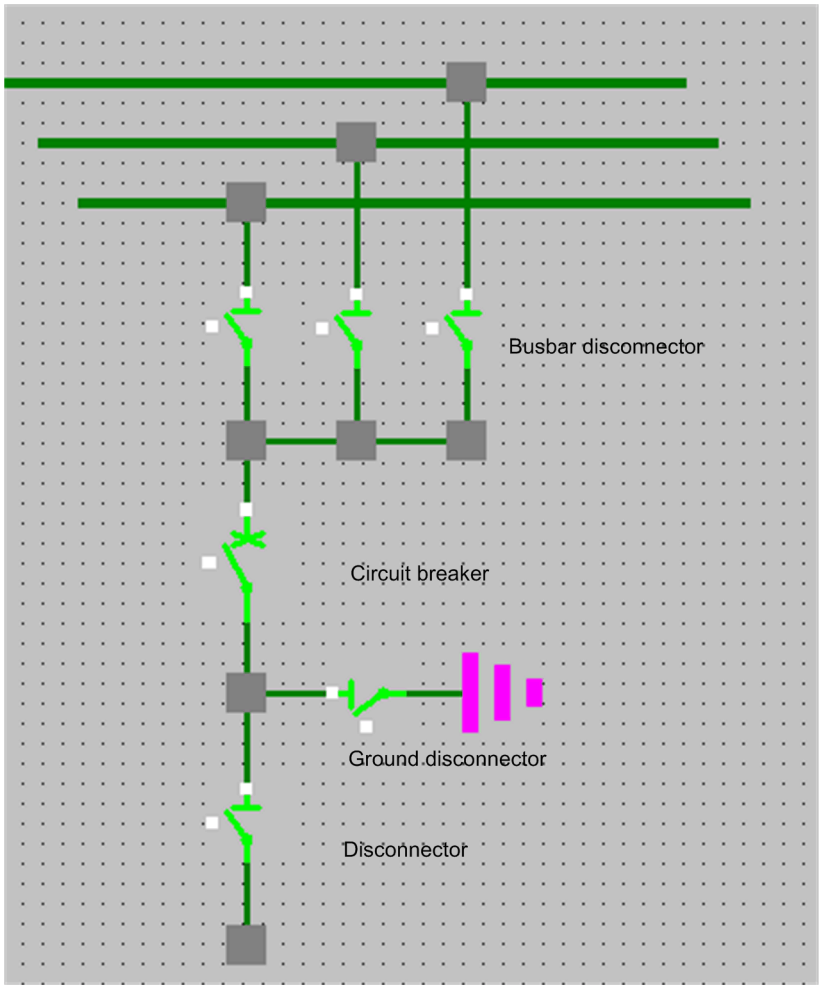
4 bay overview variants are available in the SICAM graphic object library:

Table 4-12 Graphical representation of the bay overview

Bay overview	View	Graphic
LSA rounded	LSA representation with circular symbol	
LSA boxed	LSA representation with rectangular symbol	
SICAM rounded	SICAM representation with circular symbol	
SICAM boxed	SICAM representation with rectangular symbol	

Maximum bay extension

A bay overview diagram can show one single bay with the following maximum extension:



[sc_topo max bay overview, 1, en_US]

Figure 4-31 Maximum bay extension shown in a bay overview

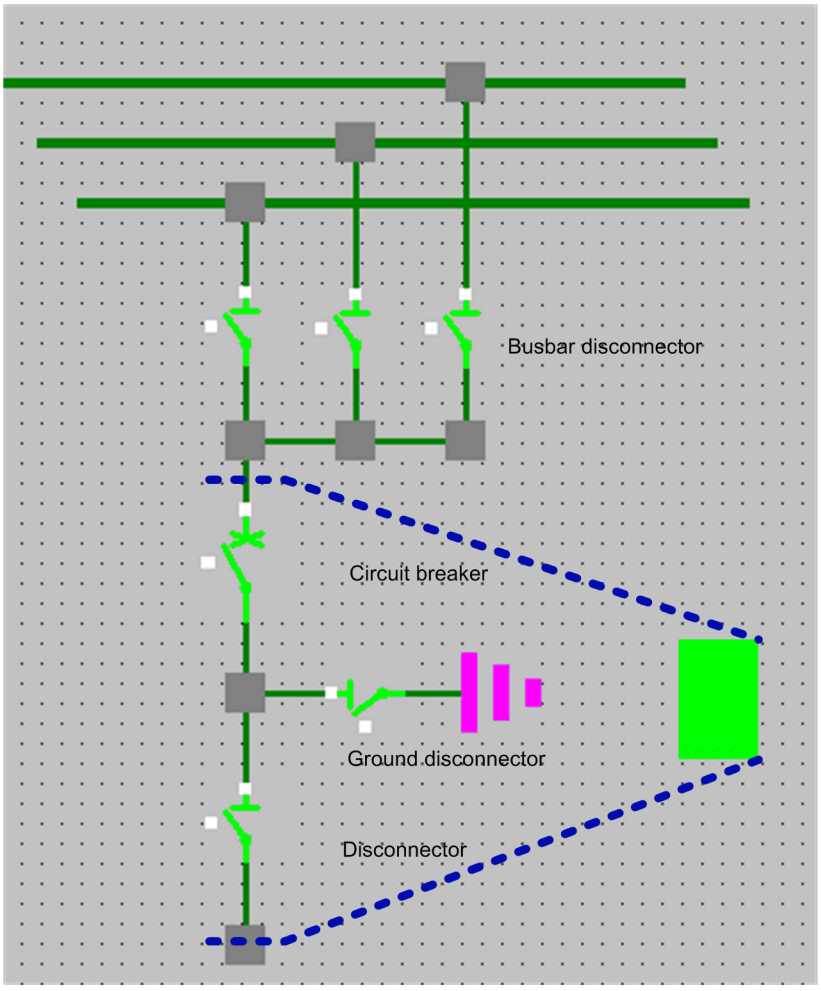
The SICAM bay overview is processed with only 1 busbar by the topology component.

NOTE

If switches configured in the bay overview are configured as single switches in another picture, you have to take care of the orientation of the connection points.

If multiple busbars should be considered, there are 2 ways for the configuration:

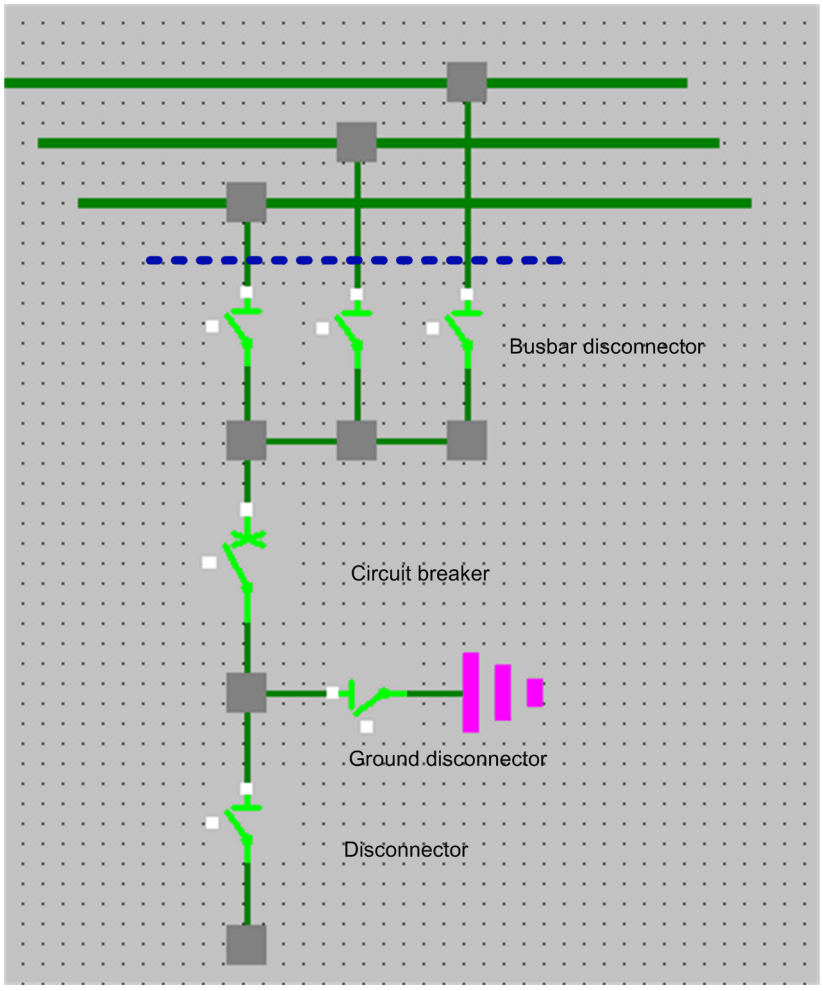
- The busbar disconnectors are configured outside of the project: The bay overview then is electrically connected between the busbar disconnectors and the circuit breakers.



[sc_topo busbar ext, 1, en_US]

Figure 4-32 Bay overview with busbar disconnector outside of object

- The busbar disconnectors are configured inside of the project: The connector to the busbar above is not considered by the topological coloring. You can color this connector at will.



[sc_topo busbar int, 1, en_US]

Figure 4-33 Bay overview with busbar disconnector within object

The picture displayed in the bay overview must be configured in another (detail) picture to ensure that a consistent topological model can be generated.

4.7.1 Representation Style of Bay Overview

Each bay overview must be assigned several properties.

✧ Double-click the graphic object.
The **SICAM Bay-Overview Control Properties** dialog opens.

The properties are listed in the **Style** tab.

Type

The following 5 options are available for the representation of the graphic object:

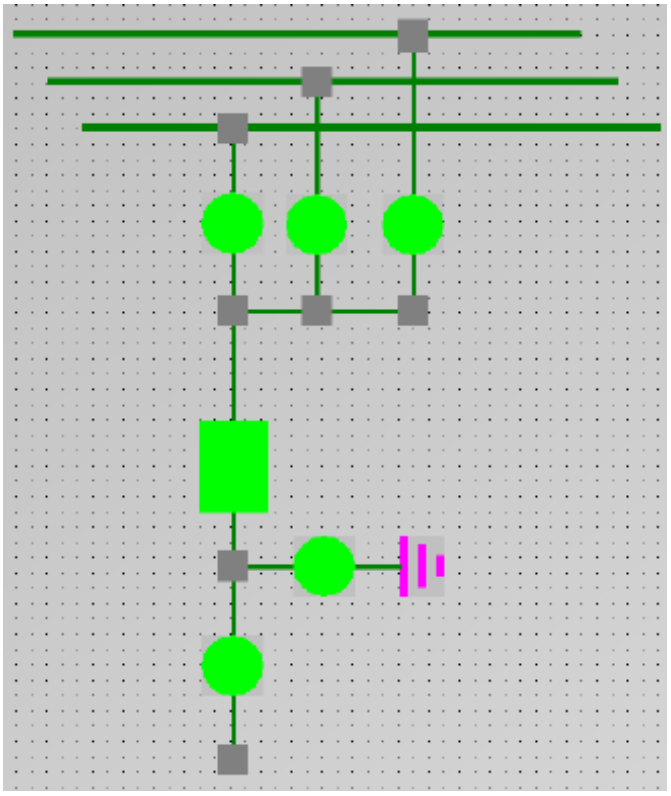
- SICAM boxed
- SICAM rounded
- LSA boxed
- LSA rounded
- Picture

With the **Picture** style, individual pictures can be displayed depending on the switch position. The individual pictures must be assigned switch positions in the **Picture** tab, see *4.7.4 Picture of Bay Overview*.

Grounded only with CB closed

With this option you define whether the grounding shall only be represented with the circuit breaker closed.

- The **Grounded only with CB closed** option is activated:
  The bay overview is only shown as grounded if the grounding disconnector and the circuit breaker are closed.
- The **Grounded only with CB closed** option is not activated:
  The bay overview is shown as grounded if the grounding disconnector is closed.



[sc_grounding_without_cb, 1, --_--]

Figure 4-34 Grounding without circuit breaker

3-D style

If this checkbox is activated, the bay overview is represented with a three-dimensional effect as soon as the user clicks with the mouse.

Line width

The **line width** of the graphic objects (LSA only) can be selected in steps from 1 to 11. Step 1 represents the smallest line width.

Tooltip text

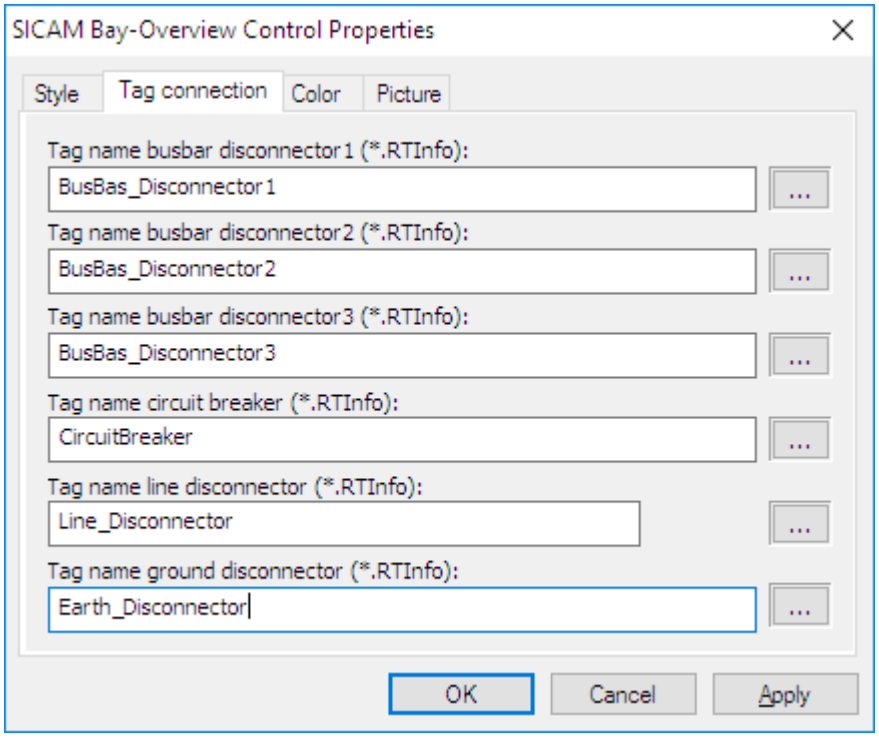
Enter a text in the entry field. This text is displayed as a **Tooltip** in the active project.

4.7.2 Tag Connection to Bay Overview

The bay overview must be assigned tags.

✧ Double-click the graphic object.
The **SICAM Bay Overview Control Properties** dialog opens.

✧ Open the **Tag connection** tab.



[scc324, 1, en_US]
Figure 4-35 Defining the bay overview

Tag assignment

Proceed as follows to assign the graphic object a tag:

✧ Click the **...** button next to the entry field.
The **Tags** dialog opens.

✧ Select the corresponding tag from the list and click **OK** to confirm.

NOTE

Delete the default tag link for switching devices which do not exist in the bay.

- Double-click the tag to be deleted. The tag is selected.
- Delete the selected tag.

This ensures that the elements in question are no longer considered for the determination of the bay state, i.e. the value and the status of the **bay overview** are independent of the deleted elements.

However, at least the circuit breaker must be configured for the bay overview.

4.7.3 Colors of Bay Overview

Value

In normal state, the color and the form of the graphic object depend on its value. A specific color is defined by default for each individual state. It is also possible to select the color from a color palette.

In the **SICAM** representation style, only the color and not the form is changed depending on the corresponding value.

Table 4-13 Colors defined according to SICAM

Value	Color	Meaning
ON	Red	The circuit breaker, the line disconnector and at least one busbar disconnector are switched on.
OFF	Green	The circuit breaker, the line disconnector or all busbar disconnectors are switched off.
Disturbed	Yellow	At least one of the connected devices in the bay is faulted.
Grounded	Pink	The bay is grounded.

Table 4-14 Colors defined according to LSA

Value	Form	Meaning
ON	Filled	The circuit breaker, the line disconnector and at least one busbar disconnector are switched on.
OFF	Not filled	The circuit breaker, the line disconnector or all busbar disconnectors are switched off.
Disturbed	Half filled	At least one of the connected devices in the bay is faulted.
Grounded Geerdet	Filled/ not filled	The bay is grounded.

Background

The default background color is gray. It can also be freely selected.

Status

The switch state is indicated by small, colored rectangles next to the graphic object. A specific color is set by default for each individual state. The color can also be freely selected from a color palette.

The following colors of the rectangles are set by default for the representation of the individual states:

Table 4-15 Status

Status	Color	Meaning
System not ok	Dark cyan (petrol)	The connection between SICAM SCC and the automation system/device.
Bay blocking	Red	Messages from this bay are no longer transferred to the automation system/device.
Not topical	Cyan (turquoise)	The device status is not topical.
Substituted	Blue	Since the connection to the primary system is interrupted, the switch position was set manually.
Telecontrol blocking	Red	Messages from this bay are no longer transferred to the control center.

Priority of the object colors

The bay overview states are represented as a sum of all the switching devices in the bay from high priority to low priority:

Fault position - Grounded - On - Off

The representation of the bay overview states is implemented as the sum of all the switching devices in the bay and shows the states of the individual switches according to their priority. If, for example, a switch is in fault position, the bay overview object is shown in fault position. This means that other switch positions are no longer relevant. If the grounding disconnectors and outgoing feeder disconnectors are switched on in such a case, the bay overview object is represented as grounded.

4.7.4 Picture of Bay Overview

You can assign the values of Bay Overview individual pictures. To ensure that these pictures are shown during runtime, the **Picture** checkbox must be activated under **Type** in the **Style** tab, see *4.7.1 Representation Style of Bay Overview*.

The following picture formats are possible:

- BMP
- EMF
- JPG
- GIF

Properties

The values of Bay Overview are listed under **Properties**. Assign each value a picture.

Highlight a value and click the **Browse** button to assign the value a picture. Pictures are stored in the **\GraCS \SicamIXPics** directory in the WinCC project. You can assign these pictures or individual pictures.

Preview

The assigned picture is shown in a preview.

4.8 Measured/Metered Value Display

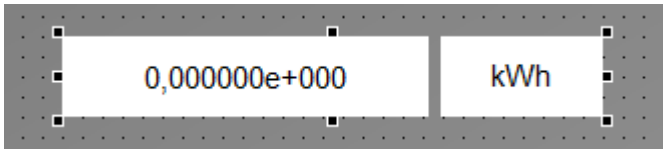
The **Measured/Metered values** folder in the SICAM graphic object library includes the **Numeric display** object. Typical functions are already provided in this ActiveX Control.
With this graphic object you can:

- display measured and metered values
- substitute measured and metered values
- issue setpoint commands for measured and metered values
- define upper and lower limits

Figures consisting of up to 7 digits can be displayed with the measured value object. The WinCC data type used does not allow any further digits.

4.8.1 Style of the Numeric Display

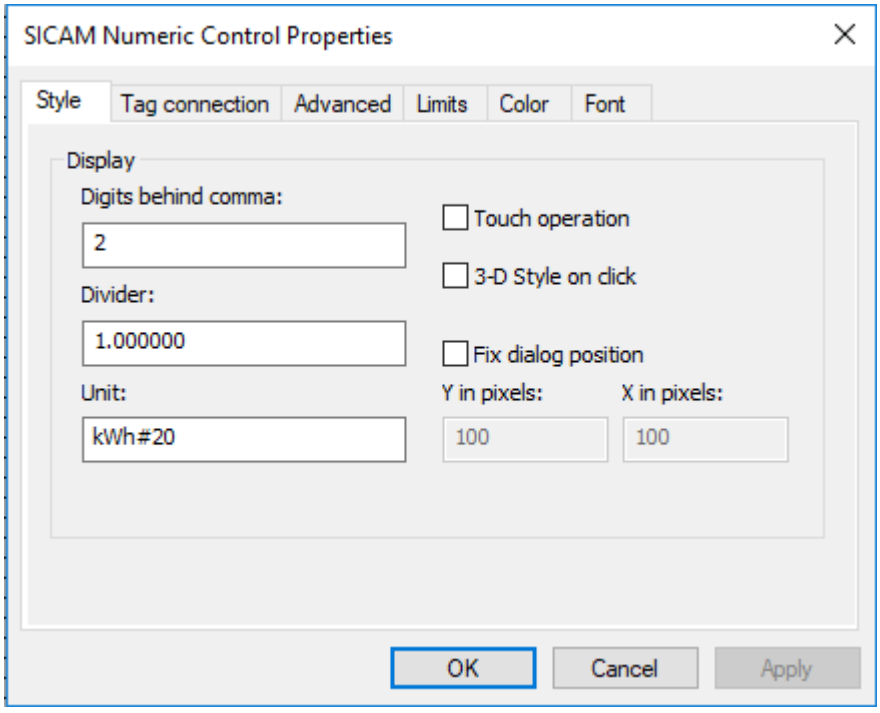
A **SICAM Numeric Control** consists of a value field and a unit field.



[sc_numeric_control_1, 1, --_--]

You can adjust its appearance as follows.

✧ Double-click the graphic object.
The **SICAM Numeric Control Properties** dialog opens.
✧ Select the **Style** tab.



[SICAM_Numeric_05, 2, en_US]
Figure 4-36 Specifying the style

Digits behind comma

Enter the desired number of decimal places.

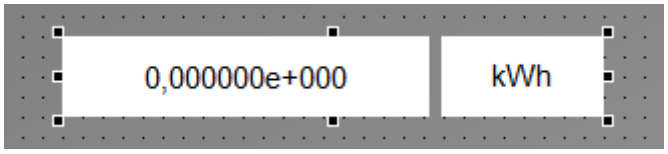
Divider

The value of the **SICAM Numeric Control** is divided by this number before being displayed.

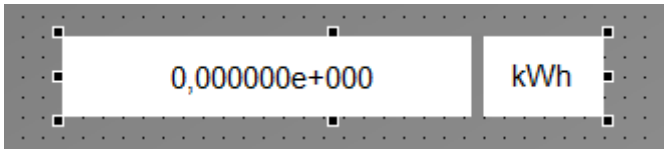
Unit

Enter the text to be displayed in the unit field.
Additionally, you can determine the ratio of the size between the value field and the unit field – or if the unit field is displayed at all.

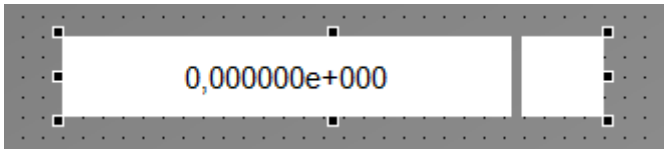
- If you want to display a unit in default size, just enter it, for example "kWh".
  Without further information, the default size (width) of the unit field represents 30 % of the width of the complete control.



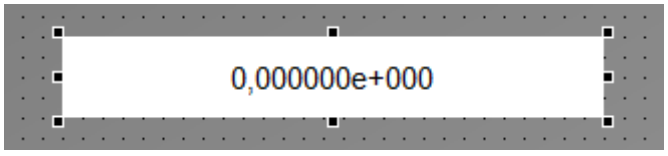
- If you want to change the size of the unit field, enter the corresponding percentage value, separated by "#", next to the text of the unit.
  In order to set the size to, for example, 20 % of the complete control, enter "kWh#20".



- If you want to display an empty unit filed with, for example, 15 % size, enter "#15".



- If you leave the text for the unit empty, the unit field is hidden.



NOTE

The unit field is limited to 10 characters.

Touch operation

If this option is activated, the runtime dialogs are displayed with optimized settings for touch operation (e.g. bigger buttons, different style).

3-D style on click

If this option is activated, the value output triggered by a mouse click is represented with a three-dimensional effect.

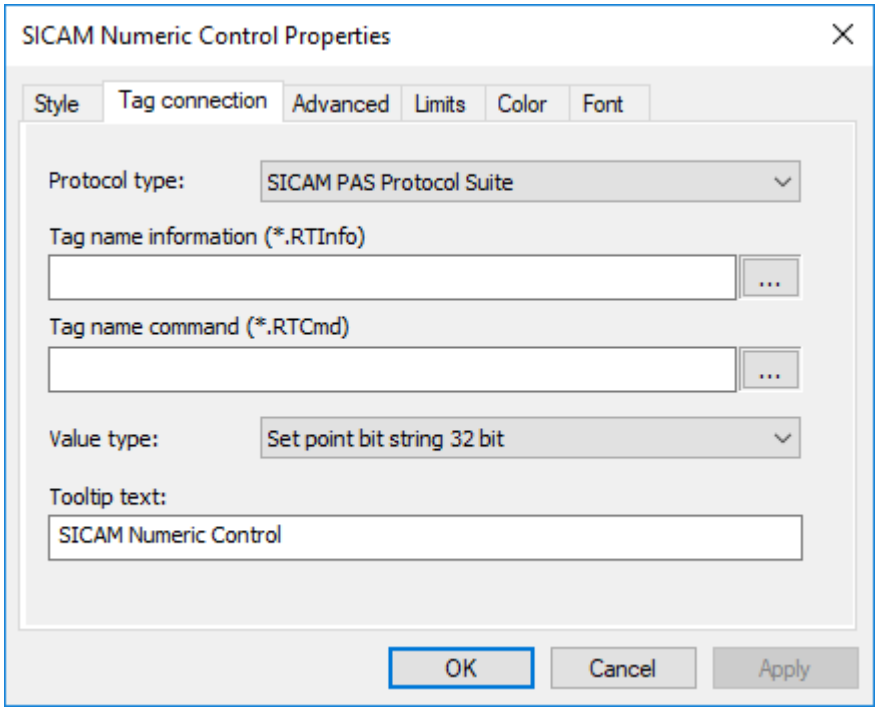
Fix dialog position

You can place the dialogs in a fixed position on the screen.

4.8.2 Tag Connection of the Numeric Display

Each value output must be assigned to a tag.

✧ Double-click the graphic object.
The **SICAM Numeric Control Properties** dialog opens.
✧ Select the **Tag connection** tab.



[SICAM_Numeric_01, 2, en_US]
Figure 4-37 Tag connection

Protocol type

Select the desired protocol type from the drop-down list box. The following protocol types are available for selection:

- **SICAM PAS Protocol Suite**
  for connection to **SICAM PAS-Stationen**
- **SICAM IEC Communication Suite**
  for connection to **SICAM RTUs** or **IEC 61850/IEC 60870-5-104 devices**

Information tag

Click the button to the right of the entry field. The **Tags** dialog opens. Select the corresponding tag from the list and click **OK** to confirm.

Tag name command

If a related command tag is indicated for an information tag in the SICAM PAS import data record, the command tag is determined automatically when selecting the information tag and entered in the **Tag name command** entry field. In order to select a tag yourself, proceed as described under **Tag name information**.

Value type

This setpoint type is used for the command tag in order to describe the data type of the command.

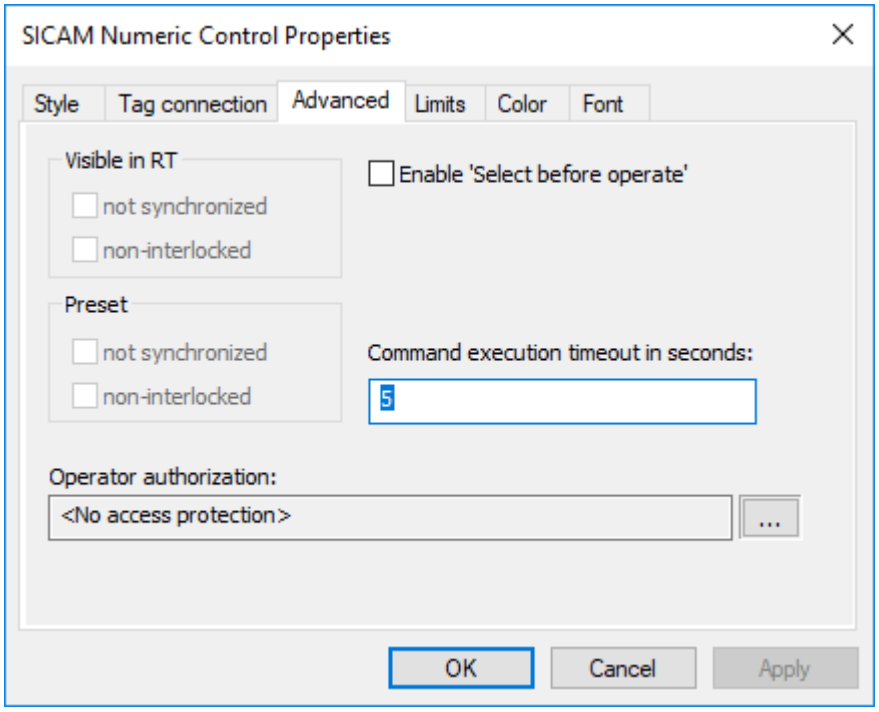
Tooltip text

Enter a text in the entry field. This text is shown as a **Tooltip** in the active project.

4.8.3 Advanced Properties of the Numeric Display

In the **Advanced** tab you can assign further value output properties.

- ✧ Double-click the graphic object.
  The **SICAM Numeric Control Properties** dialog opens.
- ✧ Select the **Advanced** tab.



[SICAM_Numeric_02, 2, en_US]

Figure 4-38 Advanced properties

Visible in RT

Under **Visible in RT**, activate the checkboxes for the options you want to show additionally during runtime in the switching dialog and which can be modified.

Preset

Under **Preset**, activate all values to be transmitted as qualifiers of command (QoC). If the **Visible in RT** option is activated, you can define here the pre-assignment in the runtime dialogs. The checkboxes under **Visible in RT** and **Preset** can only be activated if the **SICAM IEC Communication Suite** protocol type has been selected.

Table 4-16 Configuration with different attributes

Protocol type	Activated fields	Attribute	Effect
SICAM IEC Communication Suite	Visible in RT	Unsynchronized	Shown in the switching dialog during runtime.
		Non-interlocked	Shown in the switching dialog during runtime.
	Preset	Unsynchronized	Pre-assignment of the value sent as QoC as part of the command (synchronized/ unsynchronized switching)
		Non-interlocked	Pre-assignment of the value sent as QoC as part of the command (synchronized/ unsynchronized switching)

Enable 'Select before operate'

A select command is issued before the actual command. The setpoint can only be issued after the select command has been answered with a positive acknowledgment.

Command execution timeout in seconds

Enter the **Command execution timeout in seconds**. This corresponds to the maximum timeout until the successful command execution. As soon as this timeout has elapsed, the command process is terminated and a negative command termination is logged.

NOTE

For IEC connections, the **command execution timeout** only affects the switching object. The command itself only gets affected with SICAM PAS connections.

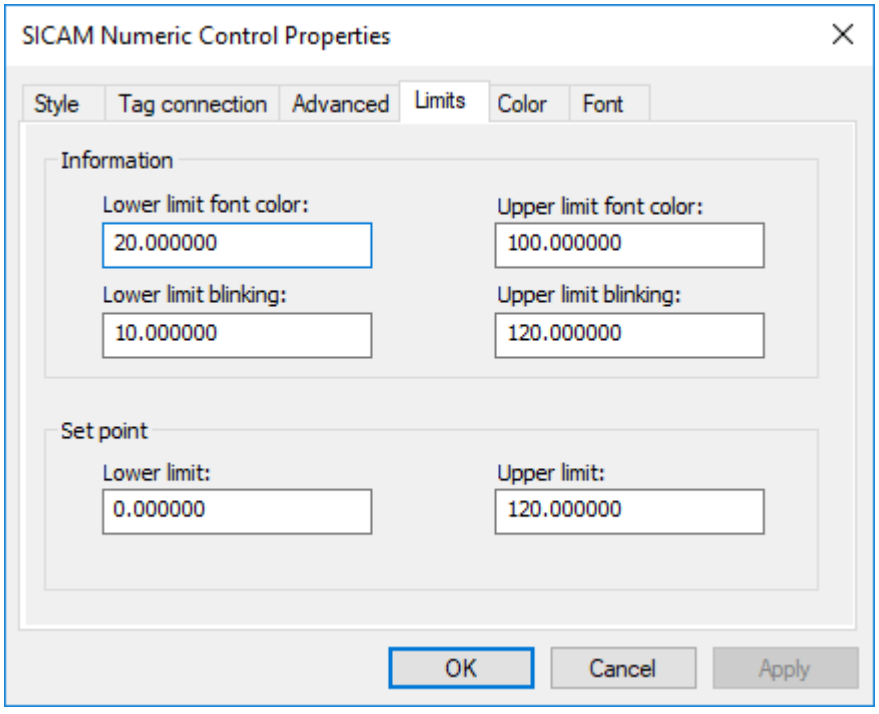
Operator authorization

Select the desired **Operator authorization**. For more detailed information on the definition and granting of operator authorizations refer to *3.8 Setting up User Authorizations*.

4.8.4 Limit Values of the Numeric Display

Enter limit values for the information and the setpoint in the **Limits** tab.

- ✧ Double-click the graphic object.
  The **SICAM Numeric Control Properties** dialog opens.
- ✧ Select the **Limits** tab.



[SICAM_Numeric_03, 2, en_US]

Figure 4-39 Defining limit values

Information

You can define 2 upper and lower limits for the value. The font color changes if the value is above or below the 1st upper/lower limit. The display starts flashing if the value is above or below the 2nd upper/lower limit.

Set point

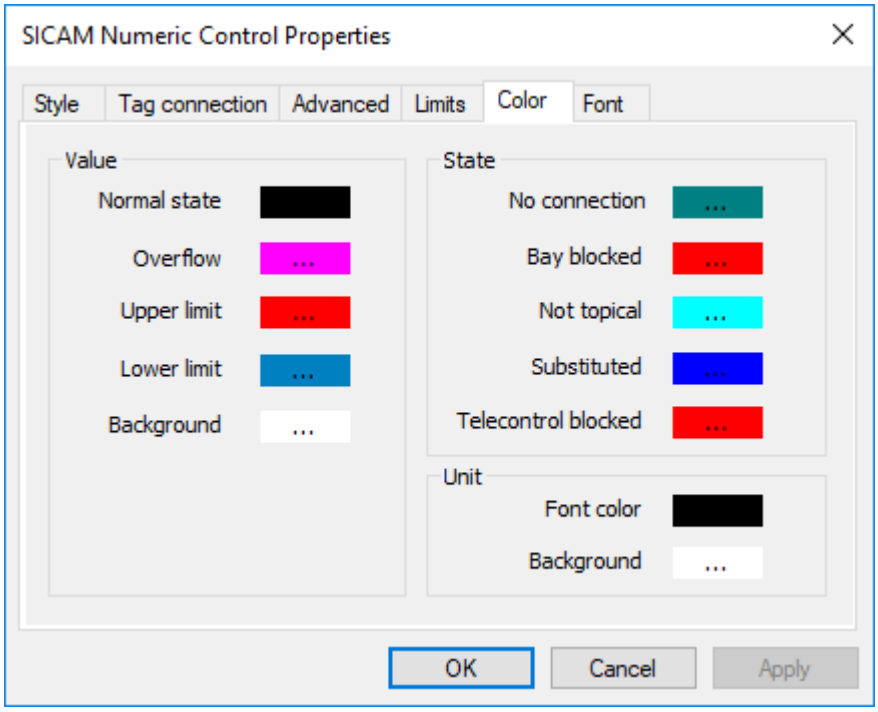
You can define a setpoint with upper and lower limits for the value. The display starts flashing if the value is above/below the upper/lower limit of the setpoint.

4.8.5 Color of the Numeric Display

Value

In the **Color** tab you can assign further colors for the value ranges and states.

- ✧ Double-click the graphic object.
  The **SICAM Numeric Control Properties** dialog opens.
- ✧ Select the **Color** tab.



[SICAM_Numeric_04, 2, en_US]

Figure 4-40 Assigning colors

The following colors are predefined for the graphic object:

Table 4-17 Value

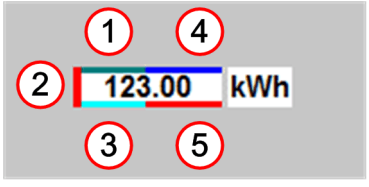
Value	Color	Meaning
Normal state	Black	The value is in the normal range.
Overflow	Magenta	The value is above/below the setpoint range.
Upper limit	Black	The value has exceeded the upper limit defined.
Lower limit	Black	The value is below the lower limit defined.

Background

You can individually define the background color of the graphic object. White is the default color.

State of the value

The state of the measured value object is represented with small, colored rectangle icons on the measured value object. A color is defined by default for each state, but the color can also be freely defined from a color palette. The size of the colored rectangles is automatically adapted to the measured value object.



[le_status, 1, --_--]

Figure 4-41 Measured value object with state

The default colors of the rectangles depend on the individual state:

Table 4-18 Value state

	State	Color	Meaning
1	No connection	Dark cyan (teal)	No connection between SICAM SCC and the automation system/device.
2	Bay blocked	Red	Messages in this field are no longer transmitted to the automation system/device.
3	Not topical	Cyan (turquoise)	The device state is not topical.
4	Substituted	Blue	The value was set manually because no connection was available, e.g. to a protection device.
5	Telecontrol blocked	Red	Messages in this field are no longer transmitted to the telecontrol center.

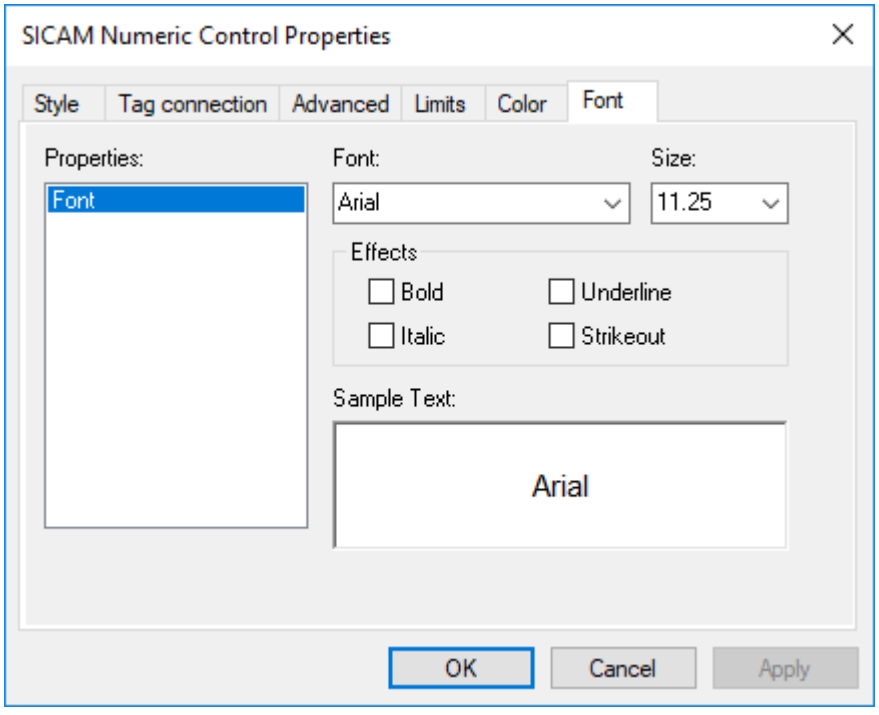
Unit

The unit color can be defined individually. Black is the default font color, and white is the default background color.

4.8.6 Font of the Numeric Display

Define the font in the **Font** tab.

✧ Double-click the graphic object.
The **SICAM Numeric Control Properties** dialog opens.
✧ Select the **Font** tab.



[SICAM_Numeric_06, 2, en_US]

Figure 4-42 Defining the font

Font

Select the desired font from the drop-down list box.

Size

Select the desired font size from the drop-down list box.

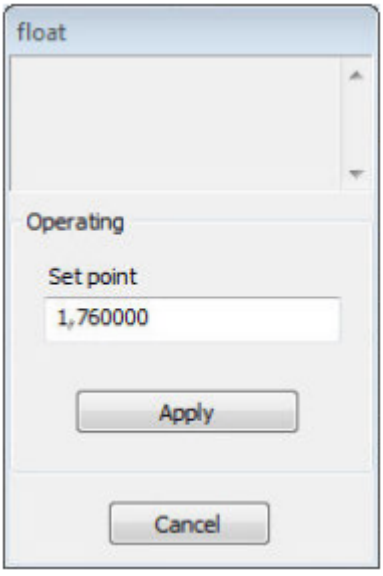
Effects

You can select the Bold, Italic, Underline and Strikeout boxes.

4.8.7 Runtime Dialogs of the Numeric Display

Issuing the setpoint

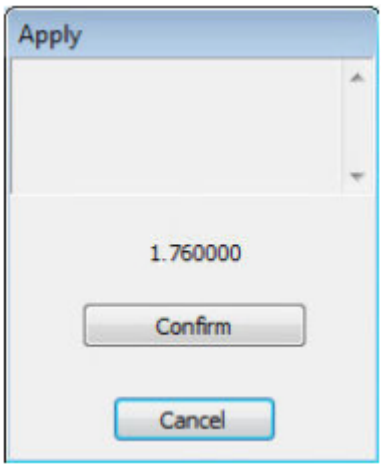
Dialogs are available in order to transmit the setpoint to the process. To call up these dialogs during runtime, click the related graphic object.



[SCC_RT_420, 1, en_US]

Figure 4-43 Applying the setpoint value

- ✧ Enter the setpoint value in the entry field.
  You can enter a dot or a comma as a decimal separator.
- ✧ Click **Apply**.
  The Apply dialog opens.



[SCC_RT_421, 1, en_US]

Figure 4-44 Issuing the setpoint

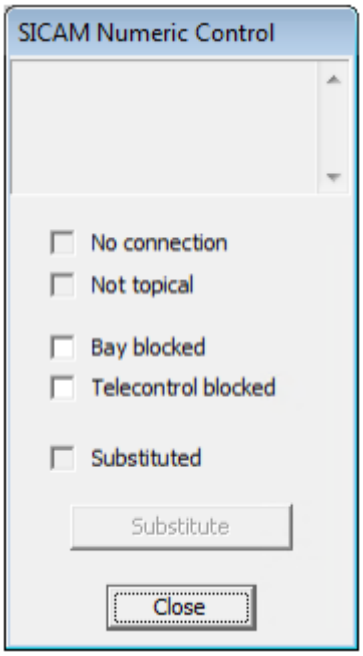
✧ Click **Confirm** in order to send the setpoint command to the destination system.

Status

The status dialog can be opened by clicking with the right mouse button, provided that the status display has been activated in the Properties dialog.

An information-specific block can be defined for the information of the SICAM PAS target system in combination with SICAM PAS/PQS V8.01 or later. This means that the process value update can be blocked for individual information objects.

You can set/undo the bay blocking/telecontrol blocking in the status dialog of the Numeric Display. To do this, activate the corresponding function.



[SCC_RT_422, 1, en_US]

Figure 4-45 Status dialog

The current status is also indicated by a tick in the corresponding checkbox in the status dialog; the Numeric Display is marked with a colored rectangle, see status information in *Figure 4-41*.

If **Bay blocked** is activated, the value of the Numeric Display can be substituted by clicking the **Substitute** button.

Substituting the value

NOTE

This function is only available with connection to SICAM PAS.

In this dialog you can define the desired substitute value (setpoint) for the corresponding value. Click **Substitute** in order to open the Apply dialog. The substitution is carried out after clicking **Confirm**.

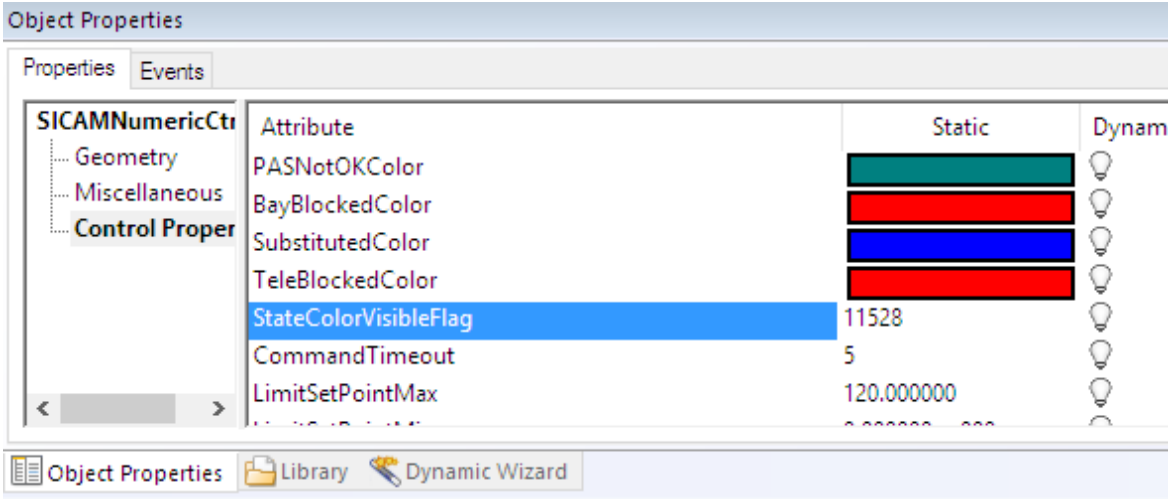
4.8.8 Representing Measured Values for the Invalid State

For the **SICAM Measured value display** object you can define the information to be displayed for the Invalid state. Depending on the individual configuration the last valid value or a question mark is displayed.

Perform the configuration via the **StateColorVisibleFlag** attribute in the **Object properties** dialog.

To configure the display for the **Invalid** state:

- ✧ Right-click **SICAM Measured value display** and select **Properties** from the context menu.
- ✧ Select **SICAMNumericCtrl > Control** properties in the **Properties** tab.



[state_unvalid, 1, en_US]

Figure 4-46 Defining the StateColorVisibleFlag attribute

NOTE

The information shown for an invalid value is defined via Bit 0x10000 in the **StateColorVisibleFlag** attribute.

- ✧ Enter the desired value for the **StateColorVisibleFlag** attribute:
  - To show the last valid value, enter 11528.
  - To show a question mark, enter 77064 (11528 + 0x10000).

5 Topological Coloring

5.1	Introduction	168
5.2	Topological Elements	170
5.3	Parameterization	183
5.4	Cross-Picture References	190
5.5	Using Topological Coloring	191
5.6	Using Picture Windows	196
5.7	Debugging	198
5.8	Application Examples	200

5.1 Introduction

The term 'Topology' describes the structure of a network resulting from the switching and operating states of the substations and lines. A network has a limited, but very large number of possible connections, i.e. a so-called potential topology. Certain connections are established to other substations or switchgear via lines and transformers. However, the major part consists of switchable connections in the bays of the switchgear. Only a subset of these possible connections is used in an individual operating state. The connections switched on at a certain time determine the current topology of the network.

The operational network conditions are represented in network diagrams.

Based on the object parameterization, the compiler creates the topology model via the SICAM add-in **Graphic editor**.

NOTE

The new topological coloring (SICAM SCC V9.0 or later) is not supported for SICAM SAS components.

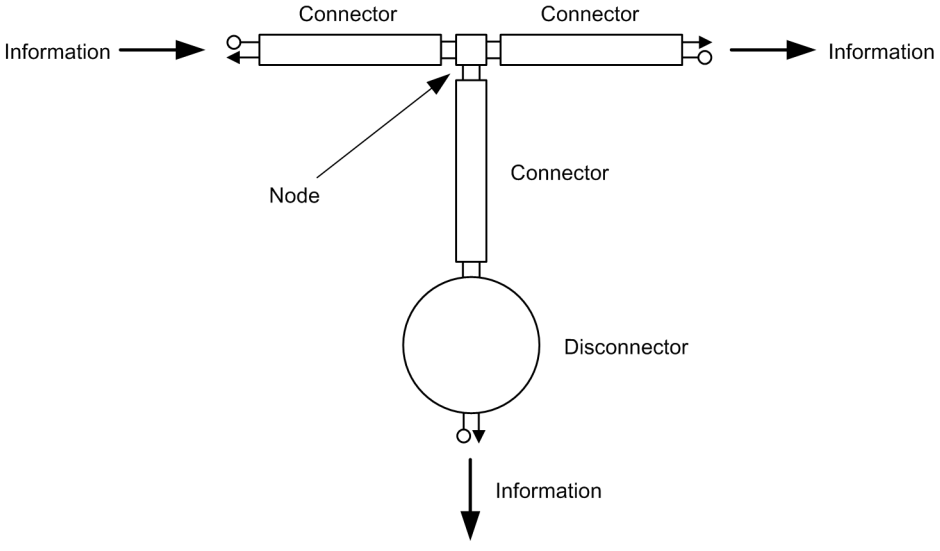
NOTE

You require a separate license for topological coloring.

Overview

Using **topological coloring**, the states of a power network can be represented by means of different colors in SICAM SCC. All adjacent graphic objects of a feeder are assigned the same color. The uniform color assignment is interrupted if a control element is open.

In terms of topological coloring, a **power network** consists of lines (connectors), transformers, switches and further objects. To be able to forward information, the network components must be interconnected through their connecting points. Each connecting point consists of one input and one output.



[dw_topo col network, 1, en_US]

Figure 5-1 Network consisting of three connectors, two nodes and one disconnector

Incoming information is forwarded through the entire network and issued via open connecting points. This mechanism works in any direction.

The following graphic objects support topological coloring:

- Circuit Breaker, disconnector, load break switch, earth isolator
- Bay Overview

- Feeder, ground, transformers, termination
- Connector and node
  Connectors in the SICAM graphic object library support the same functions as connectors in the SIMATIC WinCC object palette.

The graphic objects Feeder, Ground Disconnector, Connector and Node are available in the **Topology** folder of the SICAM graphic object library.

Dynamic Network Coloring

The Dynamic network coloring function enables the user to represent the electrical connection between various network sections using specific colors. In the network control center you can thus obtain a quick overview of the switching status of the station.

The Dynamic network coloring function detects the **Secure supply** status as well as the **Connection of several feeders**. These operating states can be highlighted specifically via the line width used to represent the tie lines, or via dashed lines.

The switching statuses can be represented by means of specific colors in all graphical network diagrams, including substation diagrams and the worldmap. The interlinkage with the dynamic network coloring algorithms is performed via the process references (variables) of the equipment represented in the pictures, such as disconnectors, circuit breakers, transformers, and connectors.

Restrictions

The restrictions concerning topological coloring specified in SICAM SCC V9.04 must be observed:

- The topological coloring does not support umlauts for tag names.
- Multi-clients with pictures including active objects from several servers are not supported.
- Mixed configurations of pictures are not possible.
- Topological coloring across several WinCC servers is not possible.
- Indirect addressing for active objects cannot be used.
- If you deactivate a picture and a different option was selected for **Apply coloring of lines**, you have to select the option **Use only colors of switch/disconnector control** in the **Settings for working area** under **Switch and disconnector**; thus, all elements are displayed with default color again. See also *5.3.3 Settings*.

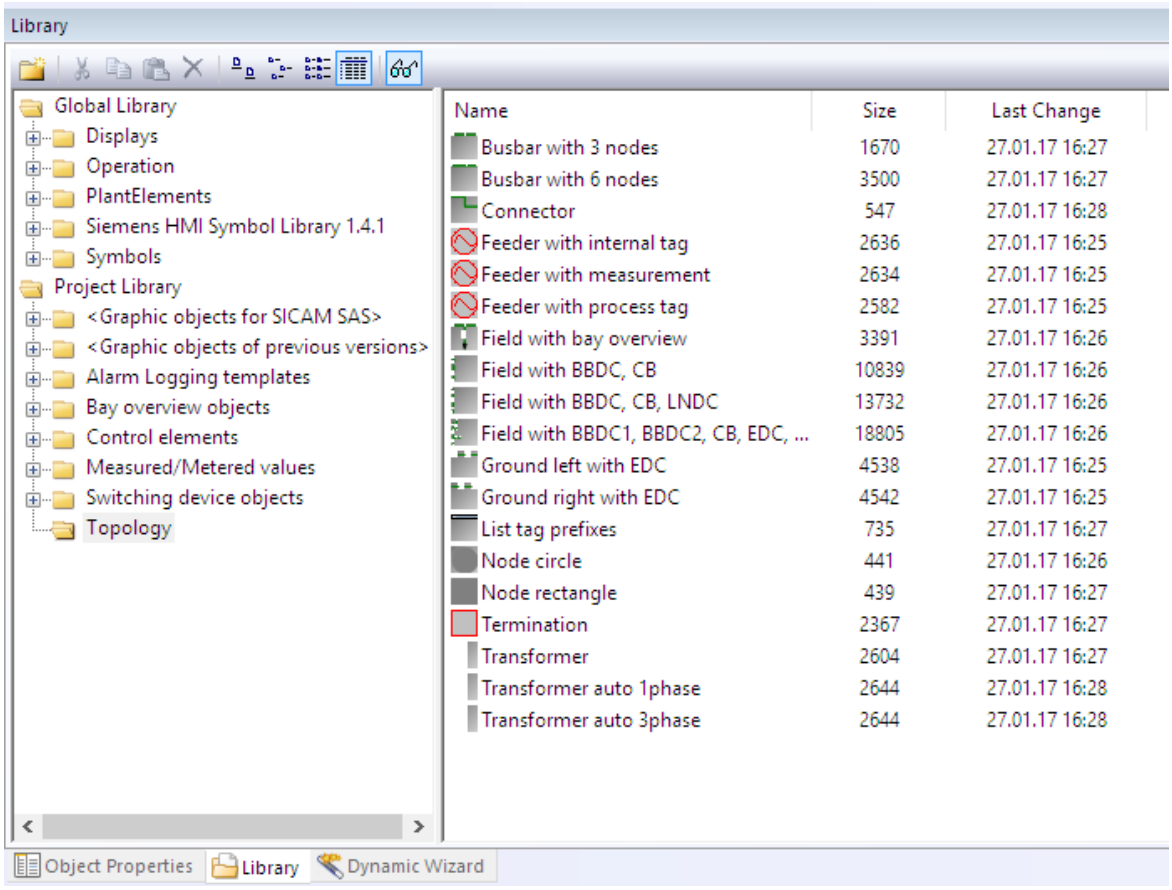
5.2 Topological Elements

5.2.1 General

The following objects are available in SICAM SCC:

- SICAM Topology (SICAM Electrical Device Control)
  - Feeder
  - Ground
  - Transformer
  - Termination
- SICAM Switch Control
  - Circuit breaker
  - Disconnector
  - Load breaking switch
  - Earth isolator
- SICAM Bay Overview
- Connector
- Node

The following paragraphs describe the individual types with their specific parameterization options.



[sc_library_topology, 1, en_US]
Figure 5-2 SICAM SCC Library

5.2.2 SICAM Electrical Device Control

5.2.2.1 Description of functions

The following **SICAM Electrical Device Control** types are available: Feeder, Ground, Transformer (additionally: Auto transformer 1-phase and Auto transformer 3-phase) and Termination. These are described below.

Feeder

The **Feeder** object represents the start of a topological network.

The feeder is an active component which initiates the coloring in the WinCC picture. It transfers its value to the graphic objects connected to it.

Each power network in which topological coloring is to be realized must have a feeder. Preferably use only 1 feeder, e.g. for a busbar. If several feeders are available on 1 busbar, you must define the preferred feeder.

A topological status (i.e. supply type with color and line style) must be defined for each feeder (see *5.3.3 Settings*)

A feeder has different statuses. The representation style is determined by the switching status of the process tag linked, as well as its status:

- Feeder switched on
  Color defined on the feeder as the Supply type color for the Topological color (see *Color, Page 175*)
- Feeder switched off
  Color for **de-energized**. This color is defined for the entire project (see *Settings for the project, Page 187*).

- Status of the feeder DIST
  Color for **Undefined**. This color is defined for the entire project (see *Settings for the project, Page 187*).
- Status of the feeder DIFF
  Color for **Undefined**
- Status Disturbed
  Color for **Undefined**
- Status initial
  Color for **Initial**. This color is defined for the entire project (see *Settings for the project, Page 187*).

Ground

Ground is a special object. It always transfers the RGB value for grounding to the graphic objects connected to it.

Ground elements serve for the grounding of station sections which have been switched off. Since the element is fixedly connected to ground potential on one side, it is considered as a 1-pole within the scope of topology calculation.

If the element has the status **ON**, i.e. the breaker is closed, the connected network section is represented in the color defined for **grounded**.

Transformer

The **transformer** performs an electrical isolation.

A transformer can operate in the same way as the **Feeder** element.

If the transformer is supplied from one side, the other side becomes a feeder, provided that a supply type has been assigned.

If reverse energization is possible, an individual supply type must be defined for each side (usually a non-secure supply type is used). If reverse energization is not possible, assign no color to the corresponding side.

NOTE

An existing structure tag has to be created for the transformer (*5.2.2.5 Creating Structure Tags*).

In addition to the ordinary transformer, the **auto transformer 1-phase** and **auto transformer 3-phase** types are available.

The **Grounded** status cannot be spread beyond a transformer.

Termination

This element is only used if a single feeder must be logically connected. This is e.g. **not** the case for sections from an overview picture.

5.2.2.2 Graphical representation

The following SICAM Electrical Device Controls are available in the **Topology** folder in the SICAM graphic object library:

Table 5-1 Graphical representation style of the SICAM Electrical Device Controls

Graphic object	Type	Graphic
Feeder	1-pole	
Ground	1-pole	
Transformer	2-pole	

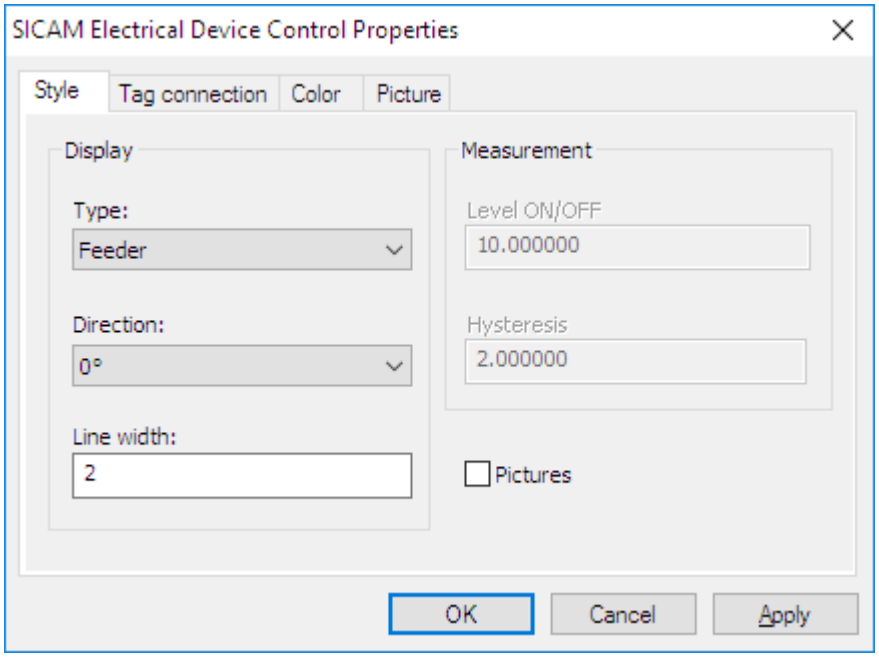
Graphic object	Type	Graphic
Auto transformer 1-phase	2-pole	
Auto transformer 3-phase	2-pole	
Termination	1-pole	

5.2.2.3 Properties of SICAM Electrical Device Controls

Each **SICAM Electrical Device Control** must be assigned a certain number of properties.

✧ Double-click the graphic object.
The **SICAM Electrical Device Control Properties** dialog opens.

Style



[sc_edc_style, 1, en_US]
Figure 5-3 Properties of SICAM Electrical Device Controls, Style

Type

The following types are available:

- Feeder
- Ground
- Transformer
- Auto transformer 1-phase
- Auto transformer 3-phase
- Termination

Each type has a pre-defined style (*5.2.2.2 Graphical representation*). You can adapt the style to your needs and requirements.

Orientation

For all representation styles apart from Picture, the orientation angles 0°, 90°, 180°, and 270° can be defined.

Line width

You can define a line width from 1 to 11 for graphic objects; line width 1 is the smallest line width.

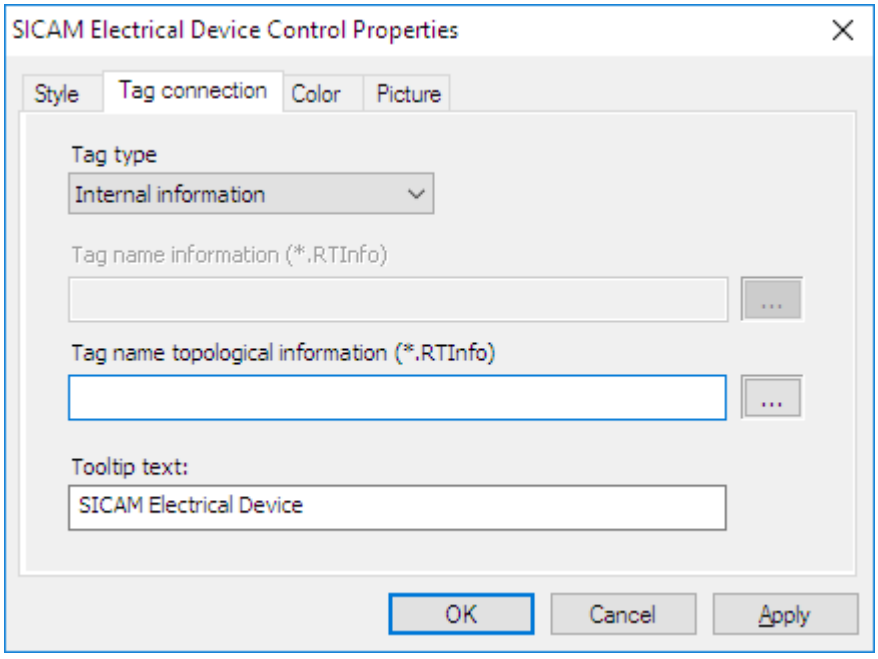
Measured value

In these input boxes you can define values for **Level ON/OFF** and **Hysteresis**.
To do this, the **Measurement** tag type must have been selected in the **Tag connection** tab (see *Tag connection, Page 174*).

Pictures

If you activate the **Pictures** checkbox, the image files selected in the **Picture** tab are used for status display.

Tag connection



[sc_edc_process, 1, en_US]

Figure 5-4 Properties of SICAM Electrical Device Controls, Tag connection

Tag type

The following types are available:

- **Internal information**
  Is used e.g. in order to integrate statuses determined from a script (on the **Tag name topological information** output). See also *5.2.2.5 Creating Structure Tags*.
- **Process information**
  A single- or double-point indication is connected here which directly includes the **ON**, **OFF**, **disturbed** states and forwards them
- **Measured value**
  Is used for connecting a measured value as an input value which controls the output via the configuration of the ON/OFF level and the hysteresis (connection: **Tag name topological information**).

See also *5.2.2.4 Tag connection of the feeder*.

Tag name information (*.RTInfo)

The tag type is not available for **Ground** and **Termination**.
In this drop-down list box you can select an **RTInfo** file for the **Process information** and **Measurement** tag types.

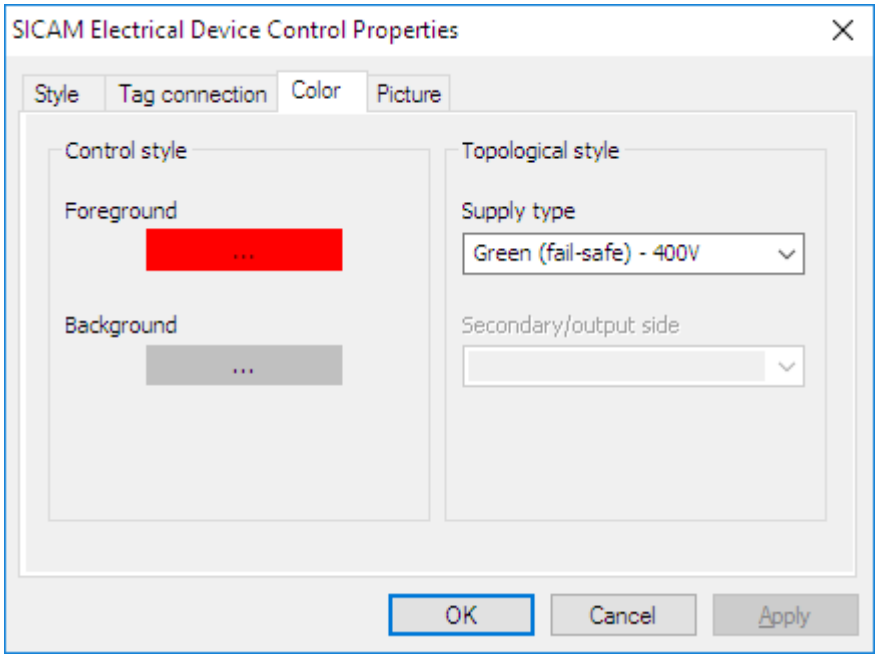
Tag name topological information (*.RTInfo)

In this drop-down list box you can select an **RTInfo** file for the **Internal information** and **Measurement** tag types.

Tooltip text

Enter a text in the entry field. This text is displayed as a **Tooltip** for the object in the active project.

Color



[sc_edc_color, 1, en_US]
Figure 5-5 Properties of SICAM Electrical Device Controls, Color

Foreground

The foreground color of the graphic object can be individually set. Red is the default setting.

Background

The background color of the graphic object can be individually defined. Gray is the default setting.

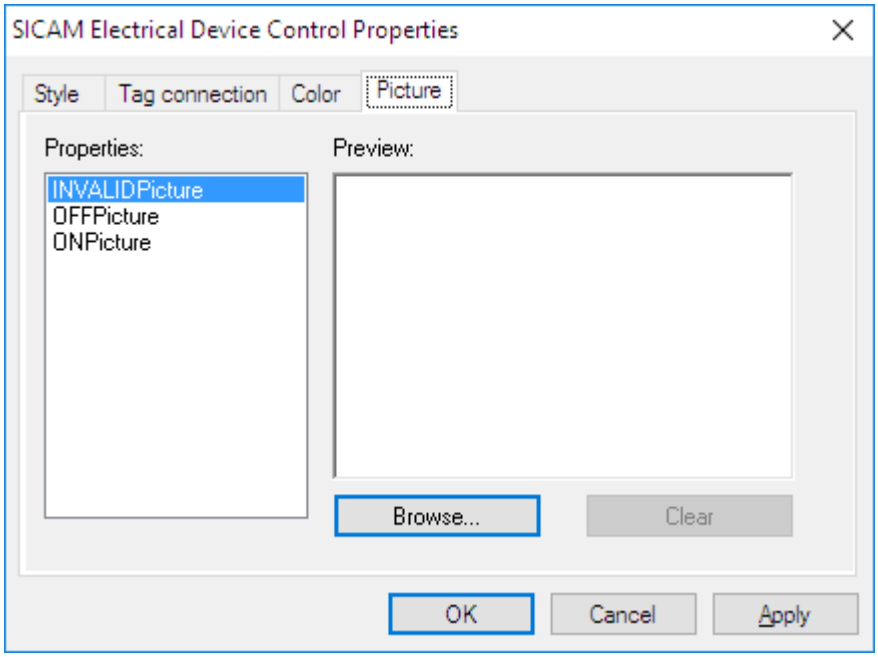
Topological style

Here you select the colors for the topological representation style of the object.

- For the **Feeder** you define the **Supply type** color.
- For the **Transformers** you define the colors for the **Primary side (reverse energization)** and the **Secondary/output side**.

Define the colors and their priority via the **Settings for the project** dialog (see *Settings for the project, Page 187*)

Picture



[sc_edc_picture, 1, en_US]

Figure 5-6 Properties of SICAM Electrical Device Controls, Picture

Assigning pictures

Select a value under **Properties** and click **Browse** to assign an image file.

- **INVALIDPicture**
  Picture for representing the INVALID status.
- **OFFPicture**
  Picture for representing the OFF status.
- **ONPicture**
  Picture for representing the ON status.

Preview

The assigned picture is shown in a preview.

NOTE

For the changes of SICAM Electrical Device Control properties to take effect (e.g. change of the supply type color), proceed as follows:

- save the changed picture in the Graphics Designer,
- re-generate the entire topology for the project,
- start – or stop and re-start – the runtime.
  This has to be done using the WinCC Explorer. Activating the picture via the Graphics Designer only is not sufficient.

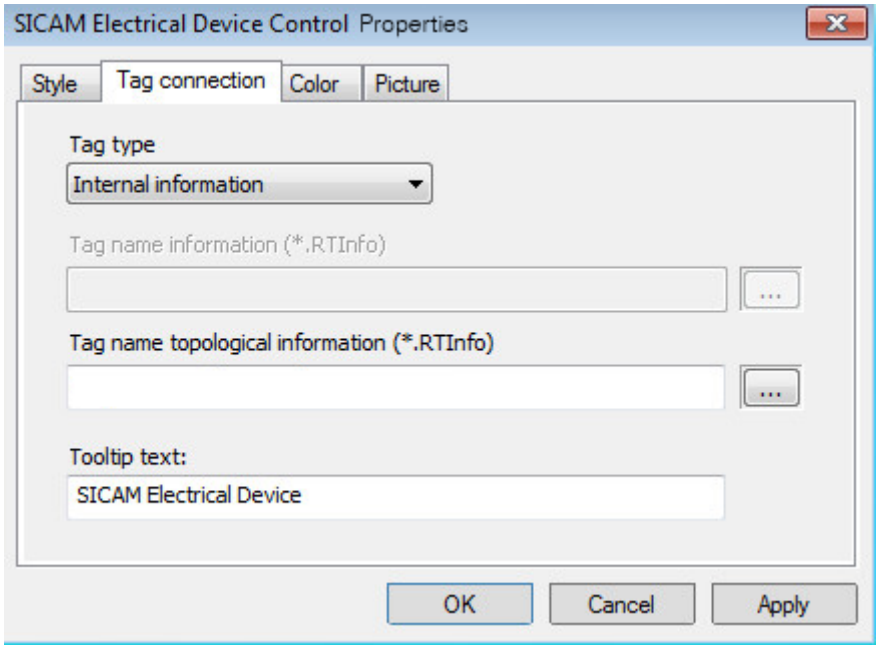
5.2.2.4 Tag connection of the feeder

The tag connection of the feeder must be defined depending on the supply type.

Supply of Internal Information

If the feeder is supplied by an item of internal information, the internal tag must be created with the **PAS_InformationInternal** structure type (see *5.2.2.5 Creating Structure Tags*) and is directly defined as topological information.

For controlling the topological coloring, the tag has the values **OFF = 1** or **ON = 2**.



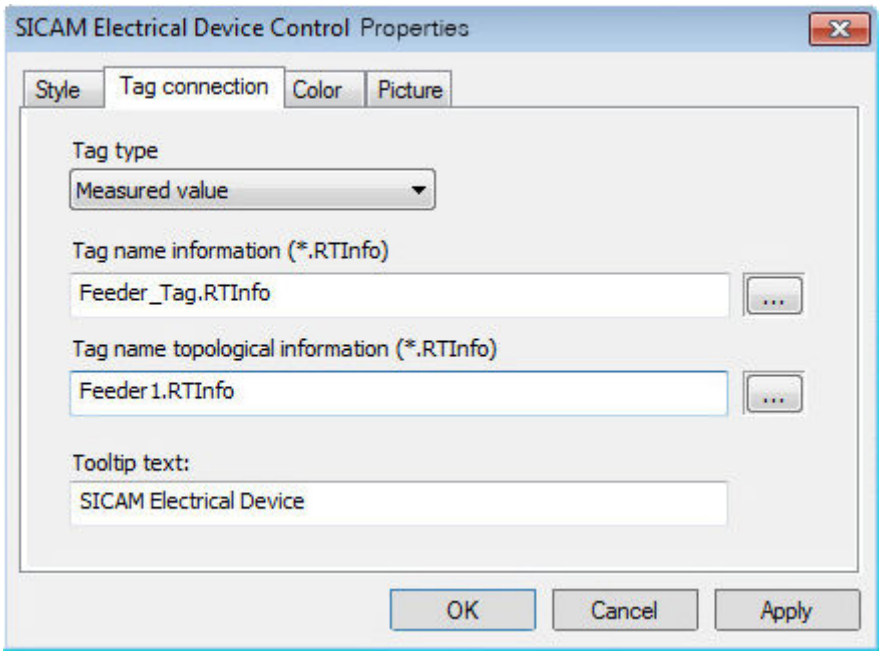
[sc_edc_process, 1, en_US]

Figure 5-7 Supply of Internal Information

Supply of a (Process) Measurement

If the feeder is supplied by a (process) measurement, an internal tag must be additionally created with the **PAS_InformationInternal** structure type (see *5.2.2.5 Creating Structure Tags*) defined for the topological information.

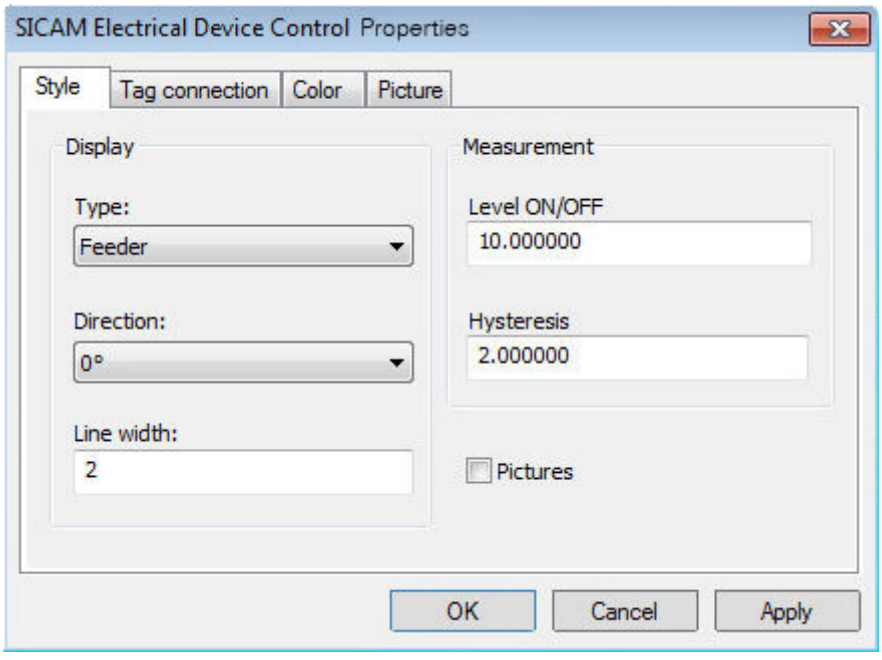
For controlling the topological coloring, the tag has the values **OFF = 1** or **ON = 2**.



[sc_topo_feeder_measured_value, 1, en_US]

Figure 5-8 Supply of a (Process) Measurement

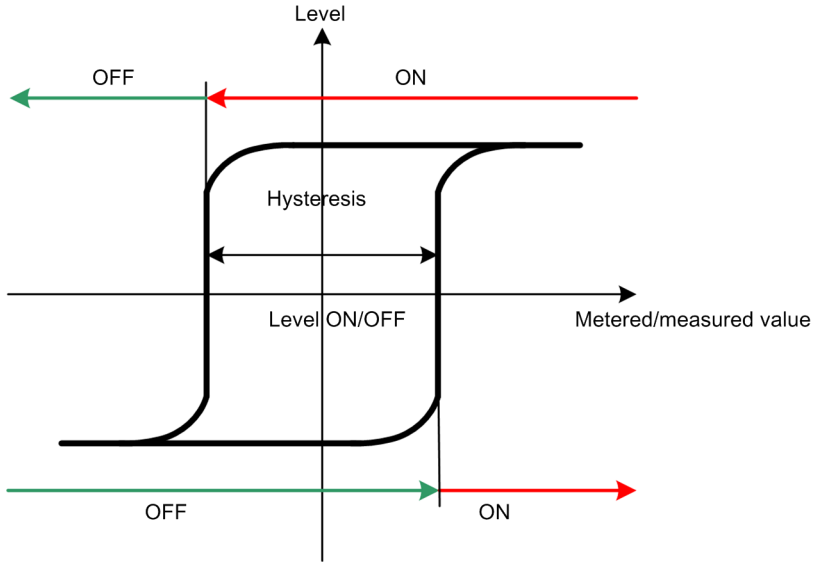
The switching point where the feeder switches from **OFF** to **ON** is defined in the **Style** tab.



[sc_topo_feeder_measured_value_level, 1, en_US]

Figure 5-9 Defining the Switching Point

In order to prevent continuous switching in the case of slightly fluctuating measurements, a **hysteresis** can be defined around the switching point.



[dw_topo value hysteresis, 1, en_US]

Figure 5-10 Hysteresis around the Switching Point

NOTE

When controlling the feeder with a measured value, the feeding object must be active in order to ensure that the changes are applied in the Runtime. The measured value is the input value which controls the topological tag with ON/OFF within the scope of configuration on the object (switching threshold and hysteresis).

The topological tag is not used if the object is not active.

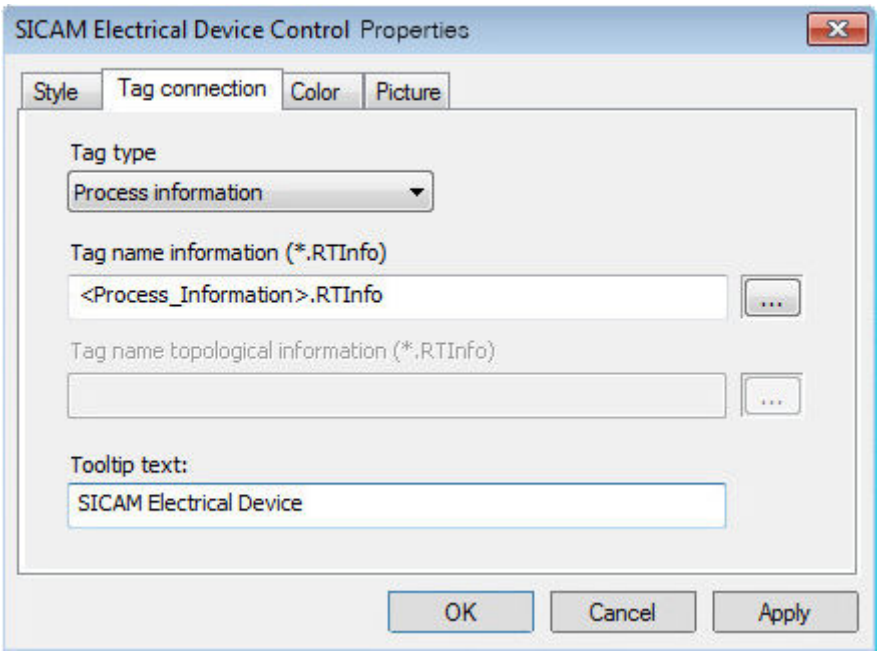
Alternatively,

- you can evaluate the measured value via a global script and define the tag.
- you can place the feeding object invisibly at any position in other pictures (no connection required).

Supply of Process Information

If the feeder is supplied by an item of process information, the value of the information is directly used as an input for controlling the topological coloring with the value **OFF = 1** or **ON = 2**.

An additional topological information tag is not required for this configuration.



[sc_topo_feeder_processinfo, 1, en_US]

Figure 5-11 Supply of Process Information

5.2.2.5 Creating Structure Tags

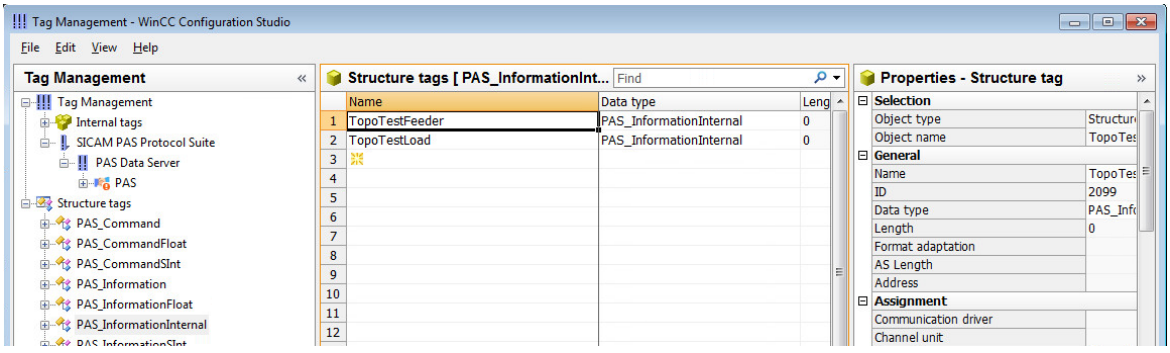
To be able to use **Internal Information** as **Tag type** for the Tag connection, you first have to create structure tags.

NOTE

Do not use special characters and umlauts in tag names.

Changes in Tag Management

- ✧ Create new tags in **Structure tags > PAS_InformationInternal**, e.g. **TopoTestLoad** and **TopoTest-Feeder**.



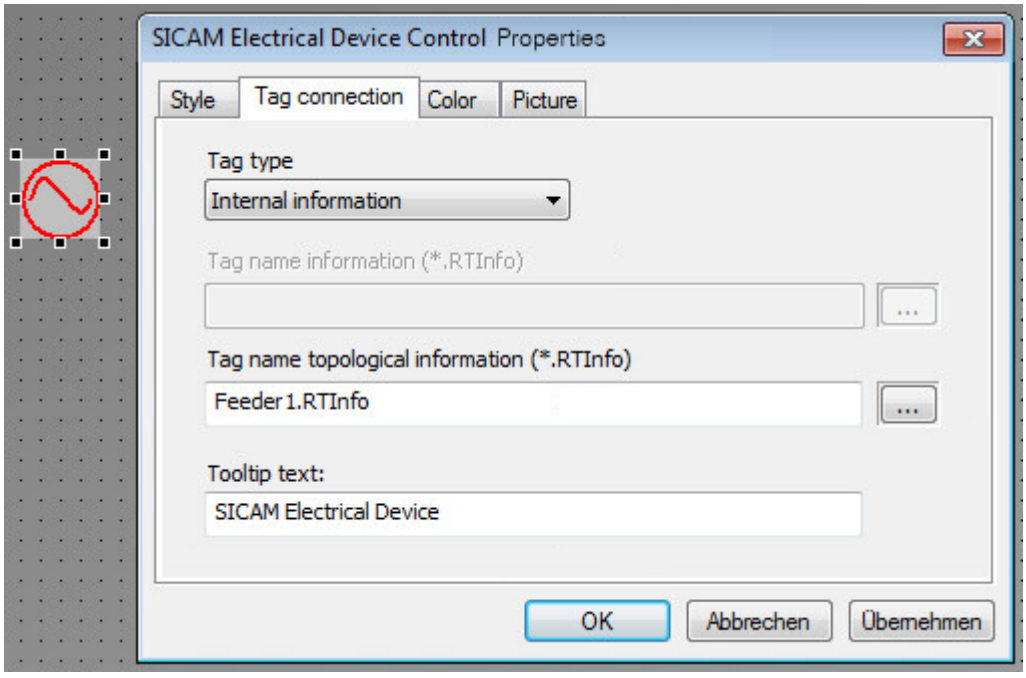
[sc_tagmanagement, 1, en_US]

Figure 5-12 Tag management

Defining SICAM Electrical Device Controls

- ✧ Insert a SICAM Electrical Device Control.
- ✧ In the **Style** tab, select **Feeder** as **Type**.
- ✧ In the **Tag connection** tab, select **Internal information** as **Tag type**.

✧ Select the **Tag name topological information** from **Internal tags**, here e.g. **TopoTestFeeder.RTInfo**.



[sc_edc_topo, 1, en_US]

Figure 5-13 Defining SICAM Electrical Device Controls

5.2.3 SICAM Switch Controls

A closed control (switching device object) functions like a connector. An incoming value is transferred to the output of the other connecting point. An open control does not transfer the value.

If the graphic object is in the **OFF** status, the corresponding defined value is not issued.

The **ON** and **Grounded** colors are not prioritized by the controls, but processed with the same priority.

If a control is in the **Intermediate position/Fault position**, the line color is transferred depending on the priority of the line color on one of the inputs: Only if the line color unequal **OFF** is pending on one of the inputs will the line color **Undefined** be transferred.

Be aware that several controls with the same tag connection must not be defined in a picture.

Circuit breaker

A circuit breaker can switch off an electric circuit if an overload or a short circuit has occurred. It also serves for operational switching, e.g. switching over to another busbar due to maintenance work.

Disconnector

Since a disconnector is a breaker without an electric arc control device, it must not be switched under load.

Load breaking switch

A load breaking switch can be switched under normal load, but cannot be switched under short circuit or overload conditions.

Earth isolator

Earth isolators serve for the grounding of station sections which have been switched off.

Since the element is fixedly connected to ground potential on one side, it is considered as a 1-pole element within the scope of topology calculation.

NOTE

To avoid errors in the topology calculation, the Earth isolator has to be rotated (if required) via its inbuilt dialog, not via the generic object properties dialog.

5.2.4 SICAM Bay Overview

You can use a bay overview to show the status of an entire bay by means of a single graphic object.

NOTE

If the breakers configured in the bay overview are configured as individual breakers in another picture, make sure that the connecting points are correctly oriented.

In the topological model of the bay overview, the earth isolator is connected to the circuit breaker connector pointing away from the busbar, if the corresponding tags have been programmed (see *Figure 4-34*).

5.2.5 Connector

Connectors are used to link graphic objects.

A connector can be linked to a graphic object on both ends. A connection is performed automatically if one end of a connector is positioned next to a graphic object. As soon as the connection has been successfully defined, the color changes from green to red.

For more detailed information regarding connectors, refer to the online help of the Graphics Designer.

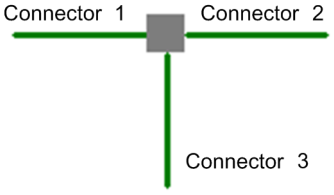
Connecting points

If a graphic object is moved, the linked end of the connector moves as well. The connector itself cannot be moved when linked to a graphic object. A connector must always be linked to a graphic object on both ends.

5.2.6 Node

With the **Node** graphic object, 2 connectors are linked or a feeder is created. A node can be represented as a circle or as a rectangle.

Up to 4 connectors can be linked to the same node.



[dw_topo col node, 1, en_US]

Figure 5-14 Node

NOTE

Do not draw the node too small in order to ensure that the link to the connector can be conveniently defined.

5.3 Parameterization

5.3.1 Data Analysis

Various definitions for the representation of the network equipment and for the evaluation of the network status must be performed in order to be able to use the Dynamic network coloring function.

- In which pictures do you want to represent the current network status?
  - Substation diagrams
  - Worldmap with definition of the zoom levels (visibility)
- Which colors and symbols are used in order to represent the various equipment items?
  - Color of the voltage levels and feeders
  - Symbols used in the network diagrams
  - Coloring of the switch symbols from the topology
- What colors are used in order to represent the individual network statuses?
  - De-energized, grounded, revision, undefined
  - Priorities of the topological status values
- Which of the following functions do you want to use additionally?
  - Consistent coloring across multiple pictures
  - Coupled and secure operating mode

The connectors are represented in the color defined for the individual network status. This line color can also be applied to the switching objects.

5.3.2 Data Model

Topological Elements

All the objects whose indications are used to determine the current switching status of the network are referred to as "topological elements".

These include:

- Switching elements, e.g. disconnectors and circuit breakers
- Feeders
- Transformers
- Termination

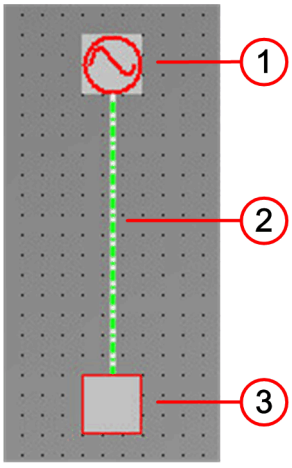
In order to design networks which enable dynamic network coloring, all equipment items must be available as dynamic SICAM structure tags (RTInfo).

When designing pictures, it must be ensured that the lines end in the objects. This is a major prerequisite in order to be able to create an electrically connected network in which the topology can be calculated.

Coloring – Basic Principles

For dynamic network coloring the topological view of the network is represented via connectors and other topological elements. This function requires at least the following topological elements connected to each other via connectors:

- Source (Feeder)
- Termination

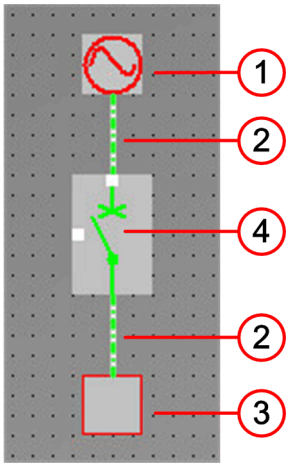


[le_basic_structure, 1, --_--]

Figure 5-15 Basic structure

(1) Feeder
(2) Connector
(3) Termination

In addition, the switching elements are inserted in this basic model, e.g. a circuit breaker.



[le_basic_structure_w_breaker, 1, --_--]

Figure 5-16 Basic structure with circuit breaker

(1) Feeder
(2) Connector
(3) Termination
(4) Circuit breaker

Via the supply type assigned, the topological element **Feeder** determines the color used for representing the lines. All other elements, e.g. the circuit breaker, transfer the color to other elements or restrict the coloring.

1- and 2-pole elements

NOTE

The left-hand connection point of the 1- and 2-pole-elements is highlighted with a small square in the Graphic Editor.

For more information regarding the connectors see *Connecting points, Page 112*

The topological graphic objects are subdivided into 1-pole elements, 1-pole elements with special function and 2-pole elements:

- **1-pole**: Feeder, ground, terminator

  A 1-pole element only has a connection on the left-hand side. Since all the objects have 4 connecting points, only 1 side may be used in any case.

- **1-pole with special function**: Grounding disconnector (Earth isolator)

  This 1-pole element must always be connected to the topology via its left-hand connection. The right-hand side can be used additionally for a connection to a Ground graphic object.

- **2-pole**: Circuit breaker, disconnector, load break switch, transformer, bay overview

  To ensure unambiguous identification, the 2 connections of these 2-pole elements are referred to as the "left-hand connection" and "right-hand connection". 2-pole elements must always be connected to 2 connectors. The left-hand connection is marked with a small square in the Graphic Editor. See also *Connecting points, Page 112*.

  Bay overview objects are not marked with a square; the left-hand connection is 'Always at the top' or on the 'Left'.

NOTE

The left-hand connection of the 1- and 2-pole elements is marked with a small square in the Graphic Editor.

Line Node

Connections connected by means of connectors (lines) form a line node.

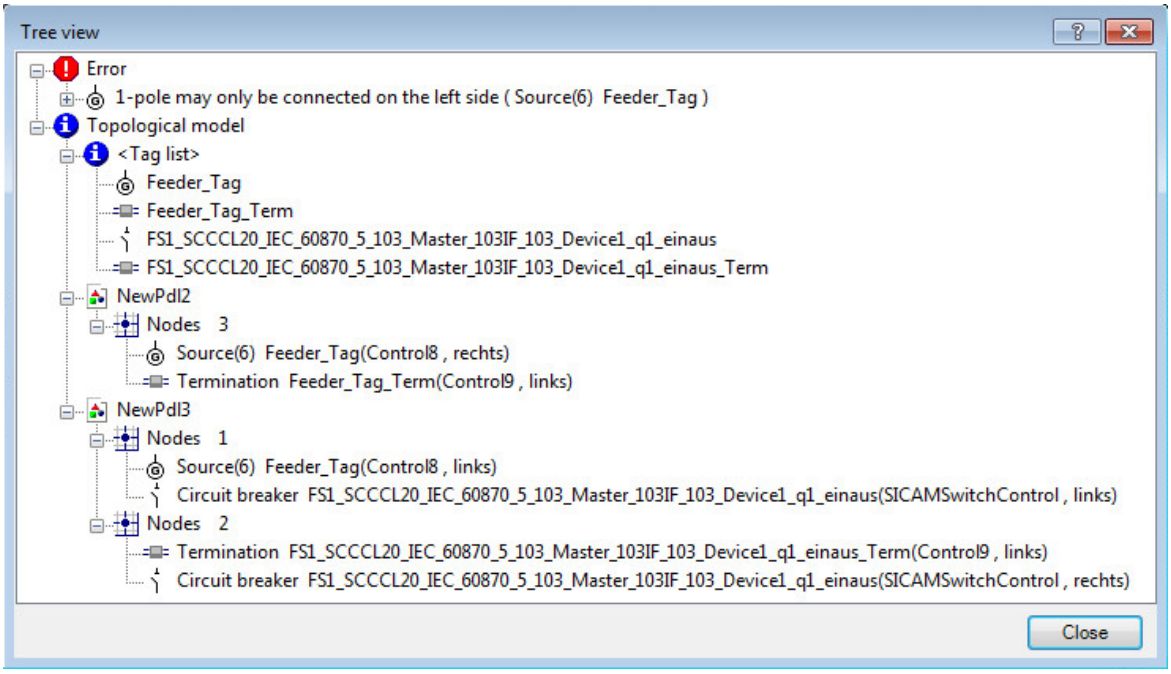
An element with 2 connections is connected to 2 line nodes, e.g. a circuit breaker (2-pole element). An element with 1 connection is connected to 1 line node, e.g. a grounding switch (1-pole element).

A line node must be represented completely with all its elements in at least one picture. For more detailed information, refer to *5.4 Cross-Picture References*

All other functions, such as coloring or , are derived from the topological calculations performed for this line node. For this reason, the topological parameters of the node elements must be identical in all pictures.

This means that a switch represented in various pictures must always have the same neighbor (breaker). However, these do not necessarily need to be drawn, e.g. for bay representations as a section from an overview picture.

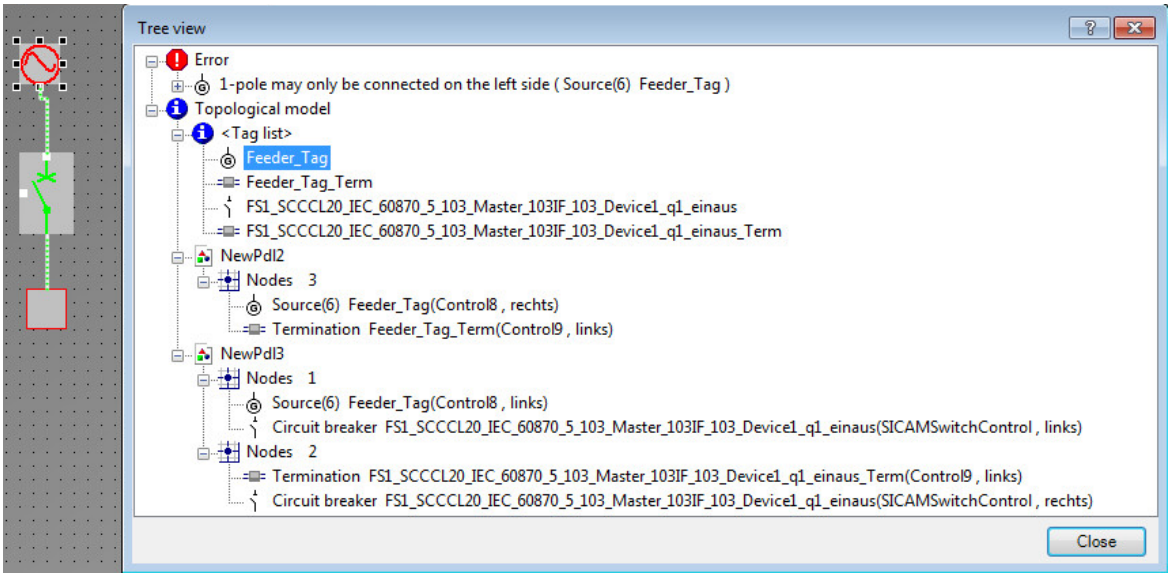
As soon as the parameterization and project generation have been completed, the node structure of your network as well as any errors are shown in the tree view of the topology.



[sc_treeview, 1, en_US]

Figure 5-17 Representation of the topological node structure in the editor, example

When selecting a topological element, the corresponding picture is shown. The selected element is highlighted.



[sc_node_and_graphic, 1, en_US]

Figure 5-18 Representation of the Topological Node Structure in the Editor with Picture Section, Example

5.3.3 Settings

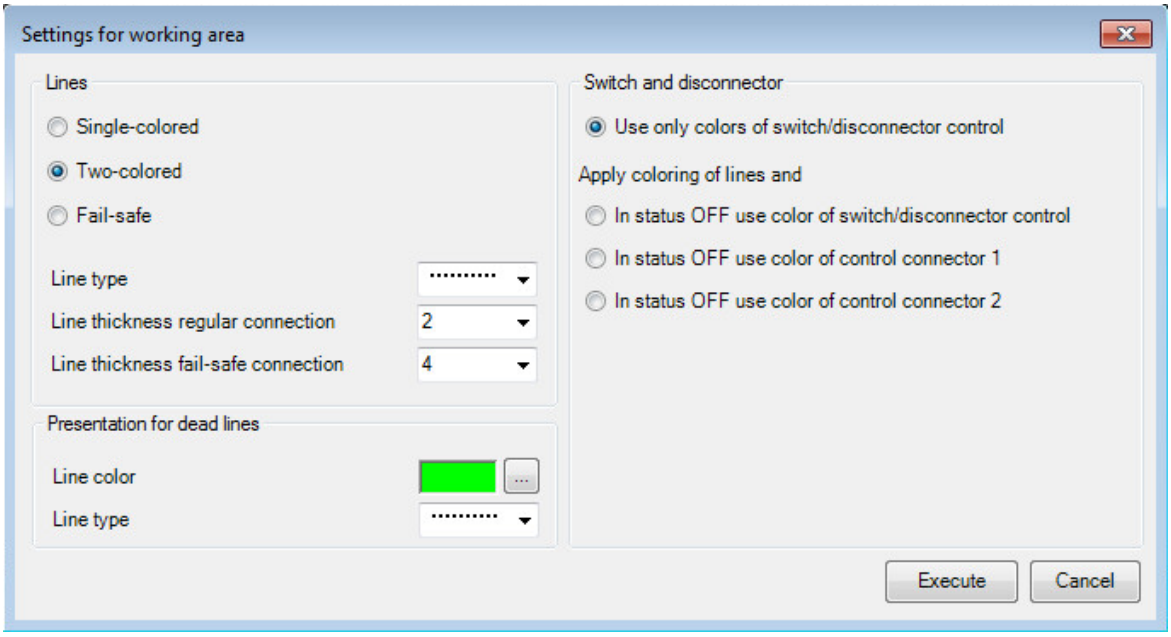
The two setting dialogs described below can be accessed via the **Topological coloring** submenu of the **SICAM menu** (see *6.2 SICAM Menu*).

Settings for working area

In the **Settings for working area** dialog you define basic parameters of the **Dynamic coloring** function for the selected area, e.g. the color for the **OFF** status.

The following applies to the **Lines**:

- **Single-colored** means that the source with the highest priority is displayed.
- **Two-colored** means that when supplied by 2 different sources the 2 source colors are indicated by dashed lines. In this case the 2 sources with the highest priority are displayed.
- **Fail-safe**, i.e. the network section is supplied by several sources, means that the color of the sources with the highest priority is displayed – with **Line thickness fail-safe connection**.



[sc_settings_for_selected_objects, 1, en_US]

Figure 5-19 Settings for working area dialog

NOTE

Even if you do not change any settings you must click **Execute** in this dialog at least once in a new project. Otherwise not all topological elements are displayed.

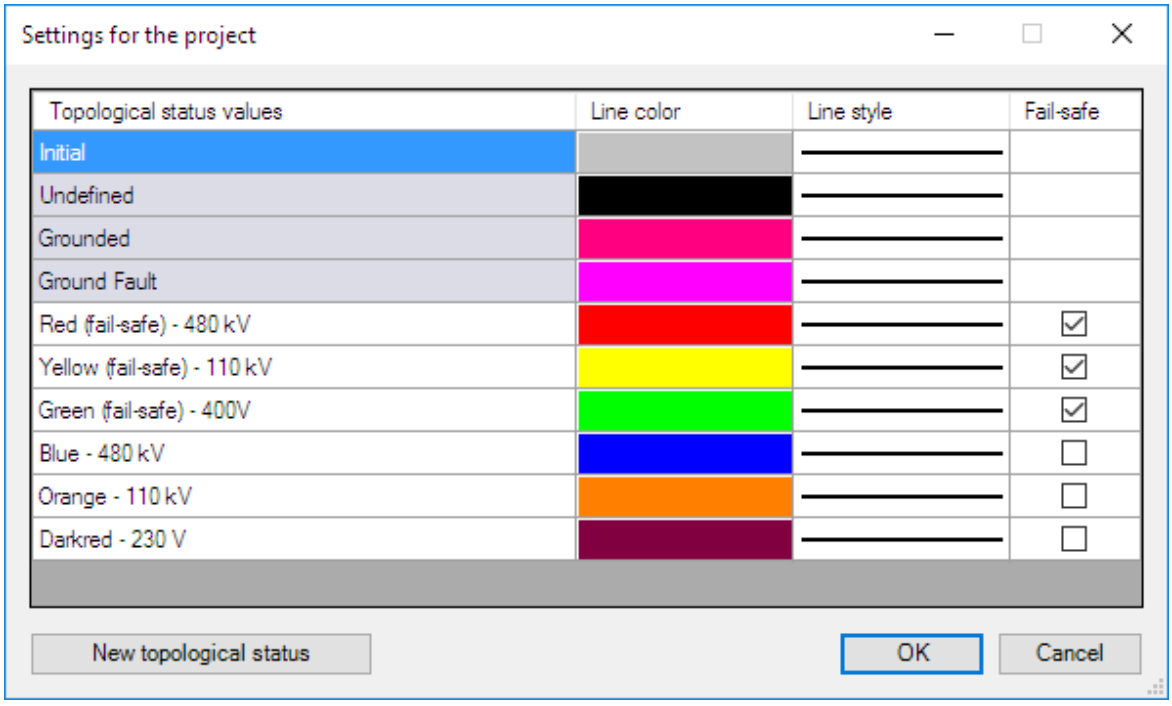
Settings for the project

In the **Settings for the project** dialog you define the line color and line style for available topological statuses for the entire project.

In addition, you can click **New topological status** in order to define further topological statuses.

The statuses highlighted in gray are predefined. In contrast to self-defined statuses (highlighted in white), only the line style and the line color can be changed for these statuses; however, they cannot be deleted or renamed.

For the SICAM Topology (SICAM Electrical Device Controls) objects, the color settings for the topological statuses are available as a selection list for the **Supply** type (see *Color, Page 175*).



[sc_settings_for_project, 1, en_US]

Figure 5-20 Settings for the project dialog

NOTE

The Graphics Designer must be restarted and the project must be created once again in order to ensure that changes can become effective (e.g. deleting or renaming topological statuses).

Priorities of the topological status values (colors)

The priorities of the topological status values are as follows:
Ground fault > **Grounded** > **Energized** > **Undefined** > **De-energized**
The color for **Ground fault** is indicated if **Grounded** and **Energized** occur at the same time.

5.3.4 Parameterizing Elements and Symbols

For more detailed information on how to set the parameters of the elements, refer to *4 Graphic Objects*.

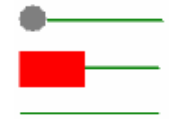
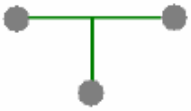
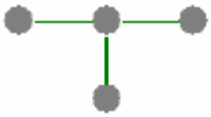
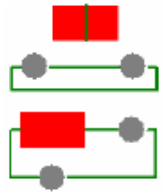
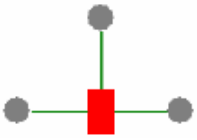
5.3.5 Notes on Configuration

Before the topological coloring scripts are created, the connections are checked. The Report window shows the result of the check, **warnings** or **error messages**.

An error message is displayed if the topological coloring could not be performed correctly during runtime. A warning is shown if the topological coloring would be performed although a discrepancy exists. A script is created if a warning occurs, but not in case of an error.

The following table provides a list of faulty connections.

Table 5-2 List of faulty connections

Erroneous Connections	Result of Check	Correct Connections	Remark
	Error The connector has not been completely linked.		Open connections can delay the build-up of a diagram. The open side of a connection can automatically link to another object.
	Error 2 connectors are linked without a node.		An additional connector or an additional node must be inserted.
	Error Circular connection	Separate the circular connection. Avoid a loop in the network.	This is a circular connection if an active object (switch, bay overview, feeder and ground disconnector) is connected to itself. A loop consisting e. g. of two switches is not considered as a circular connection.
	Warning Connection to a graphic object which does not support topological coloring		No topological coloring of this graphic object during runtime
	Warning The graphic object has more than one connection on one of its inputs/outputs.		For graphic objects, one single connection can be defined per input/output.

NOTE

Only one single set of colors is permissible in a picture section which is coherent in terms of topological coloring. This means that one specific color is used for ON, OFF, Grounded, Not topical (TopoColorON, TopoColorOFF, TopoColorGrounded, TopoColorINVALID). If several parameters with different colors for e.g. **ON** are parameterized in a topologically coherent picture section, this may lead to the fact that the lines are not colored correctly.

In order to configure e.g. various voltage levels with different colors, several topological picture sections must be used.

5.4 Cross-Picture References

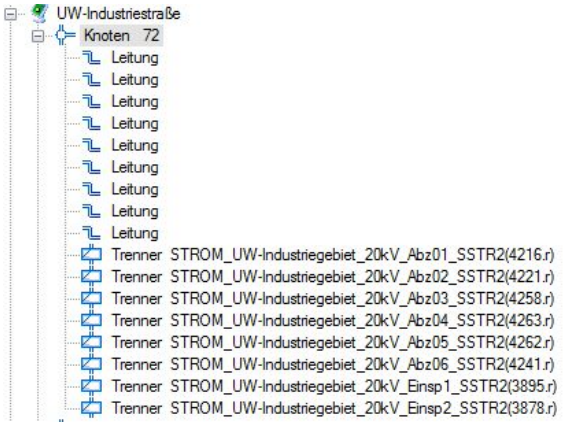
If network sections are represented in different pictures, e.g. in the worldmap and in the substation diagram, cross-picture node references must be created. This ensures that dynamic network coloring is possible across the limits of the individual picture.

Reference via Double Representation of Topological Elements

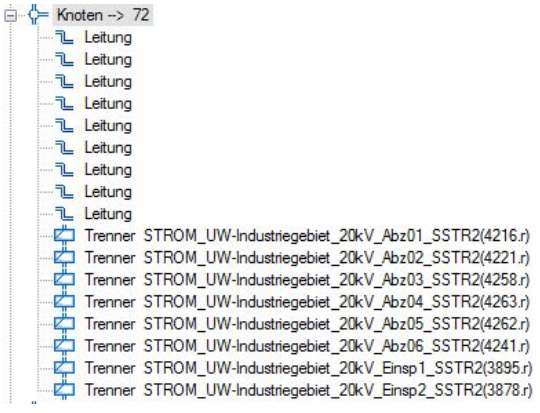
If the topological elements of a node are represented in various pictures, the topology algorithm detects that the same elements have been created in the node copy.

As a prerequisite, the node must be **completely** described with all its elements in one of the pictures. In this case, fewer elements can be created on the node in the other pictures. The same parameter values must have been set as for the original node. However, **no additional elements** may be connected to the node copy.

The example illustrated below shows the original of Network node 72 of Busbar 2 in the UW-Industriestraße picture and the **copy** (Node -> 72) in the worldmap.



Original Node Definition (Substation Diagram)



Reference Node Definition, Copy (Worldmap)

5.5 Using Topological Coloring

The following requirements must be fulfilled in order to use the topological coloring function:

- The graphic objects Feeder and Ground must be used in your station diagrams.
- Connectors and nodes must be added instead of simple lines and circles.
- Feeders must be configured and
- event functions and scripts must be created for topological coloring.

This subchapter provides an example for the creation of a picture using topological coloring. A measured value is used as source for the topological coloring.

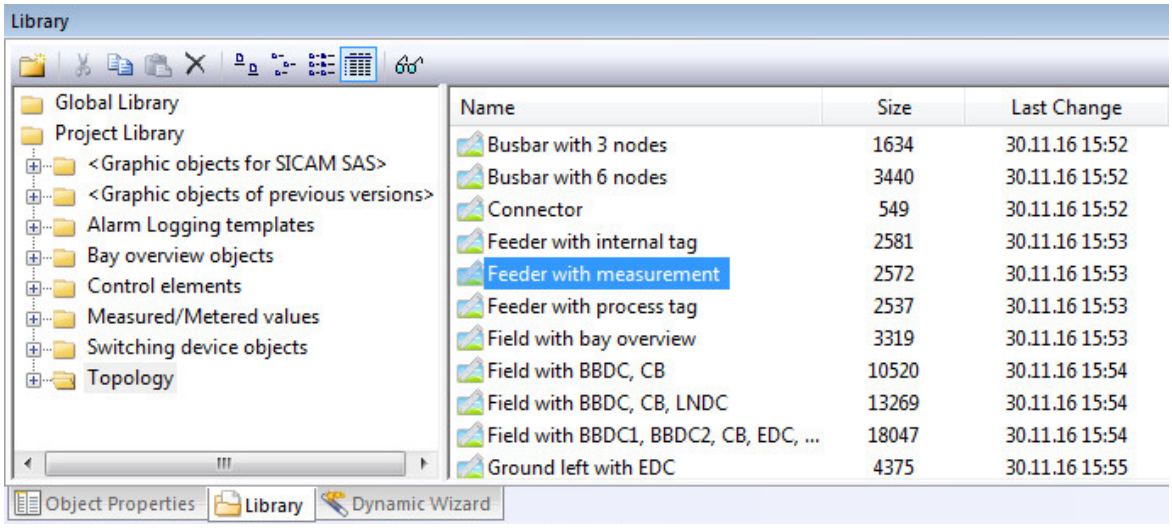
The following section describes how to draw and configure a branch. Alternatively, you can use default branches from the library.

Positioning graphic objects

Proceed as follows to position graphic objects on your workspace:

✧ To open the **Library** window, click **View > Library**.

✧ Select a **feeder** under **Topology**.



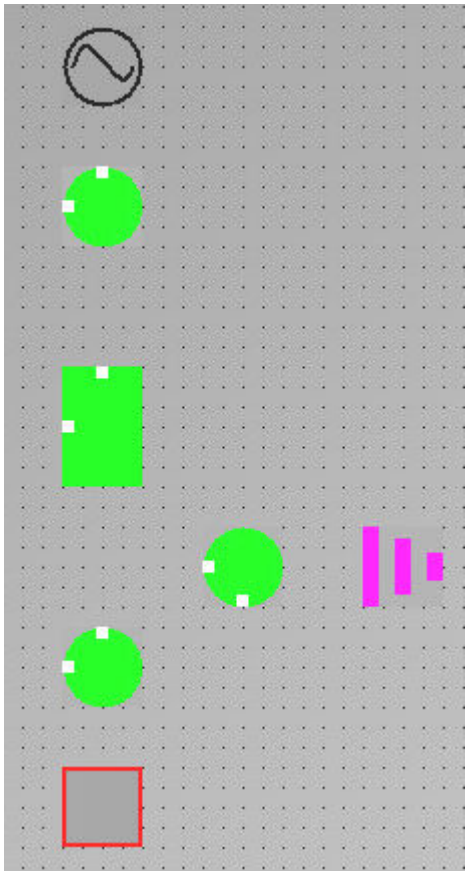
[sc_topo_insert_object, 1, en_US]

Figure 5-21 Inserting graphic objects

✧ Hold down the mouse button and move the cursor over the workspace until the graphic object has reached the desired position.

✧ Insert the controls (switching device objects) from the library.

✧ Insert a Ground element.
The Ground element is available in the library under Topology.



[sc_topo_swob1, 1, --_--]

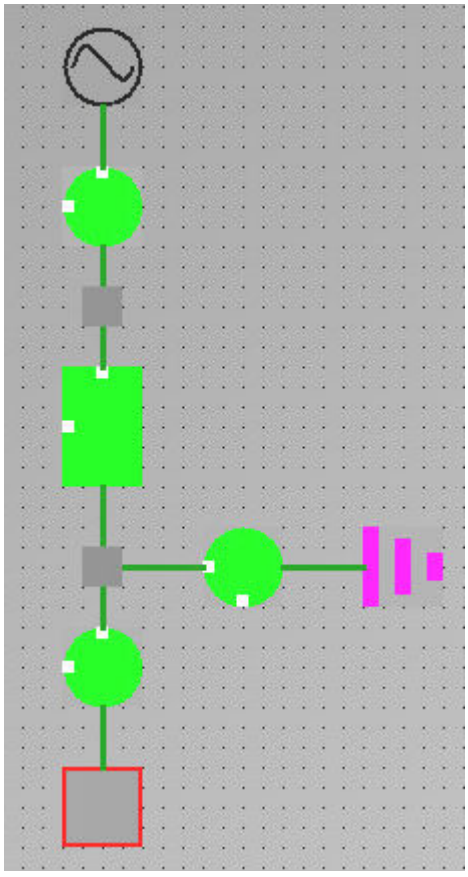
Figure 5-22 Picture with a feeder, controls (switching device objects) and a ground element.

Inserting nodes and connectors

✧ Insert the node into the picture.
The nodes and connectors are available in the library under **Topology**.

✧ Insert the connectors.

When inserting the connectors, make sure that the connection to the graphic object is properly defined. A successful connection is represented by a red dot.



[sc_topo_swob2, 1, --_--]

Figure 5-23 Picture with nodes and connectors

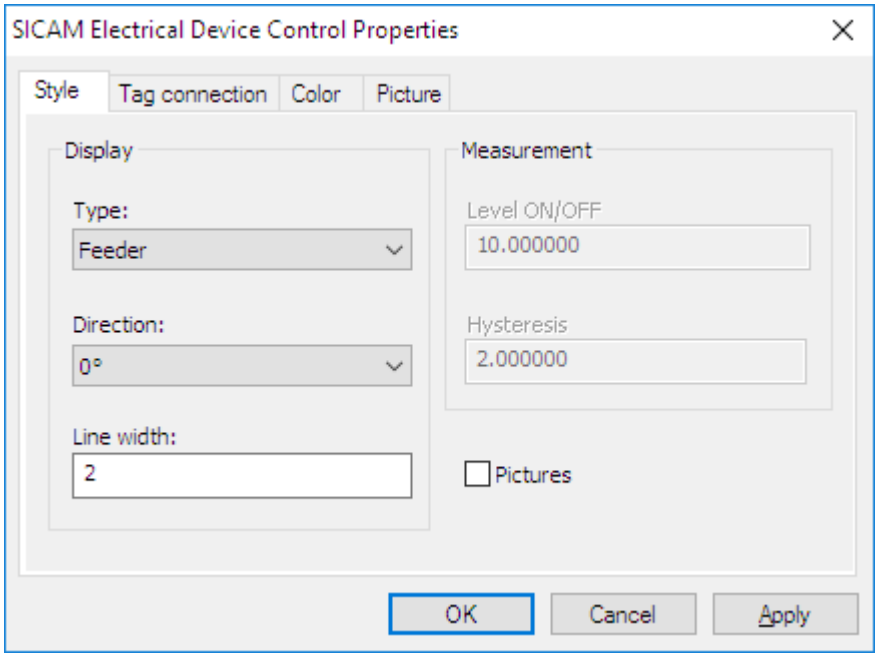
NOTE

After renaming an active graphic object (e.g. a feeder, switch or node), all connections to this graphic object must be redefined. To do this, separate the connection in the picture and redefine it afterwards. This ensures that the new name is entered in the properties of the connector.

Configuring a feeder

Proceed as follows to configure a feeder:

✧ Double-click the feeder.
The **SICAM Electrical Device Control Properties** dialog opens.



[sc_edc_style, 1, en_US]

Figure 5-24 Configuring a feeder

- ✧ In order to use a measured value as source for topological coloring, on the **Tag connection** tab, select **Measurement** as **Tag type**.
- ✧ In the **Style** tab under **Measurement**, you can now define the values for **Level ON/OFF** and **Hysteresis**.

Linking feeders to tags

Each feeder must be linked to a tag.

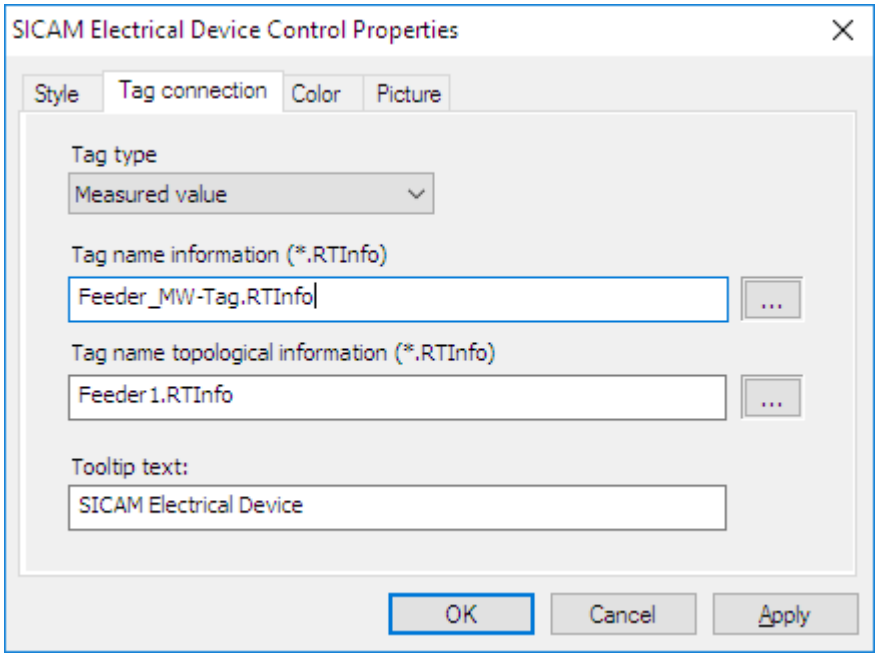
To link the feeder to a tag, proceed as follows:

- ✧ In the **SICAM Electrical Device Control Properties** dialog, select the **Tag connection** tab.
- ✧ Select a **Tag** type:

  Process information: The value of the information includes ON/OFF/DISTURBED and is directly transferred to the topology calculation

  Internal information: internal data structure, e.g. filled by a script; ON/OFF/DISTURBED values are transferred to the topology calculation

  Measured value: Input data originate from a measured value; the switching point and the hysteresis determine ON/OFF and set the additionally linked internal message transferred for topology calculation



[sc_topo_tagconnection, 1, en_US]

Figure 5-25 Feeders, connecting tags

- ✧ Select the corresponding **Tag names** (*.RTInfo).
- ✧ Click **OK** to close the dialog.

