SIEMENS

SIMOCRANE

Crane Management System (CMS)

System Manual

Valid for
Version 4.4 SP3

11/2019

Legal information

Warning notice system

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Division Process Industries and Drives
Postfach 48 48
90026 NÜRNBERG
GERMANY

Ⓟ 12/2019 Subject to change

Preface

Brief description

This document is part of the SIMOCRANE CMS product package. It describes the structure and functionality of SIMOCRANE CMS based on SIMATIC WinCC and the SIMOCRANE CMS AddOn package. With SIMOCRANE CMS, SIMATIC WinCC is expanded with specific functions of a crane management system.

The scope of functions offered by SIMOCRANE CMS include:

- Graphical visualization of the crane
- Alarm/event system and support for diagnostics
- Replay function: past crane events (historical data) are replayed on the familiar CMS user interface
- Measured value acquisition of diverse crane data
- Acquisition and analysis of move data
- Acquisition and analysis of operating hours and counters
- Process data interfaces to various automation systems
- Standard interfaces to higher-level logistics systems
- Evaluation of operating data and acquisition and evaluation of downtimes, Gantt and bar charts

The user interface is structured according to user groups and offers different users the information and functions they require for their work.

Example applications are also supplied in the CMS add-on package as a basis for configuring a CMS station. The example application includes the functions of the crane management system described above. This document describes how the example applications can be adapted to various project requirements.

Note

We recommend that projects are configured on the basis of example applications.

Demarcation

SIMOCRANE CMS provides various tools for implementing the required CMS functionality for all types of crane applications. It is not a ready-to-run crane management system. The functional scope must be configured and planned specifically for the system with the CMS system configuration.

Area of application

The system is designed for use on cranes and for harbor and industrial environments. SIMOCRANE CMS, as the SCADA product, used enables adaptation to the most varied applications. Scalability permits the building of simple CMS single-user systems up to and including complex CMS/RCMS configurations (multi-user systems) in IT infrastructures.

Target groups and level of knowledge

This document addresses the following target groups:

- Sales & Marketing
- Engineering
- Commissioning engineers
- End users

The target groups engineering and commissioning engineers require sound knowledge of SIMATIC WinCC.

Additional Information

Siemens product support

You can find the latest information about SIMATIC WinCC products, product support, and FAQs on the Internet here (https://support.industry.siemens.com/cs/document/109746335).

You will find information on WinCC as a SCADA system here (http://support.automation.siemens.com/WW/view/en/10805583/133200).

You will find the latest information on SIMOCRANE products, product support, and FAQs on the Internet here (http://support.automation.siemens.com/WW/view/en/10807397/130000).

Crane application notes can be found on the Internet:
here (http://support.automation.siemens.com/WW/view/en/48342008/136000)

Siemens product support for SIMOCRANE

The following addresses provide support for your SIMOCRANE products:

- Support request on the Internet:
  - http://support.automation.siemens.com
- Europe hotline
  - Phone: +49 (0) 911 895 7 222
  - Fax: +49 (0) 911 895 7 223
  - Email: support.automation@siemens.com

- America hotline
  - Phone: +1 423 262 5710
  - Fax: +1 423 262 2231
  - Email: support.america.automation@siemens.com
- Asia/Pacific hotline
  - Phone: +86 10 6475 7575
  - Fax: +86 10 6474 7474
  - Email: support.asia.automation@siemens.com

Application support for SIMOCRANE

For additional customer-specific requirements and applications, please contact the following e-mail address:
applications.cranes.aud@siemens.com

Further assistance

We also offer courses to help you familiarize yourself with SIMOCRANE CMS and its principle operation. You will find further information here:
applications.cranes.aud@siemens.com

If you have any additional questions, please contact your local Siemens sales office.

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Fundamental safety instructions 1

1.1 General safety instructions

⚠ WARNING

Danger to life if the safety instructions and residual risks are not observed

If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur.

- Observe the safety instructions given in the hardware documentation.
- Consider the residual risks for the risk evaluation.

⚠ WARNING

Malfunctions of the machine as a result of incorrect or changed parameter settings

As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect the parameterization against unauthorized access.
- Handle possible malfunctions by taking suitable measures, e.g. emergency stop or emergency off.

⚠ WARNING

Malfunction due to uncontrolled changeover between operating states

Uncontrolled change of the operating state can cause malfunctions on machines that can result in injuries or death.

- Assess the effects of changeover between operating states in the risk analysis.
- Provide appropriate safety measures, e.g. EMERGENCY OFF.

1.2 Warranty and liability for application examples

Application examples are not binding and do not claim to be complete regarding configuration, equipment or any eventuality which may arise. Application examples do not represent specific customer solutions, but are only intended to provide support for typical tasks.

As the user you yourself are responsible for ensuring that the products described are operated correctly. Application examples do not relieve you of your responsibility for safe handling when using, installing, operating and maintaining the equipment.

1.3 Industrial security

Note

Industrial security

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

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

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the Internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. using firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that can be implemented, please visit:

Industrial security (https://www.siemens.com/industrialsecurity)

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

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

Industrial security (https://www.siemens.com/industrialsecurity)

Further information is provided on the Internet:

Industrial security (https://www.siemens.com/industrialsecurity)

⚠ WARNING

Unsafe operating states resulting from software manipulation

Software manipulations, e.g. viruses, Trojans, or worms, can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.

- Keep the software up to date.
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.
- Make sure that you include all installed products into the holistic industrial security concept.
- Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.
- On completion of commissioning, check all security-related settings.
- Protect the drive against unauthorized changes by activating the "Know-how protection" converter function.

System requirements 2

The selection of the hardware must take into account the local ambient conditions at the place of installation. A version suitable for the EMC and vibration stresses of an industrial environment is strongly recommended for installation on a crane.

Network

Note

The SIMOCRANE CMS / RCMS may only be operated in trusted networks that are protected by firewalls.

Note

Operation of the WebNavigator Client via W-LAN can only be ensured for the SIMATIC Mobile Panel PC 12".

Virus scanner

The SIMOCRANE CMS software was tested and released with the following virus scanner:

For Windows 7 (CMS computer on the crane):

- McAfee® VirusScan® Enterprise 8.8
- Microsoft Windows Defender (version of the installed operating system)

For Windows 10 (CMS computer on the crane):

- McAfee® Endpoint Security 10.6.1 (Win10 Version 1809 or higher)
- Microsoft Windows Defender (version of the installed operating system)

For the remote PC for remote access (WebUX or web navigator):

- McAfee® WebAdvisor®
- (option) Microsoft Windows Defender (version of the installed operation system)

The virus scanner must be set to meet the requirements of the security functions of the SIMATIC/SIMOTION/SINAMICS systems.

See also: Virus scanner (https://support.industry.siemens.com/cs/mdm/108862708?c=67032977035&lc=en-WW)

⚠ WARNING

INDUSTRIAL SECURITY – system fault due to virus scanner

The automatic deletion or repair of infected files can result in system faults and in potentially dangerous crane motions.

The virus scanner must be set such that detection of a virus is reported **without** automatic repair or deletion of the files.

Note

Notes on the use of virus scanners on WinCC stations

- Deactivate the integrated firewall of the virus scanner or do not install it.
- Do not perform manual or time-controlled scans in runtime operation.
- Only monitor incoming data traffic with the automatic scan.
- Only scan local drives.
- Activate the e-mail scan only on WinCC engineering stations.
- Deactivate the display of dialog messages.

Operating system

The SIMOCRANE CMS software was tested and released with the following operating systems:

- Windows 7 SP1 (64 bit, Enterprise/Professional), MUI (Multilingual User Interface), system language English, US
- Windows 10 (64 bit, Enterprise/Professional), MUI (Multilingual User Interface), system language English, US

Note

Industrial Security

It is recommended that SIMOCRANE CMS / RCMS is only used with an operating system, where all system users are password-protected against unauthorized access.

The operating system should always be kept up to date. Customers are responsible for installing operating system patches. To determine the compatibility of these patches, contact Siemens product support for SIMOCRANE.

Note

Also check on the SIEMENS Industry Online Support site, which Microsoft patches and versions have been tested for SIMATIC WinCC.
Tested Microsoft patches: (https://support.industry.siemens.com/cs/document/18752994)

CMS computer on the crane (software)

- SIMATIC WinCC V7.4 SP1 Update 11:
  Installation of SIMOCRANE CMS requires SIMATIC WinCC.
  The license and the installation program of SIMATIC WinCC are contained in the SIMOCRANE CMS product package.