Creating event functions and scripts for topological coloring

After inserting all the graphic objects required and linking them to the appropriate connectors, the event functions and scripts must be created.

- ✧ Activate the picture (e.g. by clicking the corresponding icon in the SICAM toolbar):

- ✧ Click the **Generate project** icon:

After checking the topology, the connection scripts are generated. You can view the progress in the Report window. Also errors are displayed here, see *5.7.1 General Information*.

For more detailed information concerning error messages, refer to *5.3.5 Notes on Configuration*.

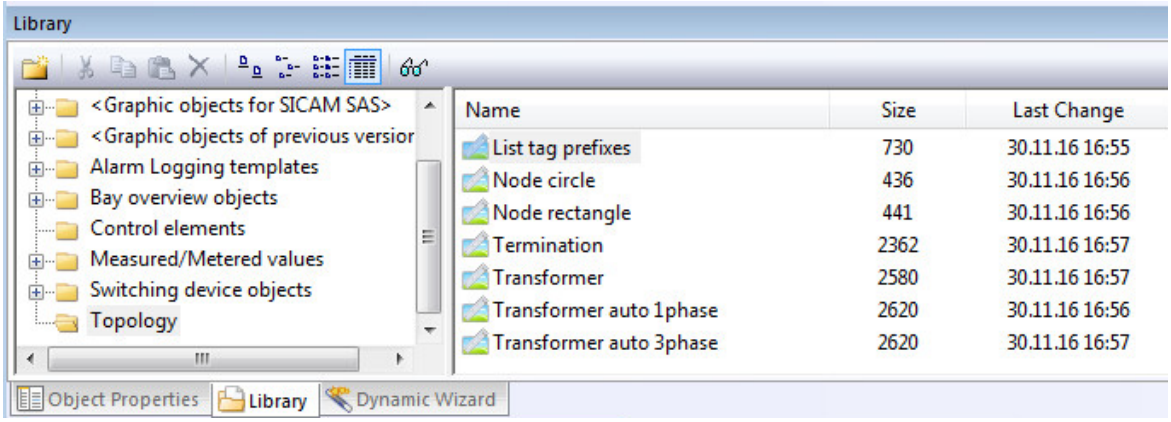
5.6 Using Picture Windows

You can use pictures as picture windows in superordinate pictures. If the picture window in the superordinate picture uses variable prefixes, you have to apply them for the picture which you want to display in the picture window. Therefore, during configuration you define a list with prefixes. These are taken to generate all possible combinations to be used for the topological coloring.

If you click a picture window in the superordinate picture during runtime, the corresponding values are displayed.

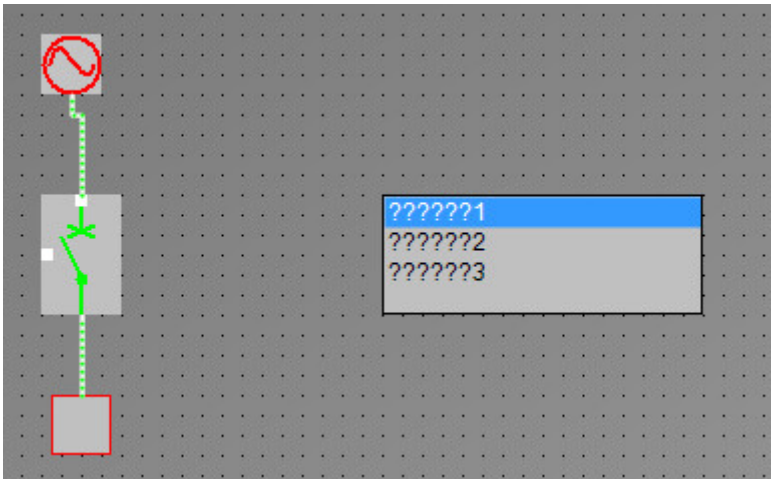
How to use the prefix list:

✧ Drag and drop the **List tag prefixes** element from the **Topology** section of the **Library** into your picture.



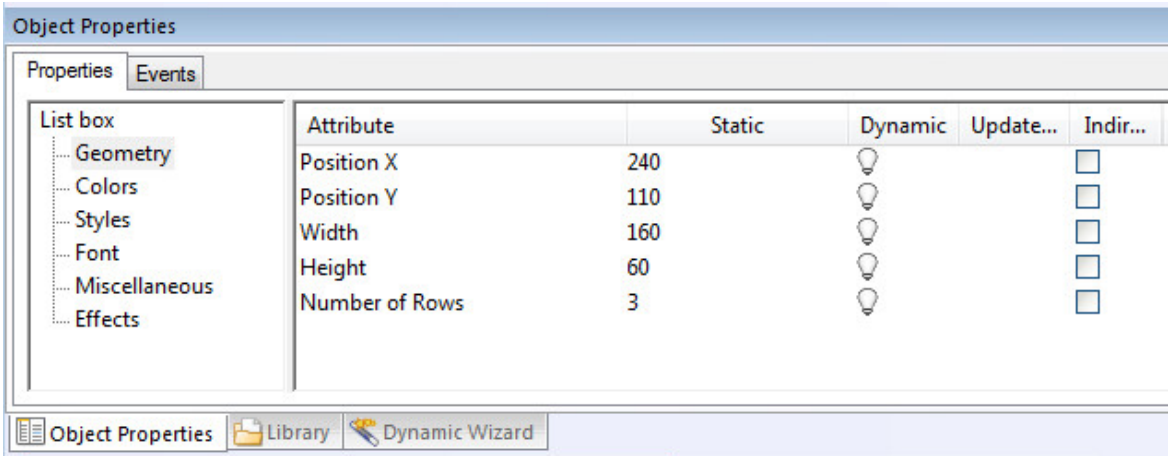
[sc_bildfenster_prefix de, 1, en_US]

The element is inserted.



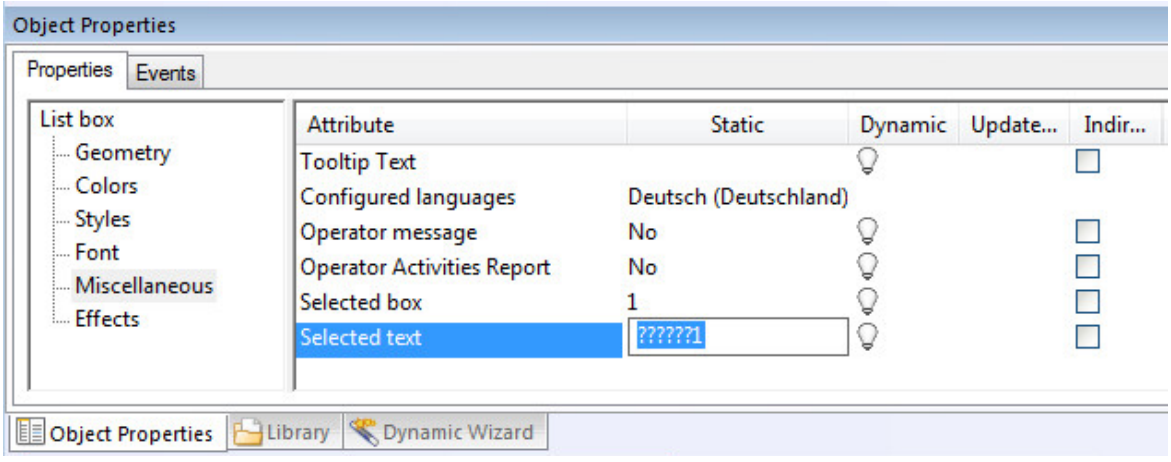
[sc_bildfenster_prefix_obj, 1, --_--]

✧ Right-click the **List tag prefixes** object and open its **Properties**.
Under **Geometry** you can set the **Number of Rows** as desired.



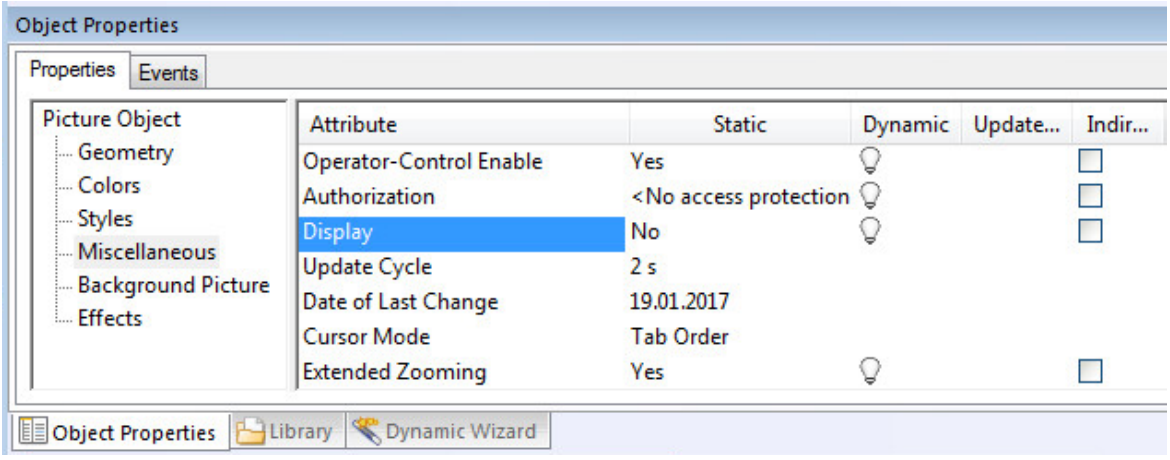
[sc_bildfenster_rows de, 1, en_US]

✧ Under **Miscellaneous** you can change the texts.
Therefore, use **Selected box** to select the entry and change it in **Selected text**.



[sc_bildfenster_text de, 1, en_US]

✧ To hide the **List tag prefixes** object during runtime, set the **Display** attribute to **No**.

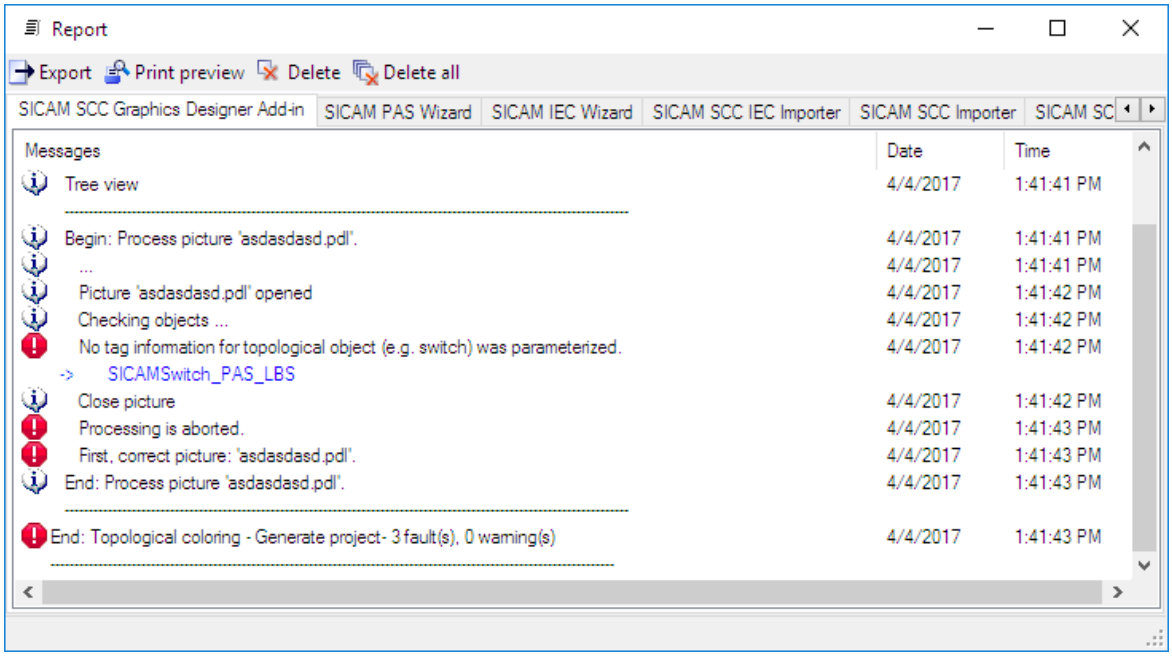


[sc_bildfenster_unsichtbar de, 1, en_US]

5.7 Debugging

5.7.1 General Information

Any warnings or error messages which may pop up from the pictures during project generation are displayed in the Report window.



[sc_error_generation, 1, en_US]

Figure 5-26 Error during generation, example

NOTE

Click the link indicated in the error message in order to jump directly to the element concerned.

5.7.2 Error Messages

- **An element occurs several times on the same node**
  An element must not occur several times on the same node. Otherwise, the representation can become inconsistent.
- **Element short circuited**
  The left- and right-hand connection of an element are connected. The subsequent error **Not connected** can also occur.
- **Connected too often**
  A 1-pole element has more than 1 connection, but may only occur in an original node.
  A 2-pole element has more than 2 connections, but may only occur in 2 original nodes.
- **Line without connection**
- **Node without connection**
- **Internal error-->Start a rebuild**
  Compile all pictures at the same time.

- **Not connected**
  At least 1 feeder or transformer and at least 1 terminator must exist and be connected in the topology description. All other elements must be connected to a line and a neighboring element. Connectors without connection cause an error message.
- **Inconsistent representation**
  Elements can be duplicated for cross-picture representations. In this case a node copy is created in the other picture. This node copy may include fewer elements than the original node, but no additional elements. No valid original node can be determined in such cases.
  Complete the original node by the missing elements.
  Connect the correct neighboring elements.
- **Incorrect transformer side**
  The transformer with its tag allocation has been used several times and has been installed at least once in the opposite direction, i.e. the Side 1 and Side 2 connections have been confused.
- **Type mismatch**
  Switching device or bay overview objects with the same tag assignment were defined with different topological types.
- **Supply type not clear**
  A different supply type was used for a SICAM Electrical Device Object in the original node and in the node copy.
- **Mounting direction (left/right reference) not consistent**
  The mounting direction of an element in the original node is opposite to the mounting direction in the node copy.
  Change the **Mounting direction** in the element of the node copy.
- **Topological status value <Number> assigned <n> times. Up to 256 are possible.**
  Reduce the number of topological status values used.

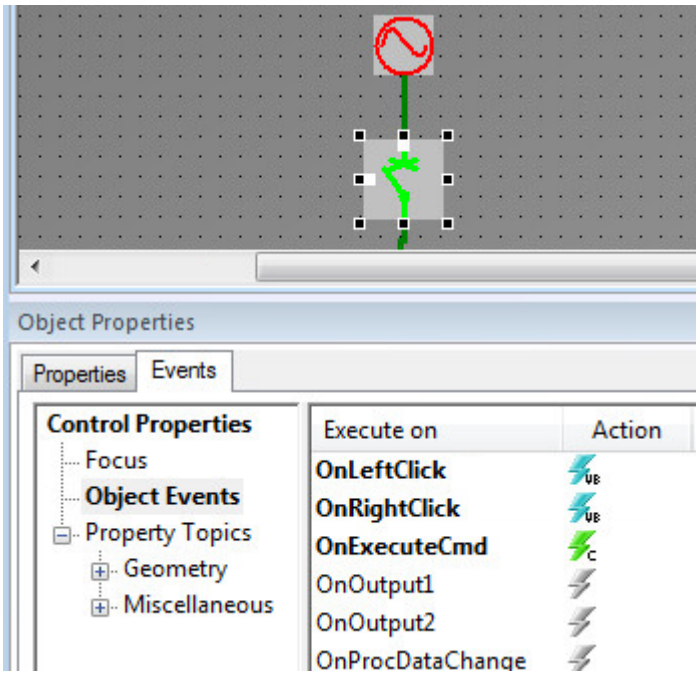
5.8 Application Examples

5.8.1 Switchgear trucks

If switchgear trucks are shown in pictures, disconnectors supplied by the same process tag are represented on both sides of the circuit breaker. Since this scenario cannot be represented in the topology, only one of the disconnectors may be configured with the process tag.

The second disconnector must be connected to a newly created internal structure tag (type: **PAS_InformationInternal**). The names can be freely selected or adapted to the name of the external process tag.

The disconnector with the internal tag connection cannot be controlled. For this reason, you can remove the **OnLeftClick** and **OnRightClick** scripts in the **Event** tab.



[sc_appex_carriage_event, 1, en_US]

Figure 5-27 Scripts

If the process values of the disconnector with the process tag change, the data of the process tag is transferred to the internal tag via copying. The C script `SCC_CopyTagValueRT(char* p_cSourceTagName, char* p_cDestinationIntTagName, BOOL p_bDigitalValue)` can be used for this purpose. You can configure the function to the **OnProcDataChange** event of the disconnector with tag connection.

```
#include "apdefap.h"
void OnProcDataChange(char* lpszPictureName, char* lpszObjectName , long opdcEvent, long Value)
{
// WINCC:TAGNAME_SECTION_START
// syntax: #define TagNameInAction "DMTagName"
// next TagID : 1
// WINCC:TAGNAME_SECTION_END

// WINCC:PICNAME_SECTION_START
// syntax: #define PicNameInAction "PictureName"
// next PicID : 1
// WINCC:PICNAME_SECTION_END

        char *    cRTInfoName;
        char *    cRTInfoNameINT;

        BOOL    bOkValue = 0;
        LINKINFO        linkinfoRTInfo;

        int    ch = '.';
        int    iCharPosition;
        int    iNameLength;


        cRTInfoName = malloc(256);
        memset (cRTInfoName, 0, 256);
        cRTInfoNameINT = malloc(256);
        memset (cRTInfoNameINT, 0, 256);

        // Get link of RTInfo property
        bOkValue = GetLink(lpszPictureName, lpszObjectName, "RTInfo", &linkinfoRTInfo);

        // get name of linked tag
        strcpy(cRTInfoName, linkinfoRTInfo.szLinkName);

        // cut off ".RTInfo" from variable name to get the structure name
        iNameLength = strlen(cRTInfoName);
        for ( iCharPosition = 0; iCharPosition < iNameLength; iCharPosition++ )
        {
                if (cRTInfoName[iCharPosition ] == ch) break;
        }
        // Build internal tag name and copy runtime data to variable
        strncpy (cRTInfoNameINT, cRTInfoName, iCharPosition );
        cRTInfoNameINT = strcat(cRTInfoNameINT, "_INT");

        SCC_CopyTagValueRT(cRTInfoName, cRTInfoNameINT, 1);    //Return-Type: long int

        free (cRTInfoName);
        free (cRTInfoNameINT);
}
```

[sc_appex_carriage_script, 1, --_--]

Figure 5-28 Example of the script

A **.var** file is required in order to ensure that the tag can be processed by the **SICAMRTDataServer**. The files for the **SICAMRTDataServer** are stored in the **GWData** subfolder of the WinCC project.

The name must end with **.var** e.g. **SICAMRTDS_TopoINT.var**.

The file structure is as follows (identical with **SICAMRTDS_TopoPlugIn.var**):

```
# 2017-01-01 01:01:01.010101; SICAM_Pas803_T103M_T103IF_7SJ63_q1_einaus_INT.RTInfo;
<Generic type>;
```

Each tag created manually for a (truck) disconnector must be entered here.

6 SICAM Add-In

6.1	Overview	204
6.2	SICAM Menu	205
6.3	SICAM Toolbar	207
6.4	Performing Settings	208
6.5	Predefined Tasks	211
6.6	Creating User-Defined Tasks	214
6.7	Replacing a Graphic Object in the Library	230

6.1 Overview

The **SICAM add-in** is an extension to the **Graphics Designer**.

It enables the parameterization of any graphic object in a diagram (picture) based on defined **tasks**. To do this, you use predefined tasks, but you can also create user-defined tasks.

The tasks allow the simultaneous parameterization of **several graphic objects**. You can define parameters for **static values**, **tag dynamizations** and also **events**.

Based on a specific task, you can e.g. assign a bay's switching device objects and measured-value objects tags from a different tag group.

As a rule, the **SICAM add-in** is enabled. To disable/enable it, click **Tools > Addin Manager** in the **Graphics Designer**.

The **Graphic Library Explorer** allows you to edit graphic objects in the SICAM graphic object library.

NOTE

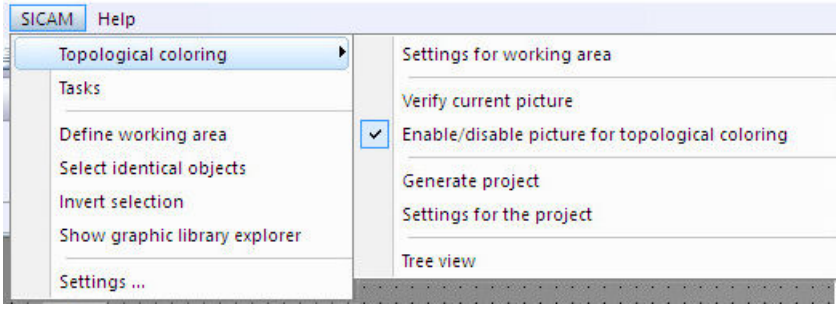
The **SICAM add-in** for the logged on Windows user is registered during installation. If another user works with SIMATIC WinCC, the SICAM add-in is not displayed in the SIMATIC WinCC Graphics Designer.

To activate the SICAM add-in for a newly logged on Windows user, the SICAM add-in must be registered while the new user is logged on. A **SICAMAddIn.reg** registration file which includes this registration is available in the <InstallationDirectory>\bin.

6.2 SICAM Menu

The **SICAM** menu provides the following functions:

- **Topological Coloring**
  - **Settings for working area**
    Opens the **Settings for working area** dialog.
  - **Verify current picture**
    Verifies the object parameterization of the current picture and shows the result as well as any errors in the Report window.
    This function enables the user to verify the picture without the need to change the existing project. The project only must be generated once again after the picture has been saved.
  - **Enable/disable picture for topological coloring**
    Enables/disables the current picture and indicates the status with a checkmark.
  - **Generate project**
    Starts the project generation for the topology and shows the result and any errors in the Report window.
  - **Settings for the project**
    Opens the **Settings for the project** dialog for defining topology statuses and assigning them a line color and line style.
  - **Tree view**
    Represents the topological node structure.
- **Tasks**
  Shows the dialog for executing predefined or user-defined tasks.
- **Define working area**
  Defines the working area in the picture by dragging a rectangle with the mouse. This working area applies to subsequent functions.
- **Select identical objects**
  Selects all graphic objects in the working area which correspond to the type of the selected graphic object. It is also possible to select several object types simultaneously.
  This function allows you to simultaneously change e.g. the color settings for all selected graphic objects in the WinCC Properties dialog.
- **Invert selection**
  Inverts the current selection. Selected graphic objects are deselected; deselected graphic objects are selected.
  This function applies to the graphic objects in the working area.
- **Show Graphic Library Explorer**
  Inverts the current selection. Selected graphic objects are deselected; deselected graphic objects are selected.
  This function applies to the graphic objects in the working area.
- **Settings...**
  This submenu items allows you to perform general settings and create user-defined tasks, see *6.4 Performing Settings*.



[sc_sicam_menu, 1, en_US]

Figure 6-1 Graphics Designer, SICAM menu

Based on these tasks, you can edit:

- Controls (switching device objects) – circuit breakers and disconnectors
- Feeders, Ground
- Measured-value objects
- All other graphic objects, e.g. standard objects

Define working area

The **Define working area** function influences the next two functions in the list. You can use it in order to define to which picture section the selection functions shall apply. If no working area or an empty working area has been defined, the selection functions apply to the entire picture.

To simultaneously modify the object properties of several identical graphic objects (e.g. breakers), you can use the selection function.

Proceed as follows to execute a selection function:

✧ Click to select the working area in your picture.

✧ Click the **Define working area** function.
The graphic objects in the working area are recorded internally.

✧ Click on a free space on the picture.
All visible markers are removed.

✧ Select the reference object.

✧ Next, click **Select identical objects**.
All identical graphic objects are selected in the working area.

The working area remains active until a new area is defined.

✧ Right-click one of the selected graphic objects.

✧ Open the **Object properties** dialog.

You can now e.g. modify the **ColorON** attribute simultaneously for all selected graphic objects.

6.3 SICAM Toolbar

The **SICAM Toolbar** is displayed if the **SICAM Add-In** has been enabled via **Tools > Addin Manager**.

Functions

Table 6-1 Functions of the SICAM Toolbar

Icon	Meaning
	Define working area
	Select identical objects
	Invert selection
	Show task dialog
	Activate/deactivate current picture
	Check current picture; if an error occurs, the red symbol is displayed
	Create project; if an error occurs, the red symbol is displayed
	Show tree view

You can also call up the functions of the SICAM Toolbar via the **SICAM menu**, see *6.2 SICAM Menu*.

6.4 Performing Settings

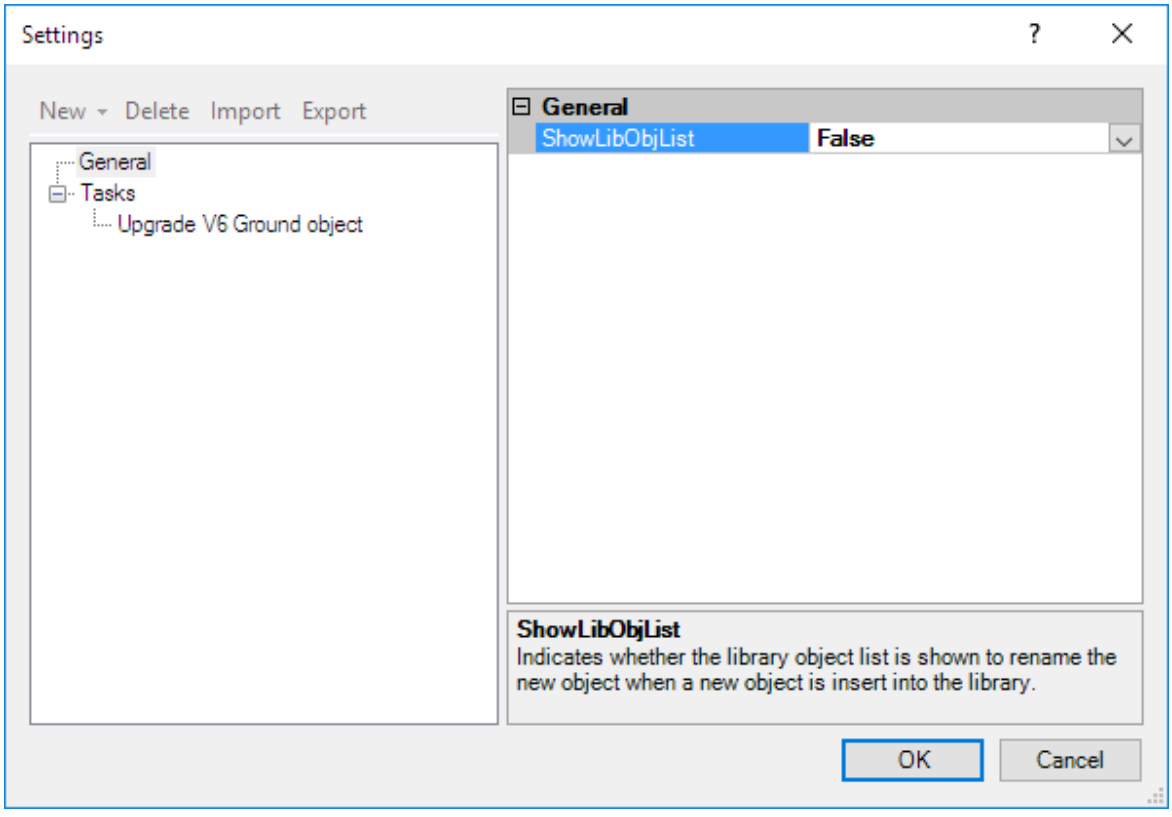
To open the **Settings** dialog, click **SICAM > Settings...**. This dialog allows you to perform general settings and create user-defined tasks.

The following entries are displayed on the uppermost level of the **tree structure** in the left-hand pane of the dialog.

- **General**
  This entry is required for working with the **Graphic Library Explorer**.
- **Tasks**
  All **user-defined tasks** are arranged under this entry. User-defined tasks can only be displayed after they have been created by the user.

The settings are displayed and can be edited in the right-hand pane of the display. The display always shows the settings which belong to the entry selected in the tree structure. The settings are described in the following paragraphs.

6.4.1 General Information



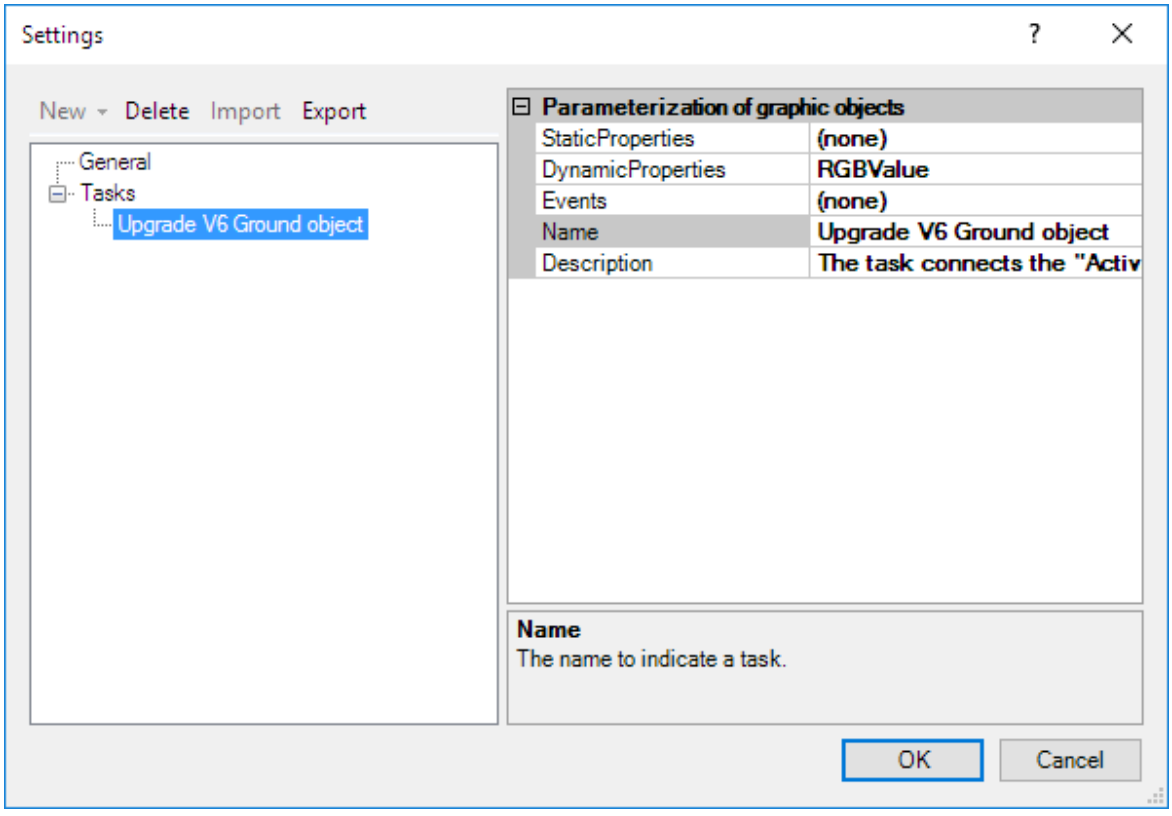
[sc_sicam_settings, 1, en_US]

Figure 6-2 Settings dialog, General

The following setting is possible under **General**:

- **ShowLibObjList**
  This setting defines how a modified graphic object is inserted in the **Graphic Library Explorer**.
  False adds the modified graphic object under a new name.
  True opens the **Select graphic object** dialog. In this dialog, you can modify the name of the graphic object and define whether it is replaced.
  To replace the existing graphic object, right-click the graphic object and click **OK.** The existing graphic object is replaced by the modified graphic object; the name is retained.
  The name of the replaced graphic object remains unchanged in each available language.

6.4.2 Tasks



[sc_sicam_tasks, 1, en_US]

Figure 6-3 Settings dialog, Tasks

User-defined **tasks** can be created and defined below the **User-defined tasks** entry, see *6.6 Creating User-Defined Tasks*.

You can call up these user-defined tasks in the **Graphics Designer** (**SICAM > Show or hide task** dialog) or via the **SICAM Toolbar**. They influence the graphic objects of a diagram.

Deleting a user-defined task

To delete a user-defined task:

✧ In the tree structure in the **Settings** dialog, select the task to be deleted.

✧ Click **Delete**.

Exporting a user-defined task

You can export the current task configuration into a ***.satsk** file. Afterwards, the task can be imported into another project.

To export a user-defined task:

- ✧ In the tree structure in the **Settings** dialog, select the task to be exported. In the tree structure, select the **tasks** in order to simultaneously export all user-defined tasks.
- ✧ Click **Export**.

Importing a user-defined task

You can import a task from a ***.satsk** file into the Settings dialog. The imported task is displayed in the tree structure in the left-hand pane of the display.

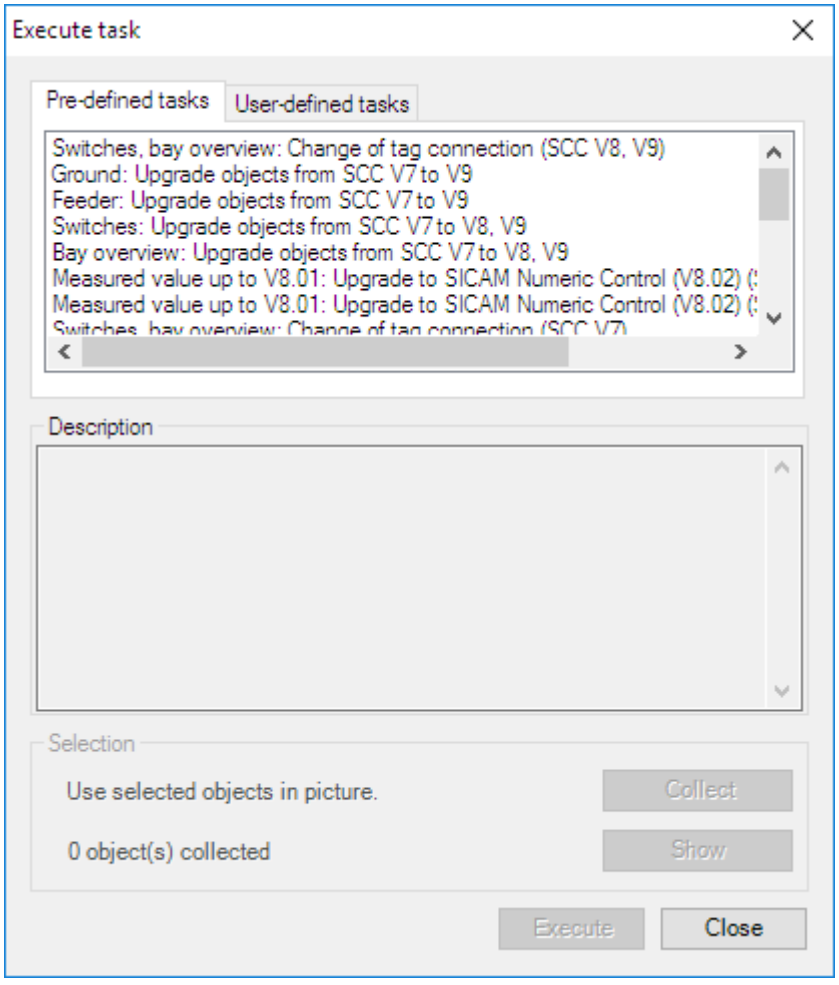
To import a user-defined task:

- ✧ In the **Settings** in the tree structure, select the **Tasks** entry.
- ✧ Click **Import**.

6.5 Predefined Tasks

The **SICAM Add-In** provides several **predefined tasks**. You can select a predefined task in the **Execute task** dialog.

To open this dialog, select **SICAM > Show task** dialog from the menu or click the icon in the toolbar.



[sc_tasks_given, 1, en_US]

Figure 6-4 Execute task dialog, Predefined tasks tab

NOTE

If objects were replaced by a task: Check after the replacement whether configured scripts which have been applied must be adapted or removed.

Predefined Tasks

The following predefined tasks are available:

- **Switches, bay overview: Change of tag connection (SCC V8, V9)**
  With this task you can change the tag connection of switch, bay overview, feeder, and ground objects in a switch bay.
- **Ground: Upgrade objects from SCC V7 to V9**
  With this task you can replace ground objects of SICAM SCC V7 with the ones of V9.

- **Feeder: Upgrade objects from SCC V7 to V9**
  With this task you can replace feeder objects of SICAM SCC V7 with the ones of V9.
- **Switches: Upgrade objects from SCC V7 to V8, V9**
  With this task you can replace switch objects of SICAM SCC V7 with the ones of V8 and accordingly V9.
- **Bay overview: Upgrade objects from SCC V7 to V8, V9**
  With this task you can replace bay overview objects of SICAM SCC V7 with the ones of V8 and accordingly V9.
- **Measured value up to V8.01: Upgrade to SICAM Numeric Control (V8.02) (step 1)**
  With this task you can replace measured value objects of former SICAM SCC versions with numeric objects of V9. For a successful upgrade you have to execute step1 and then step 2.
- **Measured value up to V8.01: Upgrade to SICAM Numeric Control (V8.02) (step 2)**
  With this task you execute the second step to upgrade measured value objects. The configured process tags ***.Counter** are replaced by ***.RTInfo**.
- **Switches, bay overview: Change of tag connection (SCC V7)**
  With this task you can change the tag connection of switch, bay overview, feeder, and ground objects in a switch bay.
- **Switches: Update PAS CC V5.10 objects with "Activate" tag**
  With this task you can update the switching device objects of PAS CC V5.10; the ActivateControls tag gets connected. The **ActivateControls** tag is connected.
- **Measured value: Upgrade PAS CC V5.10 objects to V6 (up to V8.01)**
  With this task you can replace measured value objects of SICAM SCC V5.1 with newer measured value objects (V6 to V8.01).
- **Measured value: Upgrade PAS CC V5.0x objects to V6 (up to V8.01) (step 1)**
  With this task you can replace measured value objects of PAS CC V5.0 with newer measured value objects (V6 to V8.01). For a successful upgrade you have to execute step1 and then step 2.
- **Measured value: Upgrade PAS CC V5.0x objects to V6 (up to V8.01) (step 2)**
  With this task you execute the second step to upgrade PAS CC V5.0 measured value objects. The configured process tags ***.Counter** are replaced by ***.RTInfo**.
- **Switches SICAM WinCC V3: Upgrade Switching_Device1 to SICAM WinCC SAS switching object**
  With this task you can upgrade V3 switching device objects (Switching_Device1). The task upgrades the switching device objects by replacing them by SAS switching device objects (V4 to V9).
- **Switches SICAM WinCC V3: Upgrade Switching_Device2 to SICAM WinCC SAS switching object**
  With this task you can upgrade V3 switching device objects (Switching_Device2). This task upgrades the switching device objects by replacing them with SAS switching device objects (V4 bis V9).
- **Bay Overview SICAM WinCC V3: Upgrade Bay_Overview1 to SICAM WinCC SAS-BO object**
  With this task you can upgrade V3 bay overview objects (Bay_Overview1). This task upgrades the bay overview objects by replacing them by SAS bay overview objects (V4 to V9).
- **Show dynamics**
  This task shows all the 'Dynamic' parameterization of the selected objects.
- **Edit items of a Check Box or Option Group object**
  The task adds, removes, or modifies the items of the selected Check Box or Option Group.
- **Edit Items of a Listbox or Combobox**
  The task adds, removes, or modifies the items of the selected Listbox or Combobox.

NOTE

You can continue to operate existing SICAM SCC projects of version 7.xx with the current **IndustrialX Controls** without using the SICAM SCC Runtime Data Server.

In order to continue to use current IndustrialX Controls (switching device objects) the IX State Sync can also be continue to be used.

The optionally installable **IX State Sync** redundancy component is entirely replaced by the SICAM SCC Runtime Data Server and no longer is required when using the ActiveX Controls of V8.0 or higher.

NOTE

Be aware that **pictures** and settings configured under the Bitmap option are not applied for Send **QoC in command value**.

Scripts or actions configured for properties or events of the switching device objects are not applied during conversion. They cannot be applied because the property types and events are not fully compatible. The scripts and actions must be created again after the conversion.

The new object which is used for replacement can be updated in advance with the corresponding pictures.

All further object settings are applied during conversion.

Executing a task

Due to the large number of different application options, the execution of the various tasks cannot be described in detail. However, a brief description of each predefined task is provided in the **Execute task** dialog.

Three different types of tasks are possible, see *6.6 Creating User-Defined Tasks*.

Proceed as follows to execute the **Switches**: **Update PAS CC V5.10 objects with "Activate" variable predefined task**:

- ✧ In the **Graphics Designer**, open the diagram (picture) to be edited.
- ✧ In the Graphics Designer, click **SICAM > Show task dialog** to open the **Execute task** dialog.
- ✧ Select the **Predefined tasks** tab.
- ✧ Select **Switches: Update PAS CC V5.10 objects with "Activate" tag**.
- ✧ In the display, select the V5.10 controls for which you want to perform an upgrade.
- ✧ Click **Execute**.

  The **Switches: Update PAS CC V5.10 objects with Activate variable** dialog opens. The **ActivateControls** value is entered in the **New value** column.
- ✧ To confirm, click **OK** in the dialog which opens.

  The switching device objects are upgraded and the new value is applied.

  The result is output as a report.

6.6 Creating User-Defined Tasks

You can create your own, **user-defined tasks** in addition to the predefined tasks.

The following 3 types of tasks are possible:

- **Parameterizing graphic objects**
  This task defines the properties and events of a group of graphic objects.
- **Replacing graphic objects**
  This task replaces the graphic objects in a diagram (picture) with new graphic objects. The values of the properties and events are copied in accordance with the definition.
- **Editing elements of a graphic object**
  In your diagram, you can edit the elements of a **check box**, **radio box**, **list box** or **combo box** in order to customize them according to your requirements. In the past, this task was performed in the **Object Properties**, attribute **Index** dialog. In the meantime, it could be further simplified with the new function.

The following paragraphs describe how to **create user-defined tasks**. A specific task is created for each possible task type.

The examples illustrate the creation of predefined tasks. To create customized tasks, proceed as illustrated below.

6.6.1 Upgrade V5.1 Measured Value Objects

This paragraph describes the creation and subsequent execution of the **Upgrade V5.1 measured value objects** task.

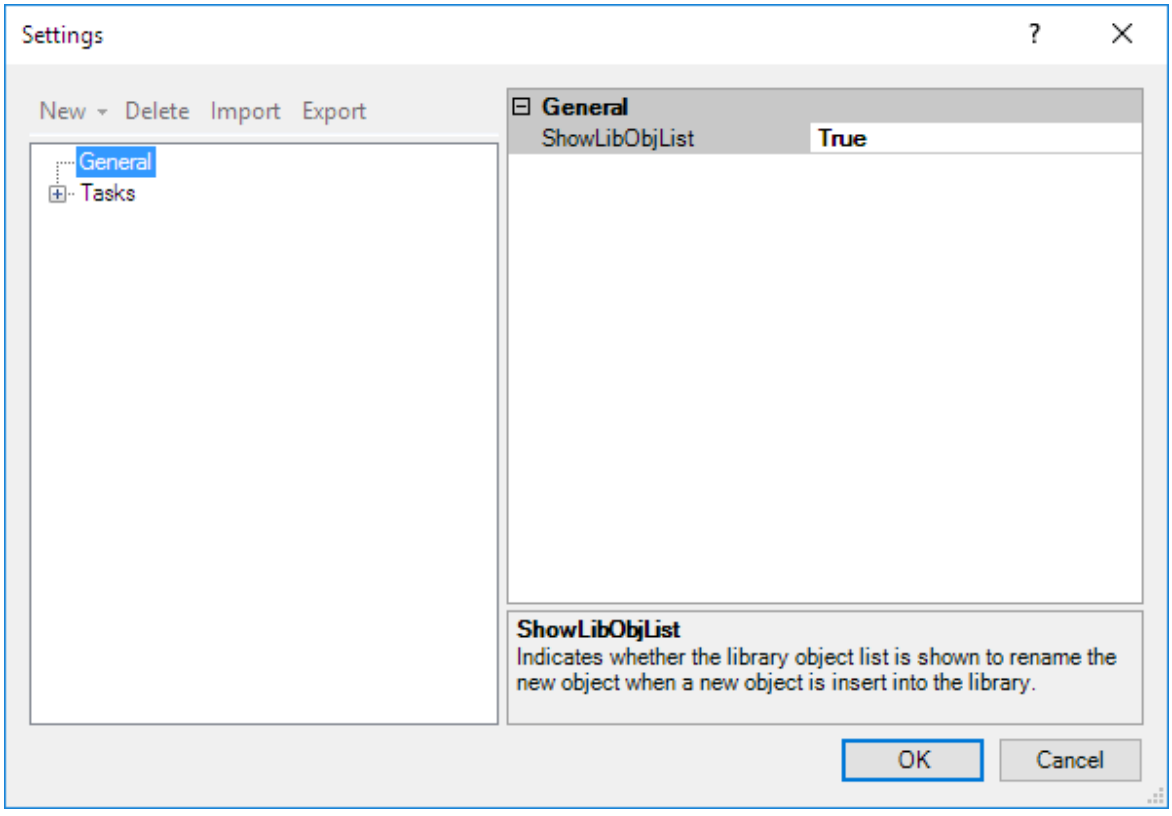
The following steps must be performed:

- Creating a task
- Configuring a task
- Executing a task

Creating a task

To create a task:

✧ In the **Graphics Designer**, select **SICAM > Settings**.
The **Settings** dialog opens.



[add-in501, 1, en_US]

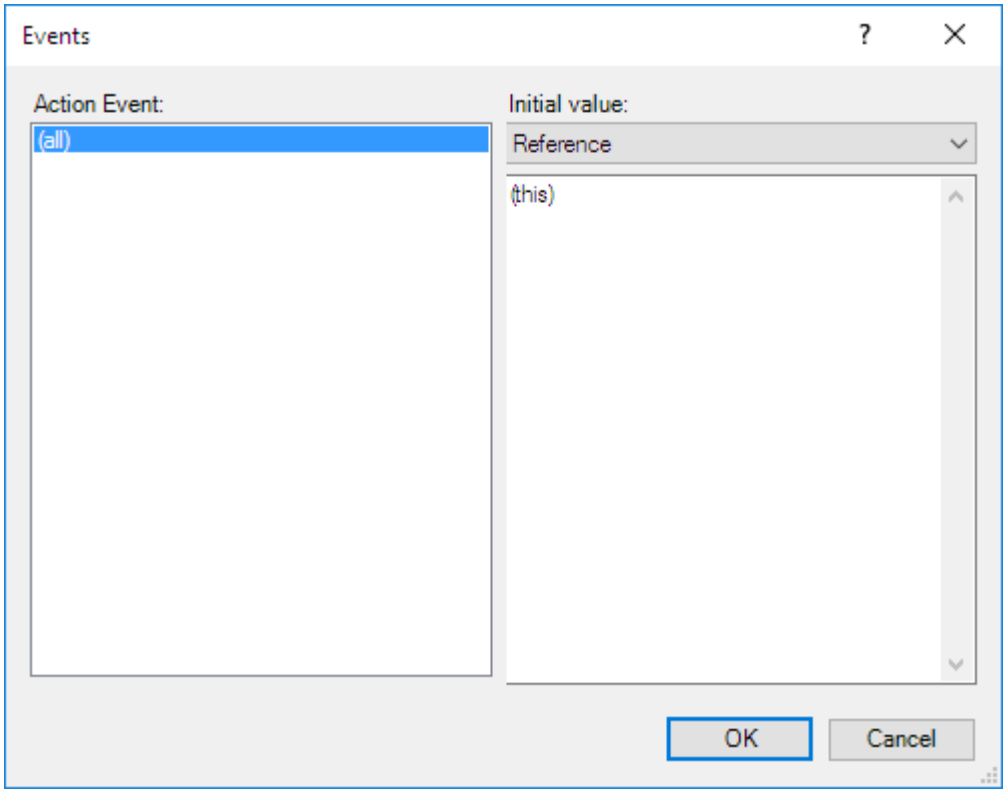
Figure 6-5 Settings dialog, creating a task

- ✧ Select **Tasks** in the tree structure.
- ✧ Click **New** and then select the **Replacement of graphic objects** task type.
  The task is created and displayed in the tree structure.

Configuring a task

You can now configure the task, i.e. define the actions performed by the task.

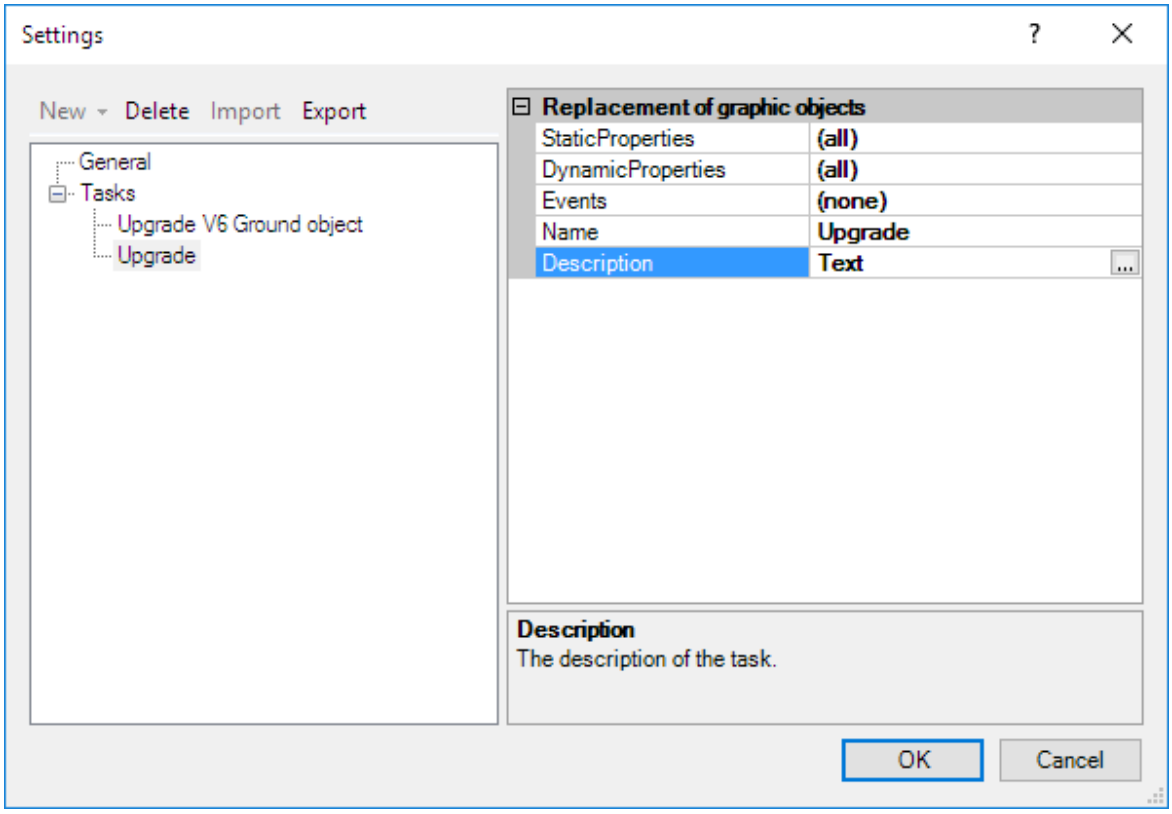
- ✧ Under **StaticProperties** and **DynamicProperties**, keep the (all) entry.
  All values of the static and dynamic properties with the same property name are transferred during the upgrade of the V5.1 graphic objects to the new graphic objects and will be retained.
- ✧ In the **Events** row, click **(all)** and then click the button with the dots.
  The **Events** dialog opens.



[add-in502, 1, en_US]

Figure 6-6 Events dialog

- ✧ Under **Action event**, right-click **(all)** and select **Delete**.
  This removes the (all) entry. During the upgrade, the scripts of the V5.1 graphic objects will be replaced by new scripts.
- ✧ Right-click the empty field under **Action event** and select **Apply**.
  The delete process is executed.
- ✧ Click **OK** to close the dialog.
- ✧ Under **Name**, enter U**pgrade V5.1 measured value objects** for the task.
- ✧ Under Description, enter a brief explanation of the task with notes on the workflow.



[add-in503, 1, en_US]

Figure 6-7 Settings dialog, newly created task

✧ Click **OK** to close the dialog.
The task has been created and is displayed in Graphics Designer, **Execute task** dialog, **User-defined tasks** tab.

Executing a task

Proceed as follows to execute a task:

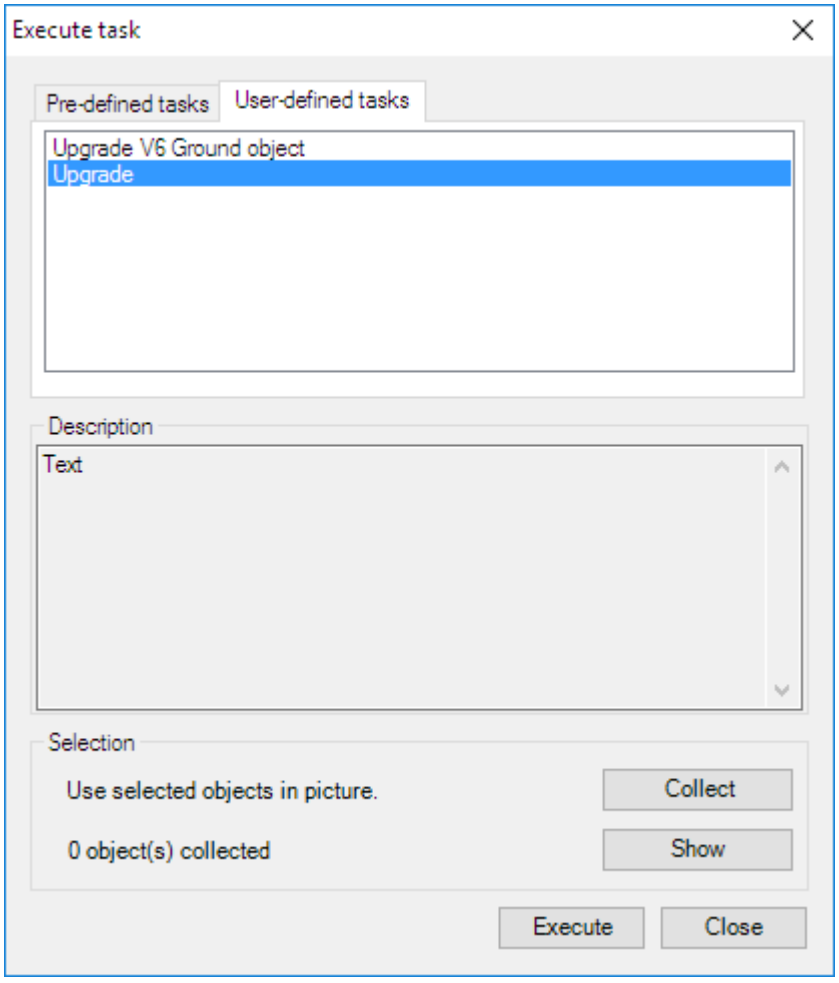
✧ In the **Graphics Designer**, open the diagram (picture) to be edited.

✧ Insert a measured value object of the new version into the diagram.

✧ In the Graphics Designer, click **SICAM > Show task dialog** to open the **Execute task** dialog.

✧ Select the User-defined tasks tab.

✧ Select the Upgrade V5.1 measured value objects task.



[add-in504, 1, en_US]

Figure 6-8 Graphics Designer, executing the task

- ✧ In the display, select the measured value objects for which you want to perform an upgrade.
- ✧ Click **Collect**.
  The highlighted measured value objects are now available for selection.
- ✧ Select the measured value object of the new version.
- ✧ Click **Execute**.
  The measured value objects are upgraded. The result is output as a report.

6.6.2 Upgrade of V5.10 Controls

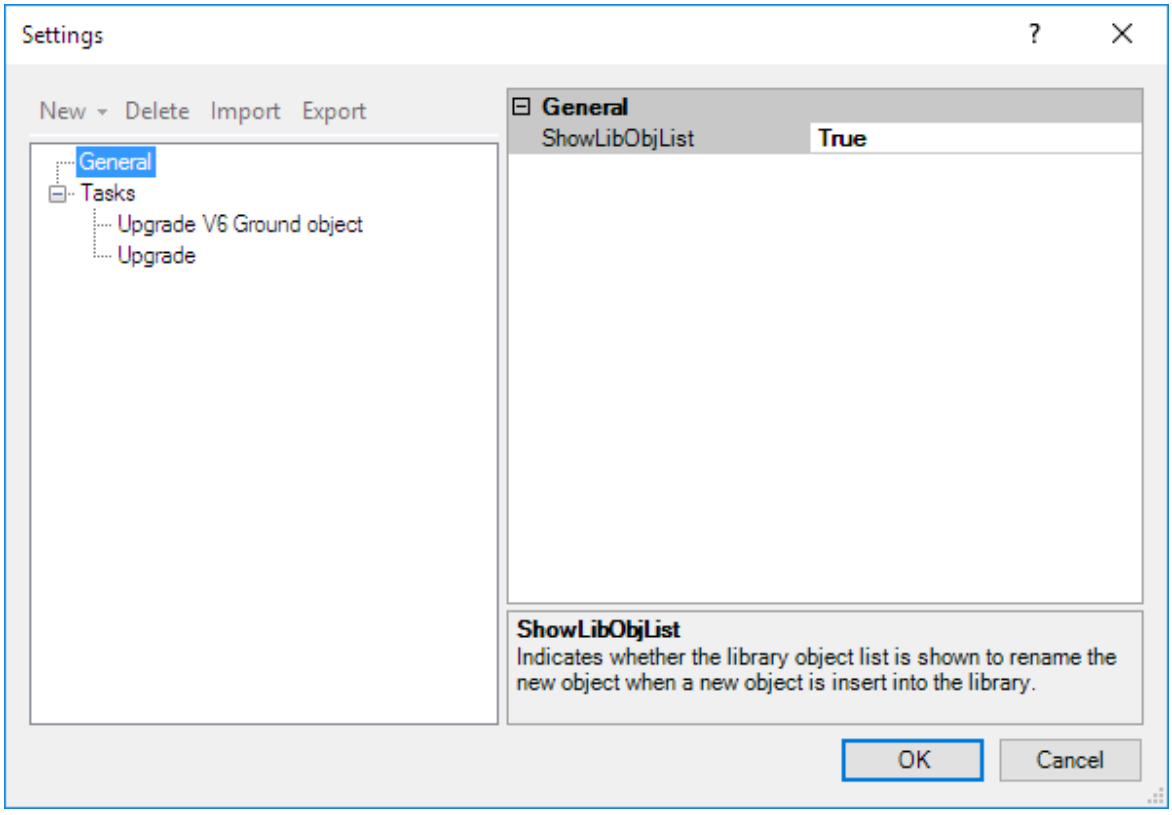
This paragraph describes the creation and subsequent execution of the Upgrade V5.10 Controls task.
The following steps must be performed:

- Creating a task
- Configuring a task
- Executing a task

Creating a task

To create a task:

✧ In the **Graphics Designer**, select **SICAM Settings**.
The **Settings** dialog opens.



[add-in505, 1, en_US]
Figure 6-9 Settings dialog, creating a task

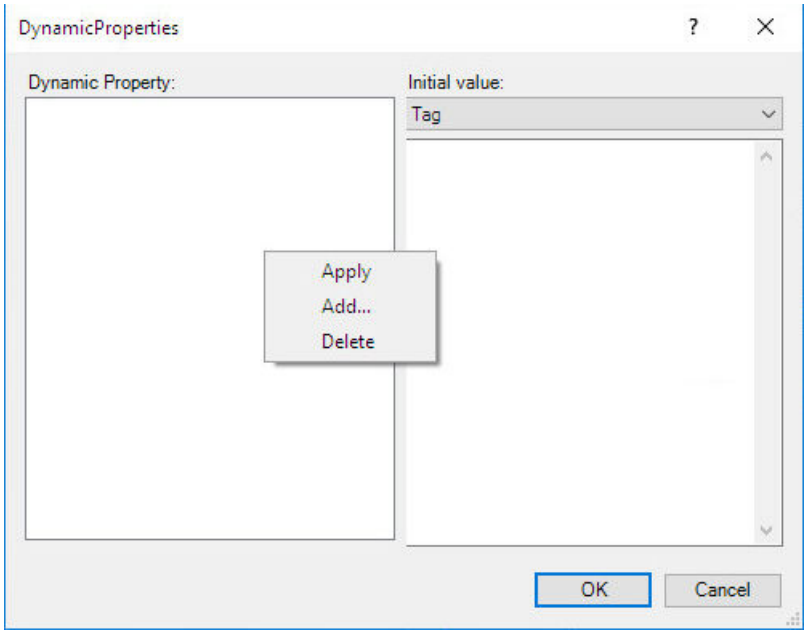
✧ Select **Tasks** in the tree structure.

✧ Click **New** and then select the **Parameterization of graphic objects** task type.
The task is created and displayed in the tree structure.

Configuring a task

You can now configure the task. i.e. define the actions performed by the task.

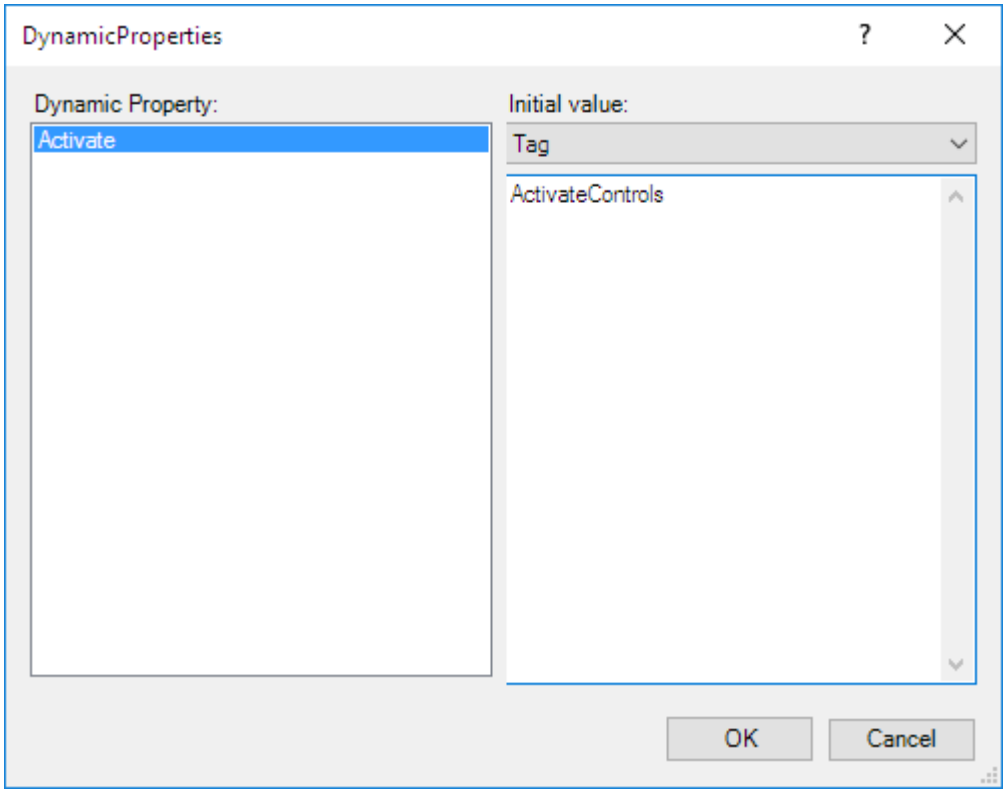
✧ Click **DynamicProperties** and then click the button with the dots.
The **DynamicProperties** dialog opens.



[add-in506, 1, en_US]

Figure 6-10 DynamicProperties dialog

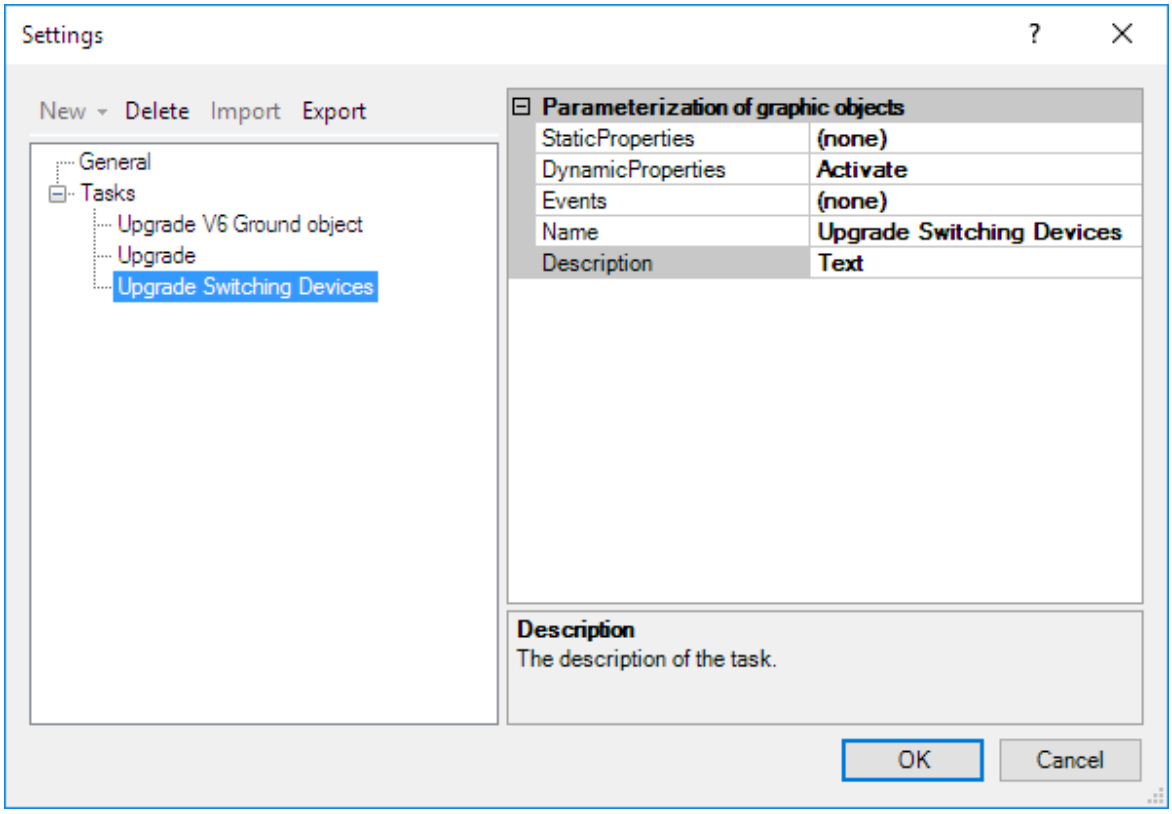
- ✧ Right-click the empty field under **Dynamic property** and select **Add**.
  The **Add** dialog opens.
- ✧ From the list in this dialog, select the name of the property you want to edit (here: Activate) and then click **OK** to close the dialog.
  If the desired property is not included in the list, you can enter the name.
- ✧ Under **Initial value**, select the **Tag** entry.
- ✧ Enter the **ActivateControls** initial value.



[add-in507, 1, en_US]

Figure 6-11 DynamicProperties dialog

- ✧ Right-click the field under **Dynamic property** and select **Apply**.
  The initial value is applied.
- ✧ Click **OK** to close the dialog.
- ✧ Under **Name**, enter **Upgrade V5.10 controls** for the task.
- ✧ Under **Description**, enter a meaningful text.



[add-in508, 1, en_US]

Figure 6-12 Settings dialog, newly created task

✧ Click **OK** to close the dialog.
The task has been created and is displayed in Graphics Designer, **Execute task** dialog, **User-defined tasks** tab.

Executing a task

Proceed as follows to execute a task:

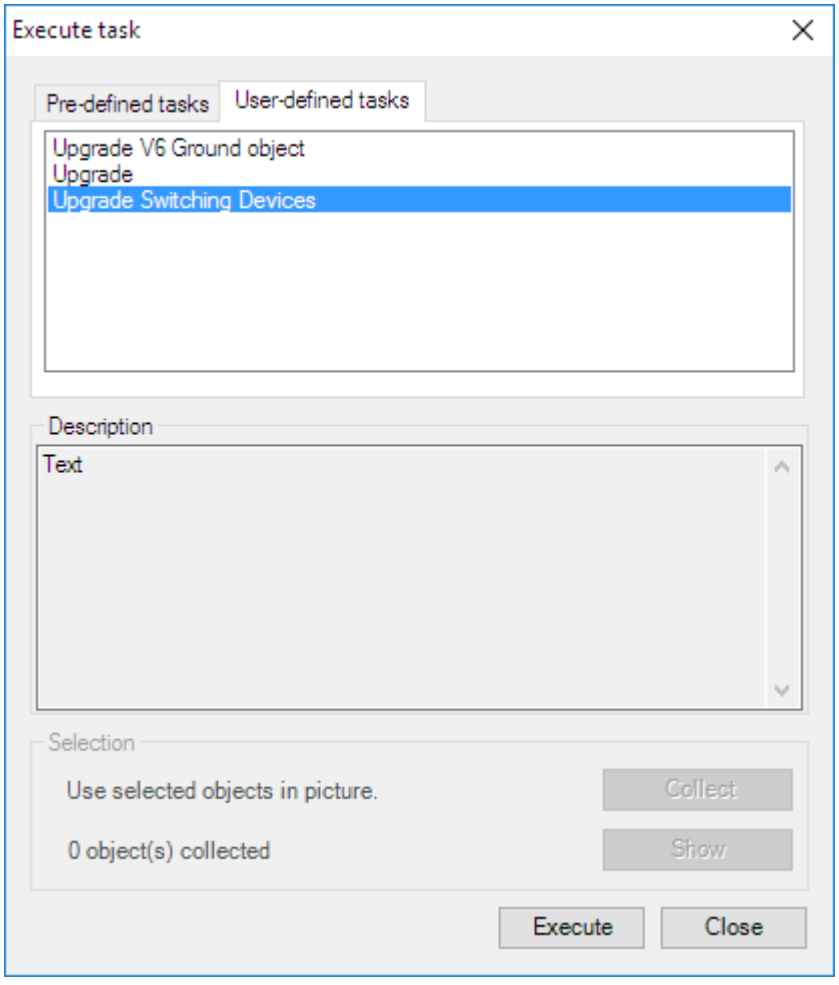
✧ In the **Graphics Designer**, open the diagram (picture) to be edited.

✧ In the Graphics Designer, click **SICAM > Show task dialog** to open the **Execute task** dialog.

✧ Select the **User-defined tasks** tab.

✧ Select the **Upgrade V5.1 controls** task.

✧ In the display, select the switching device objects for which you want to perform an upgrade.

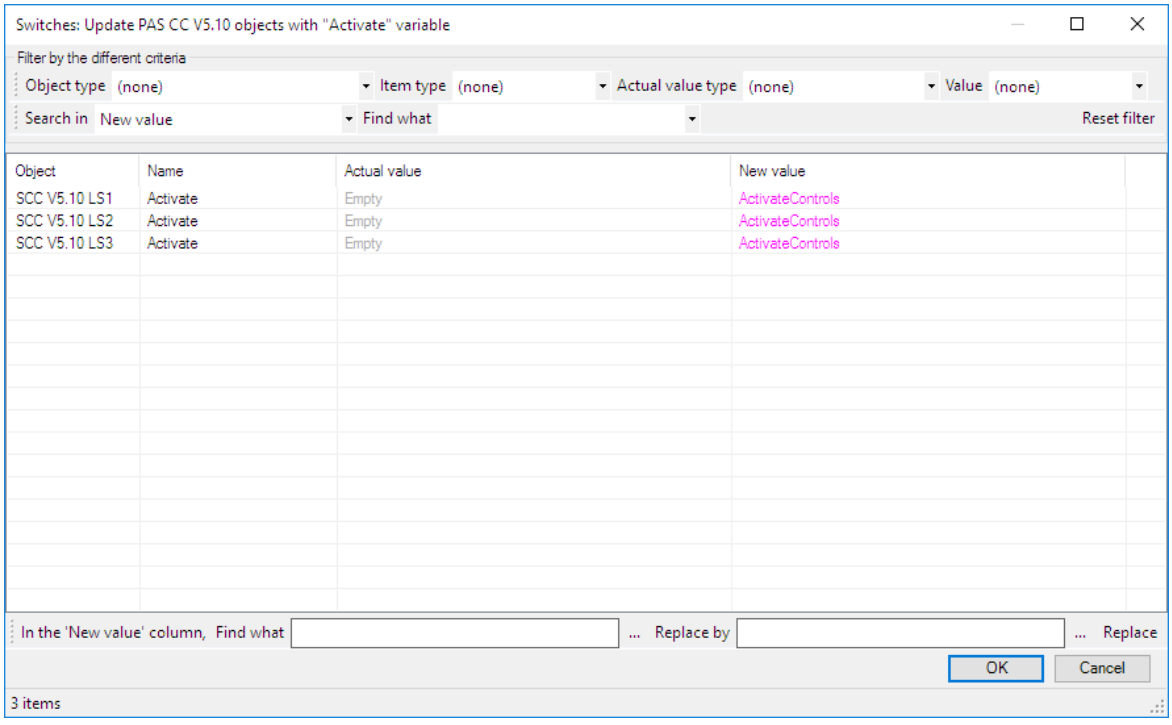


[add-in509, 1, en_US]

Figure 6-13 Graphics Designer, executing the task

✧ Click **Execute**.

The **Upgrade V5.10 controls** dialog opens. The **ActivateControls** value is entered in the **New value** column.



[add-in510, 1, en_US]

Figure 6-14 Upgrade V5.10 switching device objects (controls)

✧ Click **OK** to close the dialog.
The upgrade of the switching device objects (controls) is performed. The result is output as a report.

6.6.3 Edit Items of a Listbox or Combobox

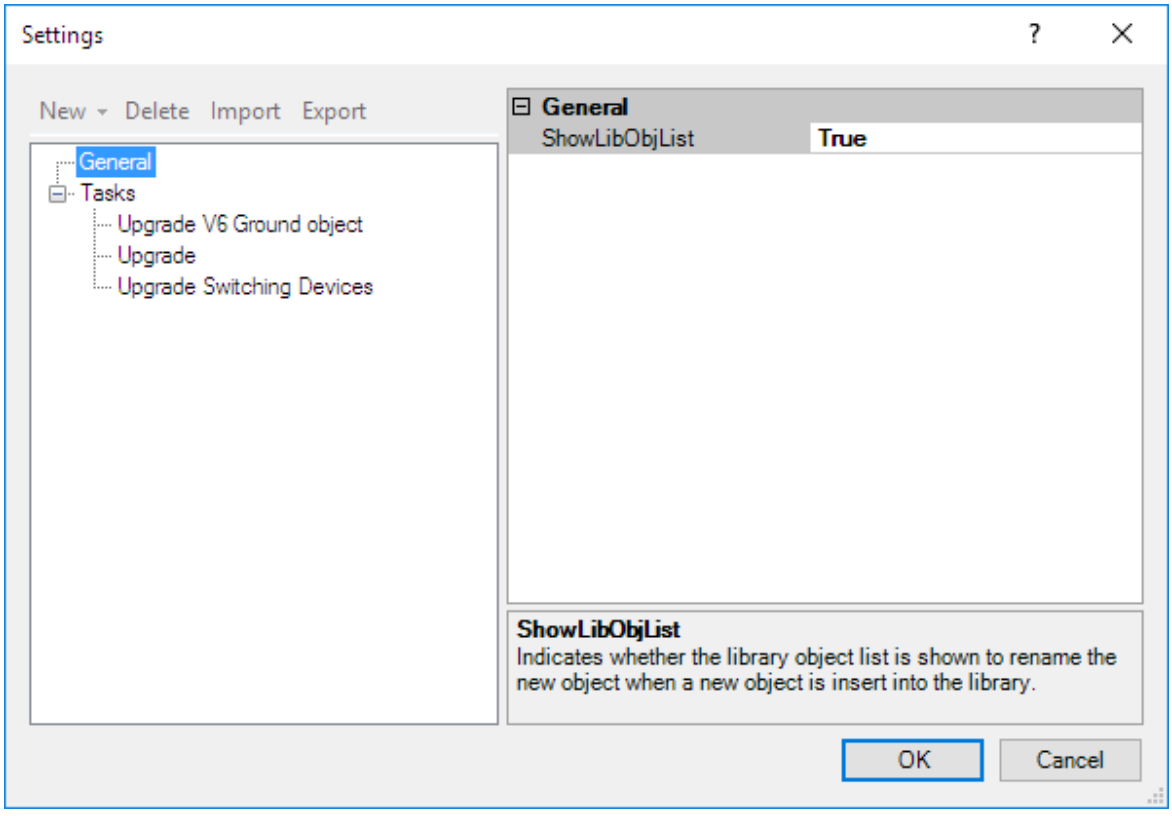
This paragraph describes the creation and subsequent execution of the **Edit items of a Listbox or Combobox** task.
The following steps must be performed:

- Creating a task
- Configuring a task
- Executing a task

Creating a task

To create a task:

✧ In the **Graphics Designer**, select **SICAM Settings**.
The **Settings** dialog opens.



[add-in511, 1, en_US]

Figure 6-15 Settings dialog, creating a task

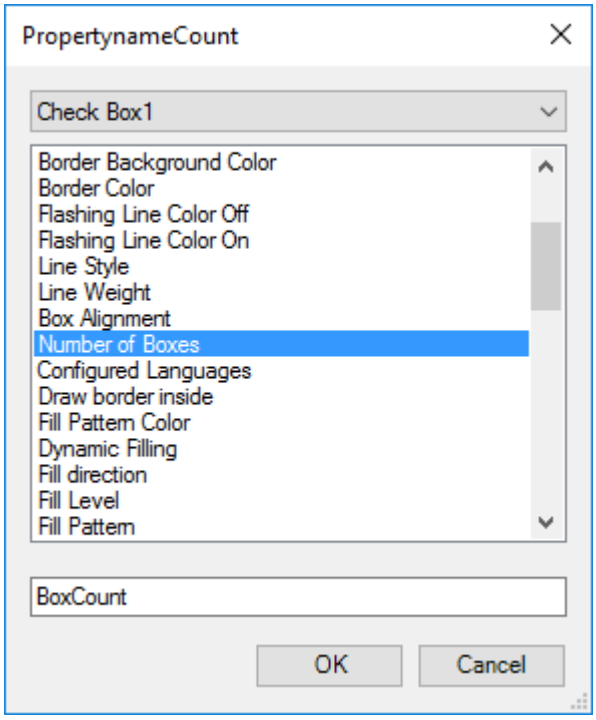
✧ Select **Tasks** in the tree structure.

✧ Click **New** and then select the **Edit items of a Listbox or Combobox** task type.
The task is created and displayed in the tree structure.

Configuring a task

You can now configure the task. i.e. define the actions performed by the task.

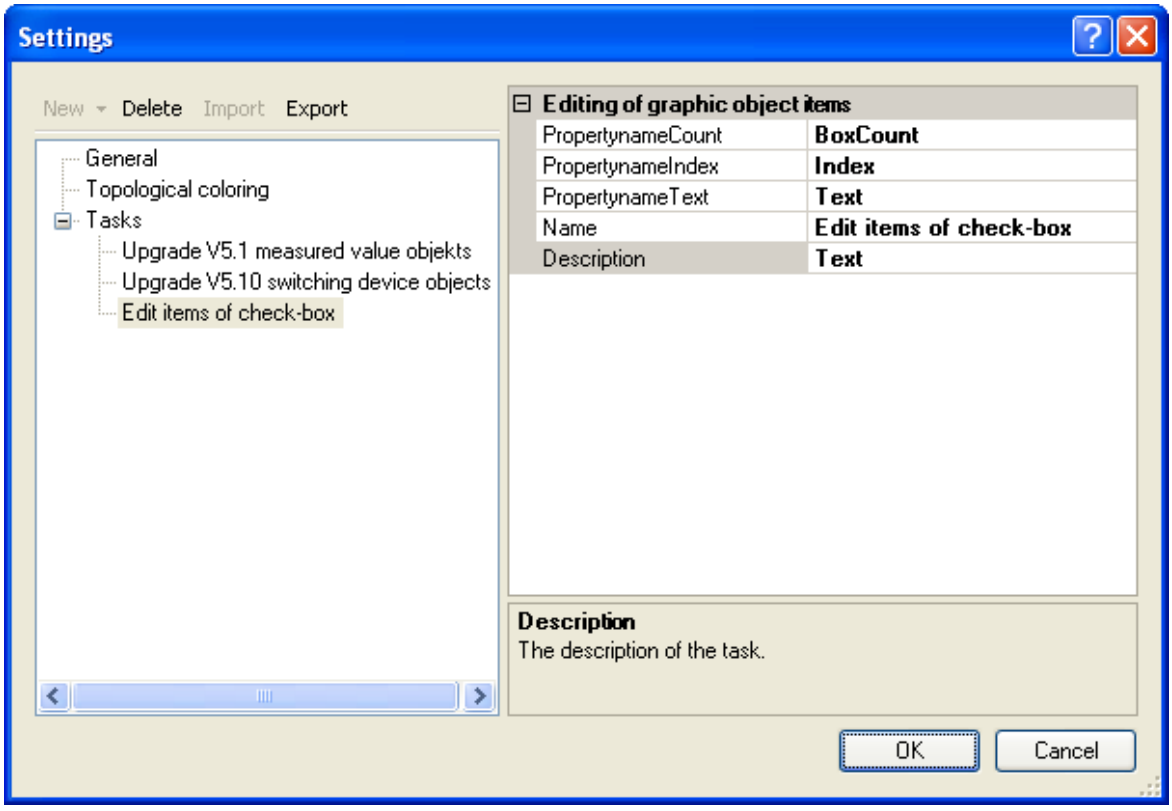
✧ Click **PropertynameCount** and then on the button with the dots.
The **PropertynameCount** dialog opens.



[add-in512, 1, en_US]

Figure 6-16 PropertynameCount dialog

- ✧ Select **CheckBox1**.
  The attributes of a check box are listed in the window in the center.
- ✧ Select the name of the property (e.g. **Number of boxes**) in order to assign the property (e.g. **BoxCount**).
- ✧ Click **OK** to close the dialog.
- ✧ Leave the entries under **PropertynameIndex** and **PropertynameText** unchanged.
- ✧ Under **Name**, enter **Edit items of check box** for the task.
- ✧ Under **Description**, enter a meaningful text.



[add-in513, 1, en_US]

Figure 6-17 Settings dialog, newly created task

✧ Click **OK** to close the dialog.
The task has been created and is displayed in Graphics Designer, **Execute task** dialog, **User-defined tasks** tab.

Executing a task

Proceed as follows to execute a task:

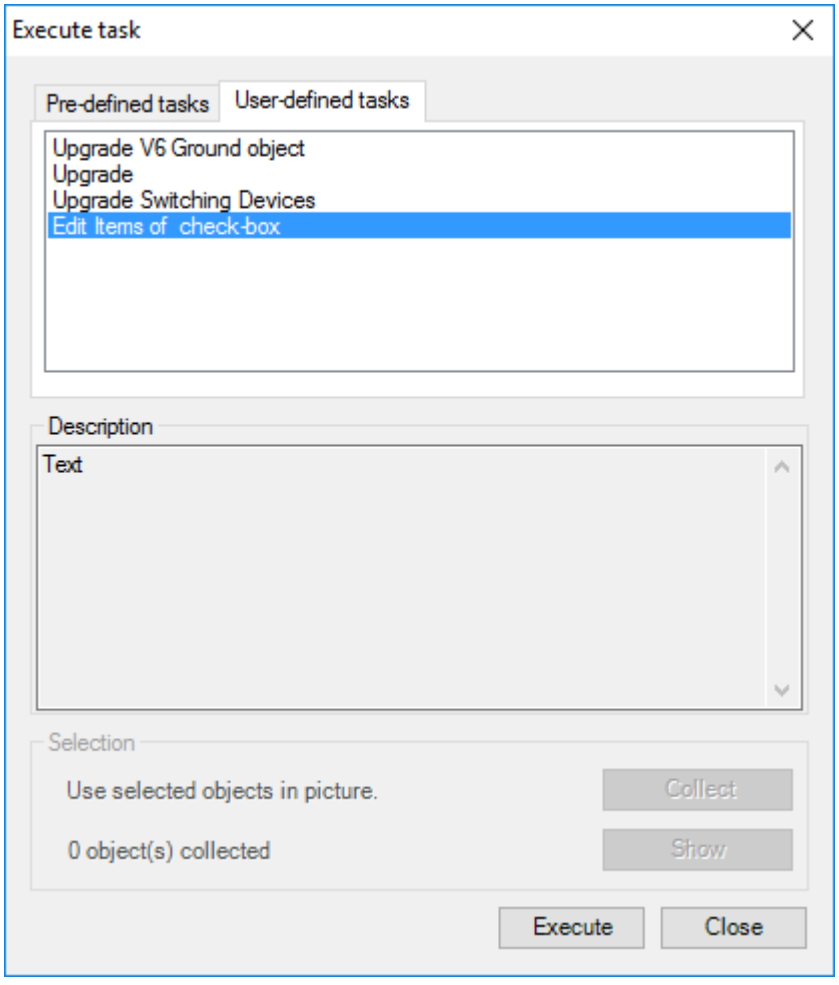
✧ In the **Graphics Designer**, open the diagram (picture) to be edited.

✧ In the Graphics Designer, click **SICAM > Show task dialog** to open the **Execute task** dialog.

✧ Select the **User-defined tasks** tab.

✧ Select the **Edit items of a Listbox or Combobox** task.

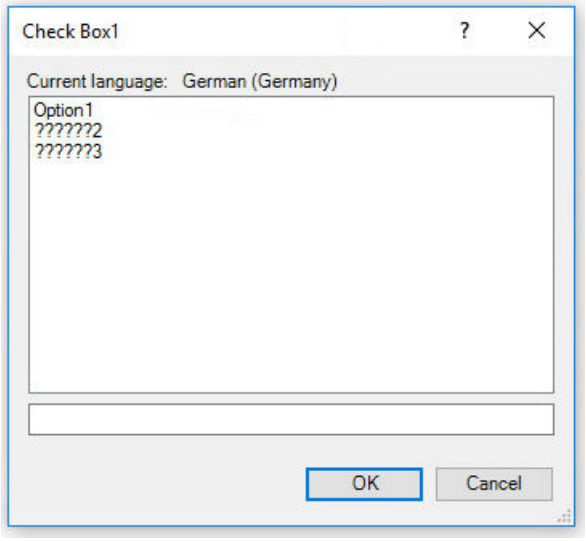
✧ In the display, select the check box which you want to edit.



[add-in514, 1, en_US]

Figure 6-18 Graphics Designer, executing the task

✧ Click **Execute**.
The **CheckBox1** dialog opens.



[add-in515, 1, en_US]

Figure 6-19 CheckBox1 dialog

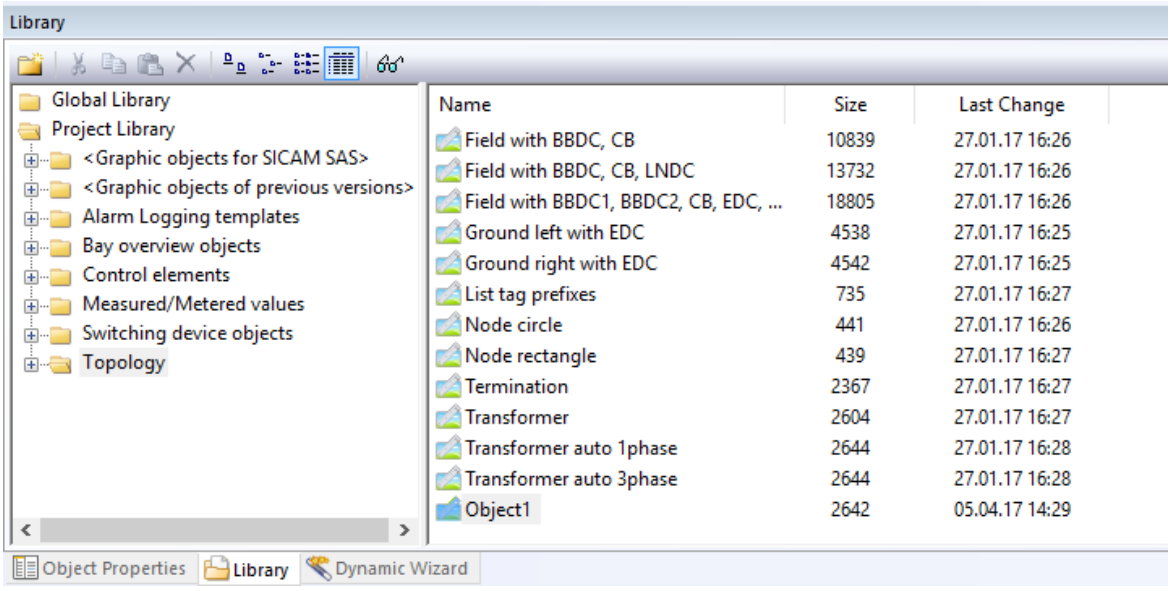
- ✧ Modify the texts of the existing options.
- ✧ To add an option, right-click the box and click **Add**.
- ✧ Click **OK** to close the dialog.
  The check box with the new texts and the additional option is displayed.

6.7 Replacing a Graphic Object in the Library

The replacement of existing objects by objects of a new version or by corrected objects can be performed automatically. When replacing the objects, the existing tag connection will be applied, which significantly reduces the configuration and testing expenditure.

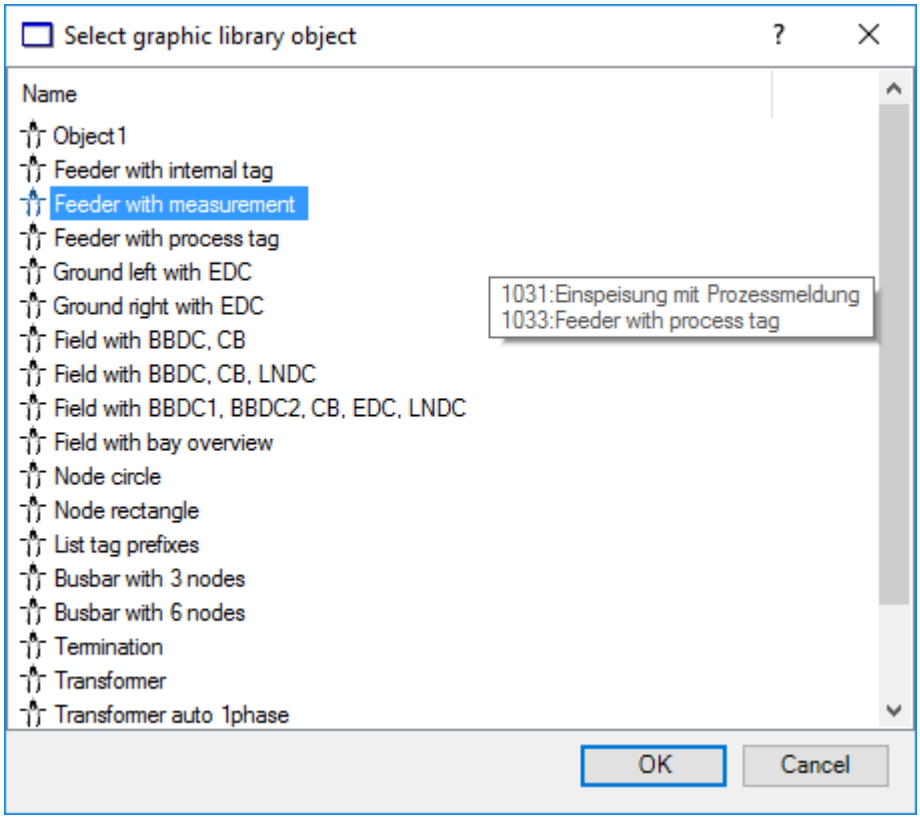
To replace a graphic object:

- ✧ In the Graphics Designer, select **SICAM > Settings**.
  The **Settings** dialog opens.
- ✧ Select **General** in the tree structure.
- ✧ Set **ShowLibObList** to **True**.
  The **ShowLibObjList** setting enables you to define how a modified graphic object is inserted in the **Graphic Library Explorer**, see chapter *6.4.1 General Information*.
- ✧ Click **OK** to close the dialog.
- ✧ Insert the graphic object to be modified, e.g. a **feeder**, into a diagram.
- ✧ Modify the object properties, e.g. the feeder width.
- ✧ Drag the modified graphic object from the diagram into the **graphic object library**.
  The graphic object is inserted temporarily, e.g. as **Object2**, and the **Graphic Library Explorer** opens.



[sc_lib_replace1, 1, en_US]

Figure 6-20 Modified graphic object, temporarily inserted

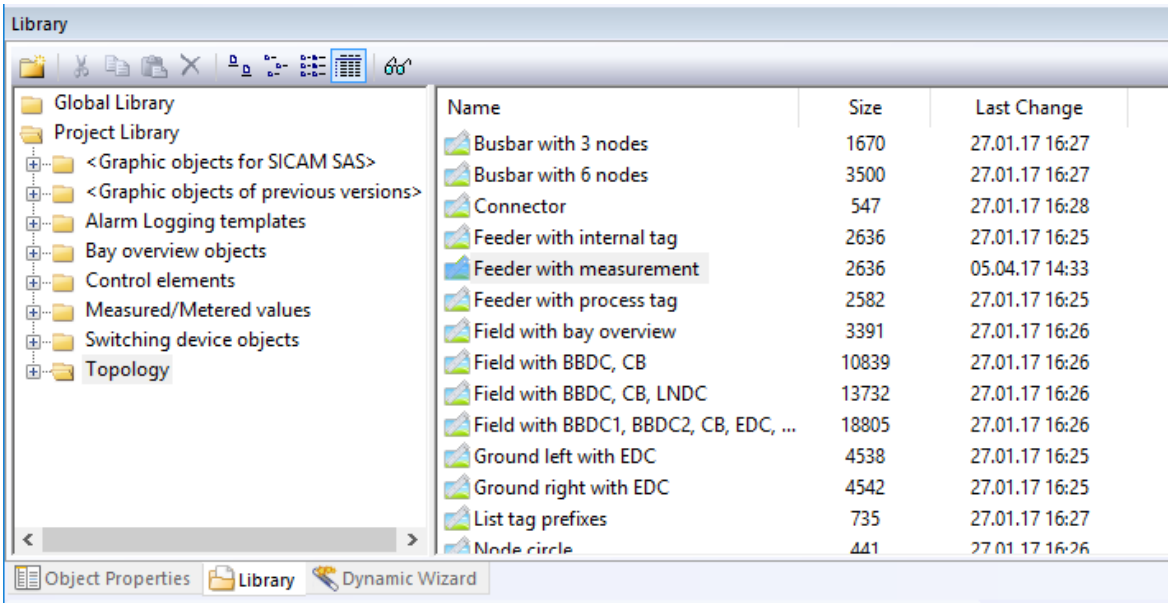


[sc_lib_replace2, 1, en_US]

Figure 6-21 Graphic Library Explorer with the list of graphic objects

The **Graphic Library Explorer** displays a list of all graphic objects which are stored in the current directory and can be replaced.

- ✧ Select the graphic object which you want to replace.
- ✧ Click **OK** to confirm.
- ✧ In the dialog which opens, click **Yes**.
  The existing graphic object is replaced by the modified graphic object in the **SICAM graphic object library**.



[sc_lib_replace3, 1, en_US]

Figure 6-22 Graphic object replaced

NOTE

This procedure does not change graphic objects in existing diagrams. Newly inserted graphic objects have the new properties.

7 Components and Functions

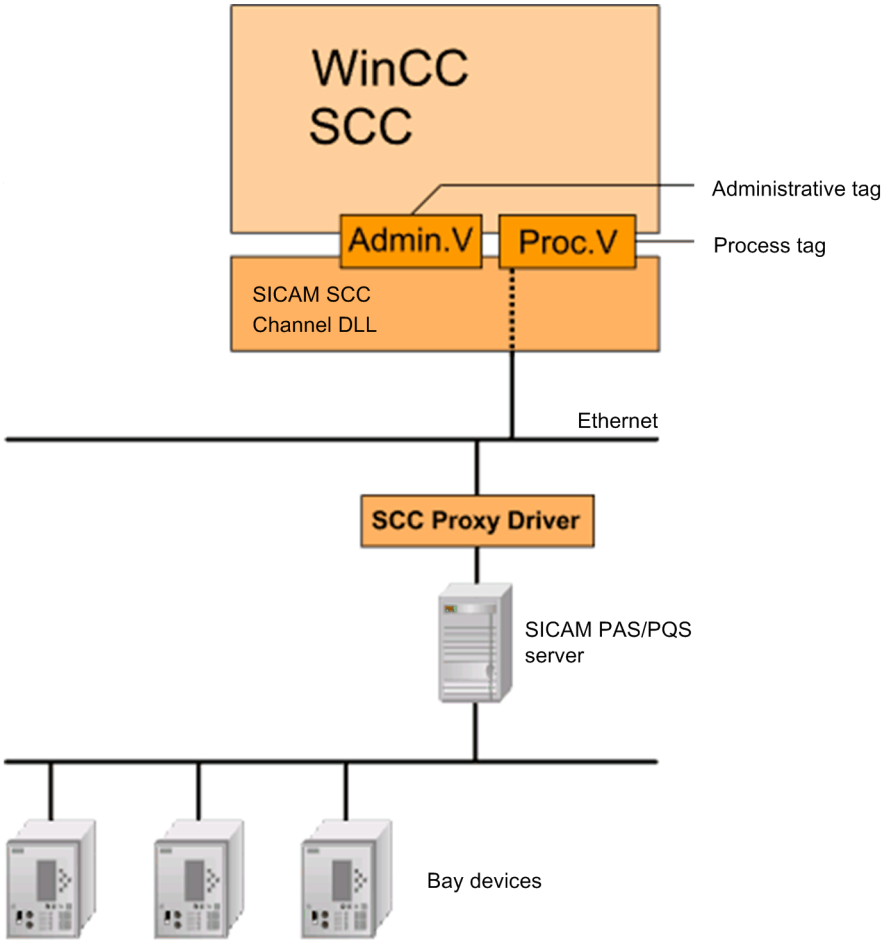
7.1	System Overview	234
7.2	Data Import	239
7.3	SICAM Communication Connection - Tag Management	254
7.4	Alarm Logging	259
7.5	Dynamic Alarm Filter (DAF)	269
7.6	SICAM Functions	281
7.7	System Control	298
7.8	SICAM SCC Runtime Data Server	311
7.9	Language Settings	312
7.10	Communication with SICAM DISTO	316
7.11	SNMP – SICAM Network Manager (NWM)	318

7.1 System Overview

This section provides you with detailed information on the connections to the supported target systems:

- SICAM PAS/PQS, see chapter *7.1.1 Connection to SICAM PAS/PQS*
- SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices, see chapter *7.1.2 Connection to SICAM RTUs or IEC 61850/IEC 60870-5-104*
- SICAM SAS, see manual */10/ SICAM SCC for SICAM SAS*

7.1.1 Connection to SICAM PAS/PQS



[System_SCC_1, 1, en_US]

Figure 7-1 SICAM SCC with SICAM PAS/PQS server and bay devices

SICAM SCC is connected to SICAM PAS/PQS using a **SICAM SCC Proxy driver** integrated in SICAM PAS/PQS. This driver communicates with the SICAM PAS/PQS channel and enables the setup and connection of redundant SICAM PAS/PQS or SICAM SCC systems.

The internal control is performed via **administrative tags** created in the corresponding channel connection in a **SICAM_Admin** tag group in the WinCC Tag Management.

The process tags are created in the Tag Management according to their names in SICAM PAS/PQS. These tags are created as data structures (structured tags) in order to enable the transmission of the value together with additional information such as the status or cause.

The process data can be mapped into both the Tag Management and the Alarm Logging systems. When using the Tag Management, the maximum number of licensed tags for SIMATIC WinCC must be taken into account.

For SICAM SCC, one item of SICAM information, i.e. one structured tag, is counted as a WinCC tag. This restriction does notapply to the information for the Alarm Logging system.

If several stations are imported into a SIMATIC WinCC project, the project ID of the imported stations must be unique because this ID becomes part of the message numbers and enables the distinction of the individual stations, see the note in chapter *Table 7-14* following table 6-7.

Process data can also be mapped into the Tag Logging system. The maximum number of licensed data points must also be observed for the Tag Logging system.A special license is available for this.

Message buffer

The **SICAM SCC Proxy driver** integrated in SICAM PAS/PQS includes a **message buffer** for the storage of messages which occur in case of a communication fault ora short-time shutdown of SICAM SCC. As soon as the communication between SICAM SCC and SICAM PAS/PQS has been restored, these buffered messages are forwarded to the WinCC Alarm Logging system in order to prevent gaps in the message archives.

The messages are buffered from the start of the SICAM SCC driver in the SICAM PAS/PQS system. All status changes which occur after the start of the SICAM PAS/PQS system and which are mapped to SICAM SCC are logged in the SICAM SCC message list.

The message buffer size can be defined in **SICAM PAS/PQS UI - Configuration**. If the message buffer is set to 0, it is deactivated. A message buffer overflow is indicated by means of a system message in SICAM PAS/PQS. This system message can also be mapped to SICAM SCC and logged in the message lists.

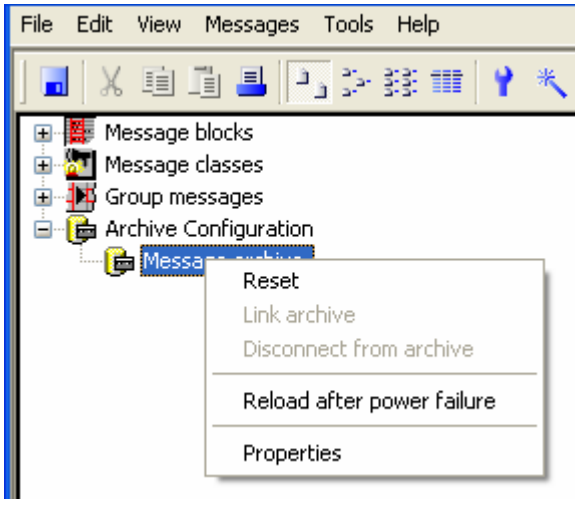
NOTE

If a redundant SICAM PAS/PQS system is connected to SICAM SCC and a SICAM PAS/PQS system cannot be contacted, the entry of messages in the message lists can be delayed after an interruption of the connection or after the start of the SICAM SCC system.

Resetting the message archive

To reset the message archive:

- In the **Alarm Logging** window, right-click **Message archive** and select **Reset** from the context menu.
  The message archive and the message lists are emptied.



[Reset_Meldearchiv, 1, en_US]

Figure 7-2 Resetting the message archive

Saving the current status

To ensure the consistency of the message lists - thus to prevent missing messages or double entries even after a restart of SICAM SCC - the last messages are saved persistently in a file. In order to enable a comparison of the messages arriving from the message buffer with the current status of SICAM SCC, this data is read in upon

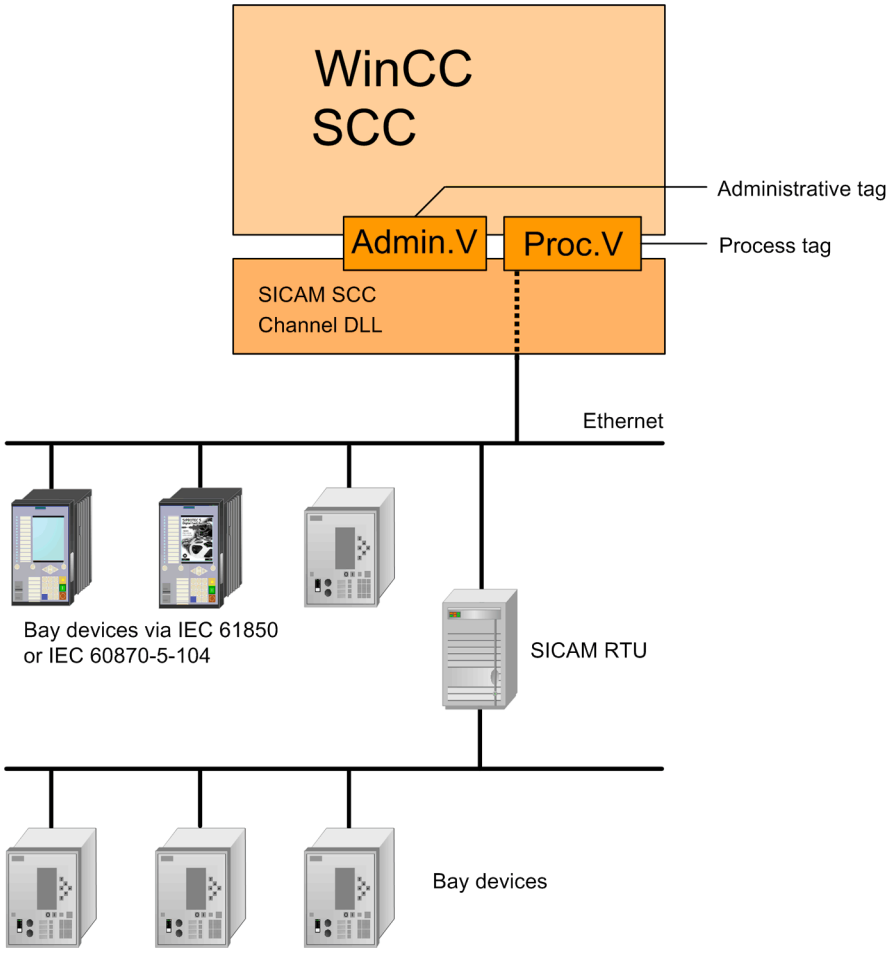
a restart of SICAM SCC. The **PersistantStorage.psf** file is stored in the corresponding station directory (...\Project directory\GWData\<Station name>).

Delete message lists: To ensure that all messages are displayed as usual in the message list upon the restart of SICAM SCC Runtime even after a reset of the message archive, the corresponding files of the stations included in the project must be deleted as well.

Adaptation of the configuration required

To prevent double entries in the message list, the message lists in the diagrams of existing projects (up to version 7.01) must be replaced by new ones from the SICAM graphic object library because the filter settings have been adapted to the message buffer.

7.1.2 Connection to SICAM RTUs or IEC 61850/IEC 60870-5-104



[System_SCC_2, 1, en_US]

Figure 7-3 SICAM SCC with SICAM RTUs and bay devices

SICAM SCC is connected to SICAM RTUs or bay devices via IEC 61850/IEC 60870-5-104 using the **SICAM IEC COMMUNICATION SUITE**. This also enables the setup and connection of redundant systems.

The internal control is performed via **administrative tags** created in the corresponding channel connection in a **SICAM_Admin** tag group in the WinCC Tag Management.

The process tags are created in the Tag Management with their names from SICAM PAS, the SICAM TOOLBOX II configuration or an SCD/CID/XML file. These tags are created as data structures (structured tags) in order to enable the transmission of the value together with additional information such as the status or cause.

The process data can be mapped into both the Tag Management and the Alarm Logging system. When using the Tag Management system, the maximum number of licensed tags for SIMATIC WinCC must be taken into

account. For SICAM SCC, one item of SICAM information, i.e. one structured tag, is counted as a WinCC variable. This restriction does not apply to the information for the Alarm Logging system.

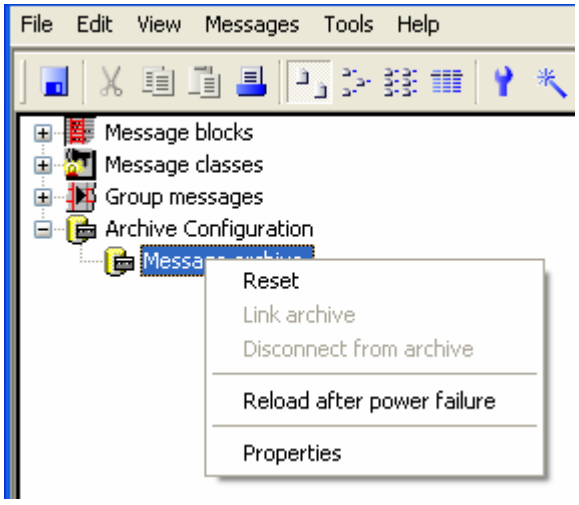
A project ID is assigned when creating a station with the SICAM IEC Wizard (import in the Wizard). The numbering of the different stations starts with 10. It remains unchanged in case of a further import using the Wizard.

Make sure that you use unique project IDs in case of mixed projects with SICAM PAS connections.

Resetting the message archive

To reset the message archive:

- In the **Alarm Logging** window, right-click **Message archive** and select **Reset** from the context menu.
  The message archive and the message lists are emptied.



[Reset_Meldearchiv, 1, en_US]

Figure 7-4 Resetting the message archive

Saving the current state for IEC 61850 devices

In order to also ensure consistency of the message lists without missing messages or double entries after a restart of SICAM SCC, the last messages are persistently saved in a file.

This data is read in upon a restart of SICAM SCC in order to ensure that the messages arriving from the message buffer can be compared to the current status of SICAM SCC.

The **BufReportData.bin** file is stored in the corresponding station directory (...\Project directory\GWData \<Station name>\ComConfig61850).

Adaptation of the configuration required

In order to prevent double entries in the message list, the message lists in the diagrams of existing projects (Version 7.01 or earlier) must be replaced by new ones from the SICAM graphic object library because the filter settings were adapted to the message buffer.

Initialization of the IEC tags upon the start of the runtime

For IEC 61850 and IEC 60870-5-104 drivers, any changed values and any changed status information of the tags during the runtime are stored in a status file (IEC 61850: DATA61850.BIN, IEC 60870-5-104: STATUS.BIN), provided that this has been defined for the corresponding tag ("Save value", "Save status").

When starting the runtime, the values and status information are read out of these files and used to initialize the tags as specified in the **Status mask** parameter. Afterwards, these tags are transmitted to the SCC. This ensures that the process image in the tag management corresponds to the process image in the driver and the GI is initiated with the correct data.

Via the **IniTimeout** parameter the Invalid identifier of the receive data points can be retained from the start of the runtime until the connection has been set up successfully. Alarm and event list entries can thus be

avoided. Once this timer has expired, the non-received data points are transmitted to the SCC via an Invalid replica.

7.2 Data Import

7.2.1 SICAM Wizard

Use the **SICAM PAS Wizard** for the connection of SICAM PAS/PQS stations. To connect SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices, you use the **SICAM IEC Wizard**.
This section describes the proceeding with the **SICAM PAS Wizard** as an example.

NOTE

Differences between the use of the two SICAM Wizards are described in chapter *3.2.4 Initializing a WinCC Project*.

NOTE

Approx. 20 000 information units of IEC 61850, IEC60870-5-104, and TOOLBOX II data can be imported into 1 station. If you want to route more information into the SICAM SCC project, distribute the data to several stations.

Initializing the project

The SICAM PAS Wizard supports you in initializing your WinCC project. It creates a new station in the project or updates an existing station. To do this, it performs the following tasks:

- Creating SICAM PAS/PQS-specific structure tags
- Importing tags from SICAM PAS/PQS
- Creating administrative tags for the SICAM PAS/PQS system
- Creating the SICAM PAS/PQS-specific alarm system
- Importing alarms/messages from SICAM PAS/PQS
- Importing the SICAM PAS/PQS graphic object library into the project
- Creating measured-value and metered-value archives for SICAM PAS/PQS process data
- Creating the SICAM PAS/PQS-specific text library
- Adding the communication driver

Creating structure tags

The structure tags are required for the data exchange with automation systems or devices. They include the complete structure of a structured tag in SICAM SCC.
The different tags are assigned individual structure tags (see *A.1 Structures*).

NOTE

Be aware of the following when upgrading the version of WinCC projects created with a predecessor version:
The structure types of existing projects are automatically changed to Version 9.00. Existing process tags are not changed.
To convert existing tags to the new structure types:

- Delete the process tags using the SICAM PAS Wizard.
- Import the process tags using the SICAM PAS Wizard.

Alternatively, you can adapt existing process tags before the first import using the SICAM SCC 9.00 Wizard as described in chapter *14.8.2 Editing Structure Types*.

Importing tags

The SICAM PAS Wizard imports the tags from a file provided by SICAM PAS/PQS. This file has the extension **PXD** (e. g. Station1.PXD).

The tags are automatically assigned to the corresponding structure type. Each tag includes several elements. Examples of elements for the monitoring direction:

- the current process value
- the status (e. g. not updated, invalid, overflow, etc.)
- the tag type
- the cause (e. g. spontaneous, periodic, polled, ...)
- the additional cause
- the counters which are counted upon a tag change

The name of the tag imported into SIMATIC WinCC corresponds to the name specified in SICAM PAS/PQS for the tag management of SICAM SCC. Special characters are already replaced by SICAM PAS/PQS UI – Configuration. Any remaining tags will be replaced by the SICAM PAS Wizard during the import process (see appendix *A.3 Character Conversion*).

Additionally, tags are structured in groups. The name of a group corresponds to the hierarchical name without considering the last hierarchical level.

Creating administrative tags

The SICAM PAS Wizard creates internal and external SICAM SCC tags. Internal tags are stored in a **SICAMAdmin** group. External tags are stored in a channel-specific **SICAMAdmin_xxx** group.

Creating an Alarm Logging system

The SICAM PAS Wizard allows you to create an alarm system under SICAM SCC that meets the requirements of a SICAM PAS/PQS system.

The alarm system consists of alarm message blocks, message classes, templates for alarm lists (Alarm Logging templates) and texts. The related SICAM-specific objects for

- the event list
- the alarm list
- the protection message list

can be viewed in the Graphics Designer under **View > Library > Project Library > Alarm Logging Templates > WinCC V7.x**.

Specific list templates are available for the connection to SICAM PAS/PQS and SICAM RTUs/IEC 61850/ IEC 60870-5-104.

Importing messages

The SICAM PAS Wizard imports messages from the PXD file.

The name of the message imported into SICAM SCC corresponds to the name configured in SICAM PAS/PQS UI – Configuration.

Additionally, each imported message has a unique number. The SICAM PAS normalization DLL is assigned, the value text group 0 is assigned, the specific properties are defined, and the message class SICAM PAS Event or SICAM PAS Event DM/WM/RM is assigned.

The message number is composed of the project ID * 10,000,000 and the value ID.

NOTE

Make sure that you use unique project IDs when importing several stations. You can configure the project ID in the SICAM PAS/PQS or SICAM TOOLBOX II project. Project IDs starting with 10 are assigned automatically during the SCD import, see note in chapter *Table 7-14*.

Importing the SICAM graphic object library

The SICAM PAS Wizard loads the SICAM graphic object library into the current project. When importing the SICAM graphic object library, administrative tags are created, and the SICAM functions (C scripts) are copied into the project.

Creating an archiving system

Process data from SICAM PAS/PQS can be archived in the archiving system.

The SICAM PAS/PQS archiving system comprises:

- a process value archive for measured values
- a process value archive for metered values

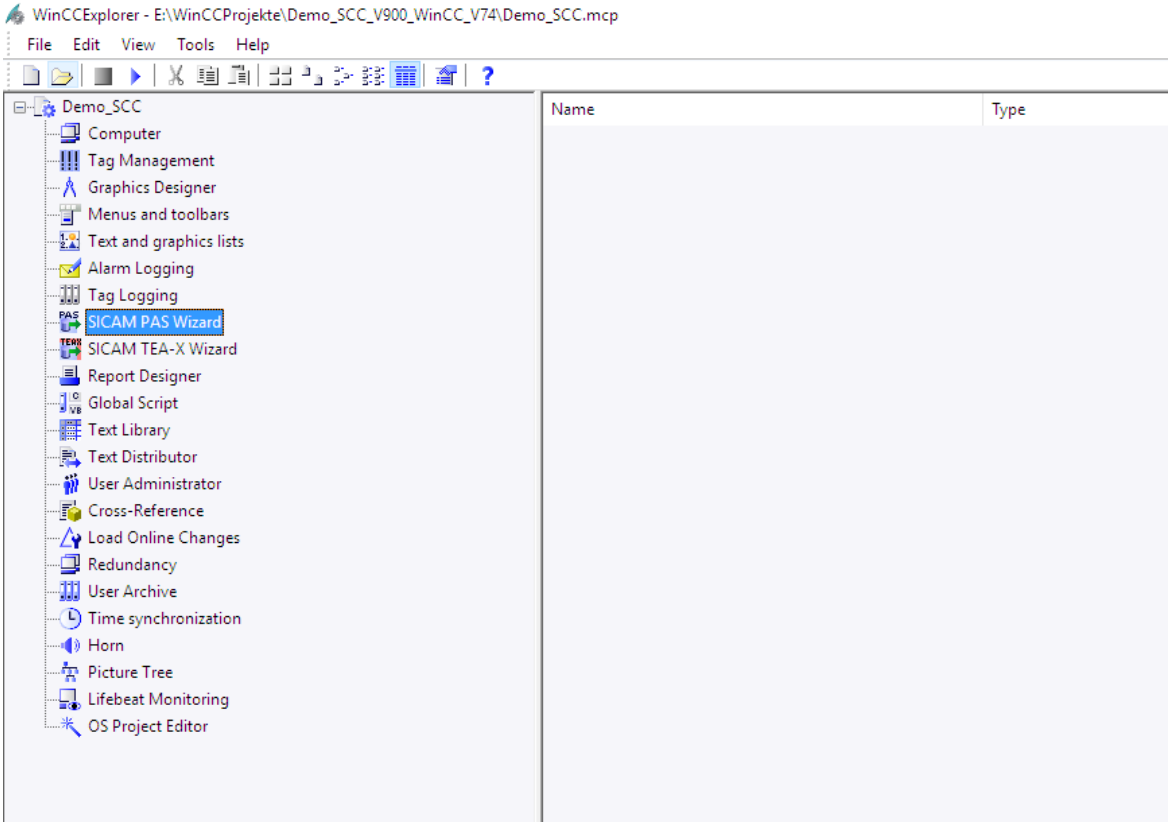
The archives are created as sequence archives on the hard disk of the PC on which SICAM SCC is installed. Their size is only limited by the capacity of the hard disk.