  Note

  You may install more recent updates for SIMATIC WinCC V7.4 SP1 Update 11, but you must not install **any service pack other than** SP1!

- PH-Ready 2014 SP3
  Only for CMS in conjunction with the SIMATIC Process Historian.
  "PH-Ready" is a SIMATIC WinCC module. You will find it on the SIMATIC Process Historian installation DVD.
- Automation License Manager V5.3 SP3 Update 3
- SIMOCRANE CMS V 4.4 SP3

Optional software:

- WebNavigator server
  The installation program of the WebNavigator server forms part of the WinCC installation.
- WebUX server
  The installation program is contained in the SIMOCRANE CMS product package.
- Performance Monitor V7.4 SP1
- X-Tools V4.04 SP1
- SIMOCRANE LTRC V1.4

  Note

  The hard disk requirement for this option must be considered in addition.

CMS computer on the crane (hardware)

CMS Lean & CMS Advanced without PMO

The minimum requirements apply as follows for SIMOCRANE CMS with the SIMOCRANE CMS example application "Lean" and the optional WebNavigator:

- Processor: Intel Core i3 or higher
- Main memory: at least 4 GB
- Hard disk: at least 160 GB (preferably more)
- Drives: DVD ROM drive

CMS Advanced with PMO

The minimum requirements are as follows for SIMOCRANE CMS with the SIMOCRANE CMS example application "Advanced" – and the options "WebNavigator" and "Performance Monitor Server":

- Processor: Multi-core CPU; 3.5 GHz
- Main memory: 16 GB
- Hard disk: 2 x 1 TB (preferably more)
- Drives: DVD ROM drive

CMS Lean & CMS Advanced with X-Tools

The minimum requirements are as follows for SIMOCRANE CMS with the SIMOCRANE CMS example application "Advanced" and the options "WebNavigator" and "Fast Trace" with installed "X-Tools" on the CMS computer:

- Processor: Multi-core CPU; 3.5 GHz
- Main memory: 8 GB
- Hard disk: 2 x 1 TB (preferably more)
- Drives: DVD ROM drive

CMS Lean & CMS Advanced with X-Tools

The minimum requirements are as follows for SIMOCRANE CMS with the SIMOCRANE CMS example application "Advanced" and the options "WebNavigator", "Performance Monitor Server " and "Fast Trace" with installed "X-Tools" on the CMS computer:

Note

Using SIMATIC WinCC with Performance Monitor and X-Tools on the same computer, utilizes a lot of resources and can mean, for certain applications, that there is not enough computer performance available.

For high quantities of data that are processed by X-Tools, we recommend that X-Tools is installed on a separate computer, and this computer is then exclusively used for X-Tools.

The hardware requirements for X-Tools are listed in the X-Tools User Manual 01, "Introduction":
See: CMS X-Tools V 04.03 User Manual, Release Notes and Change Log (https://support.industry.siemens.com/cs/de/en/view/109483230)

- Processor: Multi-core CPU; 3.5 GHz
- Main memory: 16 GB
- Hard disk: 4 x 1 TB (preferably more)
- Drives: DVD ROM drive

CMS Lean & CMS Advanced with X-Tools and LTRC

The minimum requirements are as follows for SIMOCRANE CMS with the SIMOCRANE CMS example application "Advanced" and the options "WebNavigator", "SIMOCRANE LTRC" and "Fast Trace" with installed "X-Tools" on the CMS computer:

- Processor: Multi-core CPU; 3.5 GHz
- Main memory: 16 GB
- Hard disk: 2 x 1 TB (preferably more)
- Drives: DVD ROM drive

Remote PC for remote access

The minimum requirements are as follows for a remote PC (WebNavigator Client and SIMOCRANE CMS client) for remote access to CMS stations:

- Processor: Intel Core i3 or higher
- Main memory: at least 4 GB
- Hard disk: at least 160 GB (preferably more)
- Drives: DVD ROM drive
- WebNavigator Client
  The installation program is contained in the SIMOCRANE CMS product package.
- Web browser: Internet Explorer 11

See also

General information about backward compatibility (Page 370)

Installation (Page 87)

Security features and recommendations 3

3.1 Secure network design

3.1.1 Network access protection

Customers are solely responsible for preventing unauthorized access to their plants, systems, machines and networks.