Starting the Wizard

Start the **SICAM PAS Wizard** in the WinCC Explorer.

To start the SICAM PAS Wizard:

✧ In the **WinCC Explorer**, double-click **SICAM PAS Wizard**.



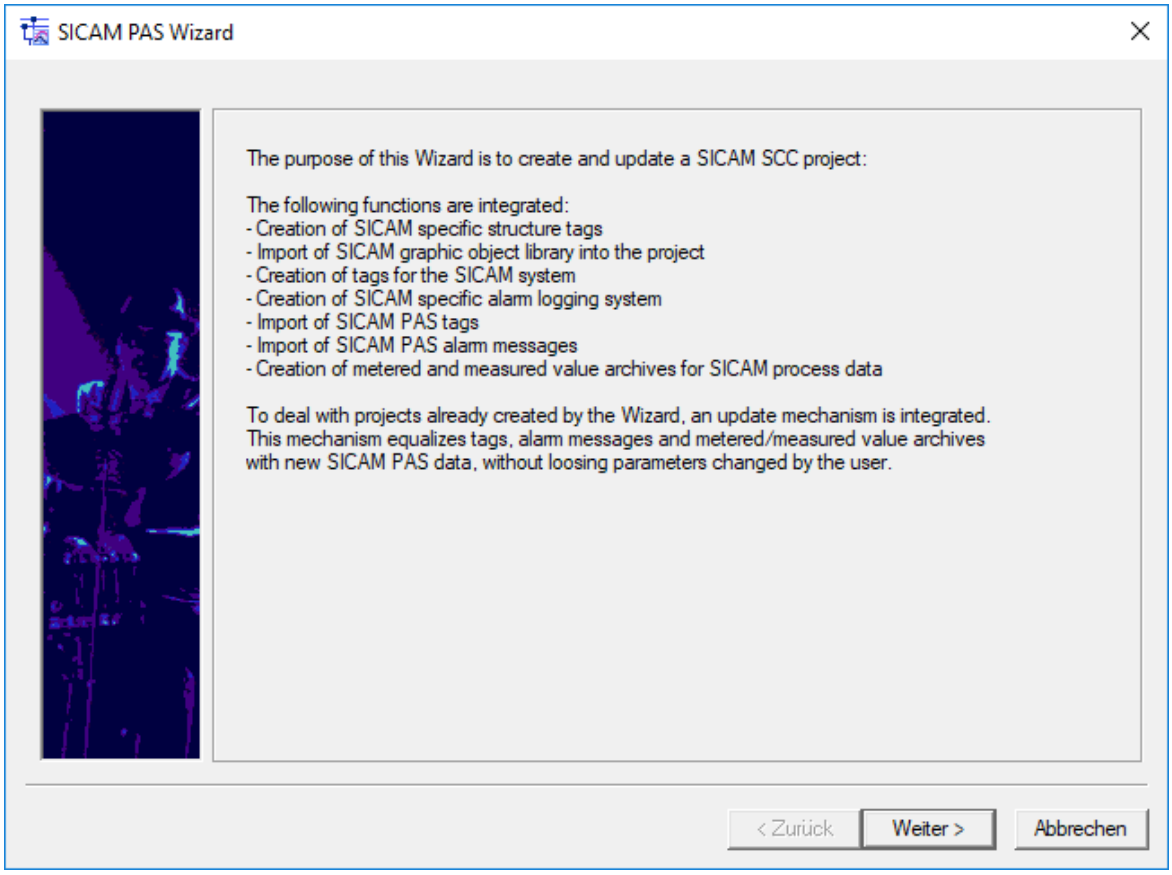
[pascc310, 1, en_US]

Figure 7-5 Calling up the SICAM PAS Wizard

NOTE

While the SICAM PAS Wizard is active, do not start any editors in SIMATIC WinCC. Otherwise, the connection of the wizard to a component will be aborted, and errors can occur during the import/update process.

The SICAM PAS Wizard starts.



[pascc311, 1, en_US]

Figure 7-6 Calling up the

SICAM PAS Wizard

✧ Click **Next** to continue.

Entering the station name

✧ To add a new station to the project, select **Create new station in project** under Select station.

✧ Enter a unique station name into the entry field (e. g. Station1). The station name is suggested as the name for the logic link in the SICAM PAS PROTOCOL SUITE.

NOTE

If you do not want to create a new station, but update an existing station, proceed as follows:

- Click Select existing station.
- Select a station from the list.

To perform an update, the import file must originate from the same SICAM PAS/PQS project.

Selecting parameters

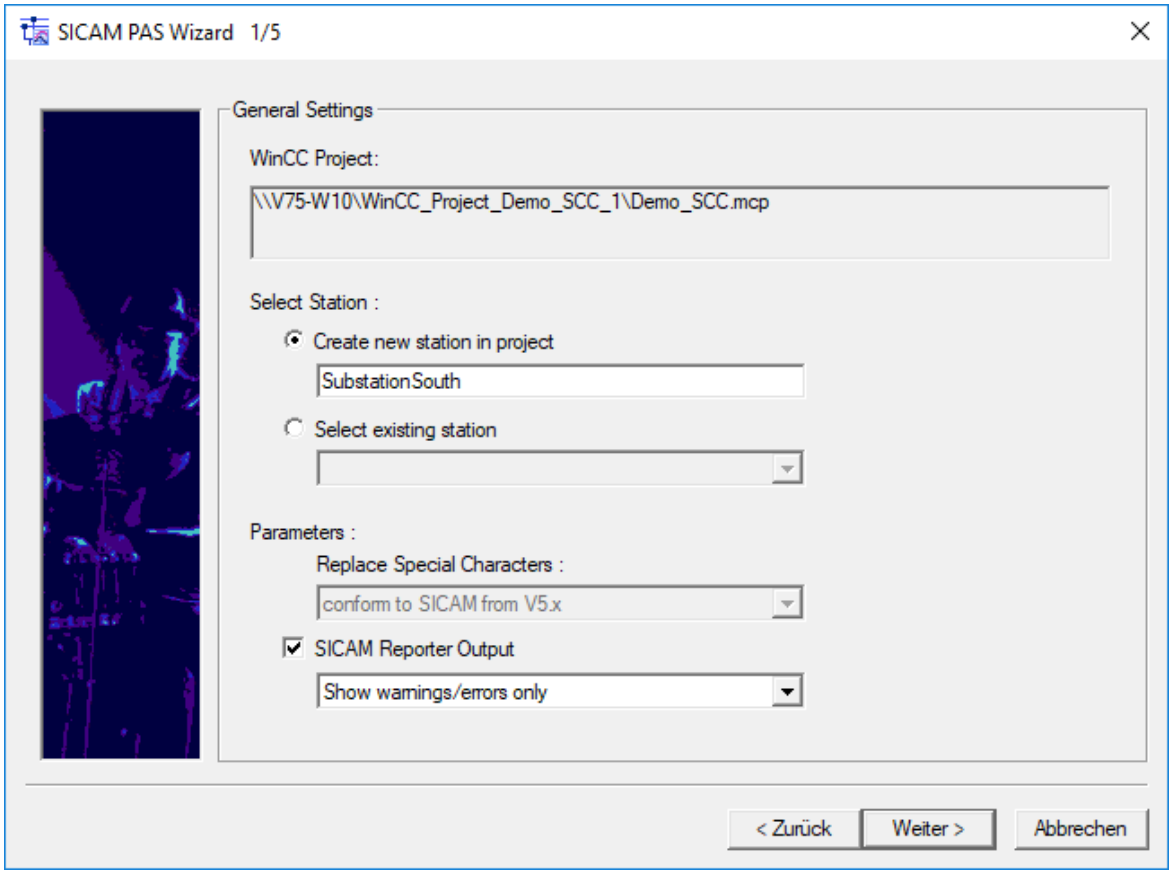
✧ Select the desired special-character replacement from the drop-down list box. This selection ensures that the SICAM PAS Wizard replaces those special characters in tag names which cannot be used by SICAM SCC by SICAM SCC-conforming characters.

NOTE

When editing old projects, you must select an option for the replacement of special characters which complies with the origin of the diagrams used in the project.

If special characters are replaced incorrectly, different tag names can be created, which could possibly cause problems concerning interconnections in these diagrams.

✧ Select **SICAM trace window output** in order to ensure that the SICAM PAS Wizard starts the SICAM PAS trace window. To provide a concise overview, you can specify that only warnings/errors are shown in the list.



[pascc312, 1, en_US]

Figure 7-7 Entering the station name and selecting parameters

✧ Click Next to continue.

Importing station data and selecting functions

In the following dialog, you can specify which components the SICAM PAS Wizard is to import from SICAM PAS/PQS to SICAM SCC.

✧ Select **Create SICAM components in project** to provide the prerequisites for the use of SICAM SCC components in multi-client projects on the client PC or to create SICAM PAS/PQS extensions in the WinCC project without import data from SICAM PAS/PQS.

✧ ✧ Select the **Import/Update item**. The components are now imported into the new station.

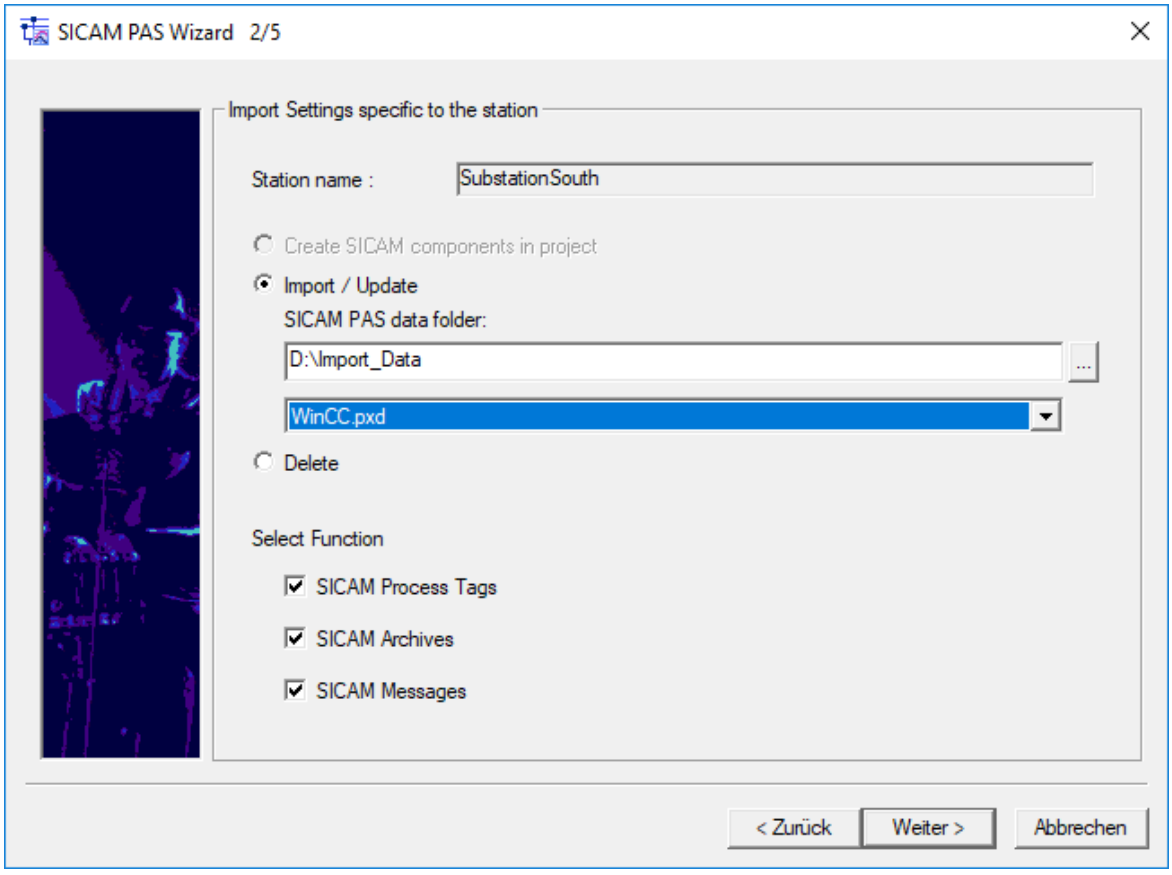
✧ Enter the complete path in the SICAM PAS/PQS data directory (e. g. ...\station1). To do this, click the ... button to open the path selection window.

✧ Select the file (e. g. station1.PXD) holding the corresponding **SICAM process tags** from the drop-down list box.

- ✧ Select **SICAM process tags**.
- ✧ Select **SICAM archives** to create the archives in your WinCC project.
- ✧ Select **SICAM PAS messages**.

NOTE

When updating an existing station, all entry fields are set to default values.
To perform an update, the import file must originate from the same SICAM PAS/PQS project.



[pascc313, 2, en_US]

Figure 7-8 Defining the path and the name of the import components

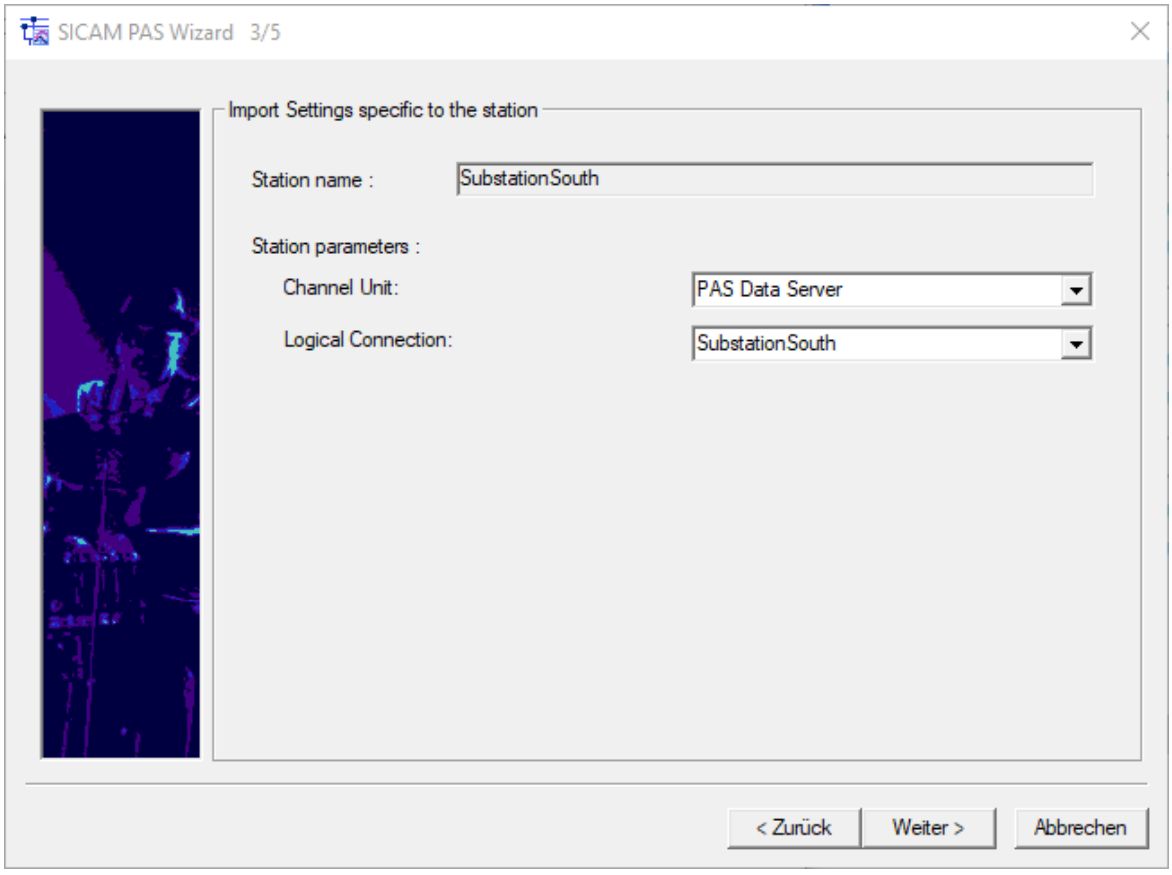
- ✧ Click **Next**.

NOTE

If **Delete** is selected in dialog **2/5 of the SICAM PAS Wizard**, the **dialogs 3/5 and 4/5** will be skipped.

Setting station parameters

The station parameters can be set in the dialog shown below.
The entries for **Channel unit** and **Logical connection** are set by default at SICAM PAS/PQS and can be applied for the first station without changes.



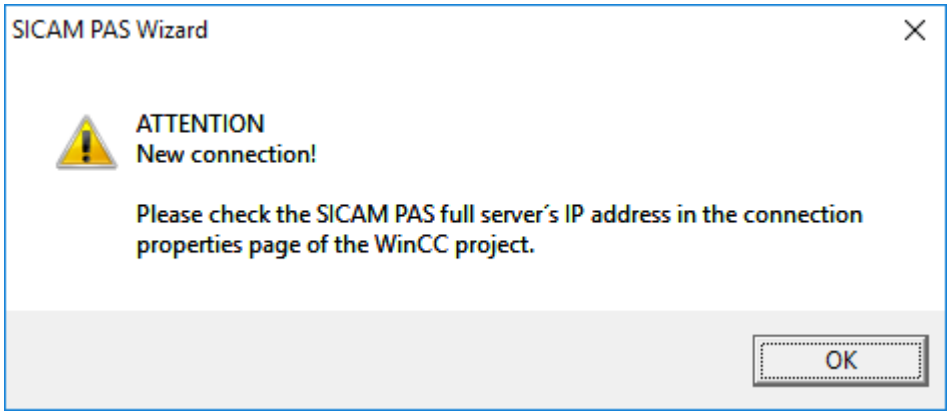
[pascc314, 2, en_US]

Figure 7-9 Setting Station Parameters for SICAM PAS/PQS

NOTE

When connecting SICAM PAS/PQS systems with different versions, select the corresponding **Channel unit** in this dialog.

✧ Click **Next**.



[pascc320, 1, en_US]

Figure 7-10 Note regarding connection parameters

No connection parameters need to be defined when connecting a **SICAM PAS/PQS** station Version 8.00 or later. The connection parameters from the SICAM PAS/PQS import file are applied. For older SICAM PAS/PQS versions, the connection parameters are pre-assigned with default values.

The connection parameters must correspond to the values defined in SICAM PAS/PQS. Check the connection parameters, see *3.2.5 Connection Parameters*.

NOTE

During a data import using the SICAM Wizard, the manually changed connection parameters are overwritten with the parameters from the import file. For this reason, the connection parameters must be checked after the data import.

Initializing the project

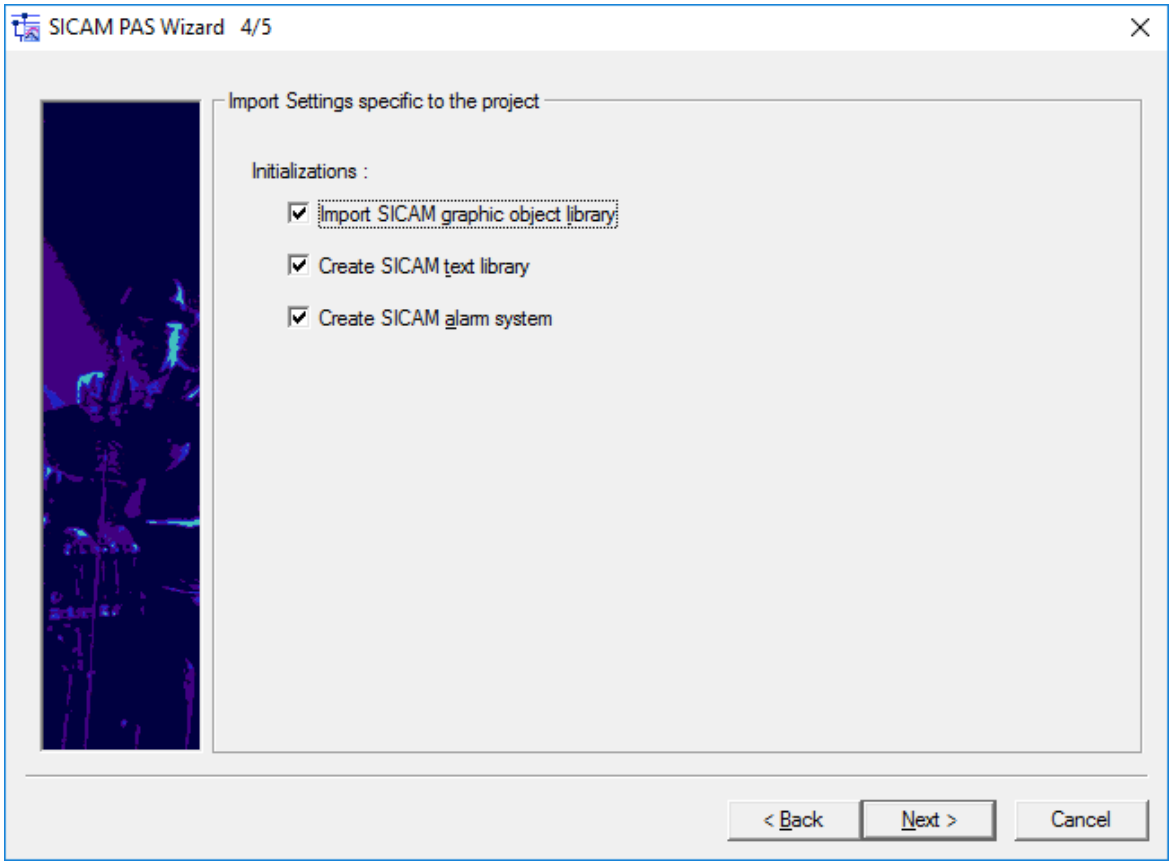
In the following dialog, you can specify the initialization of the WinCC project.

- ✧ Select the **Import SICAM graphic object library** option in order to import the SICAM PAS/PQS graphic object library (including ActiveX Controls) and the SICAM PAS/PQS administrative tags into the WinCC project.
- ✧ Select the **Create SICAM text library** option to create the text library in the WinCC project.

NOTE

If the **Create SICAM alarm system** option is selected, the **Create SICAM text library** option must also be selected during the first run.

- ✧ Activate **Create SICAM alarm system** to create the alarm system in the WinCC project.



[pascc315, 1, en_US]

Figure 7-11 Defining the project initialization

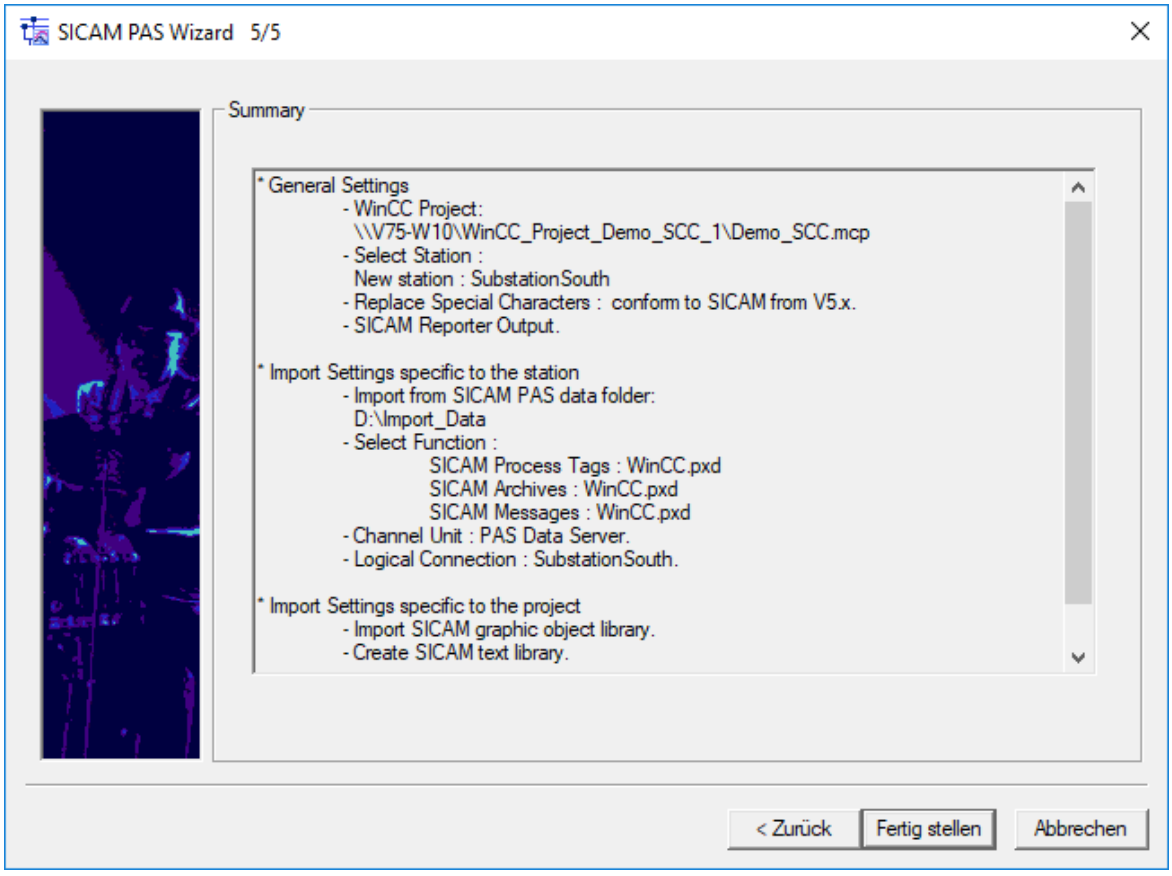
- ✧ Click **Next**.

Summary

The following dialog shows a summary of the previously defined settings. Check them for correctness.

NOTE

If one of your settings proves to be incorrect, click **Back** to return to the previous dialog and correct it. The previous dialog opens and you can correct your settings.



[pascc316, 1, en_US]

Figure 7-12 Checking the settings

✧ Click **Finish**.
The SICAM PAS Wizard now executes the selected steps.

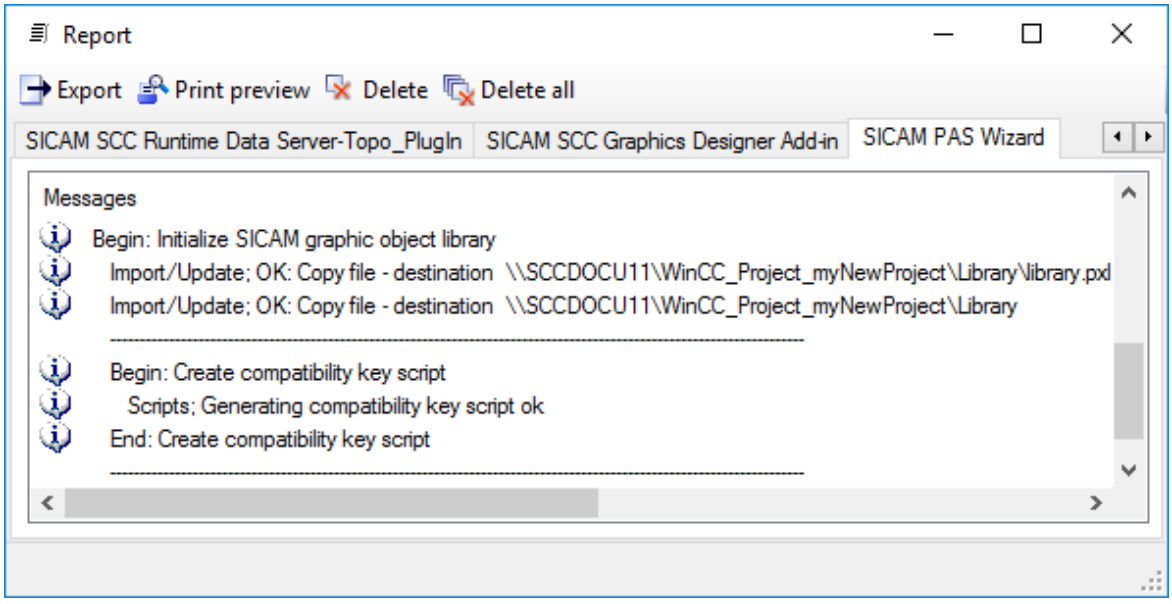
In the **Report** window, you can observe the processing and see potential error and warnings.

Viewing the report

As soon as all steps have been completed, you can view the report.

✧ To do this, select the **Overview** tab in the **Report** window. The number of errors and warnings is indicated in the **Quit:** row under Messages.

✧ Click **Close** to close the report.



[pascc317, 1, en_US]

Figure 7-13 Viewing the report

NOTE

If the **Report** indicated error or warnings, you should save these messages for viewing and editing them later.

If errors have occurred, the SICAM PAS Wizard requests you to delete the components effected during the next run.

NOTE

The SICAM PAS Wizard saves its messages in the GWLog.txt file under the path of the project (e.g. ...\project1).

The SICAM PAS Wizard overwrites this file upon each run. Save this file if required.

7.2.2 Configuring an IEC 60870-5-104 Connection During Runtime

To avoid a shutdown of the SICAM SCC Runtime in the case of minor configuration changes, an IEC 60870-5-104 station can be extended in SICAM SCC in online mode. Devices and individual items of information can be added and certain parameters can be modified.

Prerequisites/preparatory steps

In order to be able to extend an IEC 60870-5-104 station in online mode, at least 1 device with at least 1 item of information must be configured.

Please note that only existing IEC 60870-5-104 stations can be extended during runtime. In order to be able to add an IEC 60870-5-104 station in online mode, an empty dummy station including at least the administrative SICAM SCC tags must first be created in offline mode.

Restrictions

Please note the following restrictions as compared to configuration in offline mode:

- It is not possible to add new WinCC IEC 60870-5-104 stations.
- Configured devices cannot be deleted.

- Configured information cannot be deleted.
- For tags which have already been mapped in the Tag Management the following properties cannot be modified in online mode:
  - Tag name
  - Tag group
  - Tag type
  - Mapping in TagLogging or AlarmLogging
  - Linking indication and command tags
- To configure PAS and IEC 61850 stations the runtime must still be stopped first.
- Redundant systems cannot be configured during runtime.

Creating a dummy station for future extensions

To create a dummy station:

✧ Start the **SICAM IEC Wizard**.
The name cannot be changed later.
✧ Create an XML import file with 1 device without data points and the ASDU matching the station.
✧ Import this file and configure the **ComFault** or **OprReady** information in the Tag Management.

You can now extend your dummy station during runtime.
This imported dummy device must not be deleted when the station is extended later on.

Converting legacy projects created with earlier SICAM SCC versions

As a preparatory step you must convert existing projects created with a SICAM SCC version earlier than V8.03 HF1.

Make sure you call up the SICAM IEC Wizard for every IEC 60870-5-104 station with the same import data used during the last import and re-import the graphic object library.

Note that the re-import of the SICAM graphic object library must first be activated in the project-specific settings of the SICAM IEC Wizard.

7.2.3 SICAM IEC 104 XML Creator

Use the **SICAM IEC104 XML Creators** to create a parameter file (e.g. Rtu1.xml) for a SICAM RTU or another device with an IEC 60870-5-104 communication connection. This XML file can be imported into your project using the SICAM IEC Wizard. All the parameters required for import are included in the parameter file. A separate parameter file must be created for every RTU and every device. Please note that Microsoft Office is required to create and edit the parameter file.

7.2.3.1 General Procedure

Installation

To use the **SICAM IEC104 XML Creator**, the **SICAMIEC104XMLCreator.dll** must exist and be registered on the computer.

- **Computer with SICAM SCC**
  The **SICAMIEC104XMLCreator.dll** is registered automatically upon the installation of SICAM SCC.

- **Computer without SICAM SCC**
  On a computer with no SICAM SCC installed the **SICAMIEC104XMLCreator.dll** must be registered separately.
  As a prerequisite for registration **.NET Framework ab V2.0** must have been installed. Please note that administrator rights are required to perform the registration.

To register the **SICAMIEC104XMLCreator.dll**:

✧ To register the **SICAMIEC104XMLCreator.dll**, execute the **SICAMIEC104XMLCreator_reg.bat** file with administrator rights. To do this, right-click the **SICAMIEC104XMLCreator.dll** and select **Execute as administrator** from the context menu.
The batch file must not be located on a network drive or a substituted drive.

How to proceed

To create the parameter file (XML file) perform the following 3 steps:

- Save the Excel template file **SICAM_IEC104_XMLCreator.xltm** included in the scope of delivery as an XLSM file.
- Enter the parameters of your device in the **XLSM** file, e.g. Rtu1.xlsm.
- Create the **parameter file** (XML file) from the XLSM file.

For a detailed description of the procedure refer to *7.2.3.3 Creating a Parameter File*.

NOTE

You can edit Excel files using Excel versions 2007, 2010, or 2013. Furthermore, the 32-bit version of Microsoft Excel must be installed.

XLSM file

The entries in the XLSM file are divided as follows:

- Communication parameters, lines 4 to 7
- Data points and their parameters, from line 11

The XLSM file consists of 3 sheets:

- **CreateIEC104Variables**
  This sheet includes the actual parameters.
- **Help**
  This sheet includes help texts.
- **Example**
  This sheet provides an example of a SICAM RTU with 2 LRUs and their data points.

7.2.3.2 Parameters and Data Types

Table 7-1 Communication parameters

Parameter	Description	Default value / Value range	Recommended value
RTU Name	Name of the SICAM RTU		
Timeout response t1	Monitoring time for transmitting or testing the APDU	**15** 1 to 255 s	
Timeout transmit acknowledge t2	Monitoring time for acknowledgment in case of a missing data message	**10** 1 to 255 s	t2 < t1

Parameter	Description	Default value / Value range	Recom-mended value
Test frame period t3	Monitoring time for the transmission of S frames in case of an extended idle time	**20** 1 to 255 s	t3 > t1
Transmit window	Maximum difference between the sequence number received and the transmission of the status tags	**12** 1 to 32767 APDU	
Receive window (w)	Acknowledgment takes place after the receipt of w frames in I format at the latest.	**8** 1 to 32767 APDU	w < 2/3 k
TCP/IP address	TCP/IP address		

The values indicated in **bold** are default values in accordance with the EN 60870-5-104 standard.

Data Point Parameters

Table 7-2 Data Point Parameters

Parameter	Description	Value range
LRU name	Name of the LRU	
ASDU	Service data unit of the application layer	1 to 2047
Information name	Name of the item of information	
Data type	IEC 104 data type	
IOA	Information address	1 to 16777214
Feedback link	Only for commands: Information name of the corresponding message	
SCC Tag name	Name of the SICAM SCC tag	

NOTE

The information address is not checked.

Please note that you are responsible for the correctness of all parameters.

IEC 104 Data Types

SP (TI 30)	Single-point indication with time stamp CP56Time2a
DP (TI 31)	Double-point indication with time stamp CP56Time2a
ST (TI 32)	Tap position indication with time stamp CP56Time2a
BO (TI 33)	Bit pattern indication, 32 bits, with time stamp CP56Time2a
ME_TD (TI 34)	Measured value, normalized value with time stamp CP56Time2a
ME_TE (TI 35)	Measured value, scaled value with time stamp CP56Time2a
ME_TF (TI 36)	Measured value, shortened floating point number with time stamp CP56Time2a
IT (TI 37)	Metered value with time stamp CP56Time2a
SC (TI 45)	Single command
DC (TI 46)	Double command
RC (TI 47)	Regulating step command
BO (TI 51)	Bit pattern, 32 bits
SE_NA (TI 48)	Set-point control command, normalized value
SE_NB (TI 49)	Set-point control command, scaled value
SE_NC (TI 50)	Set-point control command, short floating point number

NOTE

The corresponding type identifier with time (TI > 30) must also be configured for data types without time (TI < 30).

7.2.3.3 Creating a Parameter File

After the installation of SICAM SCC the template file is available in the following directory: **..\Programme \Siemens Energy\SICAM\SCC\misc\IEC104Configuration**.

To create a parameter file:

✧ Open the **SICAM_IEC104_XMLCreator.xltm** template file in Microsoft Excel.

	A	B	C	D	E	F	G	H	I	J	K
1		Create XML file								SIEMENS SICAM SCC	
2											
3	RTU Name	Timeout response t1	Timeout transmit acknowledge t2	Test frame period t3				Transmit window	Receive window (w)	TCP/IP Address	to XML
4										1.1.1.1	✓
5	City	15	10	20				12	8		
6											
7											
8											
9										Number of datapoints added to XML file:	20
10	LRU name	ASDU	Information name	Data type	IOA1	IOA2	IOA3	IOA	Feedback link	SCC Tag name	to XML
11	East	1	OperatingState	SP (TI 30)	2	0	0	2		City_East_OperatingState	✓
12	East	1	RemoteControl	DP (TI 31)	4	0	0	4		City_East_RemoteControl	✓
13	East	1	StepPosition	ST (TI 32)	105	0	0	105		City_East_StepPosition	✓
14	East	1	BitPattern	BO (TI 33)	208	0	0	208		City_East_BitPattern	✓
15	East	1	Meas1	ME_TD (TI 34)	116	0	0	116		City_East_Meas1	✓
16	East	1	Meas2	ME_TE (TI 35)	118	0	0	118		City_East_Meas2	✓
17	East	1	MeasFloat	ME_TF (TI 36)	120	0	0	120		City_East_MeasFloat	✓
18	East	1	SingleCommand	SC (TI 45)	234	3	0	1002		City_East_SingleCommand	✓
19	East	1	DoubleCommand	DC (TI 46)	236	3	0	1004		City_East_DoubleCommand	✓
20	East	1	Meter1	IT (TI 37)	176	4	0	1200		City_East_Meter1	✓
21	East	1	SetPoint	SE_NC (TI 50)	242	3	0	1010		City_East_SetPoint	✓
22	West	2	StepPosition	ST (TI 32)	105	0	0	105		City_West_StepPosition	✓
23	West	2	BitPattern	BO (TI 33)	208	0	0	208		City_West_BitPattern	✓
24	West	2	Meas1	ME_TD (TI 34)	116	0	0	116		City_West_Meas1	✓
25	West	2	Meas2	ME_TE (TI 35)	118	0	0	118		City_West_Meas2	✓
26	West	2	MeasFloat	ME_TF (TI 36)	120	0	0	120		City_West_MeasFloat	✓
27	West	2	SingleCommand	SC (TI 45)	234	3	0	1002		City_West_SingleCommand	✓
28	West	2	DoubleCommand	DC (TI 46)	236	3	0	1004		City_West_DoubleCommand	✓
29	West	2	Meter1	IT (TI 37)	176	4	0	1200		City_West_Meter1	✓
30	West	2	SetPoint	SE_NC (TI 50)	242	3	0	1010		City_West_SetPoint	✓
31	West	3	SingleCommand	SC (TI 45)	234	3	0	1002		City_West_SingleCommand	✗
32	West	2	DoubleCommand	DC (TI 46)	236	3	0	1004		City_West_DoubleCommand	✗
33	West	2	Meter?	IT (TI 37)	176	4	0	1200		City_West_Meter?	✗

[excel-datei, 1, en_US]

Figure 7-14 VSICAM_IEC104_XMLCreator.xltm template file

✧ Save this file e.g. as **Rtu1.xlsm** (Excel file with macros). You can use this file to define the parameters of your SICAM RTU.

✧ Enter the parameters for your SICAM RTU.

Enter at least the following parameters:

- Name of the SICAM RTU
- TCP/IP address
- 1 data point with its parameters
- 1 LRU

  The example in the screenshot above shows the parameters defined for 1 SICAM RTU with 2 LRUs (East, West).

Note the entries in the SCC Tag name column: This column shows the tag names indicated later in SICAM SCC.

The following characters must not be used for parameters consisting of texts:

- Blank " $ % ' * : ? @ \
- Make sure you also check which characters are permitted in your destination system.

✧ Click **Create XML file** to create the parameter file, e.g. Rtu1.xml. It may be necessary to activate macros before clicking this button.

The XML file always has the same name as the Excel file and is saved in the directory in which the Excel file has been opened. All incorrect data points which were not exported to the Rtu1.xml file are listed in an additional **Rtu1.log** file.

✧ Create a separate parameter file for each SICAM RTU.

✧ Import the parameter file into your project via the **WinCCExplorer** using the **SICAM IEC Wizard**.

7.3 SICAM Communication Connection - Tag Management

7.3.1 SICAM Communication Connection - Tag Management

SICAM SCC makes available the following SICAM communication connections:

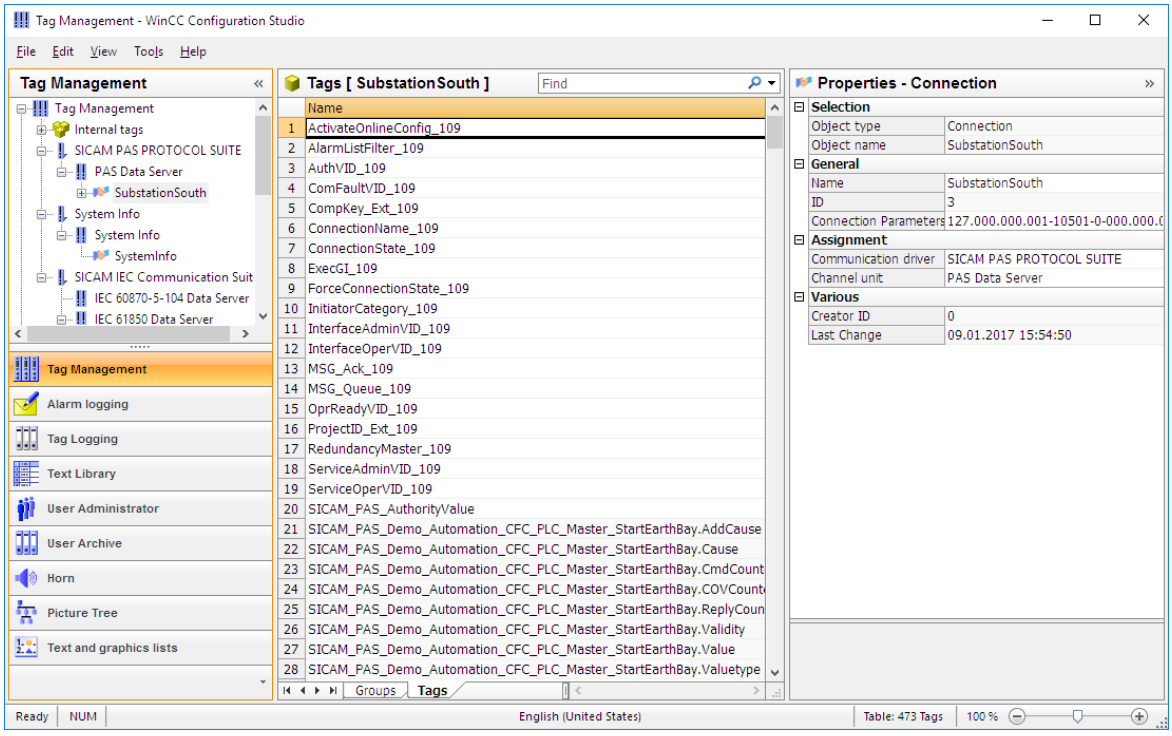
- **SICAM PAS PROTOCOL SUITE (SICAM PAS channel DLL)**
  for the connection of SICAM PAS stations
  For the connection of older SICAM PAS systems see *10 Different SICAM PAS Versions*.
- **SICAM IEC COMMUNICATION SUITE (SICAM IEC channel DLL)**
  for the connection of SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices

7.3.2 SICAM PAS PROTOCOL SUITE

Overview

The **SICAM PAS PROTOCOL SUITE** provides for the connection of SICAM SCC to the SICAM PAS Full Server. Besides this, it controls this process data connection.

The (process) connection between SICAM PAS and SICAM SCC or SIMATIC WinCC is ensured by the SICAM PAS PROTOCOL SUITE. The SICAM PAS channel DLL logs on to the SICAM SCC proxy driver during runtime in order to exchange process information.



[pascc403, 1, en_US]

Figure 7-15 SICAM PAS PROTOCOL SUITE in the WinCC Explorer

Performance characteristics

The SICAM PAS PROTOCOL SUITE has the following performance characteristics:

- Event-controlled update of the process image
- Time stamps from the process via raw data tags and the SICAM PAS normalization DLL

- Automatic start and stop via SIMATIC WinCC and SICAM PAS UI - Operation
- Connection of different or redundant SICAM PAS projects parallel to SIMATIC WinCC with automatic switchover in case of faults

Tasks

The SICAM PAS PROTOCOL SUITE performs the following tasks:

- Checking the consistency of the parameter settings
- Connect to the SICAM SCC proxy driver
- Forwarding of display and indication tags to SIMATIC WinCC
- Forwarding of commands to SICAM PAS
- Monitoring of the connection to the SICAM PAS system
- Control of SICAM PAS communication components
- Substitution of values
- Control of switching authorities

Compatibility key

A compatibility key is used in order to ensure that the project version of SICAM PAS is compatible with the project version of SICAM SCC. This key is checked by a script upon the activation of the runtime operation. If an error is detected during this check, the WinCC Runtime is stopped and an error message is displayed.

The compatibility key is irrelevant for SICAM RTUs.

For projects with an extremely large number of process tags the compatibility key upon the start-up of WinCC Runtime can only be checked after several seconds. To prevent the operation of the project until the compatibility key has been checked, a picture must be configured which is positioned on top of the process images. This picture is switched off depending on the result of the compatibility key check. To do this, compare the external and internal CompKey... tags of the corresponding SICAM PAS connection. Place a picture window on top of the start picture which you hide if the process values of the CompyKey... tags are identical.

Tags

The SICAM PAS PROTOCOL SUITE logs on to the SICAM SCC proxy driver in order to poll the required tags. Indication tags and display tags for the representation of process diagrams are polled during this process.

Additionally, system-internal tags (e. g. the project ID, compatibility key) are required from the SICAM PAS Full system.

The distinction between a **display tag** and/or an **indication tag** is based on the specific tag information created by the SICAM PAS Wizard during the creation of the tags. Furthermore, the ValueID of the corresponding tags is included in this specific tag information. Via the ValueID, the SICAM PAS PROTOCOL SUITE can perform an assignment between SICAM PAS tags and WinCC tags.

- SIMATIC WinCC uses **display tags** for process visualization.
- Unlike the display tags, the **indication tags** are not determined by the process diagram.

Licensing

With regard to the SICAM PAS PROTOCOL SUITE a distinction is made between 2 licenses, i.e. the license for SICAM SCC - Configuration and the license for SICAM SCC - Runtime.

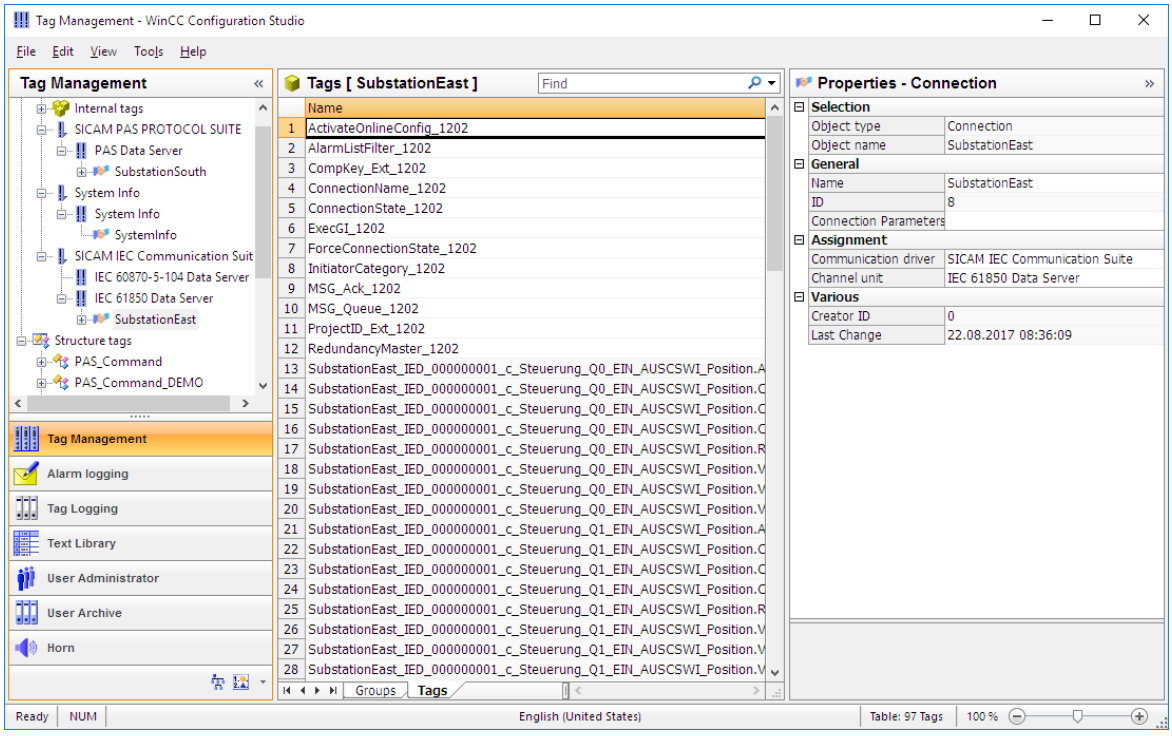
- If the license for SICAM SCC - Configuration is missing, the access to properties of connections and tags is locked and the import of process tags with the Wizard is not possible.
- If the license for SICAM SCC - Runtime is missing, you can start the Runtime in Demo mode, see *2.3.1 Design Variants*.

7.3.3 SICAM IEC COMMUNICATION SUITE

Overview

The **SICAM IEC COMMUNICATION SUITE** is required for the process data interfacing of SICAM SCC to SICAM RTUs systems and IEC 61850/IEC 60870-5-104 devices as well as for controlling the connection.

SICAM RTUs/IEC 61850/IEC 60870-5-104 devices are connected to SICAM SCC or SIMATIC WinCC via the SICAM IEC COMMUNICATION SUITE. The SICAM IEC COMMUNICATION SUITE logs on to the devices during runtime in order to exchange process information.



[pascc403_1703, 1, en_US]

Figure 7-16 SICAM IEC COMMUNICATION SUITE in the WinCC Explorer

Performance characteristics

The SICAM IEC COMMUNICATION SUITE has the following performance characteristics:

- Event-controlled update of the process image
- Time stamps from the process via raw data tags and the SICAM PAS normalization DLL
- Automatic start and stop via SIMATIC WinCC
- Parallel connection of different or redundant SICAM RTUs to SIMATIC WinCC with automatic switchover in case of faults
- Connection of different IEC 61850/IEC 60870-5-104 devices

Tasks

The SICAM IEC COMMUNICATION SUITE performs the following tasks:

- Connection to the SICAM RTUs/IEC 61850/IEC 60870-5-104 devices
- Forwarding of display and indication tags to SIMATIC WinCC
- Forwarding of commands to the SICAM RTUs substation controller/IEC 61850/IEC 60870-5-104 devices
- Monitoring of the connection to the SICAM RTUs substation controller/IEC 61850/IEC 60870-5-104 devices

Tags

To retrieve the process data required, the SICAM IEC COMMUNICATION SUITE logs on to the SICAM RTU system/IEC 61850/IEC 60870-5-104 devices. These data include process information for messages in WinCC Alarm logging and the display tags required for the representation of process diagrams.

During import the Wizard creates a ValueID for addressing in WinCC for each information. You can see the assignment of the ValueID to the external telegram address in the specific tag information (address parameters). Therefor, open the properties of a tags address.

NOTE

During the direct connection of IEC 61850 devices the user can define in the device-specific parameters which of the following communication drivers shall be used:

- **Static** or **Dynamic Dataset**
- **Unbuffered** or **Buffered Report**

The combination of Dynamic Dataset and Buffered Report is not supported. When selecting Buffered Report the user can define additionally whether buffered messages shall be logged in the Alarm Logging (**a**) or not (**b**).

If SICAM SCC is used redundantly, (**b**) must be selected.

Licensing

With regard to the SICAM IEC COMMUNICATION SUITE a distinction is made between 2 licenses, i.e. the license for SICAM SCC - Configuration and the license for SICAM SCC - Runtime.

- If the license for SICAM SCC - Configuration is missing, access to the properties of connections and tags is denied and no process tags can be imported with the Wizard.
- If the license for SICAM SCC - Runtime is missing, you can start the Runtime in Demo mode, see chapter *2.3.1 Design Variants*.

System messages

The **Communication fault (ComFault)** and **Operational readiness (OprReady)** tag types can be configured as status messages in the SICAM TOOLBOX II for the IEC 60870-5-104 and IEC 61850 connections. For an IEC 61850 connection the **general interrogation** can be also configured as status message.

During the import process for directly connected IEC 61850 devices the **ComFault**, **OprReady** and **GIStatus** tags are provided as status messages of the corresponding device for mapping. They can be mapped like normal process tags.

The **GIStatus** tag can have the following 4 status values:

- 0 = General interrogation never run
- 1 = General interrogation completed successfully
- 2 = General interrogation running
- 3 = General interrogation failed

In redundant systems the system messages from both SIMATIC WinCC servers are entered in message lists. The name of the causing system is entered in the message lists in the **Supplementary information** column.

Command logging

The following is logged in the **Additional cause** column in the message lists:

- The qualifiers of command transmitted when issuing the command
- The causes indicated by the device in case of an unsuccessful command output

Showing the Originator Address in Message Lists

To show the originator address in the **Location** column, the **orIdent** mode for IEC 61850 must be selected in the 61850.INI file of the driver; for IEC60870-5-104, the **HerkAdrStati** parameter must be set to **1** (HerkAdr-Stati=1) in the AKServ.INI file.

Qualifier of Command (QoC) with IEC 60870-5-104

To be able to use **Qualifier of Command** (QoC: sync / no sync, interlocked / not interlocked) for switching with IEC 60870-5-104, you have to activate the QoC functionality by setting the attribute **SendQOC** to **1** in the **[Default]** section of the **AKServ.ini** file (SendQOC=0 deactivates the QoC functionality).

You can find the file in the project folder under **GWData > station_name > ComConfig104 > str**.

1-of-N Command Interlocking

With the parameter **COMMAND_GRP** all commands of a command group (i.e. all with the same command group number) are interlocked against each other, so only 1 command can be executed at the same time.

Commands triggered during command interlocking are refused and acknowledged to SICAM SCC with **COT=7 (Confimation) PN-**.

The configuration is done via Toolbox, the Import Wizard writes the following lines in the **AKServ.ini** file:

```
[Default]
CommandDelay=5 ; delaytime for locking of command groups [sec], default=0
CommandTimeout=200 ; timeout for unlocking of command groups [sec], default=300
```

New Variable Parameter

In XML import file (Toolbox):

Parameter name: **COMMAND_GRP (Command group number)**

Data type: unsigned integer

Range of values: 0 to 65535

Default value: 0

Description

The following is logged in the **IECChannel_IEC104Driver.log** trace file:

```
"Command '<xxx>' rejected, because command '<yyy>' in same group is running"
```

Only after sending commands has been terminated (**Termination**, **Cancel**, or **Confirmation PN-**) and the time delay for the command (CommandDelay) has been expired, a new command can be sent.

An incomplete sequence of commands (e.g. **Termination** has not been received) would cause an infinite interlock of the command group. The parameter **CommandTimeout** is used to avoid this. When this timer has expired (after sending commands has started) the command group is unlocked. CommandTimeout=0 disables the safety mechanism.

The following is logged in the **IECChannel_IEC104Driver.log** trace file:

```
"Unlocking of commandgroup <nn> which contains control: '<yyy>'"
```

Substitute

NOTE

Substituting is only possible on IEC 61850 data points with Functional Constraint (FC) SV, e.g. SubVal. For IEC 61850 devices, substitution is usually performed to the XCBR or XCSWI data point.

Alternatively, you can create a new **SubVal2IED = 1** in the 61850.ini file under [GENERAL]; in this case, the .stVal can be used directly for substitution.

SICAM DISTO

For more detailed information on the communication between SICAM DISTO and the IEC 61850-Client, refer to chapter *7.10 Communication with SICAM DISTO*.

7.4 Alarm Logging

The Alarm Logging component of SIMATIC WinCC serves as a basis for the Alarm Logging system. It ensures that data is logged in the correct chronological order.

7.4.1 Alarm Logging System

The SICAM PAS Alarm Logging system differs from standard logging systems with regard to the information transmitted with an alarm message.

By default, SIMATIC WinCC cyclically updates all information regarding the process state.

This mechanism is sufficient for visualization in diagrams.

Alarms, however, must not be lost and must be processed in the correct chronological order.

Raw data tag

SICAM PAS alarms are transmitted to SIMATIC WinCC as raw data tags with a time stamp and additional values.

Normalization DLL

For SIMATIC WinCC Alarm Logging, a SICAM PAS normalization DLL decodes the contents of the raw data tag. It creates an alarm with a resolution of 1 ms in the Alarm Logging system.

Correct chronological order

Based on the time stamp of the raw data tag, alarms can be sorted chronologically in the alarm lists in order to ensure that they are shown in the correct order of their appearance.

Alarm lists

You can set any filters also to textual process value columns in the alarm lists (SIMATIC WinCC V7.0 SP1 or later).

7.4.2 SICAM Normalization DLL

Combined with the SICAM communication connection, the SICAM normalization DLL provides the basis for the alarming and logging of data in correct chronological order.

The SICAM normalization DLL prepares the data of the source system (SICAM PAS, SICAM RTUs or IEC 61850/IEC 60870-5-104 devices) in a SICAM-specific manner for SIMATIC WinCC Alarm Logging.

SICAM normalization DLL

The SICAM normalization DLL evaluates the additional information transmitted in the process values and generates an alarm with the corresponding alarm texts in the Alarm Logging system.

The file name is **PASNORM.NLL**.

The SICAM normalization DLL supports the hiding and blocking of messages for a SIMATIC WinCC server. The message block is not set in SICAM PAS/SICAM RTUs. It must therefore be set separately on each individual SIMATIC WinCC computer with a process connection.

Additional information

The following additional information is available:

- Value
- Location
- Cause

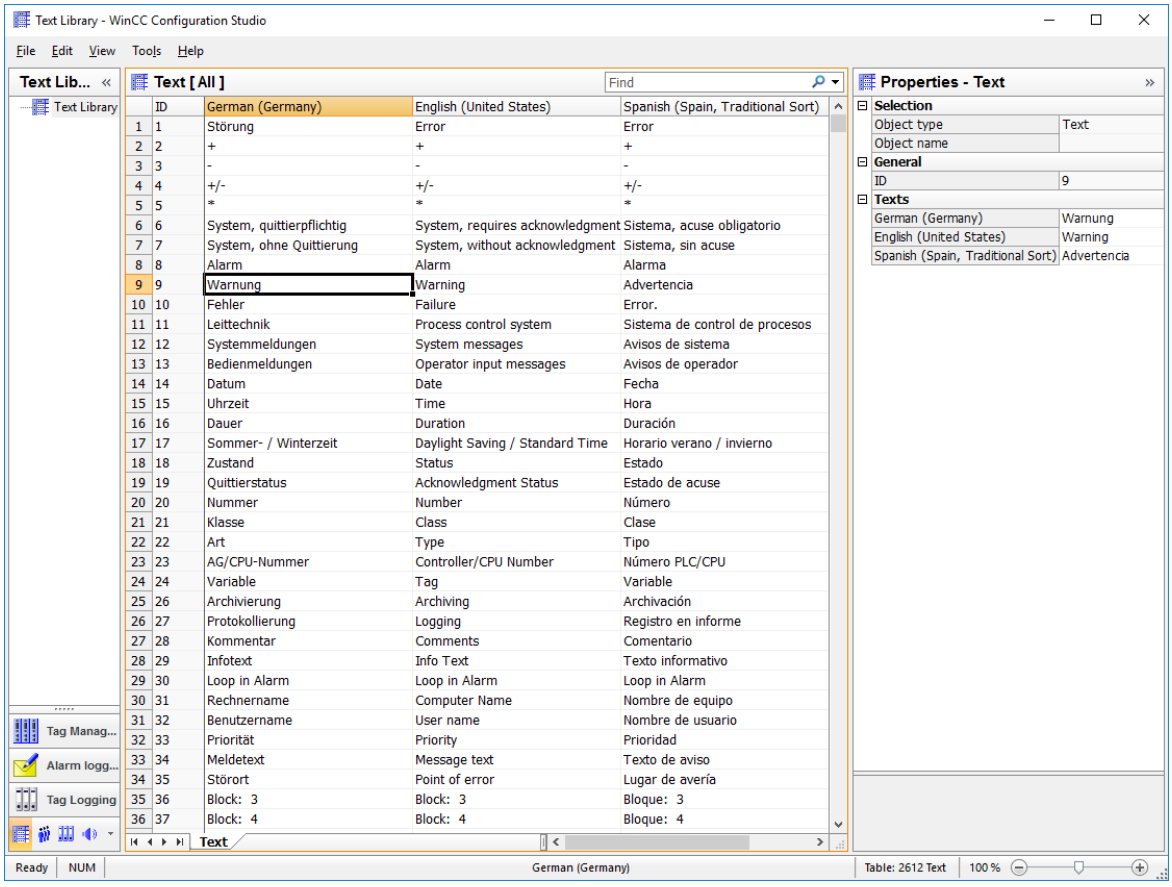
- Status
- Additional cause
- ID number[2]
- Additional information
- Time status
- Flag (SICAM PAS flag used by the Alarm Logging system to suppress internal messages which are irrelevant for typical applications. This suppression corresponds to the default setting.)

For more detailed information, refer to *Structure Elements, Page 502*.

Text library

The normalization DLL retrieves the alarm texts from the text library. The texts are stored in the text library in the language used.

To view the texts, click **Text Library > Open** in the WinCC Explorer. Texts with the **text IDs 599** to **2216** are available for new projects. These texts can be customized to meet the requirements of specific projects. Furthermore, the user can add additional language columns for translated texts.



[pascc401, 1, en_US]

Figure 7-17 Text Library

The texts for the value of a process tag (e. g. ON/OFF) in the text library are subdivided into the **value text groups** 0 to 16. Value text group 0 is the default group, and its texts should not be modified. The texts in groups 1 to 16 can be customized to meet specific requirements.

2 If the devices are connected via SICAM RTUs and directly via IEC 61850/IEC 60870-5-104, this additional information is not available.

The value text group whose texts are to be displayed in the alarm lists can be defined in the **Value Text** column for each alarm in the Alarm Logging system.

For SICAM PAS V8.02 or later you can configure the value text group assignment in **SICAM PAS – Configuration**. For older SICAM PAS versions or if no configuration has been performed, the value text group 0 is predefined as standard.

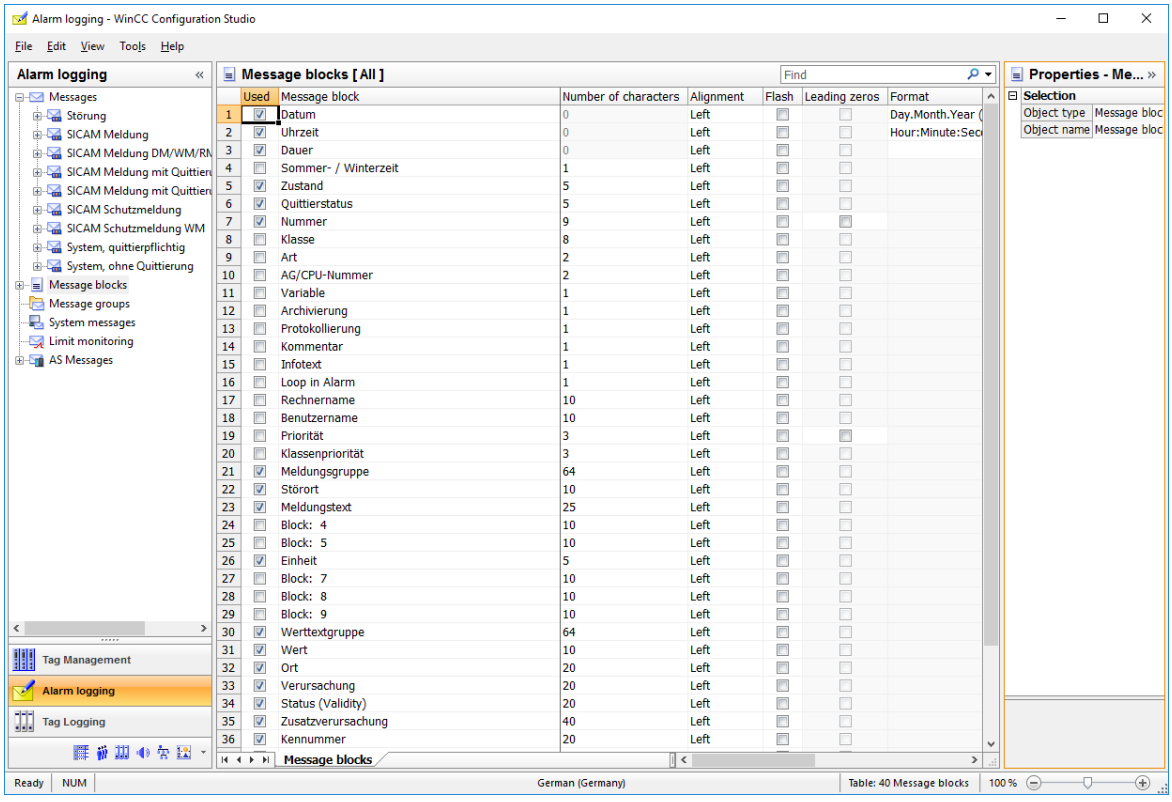
NOTE

For accelerated searching of certain value text groups (e.g. value text group 5), click **Edit > Find > Value text group 5**.

To show the value of an alarm instead of the alarm text, value text group 255 can be entered for this value.

Alarm Logging

To open the **Alarm Logging** editor in the WinCC Explorer, click **Alarm Logging > Open**. Enter the number of the value text group in the **Value Text** column. 0 is the default group.



[pascc402, 1, en_US]

Figure 7-18 Alarm Logging

NOTE

The value text group is only predefined for process values for which a text can be shown. Measured/metered values are always shown as numerical values.

7.4.3 Using the Alarm Logging Extension

In order to be able to use the alarm logging extension in a project, the Alarm Logging system must be generated in the project.

Afterwards, SICAM PAS alarm messages can be imported into this Alarm Logging system.

Creating an Alarm Logging system

Use the **SICAM PAS Wizard** to generate an Alarm Logging system in your new WinCC project which meets the requirements of SICAM PAS.

The Alarm Logging system consists of:

- Alarm message blocks
- Message classes
- Print layouts
- Texts

The corresponding graphic objects for the connection to SICAM PAS, SICAM RTUs or IEC 61850/IEC 60870-5-104 devices are:

- Event list
- Warning message list
- Protection message list

These graphic objects are available in the Graphics Designer under **View > Library > Project Library > Alarm Logging Templates**.

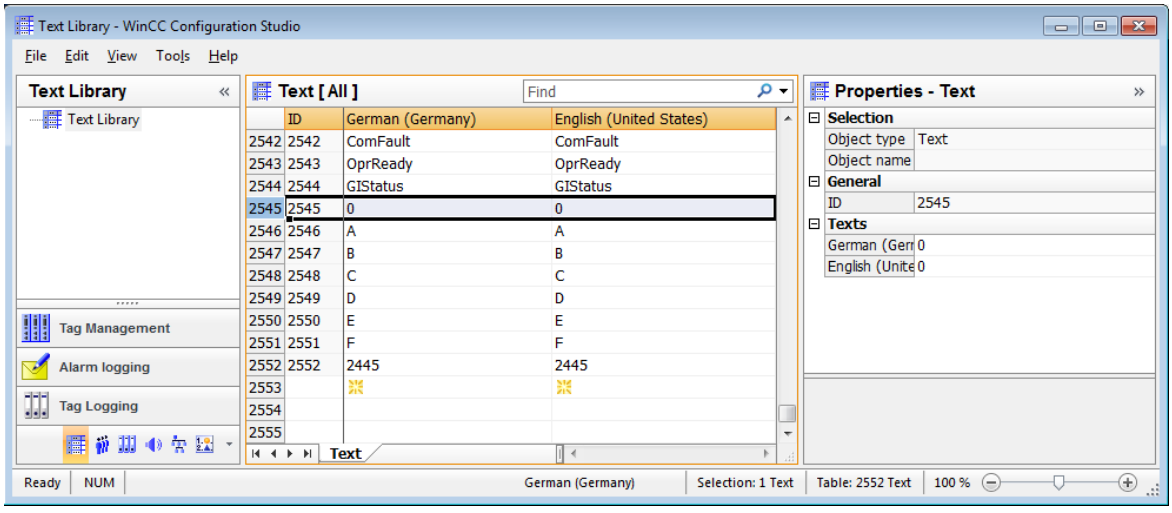
7.4.4 Value Texts

By default, for the texts of the **Value** process-value row the texts of the configured value text group (default = 0) are used depending on the data type of the message. The WinCC text library contains 16 further value text groups which you can use and change freely (groups 1 to 16).

To assign texts to dedicated integer values of a process information that are not covered by the value text groups, proceed as follows:

✧ Enter your text in the **Text Library**.

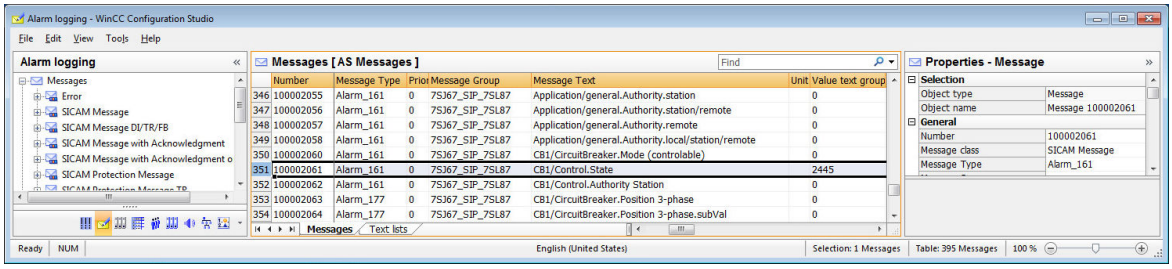
Only the next free text can be used. This first text **ID** is used for the value 0. The subsequent text IDs are used for further values. Enter all required texts at the same time.



[sc_value_text_txtlib, 1, en_US]

✧ If you only need high values (e.g. 128 to 135), you can define an offset for the calculation of the value text group entry in the Alarm Logging. Thus, you do not have to enter 127 empty texts (in this example) in the text library.

✧ In the **Alarm Logging Editor** in the **Value text group** column of the message, enter the start ID from the text library; the start value must be at least 256.



[sc_value_text_alarm, 1, en_US]

7.4.5 Message Coloring

In SIMATIC WinCC, messages are represented in different colors depending on the message state. The message states are:

- Came in
- Went out
- Acknowledged

With SICAM SCC V8.04, the **Message completed** message state can be indicated with an additional color, e.g. as soon as the processing of a fault has been completed.

The advantage of the additional color is that completed messages are no longer just displayed as **Acknowledged** or **Went out**, but a defined representation for completed processes is now possible.

This function is available if the **Alarm Logging Color Extension** option has been selected during the customized installation of SICAM SCC. If this is the case, the **CCAlarmColorProcessExtension.ini** file is stored in the **MELD** project directory when creating a SIMATIC WinCC project. You can edit this file - see the paragraphs below.

NOTE

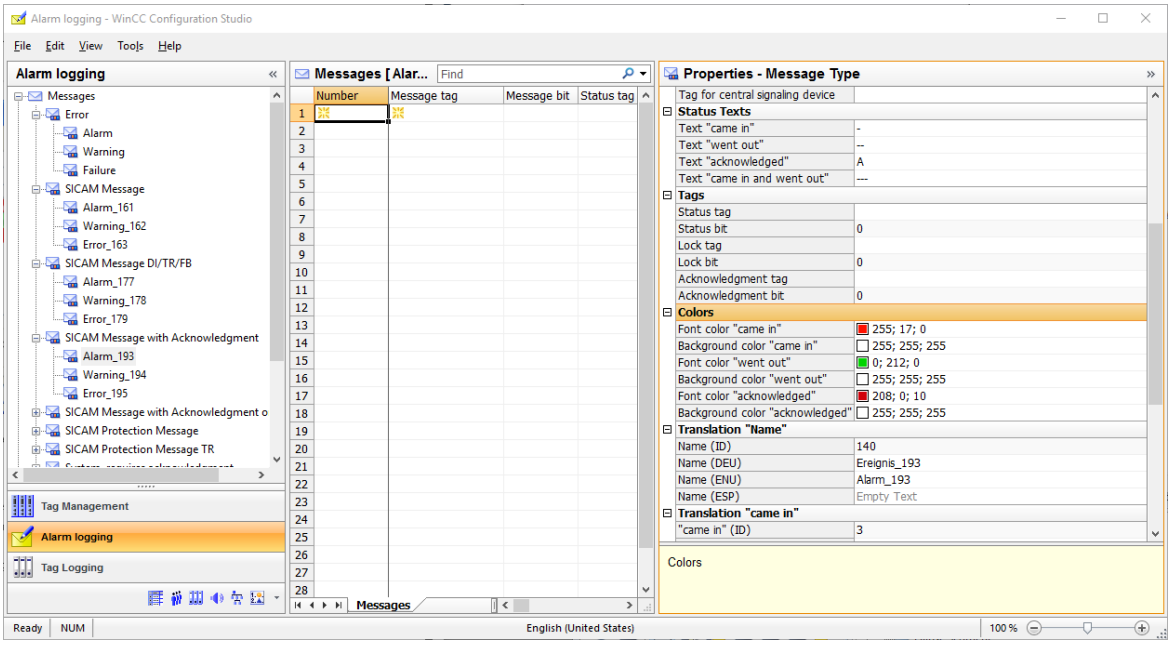
You can subsequently activate the **Alarm Logging Color Extension** option via a customized installation of SICAM SCC.

As an example, the paragraphs below describe the configuration and representation in SIMATIC WinCC for various message settings and sequences in the message lists. The **Message completed** message state is represented using a black font on a gray background.

Configuring message coloring

To configure the coloring of messages:

✧ Open the Properties dialog of the message type for which you want to configure message coloring.



[prop_colors, 1, en_US]

Figure 7-19 Configuring message coloring

✧ Configure the text and background colors for the **Came in**, **Went out**, and **Acknowledged** message states.

To activate and configure the coloring of the **Message completed** message state:

✧ Open the **CCAlarmColorProcessExtension.ini** file in the **MELD** project directory using a text editor.

The file includes the following entries:

```
[Settings]
Enabled=1
[GlobalColors]
CompletedBack=c0c0c0
CompletedFore=000000
#[GlobalStateTexts]
#Come=2
#ComeAcked=5
#Go=3
#GoAcked=5
```

✧ Under **[Settings]** set the **Enabled** entry to **1** in order to activate the function (0 =OFF, 1=ON). This ensures that the last message of a message cycle is displayed in accordance with the settings performed under **[GlobalColors]**.

✧ Via **CompletedBack** and **CompletedFore** define the background and font colors of the message.

In the example, the background is gray and the font is represented in black. The entries correspond to the RGB values of a color. These RGB color values are available in the SIMATIC WinCC Graphics Designer under the color settings for any object (Color selection - HTML code).

✧ To enable the display of user-defined texts in the **Status** system message block of the Alarm logging, remove the character **#** at the start of the line.

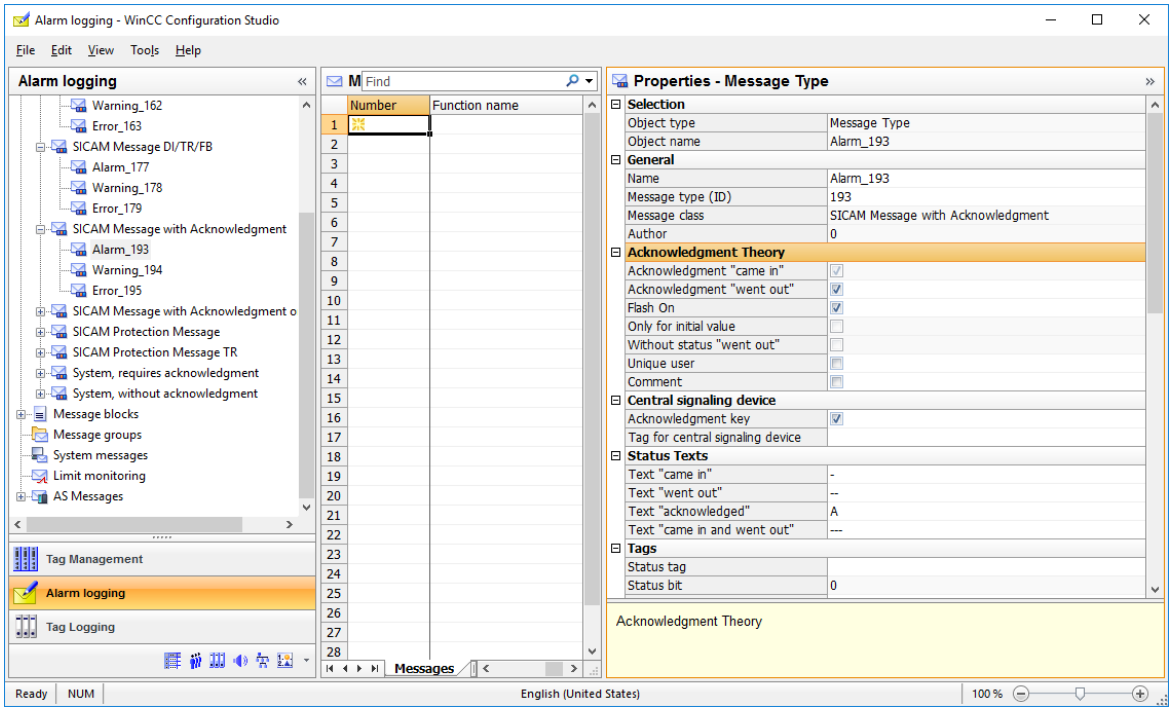
Texts that are stored under the corresponding ID in the text library in the current runtime language are displayed. You can configure both the ID in the INI file and the text in the text library.

All messages are processed according to the selected type.

Example 1

The following settings are defined in the **Configure message classes** dialog, **Acknowledgment** tab:

- The messages have the states **Came in** and **Went out**.
- The **Came in** and **Went out** messages must be acknowledged.



[prop_example_1, 1, en_US]

Figure 7-20 Example 1, configuring message classes

The **RAISED - Ack - CLEARED - Ack** message sequence is shown as follows in the event list:

326	10000012	W | VS	19.12.2011	15:35:48,671	COM	SICAM_PAS\wmware_xx	ClockSync	RAISED
327	10000012	W | VS	19.12.2011	15:35:59,965	QUIT	SICAM_PAS\wmware_xx	ClockSync	RAISED
328	10000012	W | VS	19.12.2011	15:36:09,793	GO	SICAM_PAS\wmware_xx	ClockSync	CLEARED
329	10000012	W | VS	19.12.2011	15:36:13,856	QUIT	SICAM_PAS\wmware_xx	ClockSync	CLEARED

[list_example_11, 1, --_--]

The **RAISED - CLEARED - Ack** message sequence is shown as follows in the event list:

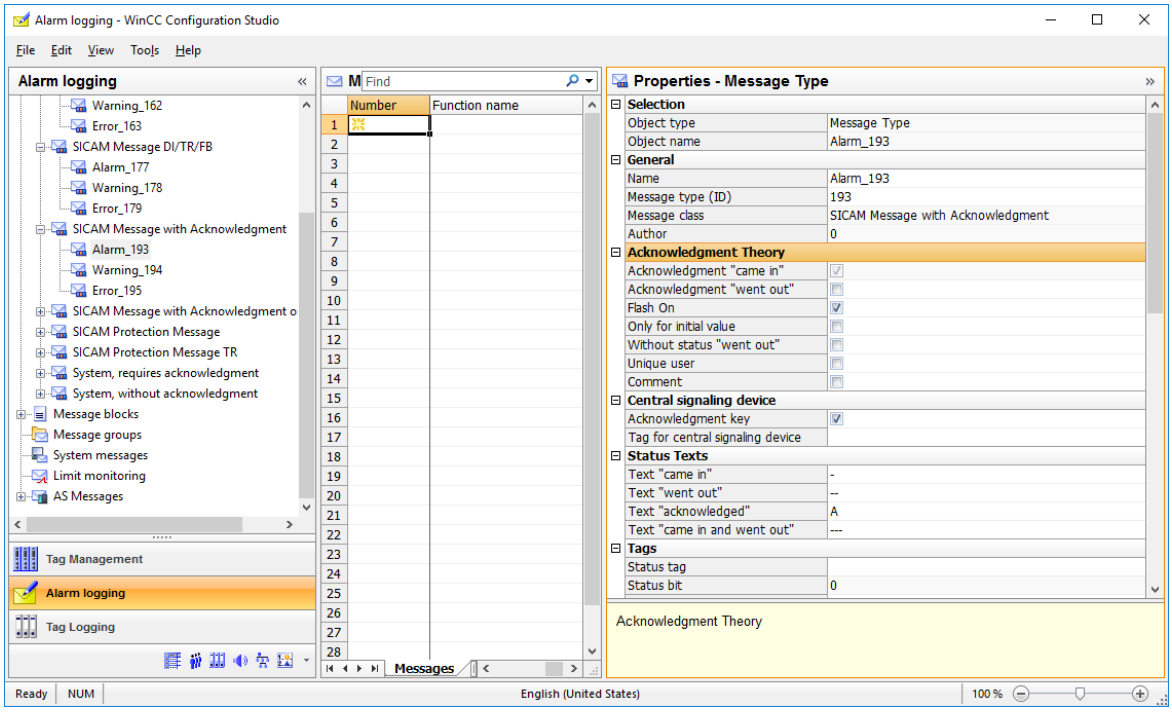
319	10000012	W | VN	19.12.2011	15:20:23,612	COM	SICAM_PAS\wmware_xx	ClockSync	RAISED
320	10000012	W | VN	19.12.2011	15:20:29,023	GO	SICAM_PAS\wmware_xx	ClockSync	CLEARED
321	10000012	W | VN	19.12.2011	15:20:36,822	QUIT	SICAM_PAS\wmware_xx	ClockSync	CLEARED

[list_example_12, 1, --_--]

Example 2

The following settings are defined in the **Configure message classes** dialog, **Acknowledgment** tab:

- The messages have the states **Came in** and **Went out**.
- The **Came in** message must be acknowledged.



[prop_example_2, 1, en_US]

Figure 7-21 Example 2, configuring message classes

The **RAISED - Ack - CLEARED** message sequence is shown as follows in the event list:

316	10000012	W | VN	19.12.2011	15:19:29,102	COM	SICAM_PAS\wmware_xx	ClockSync	RAISED
317	10000012	W | VN	19.12.2011	15:19:39,664	QUIT	SICAM_PAS\wmware_xx	ClockSync	RAISED
318	10000012	W | VN	19.12.2011	15:19:50,580	GO	SICAM_PAS\wmware_xx	ClockSync	CLEARED

[list_example_21, 1, --_--]

The **RAISED - CLEARED - Ack** message sequence is shown as follows in the event list:

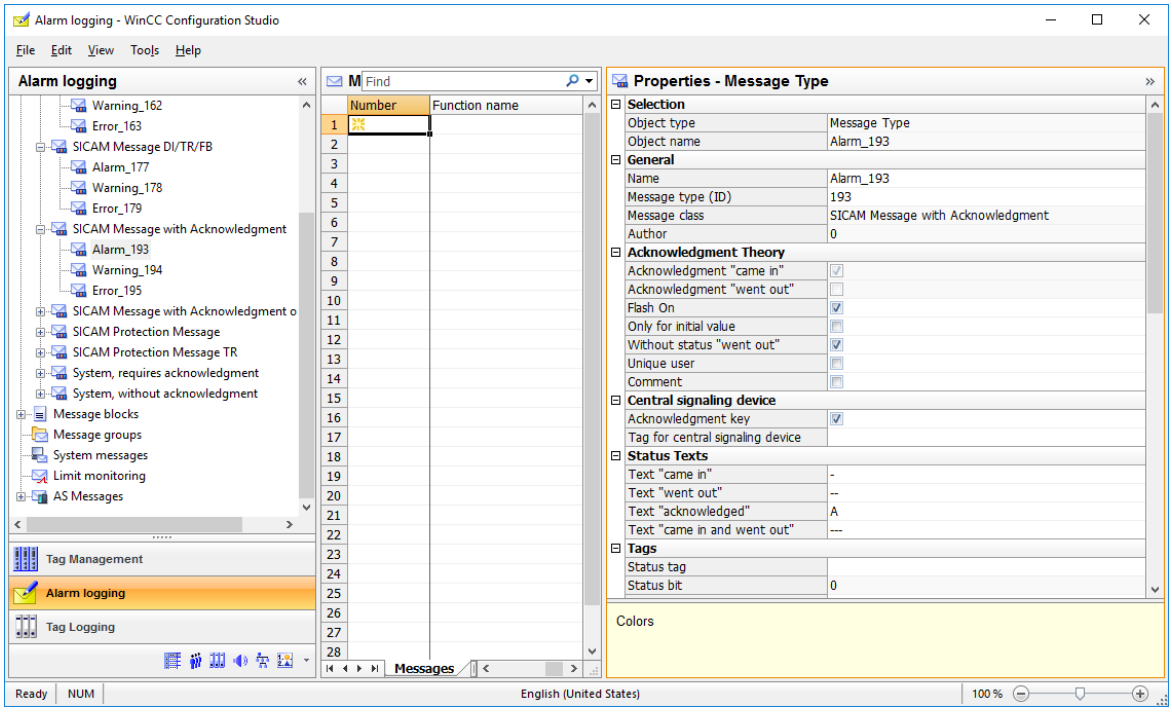
319	10000012	W | VN	19.12.2011	15:20:23,612	COM	SICAM_PAS\wmware_xx	ClockSync	RAISED
320	10000012	W | VN	19.12.2011	15:20:29,023	GO	SICAM_PAS\wmware_xx	ClockSync	CLEARED
321	10000012	W | VN	19.12.2011	15:20:36,822	QUIT	SICAM_PAS\wmware_xx	ClockSync	CLEARED

[list_example_22, 1, --_--]

Example 3

The following settings are defined in the **Configure message classes** dialog, **Acknowledgment** tab:

- The messages only have the state **Came in**.
- The **Came in** message must be acknowledged.



[prop_example_3, 1, en_US]

Figure 7-22 Example 3, configuring message classes

The **RAISED - Ack** message sequence is shown as follows in the event list:

330	10000146	W | VS	19.12.2011	15:38:05,144	COM	SICAM_PAS\wmware_xx\T103M\IF_T1	ledquittung	---
331	10000146	W | VS	19.12.2011	15:38:09,218	QUIT	SICAM_PAS\wmware_xx\T103M\IF_T1	ledquittung	---

[list_example_31, 1, en_US]

7.4.6 Flexible Configuration of the Alarm Logging System

To facilitate the interaction of SICAM SCC with other products such as SIMATIC STEP7 projects (WinCC OS Project Editor) or PCS 7, the SICAM SCC Alarm Logging System can be adapted to the Alarm Logging System in an existing SIMATIC WinCC project.

How to proceed

In SICAM SCC the Alarm Logging System can be flexibly configured in order to write texts or process values into the same columns created for SIMATIC STEP7 or PCS 7 projects.

The IDs of message blocks and message classes can be configured in the **PASNorm.ini** file. The configuration influences both the generation of the SICAM SCC Alarm Logging System during the import of the configuration data and also the Normalization DLL which writes the current process data into the desired data blocks during runtime. The default entries can be transferred to other message block IDs or deactivated.

Configuration of the PASNorm.ini file

A template for the configuration of the Alarm Logging System (**_PASNorm_.ini**) is available in the **misc** subfolder of the SICAM SCC installation directory. This template can be adapted before the start of a SICAM Wizard and saved as **PASNorm.ini** in the same directory. The PASNorm.ini is copied into the WinCC project directory when running a SICAM Wizard for the first time in a **newly created WinCC project**. For this reason any subsequent changes must be performed in the file stored in the project directory.

NOTE

The message lists (WinCC Alarm Control) included in the scope of delivery of the SICAM graphic object library are pre-configured for the SICAM SCC standard. In order to be able to use them, they must be adapted to the modified Alarm Logging System structure (column display and arrangement, SICAM filter settings in the Properties under **Message Lists > Fixed selection > Edit**).

NOTE

The modified **PASNorm.ini** file in the SICAM SCC installation directory is reused when creating a new WinCC project. To configure new projects based on the SICAM SCC standard once again or to use a different configuration, the PASNorm.ini file must be deleted or adapted before creating a new WinCC project using a SICAM Wizard.

Settings for the runtime (behavior of the Normalization DLL)

In the **## RUNTIME Behavior ##** section you configure the data for the processing of process values via the Normalization DLL during the SIMATIC WinCC runtime.

Process value blocks

You can adapt the use of process value blocks via the Normalization DLL in the **PASNorm.ini**. The process value blocks for the configuration mode must be modified analogously.

The use of the process value blocks can be adapted via the **PASNorm DLL** in the **PASNorm.ini**. The process value blocks for the configuration mode must be modified analogously.

- **Runtime mode** column
  The **RB** identifier is used to identify the process value blocks.
- **Default ID** column
  Corresponds to the process value block number which has been fixedly defined so far.
- **Process data block name** column
  Description of the text block.
- **New block ID** column
  Newly defined block number. In the default setting this block number is identical to the default ID.
- **Used Yes/No** column
  Defines whether the process value block is to be filled with process data during the SIMATIC WinCC runtime.

7.5 Dynamic Alarm Filter (DAF)

7.5.1 Overview

The **Dynamic Alarm Filter** (DAF) allows you to decide which – and how – status changes of a message or an analog value are entered into the SICAM SCC message lists or written into a trigger variable.

- You can create several DAFs. There are binary DAFs (with a value of up to 32 bits) and numerical (analog values) DAFs.
- Each DAF is written into a table line by line and you define a corresponding state/criterion and a reaction in each line.
- You can integrate additional, user-defined criteria into the decision matrix which you can control via WinCC (DAF_Marker1 ... 8).
- This means that you can, for example, process a spontaneous message in a different manner than the command acknowledgment from a switch.
- You can define that no entries are created in the message lists for certain status changes.
- Furthermore, you can define value ranges for analog values. A message is shown if an analog value exceeds this range. This ensures that a message is not entered for each value change.
- You can read out the user name from a WinCC variable and transfer it to the message lists (user name DAF, process value block 10).
- In addition, you can describe a trigger variable for each state and, e.g., trigger an action.

The DAFs configured can be assigned to one or several messages.

NOTE

In order to use the DAF functionality, SIMATIC WinCC V7.4 SP1 Upd5 or later is required.

NOTE

To work with DAF, the entire project must be adapted accordingly.

Legacy projects continue to run without DAF by default.

Since message lists with DAF do not work completely in the same way as message lists without DAF, different templates are available in the library.

Advantages

DAFs provide the following advantages:

- DAFs can be used multiple times. A DAF can be linked to several messages based on different data types.
- Value ranges are defined and a message is shown if a range is exceeded, whereas process value changes within the defined range do not trigger a message (threshold function).
- DAFs enable status requests.

User Interface

The **Dynamic alarm filter** function is operated via the **SICAM Dynamic Alarm Filter Configurator** window subdivided into the following 2 dialogs:

- In the **SICAM SCC – Dynamic Alarm Filter Configuration** dialog, you define states (filter criteria) to be checked for the tags. See *7.5.3 Configuration*.
- In the **SICAM SCC – Dynamic Alarm Filter Mapping** dialog, the messages must be assigned the corresponding DAFs. See *7.5.4 Mapping*.

User name in message lists

To write the user name into the message lists, the **DAF_UserName** text tag is created in the SICAMDAF tag group when creating the SICAM project.

The text must not exceed 30 characters. The contents of the tag are written into Process value block 10 (user name) of the AlarmLogging when creating a message. This process value block can be shown in the message lists. You can freely define the contents of the tags during the runtime. Example: The name of the current user can be written into the tag when triggering a command.

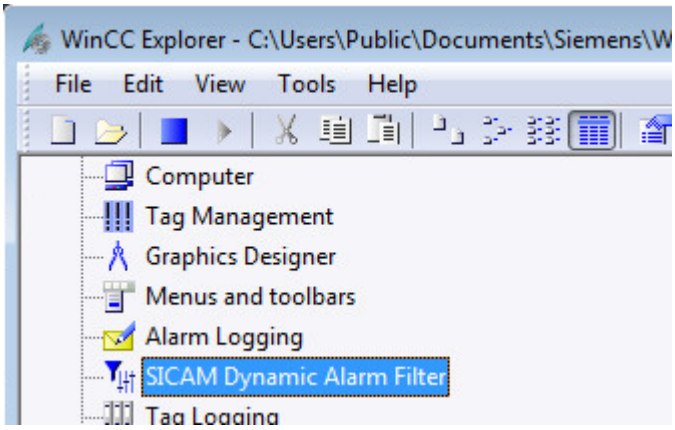
The **@CurrentUserName** tag was not used because it is computer-specific and because the user who is logged on to the process control client does not need to be identical with, e.g., the user logged on to the WinCC server creating the message.

NOTE

This function is only available if the Dynamic Alarm Filter (DAF) is used.

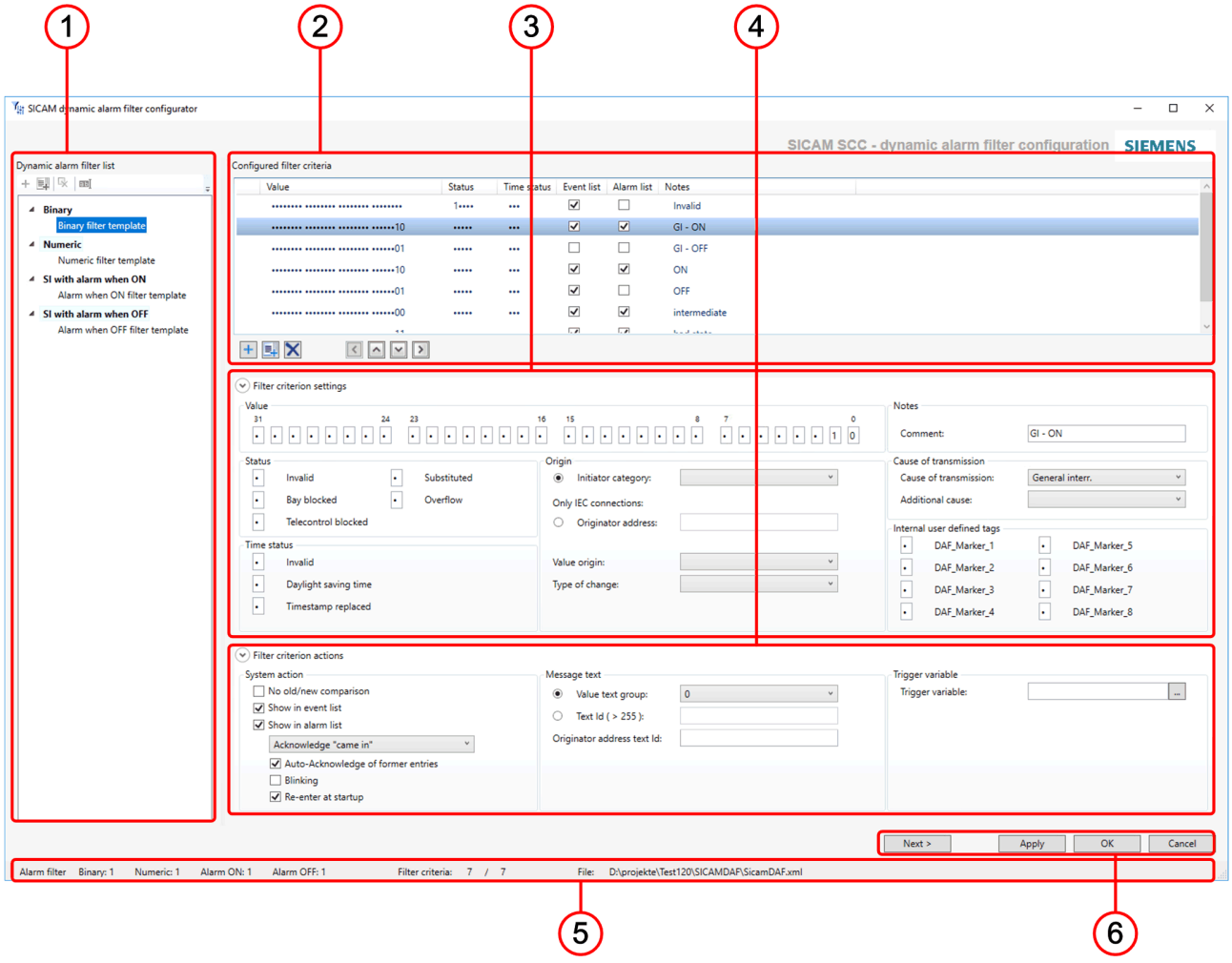
7.5.2 Starting the Dynamic Alarm Filter Function

✧ In the **WinCC Explorer**, double-click **SICAM Dynamic Alarm Filter**.



The **SICAM SCC – Dynamic Alarm Filter Configurator** opens.

7.5.3 Configuration



[le_daf_ui_config, 2, en_US]

(1) *Dynamic alarm filter list, Page 271*

(2) *Configured filter criteria, Page 272*

(3) *Filter criterion settings, Page 273*

(4) *Filter criterion actions, Page 275*

(5) Information Bar

The information bar provides useful information, such as the number of binary and numerical filters or the number of filter criteria.

(6) Buttons

Click **Apply** to save all the settings performed so far. Click **Next >** to open the *7.5.4 Mapping*. Click **OK** to apply all settings and close the window.

Dynamic alarm filter list

This list shows all existing DAFs. It is sub-divided according to the following 2 alarm filter types:

- **Binary alarm filters**

  A binary DAF enables the bit-oriented evaluation of any state and status bits of messages. In addition, you can evaluate digital values (e.g. bit patterns and metered values).

- **Numerical alarm filters**
  A numerical DAF enables the evaluation of any value ranges and status bits of digital and analog values mapped to the message lists. In contrast to the binary DAF, the evaluation is based on numerical values. This means that not the raw value, but the value converted to the measuring range is evaluated (following a linear or non-linear value adaptation).
- **Filter for Single-Point Indication with Alarm when ON**
  A filter type for single-point indications only which sets the alarm for a pending indication (10) and resets it for a non-pending indication (01).
- **Filter for Single-Point Indication with Alarm when OFF**
  A filter type for single-point indications only which sets the alarm for a non-pending indication (01) and resets it for a pending indication (10).

All types are configured and mapped in the same dialog. The display of the value in the filter criteria is the only difference.

Table 7-3 Controls

Icon	Keyboard	Function
	<Ctrl> + <N>	Add new filter A new filter always has the default name ALARMFILTER and should be renamed.
	<Ctrl> + <C>	Add filter copy A copied filter always has the default name ALARMFILTER and should be renamed.
	<Del>	Remove filter
	<F2>	Rename filter
only via context menu		Move filter Moves the filter to an other alarm filter type

You can also call up the functions via a context menu (by right-clicking the menu item).

Configured filter criteria

A DAF can include any number of filter criteria shown in this list together with the states to be checked.

The priority of the filter criteria – and of the states to be checked – decreases from top to bottom. This means that the check starts at the top of the list and runs until a filter criterion is true. In this case, all following filter criteria are not checked.

If one or several sub-criteria exist for the matching filter criteria, these sub-criteria are also checked in the order described above. If a sub-criterion is true, only the actions for this sub-criterion are executed; the actions defined for the corresponding main filter criterion are not executed. If no sub-criterion matches, the actions defined for the main filter criterion are executed.

If no filter criterion matches the variable status or the latest known filter criterion applies again, no list entry occurs. When stopping the runtime, the currently queued filter criteria of all variables are stored and will be imported again during re-start of the runtime.

Table 7-4 Controls

Icon	Keyboard	Function
	<Ctrl> + <N>	Ad new filter criterion
	<Ctrl> + <C>	Add filter-criterion copy
	<Del>	Remove filter criterion

Icon	Keyboard	Function
	<Ctrl> + ←	Use as main filter criterion
	<Ctrl> + ↑	Move up – increase priority
	<Ctrl> + ↓	Move down – lower priority
	<Ctrl> + →	Use as sub-filter criterion A sub-criterion is shown with the following icon. Each main filter criterion can include any number of sub-criteria. Sub-criteria cannot include any subordinate sub-criteria.

You can also call up the functions via a context menu (by right-clicking the menu item).

By default, **Value**, **Status**, **Time status**, **Event list**, **Alarm list** and **Notes** are shown in the header. Right-click the header to open a context menu. Via the items of this context menu, you can show or hide further columns of the **Filter criterion settings** and the **Filter criterion actions**.

Filter criterion settings

Via the **Filter criterion settings** you can define conditions to be fulfilled in order to execute the actions defined for **Filter criterion actions**.

Table 7-5 Parameters of the Filter Criteria

Parameters	Description
Value	
Binary alarm filters	Shows the individual bits (0 to 31) of the tag value from the Alarm Logging. These can be evaluated individually: • 0 (OFF) The bit is checked for the logical value 0 • 1 (ON) The bit is checked for the logical value 1 • (none = default) The bit is masked out and is not considered • (rising edge) The bit changes from 0 to 1 • (falling edge) The bit changes from 1 to 0 • (alternating) The bit changes from 0 to 1 or from 1 to 0
Numeric alarm filters	The value or value range and the hysteresis can be indicated. • (none = default) • < • >= • > • >= • = • [x,y] (range; from x to y) • (Value change)

Parameters	Description
Single-point indication with alarm when ON / Single-point indication with alarm when OFF	The two lowest bits (0 and 1) of the value of the tag from the Alarm Logging are displayed. These can be evaluated individually like for Binary alarm filters (see above).
Notes	
Comment	Enter a comment, e.g. in order to explain how the filter criterion is applied. You can also enter the comment directly in the list of **Configured filter criteria** by double-clicking the corresponding entry in the **Notes** column.
Status	
• Invalid • Bay blocking • Telecontrol blocking • Substituted • Overflow	The following settings are possible for each status: • 0 (OFF) • 1 (ON) • ↑ (rising; from 0 to 1) • ↓ (falling; from 1 to 0) • ↕ (alternating; from 0 to 1 or from 1 to 0)
Time status	
• Invalid • Daylight saving time • Timestamp replaced	The following settings can be defined for each status: • 0 (OFF) • 1 (ON) • ↑ (rising; from 0 to 1) • ↓ (falling; from 1 to 0) • ↕ (alternating; from 0 to 1 or from 1 to 0)
Origin	
Initiator category	The following settings can be defined for the initiator category: • (none) • Irrelevant • Local • Near • Remote • Automatic • Automatic bay • Process • DIGSI local • DIGSI remote • Device invalid • Device locked
For IEC connections only: Originator address	You can enter the originator address for IEC 61850 or IEC 60870-5-104 connections. If the originator address is used, the **orIdent** mode must be selected for IEC 61850 in the 61850.INI file of the driver; for IEC60870-5-104, the **HerkAdrStati** parameter must be set to **1** (HerkAdrStati=1) in the AKServ.INI file.

Parameters	Description
Initiator category	The following settings can be defined for the initiator category: • (none) • Direct (from source) • Undefined origin • From int. process image • From buffer 1 initiator category per filter criterion can be selected.
For PAS connections only: Change ID	The following settings are possible for the change ID: • (none) • Initial (First change of this value after restarting SICAM PAS [SessionID new, first change of the SICAM PAS-COVCounter[3]]) • No change of COVCounter (Message already received, no process value change [SessionID and COVCounter unchanged]) • Normal (The value or status of the process value has changed [SessionID unchanged, COVCounter increased])
Cause of transmission	
Cause of transmission	Here you can select from the list of all *PAS causes of transmission, Page 279*. 1 PAS transmission cause per filter criterion can be selected.
Additional cause	Here you can select from the list of all *PAS additional causes, Page 279*. 1 PAS additional cause per filter criterion can be selected.
User-defined tags	
DAF_Marker_1 ... 8	These are bit tags created automatically after the Wizard run. You can freely control the tag values during the runtime and use them e.g. in order to activate/deactivate individual filter criteria or activate/deactivate messages for certain operating states.

Filter criterion actions

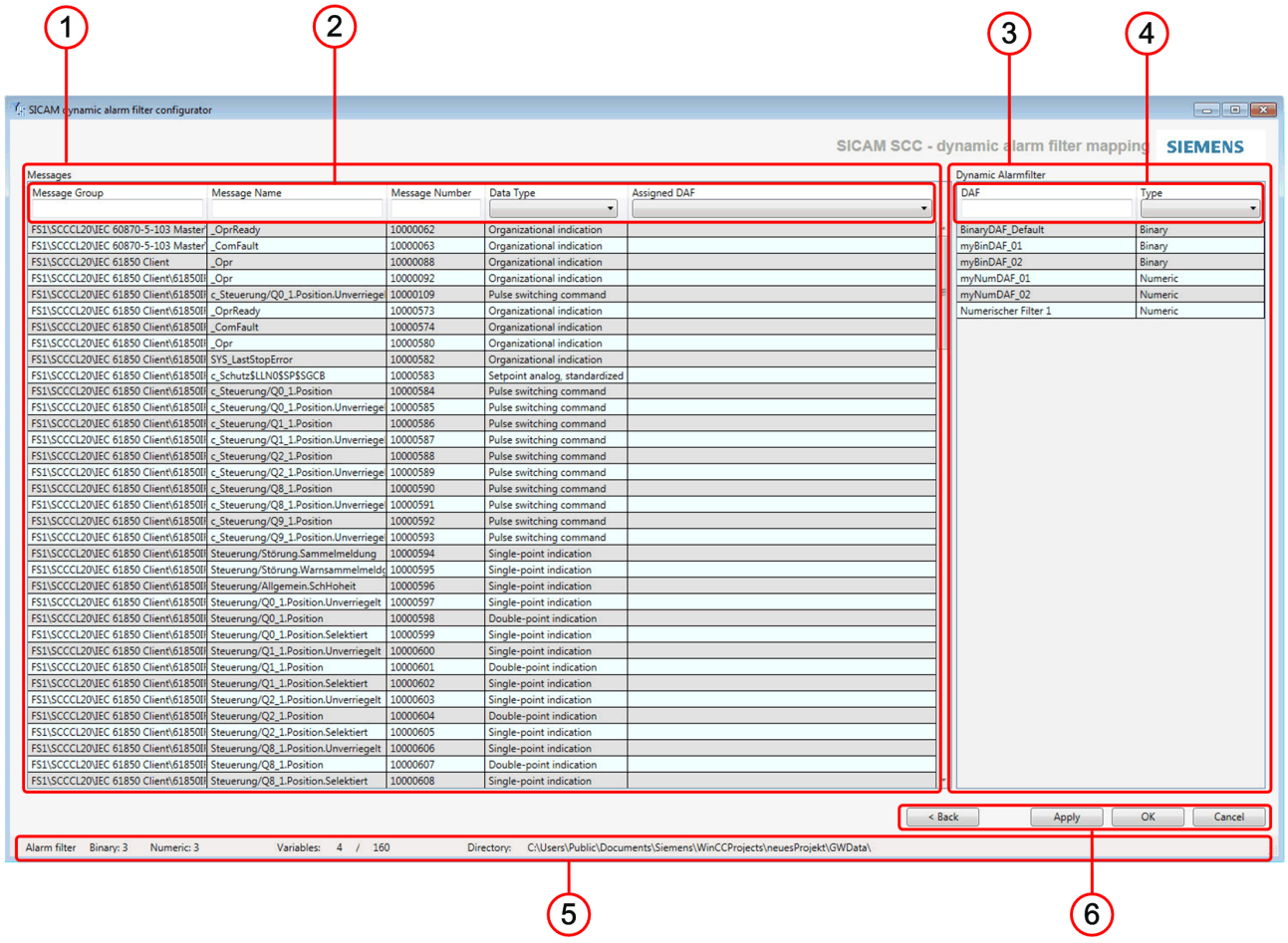
Table 7-6 Parameter for filter criterion actions

Parameters	Description
System behavior	
No old/new comparison	If this option is not active (default), indications whose filtered status equals the filtered status of the previous indication are discarded. If this option is active, the comparison between current and previous filter result is ignored. This allows, for example, to take over cyclically transmitted metered values to the message list even if their values did not change.
Show in event list	If this checkbox is activated, the status is shown in the event list. You can also activate this option directly in the **Configured filter criteria** list in the **Event list** column.

3 COV: Change of value

Parameters	Description
Show in alarm list	If this checkbox is activated, the status is shown in the alarm list. You can also activate this option directly in the **Configured filter criteria** list in the **Alarm list** column.
Acknowledge "came in" / Acknowledge "came in"/"went out"	If **Show in alarm list** is activated, you can define whether **came in** or **came in/went out** is acknowledged.
Auto-Acknowledge of former entries	If **Show in alarm list** is activated, you can also define whether previous instances of this message must be acknowledged automatically.
Blinking	If **Show in alarm list** is activated, you can also define whether the status is shown as blinking in the alarm list. In this case, **Blinking** must be activated in the **AlarmLogging** for the message type and in the corresponding message blocks. In the **AlarmControl**, **Blinking** must also be activated in the diagrams (pictures) for the corresponding message blocks. With these settings you can define different representation variants.
Re-enter at startup	If **Show in alarm list** is active, you can additionally determine with this option if the first indication after startup of SICAM SCC runtime is registered in the alarm list even if it did not change compared to the previous indication.
Message text	
Value text group	Select whether you want to display the message from a value text group (SCC default setting or Groups 1 to 16) or show directly the process value.
Text Id (> 255)	Alternatively, you can enter a text ID for a text to be displayed. This ID is used instead of the text from the value text groups.
Originator address text Id	You can define a text ID for the originator address which is additionally shown in the **ID number** column.
Trigger variable	
Trigger variable	It is also possible to trigger a tag as an action. Select the corresponding trigger variable from the tag selection dialog. Be aware that it must be **binary**. It is always set to **1** and can be reset by the user. You can use it e.g. as a trigger for scripts or in order to control a collective display of various messages which is reset by an acknowledgment.

7.5.4 Mapping



[le_daf_ui_mapping, 1, en_US]

(1) *Messages, Page 277*

(2) *Selection filter for messages, Page 277*

(3) *Dynamic alarm filter, Page 278*

(4) *Selection filters for DAFs, Page 278*

(5) Information bar

The information bar provides useful information, such as the number of binary and numerical filters or the total number of messages.

(6) Buttons

Click **Apply** to save all the settings performed; click **< Back** to return to the *7.5.3 Configuration* of the filter criteria. Click **OK** to apply all settings and close the window.

Messages

This list shows all the messages imported into your SICAM SCC project.

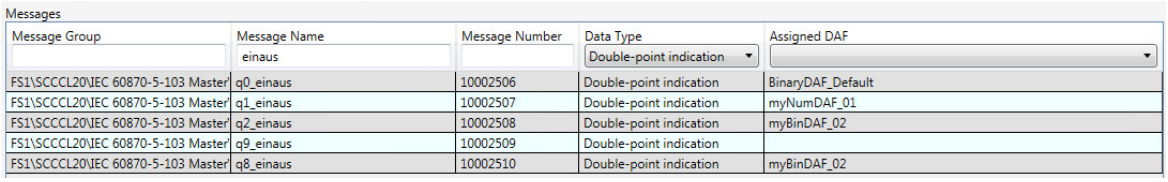
Selection filter for messages

You can filter the list in order to reduce its size and browse for specific messages. All columns are available as filter criteria.

- **Message Group** (free text)
- **Message** (free text)
- **Message Number** (free text)

- **Data Type** (list box which automatically shows all available data types)
- **Assigned DAF** (list box which automatically shows all configured DAFs)

You can, for example, only show **double-point indications** with "einaus" in the **Message Name**:



[sc_daf map filter, 1, en_US]

NOTE

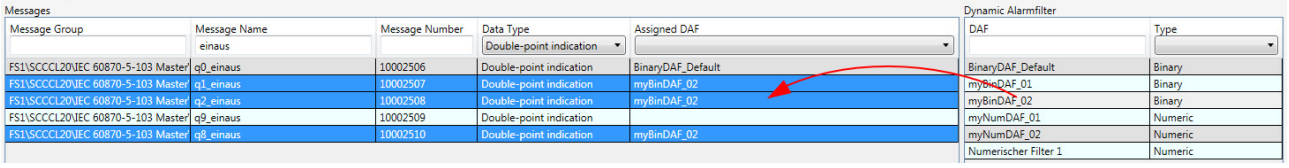
For the free texts for **Message Group** and **Message** you can use ".", "?" and "*" as wildcards.

Dynamic alarm filter

This list shows all configured DAFs.

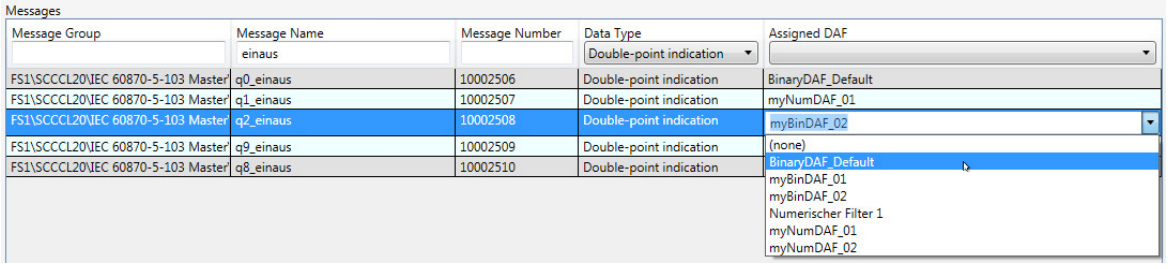
In order to assign a DAF to a message, drag and drop the DAF from the list to the message selected. To perform multiple assignments (i.e. assign a DAF to several messages), press the Shift or Alt key in order to select several messages and then drag the corresponding DAF to these messages.

In just one step, you can e.g. assign the DAF **myBinDAF_01** to the messages **q1_einaus**, **q2_einaus** and **q8_einaus** from the example above (see *Selection filter for messages, Page 277*):



[sc_daf map dnd, 1, en_US]

To assign a DAF to several messages, you can double-click the messages in the **Dynamic alarm filter** column and then select the corresponding DAF from the selection list:



[sc_daf map listbox, 1, en_US]

To delete DAF assignments, either select them individually (from the **(none)** list or press **<Del>** in the selected line) or perform a multiple selection (select several lines and then press **<Del>**).

To undo a multiple selection, press **<Esc>**.

Selection filters for DAFs

You can filter the list in order to reduce its size and browse for specific DAFs. All columns are available as filter criteria.

- **Name** (free text)
- **Type** (list box: none, binary, numerical, SI with alarm when ON, SI with alarm when OFF)

- **SI with alarm when ON**
- **SI with alarm when OFF**

7.5.5 Assignment Tables

PAS causes of transmission

The following table serves for the assignment of IEC values to SICAM PAS values.
SICAM PAS also uses additional values.

Table 7-7 IEC-COT ⇔ PAS-COT Assignment Table

IEC-COT	PN Bit[4]	SE Bit[5]	PAS-COT	InitiatorCategory empty=eIrrelevant (0)
COT_GA (2)	-	-	eGeneralInterrogation (8)	
COT_SPONTAN (3)	-	-	eSpontaneous (1)	
COT_ACTIVATION (6)	-	1	eSelect (16)	
	-	0	eCommand (19)	
COT_CONFIRMATION (7)	0	1	eSelectConfPos (17)	
	1	1	eSelectConfNeg (18)	
	0	0	eCommandConfPos (20)	
	1	0	eCommandConfNeg (21)	
COT_DEACTIVATE (8)	-	-	eAbort (25)	
COT_CONFDEACTIVATE (9)	0	-	eAbortConfPos (26)	
	1	-	eAbortConfNeg (27)	
COT_TERMINATION (10)	0	1	eSelectTermPos (39)	
	1	1	eSelectTermNeg (40)	
	0	0	eCommandTermPos (35)	
	1	0	eCommandTermNeg (36)	
COT_RUECKMFERNBEF (11)	-	-	eReturnInformation (34)	eNearControl (2)
COT_RUECKMNAHBEF (12)	-	-	eReturnInformation (34)	eLocalControl (1)
COT_BACKGROUNDSCAN (20)	-	-	eGeneralInterrogation (8)	

PAS additional causes

The following table serves for the assignment of IEC values to SICAM PAS values.
SICAM PAS also uses additional values.

Table 7-8 IEC-AddCause ⇔ PAS-AddCause Assignment Table

IEC-AddCause	PAS-AddCause
unknown (0)	eAddCPositive (0)
not_supported (1)	eAddCCommandNotAccepted (41)
Blocked_by_switching_hierachy (2)	eAddCAuthorityViolation (99)
Select_failed (3)	eAddCCommandNotAccepted (41)
Invalid_position (4)	eAddCPlausibilityError (114)
Position_reached (5)	eAddCStateAlreadyReached (117)
Parameter_change_in_execution (6)	eAddCParameterError (98)

4 PN Bit: 1 = negative confirmation, 0 = positive confirmation

5 SE Bit: 1 = select, 0 = execute

IEC-AddCause	PAS-AddCause
Step_limit (7)	CDC=BSC: Value=2 (closed) eAddCUpperBoundReached (112) Otherwise: eAddCLowerBoundReached (113) Otherwise: eAddCPositive (0)
Blocked_by_mode (8)	eAddCOutputBlockageSet (102)
Blocked_by_process (9)	eAddCOutputBlockageSet (102)
Blocked_by_interlocking (10)	eAddCSwitchingErrorProtectionInterlock (97)
Blocked_by_synchrocheck (11)	eAddCSychronizationPreconditionFailure (115)
Command_already_in_execution (12)	eAddCTooManyActiveCommands 38()
Blocked_by_health (13)	eAddCDeviceStatus (116)
One_of_n_control (14)	eAddCOneOutOfNErrorSoftware (121)
Abortion_by_cancel (15)	eAddCCommandNotAccepted (41)
Time_limit_over (16)	eAddCMonitoringTimeExpired (118)
Abortion_by_trip (17)	eAddCCommandNotAccepted (41)
Object_not_selected (18)	eAddCCommandNotAccepted (41)
Object_already_selected (19)	eAddCCommandNotAccepted (41)
No_access_authority (20)	eAddCAuthorityViolation (99)
Ended_with_overshoot (21	eAddCOverload (105)
Abortion_due_to_deviation (22)	eAddCCommandNotAccepted (41)
Abortion_by_communication_loss (23)	eAddCCommandNotAccepted (41)
Blocked_by_command (24)	eAddCOutputBlockageSet (102)
None (25)	eAddCCommandNotAccepted (41)
Inconsistent_parameters (26)	eAddCParameterError (98)
Locked_by_other_client (27)	eAddCOneOutOfNErrorSoftware (121)

7.6 SICAM Functions

Overview

The SICAM functions complement the default functions of SIMATIC WinCC. The SICAM functions are C scripts. When a project is created, they are copied as project functions and made available by a SICAM Wizard.

SICAM functions can be used for the processing of commands, alarms and measured values.

C scripts can be opened and edited using the C Editor. For more detailed information, refer to the documentation of SIMATIC WinCC.

7.6.1 Commands

Use the SICAM functions described in this paragraph for issuing commands.

The following functions are available:

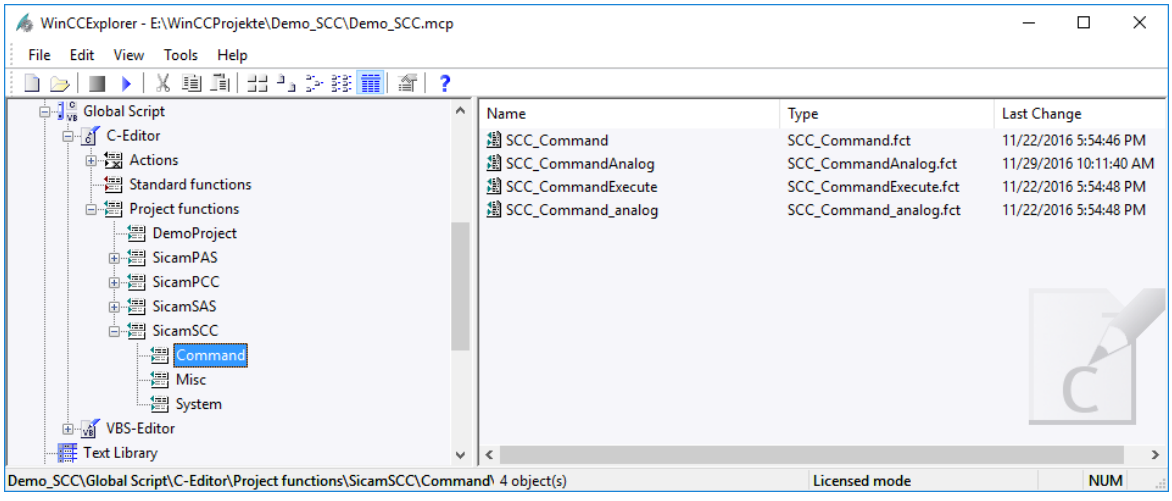
Table 7-9 SICAM functions for command execution

Name	Meaning
SCC_Command_Analog	Issuing of commands for analog values
SCC_Command	Issuing of commands for digital values
SCC_CommandExecute	Command execution, for two-step command output

The SICAM command output functions are available in the WinCC Explorer under **Global Script/C Editor/ Project Functions/SICAMSCC/Command**.

The SICAM command output functions can be used depending on the individual tag type.

By default, the **SCC_Command_Analog** and **SCC_Command** functions perform the complete command output. In order to transmit the command in 2 steps, customize the scripts and additionally call up the **SCC_CommandExecute** function. The related description is available in the corresponding scripts.



[pascc701, 1, en_US]

Figure 7-23 SICAM command output functions

7.6.1.1 Command for Floating Point Values

Format

The SICAM command output function in **Float** number format has the following structure:

```
void SCC_CommandAnalog ( char* p_cTagName, float p_fValue, DWORD p_dwValueType,
DWORD p_dwDuration, DWORD p_dwCOT )
```

Description

Use this function to issue a command in **Float** format. The name of the command tag is used as transfer parameter (e.g. **Bay01_device02** or **Bay01_device02.value**).

The tag can be any structure element (**Value**, **Cause**, **Valuetype**, **CmdCounter**).

Additionally, you transfer a value of the Float type (e.g. in order to output an analog setpoint), the number format (e. g. **22** for an analog setpoint), the command duration in milliseconds (ms), and the cause identifier. For more detailed information on number formats, refer to appendix A.1.3.

Suggested trigger

Suggested trigger for the **PAS_Command_Float** function:

As trigger for this function, you can use any action of an object, e. g. a click a button.

NOTE

Use a Windows object of the **Slider Object** type (in the Graphics Designer of SIMATIC WinCC) in order to create a variable definition of an analog setpoint in floating point format via the **value** structure element.

7.6.1.2 Command for Digital Values

Format

The SICAM command output function based on the **Signed integer** number format has the following structure:

```
void SCC_Command ( char* p_cTagName, int p_iValue, DWORD p_dwValueType,
DWORD p_dwDuration, DWORD p_dwCOT, BOOL p_bNoSynch, BOOL p_bNoLock )
```

Description

Use this function to issue a command in **PAS_Command_Integer** format. The name of the command tag is used as transfer parameter (e. g. **Bay01_device03** or **Bay01_device03.value**).

The tag can be any structure element (**Value**, **Cause**, **Valuetype**, **CmdCounter**).

Additionally, you transfer the switching direction (1=OFF, 2=ON for a pulse command), the number format (e. g. **14** for a pulse command), the command duration in milliseconds (ms), the cause identifier, and the bits for the Qualifier of Command (QoC, for the IEC Communication Suite). For more detailed information on number formats, refer to appendix A.1.3.

Suggested trigger

Suggested trigger for the **Command output with the Integer number format** function:

As trigger for this function, you can use any action of an object, e.g. a click a button.

7.6.1.3 Command Execute

Format

The Command Execute function has the following format:

```
void SCC_CommandExecute(char* p_cTagName)
```

Description

This function executes a command. To do this, the value of the **CmdCounter** structure element of the command tag is increased. The name of the command tag is used as transfer parameter.

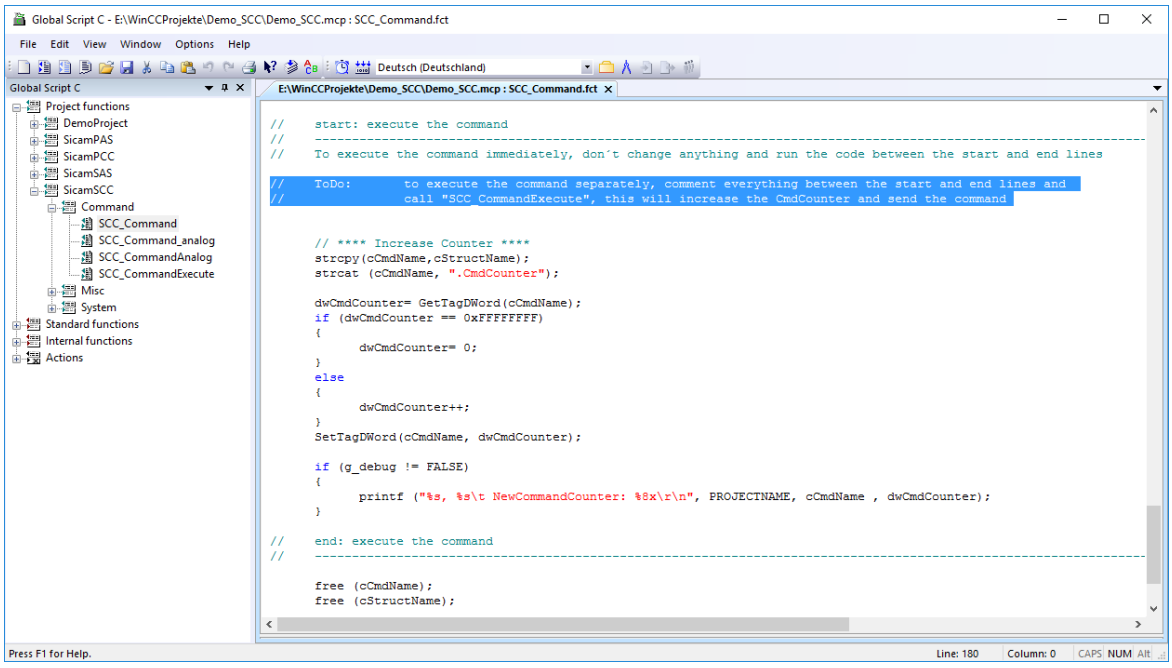
The tag can be any structure element (**Value**, **Cause**, **Valuetype**, **CmdCounter**).

The **Command Execute** function is used as second step of a command execution.

As the first step, you can e. g. use the SICAM command output function. **In this case, however, the rows for the command execution must be commented in the C script!** (See comments in the **SCC_Command** and **SCC_Command_analog** script)

To comment the script lines:

✧ Open the C script using the C editor.



[pascc702, 1, en_US]

Figure 7-24 Commenting command lines

✧ To comment the command execution lines (selected lines), add two slashes at the beginning of each line.

✧ Save the modified script.

Suggested trigger

Suggested trigger for the **Command Execute** function:

As trigger for this function, you can use any action of an object, e.g. a click a button.

7.6.2 Substituting Values

7.6.2.1 Overview

Via SICAM SCC, values in SICAM PAS/PQS and in IEC 61850 devices that support substitution (z.B. SIPROTEC 5), can be manually updated/substituted. For example, a substitution is required if there is no connection to the device/primary technology level although values are required in SICAM PAS/PQS or SICAM SCC.

SICAM functions are available for the substitution of values.

The following values can be substituted:

- Bit pattern values
- Measured values (floating point values), metered values (integer values)
- Switch positions (signed integer values)
  For more detailed information, refer to chapter *4.4.6 Runtime Dialogs of SICAM Switch Controls*.

Values are substituted by means of the following 2 subfunctions:

- Setting the value of the message to the substituted value and setting the status (validity) of the message to **substituted**.
- Incrementing the value of the **WBCounter** (Write-Back-Counter) structure element in order to ensure that the value is substituted in SICAM PAS/PQS.

For more detailed information on the structure of the indication tags, refer to appendix A.

A substitution can be performed if the message fulfils one or two of the following status criteria:

- Invalid
- Not topical
- Bay blocking set
- Substituted

The following functions are available:

Table 7-10 SICAM value substitution functions

Name	Meaning
SCC_PAS_SubstituteAnalog	Substitution of values in Float format
SCC_PAS_Substitute	Substitution of values in Integer format

Table 7-11 Additional functions for IEC Communication Suite (at present only for IEC 61850)

Name	Bedeutung
SCC_IEC_SubstituteAnalog	Nachführen mit dem Zahlenformat Float
SCC_IEC_Substitute	Nachführen mit dem Zahlenformat Integer
SCC_IEC_SubstituteReset	Rücksetzen des nachgeführten Wertes

The SICAM substitution functions are available in the WinCC Explorer under **Global Script/C Editor/Project Functions/SICAMSCC/misc**.
Various SICAM substitution functions can be used depending on the individual number format.

7.6.2.2 Substituting Floating Point Values

Format

The SICAM substitution function for values in **Float** number format has the following structure:

```
void SCC_PAS_SubstituteAnalog(char* p_cTagName, float p_fValue)
```

Description

Use this function to substitute a value in **Float** format. Therfor the tag name and the substitute value must be transferred to the function.
The tag can be any structure element of a SICAM structure tag (**Value**, **Cause**, **Valuetype**, **CmdCounter**).
For more detailed information on number formats, refer to appendix A.1.3.

Suggested trigger

Suggested trigger for the **PAS_Substitute_Float** function:
As trigger for this function you can use any action of an object, e.g. a click on a button.

7.6.2.3 Substituting Digital Values

Format

The SICAM substitution function for values in the **Signed Integer** number format has the following structure:

```
void SCC_PAS_Substitute(char* p_cTagName, int p_iValue)
```

Description

Use this function to substitute a value in the **Signed Integer** format. Therefor the tag name and the substitute value must be transferred to the function.

The tag can be any structure element (**Value**, **Cause**, **Valuetype**, **CmdCounter**).

For more detailed information on number formats, refer to appendix A.1.3.

Suggested trigger

Suggested trigger for the **Substitution with Integer number format** function:

As trigger for this function, you can use any action of an object, e. g. a click a button.

For more detailed information on the substitution of switch positions, refer to chapter *4.4.6 Runtime Dialogs of SICAM Switch Controls*.

The **Switch position substitution** function is also integrated in the ActiveX Controls.

7.6.3 Object-Specific Blocking

When using SICAM PAS/PQS, V8.01 or later, an information-specific blocking can be defined for information from the SICAM PAS target system. A C script is available for this function.

Format

The **object-specific blocking** has the following format:

```
void SCC_PAS_SetBlockState(char* p_cTagName, int p_iBayBlocked,
int p_iTelecontrolBlocked)
```

Description

You can use this function in order to set or undo blocking for an individual item of process information. When using SICAM SCC switching device objects this function is integrated in the status dialog, see chapter *4.4.6 Runtime Dialogs of SICAM Switch Controls*.

The parameters for the function are as follows:

- Tag name (p_cTagName)
- Bay blocking value (p_iBayBlock)
- Telecontrol blocking value (p_iTelecontrolBlock).

The following values are possible:

0	No change
1	Undo blocking
2	Set blocking

After activating bay blocking the value of the object can be substituted using the functions described in chapter *7.6.2 Substituting Values*.

7.6.4 Functions for Processing of Messages

7.6.4.1 Overview

Use the SICAM functions described in this paragraph for the processing of alarm messages.
The following functions are available:

Table 7-12 General SICAM functions

Name	Meaning
PAS_CreateMessage_V500	Create a message with text from the text library
PAS_CreateMessageStr_V500	Create a message with text transfer
PAS_CreateMessageStr2_V500	Create a message with transfer to 2 texts
SCC_AcknowledgeAlarm	Acknowledge message in warning message list

The SICAM functions for the processing of messages and measured values are available in the WinCC Explorer under **Global Script/C Editor/Project Functions/SICAMSCC/misc**.

7.6.4.2 Creating a Message - Text from the Text Library

Format

The **Create message** function has the following structure:

```
void PAS_CreateMessage_V500(DWORD dwMsgNr, DWORD dwState, DWORD dwTextID)
```

Description

This function creates a message in the SIMATIC WinCC Alarm Logging system.
It requires the message number, the SIMATIC WinCC message status (1 = Raised, 2 = Cleared) and the ID of the text to be shown in the **Value** column.

NOTE

The new message must be created with this ID in the Alarm Logging system first.

7.6.4.3 Creating a Message - with Text Transfer

Format

The **Create message** function has the following structure:

```
void PAS_CreateMessageStr_V500(DWORD dwMsgNr, DWORD dwState, char* lpszMsgText)
```

Description

This function creates a message in the SIMATIC WinCC Alarm Logging system.
It requires the message number, the SIMATIC WinCC message status (1 = Raised, 2 = Cleared) and the text to be shown in the **Value** column.

NOTE

The new message must be created in the Alarm Logging system first.

7.6.4.4 Acknowledging A Message in the Warning Message List

Format

The **Acknowledge message in warning message** list function has the following format:

```
void SCC_AcknowledgeAlarm(char* p_cMsgAckTagName, DWORD MsgNumber)
```

Description

This function creates Acknowledged messages in the warning message list via the message number.

For this function you transfer the name of the raw data tag (MSG_Ack_... for acknowledgment) of the communication channel via which the message is received, as well as the message number.

7.6.5 Function for Copying Tag Values

Format

The **Copy tag values** function has the following format:

```
SCC_CopyTagValueRT(char* p_cSourceTagName, char* p_cDestinationIntTagName,
BOOL p_bDigitalValue)
```

Description

This function copies the current runtime data of a tag of the **PAS Information** type into an internal tag structure of the same type. This is mainly required in order to use a switch several times for topological coloring, which the topological coloring plausibility check would not allow (e.g. use of switchgear trucks: the disconnector is drawn twice).

The transfer parameters are the structure tags of the source and target tags as well as the information whether it is a digital or analog value.

The names can be transferred with an extension (e.g. **.RTInfo**) or without an extension.

`p_bDigitalValue` is transferred with **0** for analog and **1** for digital values.

7.6.6 Using SICAM Functions

The SICAM functions can be used to assign dynamic display properties to graphic objects in SIMATIC WinCC station diagrams.

Dynamic display properties

With the dynamic display properties, you can visualize a station's status in the control and monitoring direction.

C action

Via the C action, you can use all functions provided by SIMATIC WinCC. These also include the SICAM functions.

Commands

Use the **Commands** SICAM functions for the assignment of dynamic display properties in the command direction.

General SICAM functions

The general SICAM functions allow you to visualize the different states of a station in the monitoring direction.

7.6.7 Global Actions

The currently necessary global actions are copied into the project when importing the SICAM graphic object library.

They are available in the WinCC Explorer under **Global Script/C Editor/Actions/Global Actions**.

For optional global actions and global actions originating from previous versions refer to the installation directory in the **PAS** subfolder. You can copy them into your project if required.

SicamPAS_Compkey

This global action is created dynamically during the import process. During runtime, it checks whether the **compatibility keys** of the SICAM SCC project and the SICAM PAS project are identical. If this is not the case, a message is shown when the runtime is terminated.

No compatibility check is performed for SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices.

Sicam_AsyncTicks

The **Sicam_AsyncTicks** global action writes into the **@AsyncTick** internal administrative tags (see *7.7.1 Administrative Tags*). These tags are used to initiate topological coloring or a change in colors.

SicamPas_AlarmListFilter

The **SicamPas_AlarmListFilter.pas** C script distributes the settings performed via the **Message List Filter checkbox** to the external administrative tags of the connected communication channels.

When the runtime is terminated, the filter setting can be saved for the next start:

- From SIMATIC WinCC V7.0 SP1, the **Runtime Persistence** option of the internal **@AlarmList-Filter_ValueInt** tag can be set.
- With older versions of SIMATIC WinCC (earlier than V7.0 SP1), the **AlarmListFilter_WriteExt** tag must be set to **1**. This functionality is integrated in the **Button End** graphic object.

NOTE

The **AlarmListFilter_WriteExt** tag can only be used when terminating the runtime (consistency of the tag management).

SICAM_FlashSyn

The **SICAM_FlashSyn** global action writes into the **@Flashxxx** internal administrative tags (see chapter *7.7.1 Administrative Tags*).

This synchronizes the blinking of the IndustrialX Controls (SICAM PAS CC Version 5.10 or earlier).

Sicam1703_RedundancyMaster

The **Sicam1703_RedundancyMaster.pas** C script is created dynamically during the import process. It mirrors the **@RM_Master** administrative tag to the **RedundancyMaster_xx** external tag.

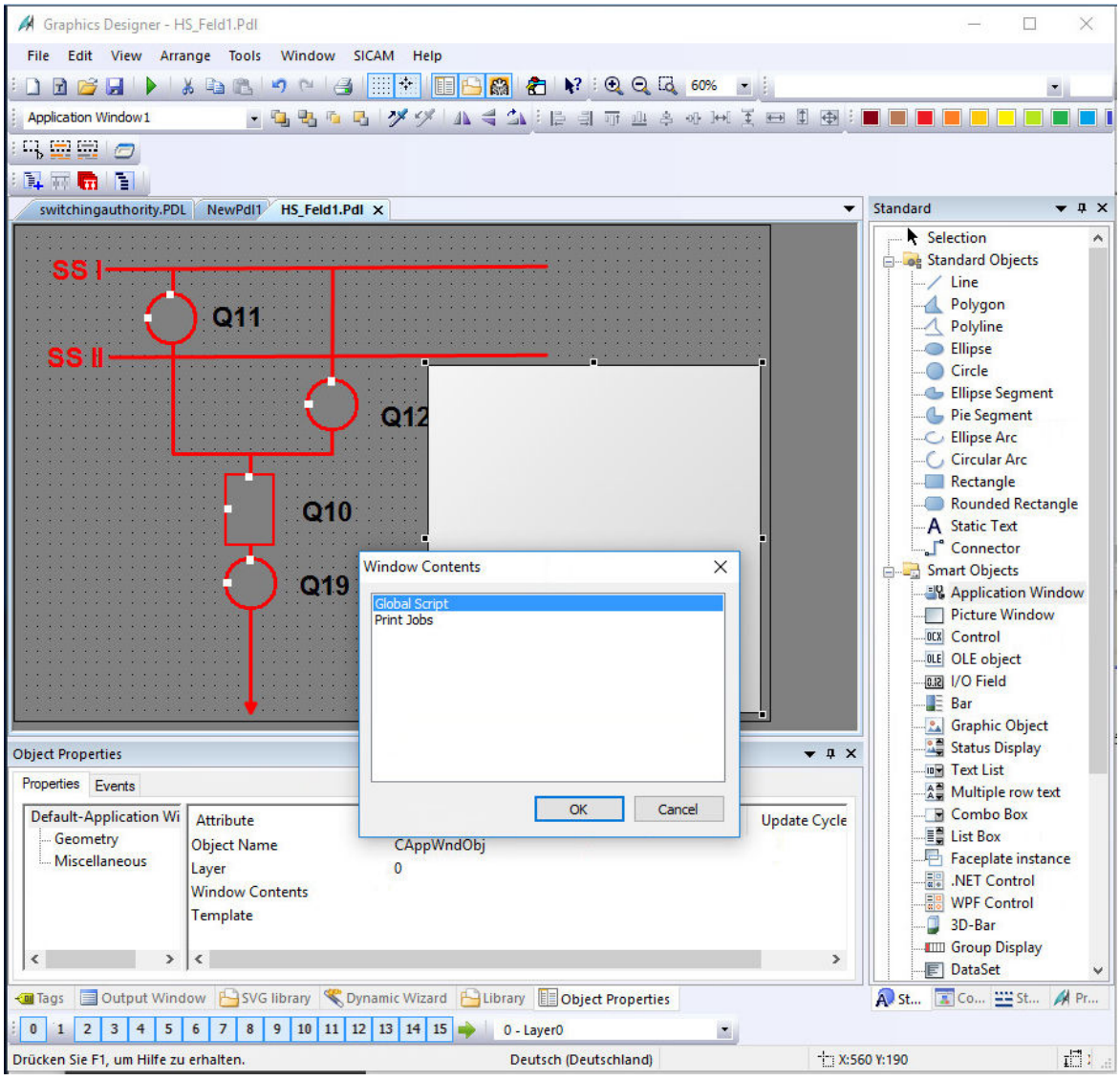
7.6.8 Testing SICAM Functions

The progress of the SICAM functions can be viewed during the runtime. To do this, add an application window and a checkbox from the project library to your diagram.

Inserting an application window

✧ Select the **Application window** object under Smart Objects in the Graphics Designer.

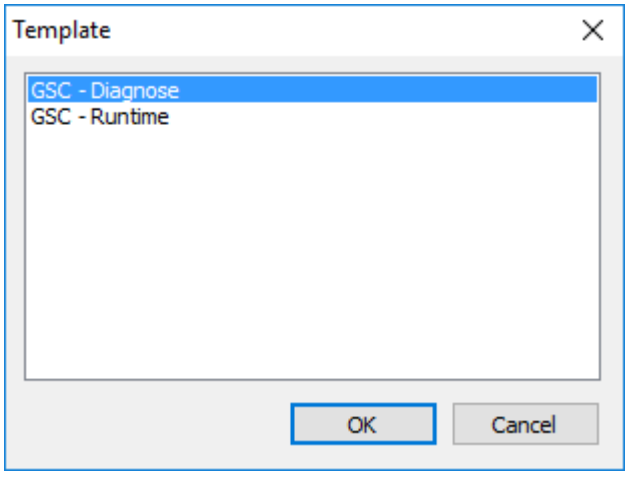
✧ Arrange the object in your diagram. The **Window Contents** dialog opens.



[pascc704, 1, en_US]

Figure 7-25 Inserting an Application Window

✧ Select **Global Script** and click **OK** to confirm. The **Template** window opens.



[pascc705, 1, en_US]

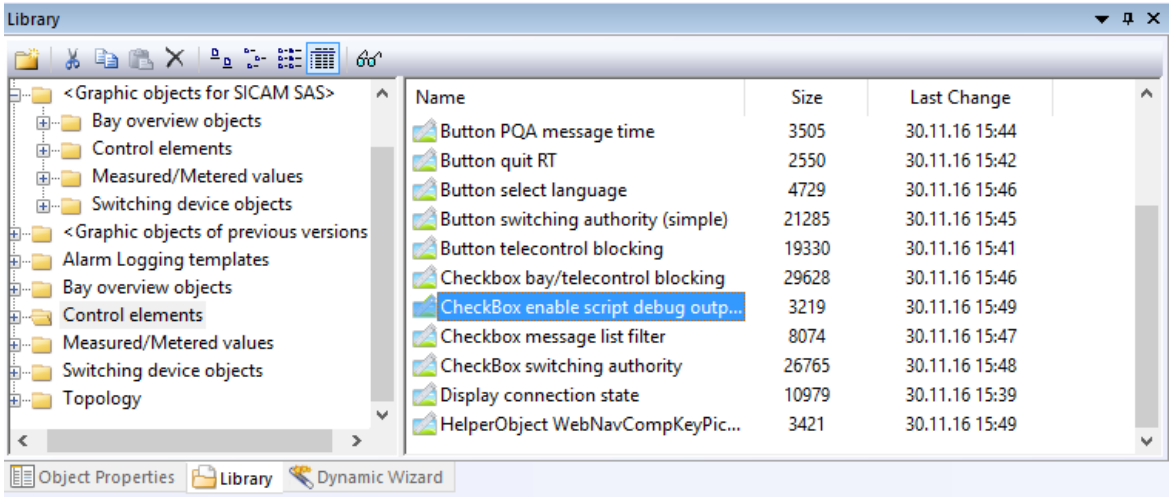
Figure 7-26 Selecting a Template

✧ Select **GSC Diagnostics** and click OK to confirm.

Inserting a checkbox

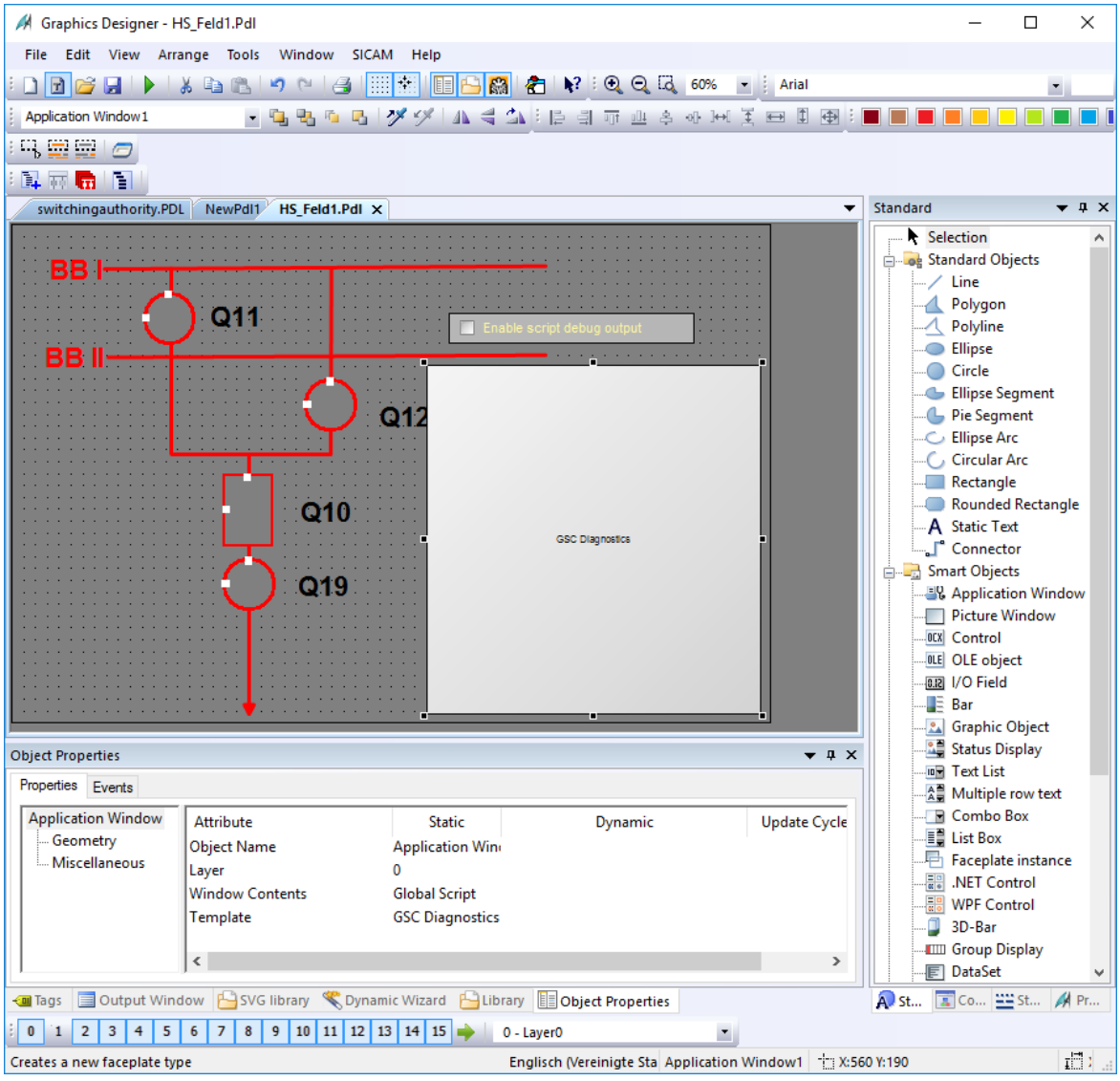
Insert the graphic object to be used for enabling/disabling the output of debug information.

✧ Insert the
CheckBox enable script output graphic object from the library into your diagram.



[pascc706, 1, en_US]

Figure 7-27 Inserting the CheckBox enable script output graphic object



[pascc707, 1, en_US]

This checkbox allows you to enable/disable the output of debug information during runtime.

7.6.9 Calling the SICAM PQ Analyzer

Overview

You can call up the **SICAM PQ Analyzer** (Incident Explorer) from within SICAM SCC. This is possible from:

- A diagram
- The event list

In SICAM SCC you create a parameter file for the SICAM PQ Analyzer. In the opened Incident Explorer, the fault records are displayed according to the parameters for topology and time period, as defined in SICAM SCC.

Prerequisites

To be able to call up the SICAM PQ Analyzer from within SICAM SCC, the following prerequisites have to be fulfilled:

- The SICAM PQ Analyzer V3.03 or higher is installed on the SICAM SCC computer with the required licenses.
- A SICAM PQ Analyzer archive is configured according to the specifications, see Manual */11/ SICAM PQ Analyzer, Incident Explorer*.
- Fault records are available in the SICAM PQ Analyzer archive.

7.6.9.1 Call from a Diagram

Configuration in SICAM SCC

To configure the call in SICAM SCC:

✧ Create a new diagram in the **Graphics Designer**.

✧ To open the **Library**, click **View > Library**.

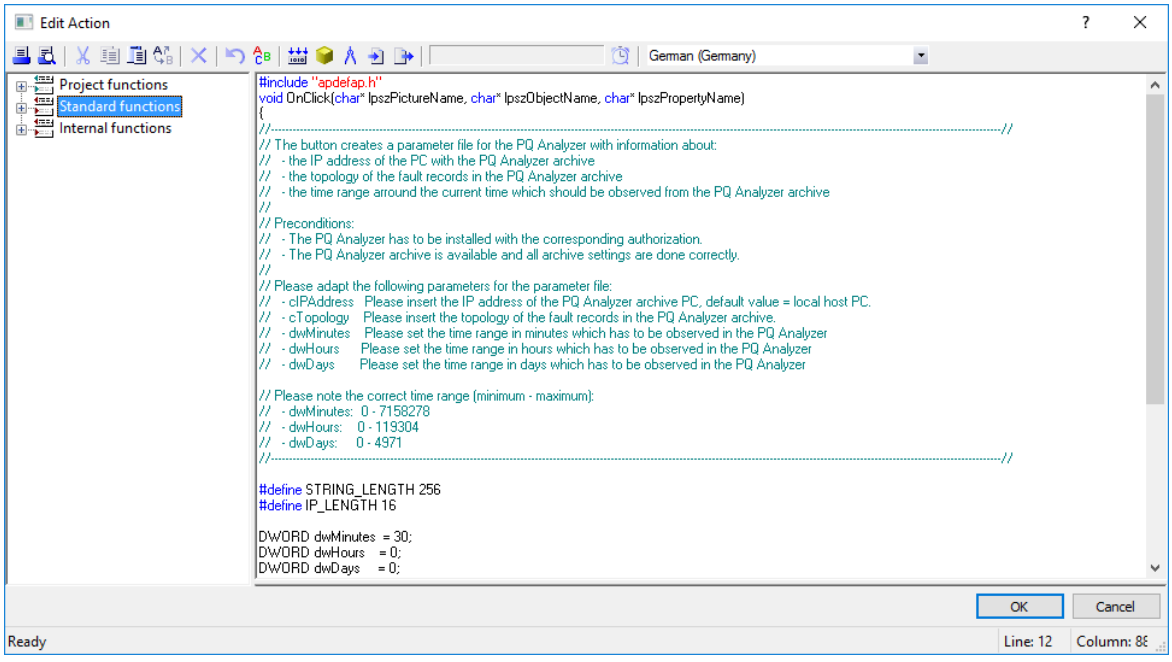
✧ Under **Controls**, select the **Button PQA current time** object.

✧ Draw the graphics object to the desired position within the diagram.

✧ Right-click the button and select **Properties** from the context menu.
The **Object properties** dialog opens.

✧ Open the **Event** tab.

✧ Under **Button > Mouse**, double-click **Mouse Action**.
The **Action Editor** opens and the C script is displayed.



[c-skript_editieren, 1, en_US]

Figure 7-28 Editing the C Script

✧ Adjust the following parameters for the display of your SICAM PQ Analyzer archive:

- **char *cIPAddress**
  The IP address of the computer where the archive is located.
  The IP address of the local computer is the default address.

- **char *cTopology**
  The topology to be displayed in the SICAM PQ Analyzer.
  Be aware of the double notation of the backslash.

NOTE

Consider the correct upper and lower case. Otherwise the SICAM PQ Analyzer cannot display the topology properly.

- **DWORD dwMinutes, DWORD dwHours, DWORD dwDays**
  The period when the fault records are to be displayed in the SICAM PQ Analyzer. You can set the period in minutes, hours, and/or days, see example below.

In the following example the **Incident Explorer** of the SICAM PQ Analyzer shows all fault records of the past 30 minutes up to now.
Example:

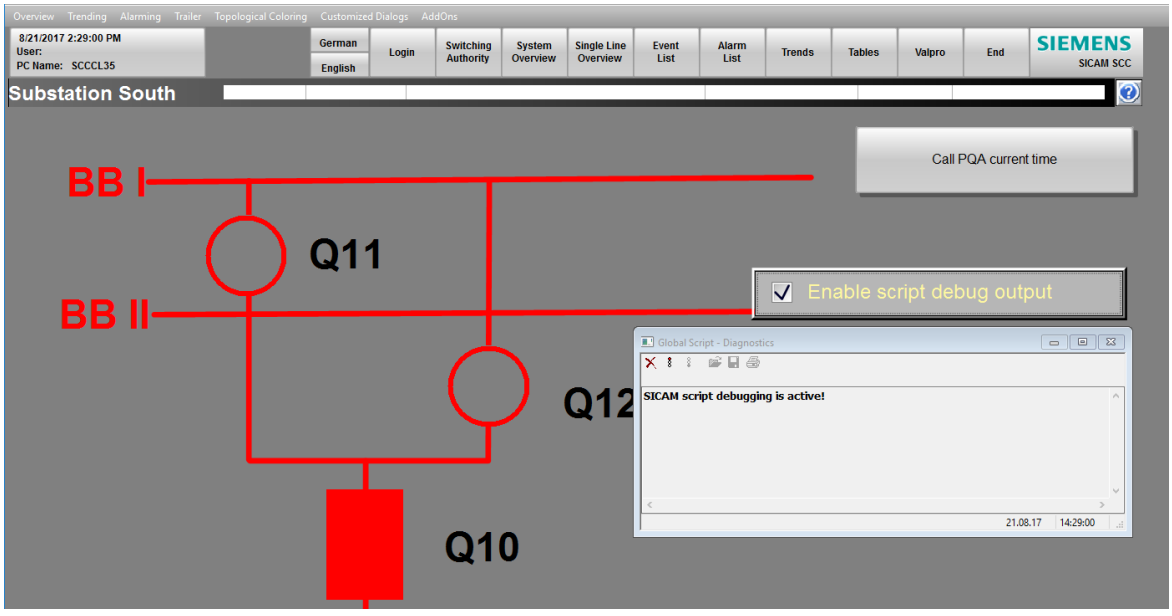
```
DWORD dwMinutes     = 30;
DWORD dwHours       = 0;
DWORD dwDays        = 0;
```

✧ Compile the adjusted script.

NOTE

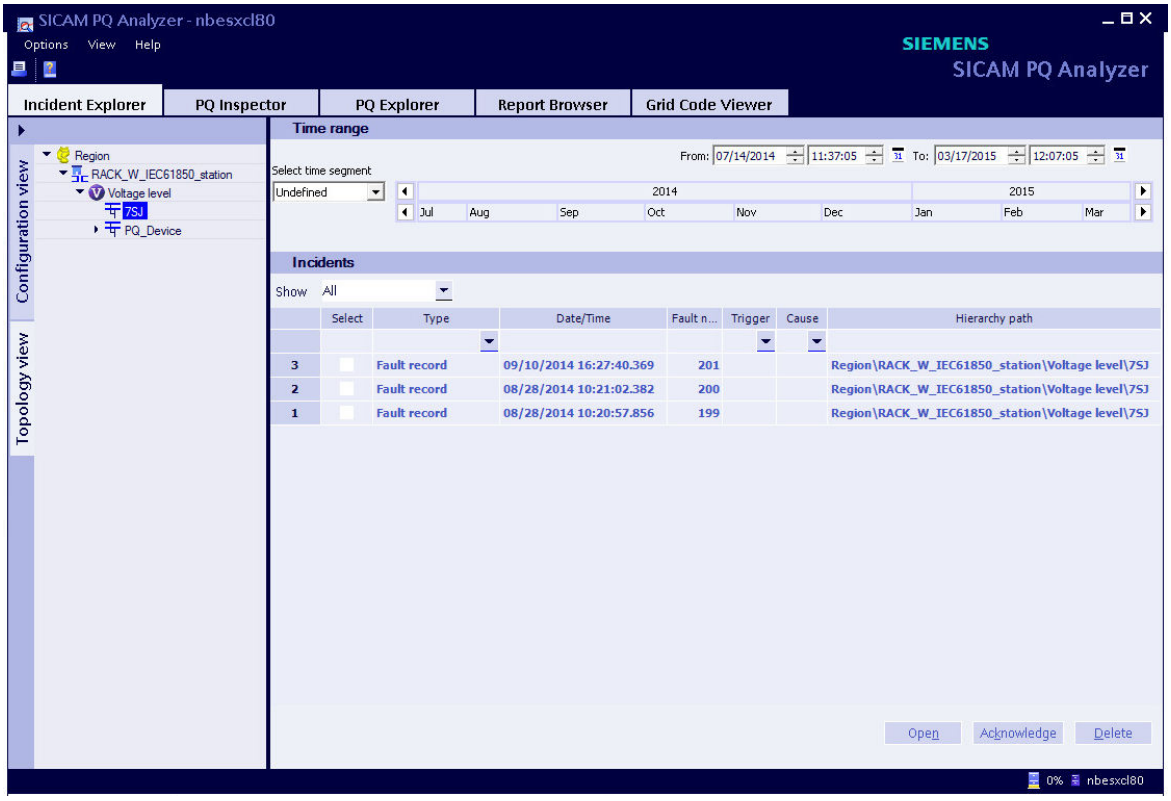
To get hints on configuration you can insert a **GSC Diagnostics** window. Therefor proceed as described in chapter *7.6.8 Testing SICAM Functions*.

✧ Save the diagram and start SIMATIC WinCC Runtime.



[pq_analyzer_aufrufen_01, 1, en_US]
Figure 7-29 WinCC Runtime with Button for Calling the SICAM PQ Analyzer

✧ To generate the parameter file for the SICAM PQ Analyzer, click **PQA call current time**. In the **GSC Diagnostics window**, the storage location of the generated parameter file is displayed.
The **Incident Explorer** opens. The fault records are displayed within the configured time period and with the correct topology.



[pq_analyzer_aufrufen_02, 1, en_US]

Figure 7-30 Incident Explorer with Displayed Fault Records

✧ Click PQA call current time to open the Incident Explorer in the foreground. The display of the Incident Explorer is updated with the content of the SICAM PQ Analyzer fault record archive.

You can place and configure several buttons with different time parameters in the same diagram.

NOTE

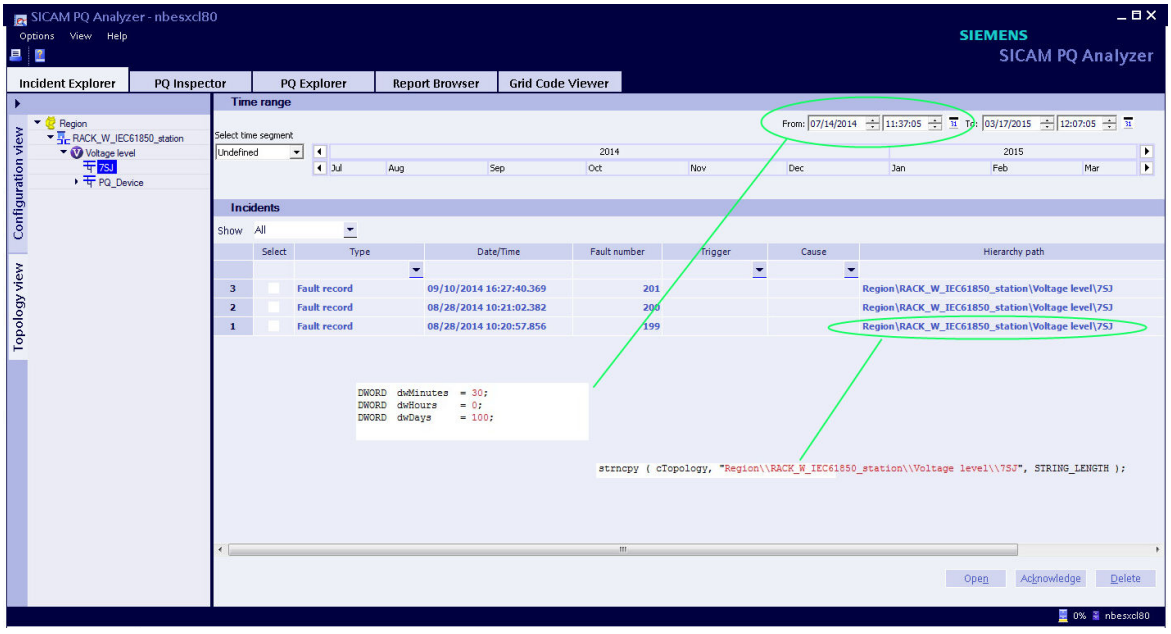
An incorrect configuration results in a corresponding message within SICAM PQ Analyzer or in the SICAM SCC GSC Diagnostics window.

If the **Incident Explorer** cannot be opened:

- Check the installation path of your SICAM PQ Analyzer as well as the path name in the C script **SCC_PQA_CreateParFile.fct**.

  You can open, change, re-compile, and save the C script in the **WinCC Explorer** under **Global Script > C-Editor > Project functions > SicamPAS > misc**.

The following figure shows the meaning of the parameters of the C script for the **PQA call current time** button in conjunction with the display in the **Incident Explorer**.



[pq_analyzer_aufrufen_03, 1, en_US]

Figure 7-31 Incident Explorer and Parameters in the C Script

7.6.9.2 Call from the Event List

Configuration in SICAM SCC

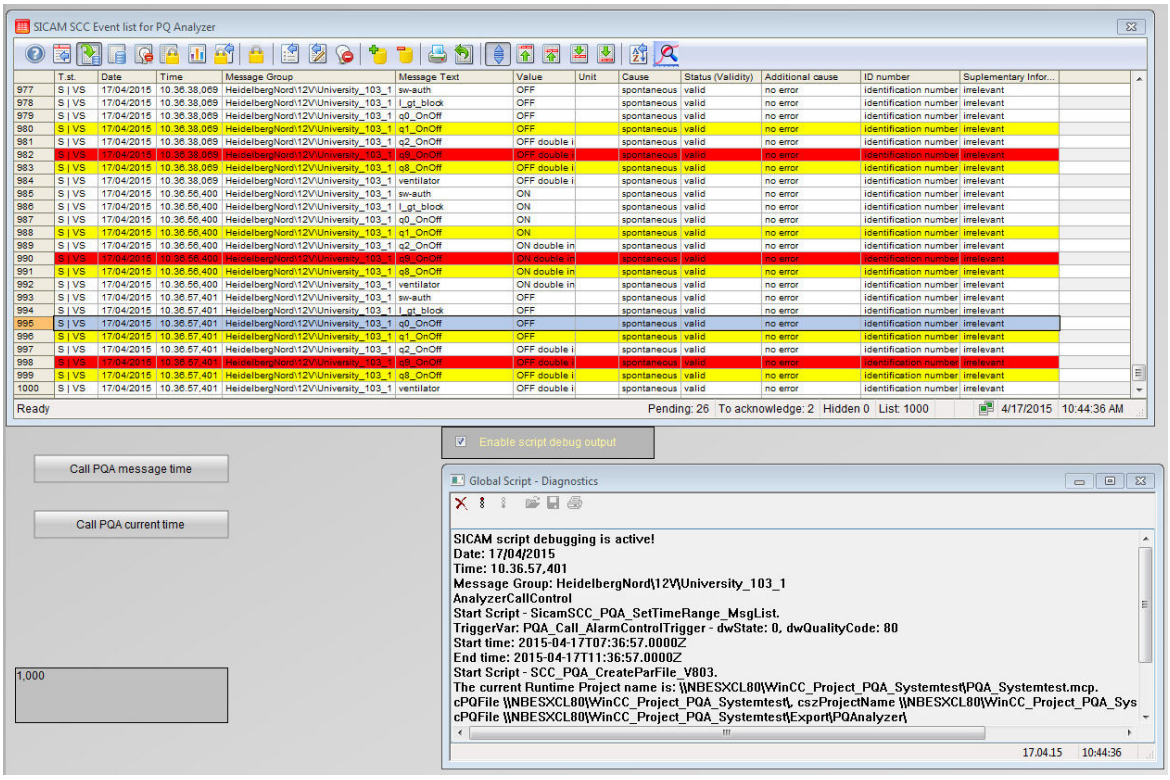
To configure the call in SICAM SCC:

- ✧ Create a new diagram in the **Graphics Designer**.
- ✧ To open the **Library**, click **View > Library**.
- ✧ Under **Alarm Logging templates > WinCC V7.x**, select the **SICAM SCC Event list for PQ Analyzer** object.
- ✧ Draw the graphics object to the desired position within the diagram.
- ✧ Under **Control elements**, select the **Button PQA message time** object.
- ✧ Draw the graphics object to the desired position within the diagram.

NOTE

To get hints on configuration you can insert a **GSC Diagnostics** window. Therefor proceed as described in chapter *7.6.8 Testing SICAM Functions*.

- ✧ Save the diagram and start SIMATIC WinCC Runtime.



[pq_analyzer_aufrufen_04, 1, en_US]

Figure 7-32 WinCC Runtime with Button for Calling the SICAM PQ Analyzer

- ✧ Select the **AutoScroll** icon in the event list for the SICAM PQ Analyzer.
- ✧ Select the message from the event list for which you want to display fault records in your SICAM PQ Analyzer archive.
- ✧ To generate the parameter file for the SICAM PQ Analyzer, click **Call PQA message time**.

  As an alternative, you can generate the parameter file for the SICAM PQ Analyzer by clicking the icon for the SICAM PQ Analyzer (magnifier) in the toolbar of the event list.

  The **Incident Explorer** opens and the fault records of the SICAM PQ Analyzer archive are displayed for the time of the message +/- 2 hours.

In the **GSC Diagnostics** window, the storage location of the new generated parameter file for the SICAM PQ Analyzer is displayed.

Clicking **Call PQA message time** again updates the display of the **SICAM PQ Analyzer**.

The SICAM PQ Analyzer gets opened in the foreground.

NOTE

If the **Incident Explorer** cannot be opened or the fault records are not displayed:

- Check the installation path of your SICAM PQ Analyzer and change it in the **SCC_PQA_CreateParFile** C script, if required.

  You can find the C scripts in the **WinCC Explorer** under **Global Script > C-Editor > Project functions > SicamPAS > misc**.

  In the C script, search for **cPQ_DEFAULT_PATH1** and change the path there. Then compile and save the changed C script.

- If the SICAM PQ Analyzer archive is not located on the SICAM SCC computer, you have to adjust the global C script **SicamSCC_PQA_SetTimeRange_MsgList.pas**.

  You can find the C script in the **WinCC Explorer** under **Global Script > C-Editor > Actions > Global actions**.

  In the C script, search for **cIPAddress** and replace the local IP address **127.0.0.1** with the IP address of your computer where the SICAM PQ Analyzer archive is located.

  Then compile and save the changed C script.

7.7 System Control

Overview

When importing the SICAM graphic object library, internal and external **administrative tags** and several **global actions** are additionally created in the project. They serve for system control only.

NOTE

Additional templates for global actions which you can use in your project are available in the installation directory of SICAM SCC, **PAS** subdirectory. Be aware of the configuration notes within the corresponding function.

NOTE

The functionality described in this section (e.g. bay/telecontrol blocking) depends on the support of the destination system - refer to the documentation of the destination system.

7.7.1 Administrative Tags

Internal administrative tags

Internal administrative tags are available in the WinCC Explorer under **Internal Tags** in the **SICAMAdmin** group. Tags starting with an @ character are required for the internal management of SICAM SCC and are not intended for the user.

Table 7-13 Required internal administrative tags

Name	Type
TextIDOffset	Unsigned 32-bit value
AckFlashing/QuitBlinking	Binary tag
@FlashFast	Signed 32-bit value
@FlashMedium	Signed 32-bit value
@FlashSlow	Signed 32-bit value
@Language	Unsigned 32-bit value
@AsyncTickx	Binary tag
@AlarmListFilter_WriteExt	Binary tag
@AlarmListFilter_ValueInt	Unsigned 32-bit value
ActivateControls	Binary tag
SubstVal_Float	Floating-point value
SICAMPASCCSynchState	8-bit character set text variable

External administrative tags

External administrative tags are available in the WinCC Explorer under **SICAM PAS PROTOCOL SUITE/ PAS Data Server/Project Name** in the **SicamAdmin_xxx** group. They must be assigned as described below.

The following applies to **SICAM PAS**:

The tag name of all external administrative tags is composed of 2 sections, i.e. a designation such as **Alarm-ListFilter** and a string of digits such as **107**. The string of digits is determined by the individual station and is generated by the SICAM PAS Wizard. The string of digits consists of 2 sections and a 0 as separator. The first section (e.g. 1) indicates the PAS project ID, and the second section (e.g. 7) indicates the HMI interface ID.

The following applies to **SICAM RTUs**, **IEC 61850** and **IEC 60870-5-104 devices**:

The tag name of all external administrative tags is composed of 2 sections, i.e. a designation such as **AlarmListFilter** and a string of digits such as **1002**. The string of digits is station-specific and is generated by the SICAM IEC Wizard. The first digit (e.g. 10) represents the SICAM RTU project ID. A zero (0) serves as delimiter. The second digit (e.g. 2) identifies the communication protocol:

1 = IEC 60870-5-104
2 = IEC 61850

Table 7-14 Required external administrative tags

Name	Type	Meaning
AlarmListFilter	Unsigned 32-bit value	for the definition of the filter function for the message/alarm list (see chapter *7.7.3 Message List Filter*)
InitiatorCategory	Unsigned 32-bit value	for the cause ID
ConnectionState[6]	Unsigned 32-bit value	status of the connection to the SICAM PAS system
ForceConnectionState[6]	Unsigned 32-bit value	for controlling the connection to the SICAM PAS system
RedundancyMaster (SICAM RTUs only)	Unsigned 32-bit value	for distinguishing the servers in case of a redundant SICAM SCC system 1 = Master server 0 = Redundant partner server

Additional tags are available for system-internal use.

NOTE

After any change of the **SICAM PAS project ID** or the **HMI interface ID**, check the assignment of the external administrative tags to the objects in the diagrams.

The **project ID** can be modified e.g. in SICAM PAS UI - Configuration.

The **HMI interface ID** can change after the deletion or re-creation of the SICAM SCC interface in SICAM PAS UI - Configuration and also after the creation of redundant WinCC connections in a SICAM PAS project.

The **project ID** is assigned after the initial creation of a **SICAM TOOLBOX II/SCDSCD/IEC 60870-5-104 project** (import in the wizard). The project ID begins with the value **10**. It remains unchanged during an additional import using the wizard.

For the combined connection of SICAM PAS, SICAM RTUs, IEC 61850 and IEC 60870-5-104 devices in a SICAM SCC project, be aware to use unique project IDs for each station.

7.7.2 Initiator Category

The initiator category is defined in the **InitiatorCategory_xxx** external administrative tag. The tag is included in the command output to the automation system[7]. The content of the tag has the following significance:

2 = NEAR (default value)
3 = REMOTE

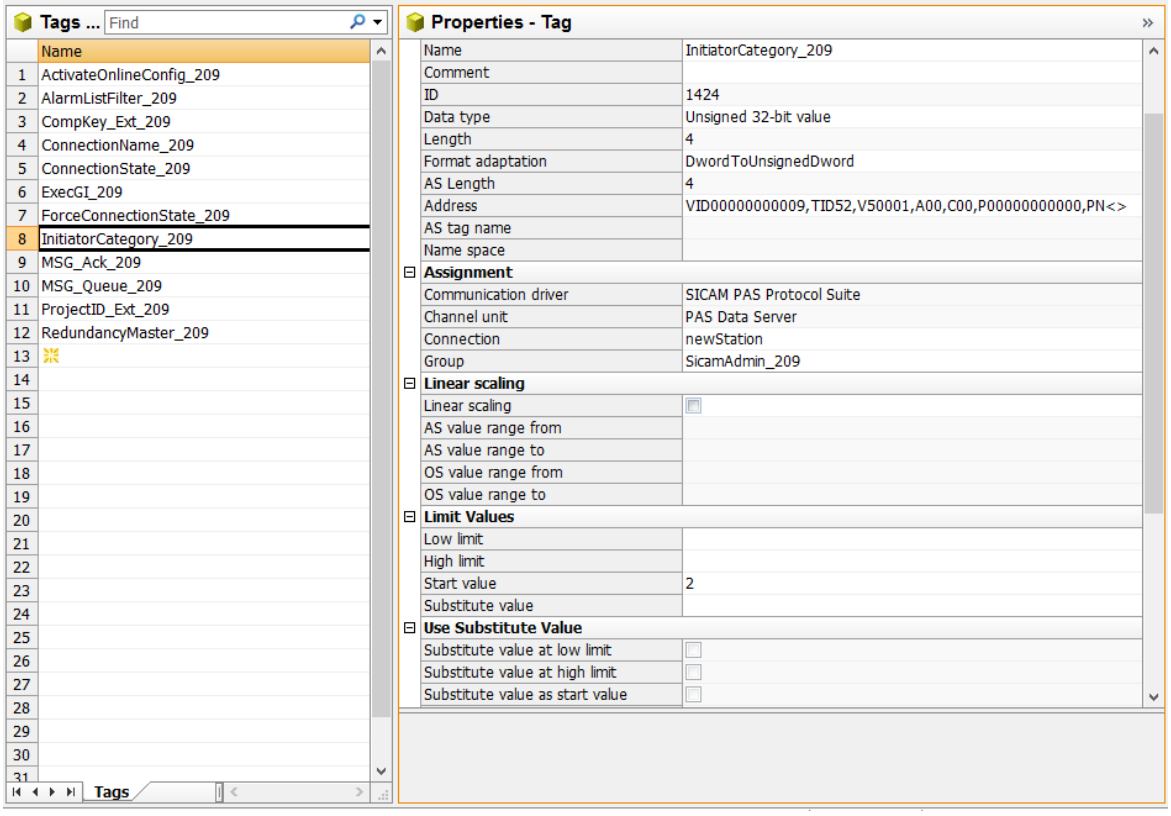
The contents of the tag must be changed to the value 3 if SICAM SCC is to act as the control center.
To modify the value of the **InitiatorCategory_xxx** tag:

6 If connected to SICAM PAS V5 or V6
7 Connection to SICAM PAS/PQS

The tag is available in the WinCC Explorer under **Tag Management/SICAM PAS PROTOCOL SUITE/ PAS Data Server/Project Name/SICAMAdmin_xxx.**

✧ Right-click the tag.

✧ Select **Properties** from the context menu.
The **Tag properties** dialog opens.



[pascc610, 1, en_US]

Figure 7-33 Tag properties

✧ Click to open the **Limits/Reporting** tab and define **3** as start value.

✧ Click **OK** to confirm your setting.

7.7.3 Message List Filter

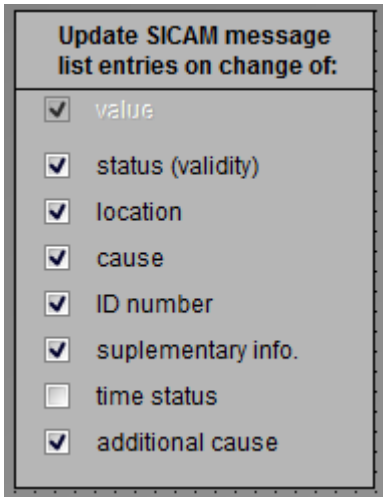
Via the **Checkbox message list filter** graphic object, you can control for which changes of process data alarms must be entered in the alarm/event list. In the **SicamPas_AlarmListFilter.pas** C script, assign the **AlarmListFilter_xxx** external administrative tag.

NOTE

If you do not use the **Checkbox message list filter** graphic object, the default settings (all options selected, time status deselected) are used.

To add the **Checkbox message list filter** graphic object to your diagram and to assign a tag:

✧ In the **Graphics Designer**, add the **Checkbox message list filter** object from the **Project Library \Controls library** directory to your diagram.



[pascc604, 1, en_US]

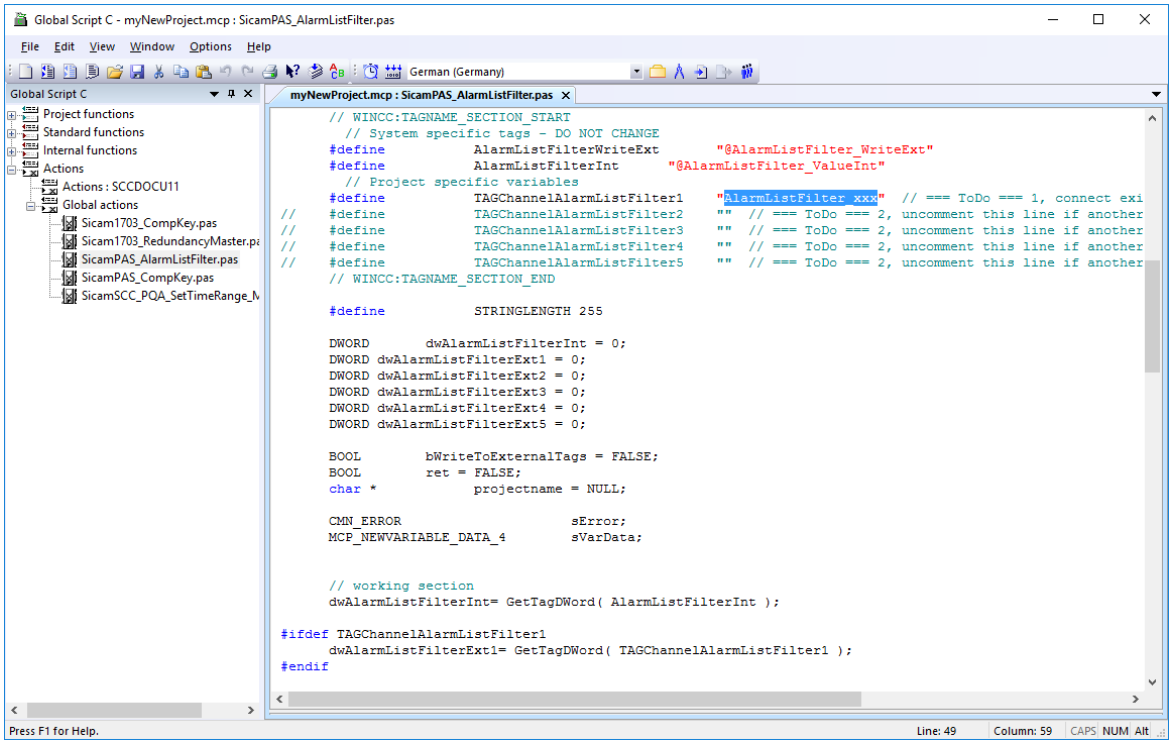
Figure 7-34 Checkbox message list filter object

NOTE

The message list filter is neither effective for SICAM RTUs nor for the direct connection of IEC 61850-/IEC 60870-5-104 devices.

Messages referring to a value change cannot be deselected. They are always entered in the list. Apart from the **Time status**, all options are set by default.

✧ Under Global Actions, open the **SicamPas_AlarmListFilter.pas** C script.

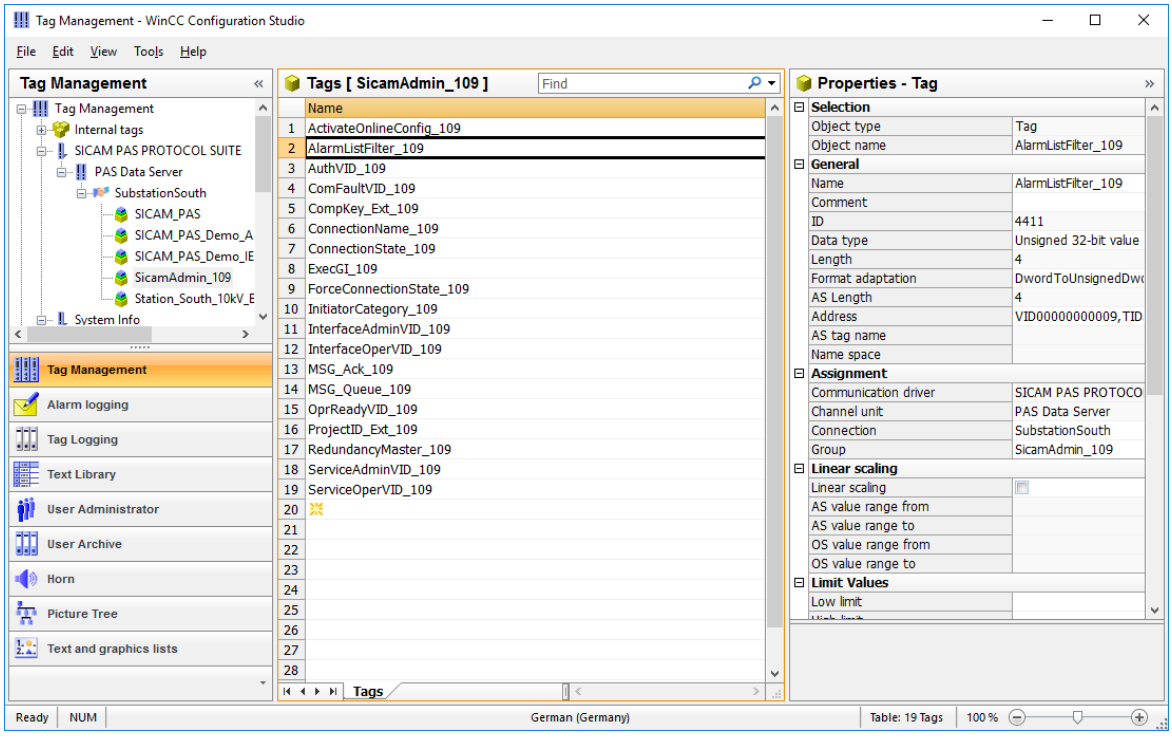


[pascc605, 1, en_US]

Figure 7-35 C Script SicamPAS_AlarmListFilter.pas

The **AlarmListFilter_xxx** entry must be replaced by the corresponding alarm list filter tag.

✧ Select **AlarmListFilter_xxx**.
✧ Select **Edit > Tag selection**.
The tag selection dialog opens.



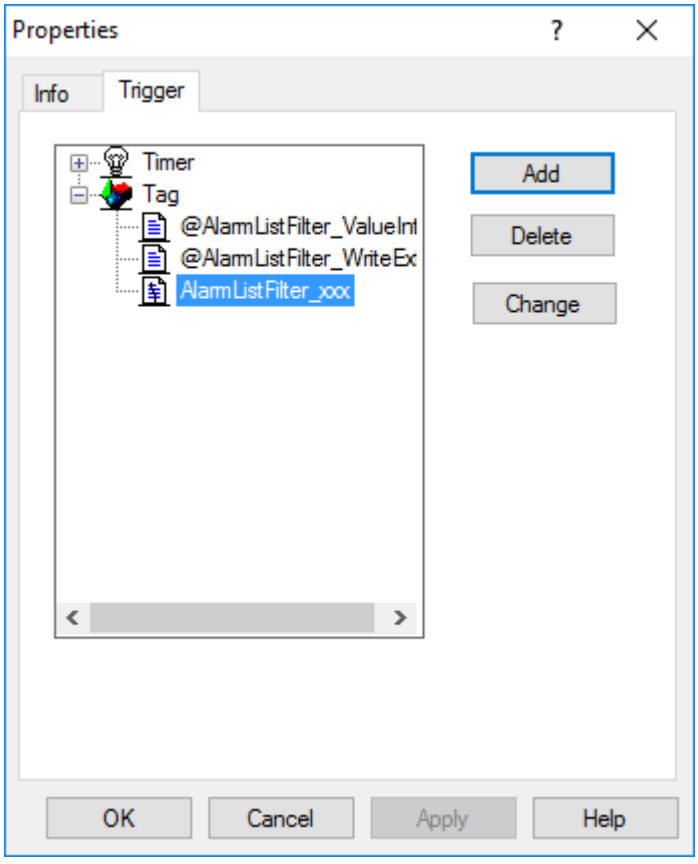
[pascc615, 1, en_US]

Figure 7-36 Tag Selection dialog

✧ Select the tag (e. g. **AlarmListFilter_1011**) and click **OK** to confirm.
The tag is inserted into the C script.

The **AlarmListFilter_1011** tag must now be entered as trigger.

✧ In the C script, right-click the **AlarmListFilter_1011** tag and select **Info/Trigger** from the context menu.
The **Properties** dialog opens.



[pascc616, 1, en_US]

Figure 7-37 Inserting a Trigger

- ✧ Select the **Trigger** tab.
- ✧ Delete the **AlarmListFilter_xxx** tag and add the **AlarmListFilter_1011** tag.
- ✧ Click **OK** to close the dialog.
- ✧ Compile and save the C script.

Structure of the AlarmListFilter tag

NOTE

In order to define a specific filter, you do not need to use the Message list filter checkbox and the global action. You can set the start value of the **AlarmListFilter_xxx** tag directly to the desired value.

The value is a bit combination as illustrated in figure 6-36. If the bits have been set, a new message is entered in the message lists when the corresponding property of an item of information changes.

Table 7-15 Value of the AlarmListFilter tag

Value (decimal)	Value (hex)	Meaning	Selected by default
0	0x00000000	Value (cannot be disconnected)	x
1	0x00000001	Status	x
2	0x00000002	Location	x
4	0x00000004	Cause	x
8	0x00000008	ID number	x
16	0x00000010	Additional information	x

Value (decimal)	Value (hex)	Meaning	Selected by default
32	0x00000020	Time status	
64	0x00000040	Additional cause	x

The options marked with an x are predefined by default.

7.7.4 Switching Authority

For the control of switching authorities, use the switching authority tags mapped in SICAM PAS UI – Configuration. These tags are stored among the status tags of the SICAM SCC interface.

The control of the switching authority is only supported for the SICAM PAS target system, but neither for SICAM RTUs nor for directly connected IEC 61850/IEC 60870-5-104 devices.

Only map the switching authority tags in the **monitoring direction**.

NOTE

In order to be able to control the switching authority, switching authority groups for the SICAM SCC interface must have been assigned in SICAM PAS.

The following 2 graphic objects are available for implementing the switching authority:

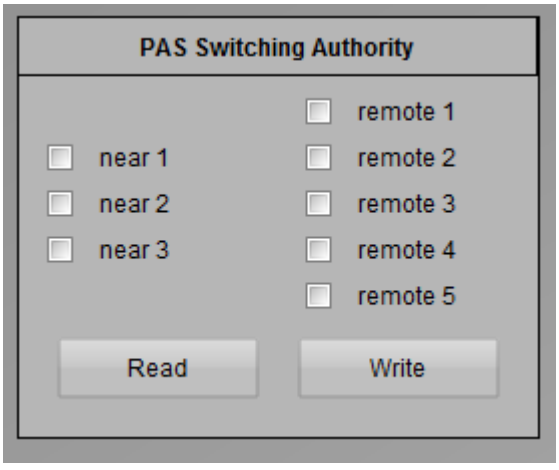
- PAS switching authority (Authority checkbox)
  All states can be controlled via this checkbox.
- PAS switching authority (Switching authority button)
  This button only controls the Near 1/Remote 1 switching.

Switching authority checkbox

This dialog provides the Read and Write buttons.

During runtime,

- the contents of the corresponding switching authority tag can be read in and shown by clicking **Read**.
- the contents of the checkbox can be written into the corresponding switching authority tag by clicking **Write**.



[pascc601, 1, en_US]

Figure 7-38 Switching Authority Checkbox

Switching authority button

This dialog provides a button for switching between **Near** and **Remote** during runtime. The button text changes depending on the current switching authority.

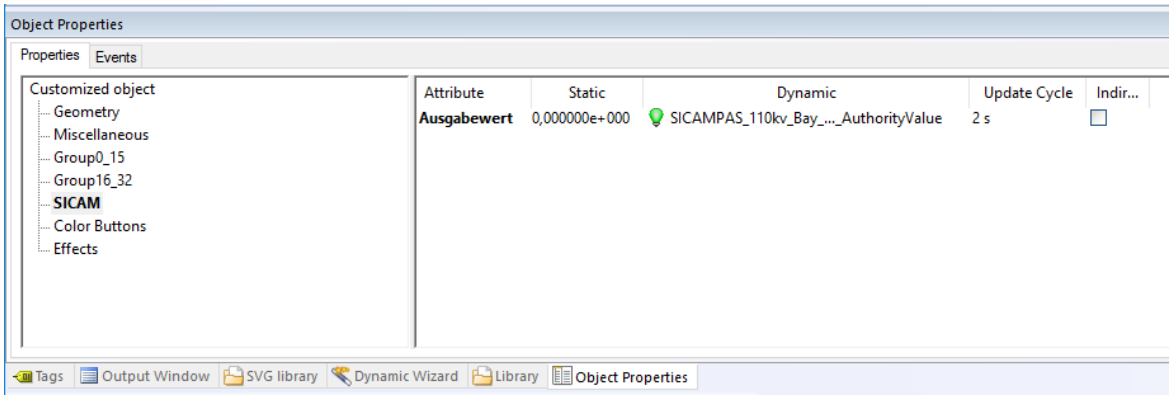
Near and **Remote** in this dialog correspond to **Near 1** and **Remote 1** in the **Switching Authority** checkbox.

[pascc607, 1, en_US]

Figure 7-39 Switching Authority Button

To add the **PAS Switching authority** graphic object to your diagram and assign a tag:

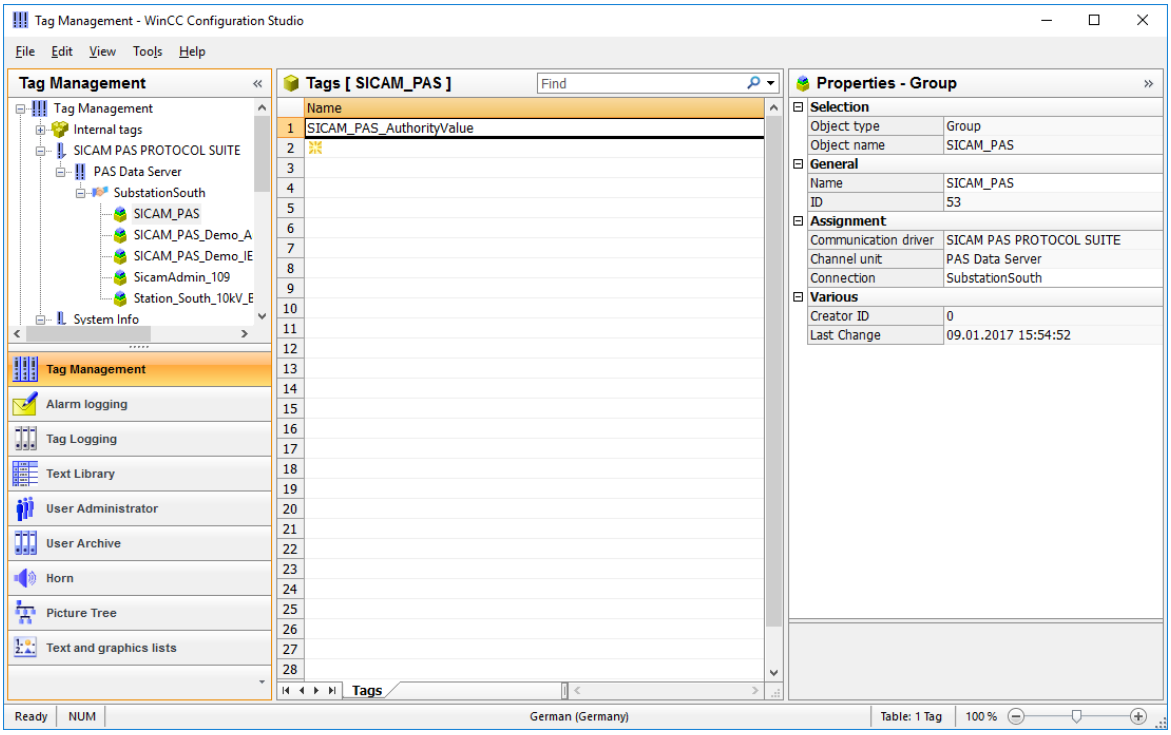
- ✧ In the **Graphics Designer**, add the **PAS switching authority** object from the library to your diagram.
- ✧ Assign the **PAS switching authority** object the corresponding switching authority tag. To do this, right-click the object.
- ✧ Select **Properties** in the context menu.
  The **Object properties** dialog opens.



[pascc602, 1, en_US]

Figure 7-40 Properties of the PAS Switching Authority Object

- ✧ Select **Tags** from the **Properties** tab.
- ✧ Right-click the **Dynamic** column in the **OutputValue** row.
- ✧ Select **Tag** from the context menu.
  The tag selection dialog opens.



[pascc603, 1, en_US]

Figure 7-41 Tag Selection

✧ Select the desired switching authority tag and click **OK**.

While the WinCC project is active, the current setting of the switching authority is shown via the **PAS switching authority** (PAS switching authority (complete)) object.

You can now request a change of the switching authority from SICAM PAS.

✧ Change the settings in the **PAS switching authority** object and then click **Write** to transmit them to SICAM PAS.

The settings are transmitted to SICAM PAS and checked for reliability. If the requested switching authority is not permissible, it is reset to the previous value.

NOTE

To log the current switching authority setting in the message lists, the switching authority tag in SICAM PAS UI – Configuration must be mapped to the SICAM SCC Alarm Logging system within the **SICAM SCC status messages**.

7.7.5 Bay/Telecontrol Blocking

NOTE

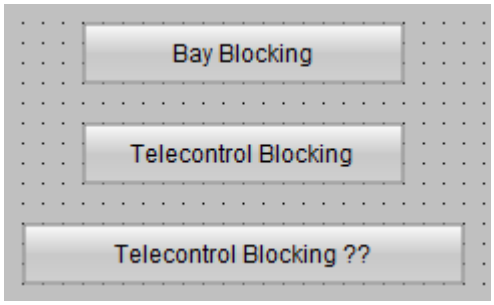
The functions described in this section cannot be used for connections via IEC 60870-5-104 and IEC 61850.

7.7.5.1 Device-Specific Blocking

The functions described in this section are used to block all the information of a device, an interface or an application in case of a connection to SICAM PAS/PQS.

The following graphic objects are available for controlling the bay/telecontrol blocking:

- **Set bay blocking**: Click this button to set/reset the bay blocking.
- **Set telecontrol blocking**: Click this button to set/reset the telecontrol blocking.
- **Ignore telecontrol blocking**: Click this button to ignore/obey the telecontrol blocking for a control center.



[pascc611, 1, en_US]

Figure 7-42 Bay/Telecontrol Blocking Graphic Object, Buttons

Depending on the status of the bay/telecontrol blocking, the texts shown on the buttons change during runtime.

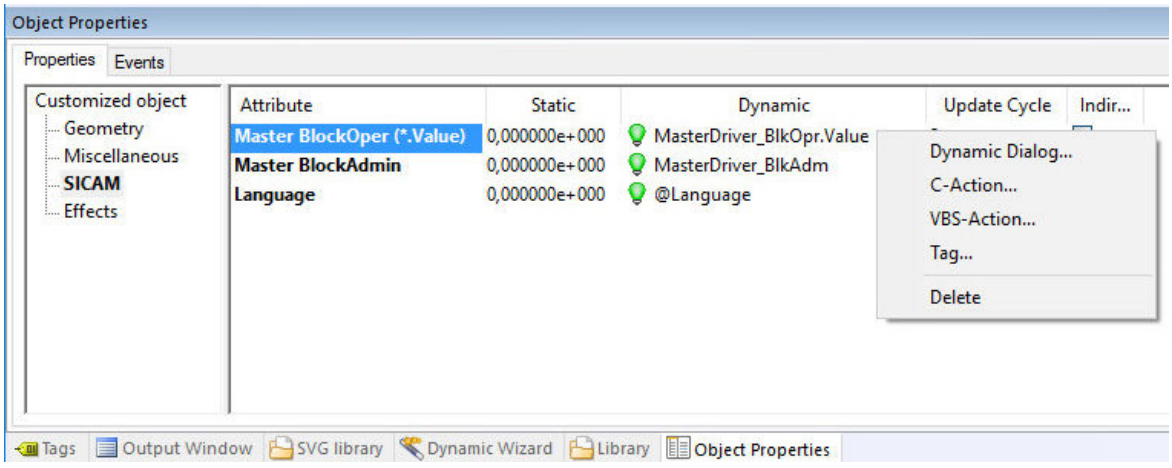
The buttons (graphic objects) must be assigned the corresponding device tags.

To add the Set bay blocking to your diagram and assign the tags:

✧ In the **Graphics Designer**, add the **Insert bay blocking** button object from the library to your display.

✧ Right-click the object.

✧ Select **Properties** in the context menu.
The **Object properties** dialog opens.



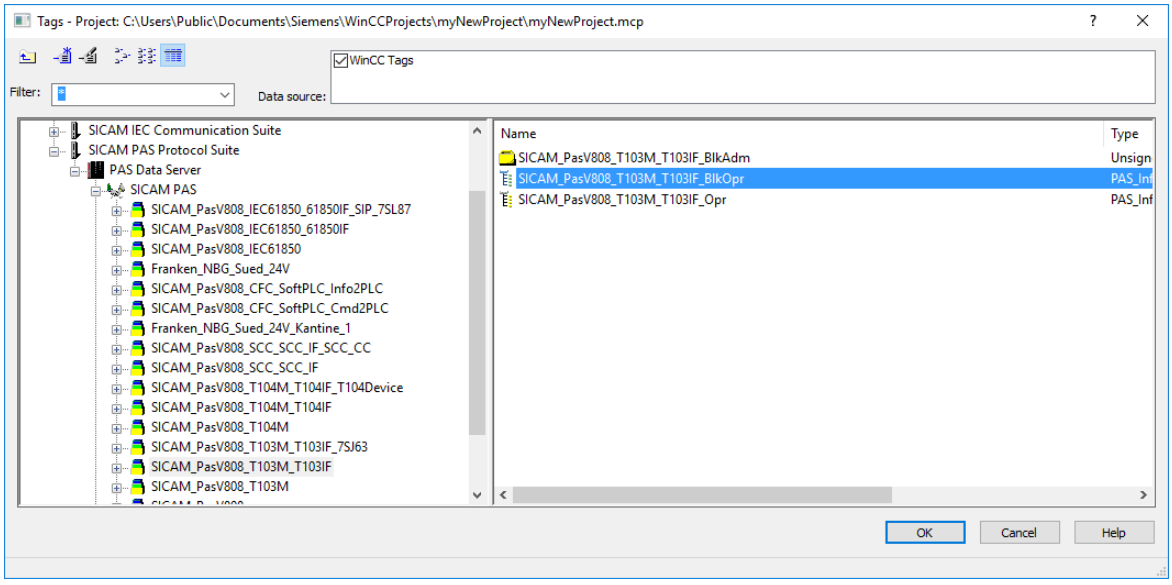
[pascc612, 1, en_US]

Figure 7-43 Properties of the BayBlockingButton Object

✧ Select **SICAM** from the **Properties** tab.

✧ Right-click the **Dynamic** column in the **Master BlockOper (*.Value)** row.

✧ Select **Tag** from the context menu.
The tag selection dialog opens.



[pascc613, 1, en_US]

Figure 7-44 Tag Selection

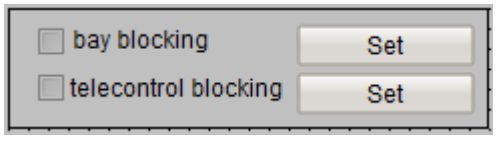
✧ Select the desired **BlkOpr.Value** tag and click **OK**.

✧ Link the **BlockAdminXXX** attribute to the **BlkAdm** tag.

Provided that a WinCC project is active, you can now set or reset the bay blocking by means of the **Bay blocking** button.

You can insert the **Telecontrol blocking** button and **Ignore telecontrol blocking** button graphic objects in the same way and assign them the same tags. The **BlkOpr.Value** and **BlkAdm** tags include information for all 3 graphic objects.

As an alternative to the buttons, you can use the **CheckboxBay/Telecontrol Blocking** graphic object.



[pascc614, 1, en_US]

Figure 7-45 Bay/Telecontrol Blocking Checkbox Graphic Object

7.7.5.2 Object-Specific Blocking

To block individual items of process information, you can set/undo a bay blocking/telecontrol blocking on a switching device object via a status dialog. After setting a bay block this information can also be substituted, see chapter *4.4.6 Runtime Dialogs of SICAM Switch Controls*.

The **PAS_SetBlockState_V801** function is available as a C script for the object-specific blocking of other objects, see chapter *7.6.3 Object-Specific Blocking*.

7.7.5.3 Ignoring Bay Blocking

You can use the **Button Ignore Telecontrol Blocking** graphic object in order to inform a control center connection on the interface level that this connection may ignore the telecontrol block.

7.7.6 Triggering a General Interrogation in Case of IEC 61850 Connection

A template for the global action **Sicam_IEC61850_DeviceGI.pas** for triggering a general interrogation to directly connected IEC 61850 devices is available in the installation directory of SICAM SCC, **PAS** subdirectory.

This template is used per device and enables a general interrogation for selected devices.

Use this script if a message/measured value blocking, e.g. on a SIPROTEC device, is undone. In this case the device does not transmit an up to date image, which means that SICAM SCC must perform a general interrogation.

Be aware of the configuration notes within the function.

7.7.7 Changing Device Parameters via IEC 61850

7.7.7.1 Switching the Parameter Groups

Prerequisites

In DIGSI 5 the **Via controller** setting must be selected as **Active parameter group** in the corresponding device settings.

SICAM SCC functionality

Tags are available for switching the parameter groups. These tags must be imported via the **SICAM IEC 61850 Wizard** and the **SICAM SCC - IEC61850 data mapping Editor** and used accordingly.

Table 7-16 Tags for switching the parameter groups

Tags	Meaning
Tag extension: • *.SettingGroup.NumberOfSG Or as IEC61850 address: • *.SGCB.NumOfSG	This information tag indicates the number of existing/ possible parameter groups in the device.
Tag extension: • *.SettingGroup.ActiveSG Or as IEC61850 address: • *.SGCB.ActiveSG	This tag exists in: • Information direction (indicates which parameter group is currently active) • Command direction (activates one/this specific parameter group)

Switching the parameter group

To switch the active parameter group, you must set the ***.ActiveSG** command tag to the value of the desired parameter group:

✧ To modify the value of the ***.ActiveSG** command tag, use a **SICAM function**, see chapter *7.6.1 Commands*, or the **SICAM measured value with operating script** object.

7.7.7.2 Modifying Individual Device Parameters/Settings Online

Prerequisites

The **Block IEC61850 parameter changes** option must not be activated in the corresponding device settings in DIGSI 5.

SICAM SCC functionality

The tags available for online configuration must be imported using the **SICAM IEC 61850 Wizard** and the **SICAM SCC - IEC61850 data mapping Editor** and used accordingly.

Table 7-17 Tags for online configuration

Tags	Meaning
Tag extension: • *.SettingGroup.EditSG Or as IEC61850 address: • *.SGCB.EditSG	This command tag is used to select/set the parameter group to be edited. If the value **0** is set, all changes are undone or rejected.
Tag extension: • *.SettingGroup.ConfirmEdit Or as IEC61850 address: • *.SGCB.ConfirmEdit	With this command tag and the value **1** all the changes performed in the selected parameter group to be edited are confirmed.

Every parameter has an information tag and a command tag assigned.

Modifying device parameters/settings online

To modify device parameters/settings online:

✧ To activate the change process, set the ***.EditSG** command tag to the value of the desired parameter group.

✧ To modify one or several parameters, set the corresponding command tag to the desired value.

✧ To confirm the change, set the ***.ConfirmEdit** command tag to the value **1**.

- or -

✧ To reject the change, set the ***.EditSG** command tag to the value **0**.

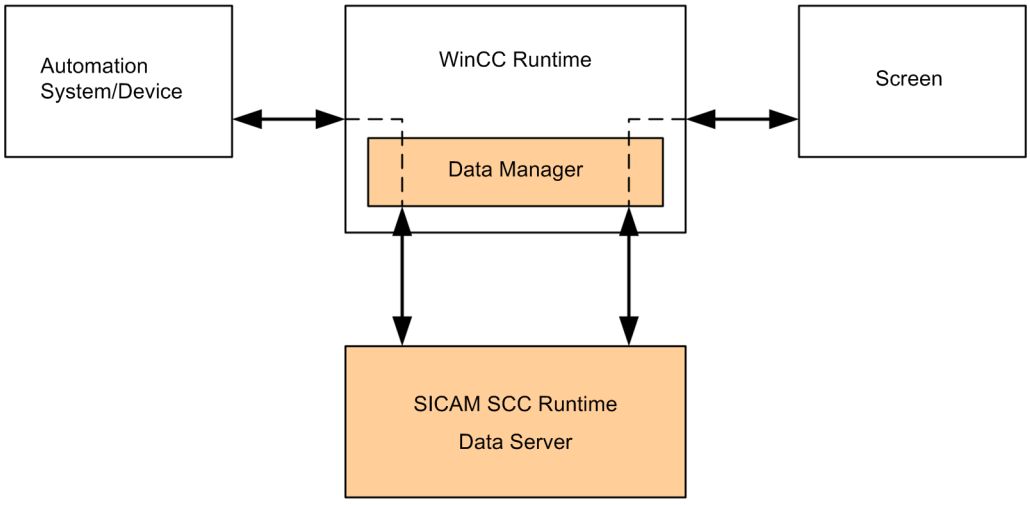
Use a SICAM function to set the ***.EditSG** and ***.ConfirmEdit** command tags, see chapter *7.6.1 Commands*.
You cannot use the **SICAM measured value with operating script** object for setting the ***.EditSG** and ***.ConfirmEdit** command tags.
You can use a SICAM function to define individual parameters, see chapter *7.6.1 Commands*, or the **SICAM measured value with operating script** object.

7.8 SICAM SCC Runtime Data Server

To increase the quantity scopes supported by SICAM SCC, the **SICAM SCC Runtime Data Server** component was introduced with Version 8.00. With SICAM SCC V8.00 or higher, up to 20,000 switching device objects per WinCC project and up to 2,000 controls per picture can be managed with the aid of this component.

The **SICAM SCC Runtime Data Server** component processes all process data of the SICAM SCC project independently of whether they are being shown in the picture or not.

SIMATIC WinCC, Version 7.0 SP3 or higher, is a prerequisite for the SICAM SCC Runtime Data Server component.



[Runtime_Data_Server, 1, en_US]

Figure 7-46 SICAM SCC Runtime Data Server

The SICAM SCC Runtime Data Server supplies the controls with the relevant, calculated process data required for display. The SICAM SCC Runtime Data Server is automatically started and stopped with the WinCC Runtime.

The blinking states between the redundant WinCC servers are compared in redundant SICAM SCC systems.

NOTE

You can continue to operate existing SICAM SCC projects of version 7.xx with the current **IndustrialX Controls** without using the SICAM SCC Runtime Data Server. In order to continue to use current IndustrialX Controls (switching device objects) the IX State Sync must also be continue to be used.

The optionally installable **IX State Sync** redundancy component is entirely replaced by the SICAM SCC Runtime Data Server and no longer is required when using the ActiveX Controls of V8.0 or higher.

In order to be able to use the SICAM SCC Runtime Data Server for existing SICAM SCC projects, the IndustrialX Controls (Switch and Bay Overview) must be replaced with the SICAM Switch Controls and SICAM Bay Overview Controls.

Using a task available in the SICAM Toolbar you can replace all IndustrialX Controls of a picture at the same time, see chapter *6.5 Predefined Tasks*.

NOTE

Be aware that pictures and settings configured under the **Bitmap** option are not applied for **Send QoC in command value**.

Scripts or actions configured for properties or events of the switching device objects are not applied during conversion. They cannot be applied because the property types and events are not fully compatible. The scripts and actions must be created again after the conversion.

All further object settings are applied during conversion.

7.9 Language Settings

Overview

When defining the language for SIMATIC WinCC/SICAM SCC, several system levels are distinguished. The language must be switched at different locations.

- **Language of the WinCC user interface**
  The language of the WinCC user interface is set in the WinCC Explorer. Any language enabled during the installation of WinCC can be set for the WinCC user interface.
- **Configuration language**
  The configuration language is set directly in the editor which you are using for configuration, e. g. the Graphics Designer. You can select further languages as configuration languages in addition to the languages installed with WinCC.
- **Runtime language**
  The runtime language and the runtime default language are defined via the start configuration of the runtime computer. You can select further languages as runtime language in addition to the languages installed with WinCC.

More detailed information on the language setting is available in the WinCC Information System under **Start > SIMATIC > WinCC > WinCC Information System**.

Specific graphic objects of SIMATIC WinCC are added to SICAM SCC. The distinction with regard to the language setting also refers to these additional graphic objects.

NOTE

Before the first data import, define the runtime language required for the runtime texts. The configuration data must be updated with the same language setting in order to ensure that the texts are stored in the correct language in the SIMATIC WinCC text library.

To use additional runtime languages, the texts in the SIMATIC WinCC text library can be translated into the corresponding language.

7.9.1 Language Setting for SICAM Graphic Objects

Several languages (e. g. English, German) are available by default for the SICAM graphic objects. You can switch between these languages without any preliminary steps.

It is also possible to use additional languages. To do this, some preliminary steps have to be performed (as described below).

- **SICAM Switch Controls**
  The texts for the Runtime dialogs of switching device objects, SICAM SCC V8.00 or later (SICAM Switch Controls), are stored in the **SICAMSwitch.xml** file. This file includes a block for each language.
- **Other SICAM graphic objects**
  The dialog/menu texts are stored in several text files for the individual languages. For the SICAM add-in within the Graphics Designer, the **SICAMToolbar_xxx.txt** file is used. The **xxx** wildcard is used for the language code, e. g. **409** for English. During the start-up, SICAM SCC loads these text files and shows the included texts on the user interface.
  The text files consist of individual rows. Each row includes the text ID, one or several space characters and the text string. The text string is placed between quotation marks; this text is displayed.

The following table indicates for which program interfaces the described language settings are valid and which text files are available.

Table 7-18 Language setting - SICAM graphic objects

Program's User Interface	Text File
Runtime dialogs of circuit breakers and disconnectors, SICAM SCC V8.00 or later	SICAMSwitch.xml
Properties dialog for circuit breakers and disconnectors	PCCIX_xxx.txt
Runtime dialogs for circuit breakers and disconnectors	
Error messages/information regarding circuit breakers and disconnectors	
Dialog for defining the properties of the bay overview	PASCC_BO_xxx.txt
Error messages/information regarding the bay overview	
Toolbar for topological coloring (in the Graphics Designer)	SICAMToolbar1_xxx.txt
Upgrade Controls dialog to be opened via **SICAM > Upgrade Controls** in the Graphics Designer	

All languages which can be set as runtime language can be used for texts shown during runtime (e. g. texts in the runtime dialogs).

All other texts (e. g. texts of the properties dialogs for circuit breakers and disconnectors) can only be shown in the languages defined for the WinCC user interface.

The texts of the properties dialogs for SICAM graphic objects, SICAM SCC V8.00 or later (SICAM Switch Controls and SICAM Bay Overview Controls), are not included in the **SICAMSwitch.xml** file. They are stored in the **SICAMSwitchxxx.lng** and **SICAMBOxxx.lng** language DLLs.

Preparing the language setting

To prepare the language setting:

First, determine the code of the desired language. All available languages are listed in the information system of SIMATIC WinCC.

- ✧ To open the information system, click **Start > SIMATIC > WinCC > WinCC Information System**.
- ✧ Browse for the term **Language code** and open the **Language code** window.
  The list shows all available languages with their code (e. g. 0x040A/1034 for Spanish).

Adding the language for Runtime dialogs of switching device objects, SICAM SCC V8.00 or later

The **SICAMSwitch.xml** file is stored in the following directory: **...\Siemens Energy\SICAM\SCC\bin**.

- ✧ Open the **SICAMSwitch.xml** file using an XML Editor.
- ✧ Copy an existing language block.
- ✧ Enter the language ID of the new language, e.g. 1034 for Spanish.
- ✧ Enter the texts for the new language.
- ✧ Save and close the XML file.

Creating language-dependent text files for other SICAM graphic objects

The text files are located in the following directory: **...\Siemens Energy\SICAM\SCC\bin** or **..\Siemens\WinCC \bin**.

- ✧ Copy the **SICAMToolbar_409.txt** file. 409 is the language code for English.
- ✧ Rename the file (e. g. to SICAMToolbar_40A.txt for Spanish).
- ✧ Open the S**ICAMToolbar_40A.txt** file using a text editor.
- ✧ All texts placed between quotation marks can now be adjusted to the desired language.
- ✧ Save and close the text file.
- ✧ Create all other text files, too.

Language of the WinCC user interface

To define the language of the WinCC user interface, click **Tools > Language** in the WinCC Explorer. You can select any language which has been enabled during the installation of WinCC. As soon as you have defined the desired language, all SICAM graphic objects can be configured in this language.

Switching the runtime language

The runtime language can be selected in the **Computer Properties** dialog, **Parameters** tab (see chapter *3.2.3 Defining Computer Properties*). The language you select in this tab is used during the start of the runtime. Alternatively, you can switch the runtime language during runtime (see chapter *7.9.2 Switching the Language During Runtime*).

7.9.2 Switching the Language During Runtime

If you have defined several languages during the configuration of a project, you need to configure a control element via which the operator can set the desired language during runtime. SICAM SCC includes a pre-configured control element which you can use in your project.

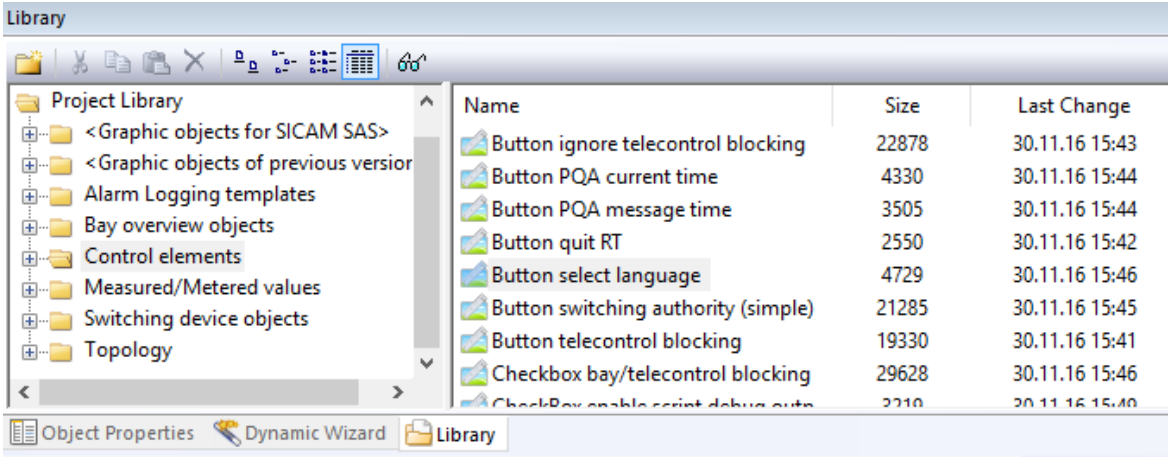
This paragraph explains how to define the switchover to the Spanish language.

For the language switching to function properly, the text files must be available in the **...\Siemens Energy \SICAM\SCC\bin** Spanish directory with the **40A** language ID.

Proceed as follows to configure the switching of the runtime language:

Adding a control element to a display

- ✧ In the **Graphics Designer**, open the display to which you want to add the control element required for switching the language.
- ✧ Insert the **Button select language** object from the SICAM graphic object library into your display.



[pascc423, 1, en_US]

Figure 7-47 Language Selection Button

Using the default control element, you can switch between the German and the English language. In order to be able to define e. g. the Spanish language during runtime, this language must be configured accordingly.

Configuring language switchover

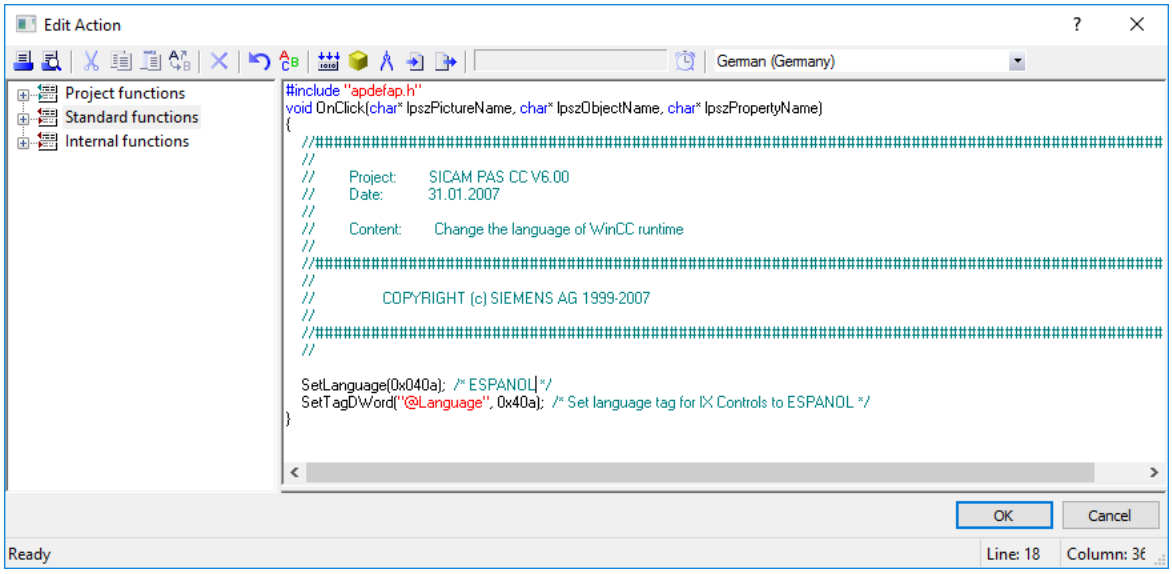
To define an additional option for switching to the Spanish language:

- ✧ Copy a button.
- ✧ Open the **Object properties** of the new button.
- ✧ Enter the new language for the attribute **Text** in the **Properties** tab.

✧ Modify the **Tooltip Text** attribute.

✧ Customize the **Text** and **Tooltip Text** attributes also for the other configuration languages used.

✧ In the **Events** tab, double-click **Mouse Action**.
The **Action Editor** opens.



[pascc424, 1, en_US]

Figure 7-48 Editing the Action for Switching the Language

✧ Change the language code to **0x040A** for Spanish at two different locations.

✧ Compile the action and close the editor.

✧ Save your display.

The configuration of the language switchover is now completed, and you can switch between 3 different languages during runtime.

[pascc425, 1, en_US]

Figure 7-49 Switching the Language During Runtime

7.10 Communication with SICAM DISTO

TCP/IP connection

The TCP/IP connection is always set up by SICAM DISTO, i.e. the IEC 61850-Client waits until the connection has been set up. The Port 5335 used is determined via the **DISTO61850** service name. This service name must be entered in the **Services** file located in the following directory: <WINDIR>\system32\drivers\etc\services.

✧ Insert the following line into the **Services** file:

DISTO61850 5335/tcp #Disto

IEC 61850 file transfer mode

The **file transfer services** are used in order to transmit the fault records from IEC 61850 servers. The protection line of devices from which fault records are to be requested must be defined as **IEC=61850-FT**. The **StatNo** parameter corresponds to the subsequent calculation of the LAN station number.

Calculation of the LAN station number

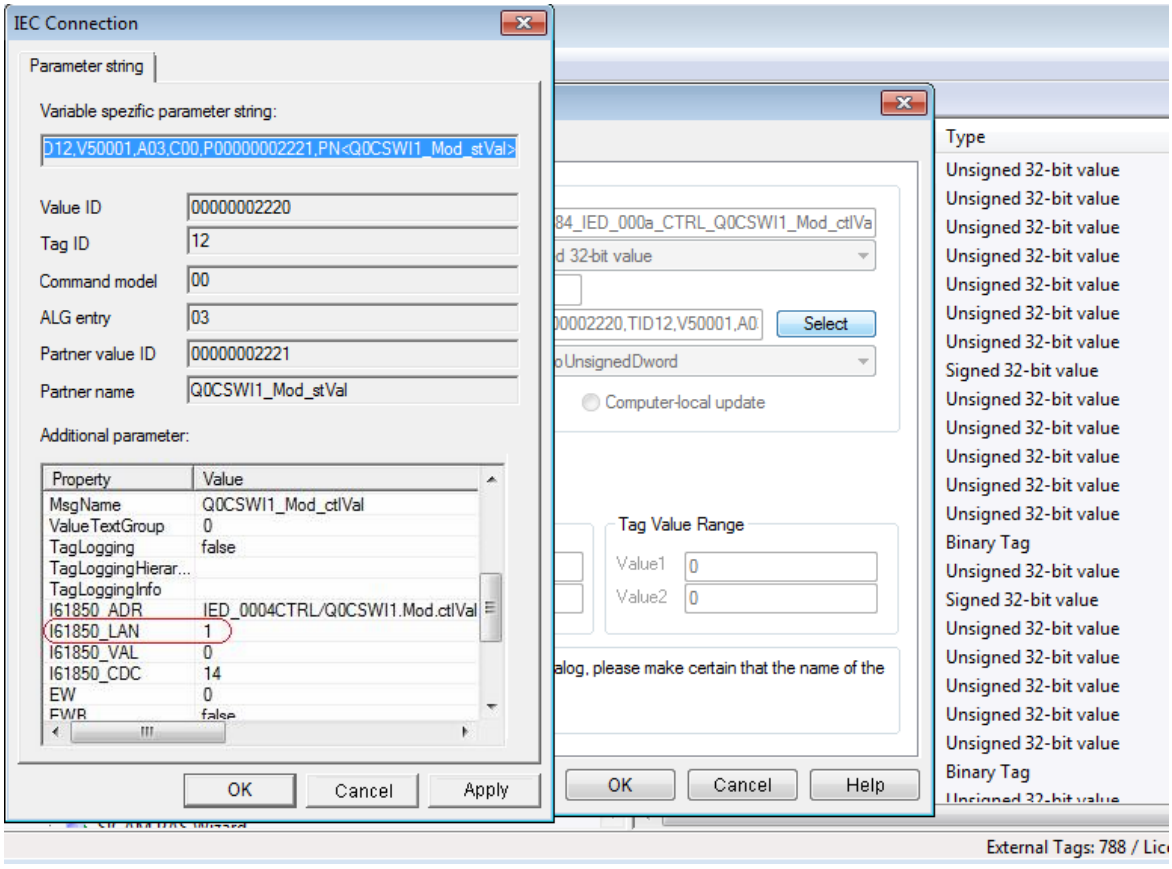
The **LAN station number** to be entered in SICAM DISTO is calculated via the number of the **IEC 61850 Data Server Station** and the **LAN number** of the device to be connected.

StatNo = StatIndex * 512 + LANNo

Significance of the individual elements of the formula:

- **StatNo** = LAN station number to be entered
- **StatIndex** = Number of the station in the station list in the IEC 61850 Data Server (SIMATIC WinCC), starting with 0
- **LANNo** = LAN number defined for the device, e.g. in the SICAM Toolbox II or in the SICAM IEC 61850 Wizard with direct connection to a IEC 61850 device.

You can view the LAN station number in the parameters of a tag of the corresponding device.



[disto_01, 1, en_US]

Figure 7-50 Viewing the LAN station number

7.11 SNMP – SICAM Network Manager (NWM)

7.11.1 Introduction

SNMP objects are managed in a kind of database in each device (Agent) to be managed. The database contains a number of objects which can be read and/or written via the network.

NOTE

The SICAM Network Manager requires a separate license.

Management Information Base (MIB)

The **Management Information Base** (**MIB**) is most important because it contains all the objects to be managed for an agent. The MIB must be available in both the agent and the network management system in order to be able to define SNMP objects.

The MIB tags are implemented in the agent software and uniquely addressable. All the objects in an agent are addressed based on a globally unique identification scheme designed as a number string. This number string is transmitted to the agent when querying an object. As a result of the query, the agent returns the object contents to the management station.

SICAM SCC also provides a collection of MIB files as a basis for defining the NWM parameters. You can extend this collection yourself.

The **Default_MIB** folder is located on the SICAM SCC DVD in the **ProductEnhancements** folder. Copy this folder to any drive.

Basic Procedure

The SNMP is configured with the following basic steps:

- Starting the **SICAM Network Manager**
- Finding and defining agents
- Loading the MibSicamSCC.mcf MIB container file
- Selecting and configuring MIB objects
- The report starts once the configuration has been completed; the parameters are processed and the Tag Management is updated in the background
- Defining the SNMP IP address in the Tag Management
- Starting the Runtime

NOTE

On redundant SICAM SCC systems, the information as to whether the computer is a master or a standby server is entered in the **RedundancyMaster_5003** tab (in the **SicamAdmin_5003** tag group of the SNMP connection).

This tag controls the transmission of messages to the Alarm Logging.

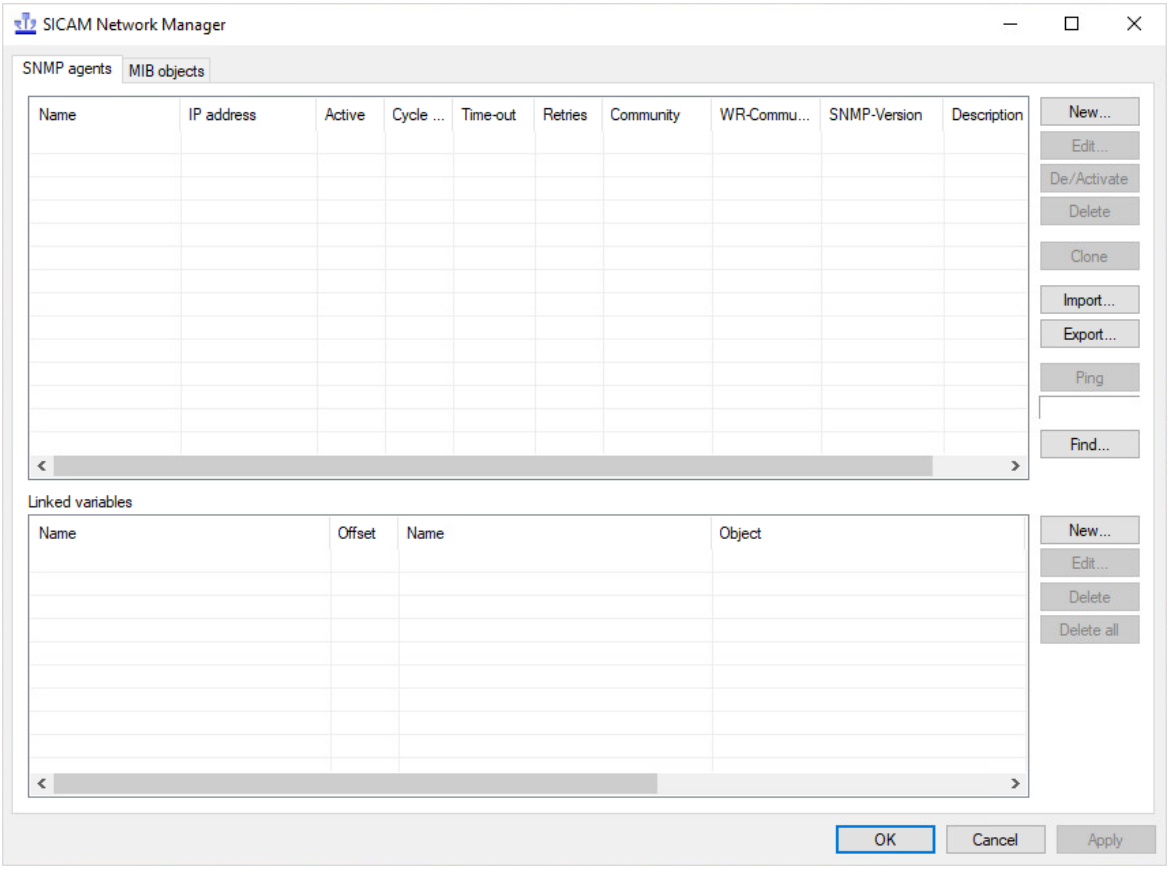
SNMP data does not have a time stamp from the data source; this data is time-stamped by the corresponding SNMP channel. To avoid double entries due to different time stamps, only the master server sends messages to the Alarm Logging in the redundant WinCC system. Afterwards, these messages are compared online on the standby server. In the WinCC Explorer, activate the **Redundancy** dialog and the **Online synchronization for Alarm Logging**.

7.11.2 SICAM Network Manager – Dialog

SNMP Agents

In this view you can find and define agents and specify the lined variables (identical with the MIB objects view).

To specify these linked variables, at least 1 MIB object must have been defined (in the MIB objects view).



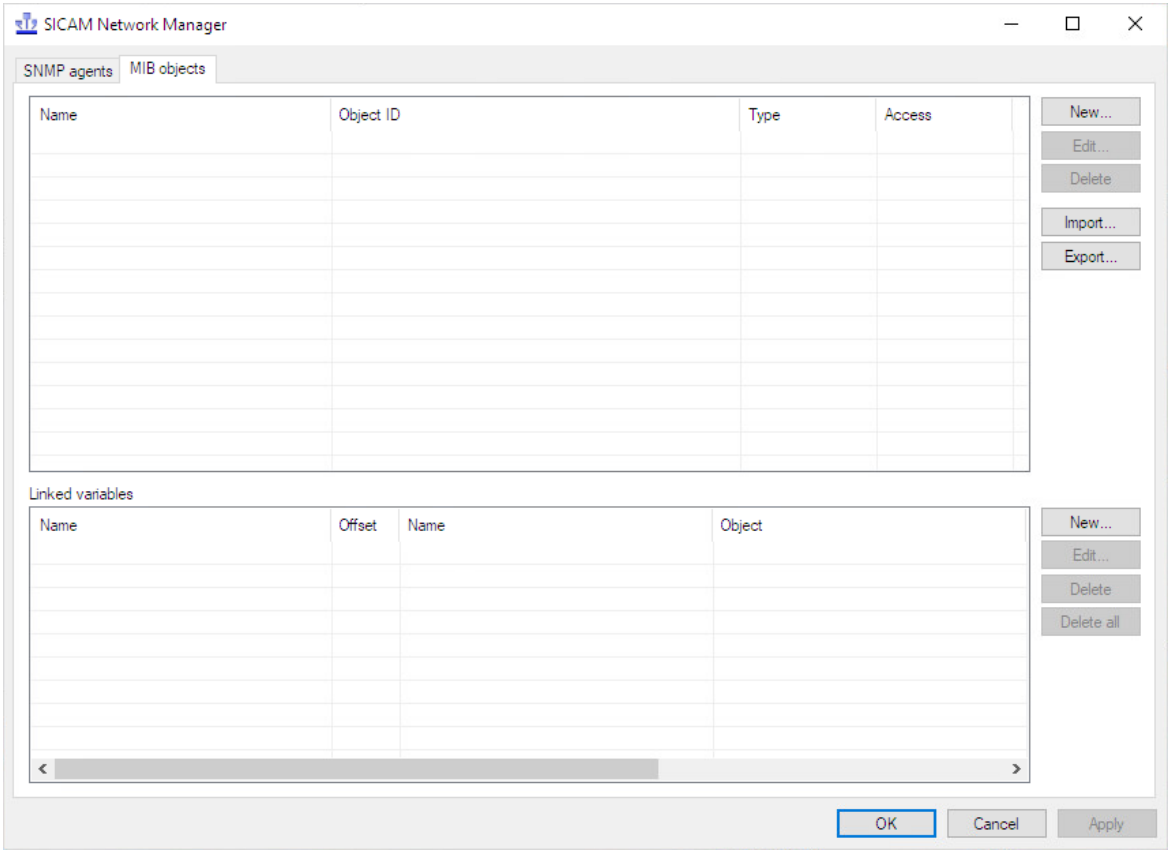
[sc_snmp_network_manager, 1, en_US]

Figure 7-51 SICAM Network Manager Dialog, SNMP Agents View

Element	Explanation
New...	Opens the **Edit agent** dialog for creating a new agent.
Edit...	Opens the **Edit agent** dialog for editing the agent selected in the list.
De/Activate	Activates or deactivates the agent selected in the list. The entry in the **Active** column changes to **Yes** or **No**.
Delete	Deletes the agent selected in the list. The agent can only be deleted if no variable is linked any more.
Clone...	Opens a dialog for cloning the variables of the agents selected in the list to the target agent.
Import...	Opens the file manager for importing from the exported agent.
Export...	Opens a dialog for exporting (and thus backing up) agents with variables and objects.
Ping	Sends a ping to the agent selected in the list and shows the result (status, response time). "Timeout" is shown if the agent cannot be contacted.
Find...	Opens the **Find agent** dialog.

MIB objects

In this view you can define and edit MIB objects.



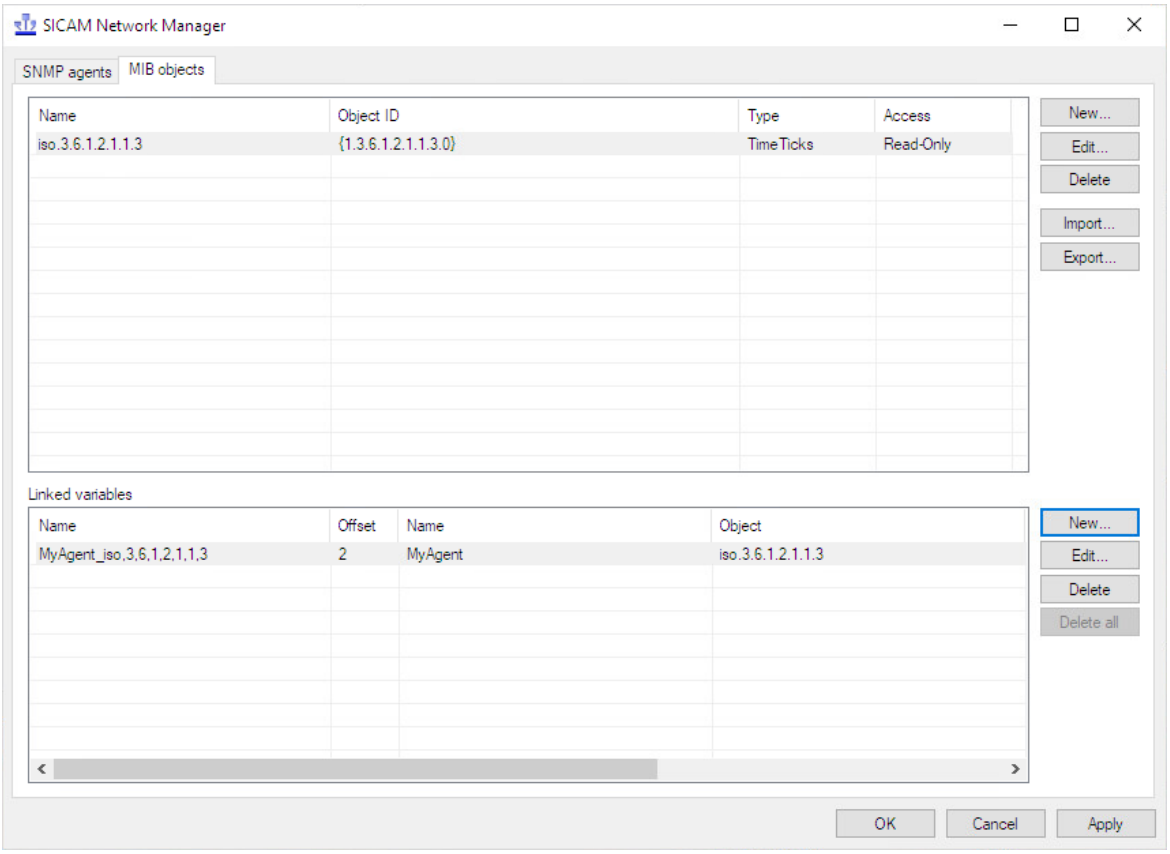
[sc_snmp_network_manager_mib, 1, en_US]

Figure 7-52 SICAM Network Manager Dialog, MIB Objects View

Element	Explanation
New...	Opens the **Create new MIB object** dialog.
Edit...	Opens the **Edit MIB Object** dialog for editing the MIB object selected in the list.
Delete	Deletes the MIB object selected in the list. The agent can only be deleted if no tag is linked any more.
Import...	Opens the file manager for importing the exported objects.
Export...	Opens a dialog where you can export objects.

Linked variables

In this window section you can link variables. This is possible in both the SNMP agents and the MIB objects view.



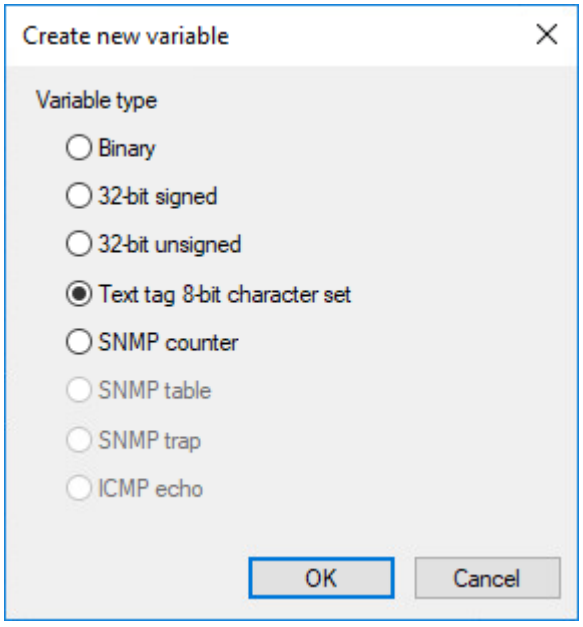
[sc_snmp_mib_linked_vars, 1, en_US]

Figure 7-53 Linked variables

Element	Explanation
New...	Opens the **Create new variable** dialog. If you open this dialog from the **SNMP agents** view, you can only select objects from the agent selected. If you open this dialog from the **MIB objects** view, you can define from which agent the selected object is to be linked (the same object can exist in several agents).
Edit...	Opens a dialog for editing the variable selected from the list. The dialog which opens depends on the variable type.
Delete	Deletes the variable selected from the list.
Delete all	Deletes all variables.

Create New Variable – Dialog

With this dialog you create new variables and select the variable type.



[sc_example_var_new_type, 1, en_US]

Figure 7-54 Create New Variable Dialog

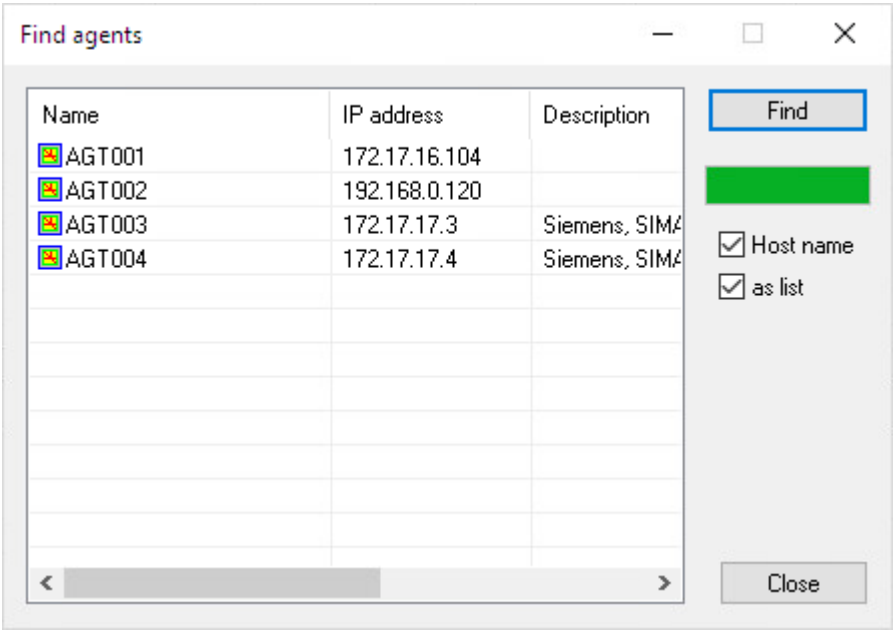
Variable Type	Explanation
Binary	Value range: 0 or 1 Supports MIB object types Integer, Timeticks, Gauge, and Counter
32 bit, signed	Value range: -2 147 483 .48 to 2 147 483 647 Supports MIB object types Integer, Timeticks, Gauge, and Counter
32 bit, unsigned	Value range: 0 to 4 294 967 295 Supports MIB object types Integer, Timeticks, Gauge, and Counter
Text tag 8-bit character set	Supports MIB object types OctetString, Integer, Timeticks, Gauge, and Counter
SNMP Counter	Value range: 0 to 4 294 967 295 Provides the change of a MIB variable of MIB object type Integer, Timeticks, or Gauge. The counter computes the average deviation of 2 values at intervals of its cycle time and sends it to the runtime.
SNMP Table	**Not supported** in SICAM V9.04
SNMP Trap	Supports MIB object type Trap, provides 0->1->0 edges when the Trap arises. Traps are spontaneous events which only contain information when they arise. Thus, an incoming variable of type Trap provides 2 signal transitions that are treated like 1 binary variable: 0 -> 1, then immediately 1 -> 0, i.e. a "fleeting indication". To extract the actually essential information from the Trap (what status really occurred?), the variables coming along with the Trap should be created. For these variables to be decoded, the Trap variable has to be defined as described above, even if it is not displayed. **Not supported** in SICAM V9.04
ICMP Echo	Via the ICMP Echo components can be monitored that do not have an SNMP agent. In this case, the monitoring is realized via a cyclic ping. The cycle time is derived from the agent cycle. This variable type provides a result of 0 (echo/ping successful) or 1 (ping not successful = error).

NOTE

When a variable is created, only those variable types are provided which are supported by the MIB objects (e.g., for the MIB object "OctetString" only the variable type "Text tag 8-bit character set" can be selected).

Find Agents Dialog

Open this dialog to find an agent.



[sc_snmp_find_agents, 1, en_US]

Figure 7-55 Find Agents Dialog

Element	Explanation
Find	Starts the search for available agents. The query can take some time depending on the number of agents. Whether agents can be contacted via routers depends on the multicast configuration of the routers. The bar under the button indicates the progress of the search.
Host name	If this checkbox is activated, the host name of the IP address found is also searched via the inverse Domain Name Service. If this checkbox is deactivated or no name server entry exists, the agent is automatically assigned a name in the following format: “AGTnnn”. NOTE: Finding the host name can take several minutes depending on the system configuration.
as list	If this checkbox is activated, the agents found are shown as a list; otherwise, they are shown as icons.

Edit Agent Dialog

Open this dialog to edit an agent.

[sc_snmp_edit_agent, 1, en_US]

Figure 7-56 Edit Agent Dialog

NOTE

Communication with an **IP address** ending with **.255** is not possible because it is a broadcast address. In this case, the Runtime uses the previously configured IP address of the agent.

NOTE

For displaying the current status of a device with **ComFault** and **OprReady**, you have to configure at least 1 SNMP variable of this device.

Element	Explanation
Agent	Enter the name of the agent.
IP address	Enter the IP address of the agent.
Read community	Read access password, default: "public"
Write community	Write access password, default: "public"
Sampling cycle	You can either apply the default value (0s) or enter a different cycle value (complemented by s, m, h for seconds, minutes, hours) for querying the agent (e.g. 10s = 10 seconds or 1m = 1 minute). The recommended minimum time is 10s. Use the default value if possible.
Time-out	Time during which the system tries to contact the agent. If the connection could not be set up within this period, the attempt is aborted.
Retries	Number of retries to set up a connection with the agent.
Agent active	Activates or deactivates the agent.
Agent description (optional)	Enter a meaningful description of the agent if required.
ComFault, OprReady	Select here where you want the **ComFault** and **OprReady** information to be issued.
SNMP version	Select the encryption: **SNMPv1**, **SNMPv2** or **SNMPv3**
SNMPv3 parameter	If you select the most secure SNMP version (v3), you can define the corresponding parameters here, such as **User name** and **Context name** for accessing the agent as well as **Security Level**, **Authentication** and **Privacy (Encryption)**.
Ping	Sends a ping to the agent and shows the result (status, response time). “Timeout” is shown if the agent cannot be contacted.

7.11.3 SNMPv3

Security

Since the SNMP versions 1 and 2 only provide reduced security mechanisms, the **SICAM Network Manager** also supports **SNMPv3**. This version provides significantly improved security. For this reason, Siemens always recommends that you use SNMPv3.

Set all the relevant parameters directly in the **Edit agent** dialog.

SNMPv3 parameter

[sc_snmp_edit_agent, 1, en_US]

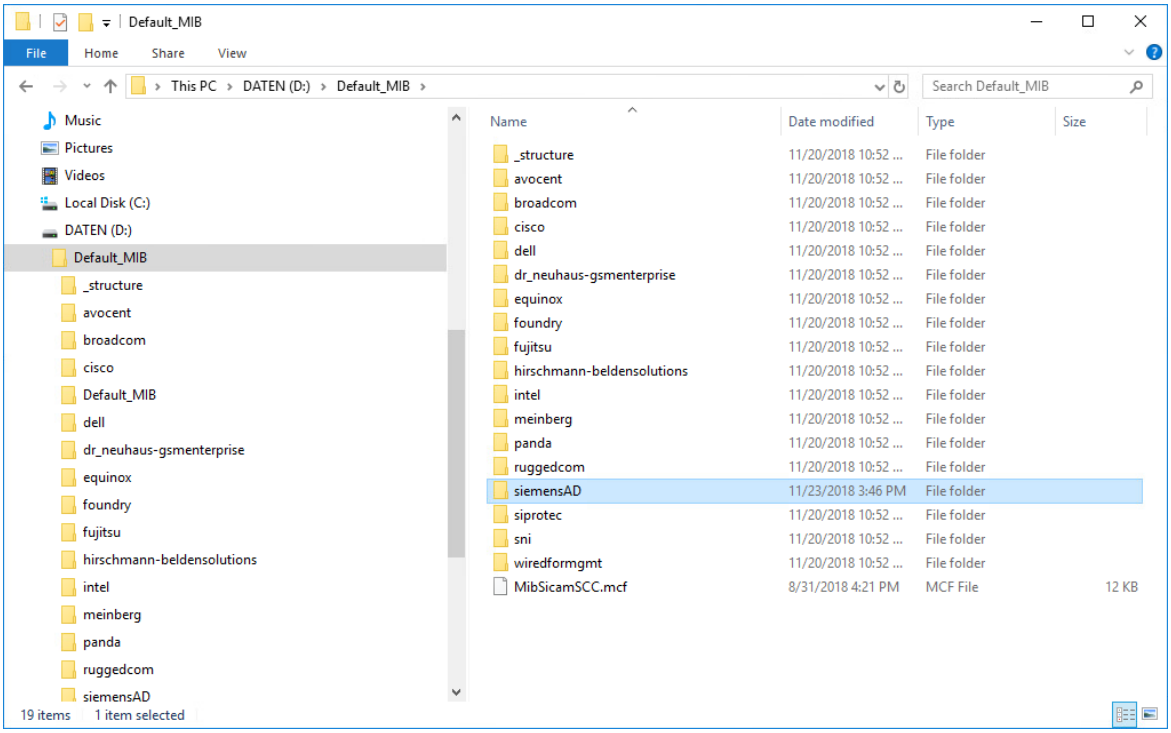
Figure 7-57 Edit agent dialog

Element	Explanation
SNMP Engine ID (as Octet string)	The **SNMP Engine ID** serves for the unique identification of the entity. Under SNMPv3, an entity is an SNMP instance which can serve as a manager, an agent, or as a combination of both. Click **Readout** in order to query this ID directly from the agent.
Readout	Queries the engine ID directly from the agent and enters it automatically in the **SNMP Engine ID (as Octet string)** field.
User name	The **User name** replaces the community strings of the versions v1 and v2c and is an integral part of the User-based Security Model (USM).
Context name	A context can be used in order to combine the management objects of an entity into logical groups. Several contexts per SNMP entity are possible and these contexts can also contain identical objects. The **Context name** serves for unique identification.
Security level	Shows the security level used: • **NoAuthNoPriv** No authentication and no privacy (encryption). Corresponds to SNMPv1/ SNMPv2c security; the user name is used as a community string. • **AuthNoPriv** Authentication is used • **AuthPriv** Both authentication and privacy are used
Authentication	
Algorithm	Authentication method (MD5, SH1) Used in the **AuthNoPriv** and **AuthPriv** security levels.
Password	Authentication password
Visibility...	Provides the **Show password** and **Hide password** options
Privacy (Encryption)	
Algorithm	Encryption type Used with the **AuthPriv** security level.
Password	Encryption password
Visibility...	Provides the **Show password** and **Hide password** options

7.11.4 Extending the MIB Container

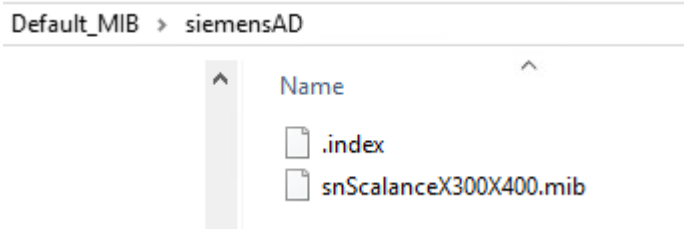
You can complement the MIB file collection by additional MIB files.

✧ Copy the folder with your new MIBs into the **Default_MIB** folder (available under any path on your drive, see *Management Information Base (MIB), Page 318*).



[sc_snmp_add_mib1, 1, en_US]

The folder includes an .index file and at least one MIB file.



[sc_snmp_add_mib1b, 1, en_US]

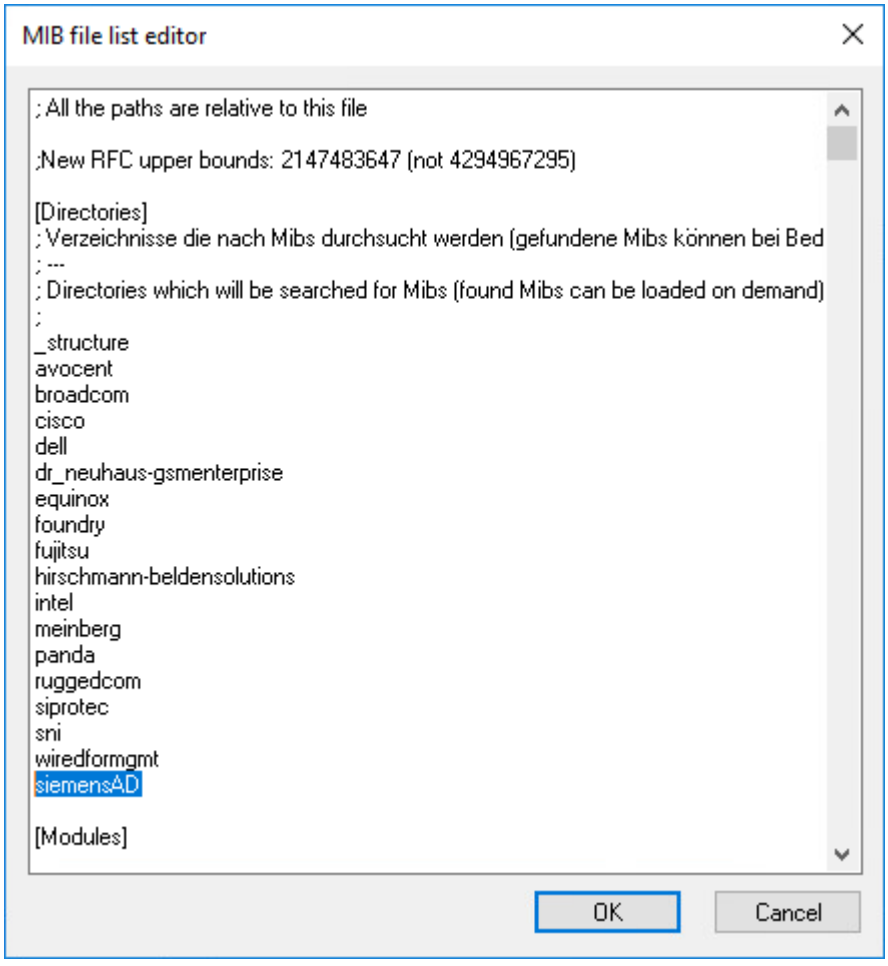
✧ Click **New...** in the **MIB objects** view of the **SICAM Network Manager**.

The **Create new MIB object** dialog opens.

✧ Click **Edit**.

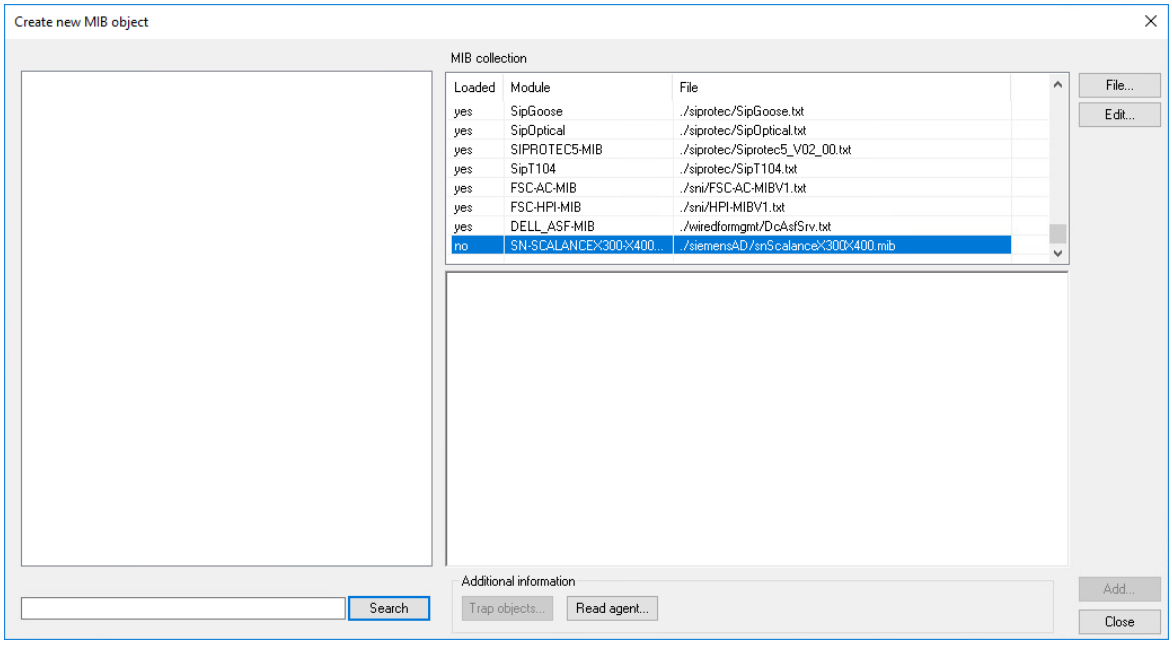
The **MibSicamSCC.mcf** container file is opened in the **MIB File List Editor**.

✧ Under **[Directories]** of the file, enter the name of the folder you have added previously and then click **OK** to confirm.



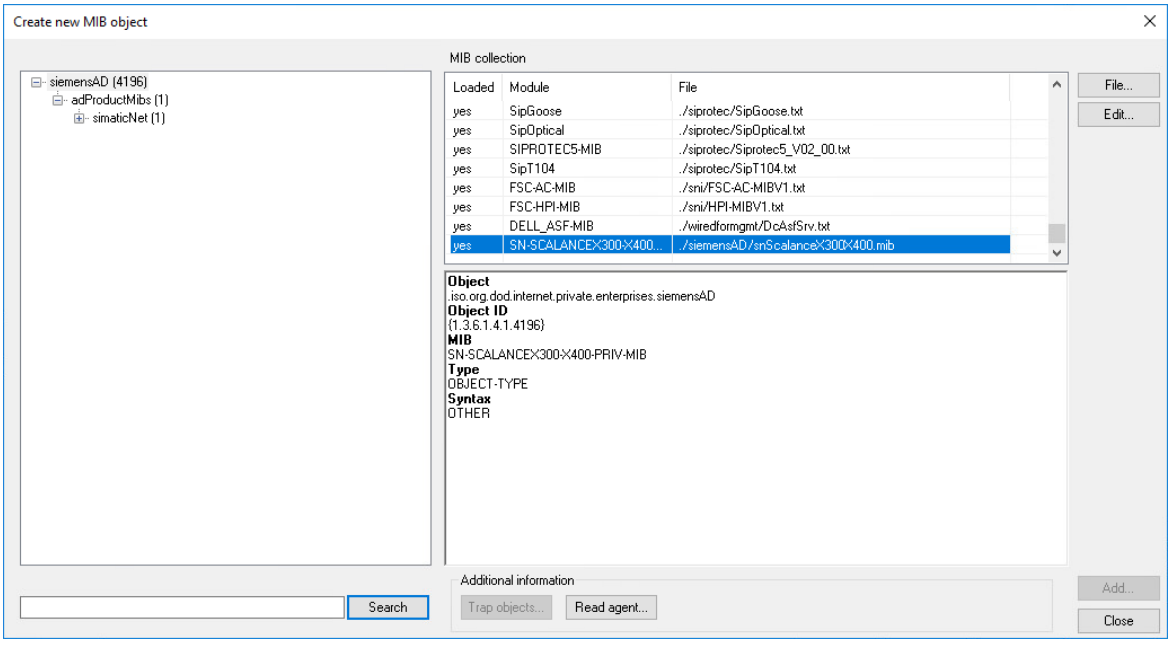
[sc_snmp_add_mib2, 1, en_US]

✧ In the **Loaded** column, double-click **no** in order to load the MIB file.



[sc_snmp_add_mib3, 1, en_US]

The entry now reads **yes** and the MIB file is available in the MIB collection.



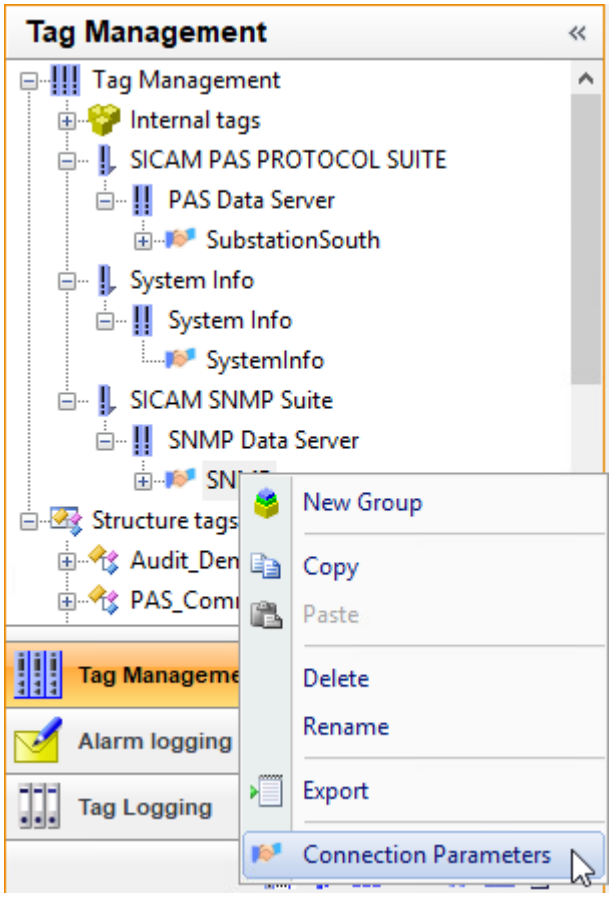
[sc_snmp_add_mib4, 1, en_US]

7.11.5 Separate Network Card for SNMP

If your computer is equipped with several network cards, you can define a specific IP address for SNMP.

✧ In the **WinCC Explorer**, open the **Tag Management**.

✧ Right-click **SNMP** and select **Connection parameters** from the context menu.

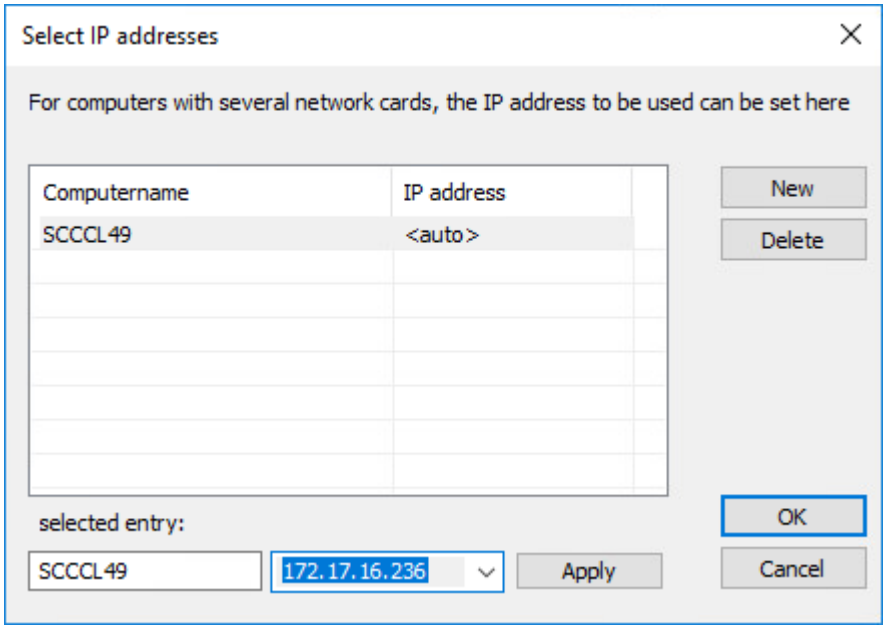


[sc_snmp_add_ip1, 1, en_US]

The **Select IP addresses** dialog opens.

✧ Click **New**.

The default IP address (**<auto>**) of your computer is displayed. Via **Selected entry** you can select another IP address, if existing.

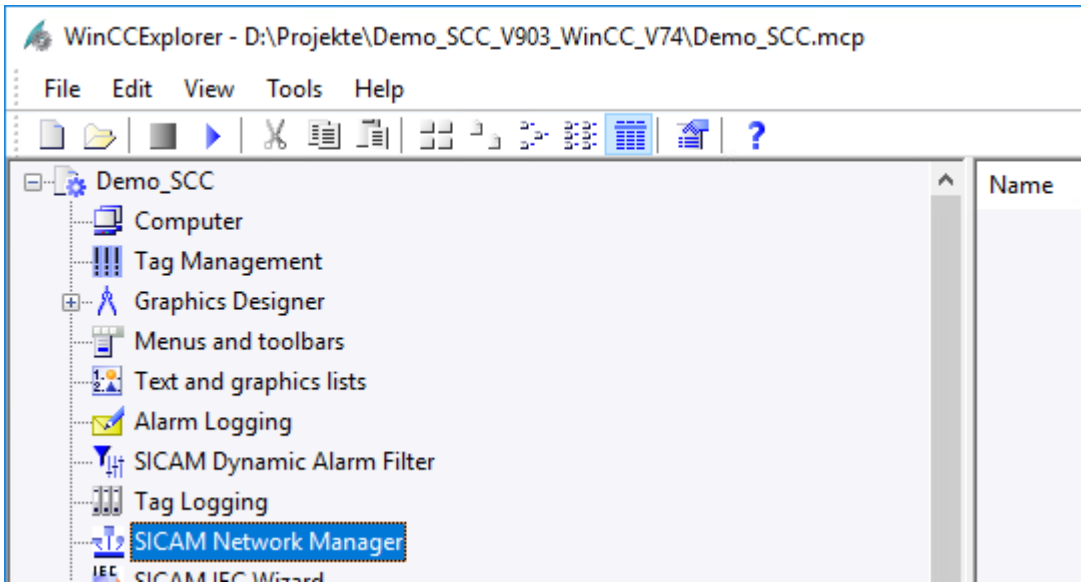


[sc_snmp_add_ip2, 1, en_US]

7.11.6 Configuring SNMP (Example)

7.11.6.1 Defining Agents

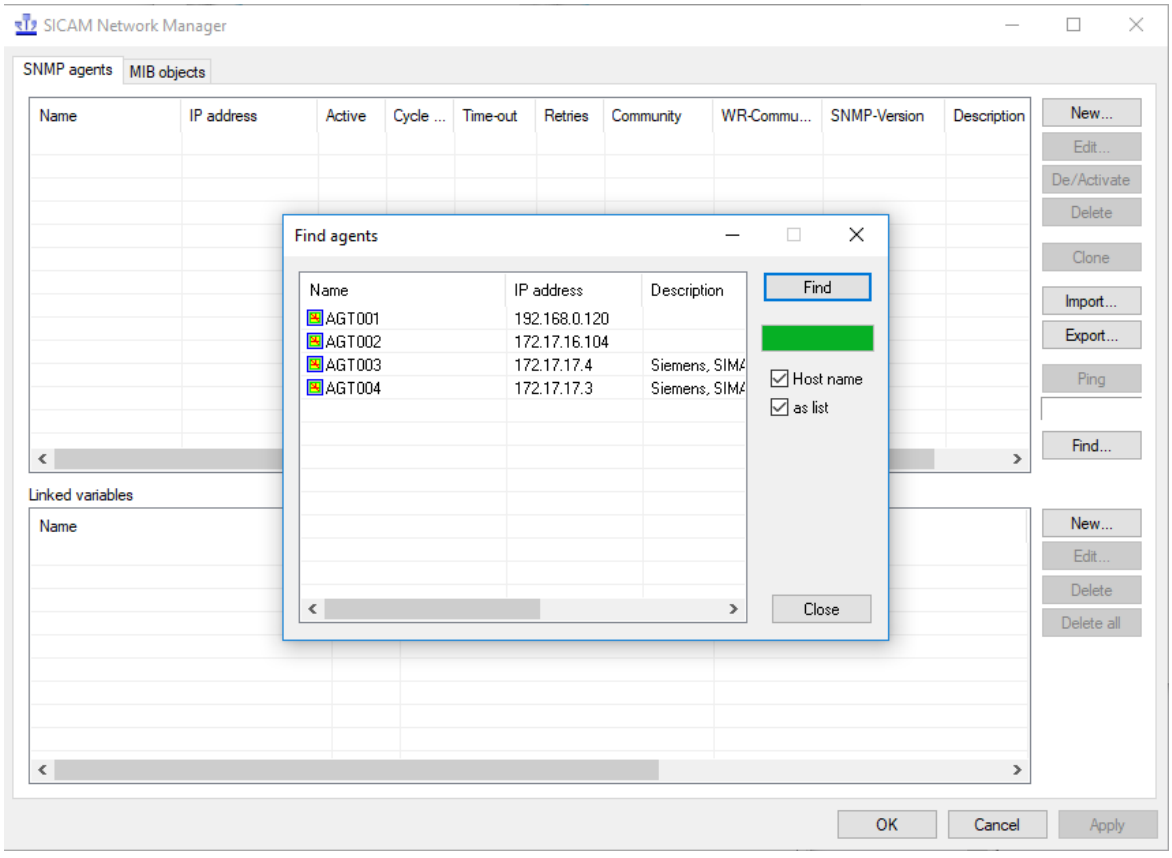
✧ In the **WinCC Explorer**, open the **SICAM Network Manager**.



[sc_example_open_nwm, 1, en_US]

✧ Click **Find...** in the **SNMP agents** view in order to open the **Find agents** dialog.
Click **Find** in the dialog.

All available agents are displayed.



[sc_example_find_agent, 1, en_US]

✧ Double-click the desired agent (here: AGT004).

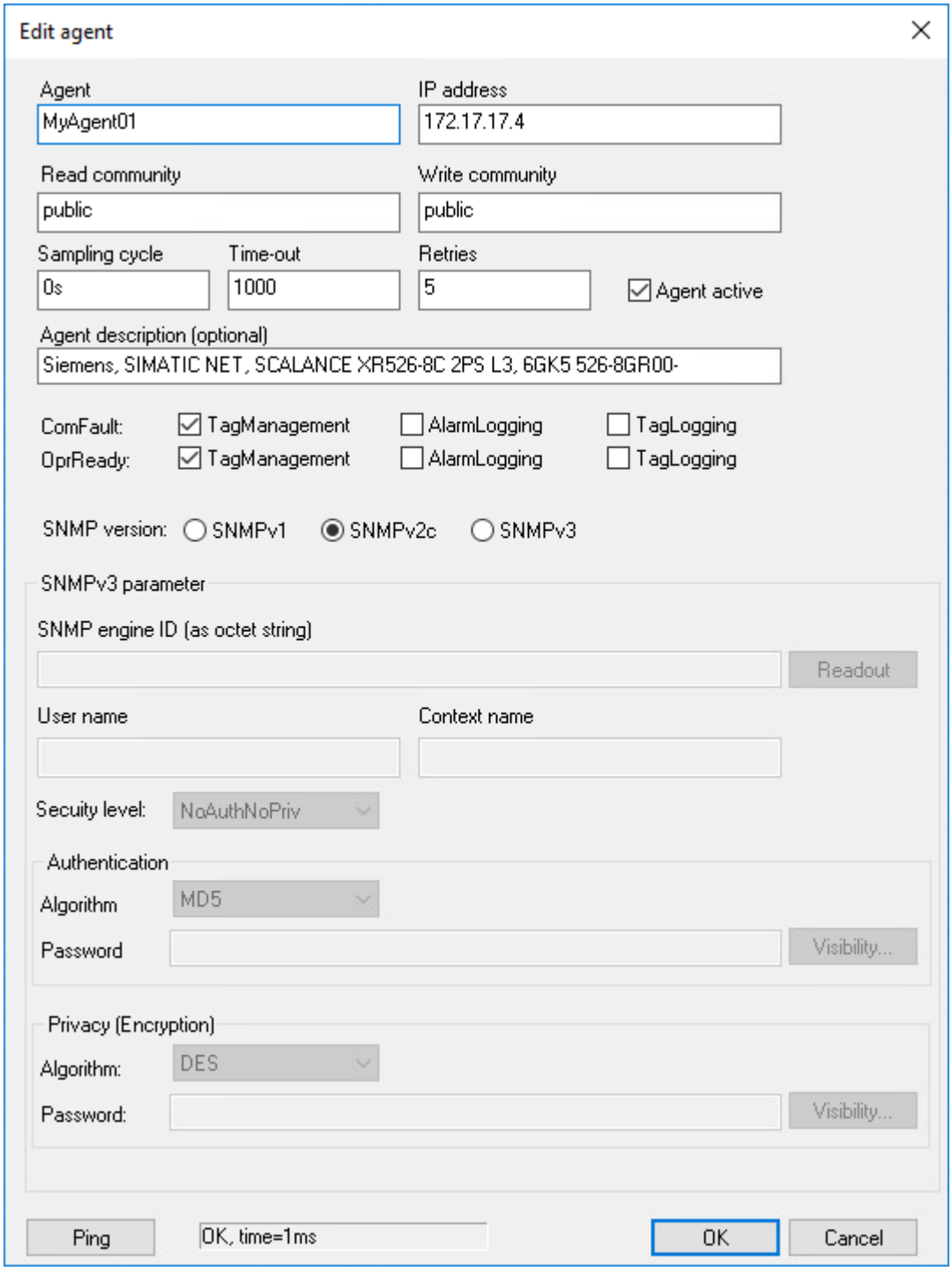
The **Edit agent** dialog opens (see *Edit Agent Dialog, Page 323*).

✧ If desired, enter a different name in the **Agent** field.

✧ For **Read community** and **Write community**, enter the "public" default entry.

✧ Select where you want the **ComFault** and **OprReady** information to be issued, e.g. in the **Tag Management**.

✧ Change further parameter settings if required.

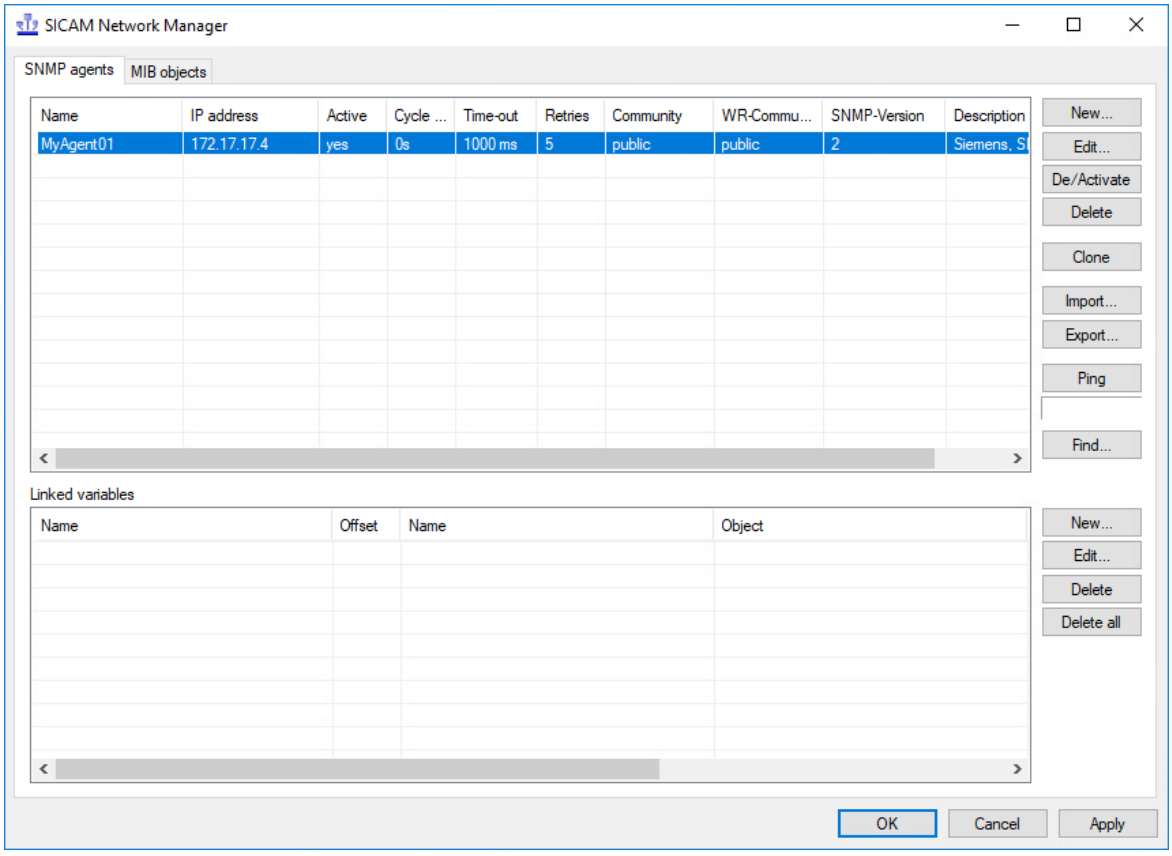


[sc_example_edit_agent, 1, en_US]

✧ Click **OK** to close the **Edit agent** dialog.

✧ Click **Close** to close the **Find agents** dialog.

The agent is now shown in the **SICAM Network Manager**, **SNMP agents** view.



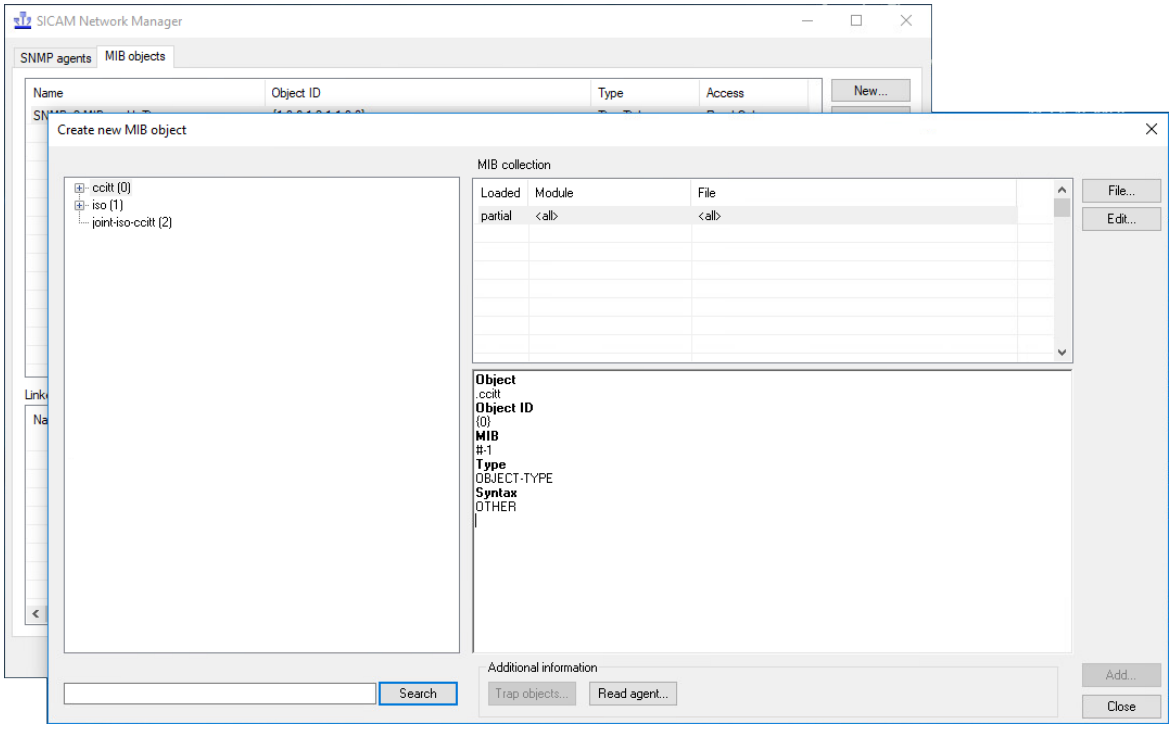
[sc_example_nwm_with_agent, 1, en_US]

7.11.6.2 Configuring MIB Objects

✧ In the **WinCC Explorer**, open the **SICAM Network Manager**.

✧ Open the **MIB objects** view and click **New...**.

The **Create new MIB object** dialog opens.



[sc_example_mib_objects, 1, en_US]

✧ Click **File**, navigate to the MIB file folder and select the **MibSicamSCC.mcf** MIB container file. This file contains a collection of all the MIB files included.

✧ Click **Open**.

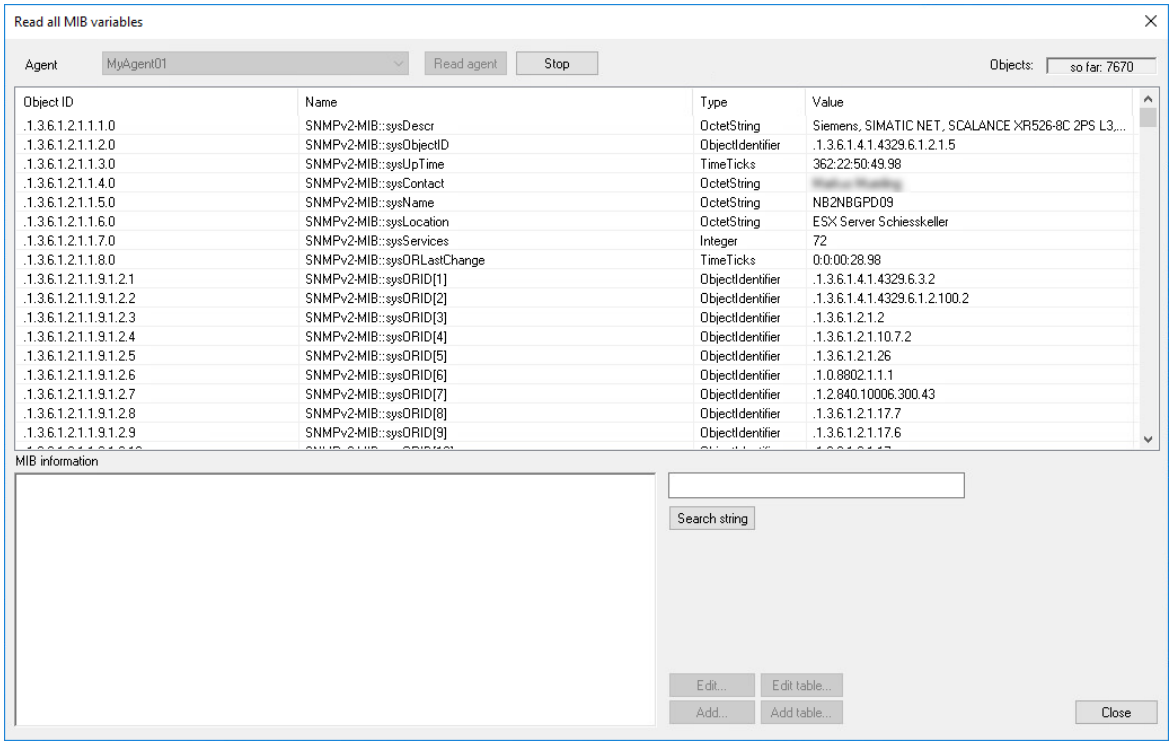
All available MIB files are read in and all MIB objects are shown in the **Create new MIB object** dialog.

✧ Click **Read agents...**.

The **Read all MIB variables** dialog opens.

✧ Select your desired **agent** from the drop-down list box and then click **Read agents**.

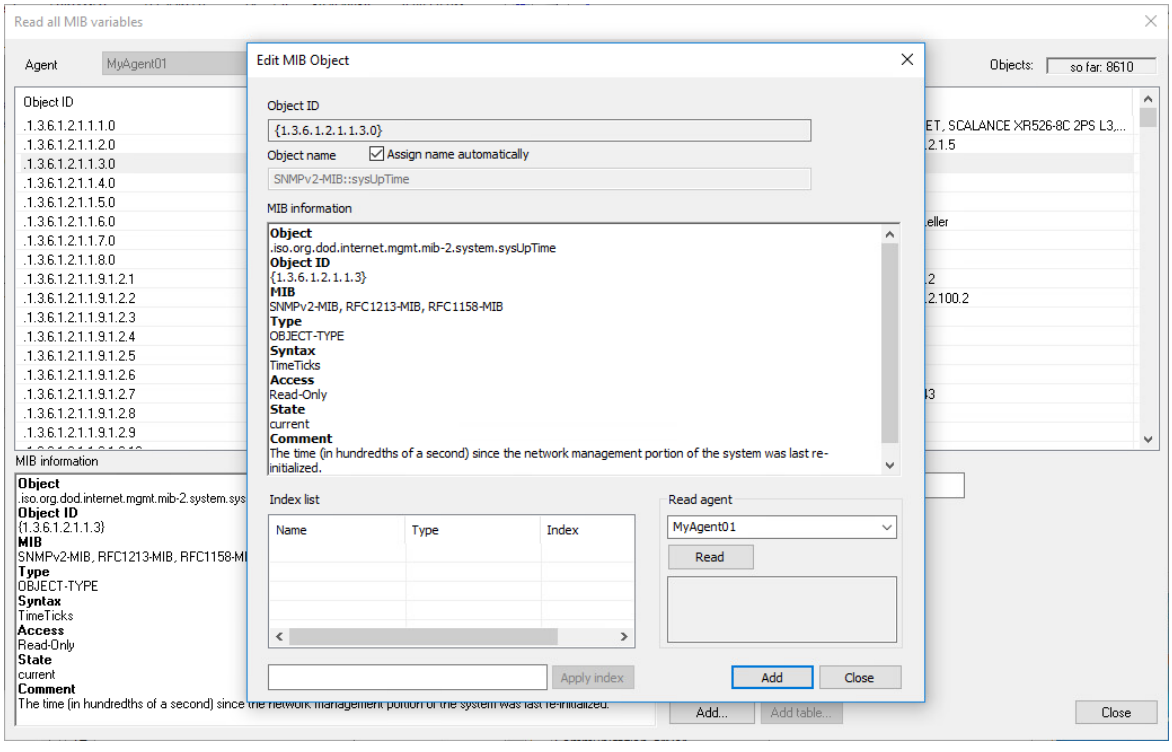
Under **Objects** you can observe how the objects are read in.



[sc_example_mib_read_agent, 1, en_US]

✧ Select the desired object and click **Add...**.

The **Edit MIB Object** dialog opens.



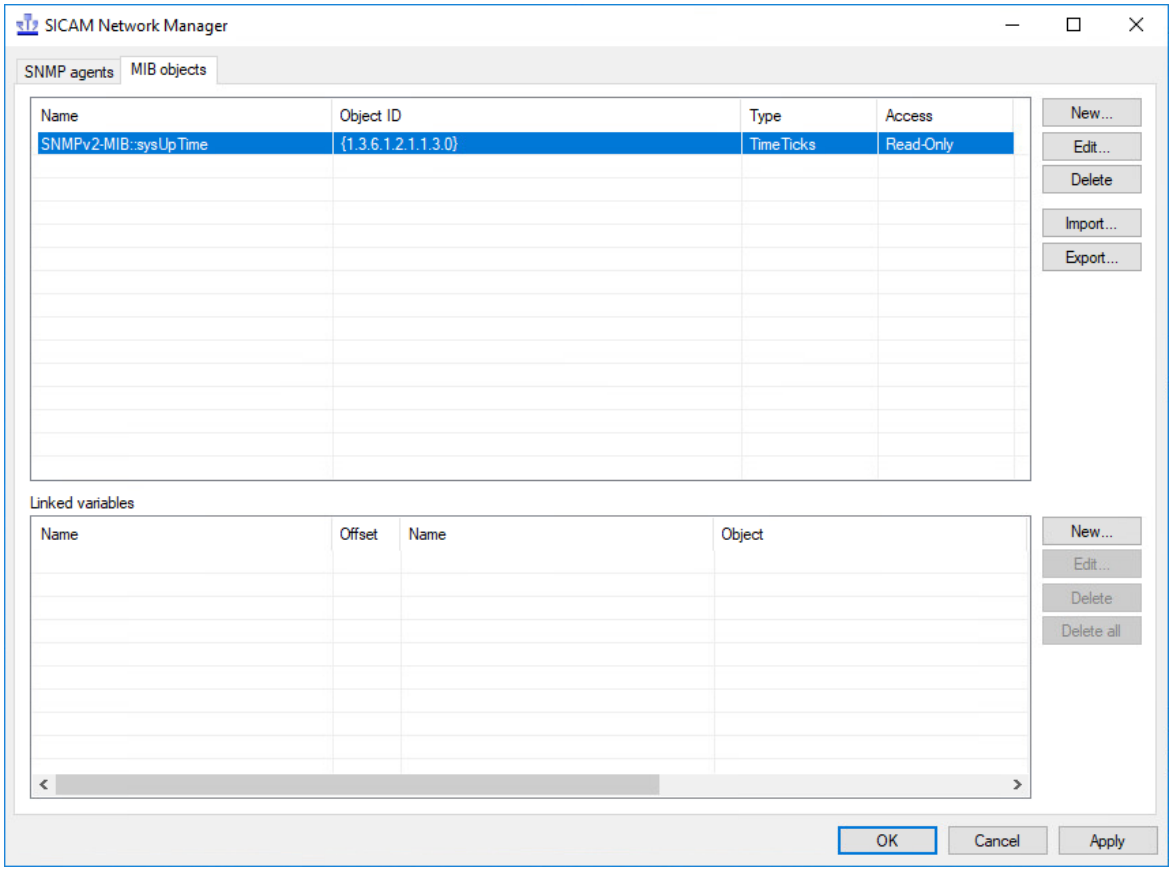
[sc_example_mib_edit_object, 1, en_US]

✧ You can change the **Object name** here, if required. **Assign name automatically** is activated by default.

✧ Click **Add** and then click **OK** to confirm that you really want to add the object.

- ✧ Click **Close** to close the **Edit MIB Object** dialog.
- ✧ Repeat these steps to add additional MIB objects, if required.
- ✧ Click **Close** to close the **Read all MIB variables** dialog.
- ✧ Click **Close** to close the **Create new MIB object** dialog.

The MIB object is now shown in the **SICAM Network Manager**, **MIB objects** view.

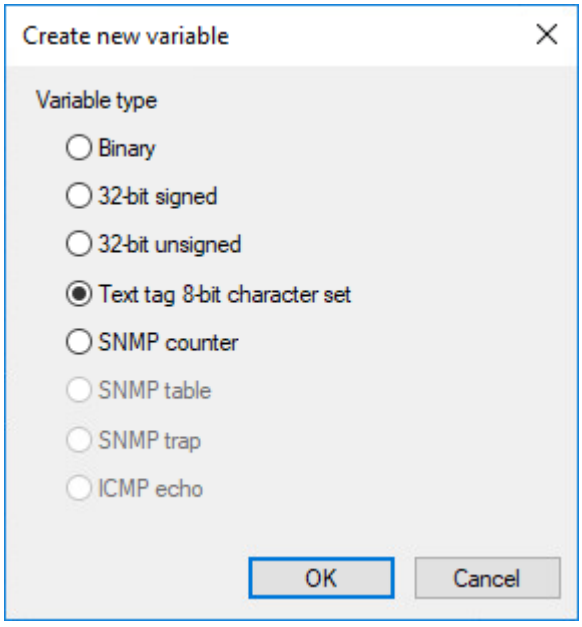


[sc_example_nwm_with_mib_object, 1, en_US]

7.11.6.3 Creating Linked Variables

- ✧ In the **WinCC Explorer**, open the **SICAM Network Manager**.
- ✧ In the **MIB objects** view under **Linked variables**, click **New...**.

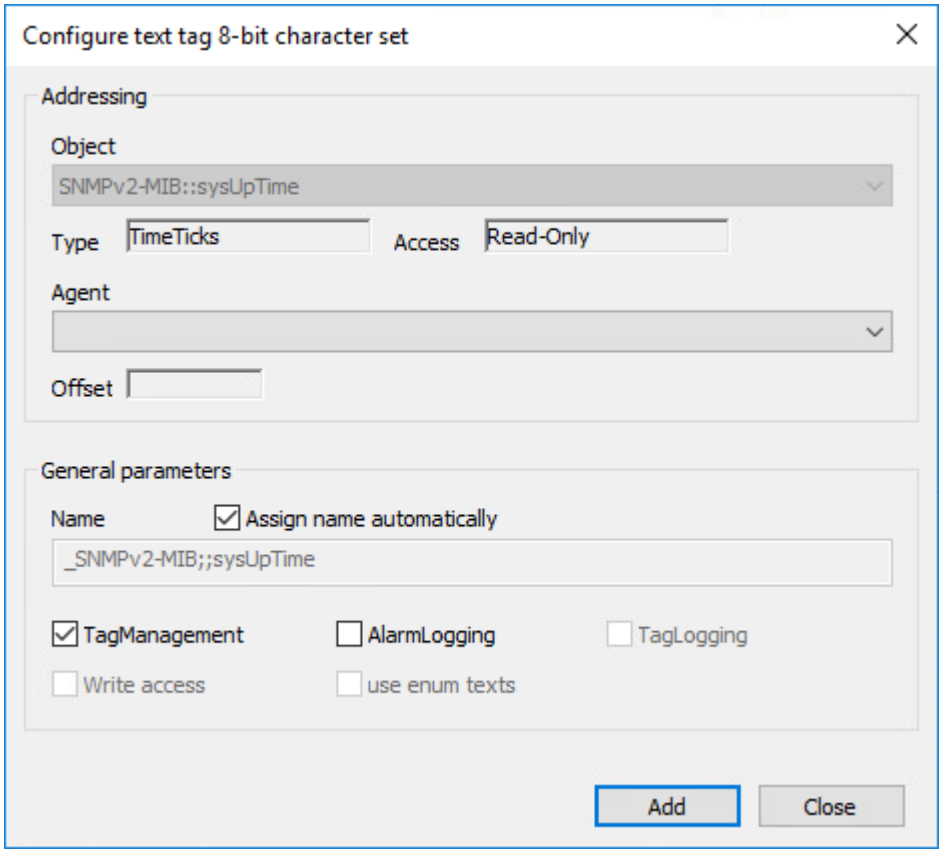
The **Create new variable** dialog opens.



[sc_example_var_new_type, 1, en_US]

✧ For this example, select **Text 8-bit character set** and click **OK**.

The dialog for configuring the variable (here: Text variable 8-bit character set) opens.



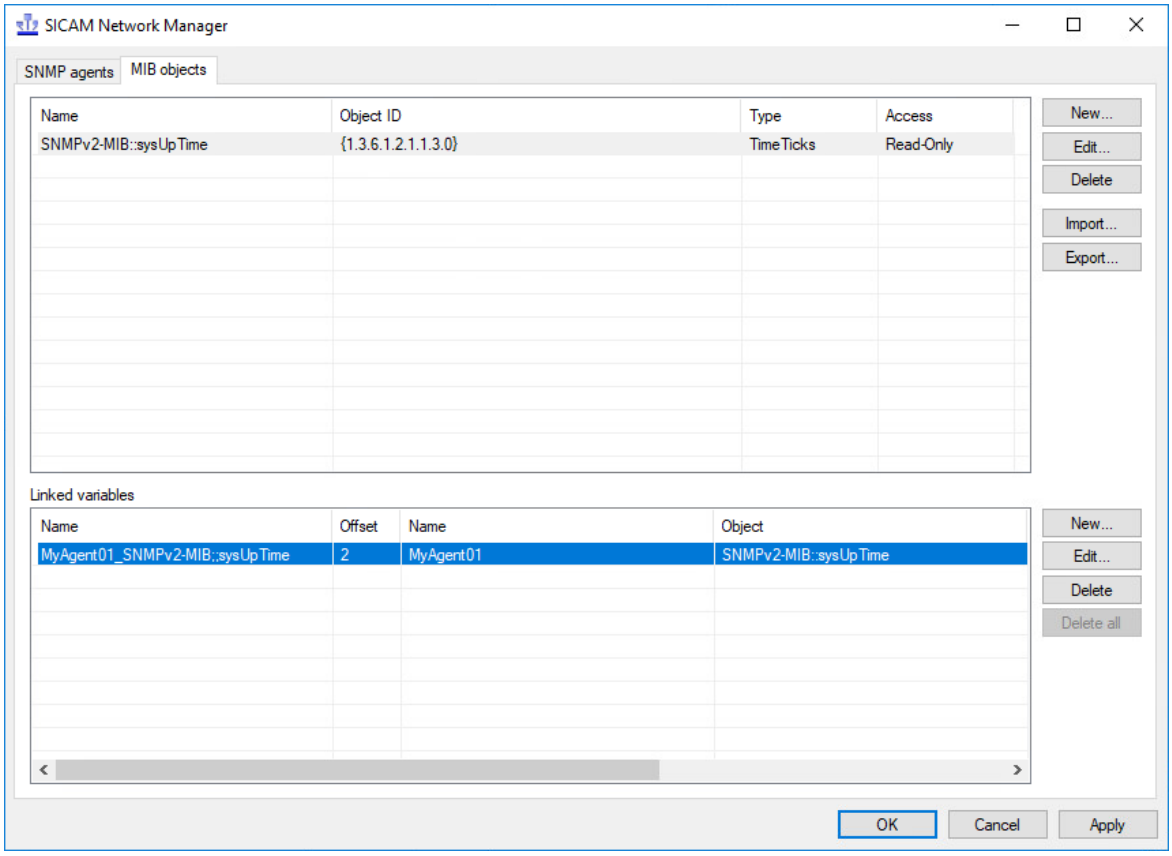
[sc_example_var_config, 1, en_US]

✧ Select the desired **Agent** from the drop-down list box.

✧ Click **Add** and then click **OK** to confirm that you really want to add the variable.

✧ Click **Close**.

The variable is now shown under **Linked variables**.



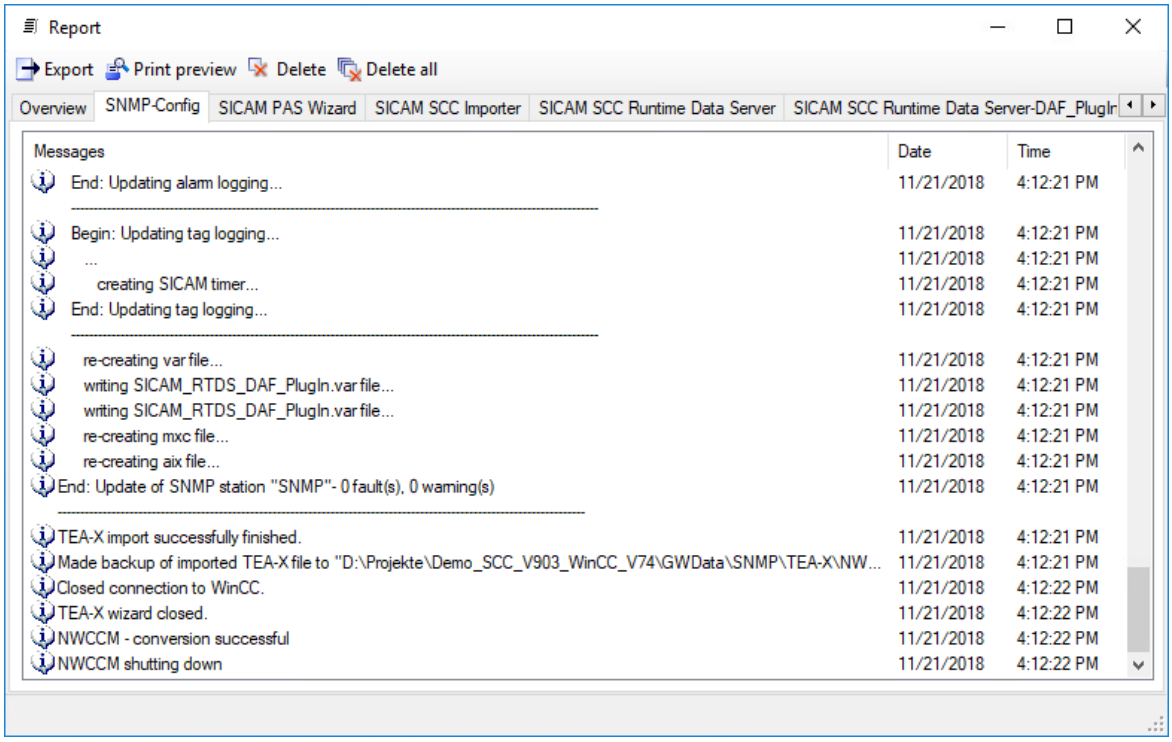
[sc_example_var_linked, 1, en_US]

✧ Click **Apply** to apply the parameters for the linked variable.

✧ Repeat these steps to add additional linked variables, if required.

✧ Click **OK** to close the **SICAM Network Manager**.

The parameters are processed in the background and the Tag Management is updated. The "NWCCM shutting down" message in the **Report** in the **SNMP-Config** view informs you that the update has been completed.

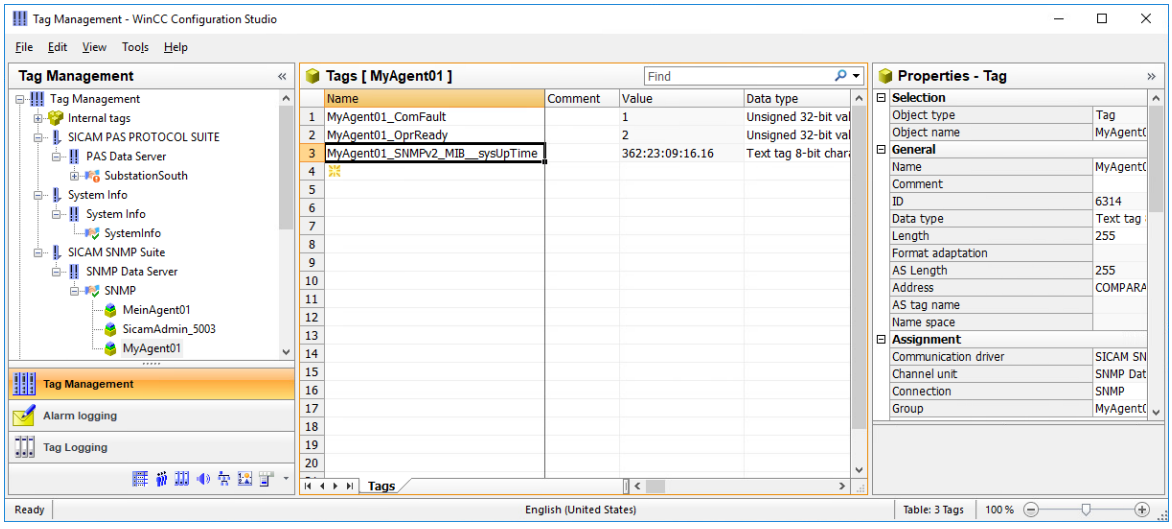


[sc_example_var_report, 1, en_US]

7.11.6.4 Starting the Runtime and Opening the Tag Management

- ✧ Start the Runtime in the **WinCC Explorer**.
- ✧ In the **WinCC Explorer**, open the **Tag Management**.
- ✧ Select your agent under **SICAM SNMP Suite > SNMP Data Server > SNMP**.

The linked objects are displayed.

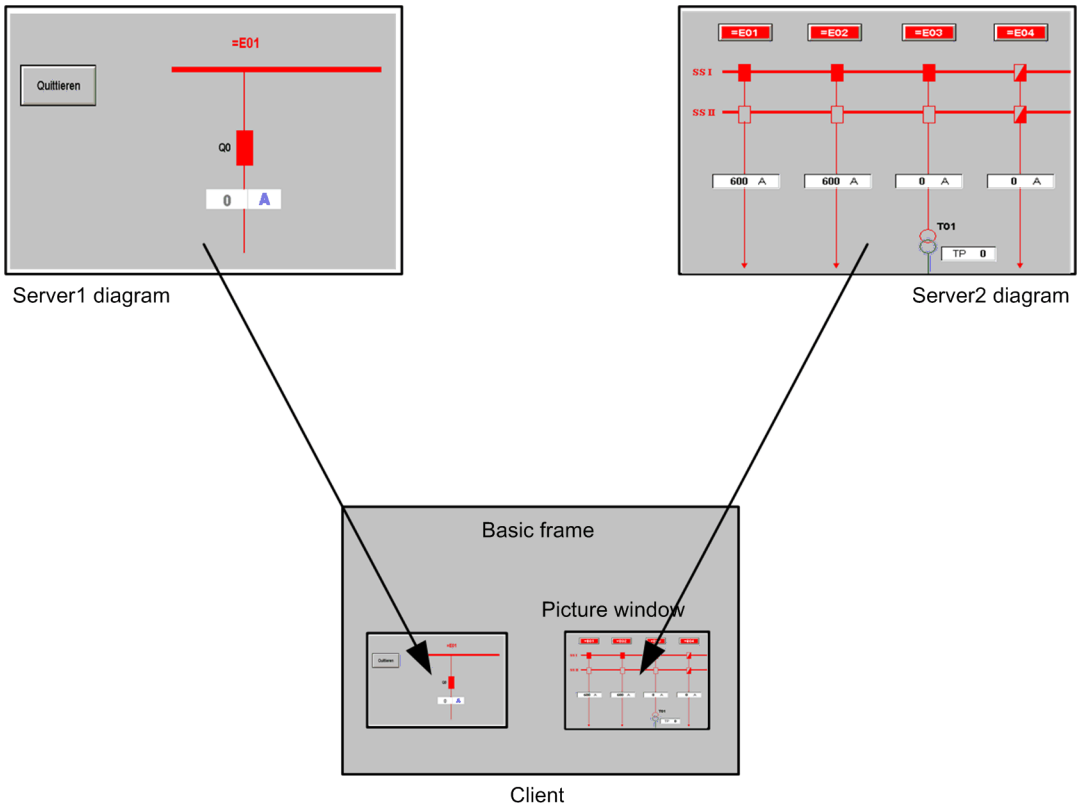


[sc_example_var_managment, 1, en_US]

8 Client-Server Systems

8.1	Configuration of the Graphic Objects	344
8.2	Configuration of the Functions	345
8.3	Configuration of the SIMATIC WinCC Components	346

8.1 Configuration of the Graphic Objects



[client_serv01, 1, en_US]

Figure 8-1 Showing a server diagram on the client computer

Diagrams from various different servers can be viewed in individual screen sections. These so-called "picture windows" are displayed in the basic frame configured on the client computer. The diagrams configured on the servers are displayed in diagram windows. Each diagram is based on the data of an individual server. In order to be able to integrate a server diagram as a picture window in a basic frame on the client computer, the file name of the diagram must be preceded by the prefix of the server name. All server prefixes must be unique within the distributed system.

The packages of the corresponding servers must be imported into the client.

- ✧ Open the basic frame on the client into which you want to insert the server diagram as picture window.
- ✧ In the **Graphics Designer**, select the **Picture window** from the group of **smart objects**. Insert it into the basic frame.
- ✧ Double-click the picture window to open the **Properties** dialog.
- ✧ In the **Miscellaneous** group of the **Properties** tab, click the **Picture name** attribute in order to browse for the diagram.
- ✧ Double-click the **Server prefix** attribute to browse for the server.
- ✧ Close the **Properties** dialog.

On the client, you can also create and show diagrams based on data from several different servers.

NOTE

On the server computer, you create the server packages in the WinCC Explorer under the **Server** level. On the client computer, you import the server package in the WinCC Explorer under the **Server** level (see chapter *8.3 Configuration of the SIMATIC WinCC Components* and WinCC Information System).

8.2 Configuration of the Functions

When importing data, the compatibility key script (SICAMPAS_CompKey.pas), the alarm list filter script and several other scripts are created in the **PAS** directory of the WinCC project directory. Scripts in this directory are executed by all computers of the project.

For efficient system operation, move the scripts **SICAMPAS_CompKey.pas** and **SicamPAS_AlarmList-Filter.pas** into the corresponding **PAS** directories of those computers in the project which are interfaced to the process.

NOTE

During each import, the **SICAMPAS_CompKey.pas** script is created again by the SICAM PAS Wizard.

The WinCC project directory holds a subdirectory (<Computer Name>) for each computer in the project. This subdirectory comprises the same subdirectories as the project directory. Data located in these subdirectories is only assigned to the individual computer.

8.3 Configuration of the SIMATIC WinCC Components

Picture Cache

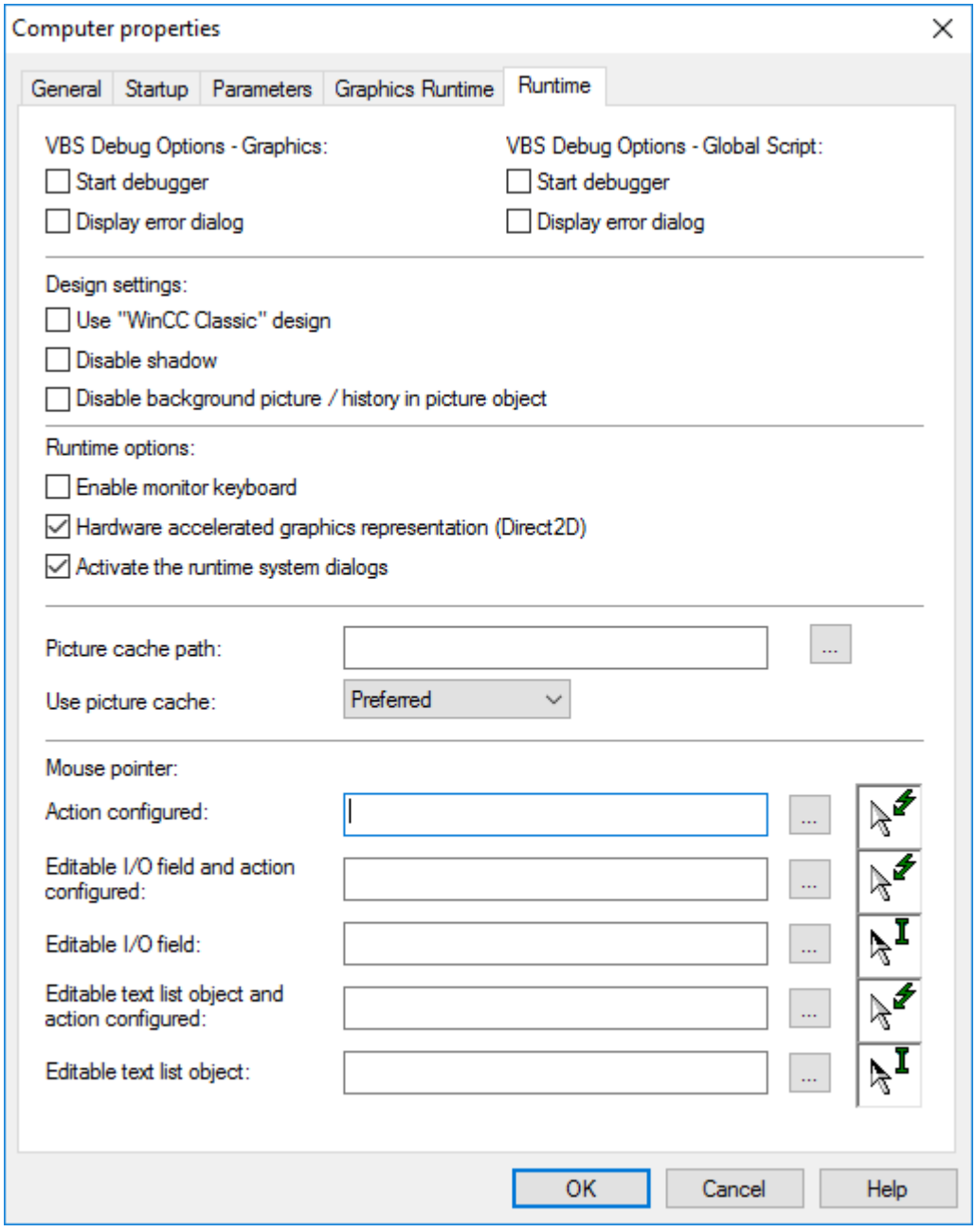
The diagrams from a connected server can be shown in a picture window on a client computer. For a speedy build-up of the diagram on the client computer, the corresponding diagrams should be copied into a Picture Cache on the client. When using a Picture Cache, the WinCC client does not need to reload all individual diagrams from the server.

Proceed as follows to set up a picture cache on the client computer:

The necessary pictures must be stored on the Client computer which shall use the picture cache.

- ✧ To do this, create the **PDLCache** directory within the **<InstallationDirectory\bin>** directory on this computer and copy the pictures into this folder.

  This folder is stored as the standard directory in the WinCC project. If you select a different directory, you enter this directory in the Path input field. Enter the path to the directory in which the PDLCache directory is stored.
- ✧ Copy the diagrams into this folder in order to show them on the client computer.
- ✧ Open the **Computer Properties** dialog on the client.
- ✧ Select the **Runtime** tab.



[client_serv02, 1, en_US]

Figure 8-2 Defining a picture cache

✧ Enter the path of the picture cache under **Path**.

✧ Select **Preferred** from the **Use cache** list box.
Modified diagrams are read from the server; unmodified diagrams are read from the picture cache.

If a diagram is modified in the project on the server, it has to be manually copied into the picture cache of the client.

Update: example of SICAM PAS data

Changes performed in SICAM PAS must be forwarded to SICAM SCC. For a client-server system, changes must be forwarded as described below.

NOTE

The export of the first package from the server and the import into a client have to be performed manually. All further updates of the packages on the server and the client can be performed automatically. You can define when the package is to be updated and specify a trigger event.

For more detailed information, refer to the *WinCC Information System*.

- ✧ Import the new PXD file created with SICAM PAS into the WinCC server.
- ✧ Create a package on the server.

To manually load a package onto the client:

- ✧ Open the client project on the client computer.
- ✧ In the WinCC Explorer, select Server data and then select Load from the context menu. The Open File dialog displays.
- ✧ Select the package to be loaded and click **OK**.

  By default, the server packages are saved in the directory **...\\<Server Project Name>\<Computer Name>\Packages** under the name **<Project Name_Computer Name>*.pck**. You can also load packages saved on any other data carrier.
- ✧ Click **Open**. The data is loaded.

To manually update a package on the client:

- ✧ Open the client project on the client computer.
- ✧ In the WinCC Explorer, select **Server data** and then select **Update** from the context menu.

  The data is updated.

9 Redundancy

9.1	Overview	350
9.2	Redundancy with a SICAM PAS System	352
9.3	Redundancy with SICAM RTUs	358

9.1 Overview

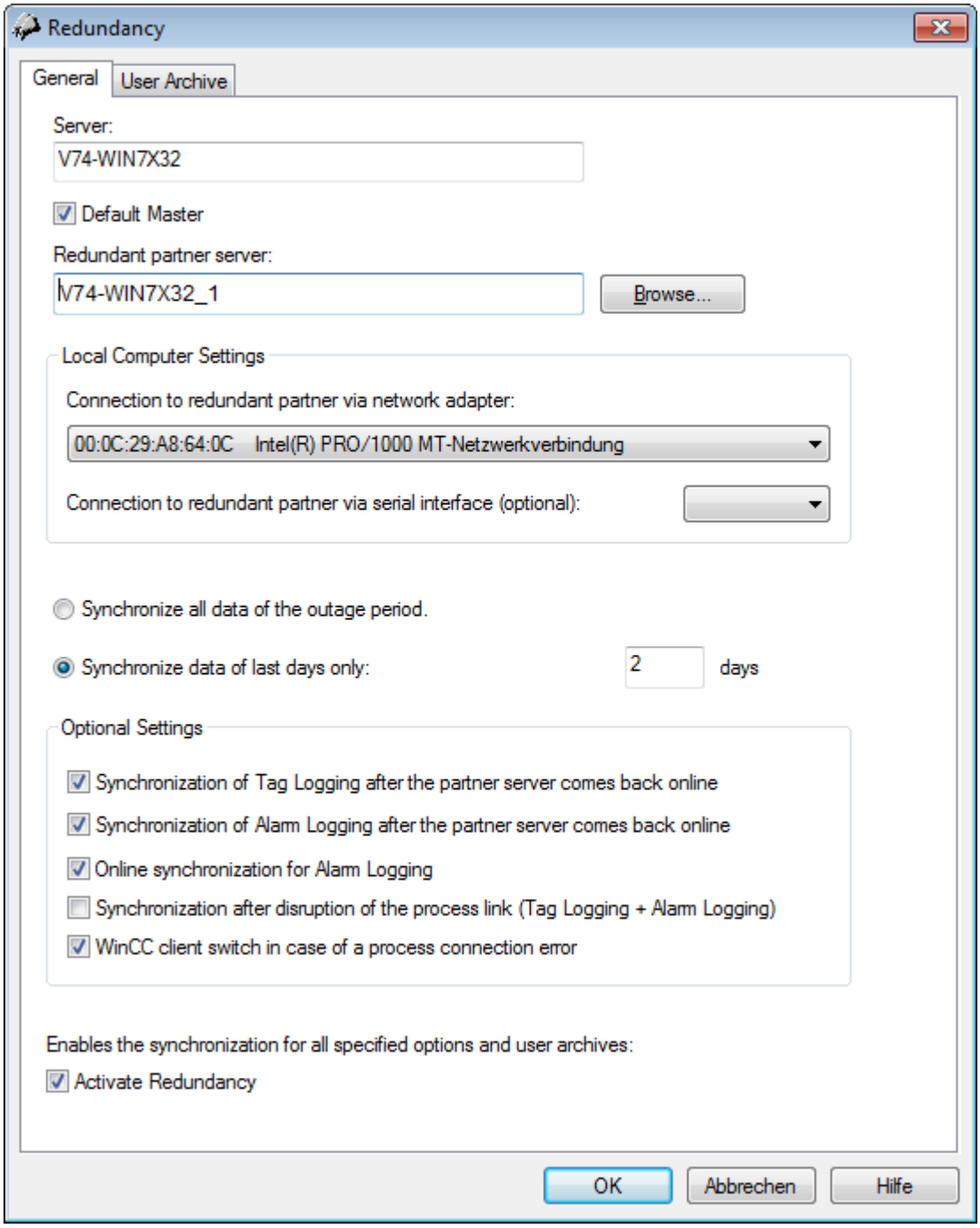
For safety reasons, a SICAM PAS system and SICAM RTUs can be implemented in redundant configuration. If required, certain components can be implemented in redundant configuration depending on the specific requirements of the individual system. This section describes the implementation of the configurations illustrated below.

- Redundant SICAM PAS systems and SICAM RTUs are connected to 1 SICAM SCC Human-Machine Interface (HMI).
- 1 SICAM PAS system/SICAM RTUs is connected to 2 redundant SICAM SCC HMIs.

Further redundant configurations are possible. For example, redundant SICAM PAS systems/SICAM RTUs can also be connected to a redundant SICAM SCC system.

For more detailed information on redundancy, refer to the SIMATIC WinCC documentation.

Settings recommended for SICAM SCC in the WinCC Redundancy



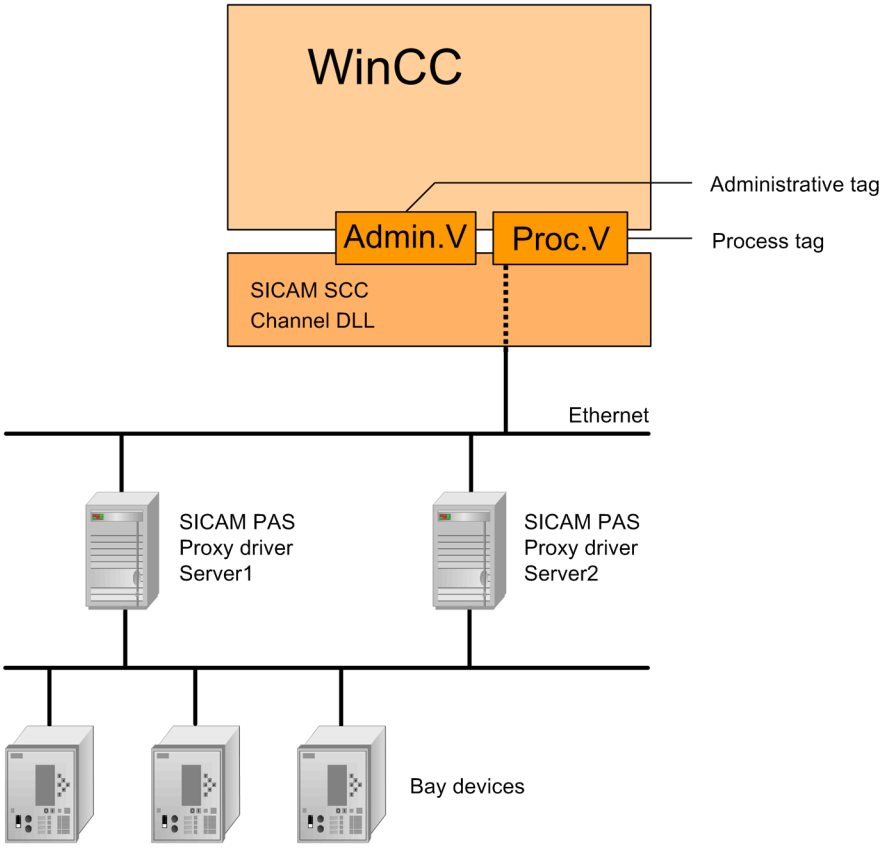
[SCC_Redundancy_settings, 1, en_US]

Figure 9-1 WinCC Redundancy Settings Recommended for SICAM SCC

9.2 Redundancy with a SICAM PAS System

9.2.1 Connection to 2 SICAM PAS Systems

A SICAM PAS system can consist of 2 redundant SICAM PAS systems running in parallel. Bay devices and substations are connected to both SICAM PAS systems, and SICAM SCC is connected to both SICAM PAS systems via the SICAM PAS PROTOCOL SUITE (SICAM PAS channel DLL). For a redundant SICAM PAS system, the connection of SICAM SCC is active parallel to both SICAM PAS systems.



[Kanal_dll_a, 1, en_US]

Figure 9-2 System with redundant SICAM PAS Full Servers

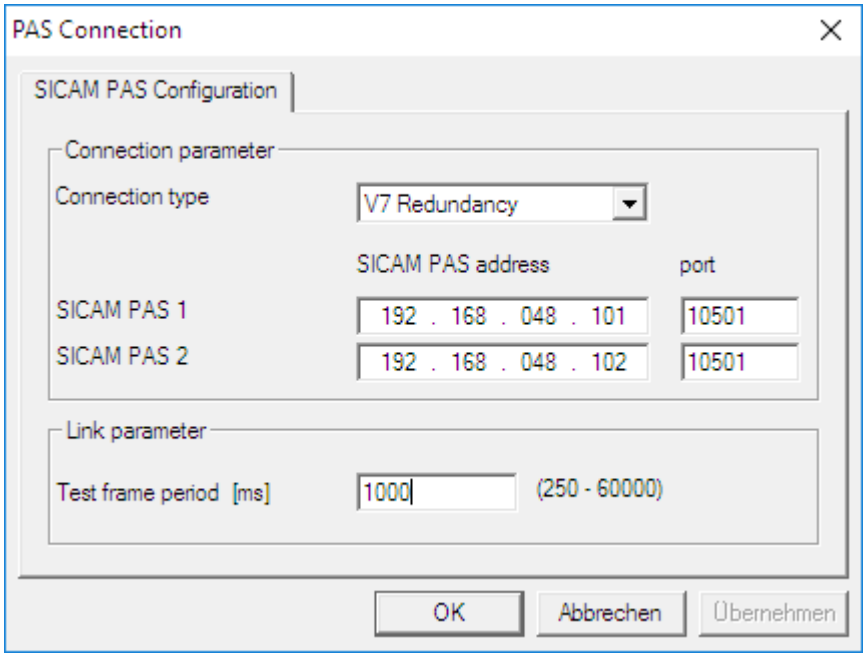
Activating redundancy

NOTE

With SICAM PAS V8.00 or higher, the redundancy parameters are entered automatically.

Proceed as follows to activate the redundant configuration:

- ✧ In the WinCC Explorer, right-click **PAS Data Server** and select **Properties** from the context menu.
  The **Channel Unit Properties** dialog opens.
- ✧ Click **Properties**.
  The **Connection properties** dialog opens.
- ✧ Click **Properties**.
  The **PAS Connection** dialog opens.



[pascc404, 1, en_US]

Figure 9-3 Activating redundancy

- ✧ Select the **Connection type**.
- ✧ Enter the IP address of the second SICAM PAS system.

The IP addresses must correspond to the IP addresses configured for the SICAM SCC interfaces in SICAM PAS.

The **ports** must match the ports parameterized in SICAM PAS.

The **Test frame period** must correspond to the Test frame period parameterized in SICAM PAS for SICAM SCC.

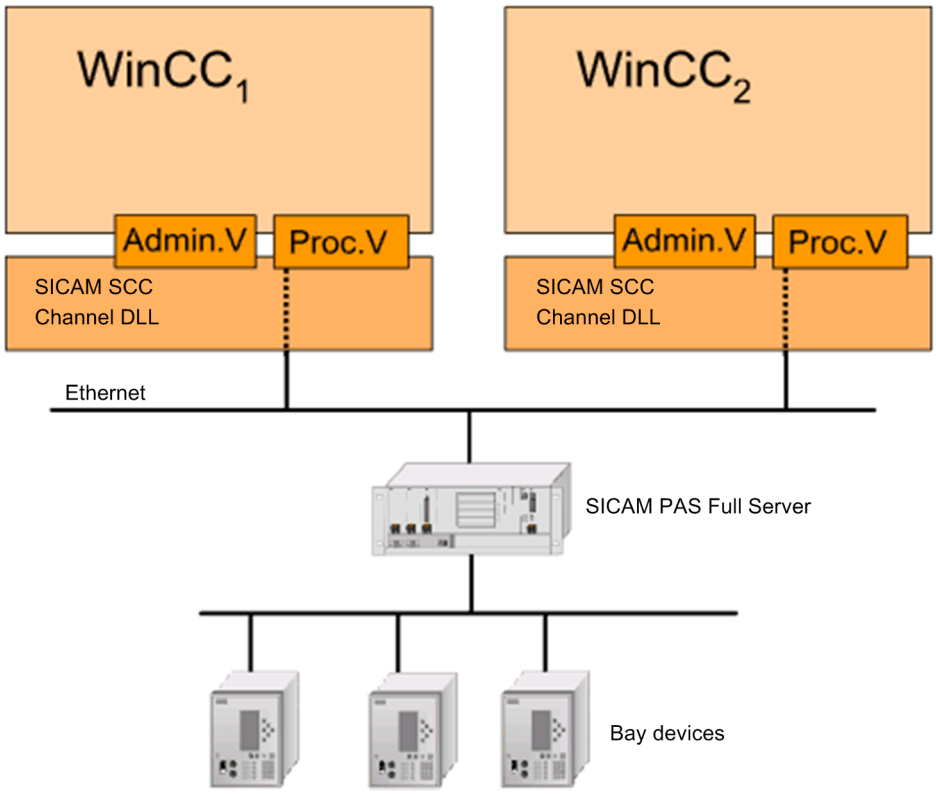
- ✧ Click **OK** to confirm your settings.

9.2.2 Redundant SICAM SCC System

A redundant system consists of SICAM SCC Servers which run in parallel. Each SICAM SCC provides a SICAM PAS PROTOCOL SUITE connection to the SICAM PAS system.

The first SICAM SCC (e.g. WinCC1) is the **Master Server**, and the second one is the **redundant Partner Server**. Both connections are active in case of fault-free operation.

The SIMATIC WinCC redundancy package for data synchronization and for the control of the server redundancy must be installed on both SICAM SCC servers.



[Kanal_dll_1, 1, en_US]

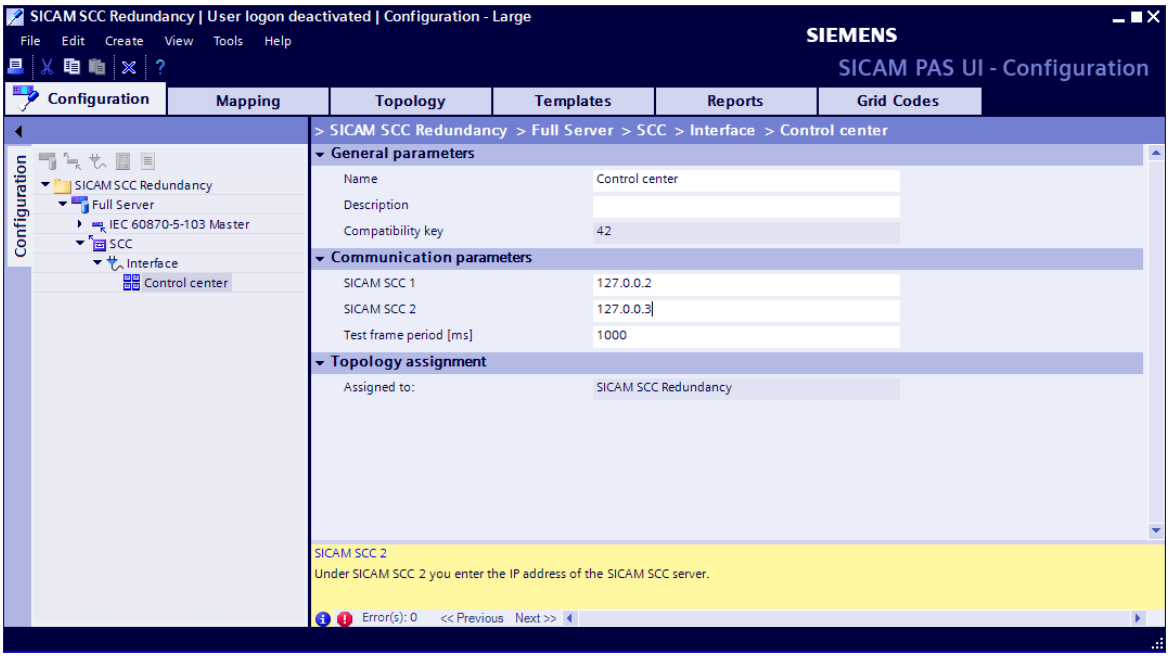
Figure 9-4 System with redundant SICAM SCC

Configuring SICAM PAS

In SICAM PAS, you must enter the IP addresses of the two SICAM SCC computers.

Proceed as follows:

- ✧ To open **SICAM PAS UI – Configuration**, click
  Start > Siemens Energy > SICAM > PAS > UI – Configuration.
- ✧ Insert an **SCC** application, an **interface** and a **control center**.
- ✧ Under **Interface**, enter the IP address of the Full Server via which you want to communicate with SICAM SCC.
  This is particularly important for Full Servers with several network cards.
- ✧ Under **Control center**, enter the IP addresses of the two SICAM SCC computers.



[sc_first_dip, 1, en_US]

Figure 9-5 Control center, entering IP addresses

✧ The items of information to be used in SICAM SCC must be activated in the information mapping.

Exporting data

To import the configured items of information into SICAM SCC, they must be exported from SICAM PAS UI – Configuration.

✧ Right-click **Control Center** and select **Export** from the context menu.

The export function creates a PXD file in the selected directory. Afterwards, you can import this file into SICAM SCC using the SICAM PAS Wizard.

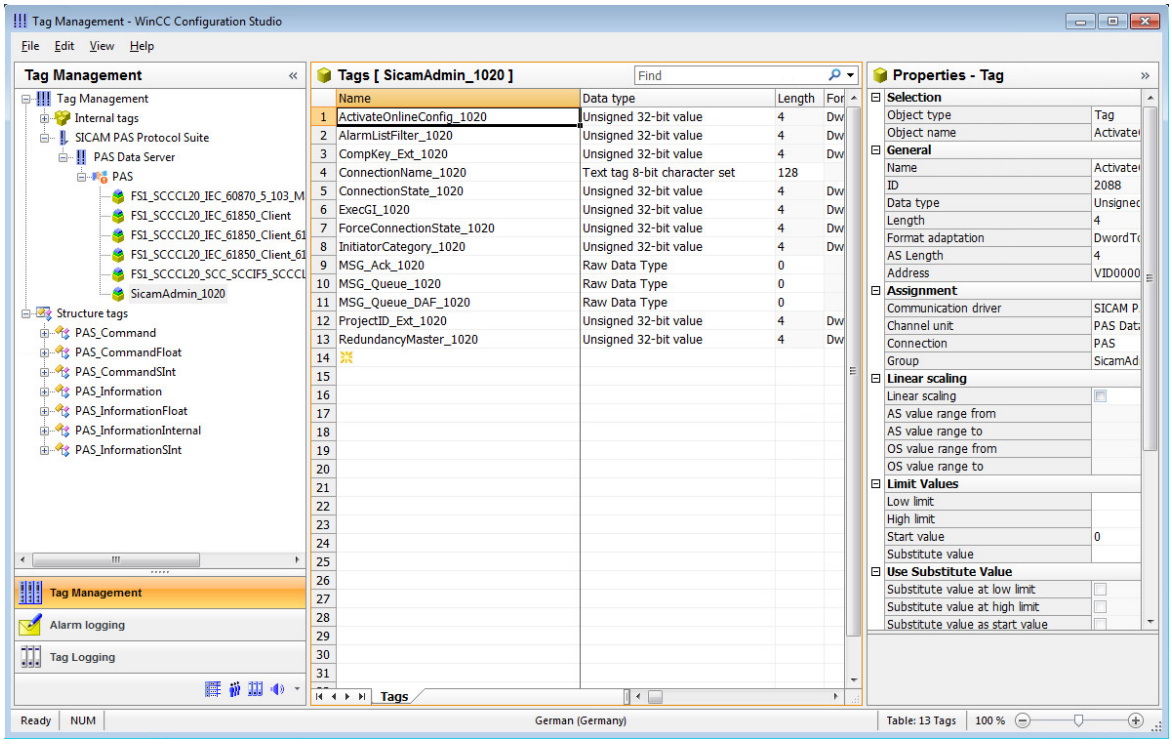
✧ Export the configuration data.

Creating WinCC projects

✧ Create a new WinCC project (e.g. SCC 1) on the first computer.

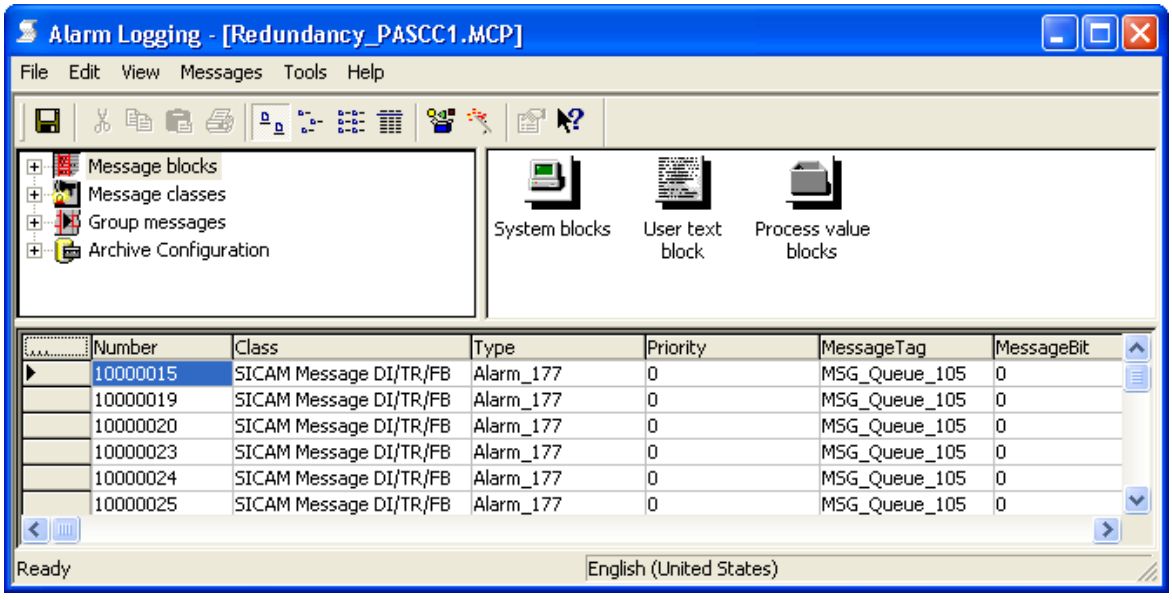
✧ Import the PXD file of the first DIP using the SICAM PAS Wizard.

The administrative tags imported from SICAM PAS have the project and interface ID as an extension of the tag name.



[pascc409, 1, en_US]

Figure 9-6 WinCC project 1



[pascc411, 1, en_US]

Figure 9-7 Alarm logging WinCC project 1

✧ Close your WinCC project.

Create the redundant WinCC project via the **Project Duplicator**. It must be saved on a second computer.

✧ To start the Project Duplicator, click **Start > SIMATIC > WinCC > Tools > Project Duplicator**.

✧ Enter **SCC 1** as source project.

✧ Enter a name for the redundant WinCC project (e. g. SCC 2).

✧ Click the **Duplicate** button. The redundant WinCC project is created now.

NOTE

To start the SIMATIC WinCC Runtime, the 2 WinCC servers must be started one after the other. Start the first server and then start the second. For more detailed information, refer to the SIMATIC WinCC Information System.

9.3 Redundancy with SICAM RTUs

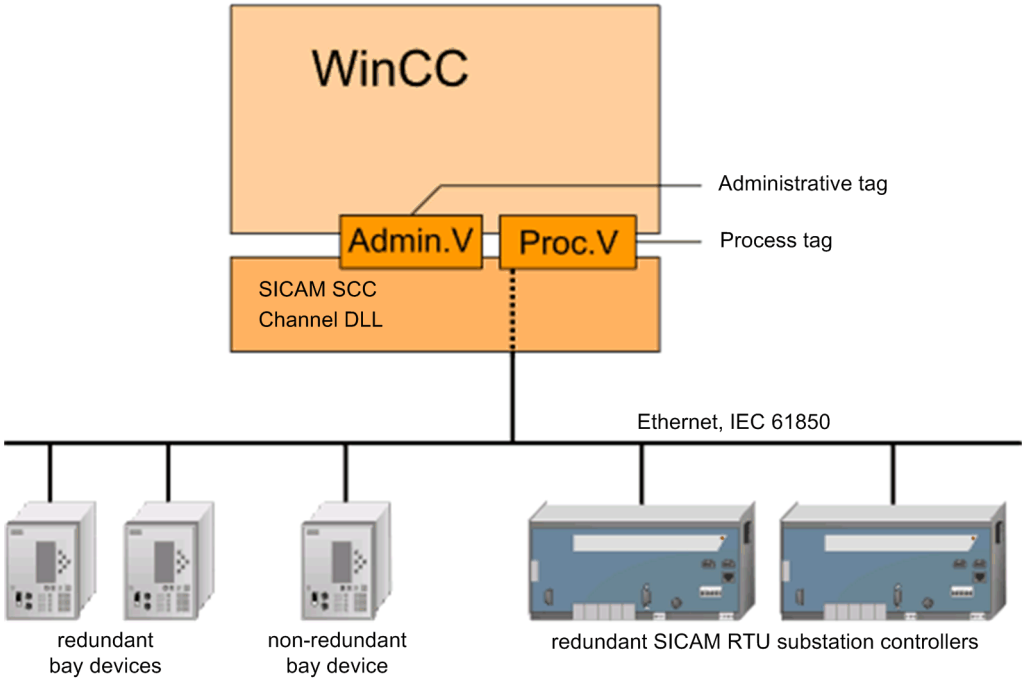
The connections between SICAM SCC and the devices of SICAM RTUs can be established on the basis of the IEC 61850 or IEC 60870-5-104 protocols. This section describes the procedure to be applied if the IEC 61850 protocol is used. The same procedure is applied to the IEC 60870-5-104 protocol.

9.3.1 Connection to Redundant SICAM RTU Substation Controllers

SICAM RTUs can be operated redundantly in order to ensure fail safety. Via the SICAM IEC COMMUNICATION SUITE (SICAM IEC channel DLL), SICAM SCC is connected to both SICAM RTUs.

In case of redundant SICAM RTUs, the SICAM SCC connection to the two SICAM RTUs is active at the same time.

For SICAM RTUs, **redundant and non-redundant** devices can be operated in parallel.



[Kanal_1703_dll_a, 1, en_US]

Figure 9-8 System with redundant SICAM RTUs and redundant bay devices

Redundancy and connection parameters

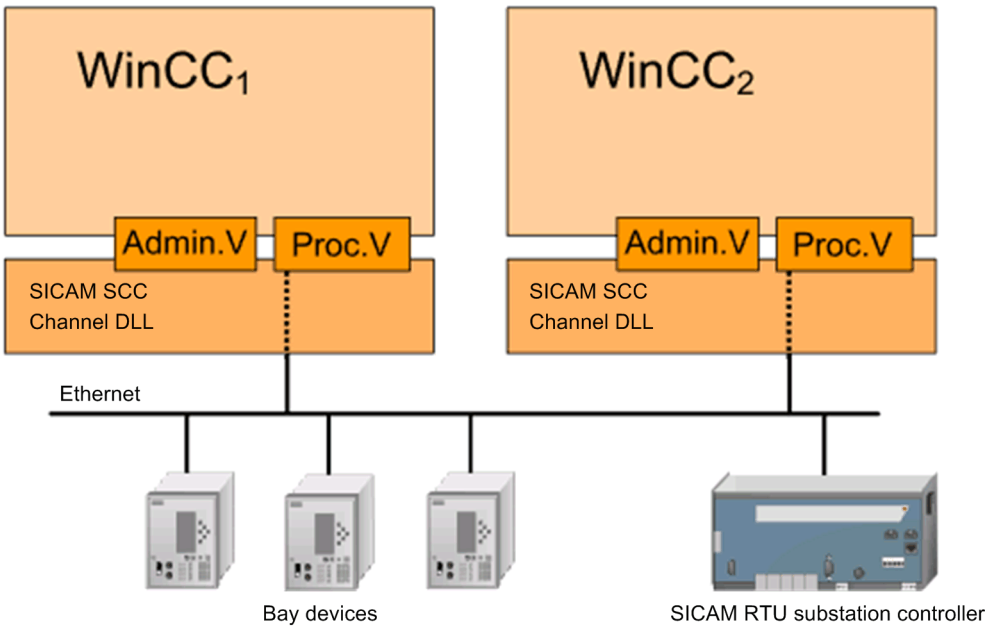
The **redundancy** and **connection parameters** (e.g. IP addresses) are defined using the **SICAM TOOLBOX II** and integrated into the SICAM SCC project by importing the SXD file.

9.3.2 Redundant SICAM SCC System

A redundant system can consist of 2 SICAM SCC servers running in parallel. Each SICAM SCC provides a SICAM IEC COMMUNICATION SUITE (SICAM IEC channel DLL) connection to the devices.

One SICAM SCC (e.g. WinCC1) is the **Master server**and the other SICAM SCC (e.g. WinCC2) is the **redundant partner server**. Both connections are active in case of fault-free operation. Commands are only issued by the **Master server**

The SIMATIC WinCC redundancy package for data synchronization and for the control of server redundancy must be installed on both SICAM SCC servers.



[Kanal_1703_dll_1, 1, en_US]

Figure 9-9 System with redundant SICAM SCC

Creating WinCC projects

- ✧ Create a new WinCC project (e.g. SCC 1) on the first computer.
- ✧ Import the **SXD file** using the **SICAM IEC Wizard**.
  The SXD file was exported from **SICAM TOOLBOX II**.
- ✧ Close the WinCC project.

Create the redundant WinCC project using the **Project Duplicator**. It must be saved on a second computer.

- ✧ To start the **Project Duplicator**, click **Start > SIMATIC > WinCC > Tools > Project Duplicator**.
- ✧ Enter **SCC 1** as the source project.
- ✧ Enter a name for the redundant WinCC project (e.g. SCC 2).
- ✧ Click **Duplicate**. The redundant WinCC project is created now.

Synchronization of SICAM acknowledgment data

SIMATIC WinCC supports the synchronization of data between redundant servers. In order to ensure that the data of the SICAM SCC components can be synchronized between the redundant servers, be aware of the following:

- For the **IX State Sync** application, the same rules apply for SICAM RTUs and SICAM PAS/PQS systems, see *14.5 IX State Sync Application*.

10 Different SICAM PAS Versions

10.1	Overview	362
10.2	Introduction	363
10.3	Use Cases from Daily Practice	364

10.1 Overview

Several **SICAM PAS systems in different versions** can be connected to a SICAM SCC. Special SICAM PAS channels are available for this purpose.

10.2 Introduction

The SICAM PAS and SICAM SCC substation automation system communicate with each other via a channel in SIMATIC WinCC. The SICAM PAS Protocol Suite uses components of the SICAM PAS system for communication. The versions of all components involved must be identical. A SICAM PAS Protocol Suite can only establish a connection to a specific SICAM PAS version.

For SICAM PAS CC/SICAM SCC V7.0 and higher the SICAM PAS channel supports the connection to SICAM PAS V7.0 and higher. Starting from these versions, a mixed-versions operation is possible with the SICAM PAS Protocol Suite standard channel.

For the extension of existing systems or upgrades of the SICAM SCC computer, such as a new SIMATIC WinCC version, it might be necessary to connect the SICAM PAS system of an older version or several SICAM PAS systems of different versions to a SICAM SCC.

In these cases, special SICAM PAS channels are available for the connection to SICAM PAS V5.11 and SICAM PAS V6.00. In the SIMATIC WinCC Tag Management, you can load the **SICAM PAS Protocol Suite V5** or the **SICAM PAS Protocol Suite V6**. Afterwards, during the data import using the SICAM PAS Wizard, select the desired **Channel PAS Data Server V5** or **Channel PAS Data Server V6**.

The **SICAM PAS Protocol Suite** included in the scope of delivery is intended for applications from V7 or applications with consistently identical software versions. In the SICAM PAS Wizard, you use the **Channel PAS Data Server**. For this channel, in case of an upgrade of SICAM PAS or SICAM SCC, the integrated components of the basic software are automatically exchanged in order to ensure that the project can be further edited immediately after the upgrade and without any further configuration efforts.

If data was imported into a version-specific channel or if data has to be moved to such a channel, the configuration must be modified accordingly. Data which you have imported into a channel is saved in the SIMATIC WinCC database with its ID.

For WinCC V7.3 and higher, this exchange can be done in the Configuration Studio. To do so, select the communication connection and change the communication driver in the properties.

During the upgrade from **SICAM PAS V5.11** to **V6.00/V7.00/V8.00**, not all the conversion which would be necessary to support new functions can be performed automatically.

10.3 Use Cases from Daily Practice

This paragraph provides a list of different examples from daily practice. Depending on the change (extension/ upgrade) to be performed on the system, a channel may or may not be exchanged.

You can exchange the channel using the Configuration Tool, see *14.8 Working with the SIMATIC WinCC Configuration Tool*.

- **Upgrade of an existing SICAM PAS/SICAM PAS CC project**
  - Upgrade of SICAM PAS and SICAM PAS CC

    Initial configuration: SICAM PAS V5.11/V6.xx with SICAM PAS CC V5.11/V6.xx

    Target configuration: SICAM PAS V7.00 with SICAM SCC V8.04

    With this upgrade scenario, a channel exchange is not necessary.
  - Upgrade of SICAM PAS CC

    Initial configuration: SICAM PAS V5.11/V6.xx with SICAM PAS CC V5.11/V6.xx

    Target configuration: SICAM PAS V5.11/V6.xx with SICAM SCC V8.04

    With this upgrade scenario, the default channel must be replaced with the version-specific V5/V6 channel.
- **Connection of an additional SICAM PAS station with a different version**
  - Integrating a SICAM PAS V7.00/V8.00 station into an existing SICAM PAS/PAS CC V5.11 system.

    Initial configuration: SICAM PAS V5.11 with SICAM PAS CC V5.11 and a new SICAM PAS V7.00/ V8.00 station

    Target configuration: SICAM PAS V5.11 and SICAM PAS V7.00/V8.00 with SICAM SCC V8.04

    For SICAM PAS CC, an upgrade from V5.11 to SICAM SCC V8.04 must be performed. With SICAM PAS V7.00/V8.00, the default channel is used.

    With SICAM PAS V5.11, the default channel must be replaced with the version-specific V5 channel.
  - Integrating a SICAM PAS V7.00/V8.00 station into an existing SICAM PAS/PAS CC V6.xx system

    Initial configuration: SICAM PAS V6.xx with SICAM PAS CC V6.xx and a new SICAM PAS V7.00/ V8.00 station

    Target configuration: SICAM PAS V6.xx and SICAM PAS V7.00/V8.00 with SICAM SCC V8.04

    For SICAM PAS CC, an upgrade from V6.xx to SICAM SCC V8.04 must be performed. With SICAM PAS V7.00/V8.00, the default channel is used.

    With SICAM PAS V6.xx, the default channel must be replaced with the version-specific V6 channel.
  - Re-integrating an existing SICAM PAS V5.11/V6.xx station into a SICAM SCC V8.04 project

    Initial configuration: SICAM PAS V7.00/V8.00 with SICAM SCC V8.04 and a separate SICAM PAS V5.11/V6.xx station

    Target configuration: SICAM PAS V5.11/V6.xx and SICAM PAS V7.00/V8.00 with SICAM SCC V8.04

    With SICAM PAS V7.00/V8.00, the default channel is used. With SICAM PAS V5.11/V6.xx, the version-specific V5/V6 channel is used instead of the default channel.

- Integrating different SICAM PAS stations
  - Initial configuration:
    The original project was based on SICAM PAS V5.11 and SICAM PAS CC V5.11. In the first expansion stage, it was complemented by a SICAM PAS V6.xx station. In the second expansion stage, the project must be complemented by another station based on SICAM PAS V7.00/V8.00.
  - First expansion stage:
    SICAM PAS V5.11, SICAM PAS V6.xx with SICAM PAS CC V6.xx For communication with SICAM PAS V5.11and SICAM PAS V6.xx, the version-specific V5 and V6 channels are used.
  - Second expansion stage, target configuration:
    The existing project is complemented by a SICAM PAS V7.00/V8.00 station. For SICAM PAS CC, an upgrade from V6.xx to SICAM SCC V8.04 must be performed. The communication for the first two SICAM PAS stations remains on the version-specific V5 and V6 channels. The default channel is used for communication with the new SICAM PAS V7.00/V8.00 station.

11 WinCC Web Navigator

11.1	Overview	368
11.2	Prerequisites	369
11.3	WinCC Web Navigator with SICAM SCC	370

11.1 Overview

Using the WinCC Web Navigator, you can operate and monitor a WinCC project from anywhere in the world via the Internet.

The WinCC Web Navigator includes special Web Navigator Server components installed on the server computer, as well as Web Navigator Client components running on the Internet computer.

NOTE

SIMATIC WinCC Web UX cannot be used with SICAM SCC with SICAM Switch, Bay Overview or Numeric Controls. Web UX does not support the ActiveX technology.

11.2 Prerequisites

A Web Navigator Server and a Web Navigator Client are required in order to implement the WinCC Web Navigator function. To use the WinCC Web Navigator for SICAM SCC, certain prerequisites must be met.

Web Navigator Server

The following requirements must be met by the computer used as a Web Navigator Server:

- SICAM SCC installed
- Web Navigator Server installed
- a user with Web Navigator rights installed
- a WinCC project installed and enabled for the WinCC Web Navigator

Web Navigator Client

The following requirement must be met by the computer used as a Web Navigator Client:

- Microsoft Internet Explorer installed

For more detailed information on the requirements with regard to the WinCC Web Navigator, refer to the documentation and the online help of the Web Navigator. The section below describes the actions to be taken especially for SICAM SCC.

NOTE

The display on the Web Navigator Client can be hidden or restricted by your browser's security settings.

Special characters

If you use scripts in your pictures, the names of the objects addressed by this script must not include blanks or special characters. The special character "_" is supported. This means that you may use the special character in the object name, e.g. StartPicture_1.

11.3 WinCC Web Navigator with SICAM SCC

To use the WinCC Web Navigator for SICAM SCC, certain prerequisites must be met. These prerequisites are illustrated in the present section and must be executed in the order described.

11.3.1 Making SICAM SCC Plug-Ins Available

WinCC Web Navigator Server

The SICAM SCC setup installs the SICAM SCC software modules (plug-ins) for the WinCC Web Navigator in the corresponding directory of the WinCC Web Navigator installation.

If the WinCC Web Navigator was installed after SICAM SCC, you must make the SICAM SCC software modules for the WinCC Web Navigator Client available on the WinCC Web Navigator server computer.

If the WinCC Web Navigator server has already been installed before installing SICAM SCC, the files are copied from the SICAM SCC setup into the WinCC Web Navigator server target directory.

Upon the installation of SICAM SCC, the SICAM SCC software modules for the Web Navigator are additionally copied into the SICAM SCC installation directory on the hard disk. Afterwards, you can copy them from the hard disk into your SIMATIC WinCC installation.

✧ Copy the **WebNavClientSICAMSCCVxxx.EXE** and the **WebNavClientSICAMSCCVxxx.XML** files from the **...\SCC\WebNavigator\Server\Web\Install\Custom** directly into the **...\WinCC\WebNavigator\Server\Web\Install\Custom** directory.

Web Navigator Client

On the Web Navigator Client computer, you must download the SICAM SCC software modules for the Web Navigator from the Web Navigator Server and install them (see chapter *11.3.5 Configuring the WinCC Web Navigator Client*).

11.3.2 Publishing Process Diagrams

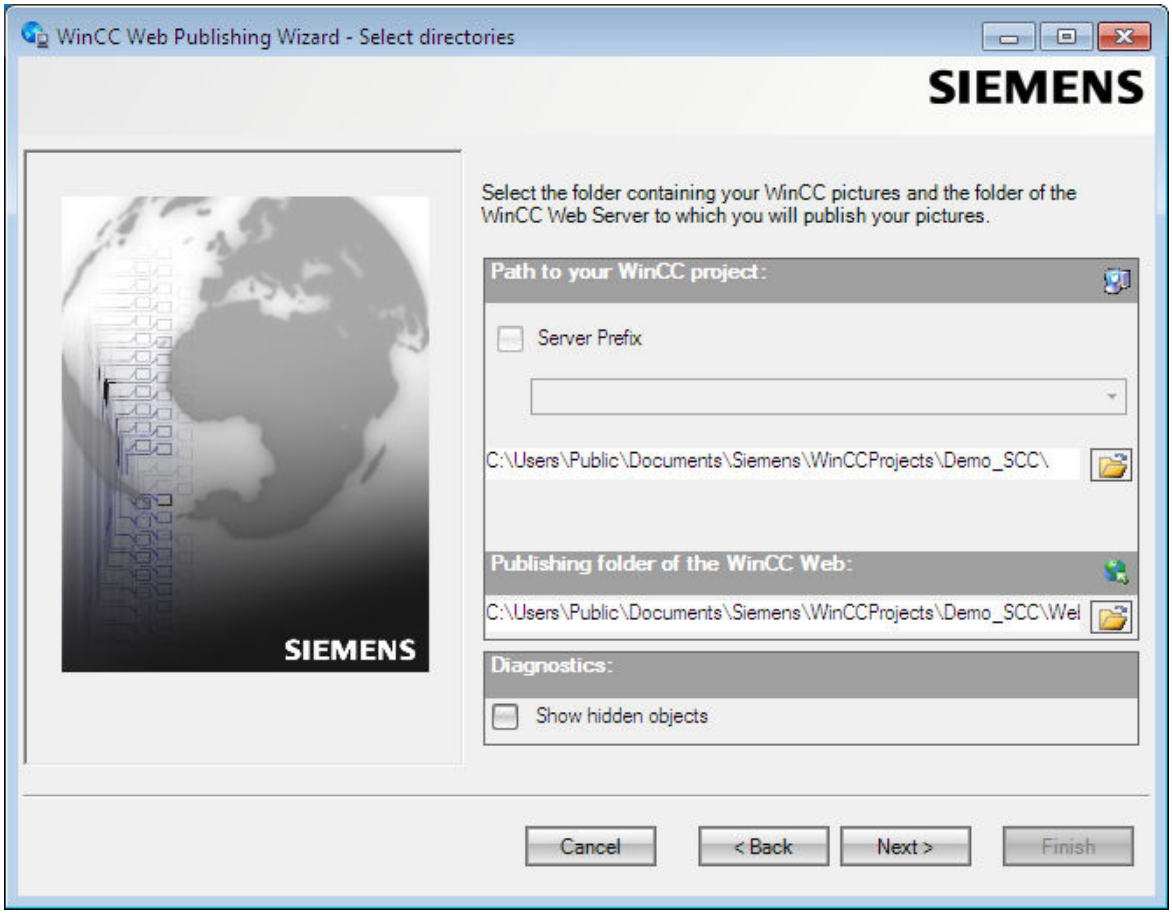
To make sure that the WinCC Web Navigator can show the process diagrams of the WinCC project, these diagrams must be published on the Web Navigator Server.

To publish the process diagrams:

✧ In the WinCC Explorer, now open the WinCC project which you want to show using the WinCC Web Navigator.

✧ In the WinCC Explorer, right-click **Web Navigator** and then select **Web View Publisher** from the context menu.

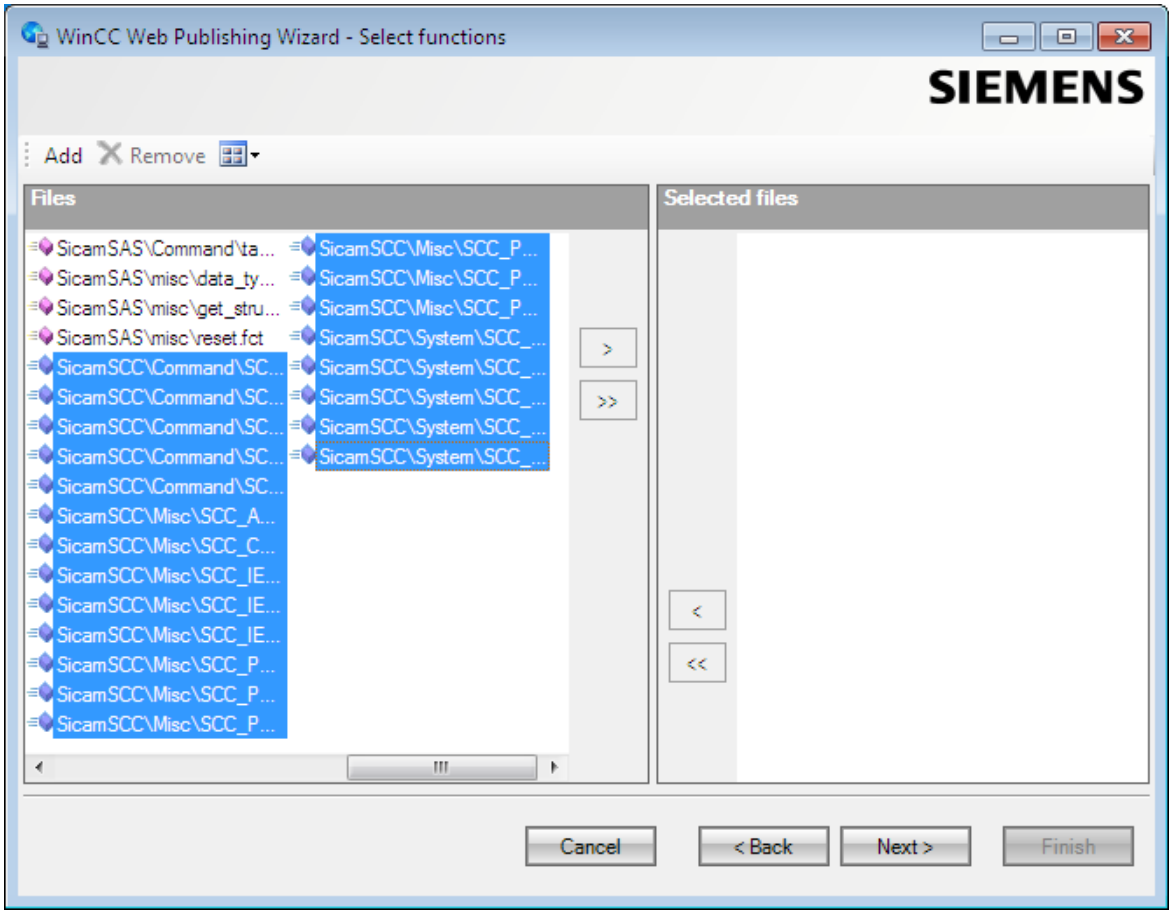
The **Web Publishing Wizard** opens.



[pascc801, 1, en_US]

Figure 11-1 Selecting Process Diagram Directories

- ✧ Enter the name of the directory which holds the process diagrams of the WinCC project (...\projectpath \projectname).
- ✧ Enter the name of the Web access directory (...\projectpath\projectname\WebNavigator).
- ✧ Click **Next**. The diagram selection dialog is displayed.
- ✧ Select all diagrams.
- ✧ Click **Next**. The function selection dialog is displayed.



[pascc802, 1, en_US]

Figure 11-2 Selecting a Function

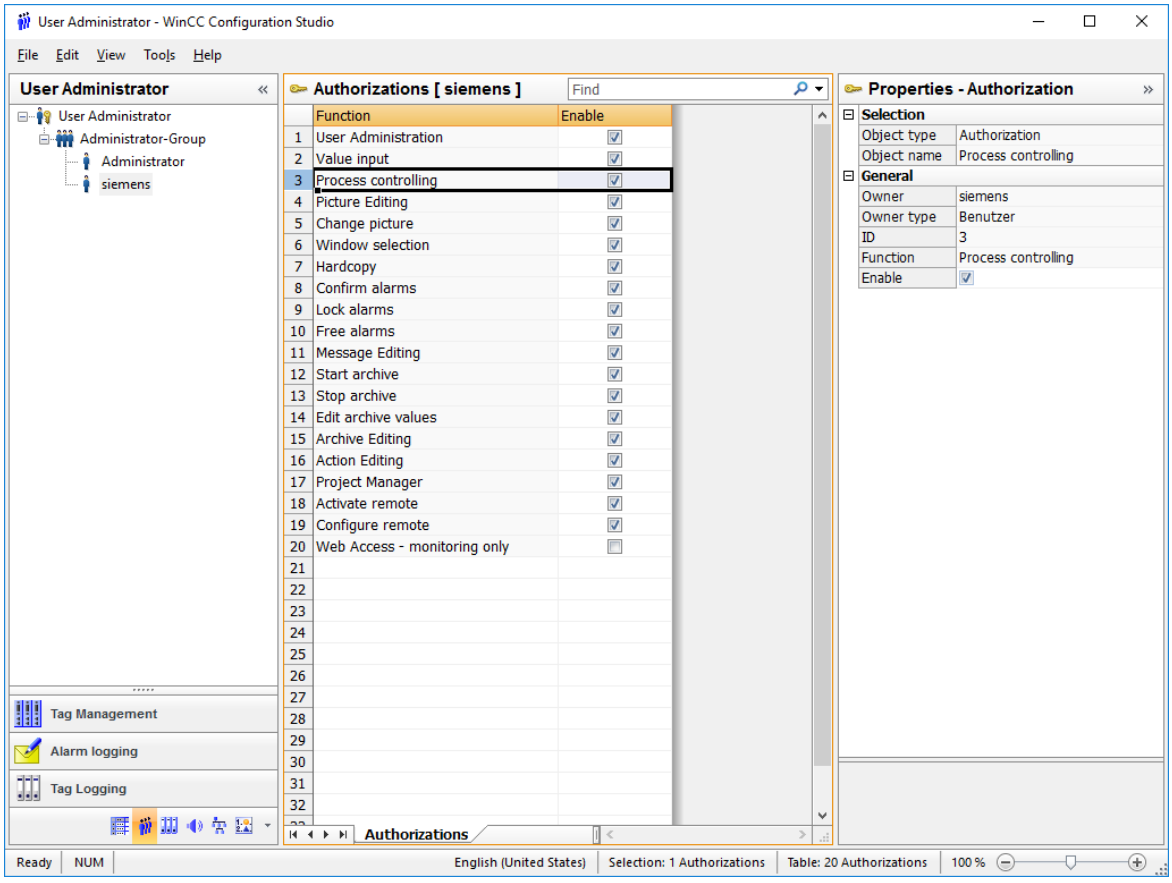
- ✧ Select all SICAM PAS, SICAM SCC and self-created functions.
- ✧ Click **Next**.
  The selection dialog of the referenced graphic diagrams opens.
- ✧ Click **Next**.
- ✧ Click **Finish**.
  The diagrams are published and available for display via the Web Navigator.

11.3.3 Installing Users for the WinCC Web Navigator

In SIMATIC WinCC, you must install a special user which is allowed to access the Web Navigator Server from the Web Navigator Client.

To install a user for the WinCC Web Navigator:

- ✧ Set up a new user.



[pascc804, 1, en_US]

Figure 11-3 Setting up New Users

- ✧ Select **WebNavigator**.
  The **Web Options** are displayed.
- ✧ Select a published diagram (e.g. ROOT.PD_) as a start picture.
- ✧ Select the rights of the individual user.

NOTE

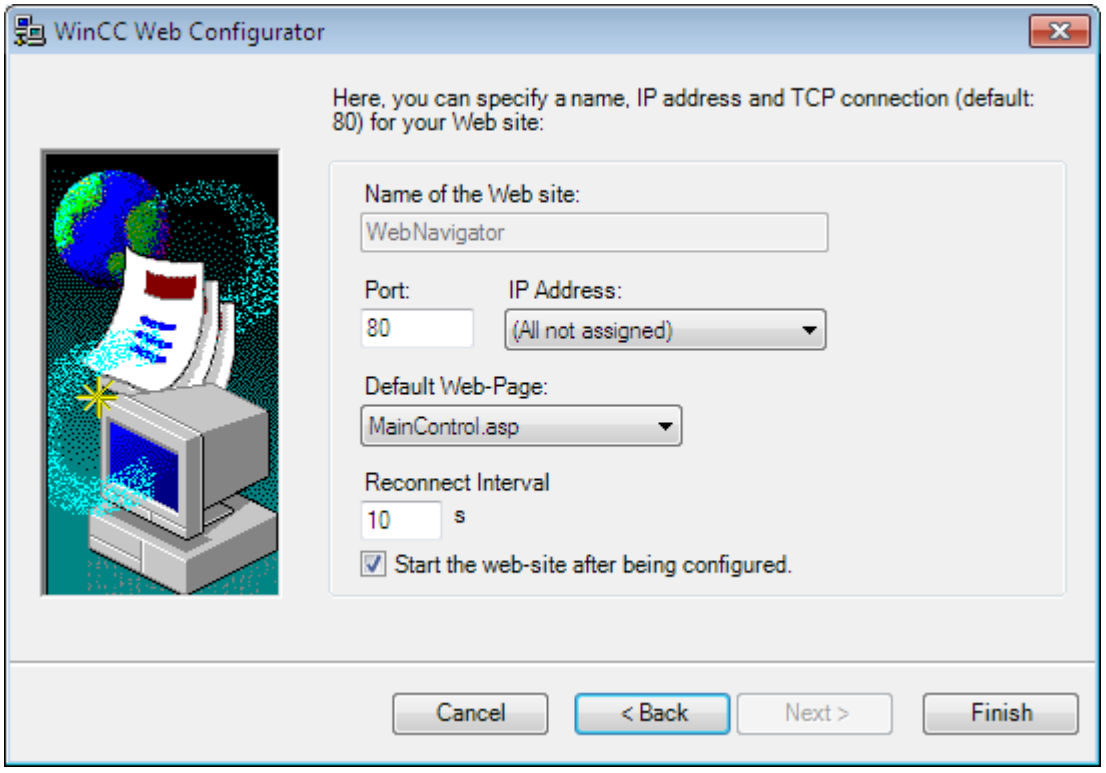
If the function number **1002 – Web Access – monitoring only –** is activated, the user is only allowed to monitor the WinCC project as a Web Navigator Client.

In order to display it in the SICAM Controls dialogs, an authorization must have been configured for the Control.

11.3.4 Configuring the WinCC Web Navigator Server

Generate a web site on the WinCC Web Navigator Server and make it available to the Web Navigator Client.

- ✧ Start your WinCC project.
- ✧ In the WinCC Explorer, right-click **Web Navigator** and select **Web Configurator** from the context menu.
  The **WinCC Web Configurator** opens.
- ✧ Click Next.



[pascc803, 1, en_US]

Figure 11-4 Configuring the WinCC Web Navigator

As a rule, you can perform the specified settings in this dialog.

✧ Click **Finish** to finish the configuration of the server.

11.3.5 Configuring the WinCC Web Navigator Client

Installing Plug-ins

To install the SICAM SCC plug-ins on the client computer:

✧ Start the **Internet Explorer**.

✧ Enter the IP address of the server computer.

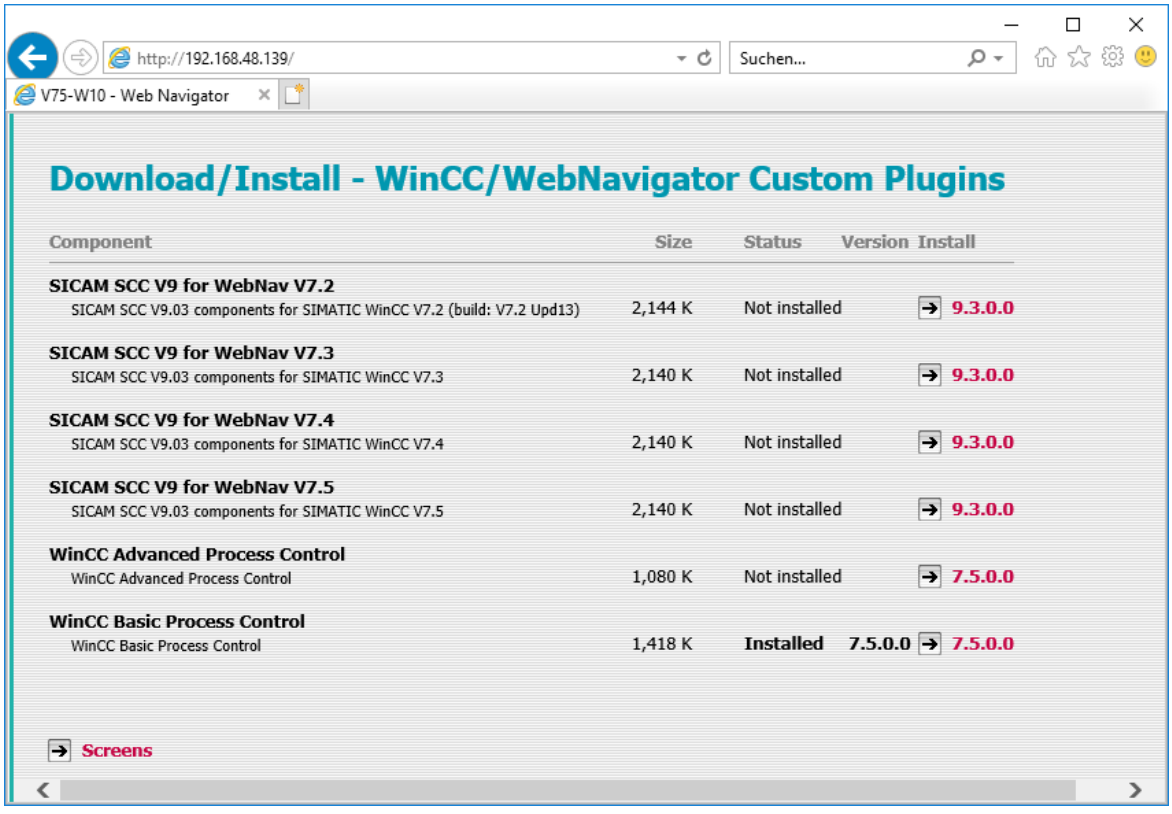
✧ Enter the WinCC user name and the password which have been previously set up on the server.

✧ Click **OK** to confirm.

The connection to the Web Navigator Server is established.

✧ Install the **Web Navigator-Client**.

✧ Navigate to the **Download Area > Download Plug-Ins**.



[pascc800, 1, en_US]

Figure 11-5 Web Navigator, Installing Plug-ins

- ✧ Click the arrow under **Version Install**.
- ✧ Click **Open** in the dialog which opens. The plug-ins are installed.
- ✧ After the installation in the Windows Explorer, open the path **C:\Program Files (x86)\Common Files \Siemens\Bin** (for Windows 32-bit **C:\Program Files\Common Files\Siemens\Bin**) and execute the **SCCCommon.bat** file with administrator rights.

NOTE

The SICAM SCC WebPlugIn requires the Microsoft .Net Framework 4.5.2 and the Visual C++ runtime components for VisualStudio 2013.

If the Visual C++ runtime components do not exist on your computer, you can install them from the SICAM SCC DVD (**..\SetupData\InstallationData\Prerequisites\vcredist_x86_2013.exe**).

Displaying a Process Diagram

The WinCC project must have been started on the Web Navigator Server in order to display the process diagram on the Web Navigator Client.

- ✧ Navigate to **Process Diagrams**. The process diagram is shown in the browser.

NOTE

Use the **Logon** and **Logoff** hotkeys in order to change the user on the Web Navigator Client. The hotkeys are defined in the Project Properties, see *3.2.2 Defining Project Properties*.

12 System Time

12.1	Overview	378
12.2	Updating Time Zones	379
12.3	Time Synchronization	380

12.1 Overview

The time information for SICAM SCC can be updated by downloading the IANA time zone database.

In the SICAM SCC system, a correct time is very important. A radio clock can be used as timer. The time of this clock is distributed over the system. The functionality of time distribution will be described by means of example configurations.

12.2 Updating Time Zones

In the IANA time zone database the time zone information of the world is maintained. This includes changes caused by political decisions regarding time zone boundaries, UTC deviations, and changes between daylight saving time and standard time. By downloading this time zone information you can update the time zone information in the SICAM system.

To update the time zone information:

- ✧ Open the Internet site http://www.iana.org/time-zones.
- ✧ Download the current version of the time zone file tzdata20xxx.tar.gz, e.g.: Time Zone Data v. 2014g (Released 2014-08-28) tzdata2014g.tar.gz (278.2kb)
- ✧ Open the directory where the program for updating the time zone information is located.
  - – For Windows 32-bit operating system:
    %CommonProgramFiles%\Siemens\Energy\TimeZoneCalculations\bin
  - – For Windows 64-bit operating system:
    %CommonProgramFiles(x86)%\Siemens\Energy\TimeZoneCalculations\bin
- ✧ Highlight the **TimeZoneDataUpdater.cmd** file and select **Run as administrator** from the context menu.
  The command line tool opens.
- ✧ In the following dialog, navigate to the downloaded time zone file and open it.
  The update of the time zone information is started.
- ✧ Click **OK** to close the program.

After the update the runtime loads the new time zone data within one hour. You do not have to shut down or reboot the system.

12.3 Time Synchronization

Time information within a SICAM SCC system can be synchronized as follows:

- Through an **NTP clock** (for example, SICLOCK, Hopf Time Server, and Meinberg Time Server), an external device connected to the SICAM PAS/PQS computer through Ethernet.
- Through a **remote terminal interface** from the control center.from the control center.
  This time synchronization method is not relevant for SICAM SCC.

The time synchronization of SICAM SCC is based on the **NTP**(Network Time Protocol) and the corresponding NTPD (Network Time Protocol Daemon) software. Under a Windows operating system, the **NTPD** service runs in the background. For the installation of SICAM PAS/PQS, it is referred to as the **Network Time Protocol Service** It is configured by means of the**ntp.conf** ASCII file. To edit this configuration file, Siemens recommends a text editor with the YAML markup language support, for example, Notepad++. Using this editor, comments and entries are displayed in different colors. The configuration file is located in the Windows directory, subfolder **\drivers\etc**, for example: **C:\WINNT\system32\drivers\etc**.

NOTE

Windows 7, **Windows Server 2008** and **Windows Server 2012** do not allow to edit the **ntp.conf** file directly within the Windows directory.

If you use one of these operating systems, copy the **ntp.conf** file to another directory (outside of the Windows directory), for example to the desktop. Edit the copied file there and save it to the Windows directory afterwards, overwriting the existing file.

The NTPD is automatically installed together with **SICAM PAS/SICAM SCC**. It is activated upon a restart of the computer.

In a SICAM SCC system, several NTPDs are simultaneously active (for example, on the external radio clock, the SICAM PAS/PQS, and the SICAM SCC computer). An NTPD can be configured as a Server or as a Client. Upon the request of a Client, the Server communicates its time information to the Client.

Based on NTP, a precision of approximately 0.1 ms can be achieved under a Windows operating system. In order to achieve this high precision, the system's NTPDs must perform extensive calculations. This process can take several hours after the system starts. If the current Time Master fails, the NTPDs use the time data determined in order to keep an utmost level of time precision for as long as possible.

For more detailed information on NTP, refer to the following web site: http://www.ntp.org.

12.3.1 Network Time Protocol Daemon

For the configuration of the NTPD, knowledge about its main functions is required. Some NTPD functions and terms are illustrated below.

Server, Client, and Peer

An NTPD can be configured as a **Server** or as a **Client**. The Server uses the current time information received from a clock. The Clients poll the time information from the Server.

Besides this, an NTPD can be configured as a **Peer**. This is the case if several clocks with the same priority exist in a distributed system. The roles (Server/Client) of the individual NTPDs are not specifically defined. The peers communicate among each other in order to determine the quality of their time signal. The NTPD of the peer with the most precise time signal is the Server.

Stratum, Offset, and Dispersion

The NTP time distribution is based on a hierarchical structure. Time information is distributed from the top level down to the lower levels. A level is referred to as a **stratum**. The clock is the top level and is referred to as Stratum 0. The Time Server, which receives its time information directly from the clock, is assigned Stratum 1. The Server, which acts as a Client of this Server is assigned Stratum 2.

The **offset** is the difference between the Client clock and the Server clock. The NTPD tries to keep the offset as small as possible. The offset is the most important criterion for the determination of the quality of time information.

The **dispersion** is another criterion used for quality determination. The dispersion defines the upper limit for the deviation of the system time from the 'real' clock time. The smaller the dispersion, the higher is the quality of the time information.

Quality of Time Information

During the SICAM PAS/PQS Runtime, the delivered time stamp is assigned a **quality** for the determination of the system time. The following 4 quality levels can be assigned:

- **High** means that the system time deviates from the 'real' clock time by less than 10 ms and that the quality of the time sources is sufficient for this determination. A dispersion of less than 10 ms is sufficient to meet the standard requirements in the field of power automation.
- **Medium** means that the system time deviates from the 'real' clock time by less than 2 s and that the quality of the time sources is sufficient for this determination. This level of precision ensures that no low-quality time stamps are produced if a switching second is inserted and the clock therefore shows a temporary deviation of ~1 second.
- **Low** means that the available time information does not have the required precision and that the system must therefore be considered as 'out of synchronization'.
- **Unknown** is assigned if the system detects that no NTP service runs at all or that the service was not able to detect a time source.

For compatibility reasons, a SICAM SCC-internal time stamp includes the **ClockSync** and **ClockValid** status bits. These bits are set depending on the quality of the time stamp:

- **High**
  The **ClockSync** and **ClockValid** status bits are set.
- **Medium**
  The **ClockValid** status bit is set.
- **Low**
  No status bit is set.
- **Unknown**
  No status bit is set.

12.3.2 Configuration File for NTPD

When installing **SICAM PAS/PQS** or **SICAM SCC**, an **ntp.conf** configuration file is copied into the **...\%windir%\system32\drivers\etc** or **...\%windir%\SysWow64\drivers\etc** directory. The **%windir%** directory name depends on the operating system, for example, **Windows** or **WINNT**.

This file is used to configure the **NTPD**.

The Time Servers are indicated in the configuration files of the Clients. However, the Clients are not indicated in the configuration files of the Servers. A Time Client can therefore be conveniently added to a system. Only the configuration file of the new Client needs to be edited.

The configuration file includes some comments on its contents. This paragraph provides information about important entries.

For more detailed information, refer to the following web site: http://www.ntp.org.

General Settings

```
#--------------------------------------------------------------------
# general settings
#--------------------------------------------------------------------

# -- panic threshold --
# if system clock is more than that distance from the best external source,
# stop the service because something is really weird.
tinker panic 7200.0

# -- driftfile storage --
# NTPD will store the clock drift here, so after restart the service will
# lock the FLL/PLL faster. On embedded systems, make sure that file is
# writeable and on a non-write-protected file system!
driftfile %windir%\ntp.drift

# -- logfile storage --
# make sure this is a writeable file on a non-write protected file system!
#logfile D:\tmp\ntpd.log

# -- Statistic file storage --
# make sure this is a directory on a non-write protected file system!
#statsdir D:\tmp\ntpstats\
```

- **Tinker panic**
  If the clock concerned deviates by more than 7,200 s from the best external clock, time information is not synchronized. The NTPD stops automatically or does not start up.
  The **Services Manager** indicates whether the NTPD has started or not. Press **<F5>** to update the Services Manager. Set the local system time manually and start the NTPD.
- **Driftfile**, **logfile**, **statsdir**
  Activate the **logfile** and **statsdir** lines for error detection only.
  The quartz drift determined is stored in the **ntp.drift** file. This allows for faster synchronization after a system start, because the clock can be set to the correct speed based on the offset value. If no writeable (and reset-proof!) file system is available, the drift file can be disabled. In this case, optimum synchronization can only be achieved some time (hours!) after a system start.

Reference Clocks

```
#--------------------------------------------------------------------
# reference clocks
#--------------------------------------------------------------------

# -- local system clock
# the local system clock is used as level 10 fallback if everything fails and
# the server must continue to operate because of (S)NTP clients like
# IEC61850 devices et al.
server 127.127.1.0
fudge 127.127.1.0 stratum 10
```

Using the lines under **local system clock**, you can define the local clock as the timer. Define a high value for the stratum. The local time is used unless another, better time base is available.

Shared Memory Clocks

```
#------------------------------------------------------------------------
# shared memory clocks ('iburst' is not useful here)
#------------------------------------------------------------------------

# minpoll 2 -> 4s / maxpoll 6 -> 64s, mode 33 -> adaptive polling

# channel 1
server 127.127.28.0 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.0 stratum 5

# channel 2
server 127.127.28.1 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.1 stratum 5

# channel 3
server 127.127.28.2 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.2 stratum 5

# channel 4
server 127.127.28.3 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.3 stratum 5
```

These lines are required in order to use **shared memory clock drivers**. They are used for time synchronization through telecontrol protocols.

- **Mode**
  Through mode 33 (see*Table 12-1*), you can define adaptive polling. During adaptive polling, the frequency of the poll is automatically adjusted to the poll result. If the result rarely changes, polls are performed less frequently..
- **Minpoll, maxpoll**
  The **minpoll** and **maxpoll** parameters must be specified in such a way that the range matches the current synchronization rate of the control center as precisely as possible.

Peers

```
#-------------------------------------------------------------------------
# peers: all time sync peers in a PAS installation
#-------------------------------------------------------------------------
# If the local system has reference clock access, mention all other systems
# (full servers and dips) in a PAS installation that can also access reference
# clocks. Peers will negotiate the leader of the pack...

# minpoll 2 -> 4s / maxpoll 6 -> 64s, iburst -> initial burst poll
#peer xxx.xxx.xxx.xxx minpoll 2 maxpoll 6 iburst
```

If one Full Server and one or several DIP(s) are used, the synchronization sources can be distributed among the computers used (HOPF6039 on the Full Server and telecontrol protocols on the DIP). To do this, activate the **peer** line.

In this case, the computers must determine among each other which clock time is most suitable. Since the classical Server/Client relationship cannot be applied in this context, all the computers involved must be configured as **peers** (that is, **colleagues** with the same priority). Data is exchanged on a bidirectional basis in order to ensure that synchronization can be performed by both systems.

Servers

```
#-------------------------------------------------------------------------
# servers
#-------------------------------------------------------------------------

# If the local system has no reference clock access, mention all systems that
# have reference clock access here. If there is a network path to an external
# clock source (NTP server in the control center, for example) list them
# here, too. And furthermore mention all fallback servers that can be used!

# minpoll 2 -> 4s / maxpoll 6 -> 64s, iburst -> initial burst poll
#server yyy.yyy.yyy.yyy minpoll 2 maxpoll 6 iburst
```

The following lines serve as examples for the definition of Time Servers. The information in these lines can be used for demo purposes only. In a **real** environment, the user must enter the parameters for Real Time Servers..

```
server  139.25.31.13 minpoll 2 maxpoll 6 iburst
server  139.25.208.27 minpoll 2 maxpoll 6 iburst
server  ntp.lpz.siemens.de minpoll 2 maxpoll 6 iburst
```

12.3.3 Clock Driver for Telecontrol Protocols (Shared Memory Clock Driver)

The driver for telecontrol protocols (Shared Memory clock driver) has been modified in such a way that it ensures proper time synchronization in the SICAM PAS/PQS system.

Using a **shared memory clock driver**, the time in a SICAM PAS/PQS system can be synchronized based on telecontrol protocols.

The following 2 modes are supported:

- **Mode 0**

  Mode 0 corresponds to the mode described in the original HTML documentation. This mode cannot be used with SICAM PAS/PQS.

- **Mode 1**
  Mode 1 is a Shared Memory clock driver with an extended functionality as used for SICAM PAS/PQS.

This paragraph only describes Mode 1.

The **ntp.conf** configuration file consists of 4 blocks for time synchronization through telecontrol protocols. A typical block has the following structure:

```
server  127.127.28.0   mode 33 minpoll 2 maxpoll 6
fudge   127.127.28.0   stratum 5
```

The 3rd address section (assigned the value 28 in the example above) defines the type of clock driver. The 4th address section (0 in the example) is used to distinguish between clocks of the same type.

Mode

Mode 33 is an advanced mode with timeout monitoring. In the **fudge** line, the value **5** is specified for the stratum.

In a SICAM PAS/PQS, only modes **1** or **33** can be used for time synchronization through telecontrol protocols.

In a SICAM PAS/PQS, only modes **1** or **33** can be used for time synchronization through telecontrol protocols. With mode **33**, timeout monitoring is automatically included. This is the most convenient mode. When using Mode **1**, the values of the **minpoll** and **maxpoll** parameters must be selected very carefully in order to match the synchronization frequency of the telecontrol center.

The **minpoll** parameter must be set in such a way that **2^minpoll** is greater than the synchronization interval of the control center. The **maxpoll** parameter must also be set to this value.

The **mode** parameter must be interpreted as a bit pattern (decimal value). The tables below illustrate the significance of the bits.

Table 12-1 Bitmuster zu mode 33

Bit	7	6	5	4	3	2	1	0
Bitpattern	0	0	1	0	0	0	0	1
Value	0	0	1	0	1			

Table 12-2 Parameter mode 33

Bit position	**Meaning**
Bit 0 to 3	Bits 0 to 3 define the mode. This half byte must have the value **1** for the cooperation with the telecontrol protocols of SICAM PAS/PQS.
Bit 4 (Bit value 16)	Setting the clock time If this bit is set, the clock driver initiates clock setting to the value present in the clock if the difference between the system time and the time available in the clock is more than 10 s. This difference value can be increased, but not reduced by means of **fudge time2**.
Bit 5 (Bit value 32)	Timeout monitoring If this bit is set, the clock driver attempts to optimize the actual poll cycle within the limits predefined by **minpoll** and **maxpoll**.
Bit 7 (Bit value 128)	Writing information in the system log file This bit is only relevant for diagnosis. All information, warning, and error conditions are written into the system log file. If this bit is not set, the driver does not attempt to perform any entries in the event list of the system ('quiet mode').

Minpoll, maxpoll

If **automatic time monitoring** (adaptive polling) is activated, the NTPD tries to set a polling interval within the limits selected through **minpoll** and **maxpoll**. If the telecontrol protocol did not provide any value within a defined interval, the polling interval is increased by one step. If more than 2 values are transmitted within an interval, the polling interval is reduced by one step.

If synchronization based on the telecontrol protocol fails, the polling interval increases until the maximum interval value has been reached. The clock is marked as faulty and the polling interval is set to the minimum value in order to detect a recovery of synchronization as quickly as possible.

The values for **minpoll** and **maxpoll** must be selected in such a way that they include the expected time synchronization interval of the telecontrol protocol. Minpoll and maxpoll are exponents referred to a basis of 2. The following values can be used: minpoll = 2 (22 = 4 s); maxpoll = 10 (210 =1024 s = 17 min)

Fudge

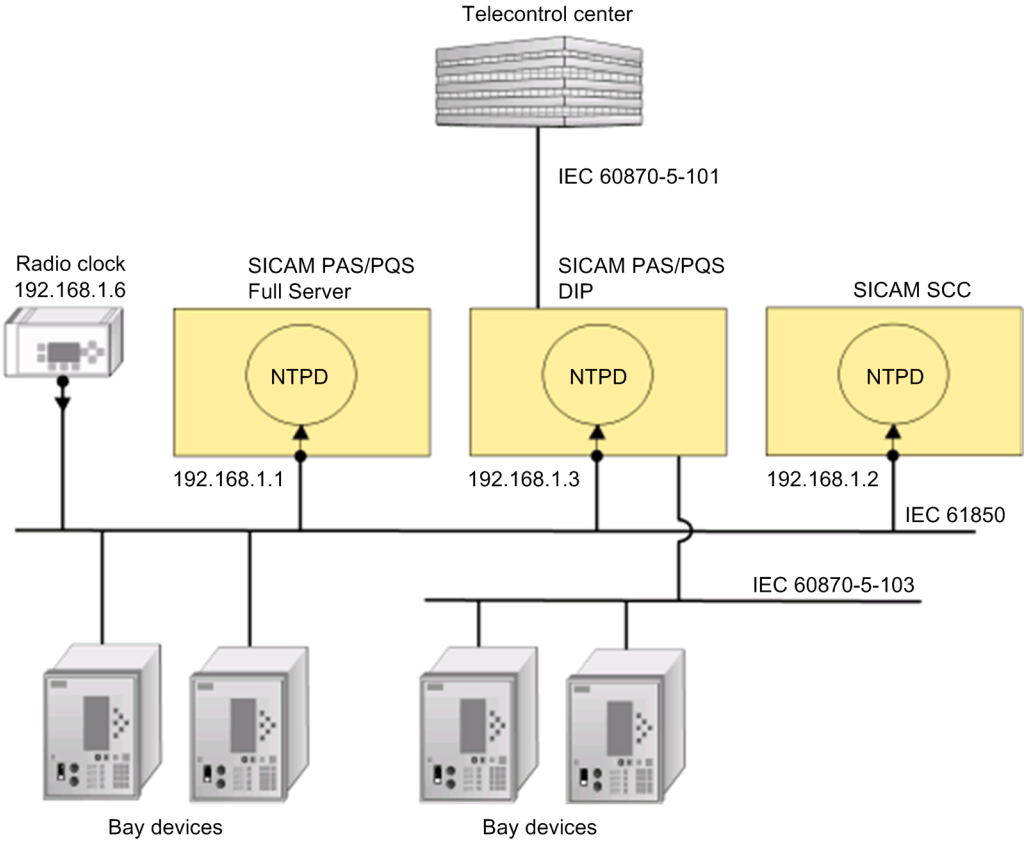
- **Time1**
  As with most clock drivers, this value is used in order to compensate a systematic (constant) offset. For example, the runtime of the telecontrol telegram between the control center and the substation can be corrected. The value is defined as a floating point value indicated in seconds.
- **Time2**
  Time2 The difference value for clock time setting can be increased to a value greater than 10 s, see Bit 4 in the description of mode, *Table 12-1*. The value is defined as a floating point value indicated in seconds.

12.3.4 Example – External Radio Clock as Timer

For system configurations with an IEC 61850 Ethernet bay bus, an **external radio clock** (for example, SICLOCK, Meinberg, and Hopf) can be used as the Time Master on the Ethernet. If this clock fails or if the quality of the time information is poor, another clock available in the system becomes the Time Master. In the NTPD configuration files, you can define which clock is to become the new Time Master.

The NTPD is active on both SICAM PAS/PQS computers (Full Server and DIP) and on the SICAM SCC computer. The NTPD of the radio clock is the Time Server; the NTPDs of the SICAM PAS/PQS computers are the Clients.

Additionally, time information can be transmitted from the telecontrol center.



[pasinst72, 1, en_US]

Figure 12-1 Time Synchronization through an External Radio Clock, Example

The bay devices on the IEC 61850 bus are Clients, which poll time information from the radio clock. Their configuration is not described in the present document. For more detailed information on this topic, refer to the documentation of the corresponding devices.

All other bay devices connected through IEC 60870-5-103 receive time information from the DIP.

Configuration Files

This paragraph provides a list of the **ntp.conf** configuration files for the SICAM PAS/PQS and the SICAM SCC computers. The entries in the list have been customized for the example illustrated. Be aware that the real system configuration (for example, IP addresses) of your own environment must be considered.

Changes to the predefined configuration files have been highlighted.

Configuration file of the **SICAM PAS/PQS DIP**:

```
#--------------------------------------------------------------------
# general settings
#--------------------------------------------------------------------

# -- panic threshold --
# if system clock is more than that distance from the best external source,
# stop the service because something is really weird.
tinker panic 7200.0

# -- driftfile storage --
# NTPD will store the clock drift here, so after restart the service will
# lock the FLL/PLL faster. On embedded systems, make sure that file is
# writeable and on a non-write-protected file system!
driftfile %windir%\ntp.drift

# -- logfile storage --
# make sure this is a writeable file on a non-write protected file system!
#logfile D:\tmp\ntpd.log

# -- Statistic file storage --
# make sure this is a directory on a non-write protected file system!
#statsdir D:\tmp\ntpstats\
```

```
#--------------------------------------------------------------------
# reference clocks
#--------------------------------------------------------------------

# -- local system clock
# the local system clock is used as level 10 fallback if everything fails and
# the server must continue to operate because of (S)NTP clients like
# IEC61850 devices et al.
server 127.127.1.0
fudge 127.127.1.0 stratum 10
```

```
#-------------------------------------------------------------------------
# shared memory clocks ('iburst' is not useful here)
#-------------------------------------------------------------------------

# minpoll 2 -> 4s / maxpoll 6 -> 64s, mode 33 -> adaptive polling

# channel 1
server 127.127.28.0 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.0 stratum 5

# channel 2
server 127.127.28.1 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.1 stratum 5

# channel 3
server 127.127.28.2 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.2 stratum 5

# channel 4
server 127.127.28.3 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.3 stratum 5
```

```
#-------------------------------------------------------------------------
# peers: all time sync peers in a PAS installation
#-------------------------------------------------------------------------
# If the local system has reference clock access, mention all other systems
# (full servers and dips) in a PAS installation that can also access reference
# clocks. Peers will negotiate the leader of the pack...

# minpoll 2 -> 4s / maxpoll 6 -> 64s, iburst -> initial burst poll
peer 192.168.1.6 minpoll 2 maxpoll 6 iburst
```

The SICAM PAS/PQS DIP must be entered as a peer for the radio clock. If this is not possible, the radio clock must **not** be used as a peer, but as the Server:

```
#-------------------------------------------------------------------------
# servers
#-------------------------------------------------------------------------

# If the local system has no reference clock access, mention all systems that
# have reference clock access here. If there is a network path to an external
# clock source (NTP server in the control center, for example) list them
# here, too. And furthermore mention all fallback servers that can be used!

# minpoll 2 -> 4s / maxpoll 6 -> 64s, iburst -> initial burst poll
server 192.168.1.6 minpoll 2 maxpoll 6 iburst
```

Configuration file of the **SICAM SCC computer** and of the **SICAM PAS/PQS Full Server**:

```
#-------------------------------------------------------------------------
# general settings
#-------------------------------------------------------------------------

# -- panic threshold --
# if system clock is more than that distance from the best external source,
# stop the service because something is really weird.
tinker panic 7200.0

# -- driftfile storage --
# NTPD will store the clock drift here, so after restart the service will
# lock the FLL/PLL faster. On embedded systems, make sure that file is
# writeable and on a non-write-protected file system!
driftfile %windir%\ntp.drift

# -- logfile storage --
# make sure this is a writeable file on a non-write protected file system!
#logfile D:\tmp\ntpd.log

# -- Statistic file storage --
# make sure this is a directory on a non-write protected file system!
#statsdir D:\tmp\ntpstats\
```

```
#-------------------------------------------------------------------------
# reference clocks
#-------------------------------------------------------------------------

# -- local system clock
# the local system clock is used as level 10 fallback if everything fails and
# the server must continue to operate because of (S)NTP clients like
# IEC61850 devices et al.
server 127.127.1.0
fudge 127.127.1.0 stratum 10
```

```
#-------------------------------------------------------------------------
# shared memory clocks ('iburst' is not useful here)
#-------------------------------------------------------------------------

# minpoll 2 -> 4s / maxpoll 6 -> 64s, mode 33 -> adaptive polling

# channel 1
server 127.127.28.0 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.0 stratum 5

# channel 2
server 127.127.28.1 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.1 stratum 5

# channel 3
server 127.127.28.2 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.2 stratum 5

# channel 4
server 127.127.28.3 mode 33 minpoll 2 maxpoll 6
fudge 127.127.28.3 stratum 5
```

```
#-------------------------------------------------------------------------
# peers: all time sync peers in a PAS installation
#-------------------------------------------------------------------------
# If the local system has reference clock access, mention all other systems
# (full servers and dips) in a PAS installation that can also access reference
# clocks. Peers will negotiate the leader of the pack...

# minpoll 2 -> 4s / maxpoll 6 -> 64s, iburst -> initial burst poll
#peer xxx.xxx.xxx.xxx minpoll 2 maxpoll 6 iburst
```

```
#-------------------------------------------------------------------------
# servers
#-------------------------------------------------------------------------
# If the local system has no reference clock access, mention all systems that
# have reference clock access here. If there is a network path to an external
# clock source (NTP server in the control center, for example) list them
# here, too. And furthermore mention all fallback servers that can be used!

# minpoll 2 -> 4s / maxpoll 6 -> 64s, iburst -> initial burst poll
server 192.168.1.3 minpoll 2 maxpoll 6 iburst
server 192.168.1.6 minpoll 2 maxpoll 6 iburst
```

13 Converting Projects from Previous Versions

NOTE

Perform the conversion steps from earlier versions to the new version one after the other.

13.1	Converting Projects Independently of the Version	394
13.2	Making Adjustments for V9.04	395
13.3	Converting Topology, V9.00	396
13.4	Converting Projects, V8.04	397
13.5	Converting Projects, V8.03	398
13.6	Converting Projects, V8.02	399
13.7	Converting Projects, V8.01	400
13.8	Converting Projects, V8.00 or Earlier	401
13.9	Converting SICAM PAS/PAS CC Projects, V5.0 and V6.0	402
13.10	Converting Projects, V6.0x	403
13.11	Converting Projects, V5.11	404
13.12	Converting Projects, V5.10 or later	405
13.13	Converting Projects, V5.10 or earlier	406
13.14	Converting a SICAM WinCC Project	407

13.1 Converting Projects Independently of the Version

Perform the following steps in order to convert existing projects to the current version of SICAM SCC:

- Re-import the SICAM Graphic Object Library into your project.
- Open and save all diagrams (pictures) including SICAM objects:
  Deactivate the **SICAM Menu in the Graphics Designer (Tools > Add-In Manager > SICAM Add-in)** and initiate the picture conversion. To do so, select **Tools > Convert Project Data > Pictures and faceplates** in the WinCC Explorer.
- The **Topological coloring** function has been revised. For information concerning versions earlier than V9.00 refer to *13.3 Converting Topology, V9.00*.
- Let the **TEA-X Wizard** run with the data previously imported.
  In order to create the configuration data for the current SICAM Runtime with Dynamic Alarm Filter (DAF), you must execute the Import Wizard with existing information once for each station in the project. This is also required if you do not use the DAF.
- Further steps see *13.2 Making Adjustments for V9.04*.

If the parameters of SICAM objects configured in your diagram differ from the current version, a warning is shown in the Report when opening your diagram, informing you with which version the particular object was configured. Check the newly added parameters on the corresponding object.

When you open a diagram and the Report shows an error message regarding the configuration of a SICAM object, renew this object.

NOTE

Make sure that you use the appropriate **configuration licenses**.

13.2 Making Adjustments for V9.04

Due to revisions and extensions of the Dynamic Alarm Filter (DAF) changes in the Alarm Logging have been necessary.

Therefore, perform the following steps:

- Open an existing WinCC project and execute and update with the Wizard, using the following options:
  - Importing the SICAM graphic object library
  - Create SICAM text library
  - Create SICAM alarm system
- Open an existing picture in the **Graphics Designer**.
- Open the **Project Library** and replace the Alarm Controls in the picture:
  - SICAM SCC Warning Message List
  - SICAM SCC Event List
  - SICAM SCC Protection Message List

Adjustments for Using DAF

Before V9.04 every status could trigger an alarm. So for WinCC, every status change was a 'Came in' alarm which restarted the WinCC-specific algorithm. In V9.04 the treatment of the single-point indications in the DAF has been adjusted to the WinCC behavior: the single-point indication has **1** status triggering the alarm.

For this, 2 new filter types have been introduced. Use the types **SI with Alarm when ON** and **SI with Alarm when OFF**, in order to trigger an alarm in WinCC with the ON **or** with the OFF status of the process value of the single-point indication. With this change the WinCC algorithm for rising/falling indications in the alarm list with the specific coloring and the acknowledge behavior is supported completely.

Therefore, move existing DAFs for single-point indications from the **Binary** node to the suitable node for single-point indications (**SI with Alarm when ON** or **SI with Alarm when OFF**).

13.3 Converting Topology, V9.00

A topological coloring configured with a SICAM SCC version prior to V9.00 cannot be converted automatically. This means that the configurations described in chapters *4 Graphic Objects*, *5 Topological Coloring*, and *6 SICAM Add-In* have to be performed in order to convert an existing topological coloring.

To be able to use the topology in projects configured with a SICAM SCC version prior to V9.00, the according Import Wizard has to be executed once. This extends the data structure within SICAM SCC with the information required for the topology.

If you open an SCC project using topological coloring configured with an earlier version and start the runtime, the topological coloring will not be executed. However, in certain situations there may occur unwanted coloring. Thus, independent from topology usage, take care that all feeders are replaced by SICAM SCC V9.00 feeders.

The function **Topologal coloring** has been reworked. If you use the topological coloring you have to

- install the **license** for topological coloring,
- update the settings for the topological coloring in the **SICAM Menu** of the Graphics Designer,
- update the pictures of your project.

13.4 Converting Projects, V8.04

The **SICAM PAS Protocol Suite V7** is no longer included. Change your SICAM SCC projects to the **SICAM PAS Protocol Suite standard channel** before updating the software.

13.5 Converting Projects, V8.03

Replace the message list templates (changing the fixed selection).

13.6 Converting Projects, V8.02

A new measured values object (SICAM Numeric) is available in order to speed up the updating times and enhance the system dimensions, see *4.8 Measured/Metered Value Display*.

The former objects can be replaced via the SICAM SCC menu in the **Graphics Designer**. Select **Show task dialog** and perform steps 1 and 2 of the task **Measured value up to V8.01: Upgrade to SICAM Numeric Control (V8.02)**.

13.7 Converting Projects, V8.01

The **Topological coloring** version was revised.

If you use the topological coloring, you must update the pictures of your project. To do this, generate the logic links/scripts in the pictures once again using the **Generate topological coloring** command in the SICAM SCC menu.

13.8 Converting Projects, V8.00 or Earlier

The SICAM SCC Runtime Data Server component was introduced in order to increase the quantity scopes supported by SICAM SCC. SIMATIC WinCC, Version 7.0 SP3 or higher, is required as a prerequisite for using the SICAM SCC Runtime Data Server component.

New projects are automatically configured for operation with the SICAM SCC Runtime Data Server. Existing projects can be converted, but can also be operated without conversion.

The following conversion steps must be performed in order to convert existing projects (basis SIMATIC WinCC V7.0 SP3 or higher) for operation with the SICAM SCC Runtime Data Server:

- ✧ Delete and re-import the process data using the corresponding wizard (at least the **SICAM process tags** function).
- ✧ Re-import the SICAM Graphic Object Library into your project.
- ✧ If you use topological coloring, remove the topological coloring via **SICAM add-in**.
- ✧ Upgrade the switching device objects and bay overview objects via the SICAM SCC menu in the Graphics Designer (show task execution box – perform the upgrade of V7 switching device objects and overview objects for each picture).
- ✧ If you use the topological coloring, you generate the topological coloring once again via **SICAM add-in**.
- ✧ Replace the **Acknowledge blinking** button in the pictures.

For **SICAM Switch Controls, V8.0 or later** the **AckFlashing** tag is used (the status changes are inverse to the tags for earlier versions – **QuitBlinking**).

NOTE

When replacing objects in WinCC V7.4, connections to the connectors may be lost and the topology cannot be generated. In this case, re-connect the connectors to the switching device and bay overview objects.

This does not occur for WinCC V7.3 or earlier versions.

13.9 Converting SICAM PAS/PAS CC Projects, V5.0 and V6.0

Conversion of the SICAM PAS project

During the conversion the contents (interface level) of the first SICAM PAS CC DIP of the SICAM PAS project are transferred to the Full Server, and the IP address of the DIP is entered as the device address of the SICAM PAS CC (SCC) control center.

All the other SICAM PAS CC connections are converted manually because the user cannot decide during conversion whether further DIPs are redundant SICAM PAS CC (SCC) or independent SICAM PAS CC (SCC) connections.

For redundant SICAM PAS CC connections on 2 Version 6 DIPs you only need to enter the IP address of the second DIP at **SICAM PAS CC (SCC) 2** in the communication parameters of the converted control center. Afterwards you can delete the DIP.

Next, export the control center data for SICAM PAS CC (SCC) and import the in your WinCC project. For picture objects and scripts you need to adapt the tags which include the interface ID in the name. Afterwards, the WinCC project can be duplicated to the redundancy partner using the WinCC Project Duplicator. No SICAMspecific adaptations and no data import are required in the redundant project.

In case of independent SICAM PAS CC connections you can transfer the interface from the SICAM PAS CC DIP into the SICAM PAS CC (SCC) application on the Full Server. Configure the IP address of the SICAM SCC computer (Version 6 DIP address) on the control center level. Afterwards you can delete the DIP.

Export the control center data for SICAM PAS CC (SCC) and import them in your WinCC project. For picture objects and scripts you need to adapt the tags which include the InterfaceID in their name.

After the conversion you must change the parameter settings of the SICAM PAS CC (SCC) interface. Enter e.g. the IP address for communication with the SICAM SCC system.oll.

Different configuration

Contrary to SICAM PAS V6.0 the SICAM SCC connections are configured on the Full Server and no longer as a DIP.

On the interface level you define the assignment of the switching authority group, the IP address of the Full server network card for communication (this address corresponds to the one to be entered for the SICAM PAS in the SICAM PAS channel) and the port number.

On the control center level you define the IP addresses of the SICAM SCC computer(s) and the channel monitoring time. (Make sure that an identical channel monitoring time is defined in SICAM SCC).

Redundant SICAM SCC systems are configured as a control center; the two IP addresses of the SICAM SCC computers are entered in the communication parameters.

Independent SICAM SCC systems to be connected to a SICAM PAS are configured in separate interfaces. This enables a different assignment of the switching authority group.

13.10 Converting Projects, V6.0x

Perform the following steps with the SICAM PAS Wizard:

- ✧ Re-import the SICAM Graphic Object Library into your project.
- ✧ Update the process data using the PXD file.

13.11 Converting Projects, V5.11

Re-import the SICAM Graphic Object Library into your project using the SICAM PAS Wizard.

The **Topological coloring** function was completely revised and is no longer compatible with Version 5.11, but you can still use pictures in the version.

Advanced structure types are required for substitution. You must convert the structure types if you want to use the **Substitute** function supported for V6.0 or higher after the upgrade or if you use the Web Navigator in your project.

There are 2 alternatives for the conversion of the structure types:

- Alternative 1

  Follow the description in *14.8 Working with the SIMATIC WinCC Configuration Tool*.

- Alternative 2

  Use the wizard to delete the **SICAM process tags** and then manually delete the structure types in your project.

  Next, re-import the **SICAM process tags** using the wizard. The advanced structure types are generated during this process.

13.12 Converting Projects, V5.10 or later

Use the SICAM PAS Wizard to re-import the SICAM Graphic Object Library.

If problems occur during the archiving of an existing project in **TagLogging**, the **SICAM Archives** must be deleted with the wizard. Afterwards, the **MeasuredValueArchive_x** and the **MeteredValueArchive_x** created by the wizard must be deleted in **TagLogging**, and the **SICAM** time must be manually deleted. Afterwards you can re-import the archive tags using the wizard.

Advanced structure types are required for substitution. If you want to use the **Substitute** function supported for V6.0 or later after the upgrade or if you are using the Web Navigator in your project, you must convert the structure types.

There are 2 alternatives for the conversion of the structure types:

- Alternative 1

  Follow the description in *14.8 Working with the SIMATIC WinCC Configuration Tool*.

- Alternative 2

  Use the wizard to delete the **SICAM process tags** and then manually delete the structure types in your project.

  Next, re-import the **SICAM process tags** using the wizard. The advanced structure types are generated during this process.

13.13 Converting Projects, V5.10 or earlier

Use the SICAM PAS Wizard to re-import the SICAM Graphic Object Library in your project.

If problems occur during the archiving of an existing project in **TagLogging**, the **SICAM Archives** must be deleted with the wizard. Afterwards, the **MeasuredValueArchive_x** and the **MeteredValueArchive_x** created by the wizard must be deleted in **TagLogging**, and the **SICAM** time must be manually deleted. Afterwards you can re-import the archive tags using the wizard.

If you use the **AlarmListFilter** object from the library, replace it by the new version. The functionality of this object was swapped out to a global script. This ensures that the alarm list filter settings are also maintained after exiting the Runtime, see *7.6.7 Global Actions*.

Advanced structure types are required for substitution. If you want to use the Substitute function supported for V6.0 or later after the upgrade or if you are using the Web Navigator in your project, you must convert the structure types.

There are 2 alternatives for the conversion of the structure types:

- Alternative 1
  Follow the description in *14.8 Working with the SIMATIC WinCC Configuration Tool*.
- Alternative 2
  Use the wizard to delete the **SICAM process tags** and then manually delete the structure types in your project.
  Next, re-import the **SICAM process tags** using the wizard. The advanced structure types are generated during this process.

13.14 Converting a SICAM WinCC Project

Use to SICAM Global Wizard in order to reimport the SICAM graphic object library into your project.

Advanced structure types (new IXHook element) are required for projects created with SICAM WinCC V3 or earlier versions.

2 alternatives are possible for the conversion of structure types:

- Alternative 1

  Proceed as described in *14.8 Working with the SIMATIC WinCC Configuration Tool*.

- Alternative 2

  Alternative 2: Delete the **SICAM process tags** using the Wizard. Afterwards, manually delete the structure types for the **SICAM SAS** connection (without **PAS_** in the name) in your project.

  Reimport the **SICAM process tags** using the Wizard. The advanced structure types are generated during this procedure.

Replace the **IndustrialX V3** objects by the up-to-date objects (V3 objects are only available in configuration mode) using the SICAM add-in (upgrade of V3 switching device objects / overview objects).

In order to ensure that the properties of V3 switching device objects and overview objects are applied correctly, the tag names and the text for the tooltip in the properties of the tag connection must be empty in the target SAS object. Before calling up the update, open the properties of the SAS object and delete all tag names and the tooltip text under **Tag connection**.

Connected scripts are also applied when replacing the objects.

- Check whether the configured scripts function correctly (especially with regard to object properties used).
- Remove the script from the **Clicked** event of the object. This script served to open switching dialogs which are no longer required with the current object because they are integrated.

14 Components and Functions of Earlier SICAM PAS CC/SCC Versions

14.1	Double/Redundant Configuration in V5/V6 Projects	410
14.2	Circuit Breaker and Disconnector	420
14.3	Bay Overview	454
14.4	Showing Texts in Runtime Dialogs	459
14.5	IX State Sync Application	464
14.6	Measured-Value Display Using the Script/Project Function	469
14.7	Introduction to the SIMATIC WinCC Configuration Tool	473
14.8	Working with the SIMATIC WinCC Configuration Tool	483

14.1 Double/Redundant Configuration in V5/V6 Projects

This chapter explains the double/redundant configuration concept in SICAM PAS/SCC systems, SICAM PAS/ PAS CC V6.03 or earlier. This type of connection of double SICAM PAS systems should no longer be used with the new SICAM PAS V7.0 version. However, the parameters of systems which are upgraded from SICAM PAS V5/V6 do not necessarily need to be modified. The explanations below apply to these systems.

For safety reasons, a SICAM PAS system can be implemented in double/redundant configuration. This means that certain components can be implemented in double/redundant configuration depending on the specific requirements of the individual system. This section describes the implementation of the configurations illustrated below.

- A doubled SICAM PAS system is connected to 1 SICAM SCC Human-Machine Interface (HMI).
- 1 SICAM PAS system is connected to 2 redundant SICAM SCC HMIs.

Further double/redundant configurations are possible. For example, double SICAM PAS Full Servers can also be connected to a redundant SICAM SCC system.

For more detailed information on redundancy, refer to the SIMATIC WinCC documentation.

14.1.1 Connection to 2 SICAM PAS Systems

A SICAM PAS system can consist of 2 SICAM PAS Full Servers running in parallel. Bay devices and substations are connected to both SICAM PAS Full Servers. SICAM SCC is connected to both SICAM PAS Full Servers via the SICAM PAS PROTOCOL SUITE.

The connection to a SICAM PAS Full Server (e.g. to Server1) is referred to as the **normal path**; the connection to the other SICAM PAS Full Server (e.g. to Server2) is the so-called **redundant path**. During fault-free operation, the connection via the normal path is active.

For SICAM SCC, a switchover to the redundant path must be performed if one of the following 2 scenarios occurs:

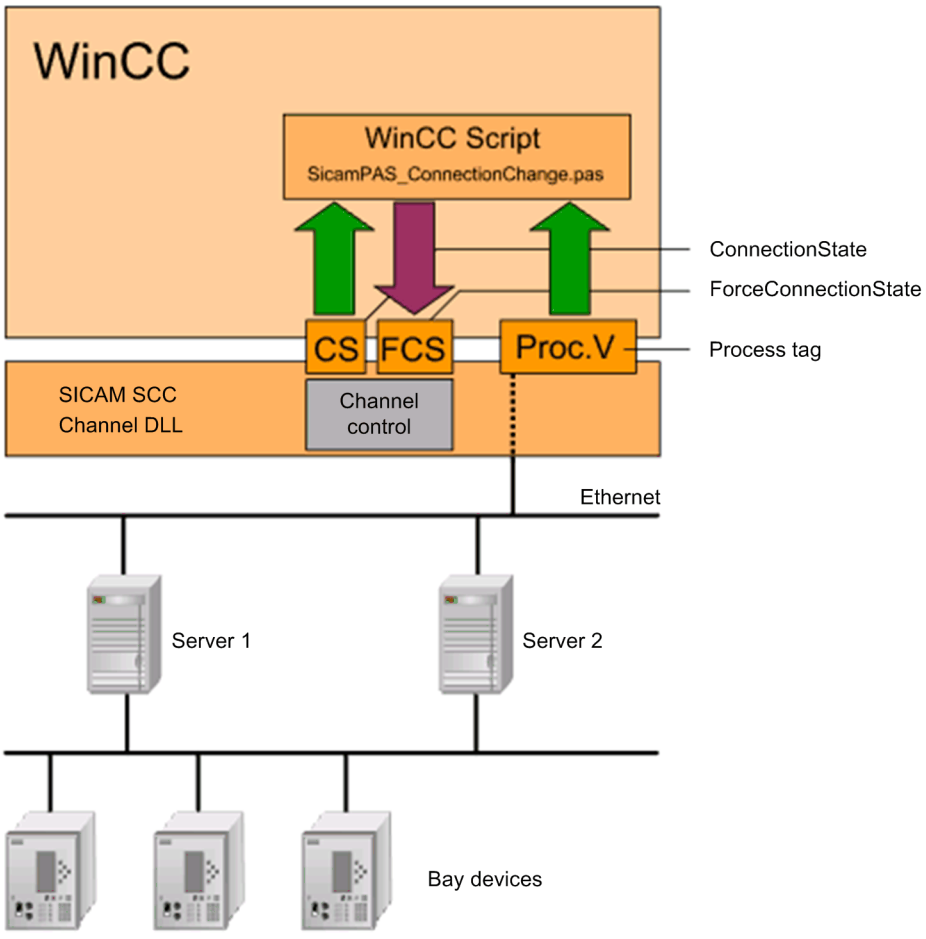
- The normal path of the SICAM PAS PROTOCOL SUITE to the connected SICAM PAS Full Server is interrupted.

  The active connection of the SICAM PAS PROTOCOL SUITE to the SICAM PAS Full Server is permanently monitored. When an error occurs, the system automatically switches over to the redundant path (to the other SICAM PAS Full Server), provided that this path has been configured.
- The communication between the SICAM PAS Full Server accessed by SICAM SCC and the bay devices is disturbed.

  This scenario also requires a switchover to the redundant path. This fault, however, cannot be detected by the SICAM PAS PROTOCOL SUITE. The detection of the fault and the switchover to the redundant path can be realized by other means. The required procedure is described below.

NOTE

For the connection to SICAM PAS V7.0, the configuration of the SICAM PAS PROTOCOL SUITE (SICAM PAS channel DLL) must be set to SICAM PAS V6 redundancy.



[Kanal_dll, 1, en_US]

Figure 14-1 System with doubled SICAM PAS system

The following components are required for the monitoring and switchover of the connections (between the normal and the redundant path):

- a process tag
- the **ConnectionState_xxx** bit array (32 bits)
- the **ForceConnectionState_xxx** bit array (32 bits)
- the WinCC script **SicamPAS_ConnectionChange.pas**

Process tag

In order to be able to monitor the connection between the SICAM PAS system and the bay devices, a process tag must be created in SICAM PAS UI-Configuration and mapped to SICAM SCC. This process tag can be e.g. a message derived via CFC and enabling the evaluation of the quality of the connection to the bay devices.

This process tag can be evaluated using the **SicamPAS_ConnectionChange.pas** or **SicamPAS_IsHeMaster-Check.pas** WinCC script. The quality of the active connection can be assessed by means of the evaluation of the process tags.

ConnectionState

The **ConnectionState_xxx** bit array shows the status of the active connection between the SICAM PAS PROTOCOL SUITE and the SICAM PAS system.

The bit array is defined as follows:

Bit	Meaning
0	0 = no connection 1 = connection active
1	1 = connection via normal path
2	1 = connection via redundant path
3 to 31	System-internal use

ForceConnectionState

The behavior of the SICAM PAS PROTOCOL SUITE can be influenced by writing the **ForceConnectionState_xxx** system tag.

The bit array can only be written completely. Read access is not possible.

The bit array is defined as follows:

Bit	Meaning
0	If this bit is set, the SICAM PAS PROTOCOL SUITE switches over to the other SICAM PAS Full Server. The triggering is performed using the WinCC script.
1	If this bit is set, the connection is activated via the normal path.
2	If this bit is set, the connection is activated via the redundant path.
3 to 31	Reserved

WinCC script

The process tag is evaluated using the **SicamPAS_ConnectionChange.pas** WinCC script. The proper functioning of the SICAM PAS system (including the communication with connected devices) can be checked by means of this evaluation.

If the quality of the active connection is found to be poor, the system can switch over to the other path using the system tag **ForceConnectionState_xxx**.

A template of the **SicamPAS_ConnectionChange.pas** WinCC script

is copied into the **...\SIEMENS\SICAM\SCC\PAS** directory during installation.

In order to be able to use the WinCC script, proceed as follows:

✧ Copy the WinCC script into the **PAS** directory of your WinCC project.

✧ To customize the WinCC script, use the related process tags in the script editor.

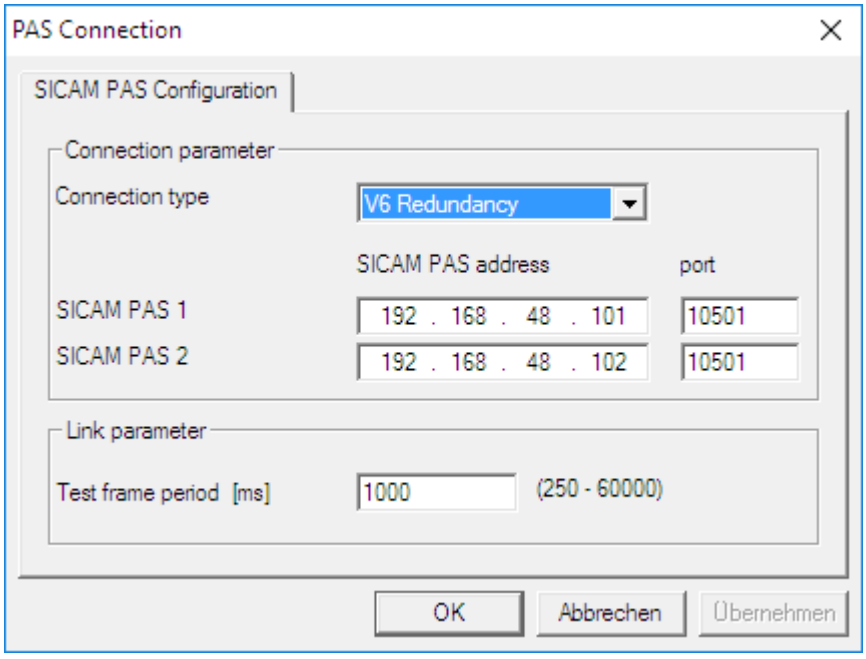
Activating redundancy

Proceed as follows to activate the redundant configuration:

✧ In the WinCC Explorer, right-click **PAS Data Server** and select **Properties** from the context menu.
The **Channel Unit Properties** dialog opens.

✧ Click **Properties**.
The **Connection properties** dialog opens.

✧ Click **Properties**.
The **PAS Connection** dialog opens.



[pascc404a, 1, en_US]

Figure 14-2 Activating redundancy

- ✧ Select the **Redundant Connection** option.
- ✧ Enter the IP address of the second SICAM PAS Full Server.

The **ports** must match the ports parameterized in SICAM PAS.

The **Test frame period** must correspond to the Test frame period parameterized in SICAM PAS for SICAM PAS CC/SCC.

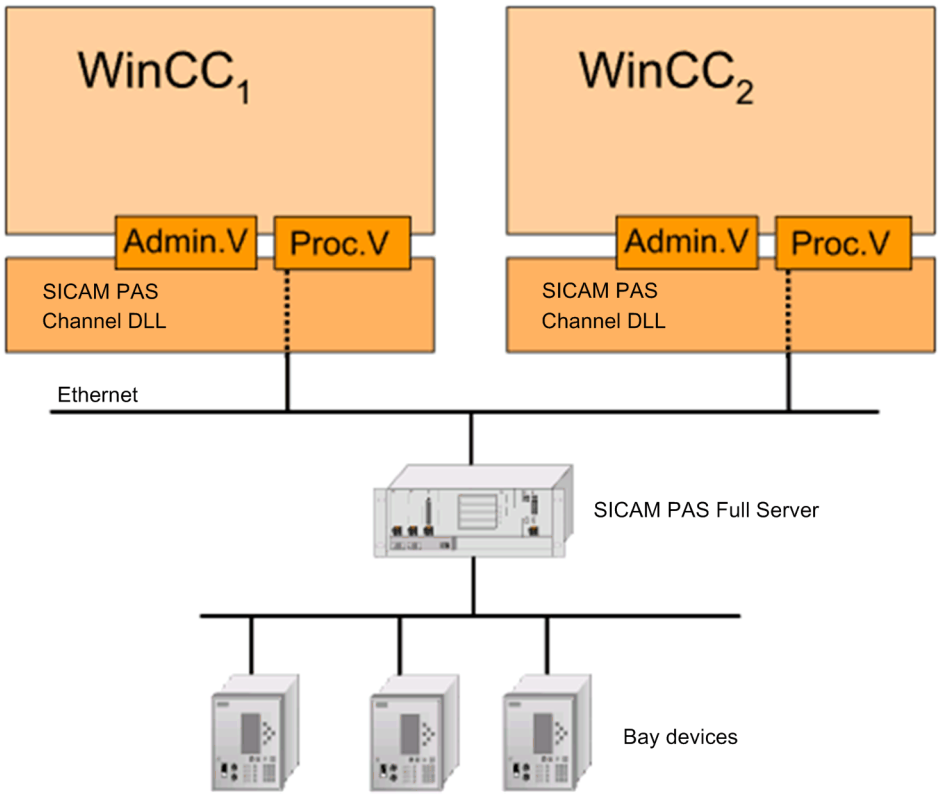
- ✧ Click **OK** to confirm your settings.

14.1.2 Redundant SICAM SCC System

A redundant system can consist of two SICAM SCC which run in parallel. Each SICAM SCC provides a SICAM PAS PROTOCOL SUITE connection to the SICAM PAS system.

The first SICAM SCC (e.g. WinCC1) is the **Master Server**, and the second one is the **redundant Partner Server**. Both connections are active in case of fault-free operation.

The SIMATIC WinCC redundancy package for data synchronization and for the control of the server redundancy must be installed on both SICAM SCC servers.



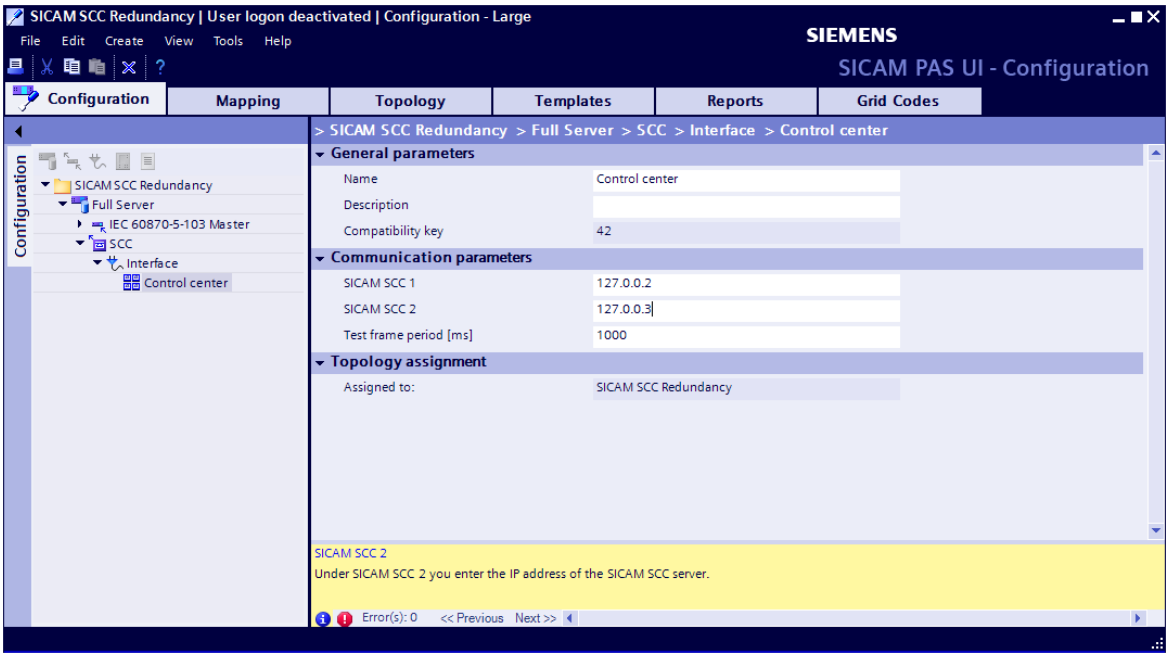
[Kanal_dll_1, 1, en_US]

Figure 14-3 System with redundant SICAM SCC

Configuring SICAM PAS

In SICAM PAS, you must add two DIPs to your project and configure them accordingly.
Proceed as follows:

- ✧ To open **SICAM PAS UI - Configuration**, click **Start > Siemens Energy > SICAM > PAS > UI - Configuration**.
- ✧ Create a DIP (e.g. PAS CC 1).
- ✧ Insert a **PAS CC/SCC application**, an **interface** and a **control center** for the DIP.
- ✧ The items of information to be used in SICAM PAS CC/SCC must be activated in the information mapping.

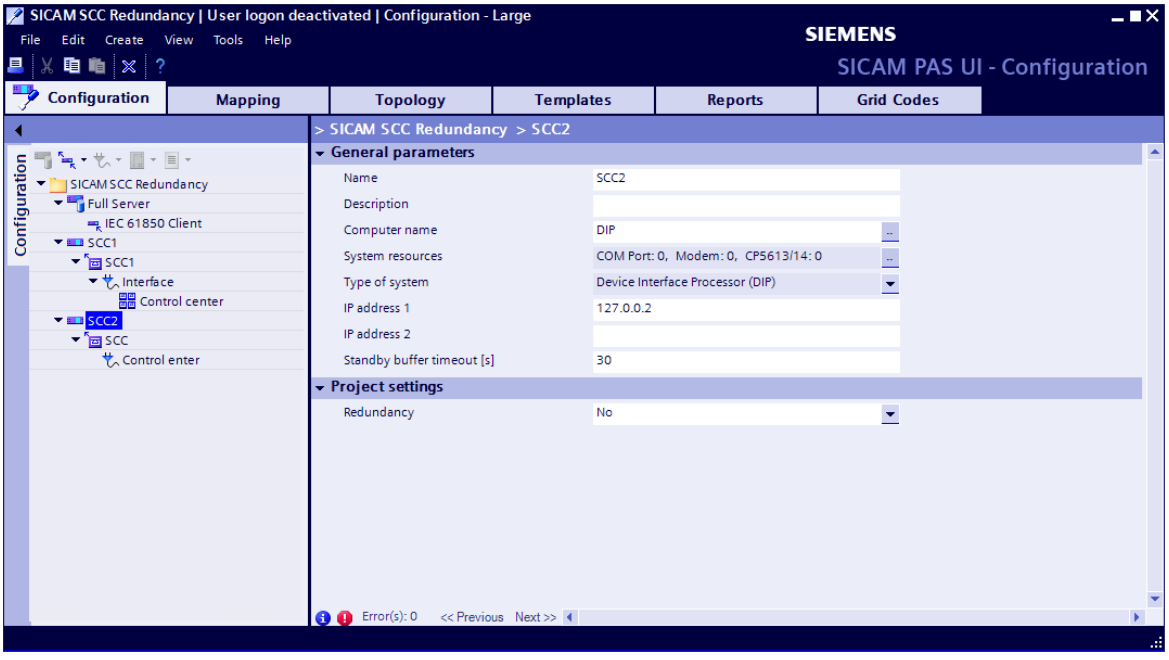


[sc_first_dip, 1, en_US]

Figure 14-4 First DIP, PAS CC 1

- ✧ Create the second DIP (e.g. PAS CC 2).
- ✧ Insert a **PAS CC/SCC application** and an **interface** for the DIP.

The interfaces include different interface addresses and compatibility keys. They are assigned by the system and cannot be modified. The compatibility key is automatically adapted upon each change of the interface parameters.



[sc_second_dip, 1, en_US]

Figure 14-5 Second DIP, PAS CC 2

- ✧ Copy the control center of the first DIP and insert the copy into the second DIP.

Exporting data

To import the configured items of information into SICAM SCC, they must be exported from SICAM PAS UI - Configuration.

✧ Right-click **Interface** and select **Export** from the context menu.

The export function creates a PXD file in the selected directory. Afterwards, you can import this file into SICAM SCC using the SICAM PAS Wizard.

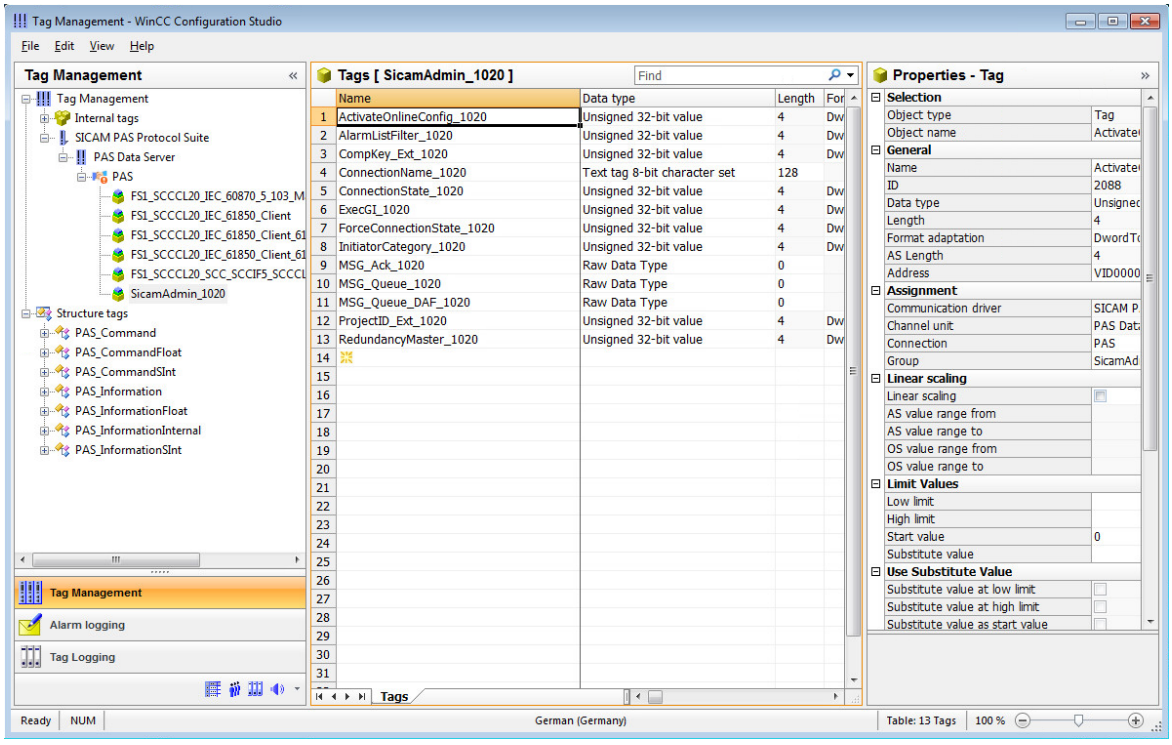
✧ Export the configuration data of the first DIP.
✧ Export the configuration data of the second DIP.

Creating WinCC Projects

Create a separate WinCC project on each of the 2 computers.

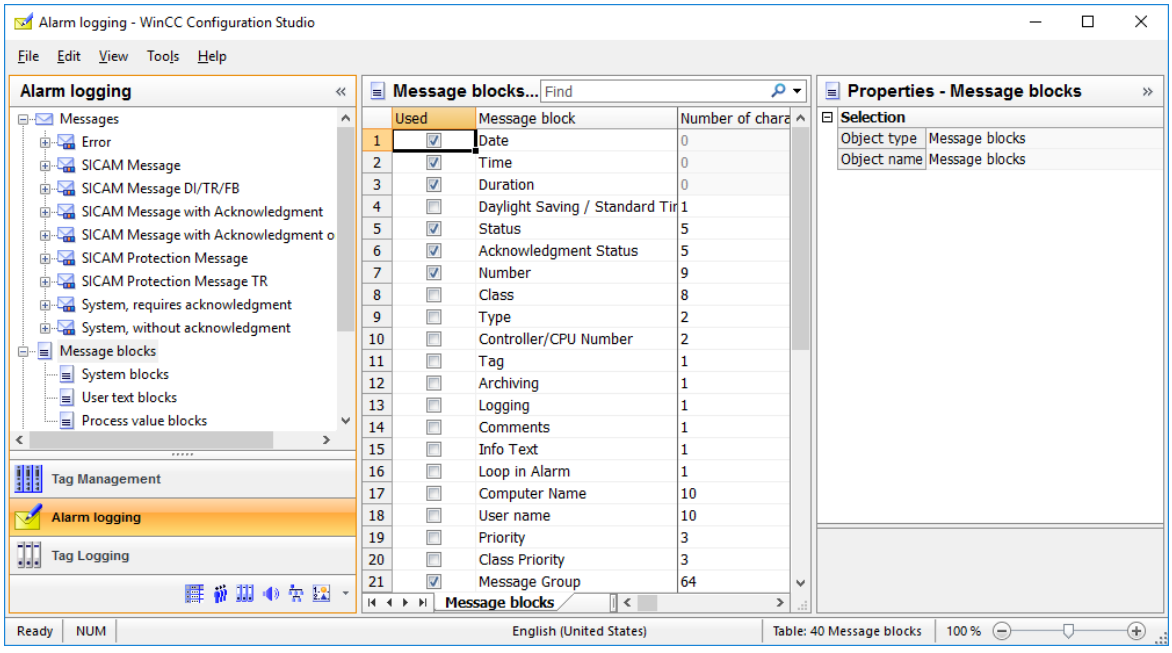
✧ Create a new WinCC project (e.g. PAS CC 1) on the first computer.
✧ Import the **PXD file** of the first DIP using the SICAM PAS Wizard.

The administrative tags imported from SICAM PAS have the project and interface ID as an extension of the tag name.



[pascc409, 1, en_US]

Figure 14-6 WinCC Project 1



[pascc411, 1, en_US]

Figure 14-7 Alarm Logging WinCC Project 1

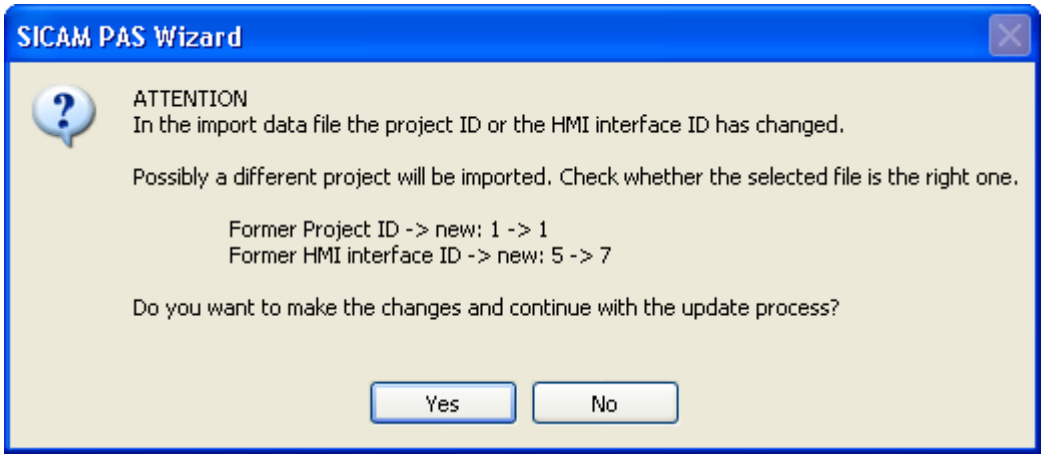
✧ Close your WinCC project.

Create the redundant WinCC project via the **Project Duplicator**. It must be saved on a second computer.

✧ To start the **Project Duplicator**, click **Start > SIMATIC > WinCC > Tools > Project Duplicator**.
✧ Enter **PAS CC 1** as the source project.
✧ Enter a name for the redundant WinCC project (e.g. PAS CC 2).
✧ Click **Duplicate**. The redundant WinCC project is now created.
✧ Call up the SICAM PAS Wizard via the redundant WinCC project.

The administrative tags must be connected to the other interface in the redundant WinCC project.

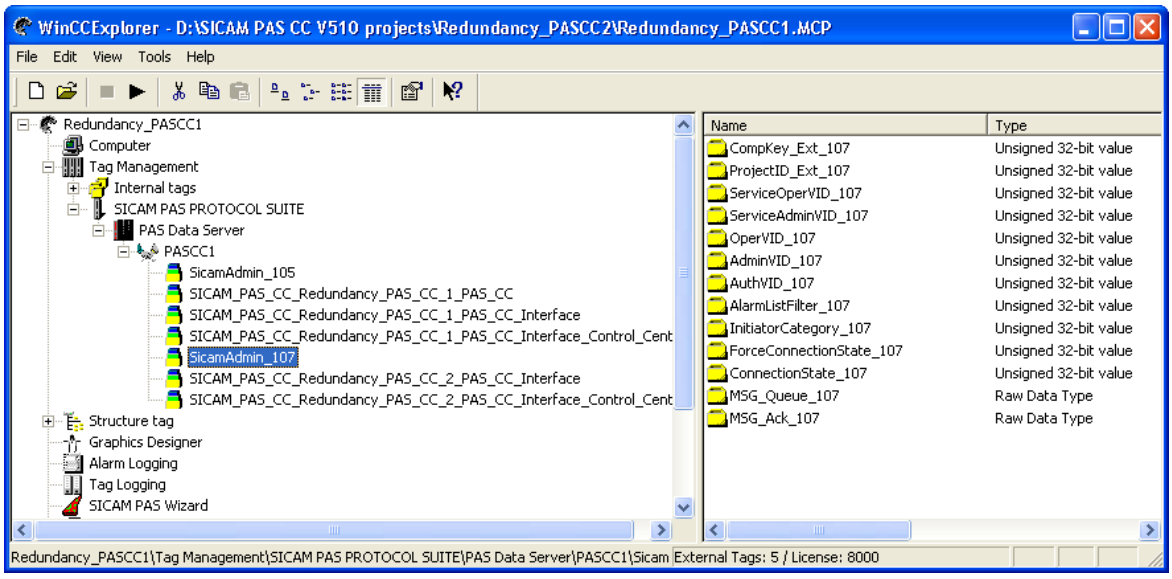
✧ Import the **PXD file** of the second DIP. Only the names of the administrative tags are changed during this step.



[pascc408, 1, en_US]

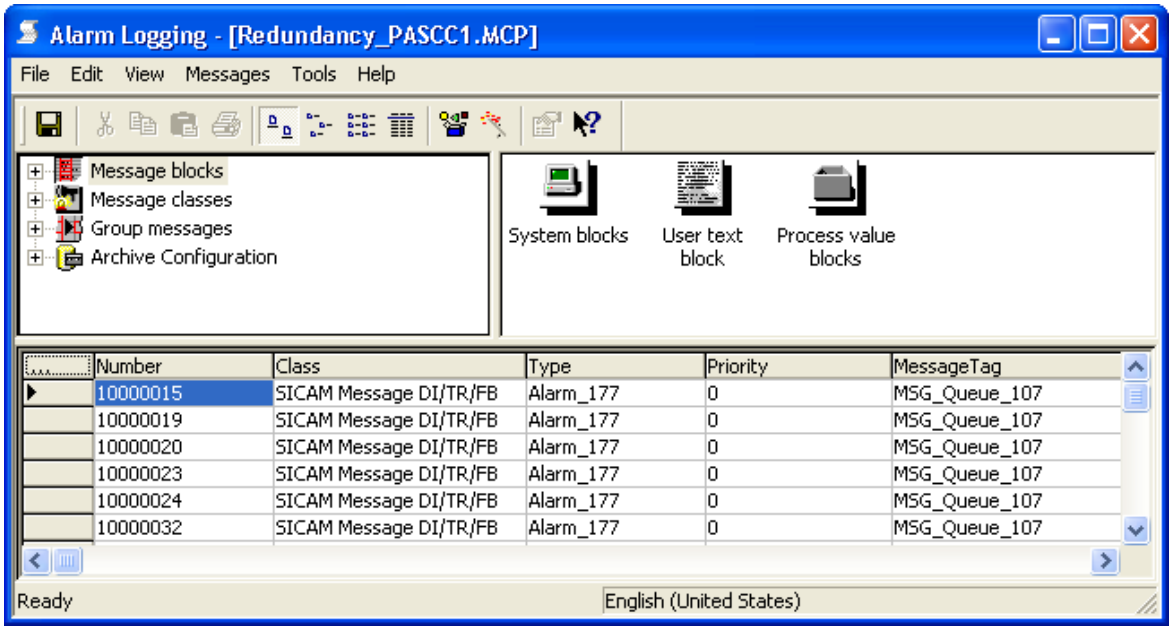
Figure 14-8 SICAM PAS Wizard, Warning

✧ The SICAM PAS Wizard issues a warning. Click **Yes** in this dialog.
The **project ID** is not changed, and the **HMI Interface ID** is assigned the value 9.



[pascc410, 1, en_US]
Figure 14-9 WinCC Project 2

The modified process tags include the project and interface IDs of the second DIP as an extension of the tag name. They are linked to the redundant interface.



[pascc412, 1, en_US]
Figure 14-10 Alarm logging WinCC Project 2

The new raw data tag is linked to the messages.
The CompKey of the redundant interface is used.
The modifications are documented in the trace window.

Synchronizing SICAM acknowledgment data

SIMATIC WinCC supports the synchronization of data between redundant servers. In order to ensure that the data of the SICAM SCC components can be synchronized between the redundant servers, the following prerequisite must be met:

For the **IX State Sync** application, the same rules apply for a SICAM RTU system as for a SICAM PAS system, see *14.5 IX State Sync Application*.

14.2 Circuit Breaker and Disconnector

This section describes the **Circuit Breaker** and **Disconnector** SICAM graphic objects for SICAM SCC V7.02 or earlier. With SICAM SCC V8.00 or higher, they were replaced by SICAM graphic objects featuring more powerful functions. However, the old SICAM graphic objects can still be used. The new circuit breakers and disconnectors are described in *4.4 SICAM Switch Controls*.

The **C**ircuit **B**reaker and the **Dis**connector are available as switching devices. They are stored in the **Switching device objects** folder under **Controls** in the SICAM graphic object library. These IndustrialX Controls already include typical functions.

NOTE

If user-specific bitmaps, configured without absolute path, are used for display within the switching objects (**Bitmap** option), these are not displayed during runtime in WinCC V7.2 or higher on the Web Navigator Client .

The default search path is relative to the directory **Programs (x86)\Siemens\WinCC\WebNavigatorClient \bin**.

You can reference the used bitmaps via this path or store them in this location.

Graphical representation

The SICAM graphic object library provides circuit breakers and disconnectors in five different representation modes:

Circuit breaker	View	Graphic
SICAM CB	in SICAM style	
DIN CB	based on DIN 42200	
IEC 445 CB	based on IEC 445	
LSA CB	based on LSA	
Bitmap CB	individual design	

Disconnector	View	Graphic
SICAM CB	in SICAM style	
DIN CB	based on DIN 42200	

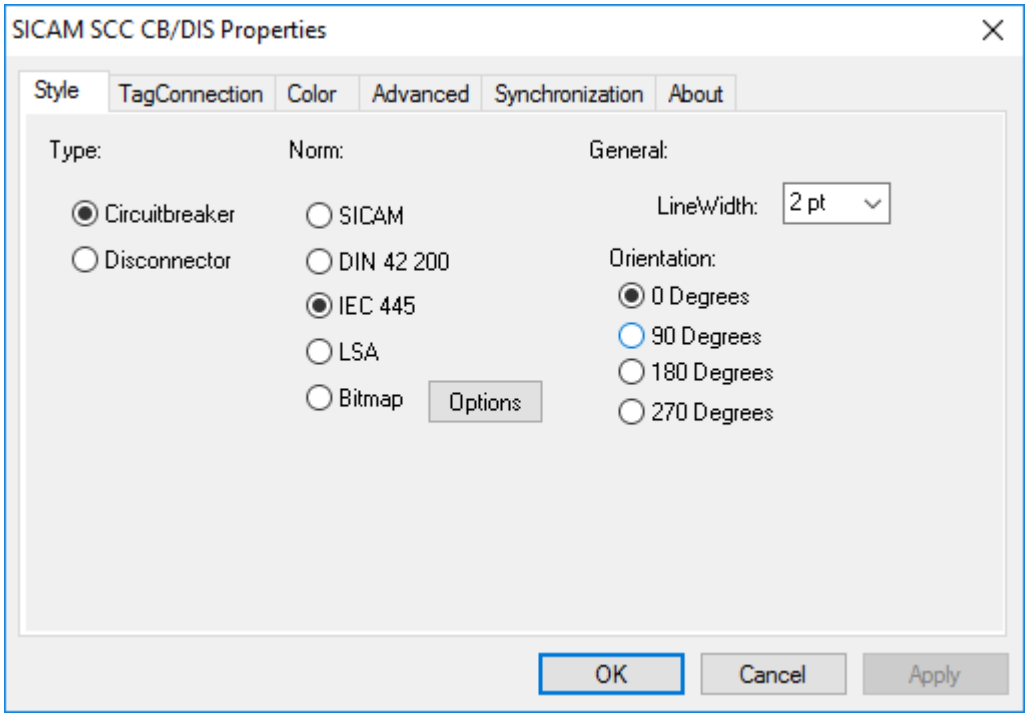
Disconnector	View	Graphic
IEC 445 CB	based on IEC 445	
LSA CB	based on LSA	
Bitmap CB	individual design	

14.2.1 Graphical Representation of Circuit Breakers and Disconnectors

Each circuit breaker and disconnector must be assigned several properties.

✧ Double-click the graphic object.
The **SICAM SCC CB/DIS Properties** dialog opens.

✧ The properties can be found in the **Style** tab.



[pascc336, 1, en_US]

Figure 14-11 Specifying the style

Type

The **Circuit Breaker** or **Disconnector** types can be selected for the graphic object.

Standard

The following five options are available for the representation of a graphic object:

- SICAM
- DIN 42200

- IEC 445
- LSA
- Bitmap

With the Bitmap style, specific diagrams can be displayed depending on the switch position.

NOTE

If user-specific bitmaps, configured without absolute path, are used for display within the switching objects, these are not displayed during runtime in WinCC V7.4.

The default search path is relative to the folder **Programs (x86)\Siemens\WinCC\bin**.

You can reference the used bitmaps using this path or store them in this location.

Line width

The **line width** of the graphic objects can be adjusted in steps from 1 to 11. Step 1 represents the smallest line width.

The adjustment of the line width is possible for all representation styles according to DIN 42200, IEC 445 and LSA.

Orientation

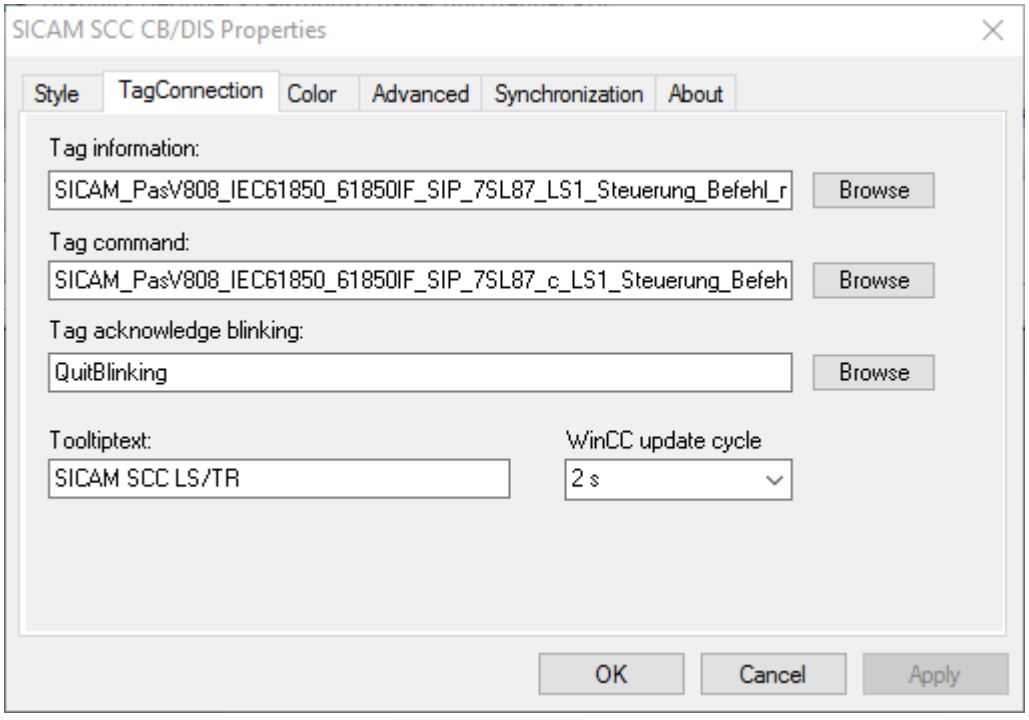
For all representation styles apart from **Bitmap**, the orientation angles 0°, 90°, 180°, and 270° can be defined.

14.2.2 Tag Connection of the Circuit Breakers and Disconnectors

Each circuit breaker and each disconnector must be assigned tags.

✧ Double-click the graphic object.
The **SICAM SCC CB/DIS Properties** dialog opens.

✧ The interfacing to the process is defined in the **Tag connection** dialog.



[pascc337, 1, en_US]

Figure 14-12 Tag connection

Tag information

Click the **Browse** button next to the edit field. The **Tags** dialog opens. Select the corresponding tag from the list and click **OK** to confirm.

Tag command

If a tag name Command related to a tag name Information is indicated in the SICAM PAS import data record, the command tab is determined automatically when the tag name information is selected. In this case, the tag name Command is entered into the **Command Direction** edit field.

To select a tag, proceed as described under Monitoring Direction.

NOTE

If you do not want to use the stored functionality in command direction, delete the prespecified tag.

Acknowledge tag for spontaneous blinking

You can keep the predefined **QuitBlinking** tag or select another tag.

Click the **Browse** button next to the edit field to select another tag. The **Tags** dialog opens. Select the corresponding tag from the list and click **OK** to confirm.

You can also assign a tag to several switching elements in order to form a group. Spontaneous blinking can be acknowledged simultaneously for all switching elements of the group.

Tooltip text

Enter a text in the edit field. This text is displayed as **Tooltip** in the active project.

WinCC update cycle

The **WinCC update cycle** of the tags can be adjusted in time intervals from 250 milliseconds to one hour. Furthermore, the setting **For change** is possible. 2 seconds is the default setting.

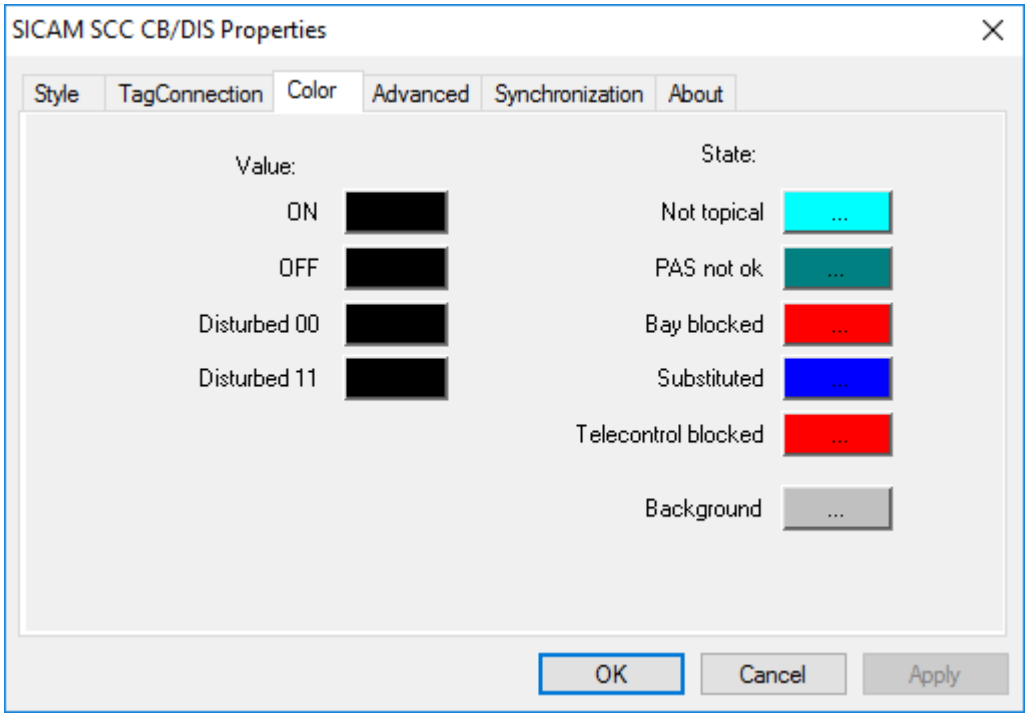
14.2.3 Colors of Circuit Breaker and Disconnector

Switch position

The color of the graphic object in normal state depends on its value. A specific color is set by default for each individual value. However, the color can also be freely selected from a color palette.

In the **Color** tab, you can assign colors for the individual switch positions and states of the Circuit Breaker/ Disconnector.

- ✧ Double-click the graphic object.
  The **SICAM SCC CB/DIS Properties** dialog opens.
- ✧ Select the **Color** tab.



[pascc339, 1, en_US]

Figure 14-13 Assigning colors

The following colors are predefined for the graphic object:

Table 14-1 Switch position

Value	Color
ON 10, value = 2	Red
OFF 01, value = 1	Green
Intermediate position 00, value = 0	Yellow
Disturbed 11, value = 3	Yellow

The form of the graphic object in representation styles in accordance with DIN 42200, IEC 445 and LSA depends on the value.

The following forms are predefined for the graphic object in the representation style in accordance with DIN 42200 and IEC 445:

Table 14-2 In accordance with DIN 42200 and IEC 445

Value	Form
ON 10, value = 2	Switch closed
OFF 01, value = 1	Switch open
Intermediate position 00, value = 0	Switch on/off dashed
Disturbed 11, value = 3	Switch on/off dashed

Graphic object forms in the representation style in accordance with LSA:

Table 14-3 In accordance with DIN 42200 and IEC 445

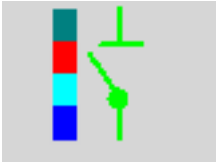
Value	Form
ON 10, value = 2	Filled
OFF 01, value = 1	Not filled

Value	Form
Intermediate position 00, value = 0	Half filled
Disturbed 11, value = 3	Half filled

A red cross is indicated for values which are not indicated in the tables (e.g. Value=4).

State

The switch status is represented with small, colored rectangles next to the switch. A default color is predefined for each status. The color can also be freely selected from a color palette.



[pascc340, 1, --_--]

Figure 14-14 Switch with switch status

The predefined colors of the rectangles depend on the status:

Table 14-4 Switch status

Status	Color	Explanation
Not topical	Cyan (turquoise)	The device state is not topical.
PAS not ok	Dark cyan (teal)	Connection between SICAM SCC and SICAM PAS disturbed.
Bay blocked	Red	Messages from this bay are no longer transmitted to SICAM PAS.
Substituted	Blue	The switch position was set manually because there is no connection to the primary system.
Telecontrol blocked	Red	Messages from this bay are no longer transmitted to the telecontrol center.

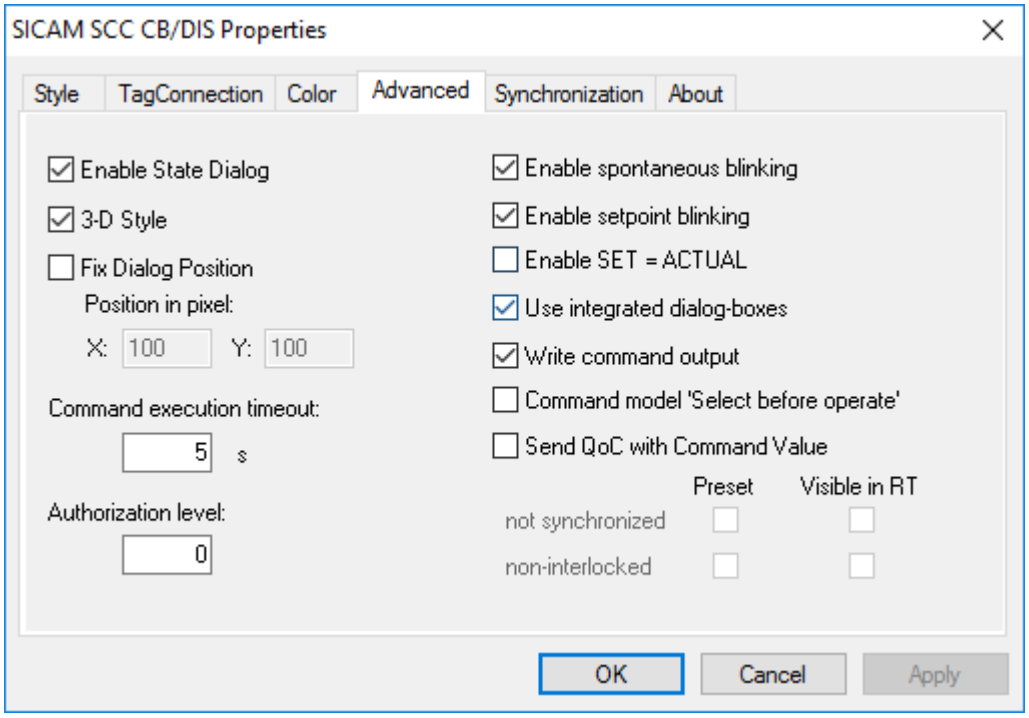
Background

The background color of the graphic object can be individually defined. Gray is the default color.

14.2.4 Advanced Properties of the Circuit Breaker and Disconnector

In the **Advanced** tab, you assign additional circuit breaker/disconnector properties.

- ✧ Double-click the graphic object.
  The **SICAM SCC CB/DIS Properties** dialog opens.
- ✧ Select the Advanced tab.



[pascc342, 1, en_US]

Figure 14-15 Advanced properties

During the connection to **SICAM RTU** or **IEC 61850 devices**, commands must be sent with Qualifiers of Command (QoC) when commands are issued. To activate the function, select **Send QoC with Command Value** in the Properties dialog of the switching device. Afterwards you can set the values to be sent in the Preset section. If you need the possibility to display and change the values in the switching dialog at runtime, select **Visible in RT**.

Enable state dialog

The display of status information by clicking with the right mouse button can be enabled or disabled.

3-D style

If this option is selected, circuit breakers and disconnectors can simulate a three-dimensional effect when clicked.

NOTE

The 3-D effect highlights the selected icon. This effect is required for operation without a mouse.

Fix dialog position

The runtime dialogs can be anchored at a specified position on the display.

Command execution timeout

In the **command execution timeout** box, you must specify in seconds how long the system shall wait for the successful execution of a command. When this time interval has elapsed, the command is terminated and the negative command termination is logged.

Authorization level

Enter the **Authorization level**. For example, select the value 3 for authorization level 3. For more detailed information regarding the setting and assignment of user authorizations, refer to *3.8 Setting up User Authorizations*.

NOTE

The line number (e.g. 3) corresponds to the authorization level in the object properties of the ActiveX Controls.

Enable spontaneous blinking

Spontaneous blinking can be enabled or disabled.

The circuit breaker or disconnector **blinks spontaneously** if the value of the assigned tag changes and if **Spontaneous** has been entered as cause.

Enable setpoint blinking

Setpoint blinking can be enabled or disabled.

When the command is issued, the graphic object starts to **blink** in the defined state as soon as the target switching direction (ON or OFF) has been selected. The blinking stops when the command is terminated or aborted, i.e. in the following cases:

- after the abortion of the command output
- when the monitoring time for the command output has expired
- if **Command Termination** was entered as the cause in the feedback message

Enable SET = ACTUAL

Switching in the represented ACTUAL state can be enabled or disabled. Select this option to enable the switching direction independently of the switch position. For example, another switch-on command can be issued for a switch which has already been switched on.

Use integrated dialog

The display of switching dialogs during runtime can be enabled or disabled.

Write command output

Deselect **Write Command Output** to prevent writing to the defined tag. In this case, you must define actions for the command output via the Object Properties, Events tab (see *14.2.9 Defining Object Properties*).

Command model 'Select before operate'

A switching operation can be executed in two steps.

A select command is issued before the actual switching command. To issue the switching command, a positive acknowledgment must have been received for the select command.

14.2.5 Controlling Synchronized Switching for the SICAM PAS Connection

In the **Synchronization** tab, you can define the control (switching device object) for synchronized switching (e. g. in order to connect two busbars).

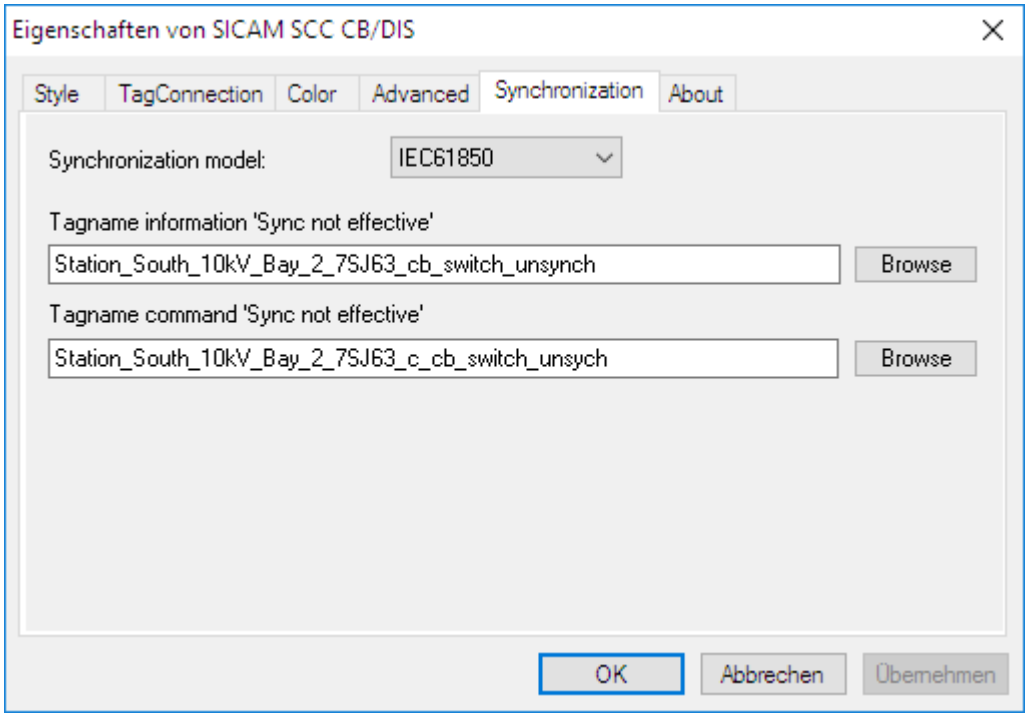
✧ Double-click the graphic object.
The **SICAM SCC CB/DIS Properties** dialog opens.

✧ Select the **Synchronization** tab.

NOTE

In case of a connection to a SICAM PAS station, additional synchronization functions can only be used with the IEC 61850 and SINAUT LSA ILSA communication protocols.

Synchronization functions with IEC 61850

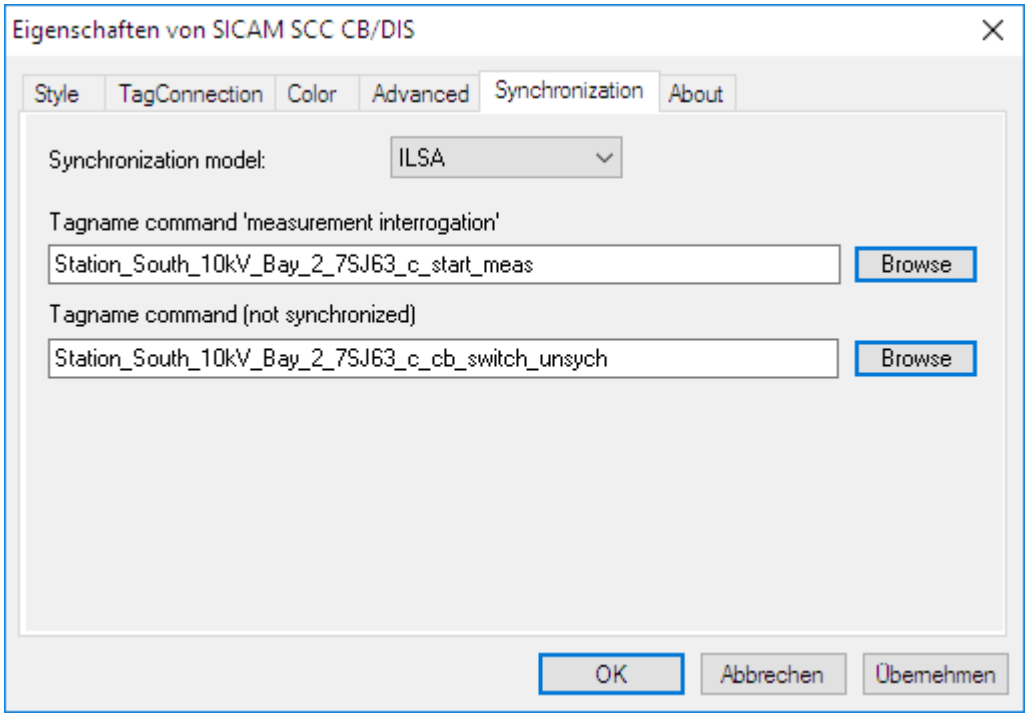


[pascc341, 1, en_US]

Figure 14-16 Define synchronization

- **Synchronizing model**
  With the communication protocol **IEC 61850**, the user can specify whether circuit breakers shall be controlled in synchronized or unsynchronized mode. If unsynchronized switching is specified, further settings or dynamic display properties must be defined. Advanced control dialogs are displayed during runtime, and the user can determine how the switching operation is to be executed.
- **Command execution timeout**
  In the **Command execution timeout** box (**Advanced** tab), you must specify in seconds how long the system shall wait for the successful execution of a command. When this time interval has elapsed, the command is terminated and the negative command termination is logged.
- **Changeover Synchronized – Not Synchronized Switching tag name information**
  The tag to be indicated includes information on whether the device synchronization is **active** or **inactive**. This tag must always be indicated.
- **Changeover Synchronized – Not Synchronized Switching tag name command marker command**
  A tag name command can be indicated. This tag does not need to be defined if the synchronization function must not be modified during runtime.

Synchronization functions with SINAUT LSA ILSA



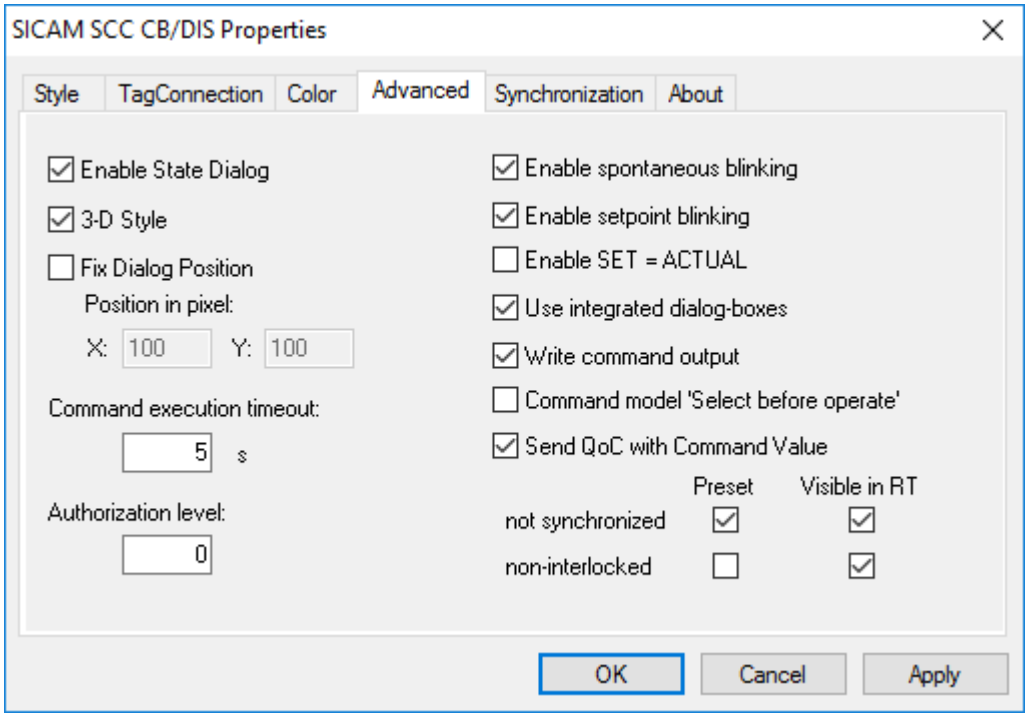
[pascc341a, 1, en_US]

Figure 14-17 Define synchronization

- **Synchronizing model**
  With the **SINAUT LSA ILSA** communication protocol, the user can specify whether circuit breakers shall be controlled in synchronized or unsynchronized mode. If synchronized switching is specified, further settings or dynamic display properties must be defined. Advanced control dialogs are displayed during runtime and the user can determine how the switching operation shall be executed.
- **Command execution timeout**
  In the Command execution timeout box (Advanced tab), you must specify in seconds how long the system shall wait for the successful execution of a command. When this time interval has elapsed, the command is terminated and the negative command termination is logged.
- **Tag name command 'measurement interrogation'**
  In the **Tag name command 'measurement interrogation'** box, define the tag name command which triggers a measurement in the synchronization unit. The measured values are updated; no switching operation is performed.
- **Tag name command (not synchronized)**
  Define the tag name command for unsynchronized switching in the **Tag Name Command (not synchronized)** entry field. If this tag is not defined, unsynchronized switching is not possible.

14.2.6 Synchronized Switching for Direct Connection of Devices

If devices are directly connected via the SICAM IEC COMMUNICATION SUITE, the Qualifiers of Command (QoC) are included in the command telegrams. These QoC are defined in the **Advanced** tab.



[QoC_einstellen, 1, en_US]

Figure 14-18 Defining Qualifiers of Command (QoC)

The Qualifiers of Command can be defined with the following object properties in the object properties of the switching commands:

- **Preset**
  With this property you can define which Qualifiers of Command are preset.
- **Visible in RT**
  With this property you can define which Qualifiers of Command are displayed in the switching dialog during Runtime and can be modified during the switching operations.

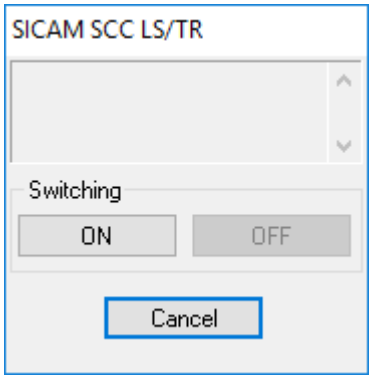
14.2.7 Runtime Dialogs of Circuit Breakers and Disconnectors

Dialogs are available for performing switching operations, for status display, to acknowledge blinking and for synchronization.

To call up these dialogs during runtime, click the related graphic object.

2-step switching operation

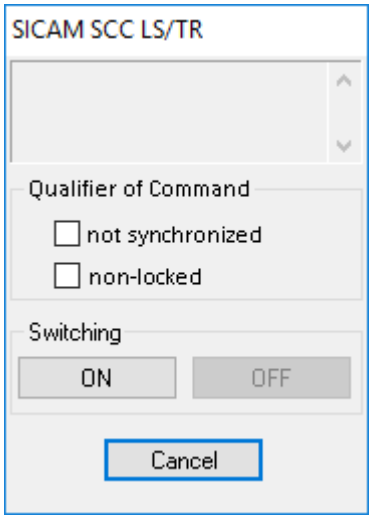
Click the graphic object to open the dialog for a switching operation.



[pascc501, 1, en_US]

Figure 14-19 Switching dialog without Qualifier of Command

The dialog below must be used for switching operations with SICAM RTUs and IEC 61850 devices and for control via the SICAM IEC COMMUNICATION SUITE.



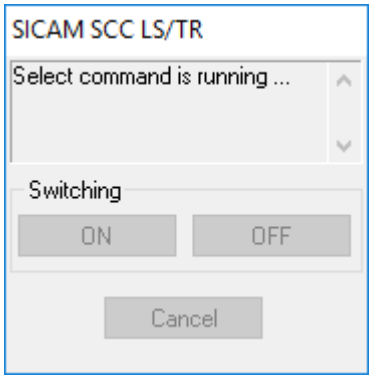
[pascc501_1703, 1, en_US]

Figure 14-20 Switching dialog without Qualifier of Command

This dialog has been complemented by 2 Qualifier of Command (QoC) setting options. Controls (switching device objects) which already support this Qualifier of Command are available in the SICAM graphic objects library, e.g. IEC 445 LS with QoC.

You can define the parameters of the **Select before operate** function via the properties of the control in the Graphics Designer, see *14.2.4 Advanced Properties of the Circuit Breaker and Disconnector*.

If bay devices are connected based on the IEC 61850 protocol, the Select command is transmitted when the user clicks the **ON** or **OFF** button. Otherwise, the confirmation dialog opens directly (see *Figure 14-22*). The **ON** and **OFF** buttons are disabled until a confirmation has been received.



[pascc505, 1, en_US]

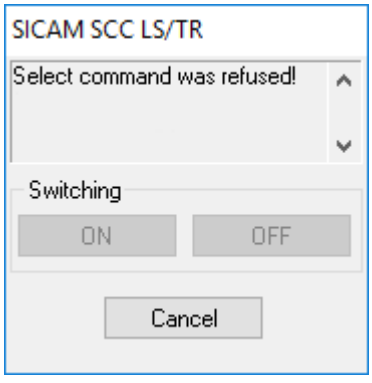
Figure 14-21 Switching dialog, Select command is running

The select command can receive a positive or negative acknowledgment. Depending on the acknowledgment, one of the following dialogs opens.

[pascc506, 1, en_US]

Figure 14-22 Switching dialog, selection is active

The check resulted in a positive acknowledgment. The actual switching command can be issued by clicking the Confirm button.



[pascc507, 1, en_US]

Figure 14-23 Switching dialog, the selection was rejected

The actual switching command cannot be issued. The switching operation must be aborted.

Synchronization functions

Based on the communication protocols IEC 61850 and SINAUT LSA ILSA, different functions for synchronized switching can be performed by means of dialog extensions. The execution of the switching operation during runtime depends on the individual protocol. For this reason, a distinction is made between these protocols in the following sub-sections.

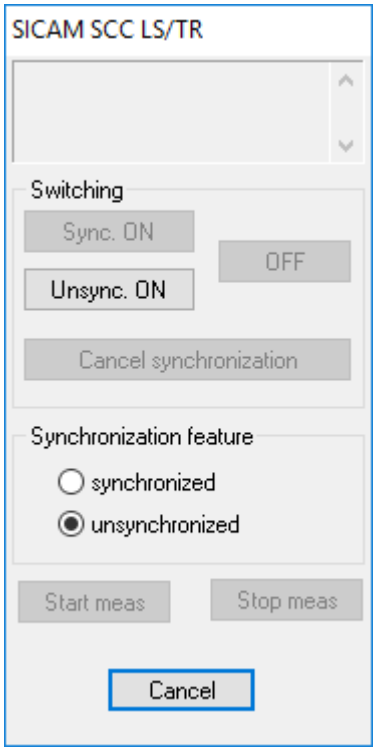
Synchronized switching is supported by further communication protocols (e.g. IEC 60870-5-101 Master). In this context, however, the dialog extensions are not used. For more detailed information, refer to the protocol descriptions.

The extended synchronization dialog is only shown if a communication protocol (not the option **-nothing-**) was selected from the drop-down list box **Synchronization Model** in the **SICAM SCC CB/DIS properties** dialog.

Synchronization functions with IEC 61850

This section describes the execution of a synchronized switching operation based on the IEC 61850 communication protocol.

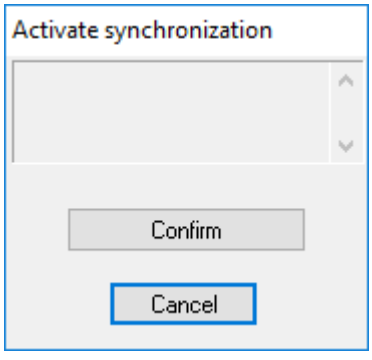
Click the graphic object to open the dialog for a synchronized switching operation.



[pascc508, 1, en_US]

Figure 14-24 Switching dialog for synchronized switching, synchronization function disabled

For synchronized switching, the Sync effective option must be selected. This selection opens the confirmation dialog.

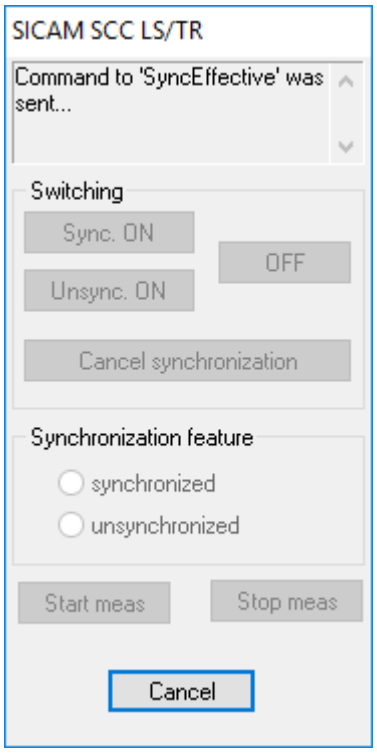


[pascc509, 1, en_US]

Figure 14-25 Dialog for Confirmation

Click **Confirm** to send a single command with the value OFF to the tag name command **Sync not effective**.

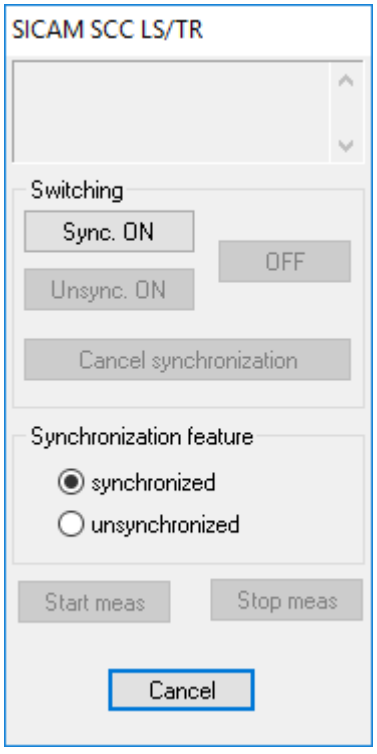
At the same time, all buttons are deactivated until a command feedback is received.



[pascc510, 1, en_US]

Figure 14-26 Switching dialog for synchronized switching, synchronization function deactivated

As soon as a message has arrived via the tag name information **Sync not effective**, the **Sync ON** button is active and can be clicked.



[pascc511, 1, en_US]

Figure 14-27 Switching dialog for synchronized switching, Sync ON button activated

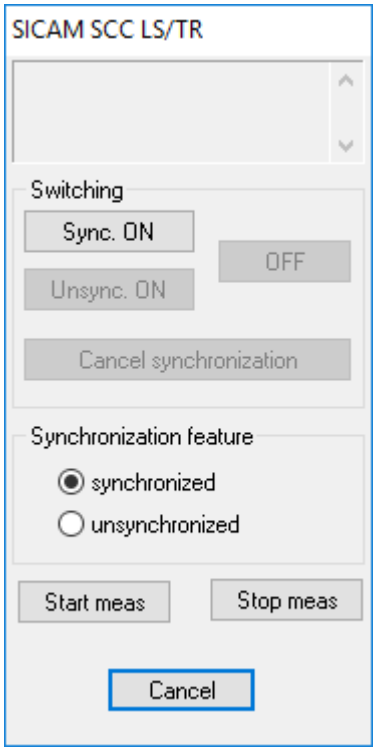
Clicking the **Sync ON** button now initiates synchronized switching. The switching command is issued as usual:

- ✧ Click **Sync ON**.
  The control blinks in the setpoint status and the confirmation dialog opens.
- ✧ Click **Confirm**.
  The command is output.

This dialog remains open until the synchronized switching operation has been completed or aborted.

Synchronization functions with SINAUT LSA ILSA

This section describes the execution of a synchronized switching operation based on the SINAUT LSA ILSA communication protocol.
Click the graphic object to open the dialog for a synchronized switching operation.



[pascc508a, 1, en_US]

Figure 14-28 Switching dialog for synchronized switching, synchronization function disabled

The **Unsynchronized** option deactivates the **Sync ON** button. Synchronized switching is not possible.

The **Synchronized** option activates the **Sync ON** button.

Clicking the **Sync ON** button now initiates synchronized switching. The switching command is issued as usual:

- ✧ Click **Sync ON** button.
  The control blinks in the setpoint status and the confirmation dialog opens.
- ✧ Click **Confirm**.
  The command is output.

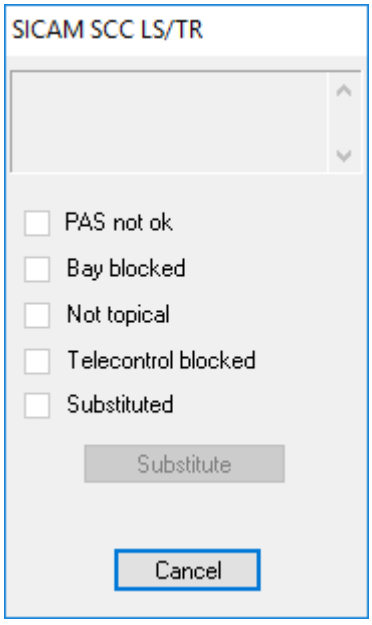
This dialog remains open until the synchronized switching operation has been completed or aborted.

If a command with synchronization has been transmitted, the synchronization can be aborted by clicking on **Cancel synchronization**. Afterwards, the control sends a cancel command to the tag name command.

Click **Start Meas** to issue a measurement trigger to the synchronization unit. The measured values are updated without performing a switching operation.

Status

The status dialog can be opened by clicking with the right mouse button, provided that the status display has been activated in the Properties dialog.

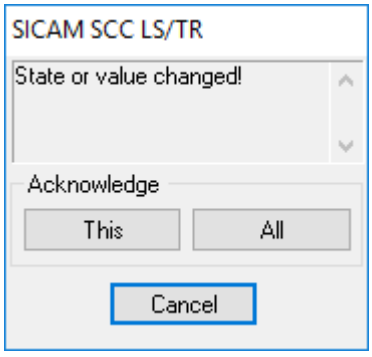


[pascc503, 1, en_US]
Figure 14-29 Status dialog

The status is indicated by a tick in the corresponding checkbox. Click **Substitute** to open the dialog for manually updating a switch position (see *14.2.8 Substituting the Switch Position*).

Acknowledge blinking

Click a blinking graphic object to open the **Acknowledging blinking** dialog.

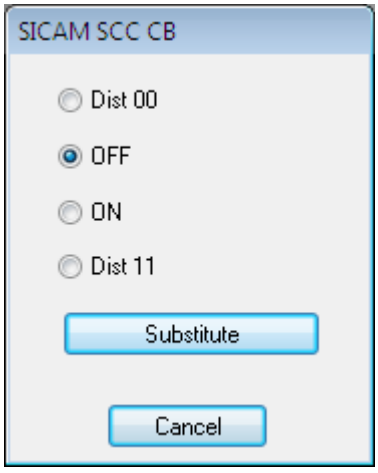


[pascc504, 1, en_US]
Figure 14-30 Acknowledge Blinking

Click This to acknowledge a status change or a spontaneous alarm for this switch.

Click **All** to use the **Tag Acknowledge Blinking** (under Properties) for acknowledging. All IndustrialX controls linked to this tag are acknowledged.

14.2.8 Substituting the Switch Position



[pascc503a, 1, en_US]

Figure 14-31 Substituting the Switch Position

In this dialog, you defined how to substitute the switch position. Click **Substitute** to open the Confirm dialog. Click the **Confirm** button to execute the substitution.

NOTE

New structure elements are required for the substitution. To continue to use projects from SICAM PAS CC Version 5.x, these projects must be converted first (see *10 Different SICAM PAS Versions*).

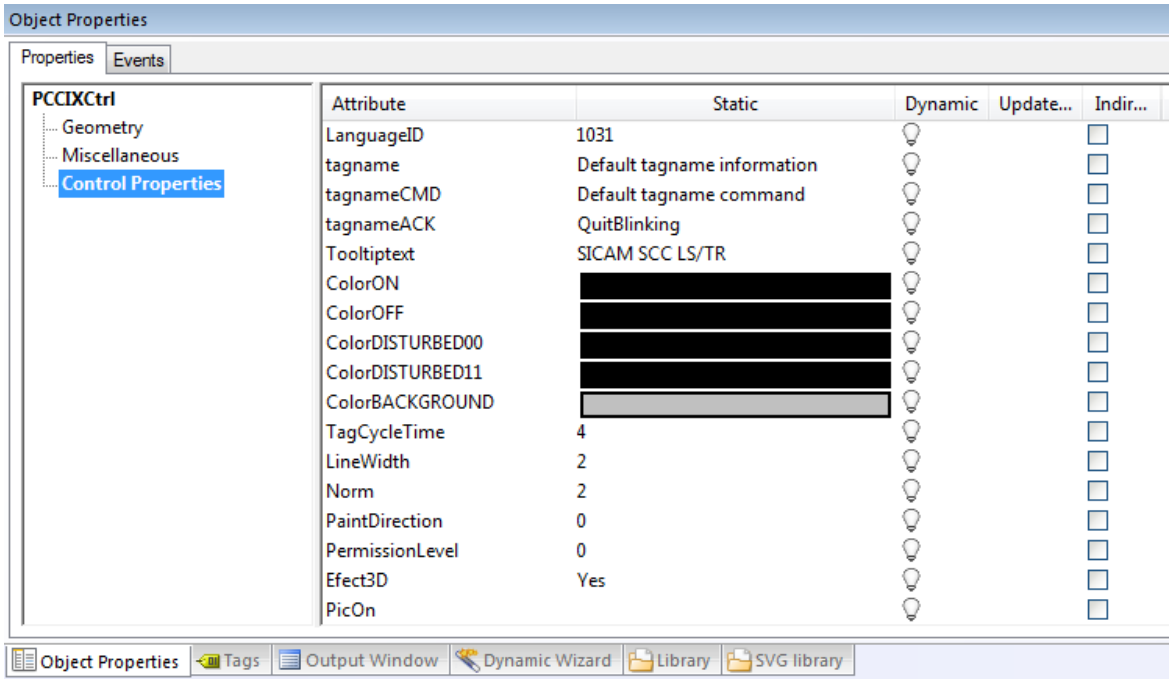
14.2.9 Defining Object Properties

The **Object properties** dialog comprises the **Properties** and the **Events** tabs. The following section describes certain parameters from these tabs.

Proceed as follows to open the **Object properties** dialog:

- ✧ Right-click the graphic object.
- ✧ Select **Properties** in the context menu.
  The **Object properties** dialog opens.

Properties tab



[pascc512, 1, en_US]

Figure 14-32 Object properties, Properties tab

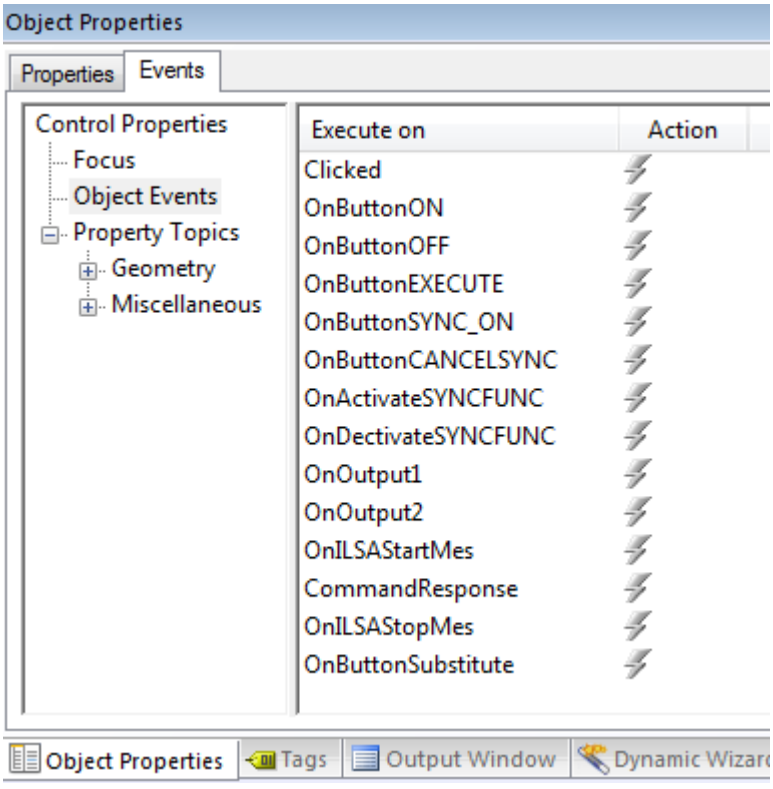
The following table provides a list of certain important object properties of the circuit breakers/disconnectors.

Table 14-5 Object properties

Object properties	Meaning
PermissionLevel	Assigns a permission level for the IndustrialX Control. Click the control to compare this value with the permission level in SIMATIC WinCC and to disable or enable operator actions.
EnableSwitching	This property generally enables or disables switching. Example of use: Enabling user-defined switching between several workstations.
LabelButton...	All properties whose name starts with Label... serve for the labeling of individual buttons.
UserStringID	This property can be used to display a text which the user has freely defined from a selection of default texts. The texts must be saved in the text files for language setting. The value of UserStringID corresponds to the number of the text in the text file. If the UserStringID has the value zero, no additional text is displayed.
Timeout	This property defines the time in seconds after which the command execution is aborted by SICAM PAS if no feedback is returned from the process. This value can also be modified in the **Advanced** tab.
InputValue1 InputValue2	Input points for topological coloring.
TOPOColorINVALID	This value defines the default color for lines in the INVALID state. It is forwarded to the related connectors if the graphic object is in the INVALIFD state. Input points for topological coloring.
TOPOColorOFF	Default value for defining the color in case of topological coloring. This value is transferred to the corresponding connectors if the graphic object is in the OFF status.

Object properties	Meaning
EnableBlinkingOnNeg Confirm	If a switching command receives a negative acknowledgment (i.e. CO- is returned), the switching device object switches from command blinking to fast blinking in order to indicate that an abnormal event has occurred. The default value is **Yes**. The switching device object does not blink fast if this parameter has been set to **No**. The switching device object changes to the actual position after a negative acknowledgment; command blinking is terminated.

Events tab



[pascc513, 1, en_US]

Figure 14-33 Object properties, Events tab

The IndustrialX Control triggers the events listed in the table.

The name of the tag name command and the name of the tag name information are assigned to the **OnButton...** events in the parameter list.

These events are used for a switch with C script (see *14.2.10 Circuit Breaker/Disconnector with C Script*).

Table 14-6 Object Events

Object Event	Meaning
Clicked	This event is triggered by clicking on the IndustrialX Control.
OnButtonON	This event is triggered by clicking the **ON** button in the switching dialog.
OnButtonOFF	This event is triggered by clicking the **OFF** button in the switching dialog.
OnButtonEXECUTE	This event is triggered by clicking on **Confirm** in the switching dialog.
OnButtonSYNC_ON	This event is triggered by clicking the **Sync ON** button for synchronous switching in the switching dialog.
OnButtonCANCELSYNC	This event is triggered by clicking the **Cancel Synchronization** button in the switching dialog for synchronous switching.

Object Event	Meaning
OnActivateSYNCFUNC	This event is triggered by activating the **Sync Effective** option under **Synchronization Feature** in the switching dialog for synchronous switching.
OnDeactivateSYNCFUNC	This event is triggered by activating the **Sync Not Effective** option under **Synchronization Feature** in the switching dialog for synchronous switching.
OnOutput1 OnOutput2	This event is triggered if a value change has occurred on **InputValue1** or **InputValue2** in the **ON** position.
OnILSAStartMes	This event is triggered by clicking the **Start Meas** button in the switching dialog for synchronous switching.

14.2.10 Circuit Breaker/Disconnector with C Script

The default circuit breakers/disconnectors feature a predefined command output mechanism for issuing pulse switching commands. The pulse duration cannot be defined.

CB/DIS with C script

The graphic objects **CB/DIS with C Script** and **CB/DIS with CScript, SBO and QoC** are available in addition to these circuit breakers/disconnectors. The integrated command output mechanism of these objects is disabled and emulated by means of C scripts. These C scripts can be customized to meet specific requirements.

The graphic object **CB/DIS with C Script** is provided for use with SICAM PAS connection, the graphic object **CB/DIS with CScript, SBO and QoC** for use with direct connection to SICAM RTU and IEC61850 devices.

For example, you can perform the following actions using the **CB/DIS with C Script** and **CB/DIS with CScript, SBO and QoC** graphic objects:

- link the command execution to a condition
- check for an interlock prior to command execution
- check the switching authority conditions prior to command execution

Example

The example below illustrates a C script for a command execution subject to a condition.

To customize the predefined C script:

✧ Open the **object properties** of the **CB/DIS graphic object with C script**.
✧ In the **Events** tab, click **Object Events**.
✧ In the **OnButtonON** row, right-click the flash icon. Select **C Action** from the context menu.
The C script is displayed.

```
#include "apdefap.h"
void OnButtonON(char* lpszPictureName, char* lpszObjectName , char* tagCommand, char* tagInformation)
{
// WINCC:TAGNAME_SECTION_START
// syntax: #define TagNameInAction "DMTagName"
// next TagID : 1
// WINCC:TAGNAME_SECTION_END
// WINCC:PICNAME_SECTION_START
// syntax: #define PicNameInAction "PictureName"
// next PicID : 1
 // WINCC:PICNAME_SECTION_END

long PCC_CMD_VALUE_ON     =  2;
long PCC_CMD_VALUETYPE_IMPULSBEFEHL = 14;
long PCC_CMD_CAUSE_BF     = 19;
long STRING_LENGTH        =  128;

char    *         tagname;
extern BOOL g_debug;

BOOL bEnableCommandExecution = FALSE;

bEnableCommandExecution  = GetTagBit ( "MyEnableCommandExecutionTag" );

if ( bEnableCommandExecution  == TRUE )
  {
        // Allocate char-memory :
        tagname = malloc (STRING_LENGTH);

        //Write command_value
        memset (tagname, 0, STRING_LENGTH);
        strcpy(tagname, tagCommand);
        strcat (tagname, ".Value");
        SetTagDWord(tagname, PCC_CMD_VALUE_ON);        //Return-Type :BOOL

        // Write command_valuetype
        memset (tagname, 0, STRING_LENGTH);
        strcpy(tagname, tagCommand);
        strcat (tagname, ".Valuetype");
        SetTagDWord(tagname, PCC_CMD_VALUETYPE_IMPULSBEFEHL);   //Return-Type :BOOL

        // Write command_cause
        memset (tagname, 0, STRING_LENGTH);
        strcpy(tagname, tagCommand);
        strcat (tagname, ".Cause");
        SetTagDWord(tagname, PCC_CMD_CAUSE_BF);        //Return-Type :BOOL

        free (tagname);
        if (g_debug == TRUE) MessageBox ( NULL, "OnButtonOn clicked", "PASCC IX Schaltobjekt", MB_OK | MB_SYSTEMMODAL );
  }
else
  {
        // do nothing
  }
}
```

[pascc514, 1, --_--]

Figure 14-34 C script OnButtonON, graphic object CB/DIS with Script

- ✧ Insert the selected rows into the C script.
  The **MyEnableCommandExecutionTag** WinCC tag must include the condition for command execution.
- ✧ Close the C script.

14.2.11 Indirect Addressing

The description in this section applies for IndustrialX Controls (Circuit Breakers/Disconnectors and Bay Overview) in SICAM PAS CC V5.0 and SICAM SCC V7.01.

Indirect addressing

Indirect addressing can be used with the attributes **tagname**, **tagnameCMD**, **tagnameACK**, **tagnameSync**, and **tagnameSyncCmd**.

The term "indirect addressing" signifies that the name of the SICAM tag is transferred in a string tag.

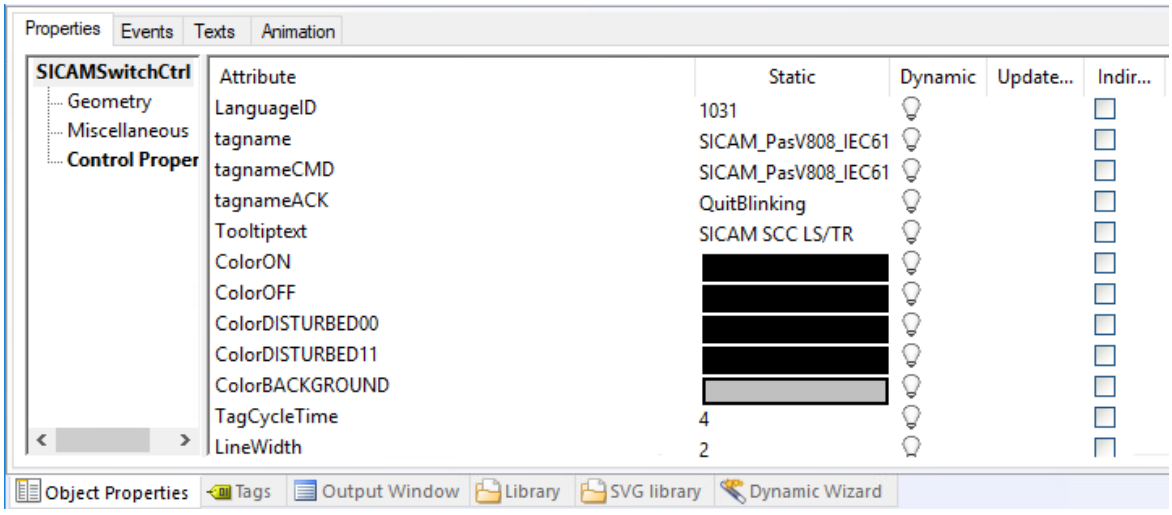
In the WinCC Object properties dialog, connect an internal string tag (e.g. TagnamePlaceholder) which contains the name of the process tag during runtime and insert a **&** character as prefix of the tag name (e.g. &TagnamePlaceholder). The control (switching device object) then interprets the tag as a string tag for indirect addressing. During runtime, the string tag must contain the name of the process tag without extension (e.g. .Value).

Parameters for indirect addressing can be defined in the following dialogs:

- **Object properties**
- **SICAM SCC CB/DIS properties**

To specify indirect addressing in the **Object properties** dialog:

✧ Enter the name of the string tag in the **Static** column.



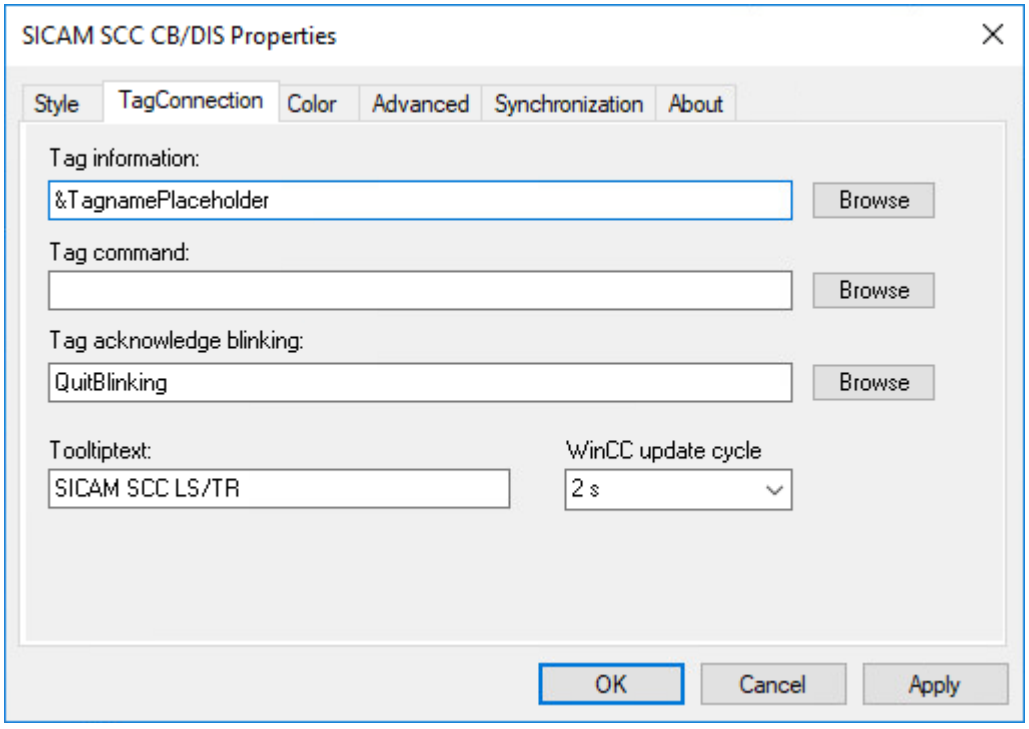
[pascc516, 1, en_US]

Figure 14-35 Object properties, defining indirect addressing

Indirect addressing is also possible when using a server or tag prefix. The prefixes cannot be suppressed in case of indirect addressing, see *14.2.12 Addressing Using Tag and Server Prefixes*. For more detailed information, refer to the **WinCC Information System**, **Using Tag and Server Prefixes** section.

To define indirect addressing in the **SICAM SCC CB/DIS properties** dialog:

✧ Enter the names of the string tags in the entry fields for the tag names in the **Tag connection** tab.



[pascc517, 1, en_US]

Figure 14-36 Properties of SICAM SCC CB/DIS, defining indirect addressing

NOTE

In the **SICAM SCC CB/DIS properties** dialog, the **Browse** button cannot be used because string tags are filtered in the selection dialog that opens.

The indirect addressing is evaluated upon the start of the IndustrialX Control. The string tag must therefore include the name of the SICAM tag before the WinCC diagram is opened.

14.2.12 Addressing Using Tag and Server Prefixes

SIMATIC WinCC provides various options for the definition and structuring of tags. For a diagram window, you can assign a **tag prefix** which is placed in front of all tags used in the corresponding diagram.

In a multi-user system, integrated diagrams can be stored on any server. The server is indicated either directly when integrating a diagram using the **server prefix** or assigned later via the object properties of the diagram window. Using the server prefix, tags can also be requested from other servers.

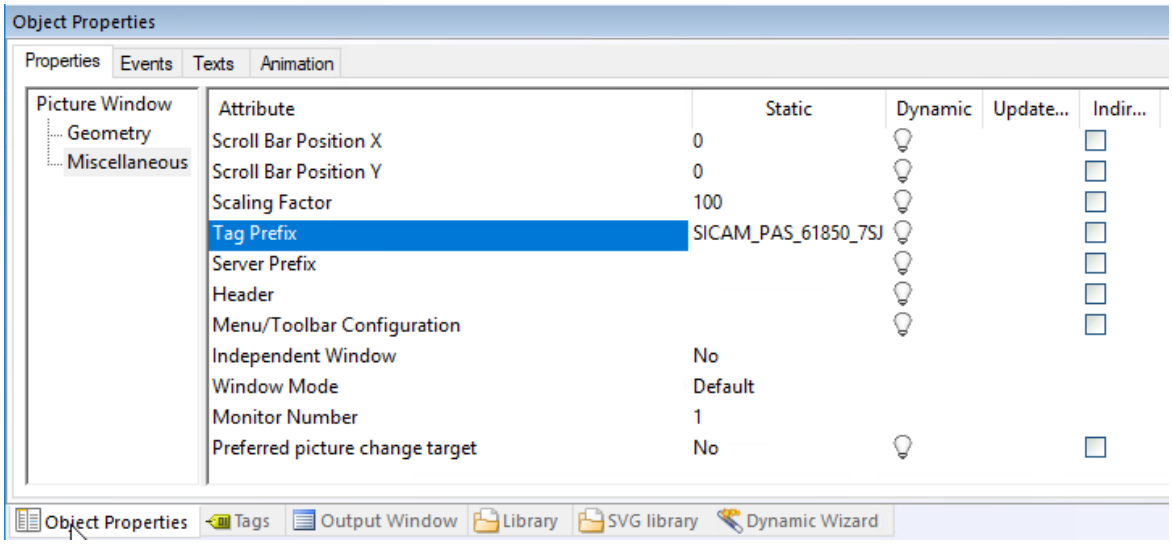
Addressing using a tag prefix in a diagram window

Using the **Tag prefix** attribute, you can define the character string which is placed in front of all tags included in the diagram window object.

The tag prefix only applies to tags of the diagram window object; it does not apply to identical tags in the higher-level window which includes the diagram window.

To define the parameters of the tag prefix:

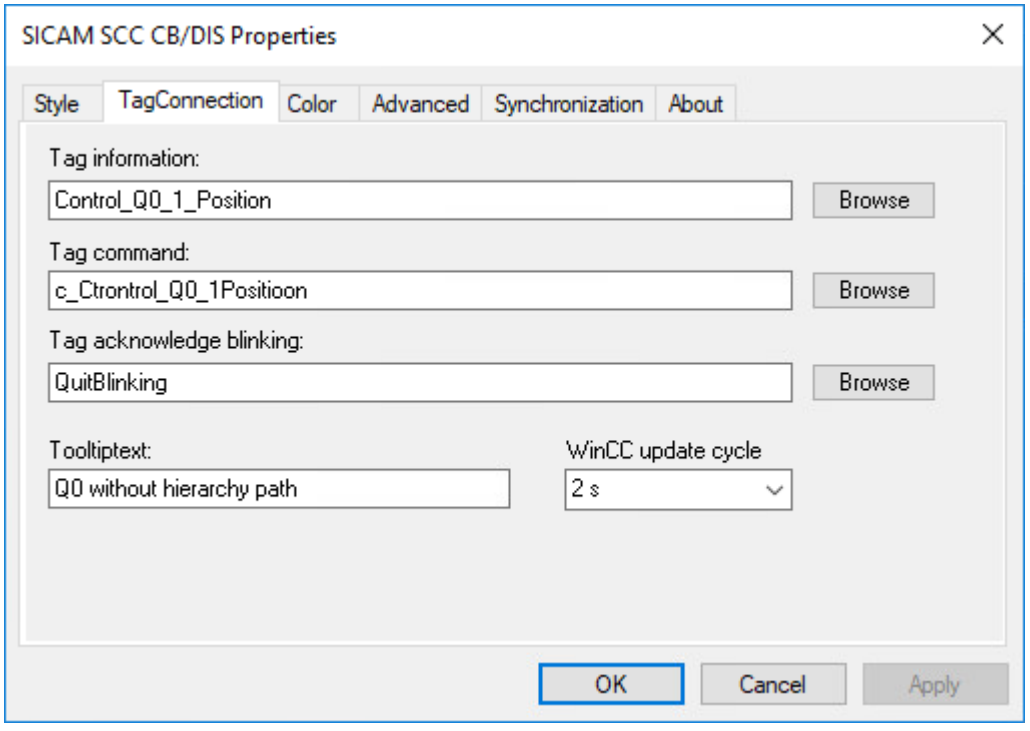
- ✧ Open the diagram window object properties.
- ✧ For the **Tag prefix** attribute, enter the prefix text.



[tagprefix_1, 1, en_US]

Figure 14-37 Defining tag prefix parameters in the diagram window

The properties of the Control, e.g. a circuit breaker, are defined as follows:



[tagprefix_2, 1, en_US]

Figure 14-38 Defining Control property parameters

Sample parameterization:

- Tag prefix of the diagram window: **SICAM_PAS_61850_7SJ63_**
- Tag name – monitoring direction of the Control: Control_Q0**_1_Position**

Result:

In the diagram window, the control requests the **Control_Q0_1_Position** tag.

If the diagram window is assigned the **SICAM_PAS_61850_7SJ63_** tag prefix, the **SICAM_PAS_61850_7SJ63_Control_Q0_1_Position** tag is requested.

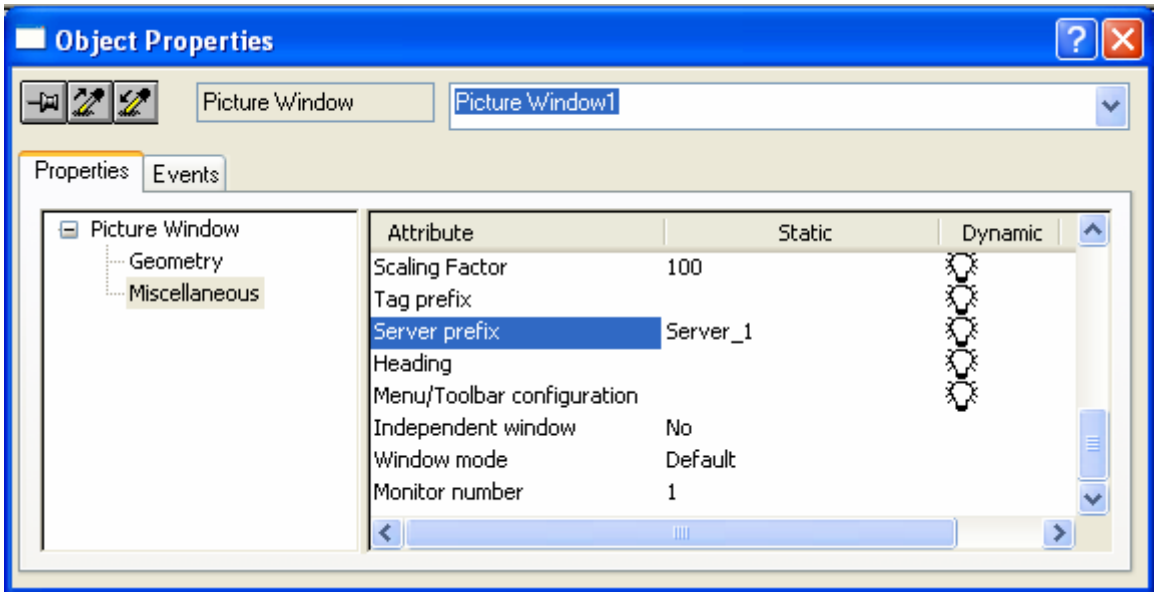
Addressing using a server prefix in a diagram window

Using the **Server prefix** attribute, you define in a multi-user system on which server the diagram to be represented in the diagram window is stored.

To define the server prefix parameters:

✧ Open the diagram window object properties.

✧ Enter the prefix text for the **Server prefix** attribute.



[serverprefix, 1, en_US]

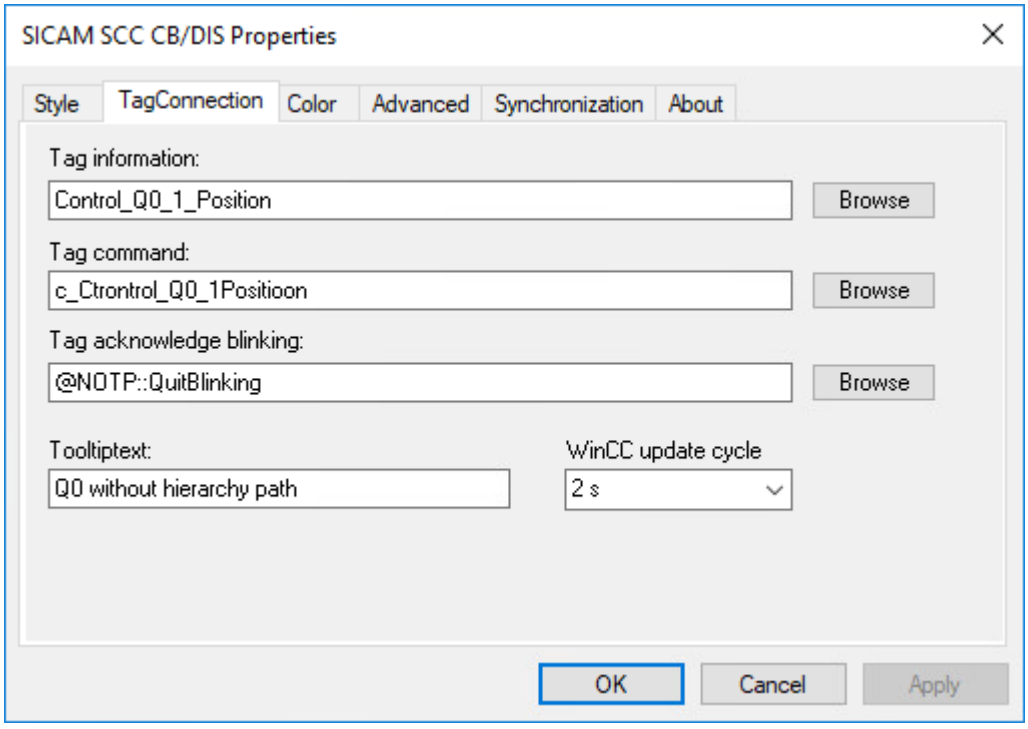
Figure 14-39 Defining the server prefix in the diagram window

Requesting tags without a prefix

The example below shows how to suppress a tag prefix.

You want to use the **QuitBlinking** tag without a prefix. In a multi-user system or for use in diagram windows, the server prefix or the tag prefix is always placed in front of the tag name. To use the **QuitBlinking** tag without a prefix, you can disable the prefix using the following tag addenda.

- **@NOTP::** disables the tag prefix
- **@NOSP::** disables the server prefix
- **@NOP::** disables both the server prefix and the tag prefix



[tagprefix_3, 1, en_US]

Figure 14-40 Suppressing the tag prefix for the acknowledge tag

For more detailed information, refer to the **WinCC Information System**, **Using Tag and Server Prefixes** section.

14.2.13 Operation via Keyboard

The **Circuit Breaker/Disconnector** graphic objects can be operated via the mouse or using the **keyboard**.

To initiate a switching operation using the keyboard, **buttons** must be inserted into the display, and a **hotkey** must be configured for each button.

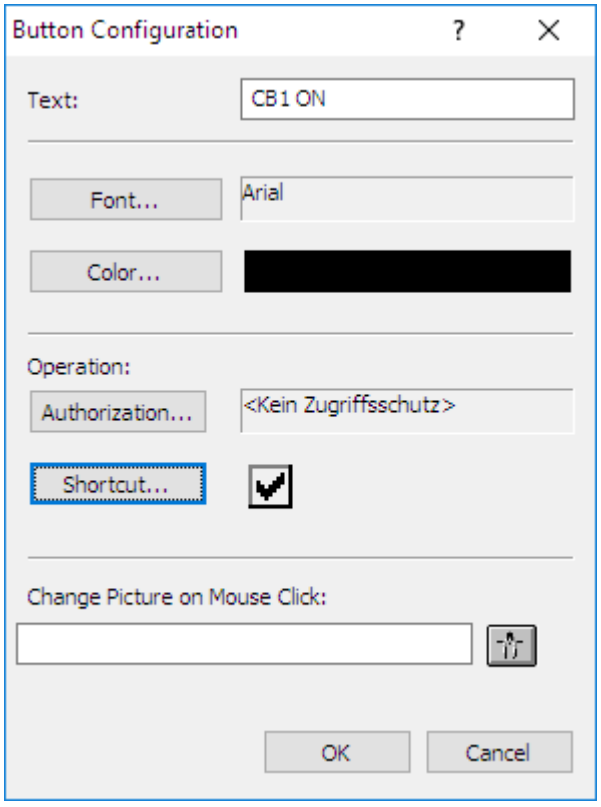
The switching operation is initiated by pressing the configured key or key combination during runtime. Additionally, a user right can be assigned for the operation of the button.

The **runtime dialogs** of switching device objects are not displayed for operation via keyboard/buttons.

An **ordinary PC keyboard** or a **special function keyboard** can be used. To use a function keyboard, the PC keyboard must be removed from the computer and the function keyboard must be plugged in instead.

Configuring a button

A specific button for each action must be inserted into the diagram (**Object palette > Windows object**). The **Button Configuration** dialog opens as soon as the button has been inserted.



[pascc440, 1, en_US]

Figure 14-41 Configuring a Button

- ✧ Enter the button text into the Text entry field.
- ✧ Next, click **Hotkey...** to define a hotkey for the button.
- ✧ Click **OK** to close the dialog.

For more detailed information regarding the configuration of a button, refer to the WinCC Information System.

Defining a C script

In order to be able to initiate an action via a button for **Circuit breaker/disconnector**, a C script has to be defined. When clicking on the button, the C script sets the attribute CommandID of the control (switching device object) to the defined value.

The following table provides a list of all permissible integer values and their meaning.

Table 14-7 CommandID attribute

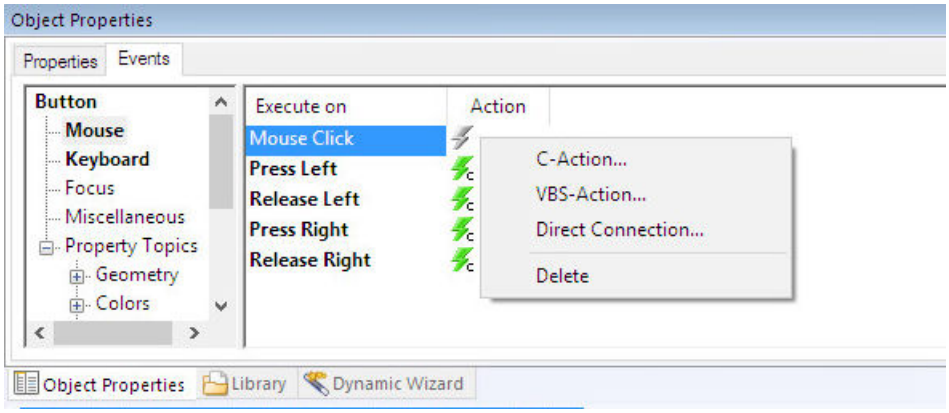
Value	Constant	Action of the Control (Switching Device Object)
0	COMMANDID_NOTHING	No action
1	COMMANDID_CANCEL	Cancel action
2	COMMANDID_SELECT_ON	Preselect switch position ON
3	COMMANDID_SELECT_OFF	Preselect switch position OFF
4	COMMANDID_EXECUTE	Enable switching operation
5	COMMANDID_SINGLEACK	Acknowledge blinking for the selected switch
6	COMMANDID_MULTIACK	Acknowledge blinking for a group (see *14.2.2 Tag Connection of the Circuit Breakers and Disconnectors*)

NOTE

Since the **Command control for synchronized/unsynchronized switching** is very complex, controlling via buttons/keyboard is not supported.

The following example illustrates how the select command for **ON** can be initiated for the control **CB1**.

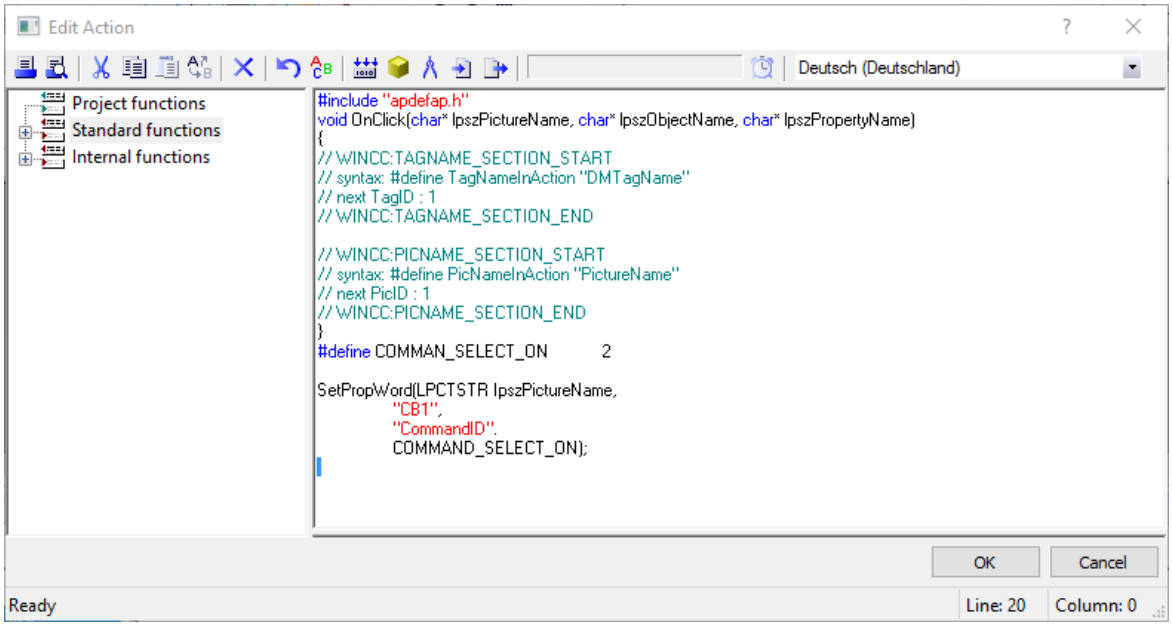
- ✧ Open the **Object properties** of the button.
- ✧ In the **Properties** tag, select **Font**.
- ✧ Next, enter **CB1 ON** for the **Text** attribute.
- ✧ Select **Mouse** in the **Event** tab.



[pascc441, 1, en_US]

Figure 14-42 Opening the editor

- ✧ Right-click **Mouse Action** in the **Action** column.
- ✧ Select **C Action** from the context menu.
  The editor opens.

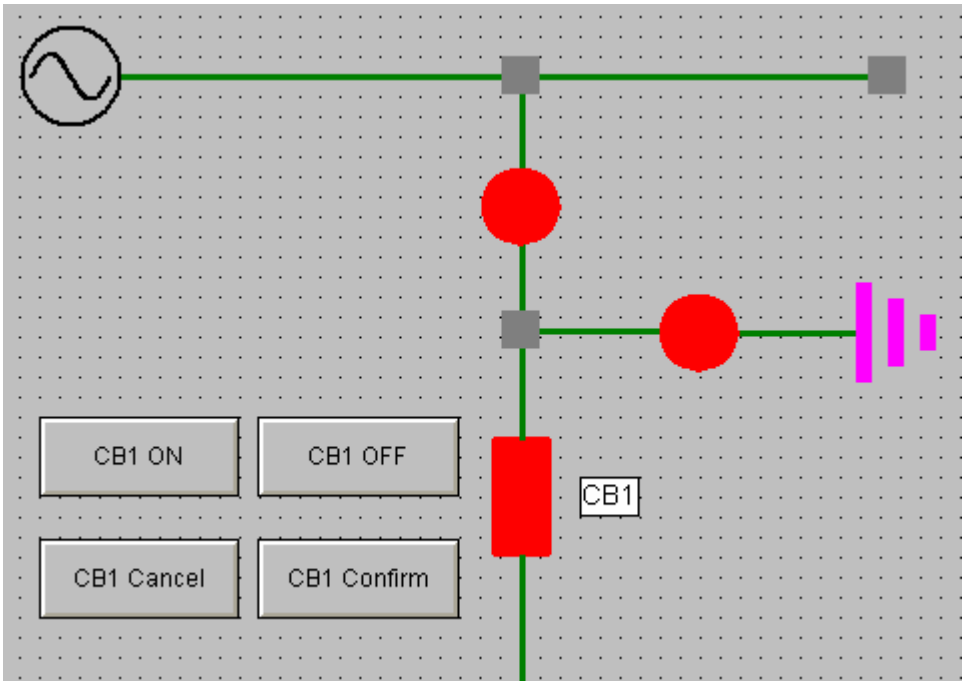


[pascc442, 1, en_US]

Figure 14-43 Edit C action

- ✧ Edit the C script.
- ✧ Compile the C script and click **OK** to close the editor.

You can now add further buttons for **deactivating**, **confirming**, and **canceling** the switching operation and configure these buttons accordingly. In this case, the diagram looks as shown below.



[pascc443, 1, en_US]

Figure 14-44 Diagram with buttons for a switching operation

Switching operation during runtime

During runtime, a switching operation (OFF > ON) would be executed as follows:

- The switch is in **OFF** state. Click **CB1 ON**.
- The control (switching device object) starts blinking in setpoint state.
- Click **CB1 Confirm**. The switching command is executed.
- The control (switching device object) switches to the **ON** state. The switching operation is completed.

Feedback messages regarding the switching operation are shown in the **event list**.

14.2.14 Controlling Runtime Dialogs for Controls (Switching Device Objects)

Runtime dialogs can be shown individually using an additional function. Depending on specific conditions, a runtime dialog can be shown or hidden. Some additional dialogs, e.g. for user authentication, can pop up between the selection of the switch and the execution of the command.

The runtime dialog can open due to a value change of the **CommandID** attribute (in the object properties of the control/switching device object). The attribute value can be modified by means of a C script.

The following table shows a list of required values.

Table 14-8 CommandID Attribute, Additional Values

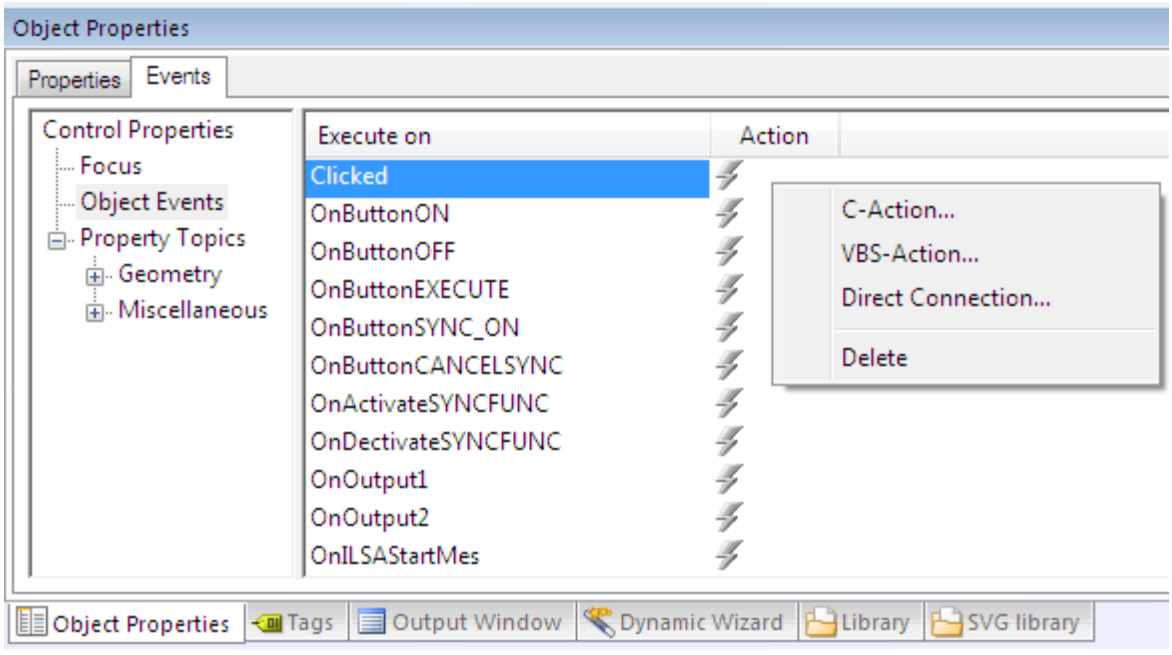
Value	Constant	Action of the Control (Switching Device Object)
20	COMMANDID_SHOWSWITCHINGDIALOG	Show the switching dialog
21	COMMANDID_SHOWSTATEDIALOG	Show the status dialog

Configuring the sequence

✧ Deselect the **Use Integrated Dialog Boxes** option in the properties of the control (switching device object).

This avoids the runtime dialog being displayed automatically.

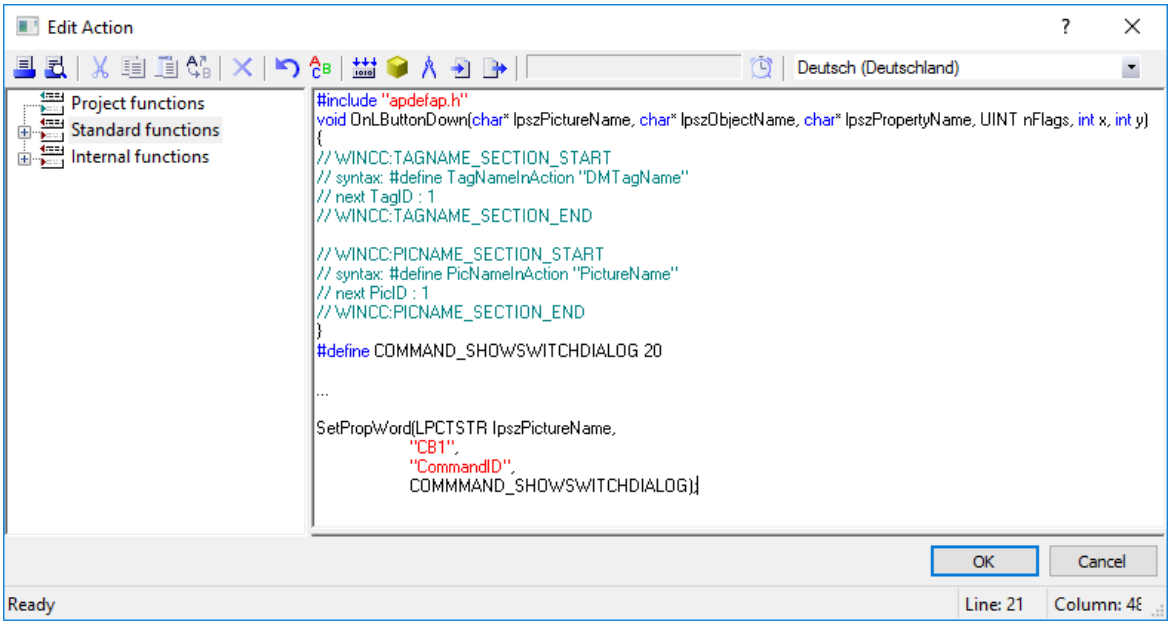
✧ Open the **Object properties** of the control (switching device object).
✧ Select the **Object events** entry in the **Events** tab.
✧ Right-click **Clicked** in the **Action** column.



[pascc450, 1, en_US]

Figure 14-45 Opening the Editor

✧ Select **C Action** from the context menu.
The editor opens.



[pascc451, 1, en_US]

Figure 14-46 Editing the C Script

The **Clicked** function has the **wmbutton** parameter assigned. Via this parameter, you can check which mouse button has been clicked.

Table 14-9 wmbutton parameter

Value	Constant	Meaning
0x0201	WM_LBUTTONDOWN	the left mouse button was clicked
0x0204	WM_RBUTTONDOWN	the right mouse button was clicked

✧ Edit the C script.
Add the **SetPropWord()** function, your test functions and all applicable conditions.
✧ Save and compile the script.

Sequence during runtime

The following sequence applies during runtime:

- Click the control (switching device object).
- The runtime dialog opens. The **Clicked** event is triggered. The C script is executed.
- The functions defined in the C script are processed. Depending on the relevant conditions, the **CommandID** attribute is set in the properties of the control (switching device object).
- The switching dialog is shown if the **CommandID** attribute includes the value 20.

14.2.15 Response to the Change of the CommandID Attribute

As soon as a control (switching device object) has processed the value change of the **CommandID** attribute, it transmits a **CommandResponse** event. The event includes three parameters which provide information about the processed action.

The **CommandResponse** function in the C script has the following structure:

```
void CommandResponse(char* lpszPictureName, char* lpszObjectName,
long CommandID,
long ResponseID,
char* msg)
{
...
}
```

lpszDisplayName and **lpszObjectName** are default parameters of WinCC and are not described in this section.

The **CommandID** parameter includes the value of the **CommandID** attribute which triggered the action. The value of the **ResponseID** parameter describes the result of the action. In case of error, the **msg** parameter includes an error description in text form.

The following table provides a list of the ResponseIDs and their meanings.

Table 14-10 ResponseID

Value	Constant	Action of the Control (Switching Device Object)
0	RESPONSEID_OK	The action could be executed without errors.
1	RESPONSEID_NOT_IMPLEMENTD	The action specified via the CommandID attribute has not been implemented.
2	RESPONSEID_NOT_SELECTED	The control (switching device object) has been enabled without preselecting the switch position (ON, OFF).
3	RESPONSEID_WRONG_MODE	The runtime dialog could not be displayed, as the control (switching device object) is in **Synchronized switching** mode
4	RESPONSEID_WRONG_STATE	The runtime dialog could not be displayed, as the control (switching device object) is in **Fast blinking** mode. The blinking must be acknowledged first.
5	RESPONSEID_NO_CMD_TAG	For the control (switching device object), no tag name has been selected in command direction.
6	RESPONSEID_SETISACTUAL_ VIOLATION	SET- ACTUAL violation For example, the user has tried to execute an OFF command although the ACTUAL position is OFF.
99	RESPONSEID_ANY_ERROR	Another error has occurred.

14.3 Bay Overview

This section describes the **Bay overview** SICAM graphic objects for SICAM SCC V7.02 or earlier. For SICAM SCC V8.00 or higher, they were replaced by SICAM graphic objects featuring more powerful functions. However, the old SICAM graphic objects can still be used. The new Bay Overview SICAM graphic object is described in *4.7 SICAM Bay Overview*.

The **Overview** folder in the SICAM graphic object library includes the Bay Overview user object. It is implemented as an IndustrialX Control and already contains typical functions.

You can use a bay overview to show the status of an entire bay by means of a single graphic object.

Graphical representation

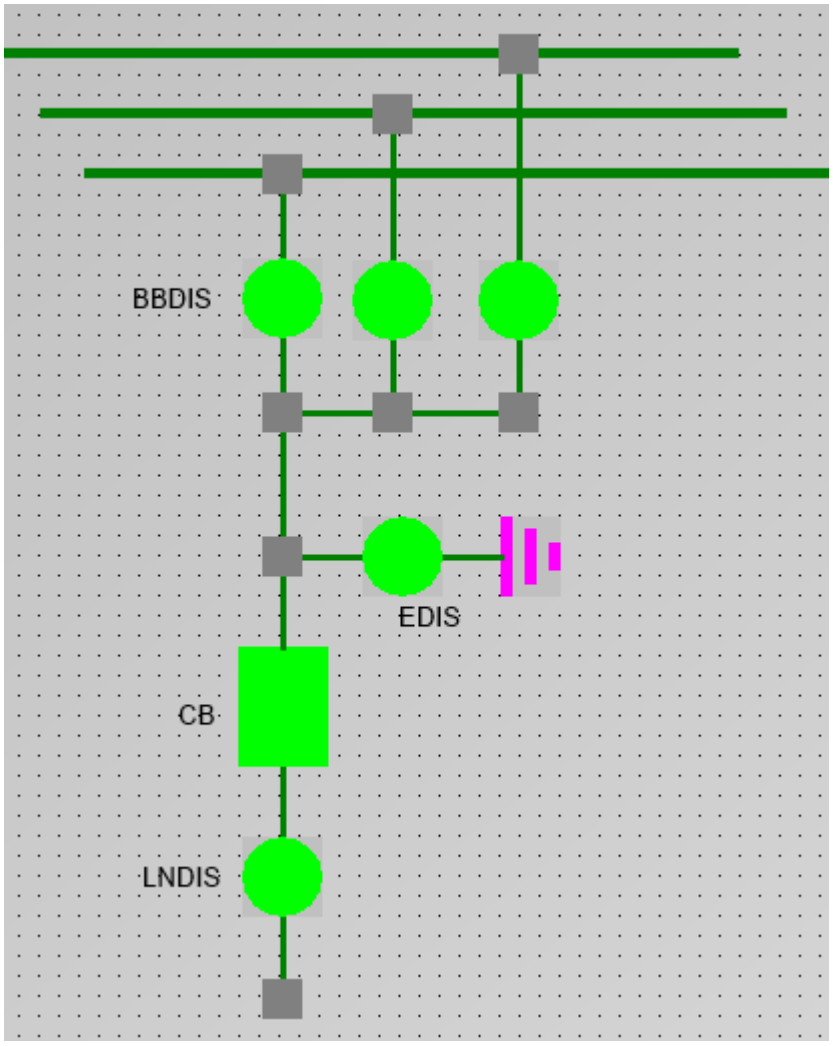
4 bay overview variants are available in the SICAM graphic object library:

Table 14-11 Graphical representation of the bay overview

Bay overview	View	Graphic
LSA rounded	LSA representation with circular symbol	
LSA boxed	LSA representation with rectangular symbol	
Sicam rounded	SICAM representation with circular symbol	
Sicam boxed	SICAM representation with rectangular symbol	

Maximum bay extension

A bay overview diagram can show one single bay with the following maximum extension:



[pascc515, 1, en_US]

Figure 14-47 Maximum bay extension shown in one bay overview

14.3.1 Properties of the Bay Overview

Each bay overview must be assigned several properties.

✧ Double-click the graphic object.
The **SICAM SCC BAY properties** dialog opens.

The properties are shown in the **General** tab.

Display

The following five options are available for the representation of a graphic object:

- SICAM boxed
- SICAM rounded
- LSA boxed
- LSA rounded
- Bitmap

In the Bitmap representation mode, individual diagrams can be shown depending on the value. The file formats **BMP**, **WMF**, **EMF**, **JPG**, and **GIF** are supported for diagrams.

Line width

The **line width** of the graphic objects (LSA only) can be selected in steps from 1 to 10. Step 1 represents the smallest line width.

WinCC update cycle

The **update cycle** of the tags can be set in time intervals from 250 milliseconds to one hour. Furthermore, the setting **For change** is possible. 2 seconds is the default setting.

Value

In the normal state, the color and the shape of the graphic object depend on its value. A specific color is set by default for each individual value. It is also possible to select the color from a color palette.

In the **SICAM** representation mode, only the color and not the shape is changed depending on the corresponding value.

The following colors are defined by default for the graphic object in the **SICAM** and in the **LSA** representation modes:

Table 14-12 SICAM and LSA representation modes

Value	Color	Meaning
ON	Red	The circuit breaker, the line disconnector and at least one busbar disconnector are switched on.
OFF	Green	The circuit breaker, the line disconnector or all busbar disconnectors are switched off.
Intermediate position	Yellow	At least one of the connected devices in the bay has a fault.
Grounded	Pink	The bay is grounded.

Status

The switch state is indicated by small, colored rectangles next to the graphic object. A specific color is set by default for each individual state. The color can also be freely selected from a color palette.

The following colors of the rectangles are set by default for the representation of the individual states:

Table 14-13 Status

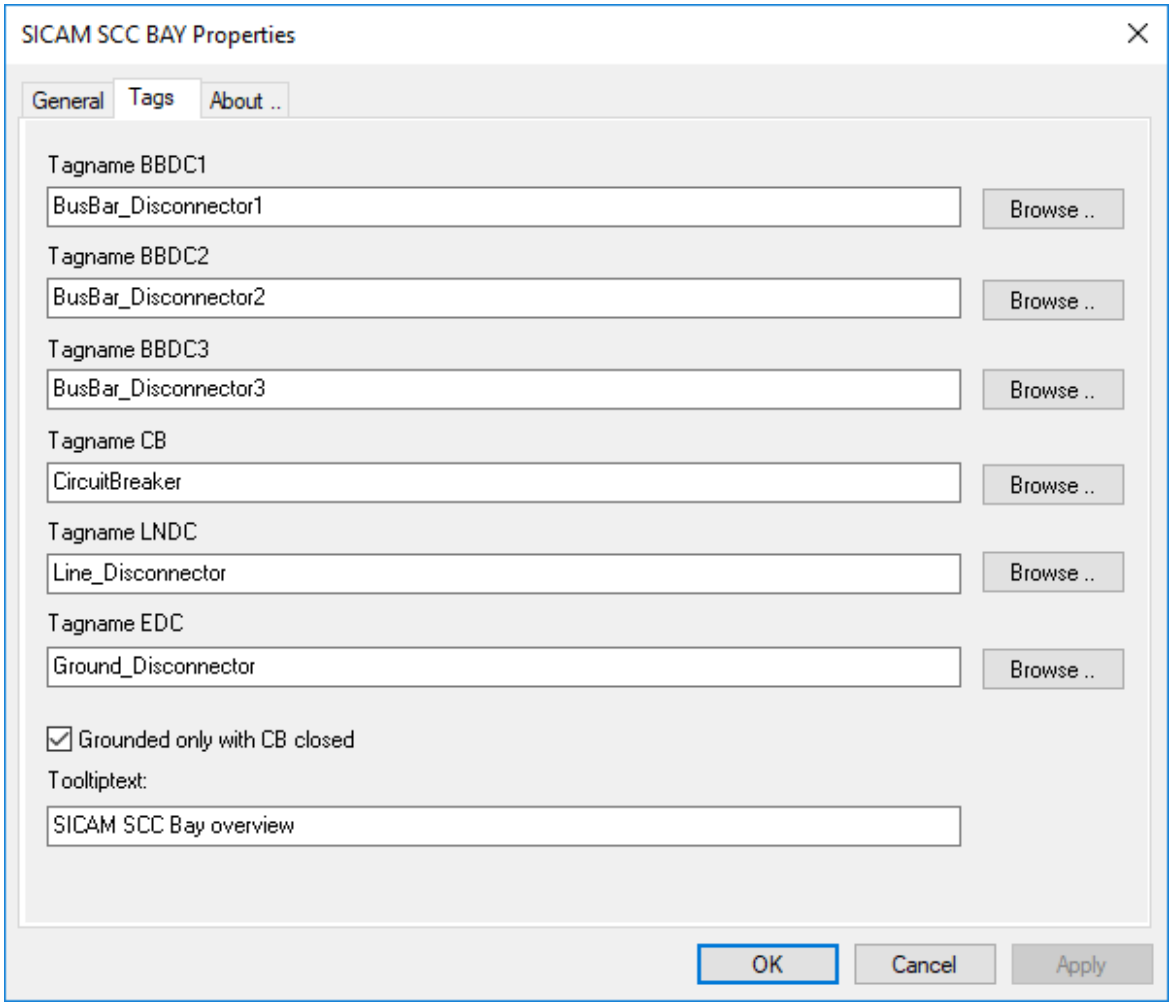
Status	Color	Meaning
Not topical	Cyan (turquoise)	At least one of the devices in the bay has the status **Not Topical**.
PAS not OK	Dark cyan (petrol)	The connection between SICAM SCC and SICAM PAS or SICAM RTU is disturbed.

The default background color is gray. It can also be freely selected.

14.3.2 Tag Connection to Bay Overview

The bay overview must be assigned tags.

✧ Double-click the graphic object.
The **SICAM PAS CC Bay Properties** dialog opens.
✧ Open the **Tags** tab.



[pascc324, 1, en_US]

Figure 14-48 Defining the Bay Overview

Tagname BBDC1

Assign a tag to **Busbar Disconnector 1**:

- ✧ Click the **Browse** button next to the edit field.
  The **Tags** dialog opens.
- ✧ Select the corresponding tag from the list and click **OK** to confirm.

Tagname BBDC2

Assign a tag to **Busbar Disconnector 2**:

- ✧ Click the **Browse** button next to the edit field.
  The **Tags** dialog opens.
- ✧ Select the corresponding tag from the list and click **OK** to confirm.

Tagname BBDC3

Assign a tag to **Busbar Disconnector 3**:

- ✧ Click the **Browse** button next to the edit field.
  The **Tags** dialog opens.
- ✧ Select the corresponding tag from the list and click **OK** to confirm.

Tagname CD

Assign a tag to the **circuit breaker**:

✧ Click the **Browse** button next to the edit field.
The **Tags** dialog opens.
✧ Select the corresponding tag from the list and click **OK** to confirm.

Tagname LNDC

Assign a tag to the **line disconnector**:

✧ Click the **Browse** button next to the edit field.
The **Tags** dialog opens.
✧ Select the corresponding tag from the list and click **OK** to confirm.

Tagname EDC

Assign a tag to the **ground disconnector**:

✧ Click the **Browse** button next to the edit field.
The **Tags** dialog opens.
✧ Select the corresponding tag from the list and click **OK** to confirm.

NOTE

Delete the default tag link for switching devices which do not exist in the bay.

- Double-click the tag to be deleted. The tag is selected.
- Press the **Del** key to delete the selected tag.

This ensures that the elements in question are no longer considered for the determination of the bay state, i. e. the value and the status of the **bay overview** are independent of the deleted elements.

Grounded only with CB closed

Specify whether the grounding shall only be shown when the circuit breaker is closed.

Tooltip text

Enter a text in the edit field. This text is displayed as **Tooltip** in the active project.

14.4 Showing Texts in Runtime Dialogs

Freely defined texts, e. g. notes for the operator, can be shown in runtime dialogs of switches. The texts must be saved in the **PCCIX_xxx.txt** text files.

Texts can be shown statically or dynamically. In this context, the term "statically" means that the text defined via the object properties is shown during runtime.

If a dynamic display is defined, the displayed text is entered during runtime. To do this, an entry field must be configured in the display. Via this entry field, the value of the **UserStringID** can be changed dynamically.

Creating/editing texts

✧ Open the **...\Siemens Energy\SICAM\SCC\bin\PCCIX_xxx.txt** file in a text editor. **xxx** is used as a wild-card for the language code.

```
// user defined strings
1001 Synchronisierung                    "Synchronisiert"
1002 Synchronisierung deadline           "Synchronisiert + deadline"
1003 Synchronisiert deadbus              "Synchronisiert + deadbus"
1004 Synchronisiert deadline+deadbus     "Synchronisiert + deadline + deadbus"
1005 userdefined_5                       "Text01"
1006 userdefined_6                  ""
```

[pascc420, 1, en_US]

Figure 14-49 Entering user-defined texts

✧ Under **User-defined strings**, enter your text (e.g. Text01) between quotation marks.
Values between **1000** and **1198** can be used as text IDs.

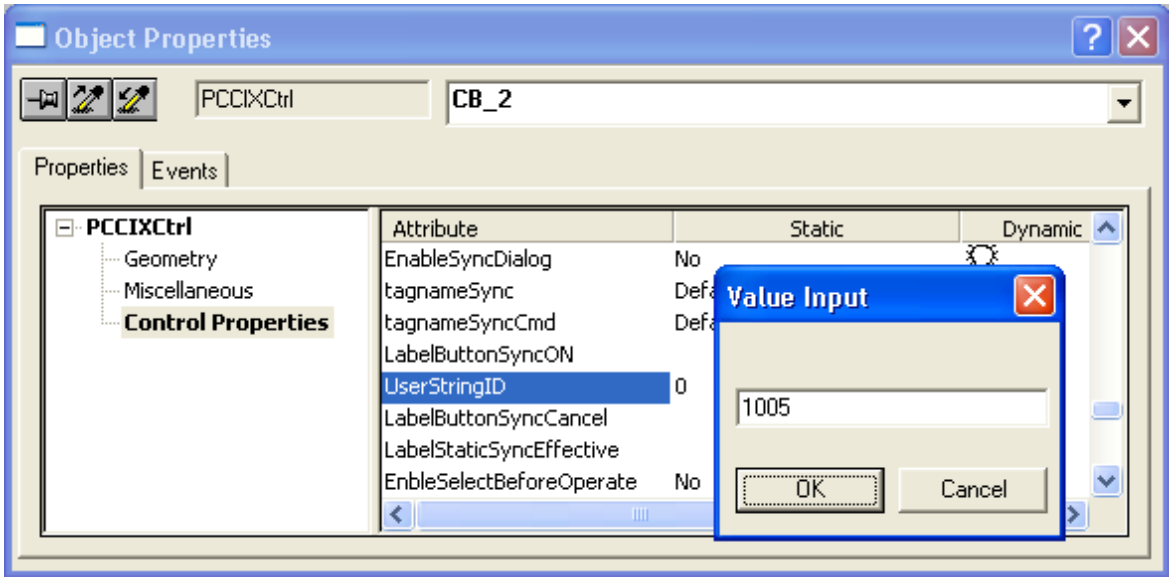
✧ Save and close the file.

14.4.1 Showing Static Texts

Proceed as follows to show a static text:

Defining the object properties

✧ Open the **Object properties** of the switch in the Graphics Designer.



[pascc421, 1, en_US]

Figure 14-50 Defining the Object Properties

✧ Enter the text ID for the attribute **UserStringID** in the **Properties** tab. The text ID corresponds to the number of the text in the text file.

If the **UserStringID** has the value zero, no additional text is displayed.

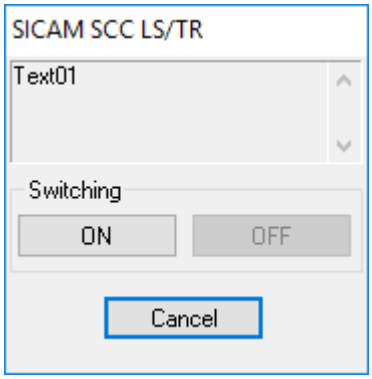
✧ Close the **Object properties** dialog and save your display.

Text display

The defined text is shown in the runtime dialog of the switch during runtime.

✧ Start the runtime.

✧ Click the switch. The runtime dialog is displayed with the defined text.



[pascc422, 1, en_US]

Figure 14-51 Showing Text

14.4.2 Showing Dynamic Texts

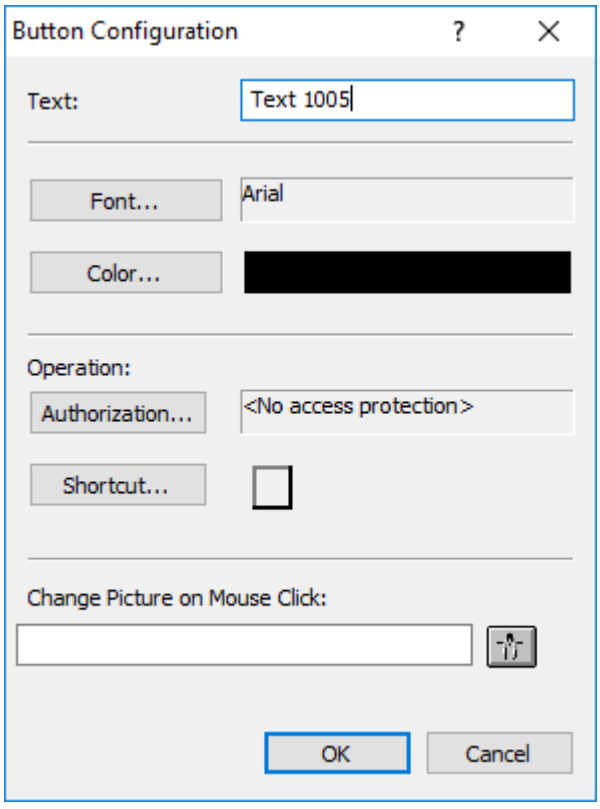
To show a dynamic text, the text ID must be changed in the **UserStringID** attribute of the control object during runtime. The ID can be changed via a direct connection, a C script or a VB script.

This paragraph explains how to change the attribute using a button or a direct connection.

Proceed as follows to show a dynamic text:

Defining a button

✧ Add a Windows object of the **Button** type to your display.
The **Button configuration** dialog opens.



[pascc426, 1, en_US]
Figure 14-52 Configuring a button

✧ Enter a button text in the **Text** box.

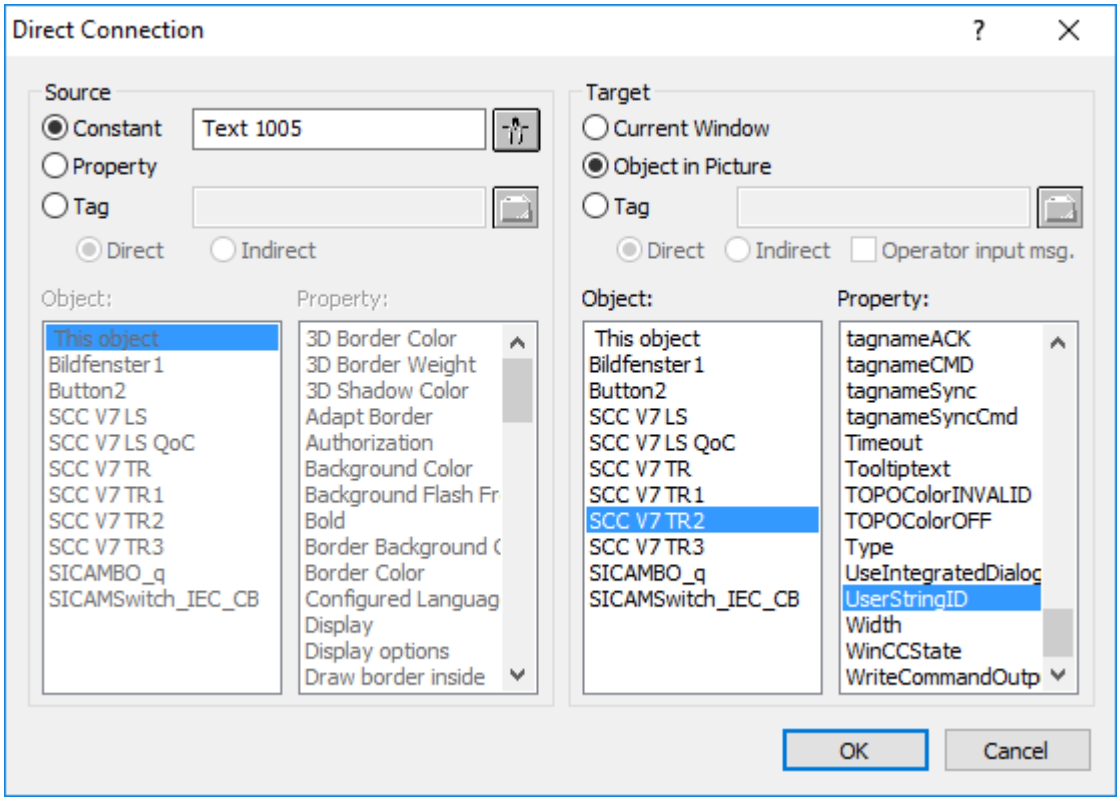
✧ Click **OK** to close the dialog.

✧ Right-click the button and select **Properties** from the context menu.

✧ Select the **Events** tab in the **Object properties** dialog.

✧ Select **Mouse**.

✧ Right-click **Action** in the **Mouse Action** row and select **Direct connection** from the context menu.
The **Direct connection** dialog opens.



[pascc427, 1, en_US]

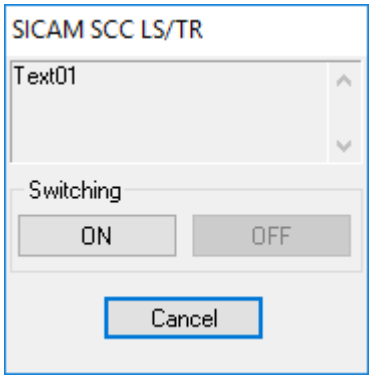
Figure 14-53 Configuring a direct connection

- ✧ Enter the text ID under **Source**, **Constant**.
- ✧ Select the **Object in picture** option under **Target**.
  The objects are shown in a list.
- ✧ Select the control object in order to show the text in the related runtime dialog.
- ✧ Select **UserStringID** under **Property**.
- ✧ Click **OK** to close the dialog and save the display.

Text display

The defined text is shown in the runtime dialog of the switch during runtime.

- ✧ Start the runtime.
- ✧ Click the button.
  The text ID is written into the **UserStringID** attribute of the switch.
- ✧ Click the switch.
  The runtime dialog is displayed with the defined text.



[pascc422, 1, en_US]

Figure 14-54 Showing text

To deactivate the text, write the value **0** with a direct tag into the **UserStringID** attribute.

14.5 IX State Sync Application

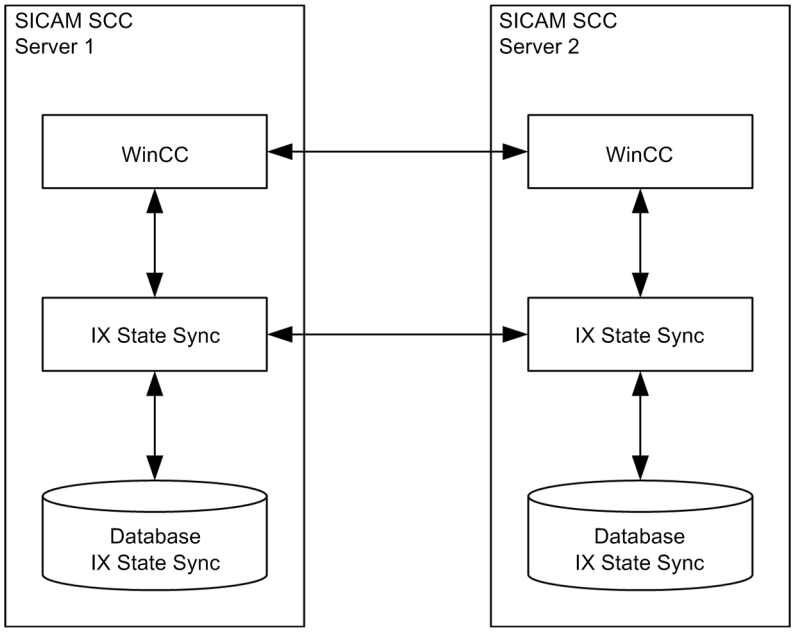
The **IX State Sync** application synchronizes the blinking of switching devices. For a redundant SICAM SCC system, it must have been installed on both servers and configured accordingly.

It synchronizes operator control actions, such as acknowledgment of spontaneous blinking, on both computers. This also applies for the acknowledgment of spontaneous messages on a switching device object.

NOTE

If V7 switching device objects are still used in existing SICAM SCC projects, the **IX State Sync** application can be continued to be used.

With SICAM SCC V8.00, the related functions for the new switching device objects (ActiveX Controls) are performed by the new **SICAM SCC Runtime Data Server** component.



[synctool, 1, en_US]

Figure 14-55 IX State Sync

The IX State Sync application consists of a data connection to WinCC, a database and a network connection to the IX State Sync of the other server.

Installation

The **IX State Sync** application is not part of the default installation of SICAM SCC. For the user-defined installation, you can select the installation of this application as **SICAM PAS Redundancy components**.

A subsequent installation of the **IX State Sync** application is also possible.

To install the **IX State Sync** application:

- ✧ Select **Start > Settings > Control Panel > Add/Remove Programs**.
- ✧ Select **SICAM SCC** in the list of programs and then click **Uninstall/Remove**.
- ✧ In the setup of SICAM SCC, select the **Change** option.
- ✧ Select **User-defined setup**.
- ✧ Activate **IX State Sync** and click **Next**.

  The **IX State Sync** application is installed.

Starting the IX State Sync application

For operation, you can enter the **IX State Sync** application in the startup list of WinCC Runtime in order to be able to start and stop this application automatically together with WinCC Runtime. To perform the entry in the startup list, select **WinCC Project > Computer Properties > Startup > Additional Tasks/Applications**. The default path of the IX State Sync application is **C:\Programs\Siemens Energy\SICAM\SCC\bin**.

If WinCC Runtime is not running, the **IX State Sync** application shuts down automatically. For this reason, WinCC Runtime must be activated in order to be able to configure **IX State Sync**.

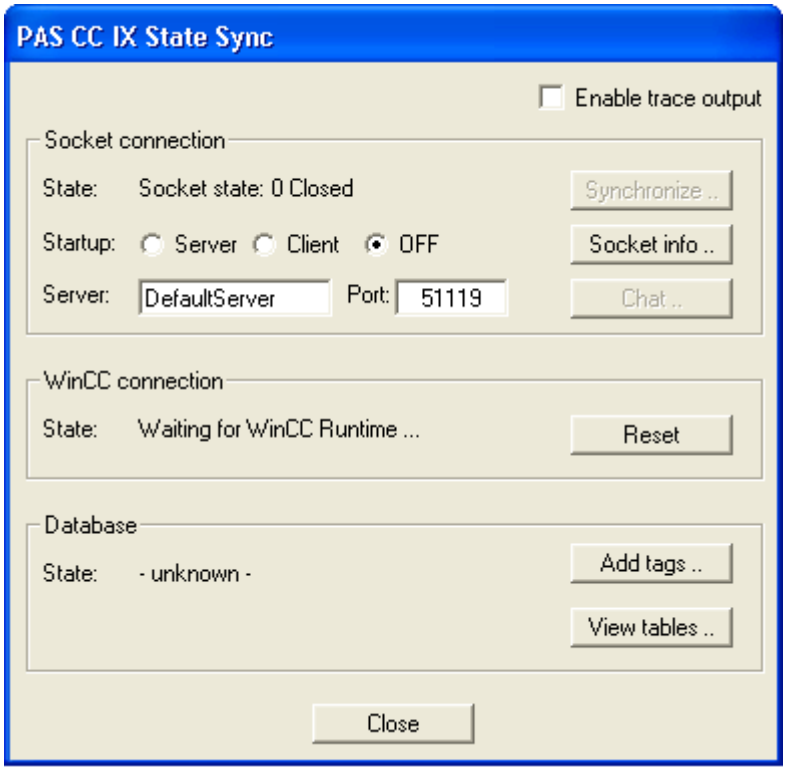
The icon of the started **IX State Sync** application is shown in the Windows task bar.

Configuring the connection

The **IX State Sync** application synchronizes data via a special TCP connection. To set up this connection, one computer is configured as server, and the other computer is configured as client. The configuration is independent of the function of the computer in the redundant system (master/standby). In this context, the term "Server/ Client" only refers to the TCP connection. It must not be confused with the client-server terminology used for SIMATIC WinCC.

This connection must be set up as described below:

✧ Right-click the icon of the **IX State Sync** application. Select **Control Center** from the context menu.
The **PAS CC IX State Sync** dialog opens.



[synctool01, 1, en_US]

Figure 14-56 Configuring a TCP connection

The state of the TCP connection is shown under **State**.

✧ Select the option **OFF** next to **Startup**.

✧ On the first computer, enter the name or the IP address of the second computer in the **Server** entry field.

- ✧ Continue to use the default **Port**.
  If you have any problems with your connection, contact your network administrator to request a valid port number.
- ✧ Select **Client**. The application now tries to establish a connection to the other computer.
  The connection can only work properly if it has been set up also on the second computer.
- ✧ Enter the same **port** number on the second computer and then select **Server**.

The computers try to set up the connection. The status **Connected** shows that the connection is up.

User information/error messages are displayed in the **Report**. If the **Enable trace output** option is selected, all actions are shown in the Report. In addition, status indications are shown in the internal **SICAMPASCCSynch-State** WinCC tag.

The **Synchronize** and **Chat** buttons are enabled as soon as the connection to the other computer has been established.

Click the **Synchronize** button to delete the entries from the database tables on the other computer and to replace them with entries from the local computer.

Click **Socket info** to show current information about the connection in the trace window.

Click **Chat** to open a dialog window for contacting the partner computer. The current state of the connection is shown in the status bar.

Click **Reset** to clear the connection to the WinCC Data Manager and to re-establish it afterwards.

- ✧ Click **Close** to close the **PAS CC IX State Sync** dialog window.

All settings performed are saved when closing the application. They are still available when the application is started again later. Click **Exit** in the context menu to exit the application.

Configuring the IX State Sync database

You must determine which data is to be included in the data synchronization process. These are mainly tags used for the representation of switching devices in the monitoring direction whose IX Hook tags must be synchronized.

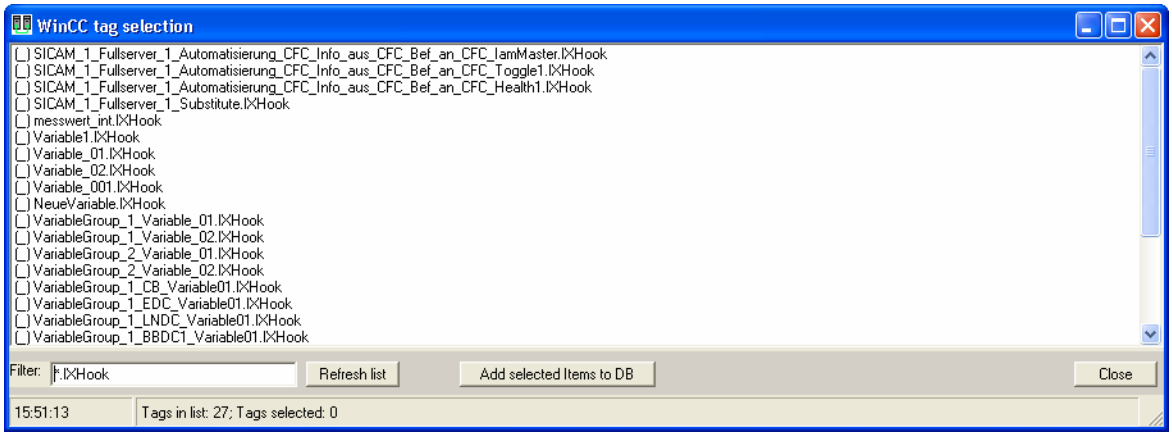
To do this, the names of the WinCC tags including this data must be entered in the database. As a rule, the **IXHook** elements of structured tags of the PAS_Informationtype must be entered.

For more detailed information about how to change the IX State Sync database, refer to (*Modifying the IX State Sync database, Page 468*).

To configure the database:

- ✧ Start the **WinCC Explorer** with your WinCC project.
- ✧ Start **WinCC Runtime**.
  If no WinCC project is running, the IX State Sync application shuts down automatically. For this reason, WinCC Runtime must be activated in order to be able to configure IX State Sync.
- ✧ Right-click the icon of the **IX State Sync** application and select **Control Center** from the context menu.
  The **PAS CC IX State Sync** dialog window opens.
- ✧ In the **PAS CC IX State Sync** dialog, click the **Add Tags** button.
  The **WinCC Tag Selection** dialog window opens.
- ✧ Click the **Refresh List** button.
  All tags which meet the filter criteria are shown in the list.

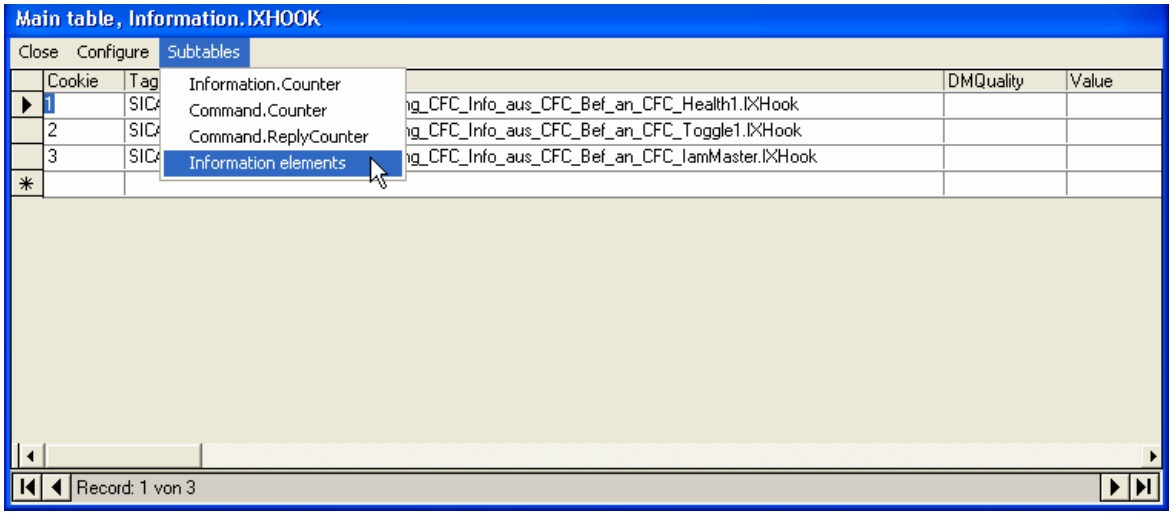
The asterisk symbol (*) for the filter can be replaced, but the filter name must have the extension **.IXHook**. For each entry, the application searches the name of the tag structure and the name of the corresponding tag name command structure. This combination is shown in the list. Information tags for which no tag name command is available are ignored.



[synctool02, 1, en_US]

Figure 14-57 Selecting tags

- ✧ Select the elements which you want to transfer to the database.
- ✧ Click **Add selected items to DB**.
  The elements are entered in the database.
- ✧ Click **Close** to close the dialog.
- ✧ To check the entries in the database, click the **View tables** button in the **PAS CC IX State Sync** dialog.
  The **Main Table, Information.IXHook** dialog opens. The content of the database is shown.



[synctool03, 1, en_US]

Figure 14-58 Showing the content of the database

Table 14-14 Description of the menu items available in the Main Table, Information.IXHook dialog window

Menu Item		Meaning
Close		Closes the dialog.
Configure	Delete values	Deletes the entries in the **DMQuality** and **Value** columns.
	Delete table	Deletes the contents of the database, i. e. all tags are removed.
Subtables	Information.Counter Command.Counter Command.ReplyCounter Information elements	Shows the corresponding database table. Changes in these tables are not possible. These functions are only used for diagnostic purposes.

✧ Click **Close** to close the dialog.

Synchronizing the IX State Sync databases

Following the configuration of the database on the first computer, the database has to be synchronized with the one on the second computer.

To synchronize the database on the second computer:

✧ Select **Control center** from the context menu.

The **PAS CC IX State Sync** dialog opens.

✧ Click the **Synchronize** button to stop the application on both computers.

The database on the second computer is deleted; the tables of the local database are transmitted to this computer. Afterwards, the application is restarted on both computers.

NOTE

After each change of the local database, this database has to be synchronized with the one on the partner computer.

Modifying the IX State Sync database

To add a tag in the database or to remove it, proceed as described below.

✧ Modify the configuration of the IX State Sync database on a SICAM SCC server (refer to *Configuring the IX State Sync database, Page 466*).

✧ Synchronize the databases of the two SICAM SCC servers (refer to *Synchronizing the IX State Sync databases, Page 468*).

Following synchronization, the application is restarted on both servers. The data is synchronized according to the new configuration.

14.6 Measured-Value Display Using the Script/Project Function

The **Measured/Metered Values** folder in the SICAM graphic object library includes the **Measured value integrated C script** and **Measured value project function** user objects. These user objects already include typical functions.

Use these objects to show measured values with an upper and a lower limit.

NOTE

Use the **Measured value integrated C script** objects to implement various functions by means of script changes to individual objects.

Use the **Measured value project function** objects to control the behavior of the objects from a central level.

14.6.1 Defining the Measured-Value Output

Proceed as follows to define the measured-value output:

- ✧ Right-click the object and select **Properties** from the context menu.
- ✧ The parameters are located in the **Properties** tab under **SICAM**.

NOTE

Scripts stored in the user objects must not be changed in the **Events** tab.

Value (*.Counter)

- ✧ Right-click the green bulb icon in the **Value (*.Counter)** row of the **Dynamic** column. Select **Tag** from the context menu in order to assign the output box a SICAM PAS tag (e. g. **MW1.Counter**).

NOTE

Always use the **Counter** structure element for **Value (*.counter)**.

Limit Max/Min

You can define 2 upper and 2 lower limits for the measured value. The text color changes when the value exceeds the first upper limit or falls below the first lower limit. The display starts blinking when the value exceeds the 2nd upper limit or falls below the 2nd lower limit.

- ✧ Double-click **Limit Max/Min** in the **Attribute** column.
- ✧ Enter the limit value.

Update

For the **Value (*.Counter)** attribute, a parameter is entered in the **Current** column. With this parameter, you can define the refresh cycle of the measured value.

The following parameter values can be defined: **Picture cycle**, **Window cycle**, **Upon change** and time values between 250 ms and 1 hour. Besides this, user cycles can be defined. 500 ms is the default setting.

The refresh cycle of the diagram can be defined using the **Update Cycle** attribute under **Miscellaneous** in the **Properties** of the diagram.

Recommendation: 2 s.

- ✧ Double-click the entry in the **Current** column. Select the parameter from the drop-down list box which opens.

Tooltip text

The tooltip text shows the name of the object on which the mouse cursor is positioned during runtime.

- ✧ Double-click **Tooltip text** in the **Attribute** column.
- ✧ Enter the desired text.

Divider

The measured value is divided by the entered value and shown.

- ✧ Double-click **Divider** in the **Attribute** column.
- ✧ Enter the desired value.

Digits

The measured value is shown with the number of entered digits.

- ✧ Double-click **Digits** in the **Attribute** column.
- ✧ Enter the desired value.

Font color value

The font color and the background color of the value can be selected. White is the default setting for the background color. The font color depends on the state. A specific font color is set by default for each of the following states:

Table 14-15 Font color value

Color	State	Meaning
Black	Normal state	
Cyan (turquoise)	Not topical	The measured value is not topical.
Gray	Not Connected	The measured value object is not linked to a tag.
Dark cyan (petrol)	PAS not ok	The connection between SICAM SCC and SICAM PAS is disturbed.
Red	Limit Max 1	The defined first upper limit of the measured value has been exceeded.
Blue-gray	Limit Min 1	The measured value has fallen below the defined first lower limit.
Pink	Overflow	A measured value overflow has occurred.
Blue	Substituted	The measured value has been substituted.

Unit

The font color and the background color of the unit can be selected. Black and white are the default settings. Proceed as follows to enter the text to be shown as unit:

- ✧ Double-click **Unit** in the **Attribute** column.
- ✧ Enter the text to be shown as unit.

Unit

The font color and the background color of the unit can be selected. Black and white are the default settings. Proceed as follows to enter the text to be shown as unit:

- ✧ Double-click **Unit** in the **Attribute** column.
- ✧ Enter the text to be shown as unit.

Value range of the measured-value object

Figures with up to 7 digits can be shown using the measured value object. The WinCC data type does not allow more digits.

The substitute dialog is set for the display of 5 positions before and 2 positions after the decimal point. It must be reconfigured if another format is required. The dialog is a user object which has been configured according to WinCC conventions.

14.6.2 Substitute Functionality

The measured value object from the SICAM graphic object library uses the **PAS_Substitute_Float_V600** SICAM function for substituting.

Setting parameters for value substitutions

To set the parameters for the substitution of a floating point value:

- ✧ Add the **Measured value display** measured-value object from the SICAM graphic object library to your diagram.

  It is available under **Measured/metered value**.

- ✧ Insert the **Substitution dialogs** graphic object from the same folder.

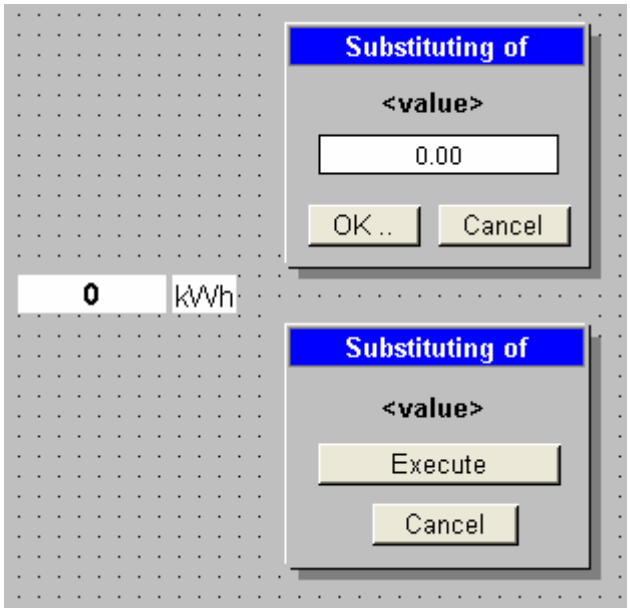
The **DlgSubstitute** graphic object opens the dialog for entering the substitute value. The **DlgConfirm** graphic object opens the dialog for the confirmation of the substitution.

The **CloseMeasuredValueDialoges** graphic object automatically closes the value substitution dialogs.

The measured-value object is always visible during runtime. By default, the two dialogs are not shown during runtime. They are only shown if required.

Several measured-value objects can be included in the same diagram. The **Value Substitution Dialogs** graphic object must be inserted only once in each WinCC diagram.

During runtime, the dialogs are shown next to the measured-value object when you right-click the measured-value object (provided that all conditions for the substitution are met). The position of the dialogs can be defined in the C script of the measured-value object (**PAS_ShowDialogSubstitute_V600 function**).



[pascc530, 1, en_US]

Figure 14-59 Inserted graphic objects

During runtime, the dialogs show the second half of the tag name at the **<name>** position. int is shown if the tag has the name **Fullsever1_measuredvalue_int.***.

A process tag must now be linked to the measured-value object.

- ✧ Right-click the EA field and select **Properties** from the context menu.
- ✧ Select **SICAM** in the **Properties** tab of the **Object properties** dialog.
- ✧ Right-click the bulb icon in the **Value (*.Counter)** row of the **Dynamic** column. Select **Tags...** from the context menu.
- ✧ Select the desired tag of the ***.Counter** type and click **OK**.
- ✧ Close the **Object properties** window.

Substitution during runtime

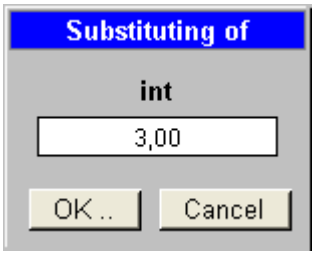
A value substitution during runtime is performed as follows:

- ✧ Start WinCC runtime.
- ✧ Click the output box of the measured-value object.
  The dialog for entering the substitute value opens. The current tag value is shown by default.

NOTE

This dialog is not shown if the status of a message does not allow for a value substitution.

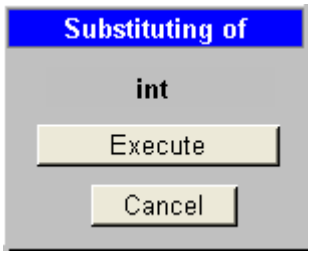
Unless an operator action is performed, the value substitution dialogs are closed automatically after 30 seconds. In this case, the substitution is not executed.



[pascc531, 1, en_US]

Figure 14-60 Dialog for entering a value

- ✧ Enter the value and click **OK** to confirm.
  The dialog for confirming the value substitution opens.



[pascc532, 1, en_US]

Figure 14-61 Confirmation dialog

- ✧ Click **Execute** to confirm the action.

The value is now substituted. The substitute value is shown in the measured-value object in the color of the **Substituted** status.

The actions requested in the dialogs can also be performed by pressing the **ENTER** and **ESC** keys on the keyboard.

14.7 Introduction to the SIMATIC WinCC Configuration Tool

Overview

The **Configuration Tool** is subject to the system requirements of SIMATIC WinCC and Microsoft Excel. It is also possible to use the Configuration Tool without SIMATIC WinCC. In this case, you cannot write data to SIMATIC WinCC.

Starting from SIMATIC WinCC V7.3, the functions of the Configuration Tool of the **WinCC Configuration Studio** are integrated in the SIMATIC WinCC UI.

NOTE

For Microsoft Excel, you require the **Office Wizard** in order to output warnings from the SIMATIC WinCC Configuration Tool.

14.7.1 Installing the SIMATIC WinCC Configuration Tool

The SIMATIC WinCC Configuration Tool can be installed in two different ways.

Approach 1

- ✧ During the setup of SIMATIC WinCC, select the **WinCC V7.0 complete** entry in the **Programs** dialog.
  SIMATIC WinCC is installed by means of the SmartTools, the SIMATIC WinCC Configuration Tool and the SIMATIC WinCC Archive Configuration Tool.
  To start the SIMATIC WinCC Configuration Tool, click **Start > SIMATIC > WinCC > Tools**.

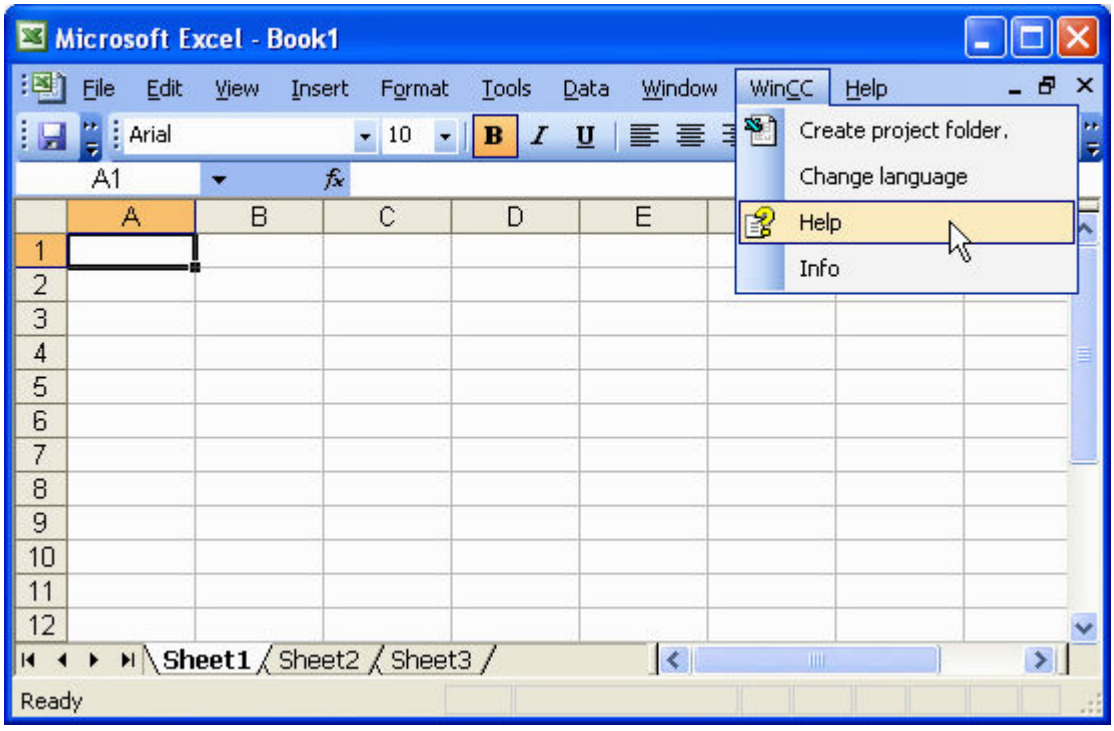
Approach 2

- ✧ On the SIMATIC WinCC DVD, change to the **InstData\WinCC\setup\Products\ConfigurationTool** directory.
- ✧ Double-click the setup.exe routine.
- ✧ Follow the instructions in the different dialogs of the routine.
  The SIMATIC WinCC Configuration Tool is installed.

After the installation, a file with SICAM SCC-specific extensions must be copied into the installation directory of the Configuration Tool. On the SICAM SCC DVD in the **ConfigurationTool**, you will find version-specific zip files. Each of them holds a **resource.xla** file.

- ✧ Select the zip file with the corresponding version and extract the **resource.xla** file.
- ✧ Copy this file into the installation directory of the Configuration Tool (... SIEMENS\WinCC\Configuration-Tool).
  The existing file must be overwritten.

For more detailed information on how to use the SIMATIC WinCC Configuration Tool, refer to the **Help** menu item in Microsoft Excel.



[pas01, 1, en_US]

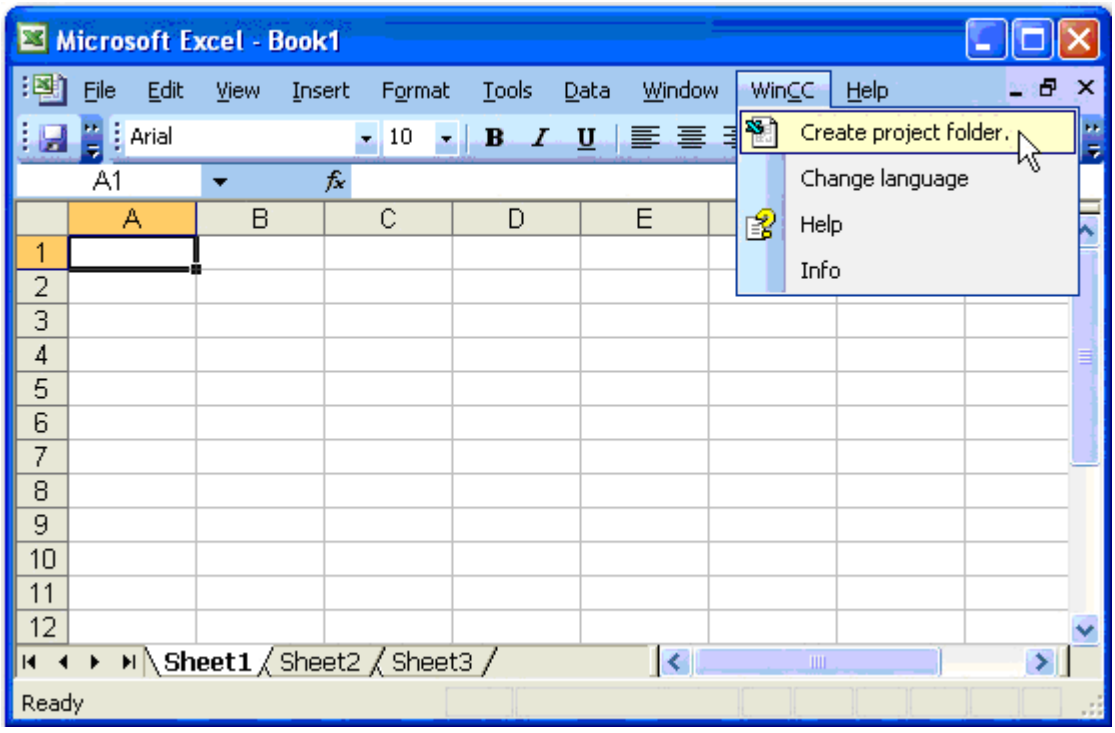
Figure 14-62 SIMATIC WinCC Configuration Tool, calling up the help menu

14.7.2 Creating an Excel Project Folder

✧ Start **Microsoft Excel**.
In the menu bar, you will find the **WinCC** entry.

Here you can:

- obtain information on the SIMATIC WinCC Configuration Tool (About)
- call up the SIMATIC WinCC help for the Configuration Tool (Help)
- select the language for the Configuration Tool (Change language)
- create an Excel folder with the data of an existing or new project (Create project folder)



[pas02, 1, en_US]

Figure 14-63 SIMATIC WinCC Configuration Tool, WinCC menu

✧ Select **Create project folder**.

You can create a project folder

- with a connection to an existing SIMATIC WinCC project
- without a connection to an existing SIMATIC WinCC project
- with a connection to a new SIMATIC WinCC project

The following tables are created by the SIMATIC WinCC Configuration Tool:

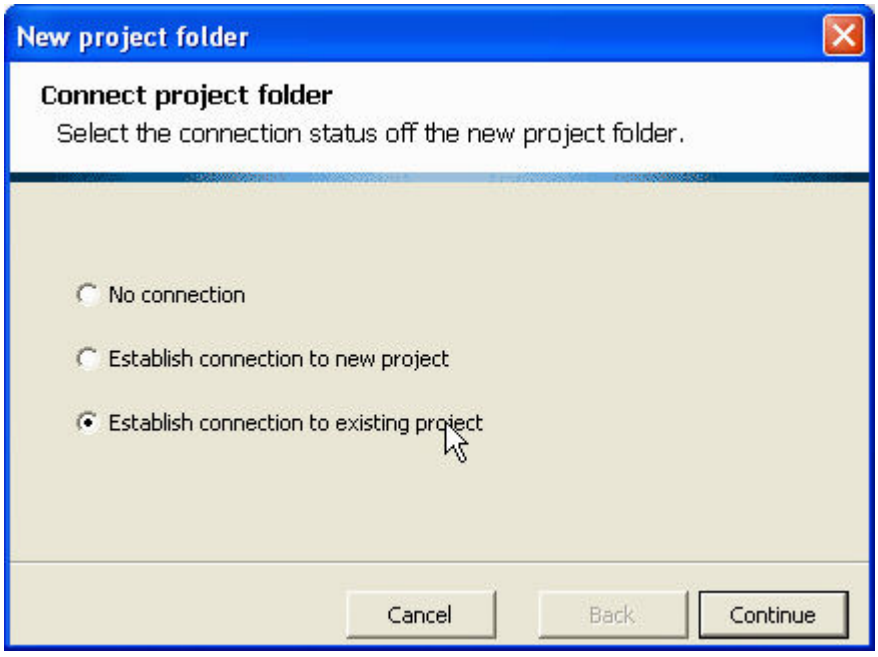
- Project properties
- DM_default values
- Connections
- Tags
- Structure tags
- Structure types
- ALG_default values
- Message blocks
- Message classes
- Group indications
- Single-point indications
- Limit-value monitoring
- Texts
- TLG_default values

- Times
- Process value archives
- Compression archives
- Error list (only if errors occur when writing tags)

All tables can be edited using Excel functions.

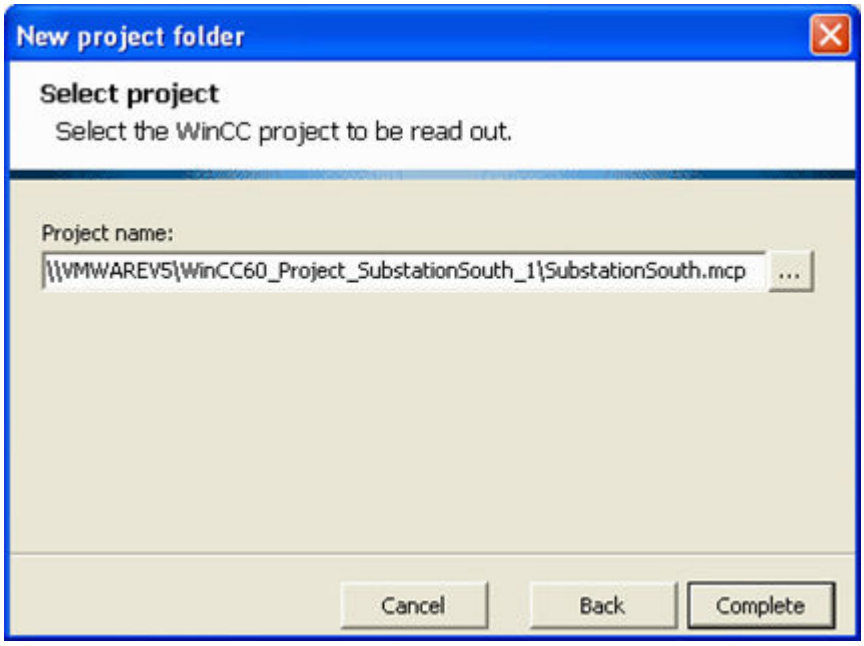
14.7.2.1 Project Folder with Connection to an Existing SIMATIC WinCC Project

If **Establish connection to existing project** is selected, all the data of the SIMATIC WinCC project is transferred to the Excel project folder, i.e. all alarms, message classes, data types, structures, structure types, limit values, etc.



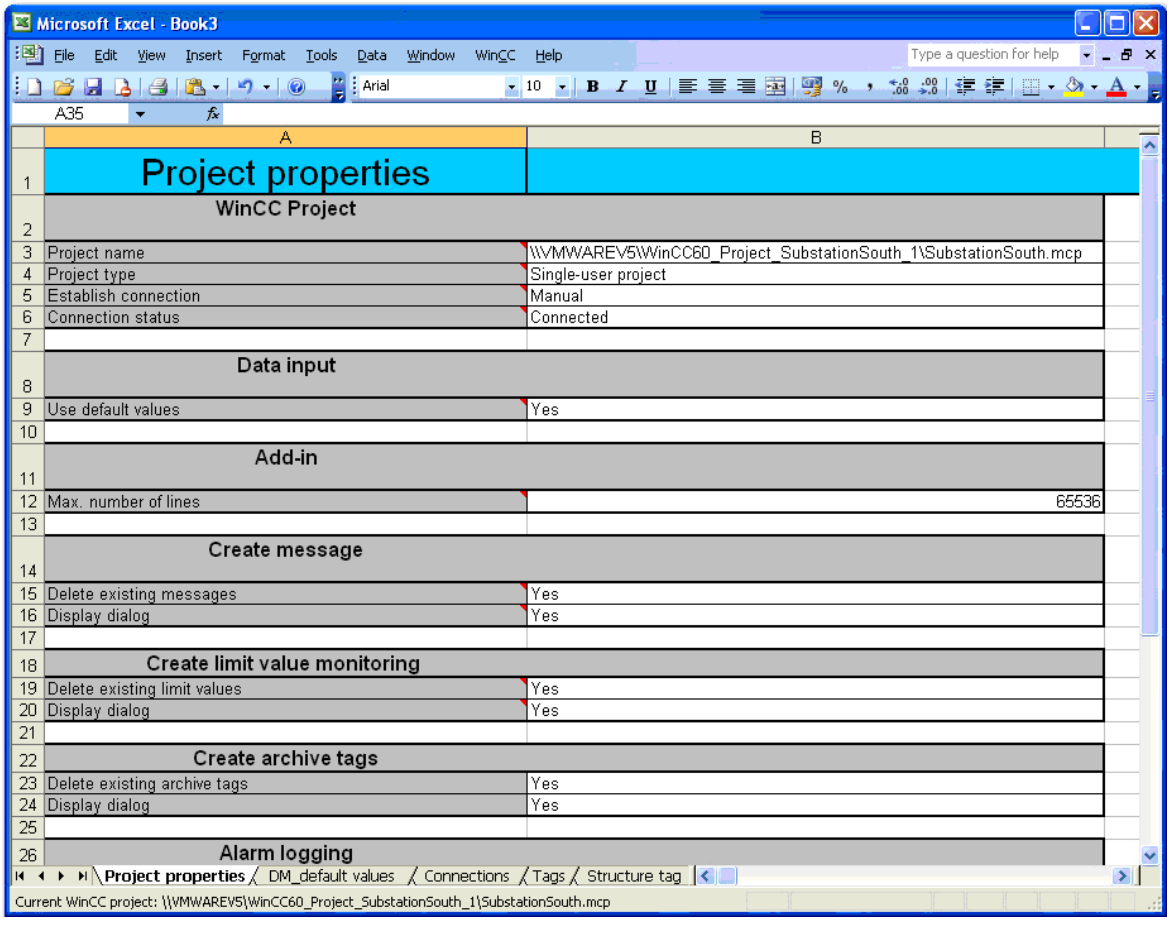
[pas03, 1, en_US]

Figure 14-64 Creating a project folder



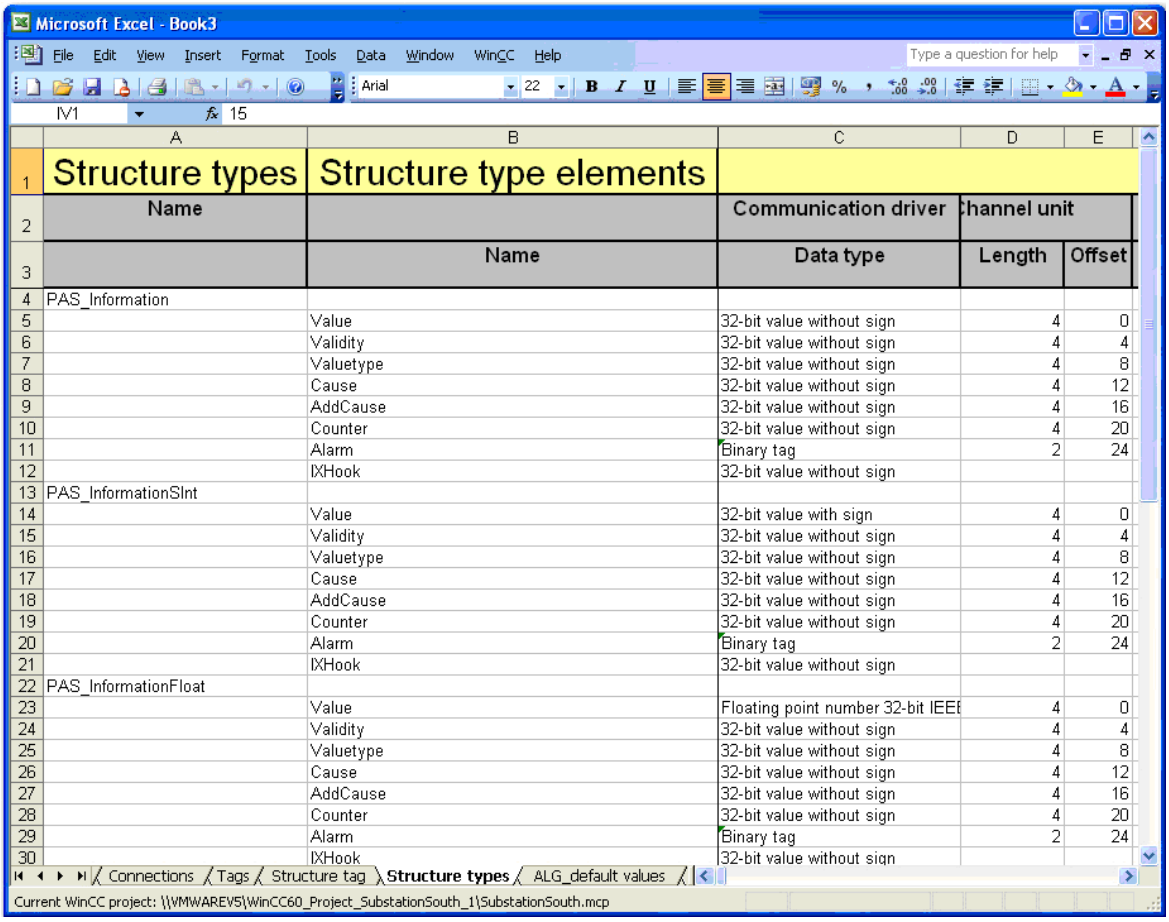
[pas04, 1, en_US]

Figure 14-65 Connecting a project folder with a SIMATIC WinCC project



[pas05, 1, en_US]

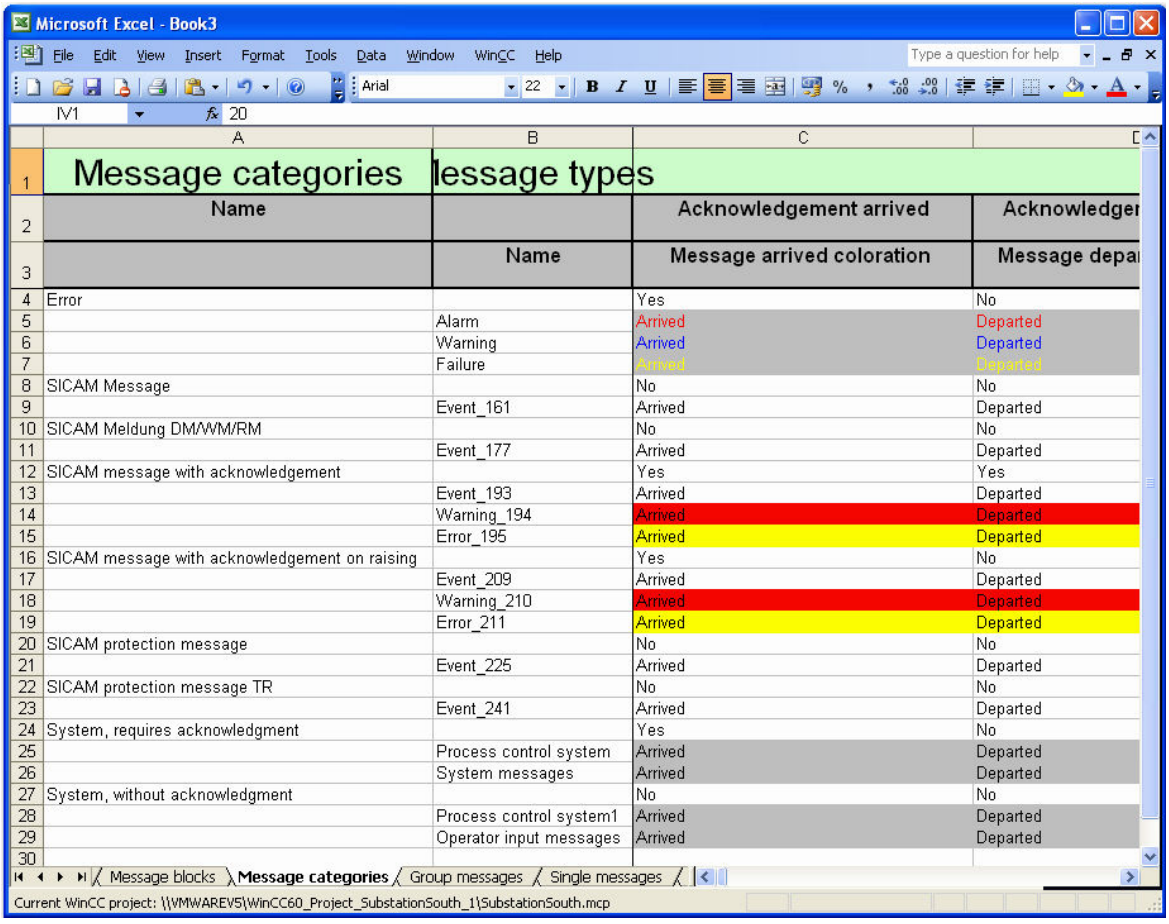
Figure 14-66 Properties of a project connected to a SIMATIC WinCC project



	A	B	C	D	E
1	Structure types	Structure type elements			
2	Name		Communication driver	Channel unit	
3		Name	Data type	Length	Offset
4	PAS_Information				
5		Value	32-bit value without sign	4	0
6		Validity	32-bit value without sign	4	4
7		Valuetype	32-bit value without sign	4	8
8		Cause	32-bit value without sign	4	12
9		AddCause	32-bit value without sign	4	16
10		Counter	32-bit value without sign	4	20
11		Alarm	Binary tag	2	24
12		IXHook	32-bit value without sign		
13	PAS_InformationSInt				
14		Value	32-bit value with sign	4	0
15		Validity	32-bit value without sign	4	4
16		Valuetype	32-bit value without sign	4	8
17		Cause	32-bit value without sign	4	12
18		AddCause	32-bit value without sign	4	16
19		Counter	32-bit value without sign	4	20
20		Alarm	Binary tag	2	24
21		IXHook	32-bit value without sign		
22	PAS_InformationFloat				
23		Value	Floating point number 32-bit IEE	4	0
24		Validity	32-bit value without sign	4	4
25		Valuetype	32-bit value without sign	4	8
26		Cause	32-bit value without sign	4	12
27		AddCause	32-bit value without sign	4	16
28		Counter	32-bit value without sign	4	20
29		Alarm	Binary tag	2	24
30		IXHook	32-bit value without sign		

[pas06, 1, en_US]

Figure 14-67 SICAM structure data types of a project connected to a SIMATIC WinCC project



Microsoft Excel - Book3

File Edit View Insert Format Tools Data Window WinCC Help

Type a question for help

Arial 22

IV1 20

	A	B	C	D
1	Message categories	lessage types		
2	Name		Acknowledgement arrived	Acknowledger
3		Name	Message arrived coloration	Message depa
4	Error		Yes	No
5		Alarm	Arrived	Departed
6		Warning	Arrived	Departed
7		Failure	Arrived	Departed
8	SICAM Message		No	No
9		Event_161	Arrived	Departed
10	SICAM Meldung DM/WM/RM		No	No
11		Event_177	Arrived	Departed
12	SICAM message with acknowledgement		Yes	Yes
13		Event_193	Arrived	Departed
14		Warning_194	Arrived	Departed
15		Error_195	Arrived	Departed
16	SICAM message with acknowledgement on raising		Yes	No
17		Event_209	Arrived	Departed
18		Warning_210	Arrived	Departed
19		Error_211	Arrived	Departed
20	SICAM protection message		No	No
21		Event_225	Arrived	Departed
22	SICAM protection message TR		No	No
23		Event_241	Arrived	Departed
24	System, requires acknowledgment		Yes	No
25		Process control system	Arrived	Departed
26		System messages	Arrived	Departed
27	System, without acknowledgment		No	No
28		Process control system1	Arrived	Departed
29		Operator input messages	Arrived	Departed
30				

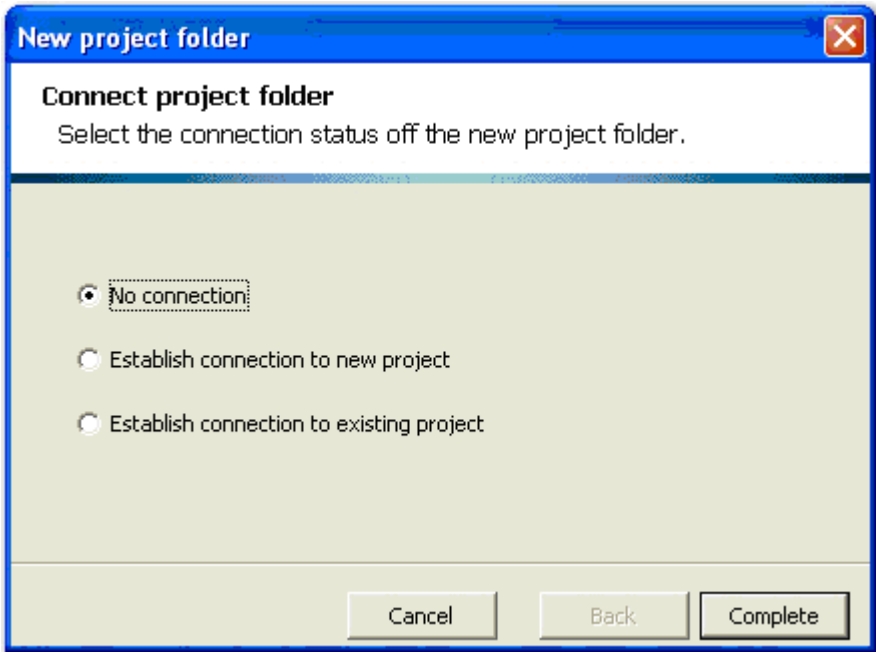
Message blocks | Message categories | Group messages | Single messages

Current WinCC project: \\VMWAREV5\WinCC60_Project_SubstationSouth_1\SubstationSouth.mcp

[pas07, 1, en_US]

Figure 14-68 SICAM message classes and their formatting of a project connected to a SIMATIC WinCC project

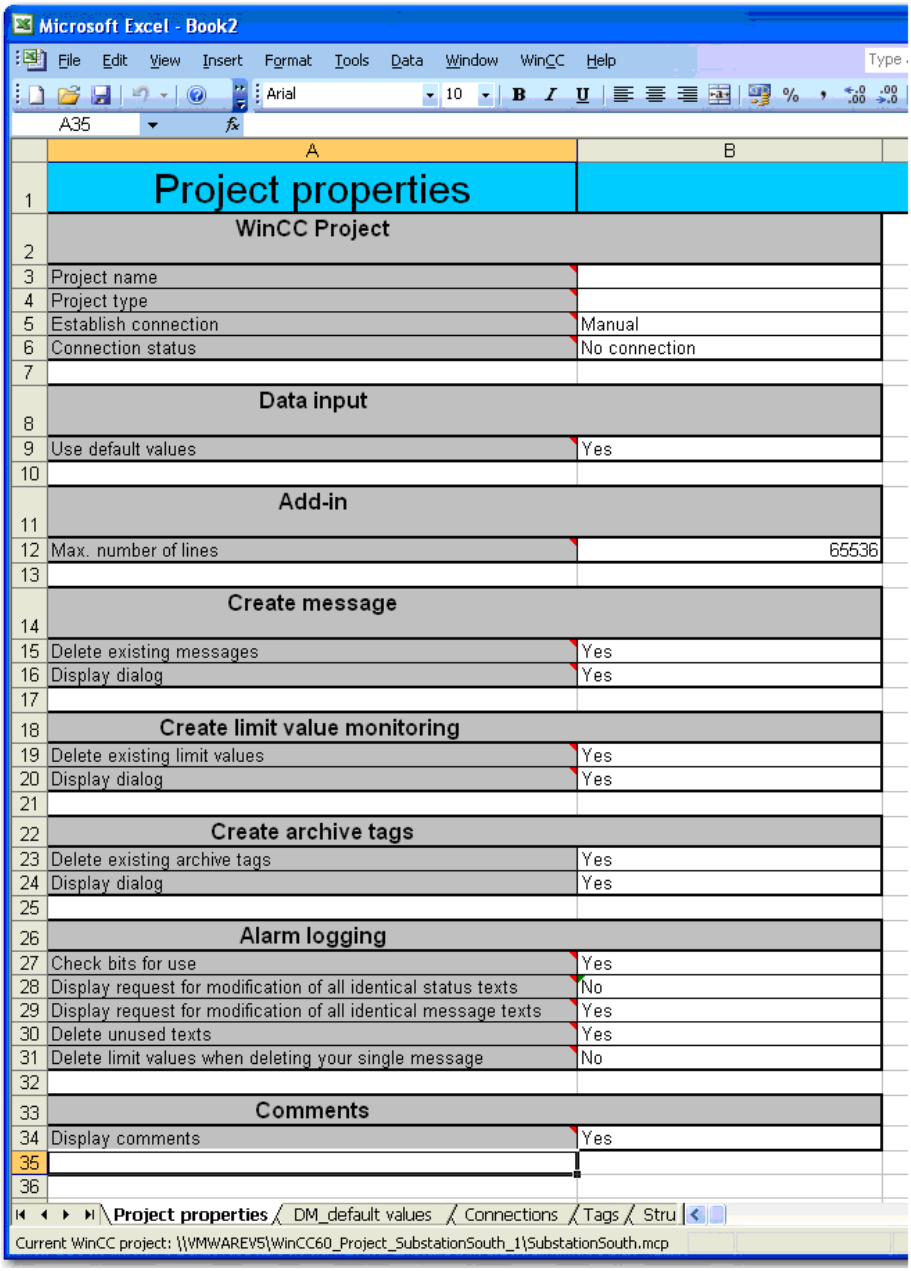
14.7.2.2 Project Folder without Connection to an Existing SIMATIC WinCC Project



[pas08, 1, en_US]

Figure 14-69 Creating a project folder

If **No connection** is selected, a project folder is created which includes the default values for the project settings. It does not include any SICAM-specific project settings and no connections, tags, structure types and alarms/messages.

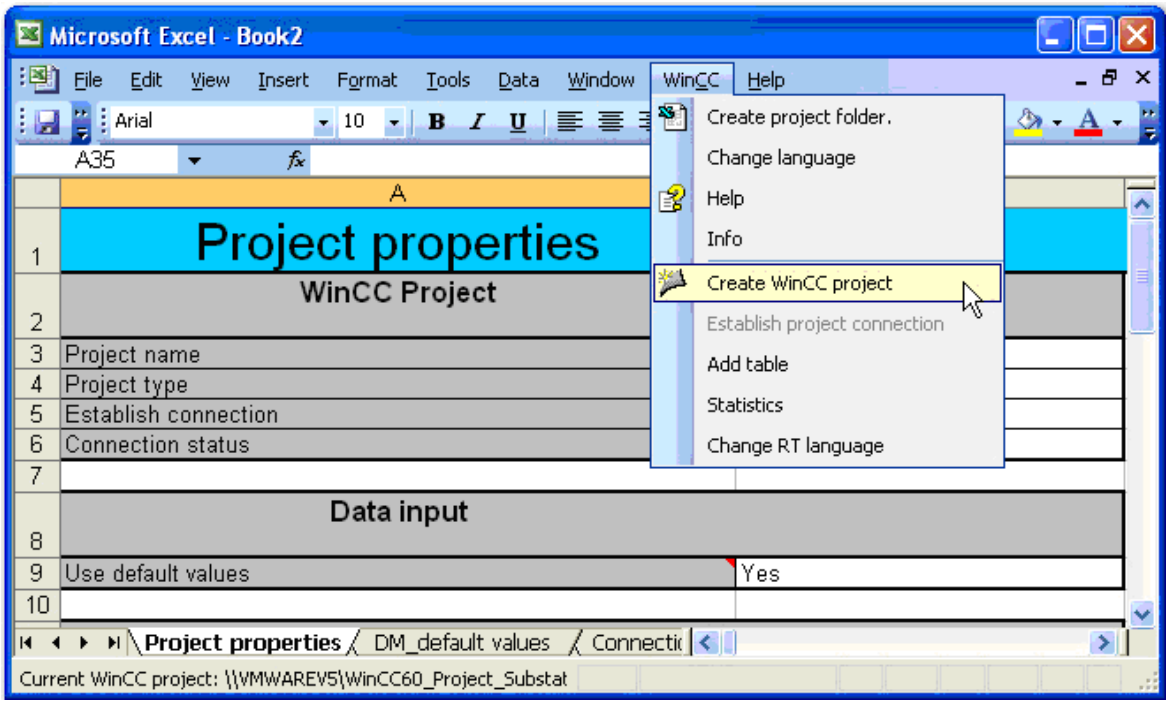


[pas09, 1, en_US]

Figure 14-70 Predefined properties of a project without a connection to a SIMATIC WinCC project

You can now have a WinCC project created from the Excel project folder.

✧ To do this, select **Create WinCC project** in the **WinCC** menu of Microsoft Excel.



[pas10, 1, en_US]

Figure 14-71 Creating a SIMATIC WinCC project

✧ Define the **project type** (single-user project, multiple-user project or multi-client project), a **project name** and a **path**.

All the files required for the SIMATIC WinCC project are created. In addition, the project properties, including the project name and project type, are entered in the Excel project folder.

You can now modify the project using the WinCC Explorer (i.e. insert alarms, structure types, connections, etc.) or further edit the Excel project.

14.7.2.3 Project Folder with Connection to a New SIMATIC WinCC Project

The result of a project folder with connection to a new SIMATIC WinCC project is the same as the creation of a project folder **without connection** to a SIMATIC WinCC project and the subsequent **Create WinCC project**, see chapter *14.7.2.2 Project Folder without Connection to an Existing SIMATIC WinCC Project*

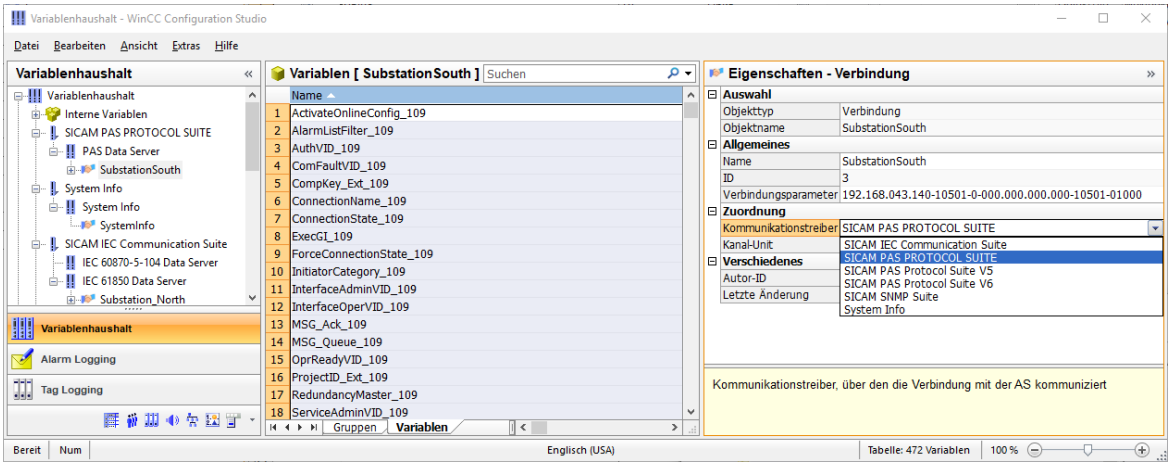
14.8 Working with the SIMATIC WinCC Configuration Tool

NOTE

The following sub-chapters are only relevant for WinCC V7.2 or earlier!
The **WinCC Configuration Tool** is no longer supported for WinCC V7.2 or later.

For SIMATIC WinCC V7.3 or later, the functions of the Configuration Tool of the **WinCC Configuration Studio** are integrated in the SIMATIC WinCC UI.

In **WinCC Configuration Studio**, open the connection properties and select the suitable communication driver.



[sc_change_version_of_channel, 1, en_US]

NOTE

This is only possible for different SICAM PAS versions!

14.8.1 Modifying the Channel Version

When working with different versions of the SICAM PAS system, e.g. after an upgrade, version-specific channels must be used. To do this, it might be necessary to reconfigure existing project data.

The following SICAM SCC communication drivers are supported by SIMATIC WinCC:

Table 14-16 SICAM SCC communication drivers supported

SICAM PAS PROTOCOL SUITE (default channel)	Channel for communication with a SICAM PAS of the same version as the currently installed SICAM SCC version; and default channel for all versions of SICAM PAS/PQS V7 and higher, SICAM SCC V7 and higher
SICAM PAS PROTOCOL SUITE V5	Channel for communication with SICAM PAS V5.11
SICAM PAS PROTOCOL SUITE V6	Channel for communication with SICAM PAS V6.xx
SICAM IEC COMMUNICATION SUITE	Channel for communication with IEC 61850 and IEC 60870-5- 104 devices

NOTE

When using different channels, you must ensure that you only integrate channels of different versions in SIMATIC WinCC. The default channel cannot be operated with a version-specific channel of the **same** version.

Only if different versions of SICAM PAS are connected to a SICAM SCC project, must different channels be used. Several SICAM PAS with the same version can communicate with SICAM SCC via the same channel.

NOTE

If data was imported into a version-specific channel or if data has to be moved to such a channel, the configuration must be modified accordingly. Data which you have imported into a channel is saved in the SIMATIC WinCC database with its ID. Data therefore cannot be moved from one channel to another on the SIMATIC WinCC user interface.

The standard solution in SICAM SCC would be to delete the data using the wizard and to re-import it into the other channel. During this process, all data configured after the import will be lost. For this reason, this approach does not always make sense. Using the SIMATIC WinCC Configuration Tool, it is possible to exchange one channel for the existing data. To do this, the SIMATIC WinCC project must be loaded into **Microsoft Excel** and further edited using the Configuration Tool in this program.

It is possible to exchange one channel for the existing data using the SIMATIC WinCC Configuration Tool. To do so, the SIMATIC WinCC project must be loaded into **Microsoft Excel** and further edited using the Configuration Tool in this program.

Notes on parameterization

- During an upgrade, an update in the default channel is performed **automatically**. There is no need to change the parameter settings.
- Data in version-specific channels with the versions 5 or 6 can only be moved by means of a manual change of the connection - either to the default channel or a channel with a different version (as described in the following paragraph).

The following paragraphs describe a change of the channel version for an existing SIMATIC WinCC project.

14.8.1.1 Creating a Project Folder

✧ Create an Excel project folder for the existing project and then connect it to the SIMATIC WinCC project. To do this, the SIMATIC WinCC project does not need to be open.

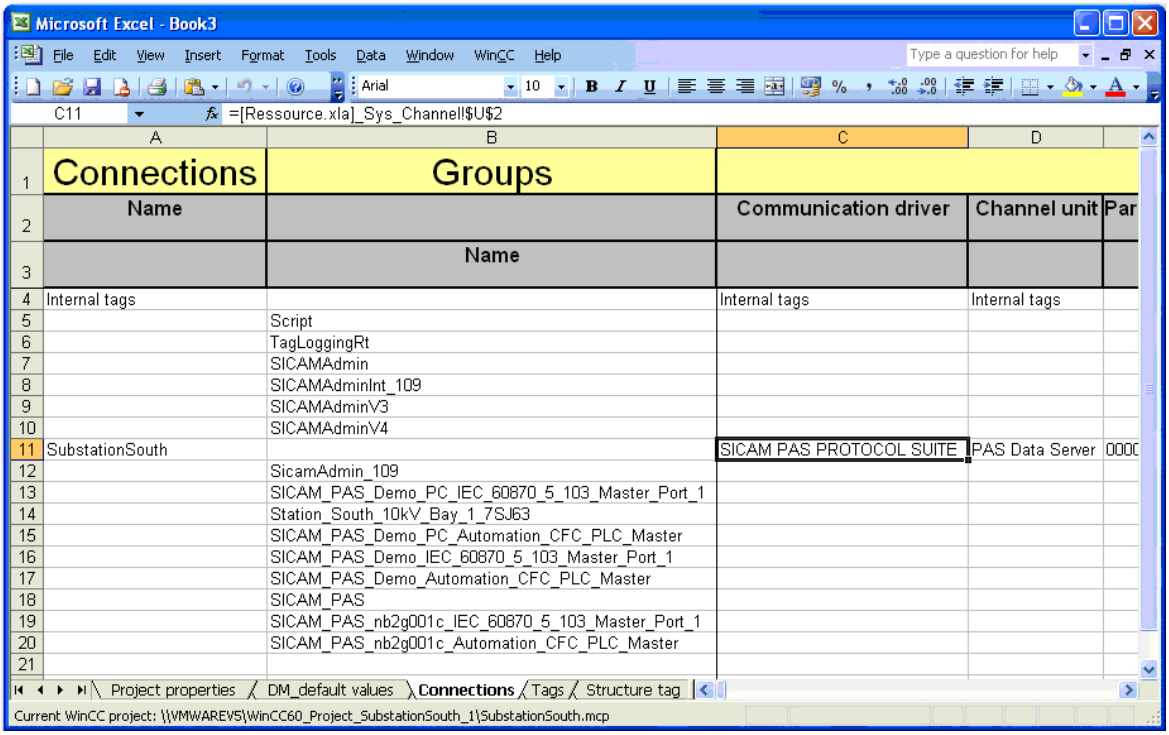
✧ Open the Connections table.

14.8.1.2 Selecting a Channel

The channel currently used for a station is indicated in the **Communication Driver** column.

- SICAM PAS PROTOCOL SUITE for the default channel
- SICAM PAS PROTOCOL SUITE V5 for a channel for communication with SICAM PAS V5.11
- SICAM PAS PROTOCOL SUITE V6 for a channel towards SICAM PAS V6.xx

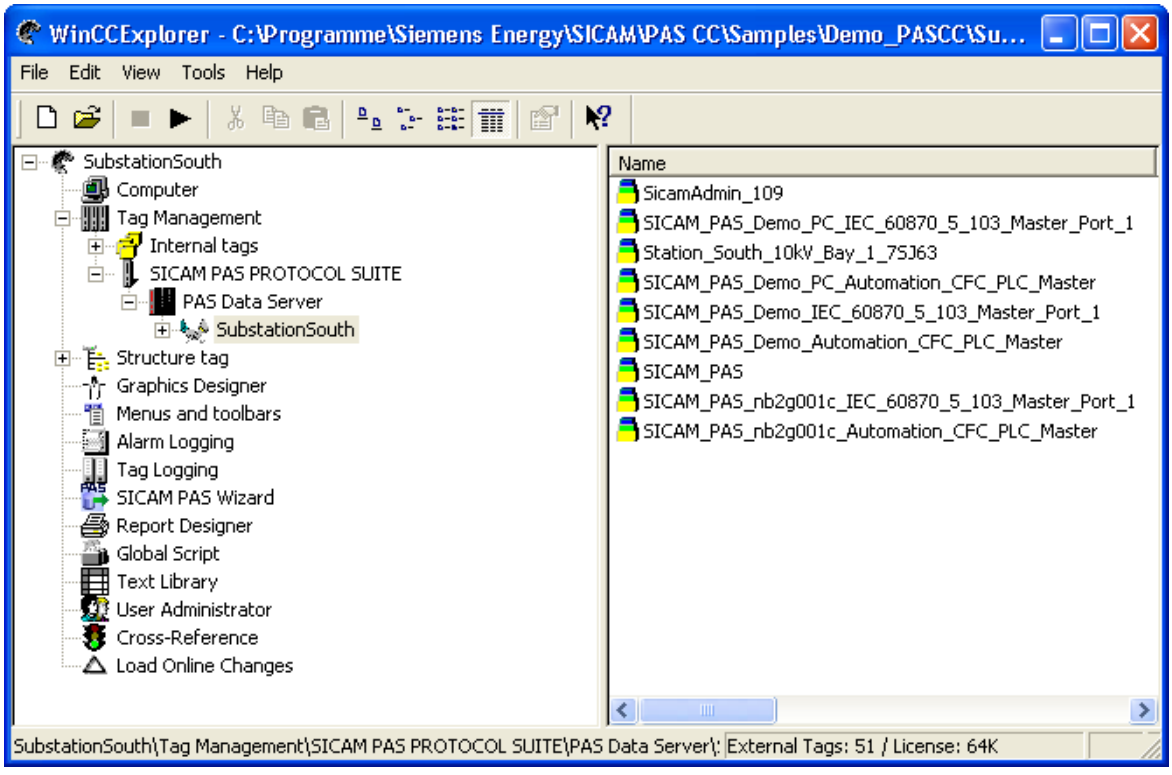
The default channel is used in the example below.



[pas11, 1, en_US]

Figure 14-72 SICAM PAS PROTOCOL SUITE communication driver

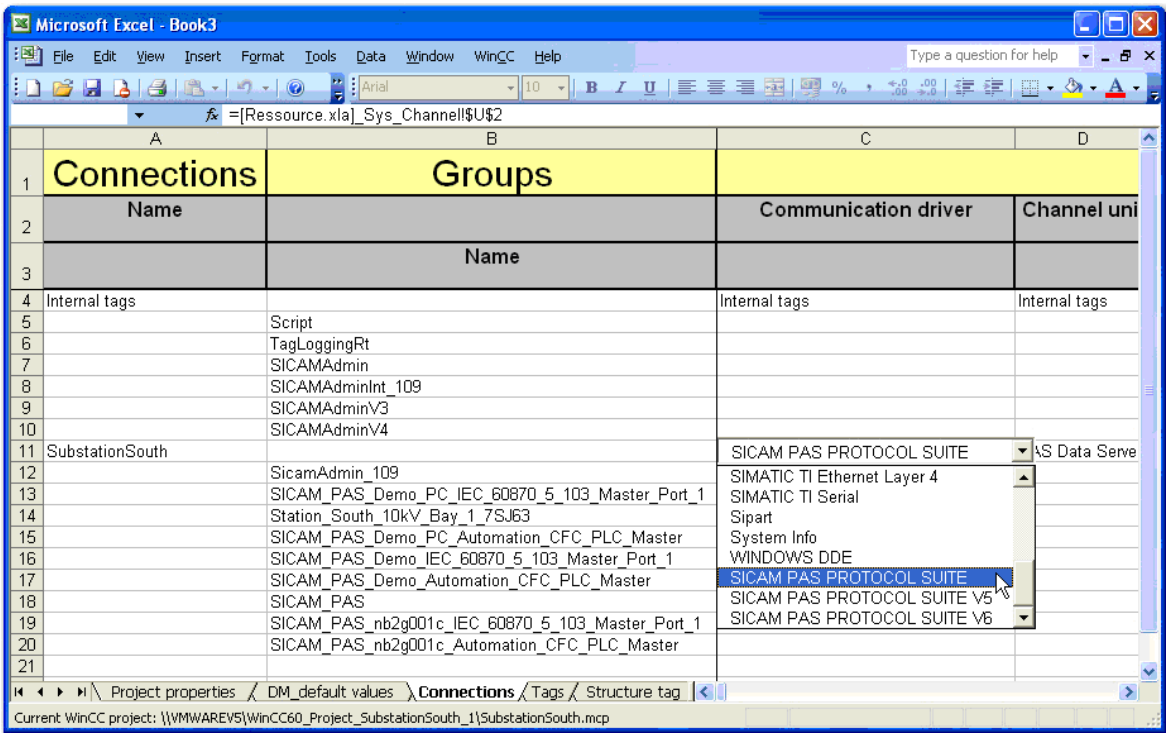
In the **WinCC Explorer**, the connection of **StationSouth** is represented as follows:



[pas12, 1, en_US]

Figure 14-73 Representation of the connection in the WinCC Explorer

✧ In the Excel table, double-click **SICAM PAS PROTOCOL SUITE**.
A selection menu with all the communication drivers available under SIMATIC WinCC opens:



[pas13, 1, en_US]

Figure 14-74 Selection of the communication drivers

✧ Select the corresponding communication driver.

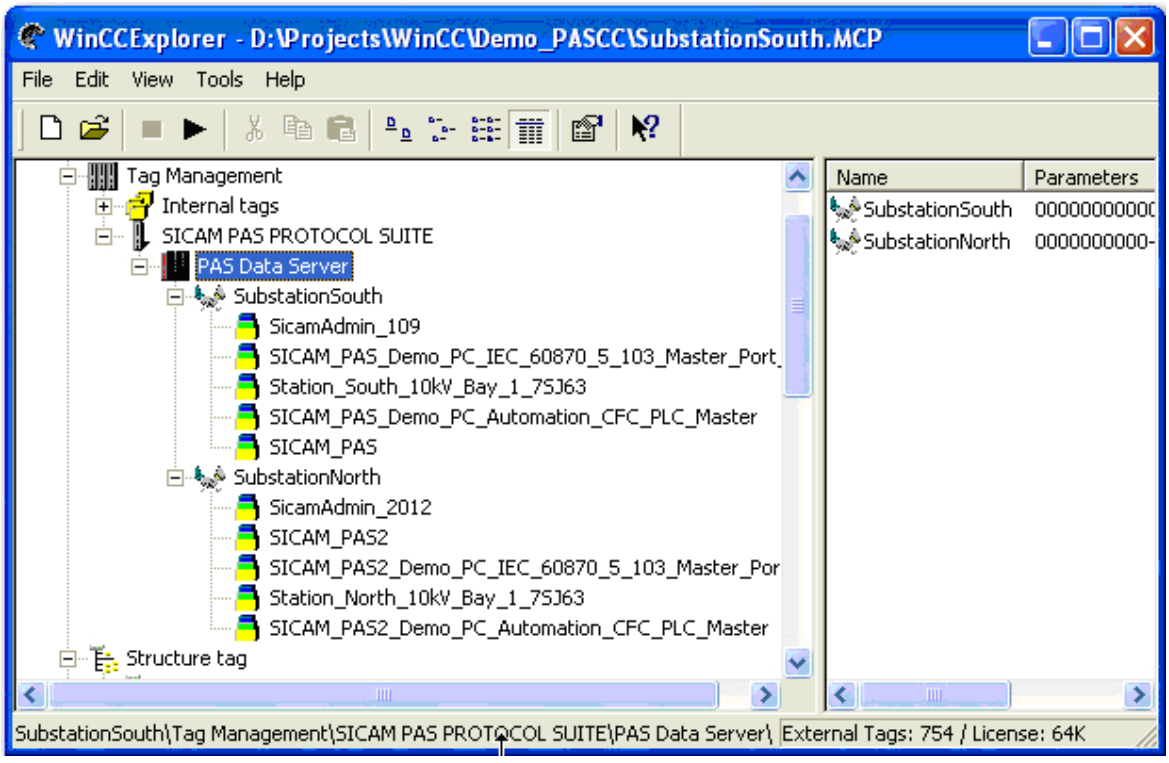
NOTE

If several stations exist, you must either select the default channel for each station or select one of the version-specific channels. You can select the same channel for several connections. The combination of a default channel and a version-specific channel of the **same** version is not permissible.

No check is performed. A potentially incorrect parameterization is not blocked by SIMATIC WinCC.

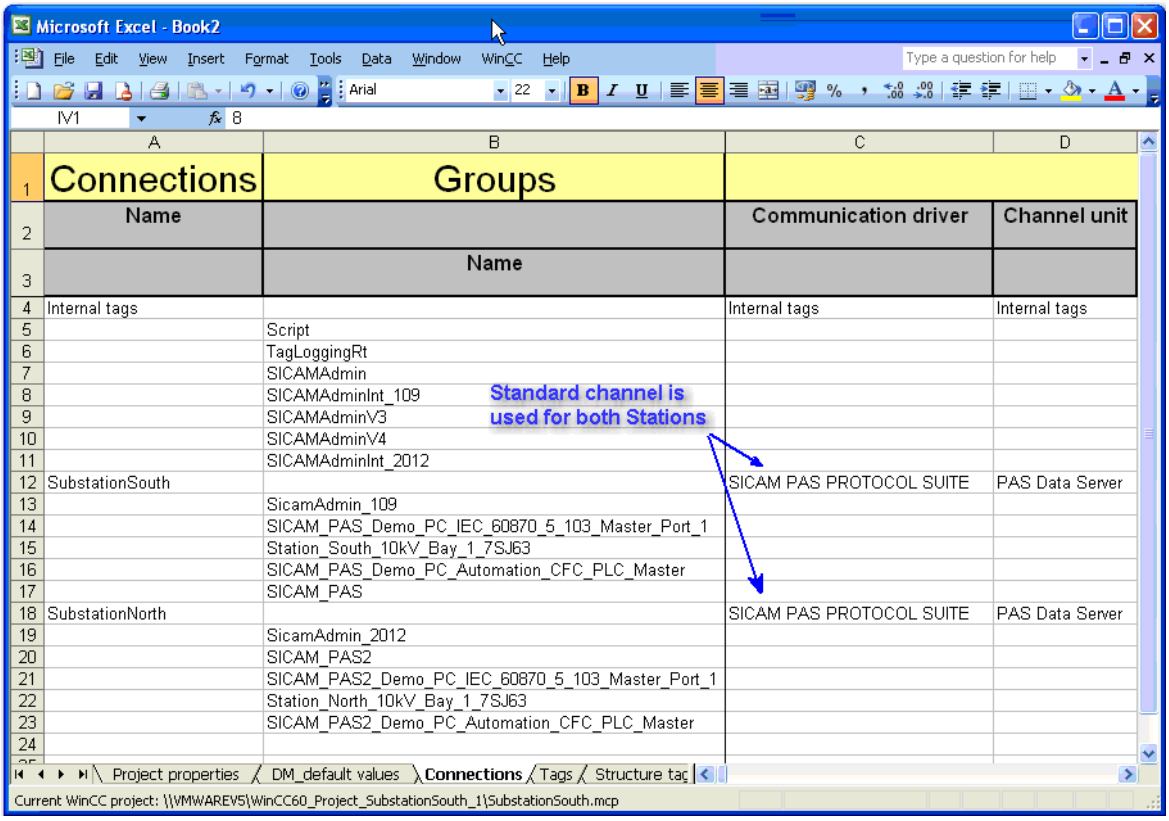
Working with the default channel

In the example, the **SICAM PAS PROTOCOL SUITE** channel has been selected for all connections (stations). Upgrades are performed automatically for this variant. It is not necessary to perform a manual parameterization by means of the SIMATIC WinCC Configuration Tool.



[pas14, 1, en_US]

Figure 14-75 Permissible parameterization: several stations on the default channel in the WinCC Explorer



	A	B	C	D
1	Connections	Groups		
2	Name		Communication driver	Channel unit
3		Name		
4	Internal tags		Internal tags	Internal tags
5		Script		
6		TagLoggingRt		
7		SICAMAdmin		
8		SICAMAdminInt_109		
9		SICAMAdminV3		
10		SICAMAdminV4		
11		SICAMAdminInt_2012		
12	SubstationSouth		SICAM PAS PROTOCOL SUITE	PAS Data Server
13		SicamAdmin_109		
14		SICAM_PAS_Demo_PC_IEC_60870_5_103_Master_Port_1		
15		Station_South_10kV_Bay_1_7SJ63		
16		SICAM_PAS_Demo_PC_Automation_CFC_PLC_Master		
17		SICAM_PAS		
18	SubstationNorth		SICAM PAS PROTOCOL SUITE	PAS Data Server
19		SicamAdmin_2012		
20		SICAM_PAS2		
21		SICAM_PAS2_Demo_PC_IEC_60870_5_103_Master_Port_1		
22		Station_North_10kV_Bay_1_7SJ63		
23		SICAM_PAS2_Demo_PC_Automation_CFC_PLC_Master		
24				

[pas15, 1, en_US]

Figure 14-76 Permissible parameterization: several stations on the default channel in Excel

Working with version-specific channels

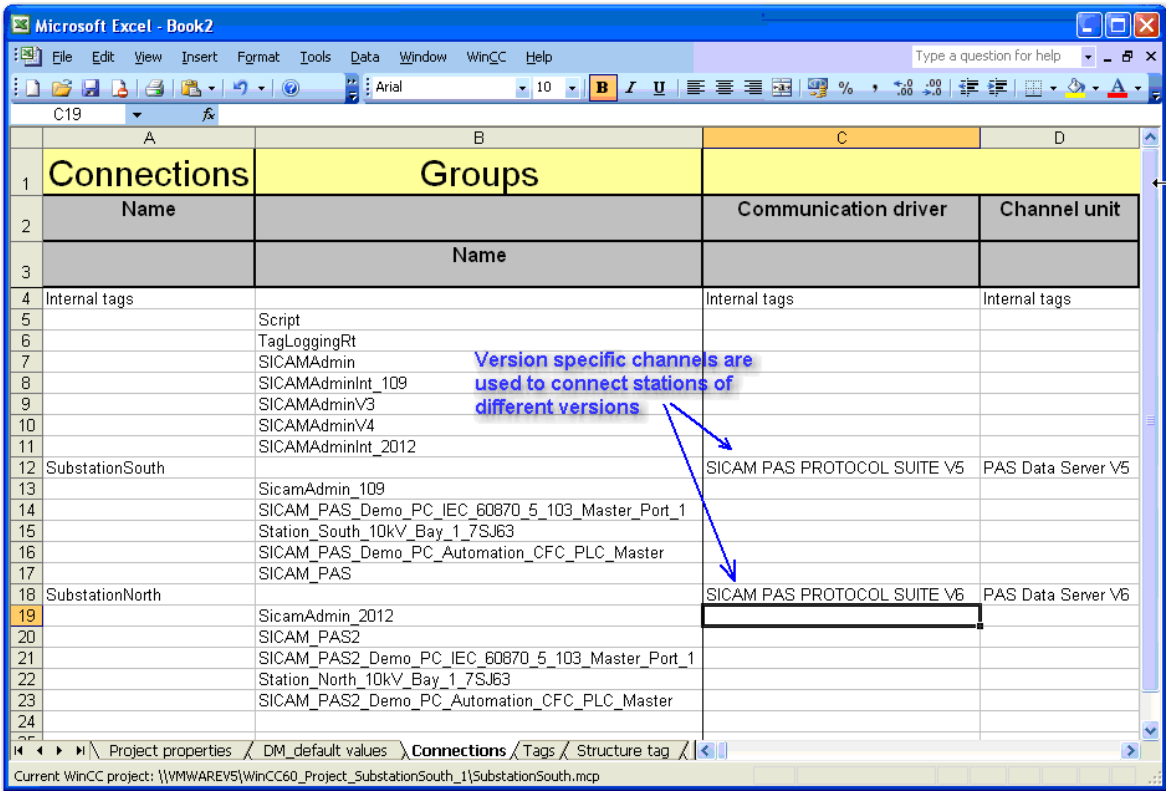
✧ Based on the explanations in the **Cases from Daily Practice** paragraph, you must decide which channels you want to use.

✧ Select the correct channel for the connections to your SICAM PAS systems:

- SICAM PAS PROTOCOL SUITE V5 for communication with SICAM PAS V5.11
- SICAM PAS PROTOCOL SUITE V6 for communication with SICAM PAS V6.xx

You can combine the different channels.

✧ Save the table.



	A	B	C	D
1	Connections	Groups		
2	Name		Communication driver	Channel unit
3		Name		
4	Internal tags		Internal tags	Internal tags
5		Script		
6		TagLoggingRt		
7		SICAMAdmin		
8		SICAMAdminInt_109		
9		SICAMAdminV3		
10		SICAMAdminV4		
11		SICAMAdminInt_2012		
12	SubstationSouth		SICAM PAS PROTOCOL SUITE V5	PAS Data Server V5
13		SicamAdmin_109		
14		SICAM_PAS_Demo_PC_IEC_60870_5_103_Master_Port_1		
15		Station_South_10kV_Bay_1_7SJ63		
16		SICAM_PAS_Demo_PC_Automation_CFC_PLC_Master		
17		SICAM_PAS		
18	SubstationNorth		SICAM PAS PROTOCOL SUITE V6	PAS Data Server V6
19		SicamAdmin_2012		
20		SICAM_PAS2		
21		SICAM_PAS2_Demo_PC_IEC_60870_5_103_Master_Port_1		
22		Station_North_10kV_Bay_1_7SJ63		
23		SICAM_PAS2_Demo_PC_Automation_CFC_PLC_Master		
24				

[pas16, 1, en_US]

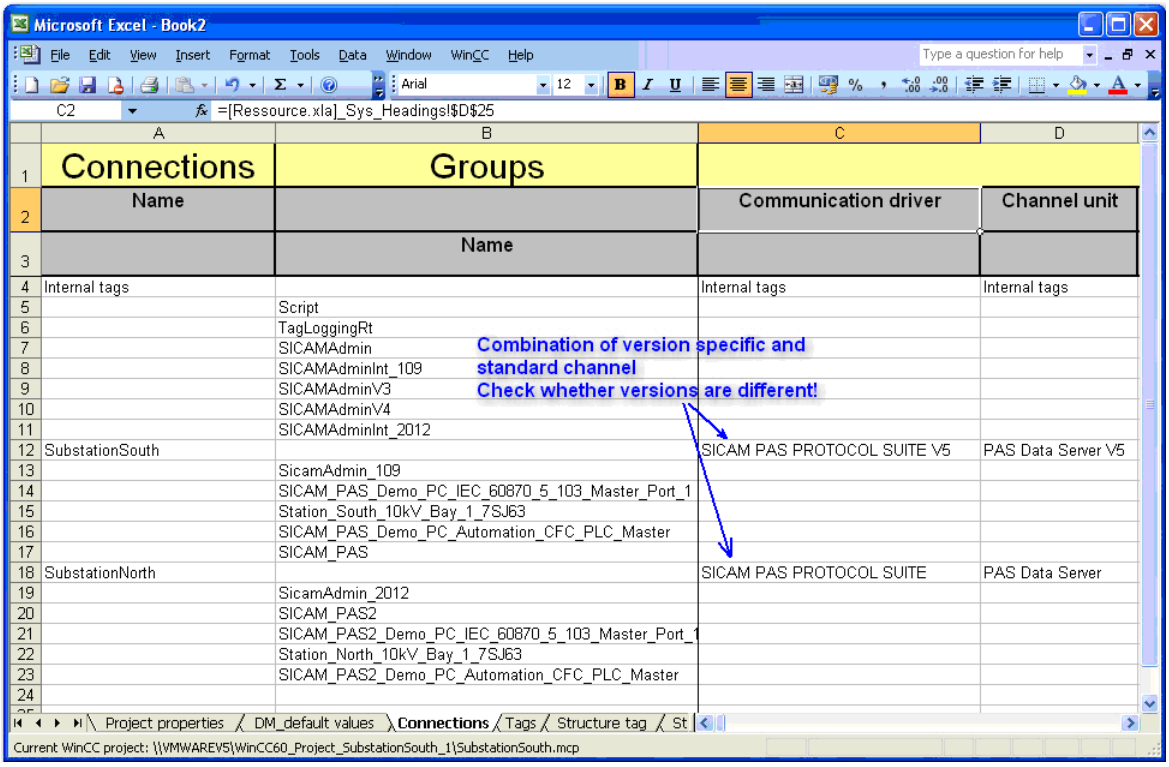
Figure 14-77 Parameterization: several stations on version-specific channels in Excel

Combination of the default channel and a version-specific channel

The combination of a default channel and a version-specific channel of the **same** version is not permissible. However, no check is performed. A potentially incorrect parameterization is not blocked by SIMATIC WinCC.

NOTE

Be aware that different versions must be used when combining the default channel with a version-specific channel. This check is particularly important for all upgrade scenarios.



[pas17, 1, en_US]

Figure 14-78 Parameterization: combination of a version-specific channel with a default channel in Excel

14.8.1.3 Writing Connections Back into the SIMATIC WinCC Project

After selecting a valid combination for the channels, you can write the modified settings back into the SIMATIC WinCC project.

If the SIMATIC WinCC project to be edited is open:

✧ In Microsoft Excel, select the **WinCC > Write connections** menu item.

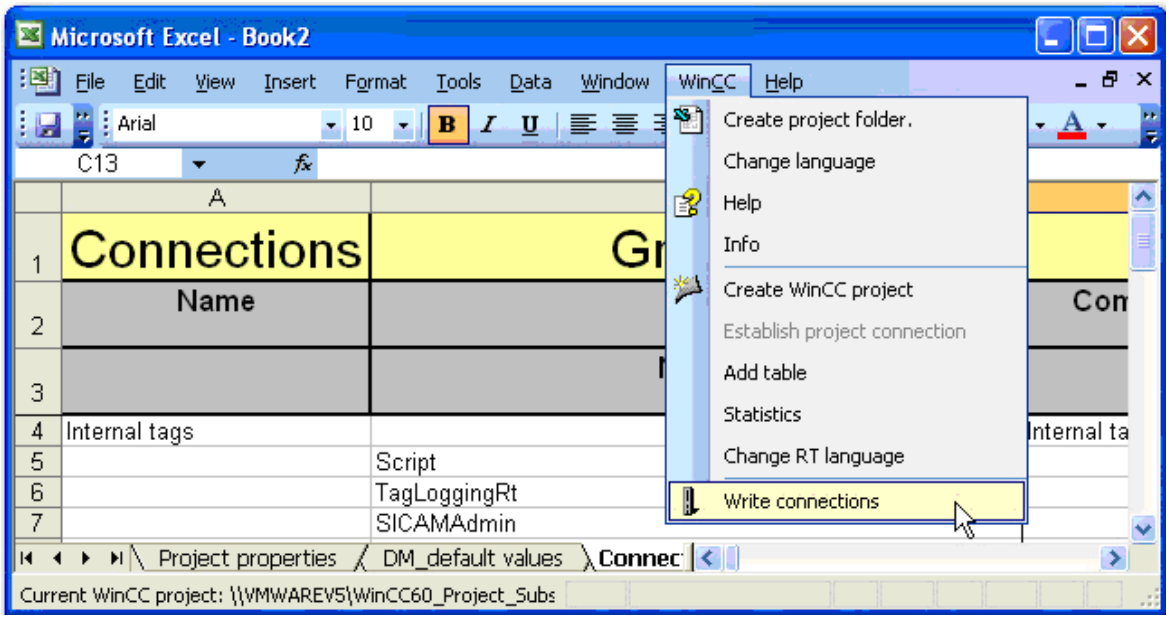
If the SIMATIC WinCC project to be edited is not open:

✧ Select the **Establish project connection** menu item.

A connection is established with the SIMATIC WinCC project assigned to the project folder. To do this, the WinCC Explorer is, however, not opened.

✧ In Microsoft Excel, select the **WinCC > Write connections** menu item.

You only need to write the changes.

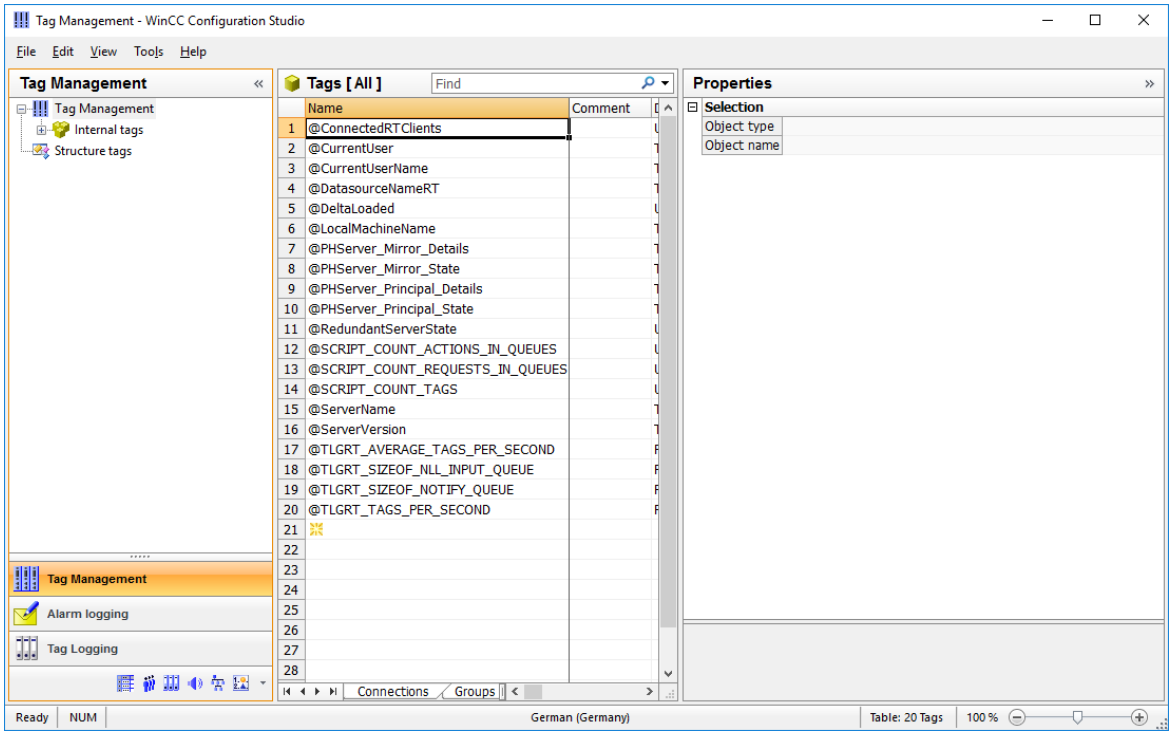


[pas18, 1, en_US]

Figure 14-79 Writing connections

You can now check the new connections in the WinCC Explorer.

After writing back the connections into the SIMATIC WinCC project, the version-specific channels with the stations are displayed as soon as the view has been refreshed. The default channel originally used is empty.



[pas19, 1, en_US]

Figure 14-80 WinCC Explorer after the change to version-specific channels

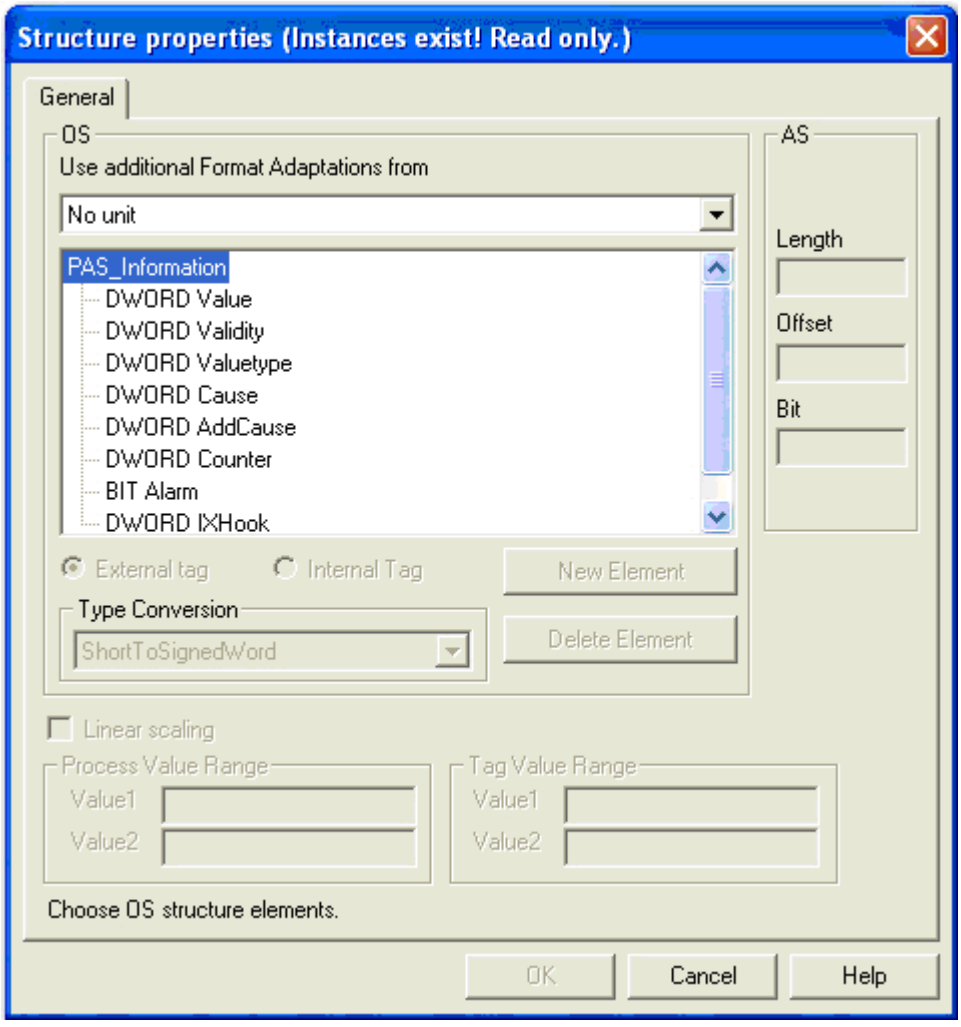
The **SICAM PAS PROTOCOL SUITE** driver previously used is still displayed in the Tag Management of the WinCC Explorer. This information cannot be automatically deleted from the system, but you can remove the driver manually.

The **SubstationSouth** station now uses the **SICAM PAS PROTOCOL SUITE V5** driver, whereas the **Substation-North** station uses the **SICAM PAS PROTOCOL SUITE V6** driver.

14.8.2 Editing Structure Types

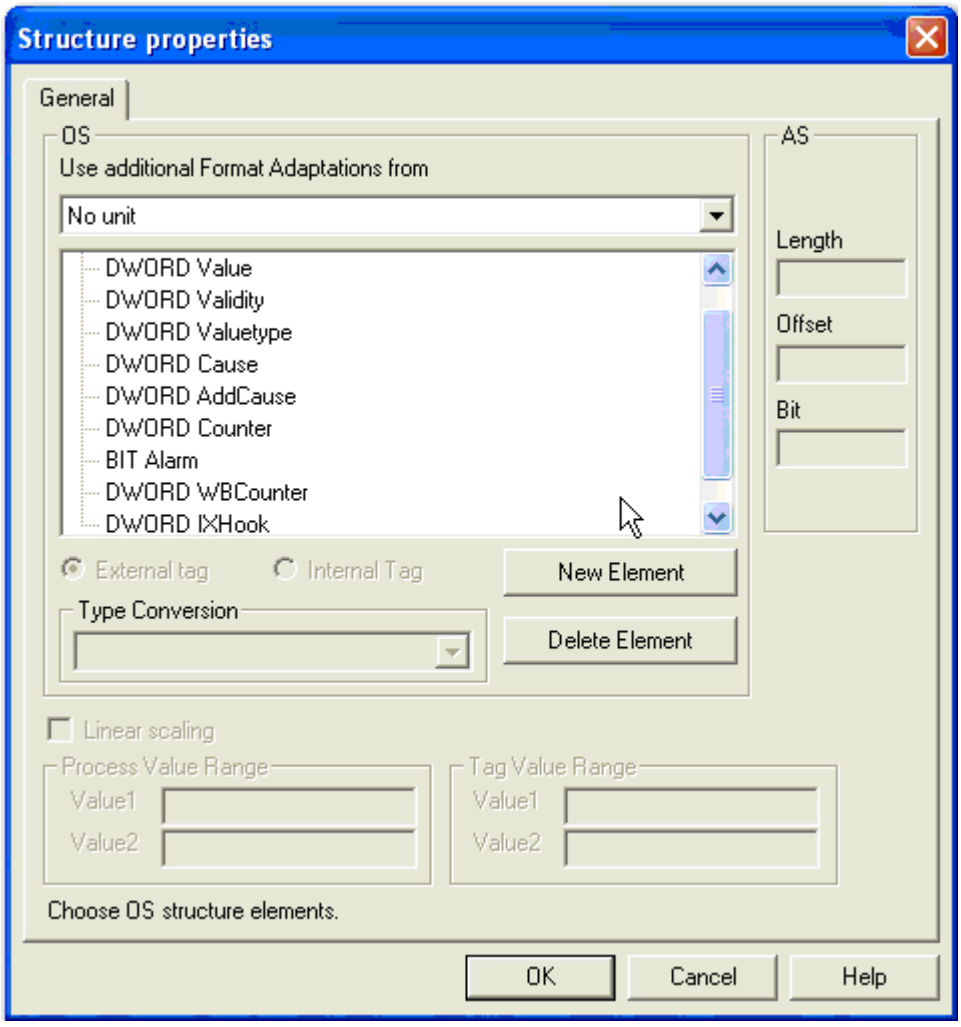
For a migration of SICAM PAS/SICAM PAS CC from V5.xx to SICAM SCC V8.04, the structure types must be extended in order to be able to use new functions of SIAM PAS V7.00/V8.00 or the SIMATIC WinCC WebNavigator.

For SICAM PASCC V6.00 or higher, you require an extension of the structure types by the **DWORD WBCounter** element in order to be able to execute the **Substitute** function.



[pas20, 1, en_US]

Figure 14-81 PAS_Information V5.xx structure type

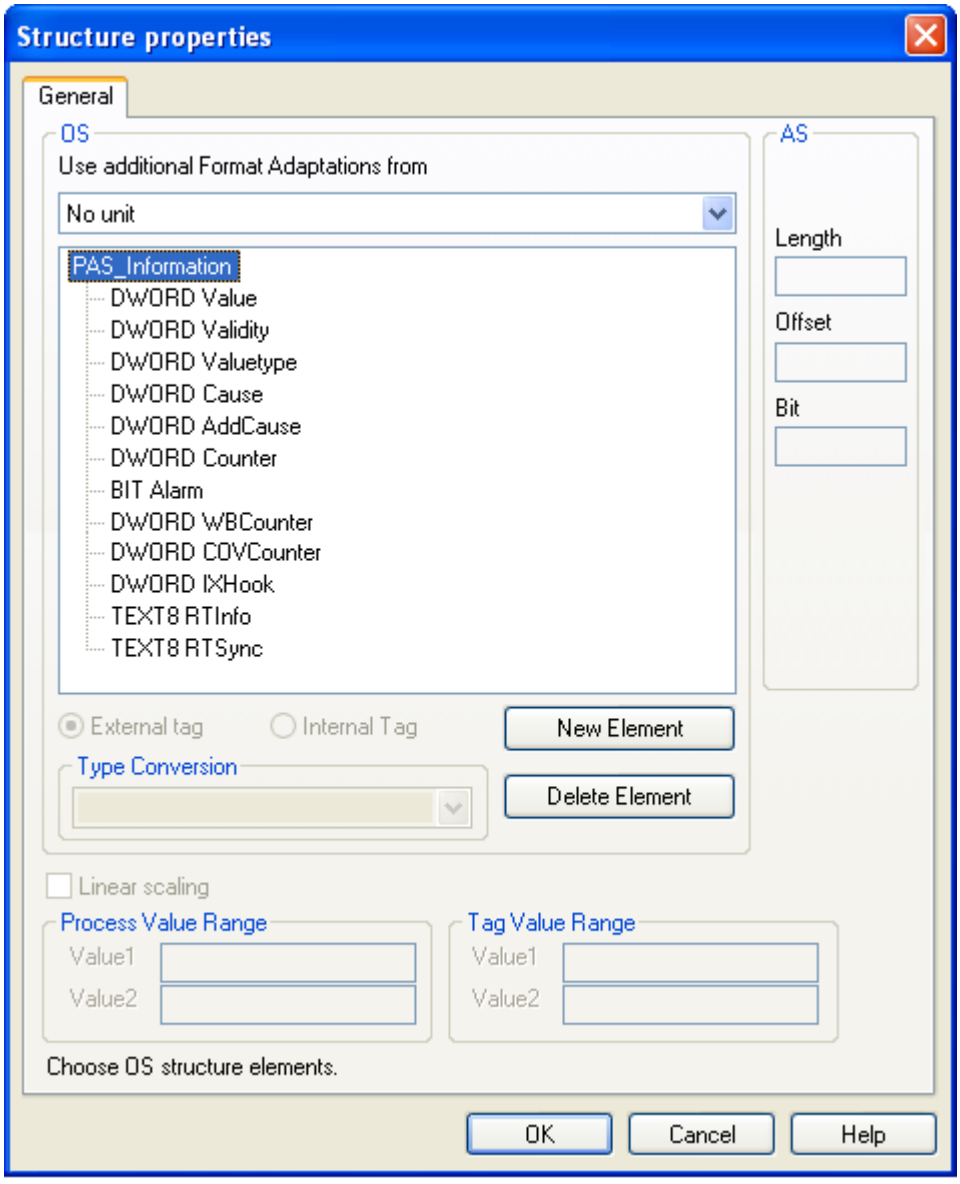


[pas21, 1, en_US]

Figure 14-82 PAS_Information V6.xx/V7.00 structure type

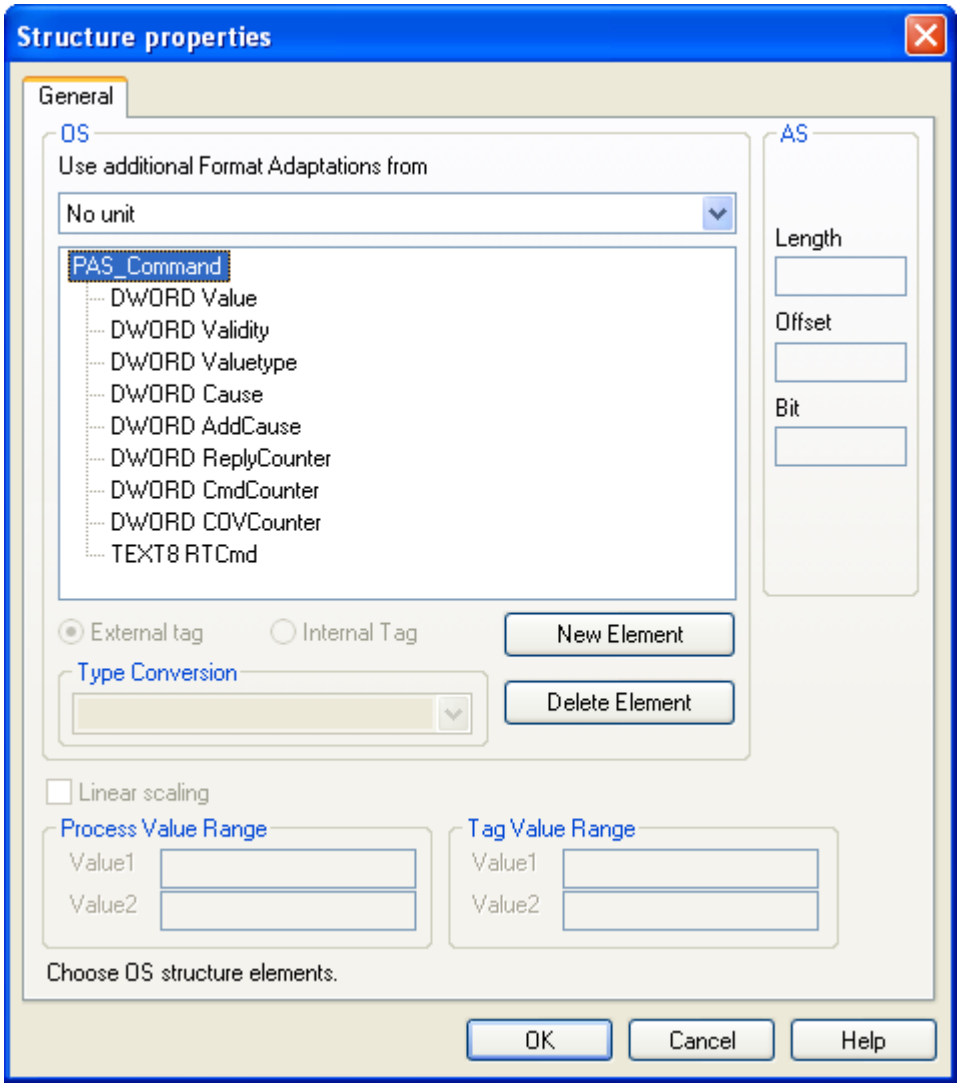
Additional structure element for the **PAS_Information V6.xx/V7.00** structure types:

- WBCounter



[SCC_PAS_Information, 1, en_US]

Figure 14-83 PAS_Information V8.00 structure type



[SCC_PAS_Command, 1, en_US]

Figure 14-84 PAS_Command V8.00 structure type

From SICAM SCC V8.00 (SIMATIC WinCC V7.0 or higher), an extension of the structure types by further elements is required in order to be able to establish the connection to the SICAM Runtime Dataserver, see chapter*7.8 SICAM SCC Runtime Data Server*.

Additional structure elements for the **PAS_Information V8.00** structure type:

- WBCounter
- COVCounter, external
- RTInfo, internal
- RTSync, internal

Additional structure elements for the **PAS_Command V8.00** structure type:

- COVCounter, external
- RTCmd, internal

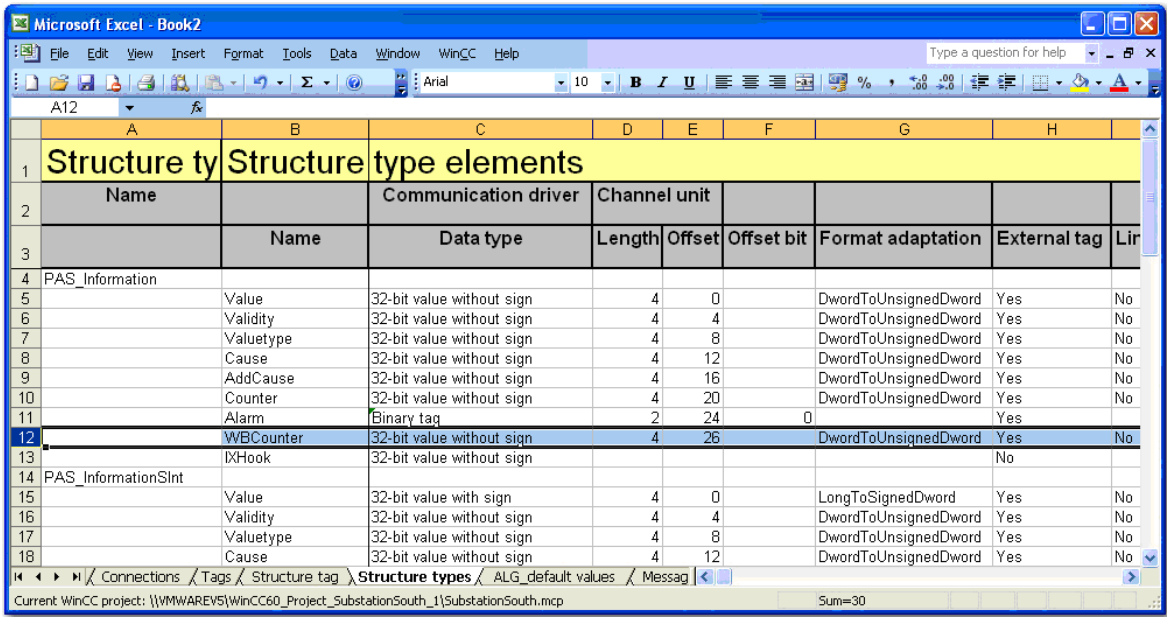
✧ Add/modify the structure types described in the paragraph below.

14.8.2.1 Modifying Structure Types

Using the SIMATIC WinCC Configuration Tool, it is also possible to modify structure types and the corresponding structure elements.

Proceed as follows in order to add a new structure element, e.g. **WBCounter**, to the **PAS_Information** structure type:

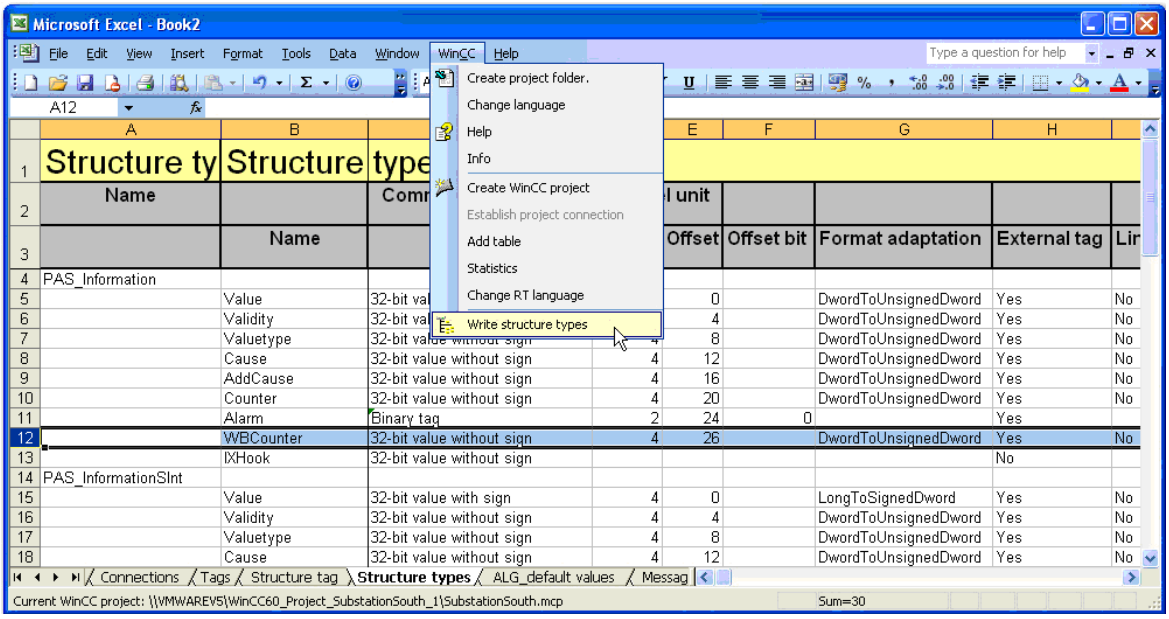
- ✧ Select the **Structure types** table in Microsoft Excel.
- ✧ Click **Insert > Rows** in order to insert a new row for the **PAS_Information** structure type.
- ✧ In the new row under **Structure elements**, enter **WBCounter** in the **Name** column.
- ✧ Double-click in the **Data type** column and select the **32-bit value without sign** data type from the list.
- ✧ Double-click in the **External tag** column and select **Yes**.
  Internal tags are only visible in SIMATIC WinCC on the internal, local or project level. The channel and SICAM PAS cannot "see" them.



[pas22, 1, en_US]

Figure 14-85 Defining a new structure element

- ✧ In Microsoft Excel, select the **WinCC > Write structure types** menu item.



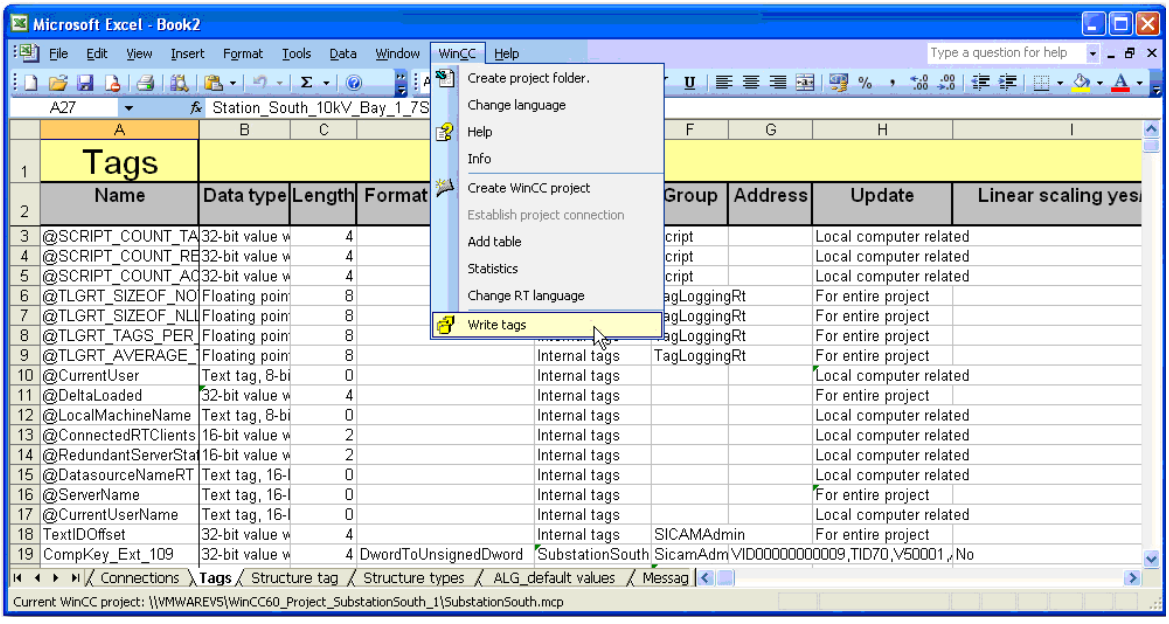
[pas23, 1, en_US]

Figure 14-86 Writing a structure type

It is sufficient only to write changes - select the **Changes only** checkbox for writing connections.

✧ Open the **Tags** table.

✧ Select the **WinCC > Write tags** menu item.
The new tags are transferred back into the SIMATIC WinCC project.



[pas24, 1, en_US]

Figure 14-87 Writing tags

14.8.2.2 Deleting Structure Types/Tags

When exchanging a V8 default channel by a version-specific V5 channel, you can use the Configuration Tool in order to delete V6-specific structure elements (if existing). If only SICAM PAS V5.xx is connected, the **WBCounter** structure element can be deleted.

In Microsoft Excel, do not use the **Edit > Delete cells** function in order to delete tags, structure types or structure type elements.

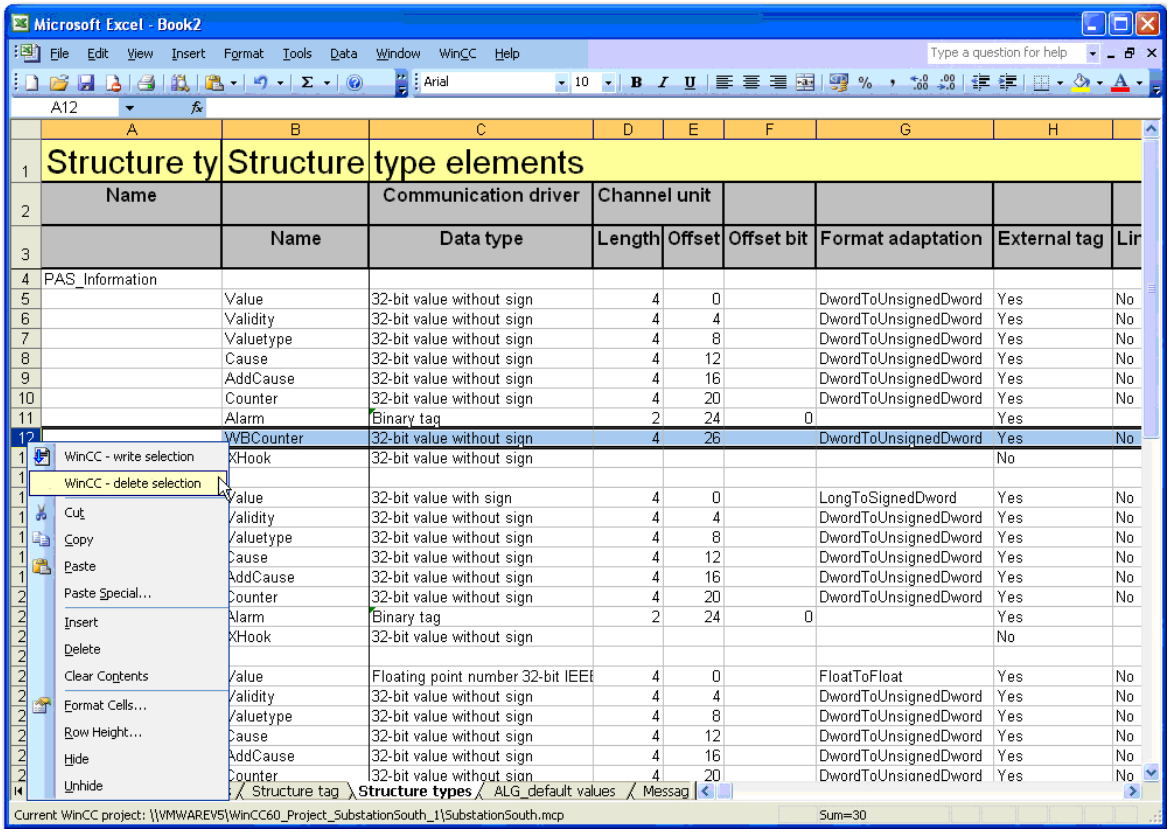
NOTE

Before each delete action, save the SIMATIC WinCC project because the delete action cannot be undone.

To delete tags, structure types, or structure type elements:

✧ Highlight the rows which you want to delete.

✧ Right-click the highlighted rows and then select **WinCC - Delete selection** from the context menu.



[pas25, 1, en_US]

Figure 14-88 Deleting a structure element

When deleting structure types and structure elements, the corresponding structure tags are deleted automatically.

A Appendix

A.1	Structures	500
A.2	Quality Codes of Variables	509
A.3	Character Conversion	510
A.4	Additional Information in Message Lists	514

A.1 Structures

In SICAM SCC, the items of PAS information (tags) is (are) processed as structures; a structure consists of several elements. There are 6 different structure types.

When importing tags from SICAM PAS, the tags are automatically assigned to the corresponding structure type.

In SICAM SCC, you directly access structure type elements, i.e. tags and relevant additional information.

This chapter provides a list of the structure types and an overview of the meaning of the structure elements.

External Structure Types

The following external SICAM SCC structure types are created by the **SICAM PAS Wizard**:

- PAS_Information
- PAS_InformationFloat
- PAS_InformationSInt
- PAS_Command
- PAS_CommandFloat
- PAS_CommandSInt

Structure Elements

The structures are composed of elements.

Table A-1 **PAS_Information** structure (monitoring direction)

Double word (4 bytes)	Value
Double word (4 bytes)	Validity
Double word (4 bytes)	Valuetype
Double word (4 bytes)	Cause
Double word (4 bytes)	Additional cause (AddCause)
Double word (4 bytes)	Counter
Bit	Alarm
Double word (4 bytes)	WBCounter
Double word (4 bytes)	IXHook
Double word	COVCounter
8-bit character set text variable	RTInfo
8-bit character set text variable	RTSync
8-bit character set text variable	RTTopo

NOTE

WBCounter is only available for newly created projects. Old projects can be adjusted accordingly (see *14.8.2 Editing Structure Types*)

Table A-2 Structure **PAS_InformationFloat** (monitoring direction)

Floating point (4 bytes)	Value
Double word (4 bytes)	Validity
Double word (4 bytes)	Valuetype
Double word (4 bytes)	Cause
Double word (4 bytes)	Additional cause (AddCause)

Double word (4 bytes)	Counter
Bit	Alarm
Double word (4 bytes)	WBCounter
Double word (4 bytes)	IXHook
Double word	COVCounter
8-bit character set text variable	RTInfo
8-bit character set text variable	RTSync
8-bit character set text variable	RTTopo

Table A-3 **PAS_InformationSInt** structure (monitoring direction)

Long (4 bytes)	Value
Double word (4 bytes)	Validity
Double word (4 bytes)	Valuetype
Double word (4 bytes)	Cause
Double word (4 bytes)	Additional cause (AddCause)
Double word (4 bytes)	Counter
Bit	Alarm
Double word (4 bytes)	WBCounter
Double word (4 bytes)	IXHook
Double word	COVCounter
8-bit character set text variable	RTInfo
8-bit character set text variable	RTSync
8-bit character set text variable	RTTopo

Table A-4 **PAS_Command** structure (command direction)

Double word (4 bytes)	Value
Double word (4 bytes)	Validity
Double word (4 bytes)	Valuetype
Double word (4 bytes)	Cause
Double word (4 bytes)	Additional cause (AddCause)
Double word (4 bytes)	ReplyCounter
Double word (4 bytes)	Command counter (CmdCounter)
Double word	COVCounter
8-bit character set text variable	RTCmd

Table A-5 **PAS_CommandFloat** structure (command direction)

Floating point (4 bytes)	Value
Double word (4 bytes)	Validity
Double word (4 bytes)	Valuetype
Double word (4 bytes)	Cause
Double word (4 bytes)	Additional cause (AddCause)
Double word (4 bytes)	ReplyCounter
Double word (4 bytes)	Command counter (CmdCounter)
Double word	COVCounter
8-bit character set text variable	RTCmd

Table A-6 **PAS_CommandSInt** structure (command direction)

Long (4 bytes)	Value
Double word (4 bytes)	Validity
Double word (4 bytes)	Valuetype
Double word (4 bytes)	Cause
Double word (4 bytes)	Additional cause (AddCause)
Double word (4 bytes)	ReplyCounter
Double word (4 bytes)	Command counter (CmdCounter)
Double word	COVCounter
8-bit character set text variable	RTCmd

For monitoring and controlling, you specifically access the elements of the structures.

Structure Elements

- **Value**
  The possible variants are indicated for each **Value Type**. The description does not mention all possible types, but is restricted to the most important types.

Value Type 1: Organizational message
Frei definiert, je nach Informationsadresse.

Value Type 2: Double-point indication

Highword			
Lowword			D

D:	00	Intermediate position
	01	OFF
	10	ON
	11	Fault

Value Type 3: Single-point indication

Highword			
Lowword			S

S:	1	OFF
	2	ON

Value Type 5: Transformer tap indication

Highword				
Lowword		LZ	LK	8 bits Transformer tap (binary)

LZ:	0	Runtime monitoring not activated
LZ:	1	Runtime monitoring activated
LK:	0	Moving contact does not move (final position)
LK:	1	Moving contact moves (intermediate position)

Value Type 6: Message with value

Highword	32 bits real value
Lowword	

Value Type 7: Bit pattern indication, 8 bits

Highword		
Lowword		8 bits bit pattern (binary)

Value Type 8: Bit pattern indication, 16 bits

Highword		
Lowword	16 bits bit pattern (binary)	

Value Type 9: Bit pattern indication, 24 bits

Highword	
Lowword	24 bits bit pattern (binary)

Value Type 10: Bit pattern indication, 32 bits

Highword	32 bits bit pattern (binary)
Lowword	

Value Type 12: Metered value

Highword	32 bits value, two's complement
Lowword	

Value Type 13: Persistent switching command

Highword			
Lowword			S

S: 0 OFF
1 ON

Value Type 14: Pulse switching command

Highword	24 bits		
Lowword	Duration in ms		S

S: 0 OFF
1 ON

If 0 ms is used as the period, the time sent by the CFC is used.

Value Type 17: Transformer tap positioning command

Highword		
Lowword		8 bits Transformer tap (binary)

Value Type 18: Setpoint digital, 8 bits

Highword		
Lowword		8 bits setpoint value (binary)

Value Type 19: Setpoint digital, 16 bits

Highword		
Lowword	16 bits setpoint value (binary)	

Value Type 21: Setpoint digital, 32 bits

Highword	32 bits setpoint value (binary)
Lowword	

Value Type 22: Setpoint value analog, floating point

Highword	32 bits real value
Lowword	

Values which cannot be represented as a 16 Bit-value are not output. They are BF-acknowledged with a plausibility error as an additional cause.

Value Type 24: Setpoint value analog, fixed point

Highword		
Lowword	Value	

16 bits value, two's complement

Value Type 28: Measured value, floating point

Highword	32 bits real value
Lowword	

Value Type 30: Measured value, fixed point

Highword		
Lowword	Value	

16 bits value, two's complement

- **Status**

  The **Status** element is composed of two parts. Byte 0 and Byte 1 include the **Status**, Byte 2 and Byte 3 indicate a **Timeout** in seconds.

  The timeout is the system-internal monitoring time for the command output.

Value (Byte 0 and Byte 1)	**Meaning**
Bit 0	Reserved (System)
Bit 1	Reserved (System)
Bit 2	Bit 2 within the status means that the process data have been written into SICAM SCC for the first time after a restart (SICAM PAS or SICAM SCC). This informs all components about the system restart. The components then check if they can continue from the last known status or if they have to re-initialize.
Bit 3	Reserved (System)
Bit 4	Reserved (System)
Bit 5	Reserved (System)
Bit 6	Reserved (System)
Bit 7	Counter state
Bit 8	Bay blocking set
Bit 9	Reserved (System)
Bit 10	Not updated (not topical)
Bit 11	Substituted
Bit 12	Reserved (System)
Bit 13	Remote monitoring direction blocked
Bit 14	Invalid
Bit 15	Overflow

- **Value Type**

Value	Meaning
1	Organizational indication
2	Double-point indication
3	Single-point indication
4	Event indication
5	Transformer tap position indication
6	Indication with value
7	Bit pattern indication, 8 bits
8	Bit pattern indication, 16 bits
9	Bit pattern indication, 24 bits
10	Bit pattern indication, 32 bits
11	Organizational acknowledgment
12	Metered value
13	Persistent switching command
14	Pulse switching command
15	Continuous control command
16	Auto-reclose command
17	Regulating step command
18	Scheduled value digital, 8 bits
19	Scheduled value digital, 16 bits
20	Scheduled value digital, 24 bits
21	Scheduled value digital, 32 bits
22	Setpoint analog, floating point
23	Setpoint analog, standardized
24	Setpoint analog, fixed point
25	GI request
26	Restore command
27	Organizational command
28	Measured value, floating point
29	Measured value, normalized
30	Measured value, fixed point
31	Sequence

- **Cause**

Group / Value	Meaning
0	Irrelevant
1	Spontaneous
2	Cyclic, periodic
3	Initialized/default
4	Buffered
8	General interrogation
9	Request
10	Metered-value interrogation
16	Check

Group / Value	Meaning
17	Positive check result
18	Negative check result
19	Command execution
20	Command acceptance positive
21	Command acceptance negative
23	Return information negative
24	Command feedback intermediate position
25	Cancellation
26	Positive abortion procedure
27	Cancellation negative
28	Command execution ending
29	Release request
30	Positive release request
31	Negative release request
32	Organizational information
33	Information loss
34	Return Information
35	Command termination positive
36	Command termination negative
Bit 7	Direction bit

- **Additional Cause**

Value	Meaning
0	No error
32	Release control
33	Reset command
34	Incorrect output time
35	Error on command check
36	Error in counter release
37	Unknown I/O channel
38	Too many commands active
39	Incorrect command type
40	Incorrect data type
41	Command not accepted
64	1-out-of-n error (hardware)
65	Target check
66	Voltage command relay
67	Release relay cannot be terminated
68	Output register not plausible
80	De-energized
81	Switching current check
82	Incorrect operational output
83	Command output voltage missing
96	Interlock finding
97	Switching error protection interlock
98	Parameter error

Value	Meaning
99	Violation of switching authority
100	Command too old
101	No process output object
102	Output disabled
103	Hardware error module
104	Hardware error I/O channel
105	Overload
112	Upper limit
113	Lower limit
114	Plausibility error
115	Sync. prerequisite missing
116	Device state preventing command
117	SCHEDULED = ACTUAL
118	Monitoring time elapsed (timeout)
119	Acquisition disabled
120	Chatter disabling active
121	1-of-n error (software)

- **Counter**

For process indications

The **counter** is increased by the SICAM PAS PROTOCOL SUITE whenever a new item of information has been transmitted.

The **WBCounter** is increased by the WinCC object whenever an item of information must be substituted on the SICAM PAS server.

For commands

For SICAM SCC to send a command, the **command counter** (CmdCounter) must be increased. In this way, the SICAM PAS PROTOCOL SUITE detects that the information has changed.

The **ReplyCounter** is increased by the SICAM PAS PROTOCOL SUITE whenever a new item of information, e.g. a CO+ or COE command feedback, has been transmitted.

System-wide centralized counter (COVCounter)

The **COVCounter** is managed consistently on a system-wide level in SICAM PAS and SICAM SCC and enables the precise assignment of information.

- **Alarm**

This element is only relevant for old systems. For old projects in which the alarms are triggered by changes of the process tags (bit message procedure), the alarm bit of the corresponding tag is used as a trigger.

0	OFF
1	ON

- **IXHook**

The IXHook tag is created as an internal tag of an ActiveX Controls. It comprises the current status of the ActiveX Controls during the runtime of the project.

- **RuntimeDataServer Tags**

The **RTInfo** and **RTCmd** tags are required for the internal communication of the graphic objects via the RuntimeDataServer. Process values and command outputs are routed via the RuntimeDataServer which processes them.

The **RTSync** tag is used in order to match items of SICAM information between redundant WinCC servers.

The **RTTopo** tag is used in order to transfer the topological information from the topology component (colors, style, topological status).

A.2 Quality Codes of Variables

The following table lists the quality codes that are set by the SICAM PAS PROTOCOL SUITE.

Table A-7 Quality codes of variables

Hex value	Quality	Meaning	Q	Q	S	S	S	S	L	LA
00	Bad	Non-specific - There is no specific reason why the value is bad. Used for propagation.	0	0	0	0	0	0	-	-
0C	Bad	Device Failure - Set if the source of the value is affected by a device failure.	0	0	0	0	1	1	-	-
14	Bad	No Communication, with last usable value - Set if this value had been set by communication, which has now failed.	0	0	0	1	0	1	-	-
18	Bad	No Communication, with no usable value - Set if there has never been any communication with this value since it was last "Out of Service".	0	0	0	1	1	0	-	-
44	Uncertain	Last Usable Value - Whatever was writing this value has stopped doing so. This is used for fail safe handling.	0	1	0	0	0	1	-	-
48	Uncertain	Substitute value - Predefined value is used instead of the calculated one. This is used for fail safe handling.	0	1	0	0	1	0	-	-
4C	Uncertain	Initial Value - Value of volatile parameters during and after reset of the device or of a parameter.	0	1	0	0	1	1	-	-
80	Good (Non-Cascade)	OK - No error or special condition is associated with this value.	1	0	0	0	0	0	-	-

The 2 low-order bits are set optionally in the quality codes.

Table A-8 Limits - optionally in the quality codes

Meaning	Q	Q	S	S	S	S	L	L
O.K. - The value is free to move	-	-	-	-	-	-	0	0
High limited - The value has exceeded its high limits	-	-	-	-	-	-	1	0

The abbreviations in the table columns mean:

Q	Quality
S	Substatus of the quality
L	Limits, this value is optionally

A.3 Character Conversion

When importing SICAM PAS process tags or SICAM PAS archive tags from SICAM PAS or SICAM plusTOOLS, the tag names are adapted to the conventions of SIMATIC WinCC.

This paragraph contains conversion tables showing how the names are changed during the import process.

Process Tags

For SICAM PAS CC and SICAM SCC, the type of special character conversion is defined in the SICAM PAS Wizard. For SICAM SAS, it is defined in the SICAM Global Wizard.

- **Character conversion in SICAM SCC**

  In order to create a new station in SICAM SCC, the **SICAM, V5.0 (or later) conforming** parameter must be selected in the SICAM PAS Wizard under **General settings**. The special characters in tag names are converted as follows during the import process:

Table A-9 Character conversion in SICAM SCC

SICAM PAS	SICAM SCC
\	_ (underscore)
Blank character	is deleted
.	_
;	_
,	_
:	_
=	EQ
<	SM
>	GR
{	(
}	)
[	(
]	)
*	_
"	_
`	_
´	_
&	_
/	_
+	_
-	_
'	_
?	_
!	_
$	_
%	_

The special character conversion includes special characters of the German and English keyboard. All other special characters which are represented on keyboards for other languages are converted to the corresponding ASCII codes.

NOTE

Special features in **SICAM IEC Wizard**:
Texts being too long are cut automatically. For resulting identical entries warnings are displayed during import. This behavior may occur especially for direct SCD import, without editing via SICAM TOOLBOX II. Observe the warnings.

- **SICAM WinCC V2.xx character conversion**
  To update an existing station created with SICAM WinCC V2.xx, the **Special character conversion SICAM WinCC to V2.1x conforming** parameter must be selected in the SICAM Global Wizard under **General settings**. The special characters in tag names are converted as follows during the import process:

Table A-10 SICAM WinCC V2.xx character conversion

SAS	WinCC
\	_
Blank character	is deleted
.	_
ä	ae
ö	oe
ü	ue
Ä	AE
Ö	OE
Ü	UE
;	_
:	_
=	##
<	#_
>	_#
{	_
}	_
[	_
]	_
*	_
"	_
`	_
´	_
&	_
/	_
+	_
-	_
@	_

- **Character conversion SICAM WinCC V3.1**
  In order to create a new station with SICAM WinCC V3.1, the **Special character conversion SICAM WinCC, V3.1x (or later) conforming** parameter must be selected in the SICAM Global Wizard under **General settings**. The special characters in tag names are converted as follows during the import process:

Table A-11 Character conversion SICAM WinCC V3.1

SAS	WinCC
\	_
Blank character	is deleted
.	_
;	_
:	_
{	_
}	_
[	_
]	_
*	_
“	_
`	_
´	_
/	_
+	_
-	_

Archive Tags

Special characters in message names are converted during the import process as described below.

- **SICAM SCC character conversion**

Table A-12 Character conversion in message names

SICAM PAS	SICAM SCC
\	_
Blank character	is deleted
.	_
;	_
,	_
:	_
=	EQ
<	SM
>	GR
{	(
}	)
[	(
]	)
*	_
“	_
`	_
´	_
&	_
/	_
+	_
-	_
@	_

SICAM PAS	SICAM SCC
’	_
?	_
!	_
$	_
%	_

The special character conversion includes special characters of the German and English keyboard. All other special characters which are represented on keyboards for other languages are converted to the corresponding ASCII codes.

- **SICAM WinCC character conversion**

Table A-13 Character conversion in message names

SAS	WinCC
\	_
Blank character	is deleted
.	_
ä	ae
ö	oe
ü	ue
Ä	AE
Ö	OE
Ü	UE
;	_
‚	_
:	_
=	EQ
<	SM
>	BG
{	_
}	_
[	_
]	_
*	_
“	_
`	_
´	_
&	_
/	_
+	_
-	_
@	_

A.4 Additional Information in Message Lists

This paragraph describes which additional items of information are written into which columns of the SICAM SCC message lists.

The list refers to the text library which is included in the program.

Table A-14 Additional information in message lists - Value

Column	Textlib-ID (Offset in Value Text Group)	Process Value	German Text	English Text
Value	0	0	Zwischenstellung Doppelmeldung	interm. state double indication
	1	1	AUS Doppelmeldung	OFF double indication
	3	2	EIN Doppelmeldung	ON double indication
	22	3	Störstellung Doppelmeldung	bad state double indication
	3	2	KOM Einzelmeldung	RAISED single indication
	4	1	GEH Einzelmeldung	CLEARED single indication
	5	0	Ereignis Statusänderung	event state change
	6	2	Wischer	transient
	7	SICAM SAS	Trafostufenstellbefehl RC	tap position RC
	8	SICAM SAS	Trafostufenstellung Laufkontakt	tap position moving contact
	9	SICAM SAS	Messwert TCB (Total Count Bit)	metered value TCB
	10	SICAM SAS	Messwert IEB (Internal Error Bit)	metered value IEB
	11	SICAM SAS	Messwert RB (Restore Bit)	metered value RB
	12	1	AUS Befehl	OFF static output command
	13	2	EIN Befehl	ON static output command
	14	0/3	STOP Dauerbefehl	STOP continous command
	15	1	MINUS Dauerbefehl	MINUS continous command
	16	2	PLUS Dauerbefehl	PLUS continous command
	17	2	EIN Impulsbefehl	ON pulse output command
	18	1	AUS Impulsbefehl	OFF pulse output command
	19	1	TIEFER Trafostufenstellbefehl	DOWN tap position command
	20	2	HOEHER Trafostufenstellbefehl	UP tap position command
	21	_	nicht initialisiert	not initialized

Table A-15 Additional information in message lists - Block Status

Column	Textlib-ID 2030 (+ Offset)	German Text	English Text
Block status	9	Aus Feld- und Fernwirksperre	Not blocked bay and telecontrol
	10	Feldsperre	bay blocked
	11	Fernwirksperre	telecontrol blocked
	12	Feld- und Fernwirksperre	bay and telecontrol blocked
	13	ignoriere Fernwirksperre	ignore telecontrol blocking
	14	werte Fernwirksperre aus	evaluate telecontrol blocking

Table A-16 Additional information in message lists - Location

Column	Textlib-ID 1700 (+ Offset)	German Text	English Text
Location	0	Irrelevant	irrelevant
	1	Vorort	local
	2	Nah	near
	3	Fern	remote
	4	Automatisch	automatic
	5	Automatisch (Feld)	automatic (bay)
	6	Prozess	process
	10	DIGSI Vorort	DIGSI local
	11	DIGSI Fern	DIGSI remote
	20	Gerät ungültig	device invalid
	21	Gerät gesperrt	device locked

Table A-17 Additional information in message lists - Cause

Column	Textlib-ID 1000 (+ Offset)	German Text	English Text
Cause	0	Ursache irrelevant	cause irrelevant
	1	spontan	spontaneous
	2	periodisch	periodic
	3	initialisiert	initialized
	4	Generalabfrage	buffered
	8	Generalabfrage	general interrogation
	9	Anfrage	request
	10	Zählwertabfrage	counter value request
	16	Prüfung	check back
	17	Prüfung +	check back +
	18	Prüfung -	check back -
	19	Befehl	command
	20	Befehl +	command +
	21	Befehl -	command -
	22	Rückmeldung +	feed back +
	23	Rückmeldung -	feed back -
	24	Rückmeldung stör	feed back intermediate
	25	Abbruch	abortion
	26	Abbruch +	abortion +
	27	Abbruch -	abortion -
	28	Befehlsende	command execution end
	29	Freigabeanforderung	release request
	30	Freigabeanforderung +	release request +
	31	Freigabeanforderung -	release request -
	32	Organisatorische Meldung	organisatory indication
	33	Meldungsverlust	information loss
	34	Rückmeldung	feed back
	35	Befehlsende +	command execution end +
	36	Befehlsende -	command execution end -
	37	Abbruch Ende +	abortion end +
	38	Abbruch Ende -	abortion end -
	39	Prüfungsende +	check back end +
	40	Prüfungsende -	check back end -
	41	Freigabeanf. Ende +	release reg end +
	42	Freigabeanf. Ende -	release reg end -

Table A-18 Additional information in message lists - Status

Column	Textlib-ID 2100 (+ Offset)	German Text	English Text
Status	5	Umspeicherbit	metered value freeze bit
	6	Internes Fehlerbit	internal Error bit
	7	Zählerstand	metered value
	8	Feldsperre	bay blocked
	9	Externer Fehler	external error
	10	Nicht aktuell	not topical
	11	Nachgeführt	substituted
	12	Flattersperre	debounced
	13	Fernwirksperre	telecontrol blocked
	14	Ungültig	invalid
	15	Überlauf	overflow
	16	Status Ok	status ok

Table A-19 Additional information in message lists - Additional Cause

Column	Textlib-ID 1200 (+ Offset)	German Text	English Text
Additional cause	0	Kein Fehler	no error
	32	Freigabeansteuerung	release control
	33	Rücksetzen Befehl	reset command
	34	Falsche Ausgabezeit	output time error
	35	Fehler bei Befehlskontrolle	control error
	36	Fehler Zählerfreigabe	counter release error
	37	Unbekannter I/O-Kanal	unknown I/O channel
	38	Zu viele Befehle aktiv	too many active commands
	39	Falscher Befehlstyp	command type error
	40	Falscher Datentyp	datatype error
	41	Befehl wird nicht angenommen	command not accepted
	64	1 aus n-Fehler (Hardware)	1 out of n-error (hardware)
	65	Zielkontrolle	target check
	66	Spannung Befehlsrelais	command relay voltage
	67	Freigaberelais nicht absteuerbar	release can not be terminated
	68	Ausgaberegister nicht plausibel	output register not plausible
	80	Spannungsfreiheit	de-energized
	81	Schaltstromkontrolle	terminal allocation
	82	Falscher Betriebsausgang	operational output error
	83	Befehlsausgabespannung fehlt	command output voltage missing
	96	Verriegelungsbefund	interlocking
	97	Schaltfehlerschutzverriegelung	switchgear interlocking
	98	Parameterfehler	parameter error
	99	Verstoß Schalthoheit	authority violation
	100	Befehl zu alt	command too old
	101	Kein Prozessausgabeobjekt	no process output object
	102	Ausgabesperre	output disable
	103	HW-Fehler Baugruppe	HW error module
	104	HW-Fehler I/O-Kanal	HW error I/O channel
	105	Überlast	overload
	112	Obere Grenze	upper limit
	113	Untere Grenze	lower limit
	114	Plausibilitätsfehler	plausibility error
	115	Voraussetzung für Sync. fehlt	sync. precondition missing
	116	Gerätezustand verhindert Befehl	dev. state disables command
	117	SOLL = IST	set = actual
	118	Überwachungszeit abgelaufen	monitoring time expiredset = actual
	119	Erfassungssperre	acquisition disable
	120	Flattersperre aktiv	debouncing active
	121	1 aus n-Fehler (Software)	1 out of n-error (software)
	196	Verriegelt, synchronisiert	interlocked, synchronized
	197	Verriegelt, nicht synchronisiert	interlocked, not synchronized
	198	Unverriegelt, synchronisiert	non-interlocked, synchronized
	199	Unverriegelt, nicht synchronisiert	non-interlocked, not synchronized

Table A-20 Additional information in message lists - ID number, Additional information

Column	Textlib-ID 1900 (+ Offset)	German Text	English Text
ID number	0	Identifikationsnummer irrelevant	identification number irrelevant
	1	Implizit bestimmt	implicitly determined
	2	Rückmeldungsidentifikator	return information identifier
	3	Fehlernummer	fault number
Additional information	4	Zusatzinformation irrelevant	suppl. info irrelevant
	5	Zusatzinformation impl. bestimmt	suppl. info impl. determined
	6	Relativzeit in ms	relative time in ms
	7	Quelladresse	initiator address
	8	Ein Laufkontakt	ON transition information
	9	Gemeldet von:	Reported by:

Table A-21 Additional information in message lists - Time Status IEC Communication Suite

Column	Textlib-ID 1170 (+ Offset)	German Text	English Text
Time status IEC Communication Suite	0	W | EXT (Winterzeit, Prozess - extern)	W | EXT (Standard time, process - extern)
	1	S | EXT (Sommerzeit, Prozess - extern)	S | EXT (DST, process - extern)
	2	W | INT (Winterzeit, Kanal - intern)	W | INT (Standard time, channel - intern)
	3	S | INT (Sommerzeit, Kanal - intern)	S | INT (DST time, channel - intern)

Table A-22 Additional information in message lists - Time Status PAS Channel

Column	Textlib-ID 1180 (+ Offset)	German Text	English Text
Time status PAS channel	0	W |GN (Winterzeit, gültig, nicht synchronisiert)	W | VN (Standard time, valid, not synchronized)
	1	S |GN (Sommerzeit, gültig, nicht synchronisiert)	S | VN (DST, valid, not synchronized)
	2	W |GS (Winterzeit, gültig, synchronisiert)	W | VS (Standard time, valid, synchronized)
	3	S |GS (Sommerzeit, gültig, synchronisiert)	S | VS (DST, valid, synchronized)
	4	W |UN (Winterzeit, nicht gültig, nicht synchronisiert)	W | IN (Standard time, not valid, not synchronized)
	5	S |UN (Sommerzeit, nicht gültig, nicht synchronisiert)	S | IN (DST, valid, not synchronized)
	6	W |US (Winterzeit, nicht gültig, synchronisiert)	W | IS (Standard time, not valid, synchronized)
	7	S |US (Sommerzeit, gültig, synchronisiert)	S | IS (DST, not valid, synchronized)
	8	e (von SICAM PAS ersetzt)	r (replaced by SICAM PAS)
	-	(WinCC) Zeitstempel von SICAM SCC erzeugt	(WinCC) Time stamp generated by SICAM SCC

Table A-23 Additional information in message lists - Time Status SIMATIC S7 Channel

Column	Textlib-ID 1190 (+ Offset)	German Text	English Text
Time status SIMATIC S7 channel	0	GN (gültig, nicht synchronisiert)	VN (valid, not synchronized)
	1	GS (gültig, synchronisiert)	VN (valid, synchronized)
	2	UN (ungültig)	IN (invalid)
	3	S (Sommerzeit)	DST (Daylight Saving Time)
	4	W (Winterzeit)	noDST (Standard time)

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Index

1,2,3 ...

1-of-N Command Interlocking 258
1-pole 185
2-pole 185

A

Adjustments for DAF 395
Alarm systems extension 17
Anwendungsbeispiele 200
Anzeige Messwert/Zählwert 156
Assignment Tables
    DAF 279
Aufgaben
    benutzerdefiniert 214
Automated Installation 28

B

Basic Hardware 22

C

Client-Server-Systeme 343
Coloring 183
Command Interlocking 258
Configuration
    DAF 271
Connector 183

D

DAF
    adjustments 395
    Assignment Tables 279
    Configuration 271
    Filter criterion actions 275
    Filter Criterion Settings 273
    Mapping 277
Data Analysis 183
Defining SICAM Electrical Device Controls
    180
Demo Mode 26
Demo Project 34
Design Variants 26
Detailbild erstellen 78
Dynamic Alarm Filter
    Assignment Tables 279
    Configuration 271
    Mapping 277
Dynamic Network Coloring 168

F

Feeder 171, 183
    Supply 177
    Tag connection 177
Fehlersuche 198
Feldübersicht 148
Frühere SICAM PAS CC/SCC-Versionen 409

G

Grafikobjekte 107
Ground 171

I

IEC 60870-5-104 236
IEC 61850 236
IEC tags 237
Installation
    Automated 28
    SICAM SCC components 27
    SIMATIC WinCC 25
Installation Requirements 22

K

Konvertieren vorheriger Projekte 393

L

Licensed Version 27
Licensing
SICAM SCC components 28
SIMATIC WinCC 25
Line Node 185
List tag prefix 196

M

Mapping
DAF 277
Microsoft .NET Framework 22

N

Neues Projekt anlegen 35

O

Operating System 22

P

Parametrierung 183
Picture window 196
Product Overview
Redundant system 19
SICAM functions 19
SICAM graphic object library 17
SICAM Graphics Designer Extension 19
SICAM SCC Components 17
SICAM Valpro 19
SICAM Wizard 18
Product Overwiev
Alarm systems extension 17

R

Redundant system 19
Redundanz 349
Removing the license
SICAM SCC components 30
SIMATIC WinCC 31

S

Schalterleiste
erstellen 97
Sequence of Installation 22
SI with Alarm when OFF 395
SI with Alarm when ON 395
SICAM Add-In 203
SICAM Bay Overview 148
SICAM Electrical Device Control 171, 171
SICAM functions 19
SICAM graphic object library 17
SICAM Graphics Designer Extension 19
SICAM RTU 236
SICAM SCC components 27
SICAM SCC Components 17
SICAM SCC-Komponenten und -Funktionen 233
SICAM Schaltobjekte 112
SICAM Switch Controls 112, 181, 181
SICAM Topologie 171
SICAM Valpro 19
SICAM Wizard 18
SIMATIC WinCC
installation 25
Source 183
Structure tags 180
Supply 177
Systemzeit 377

T

TEA-X Wizard 74
Termination 171, 183
Topological Elements 183
Topologische Einfärbung 167
Topologische Elemente 170
Transformer 171
Trial Mode 27

U

Uninstallation
SICAM SCC components 30
SIMATIC WinCC 31

V

Verschiedene SICAM PAS-Versionen 361
Volume Requirements 44

W

WinCC Web Navigator 367
WinCC-Projekt initialisieren 43