Such systems, machines and components should only be connected to an enterprise network or the Internet if and to the extent that such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

In order to protect plants, systems, machines and networks against cyber attack, Siemens industrial security functions can be incorporated into a customized industrial security concept.

You can find more information about the industrial security functions of SIMATIC/SIMOTION/SINAMICS under:

- SINUMERIK / SIMOTION / SINAMICS Industrial Security (https://support.industry.siemens.com/cs/ww/en/view/108862708)
- Security for SIMATIC S7 controllers (https://support.industry.siemens.com/cs/ww/en/view/90885010)
- Security concept PCS 7 & WinCC (https://support.industry.siemens.com/cs/ww/en/view/60119725)
- SIMATIC Process Historian 2014 SP3 System Manual (https://support.industry.siemens.com/cs/ww/en/view/109771899), Chapter 1.2.2 "Security settings"
- SIMATIC Process Historian 2014 SP3 System Manual (https://support.industry.siemens.com/cs/ww/en/view/109771899), Chapter 1.5 "Firewall settings"

Also check the SIEMENS Industry Online Support site to find out which Microsoft patches have been tested for SIMATIC WinCC.

Tested Microsoft patches (https://support.industry.siemens.com/cs/document/18752994)

3.1.2 Firewall

The SIMOCRANE CMS / RCMS may only be operated in trusted networks that are protected by firewalls.

When starting "CMSRuntime.exe" with the firewall of the CMS station activated for the first time, "CMSRuntime.exe" must be added to the white list.
See: Activation of the communication port (CMS with RCMS (WinCC)) (Page 379)

Note

Only enable the required ports.

Any unnecessarily open ports pose a security risk.
See: Recommendation for system hardening (Page 31)

3.2 Identity and access management

3.2.1 Account management and configuration of access rights and other privileges

User groups in the CMS application

In the delivered WinCC project of an example application, a distinction is made between four user groups. Different rights are assigned to these user groups for the CMS user interfaces:

- Crane operator ("Operator")
- Maintenance personnel ("Maintenance")
- User whose primary objective is to evaluate operating data ("Management")
- Administrator

Additionally, the customer can add new user groups and adapt existing user groups.
You can find more information about user groups under: User groups (Page 263)

User groups in the CMS configuration editor

When starting the CMS Editor, a distinction is made between two user roles with different rights. These roles are based on Windows user groups.

- User
  The "User" role is automatically assigned to anyone who starts the CMS Editor.
  The user's rights are restricted to the following functionalities:
  - Parameterization functions for creating and maintaining reference types
  - Changing symbols
  - Adapting displayed message details in the CMSFaults Control
- CMS Administrator
  A "CMS Administrator" must be a member of the Windows user group "CMSAdmin".
  This role has unrestricted access to the functions of the CMS Editor.

3.2.2 Authentication mechanisms

WinCC authentication

WinCC has integrated users. WinCC offers an authentication mechanism for these users. The menu of WinCC Runtime changes depending on the user group.
For further details, please refer to:
WinCC V7.4 SP1 Working with WinCC (https://support.industry.siemens.com/cs/document/109746340) (Chapter 14 "Setting up user administration")

An automatic user logoff function is available in WinCC, but it is not activated. If you activate this feature, it allows you to avoid situations where unauthorized persons could gain access to

specific functions should the logged-on user forget to log off.
For further details, please refer to:
WinCC V7.4 SP1 Working with WinCC (https://support.industry.siemens.com/cs/document/109746340) (Chapter 14.5 "Configuring automatic logout")

SIMATIC Logon enables central and system-wide user administration. This simplifies system validation for access protection pursuant to FDA 21 CFR Part 11.
For further details, please refer to:
WinCC V7.4 SP1 Working with WinCC (https://support.industry.siemens.com/cs/document/109746340) (Chapter 14.5 " Central user administration with SIMATIC Logon")

CMS configuration editor

The CMS configuration editor features an authentication mechanism. The user has different rights depending on the user group.

Authentication is managed via Windows user accounts and Windows user groups.

3.2.3 Management of IDs and login credentials

- Login credentials for the CMS application are managed by WinCC.

  Note

  Passwords can be changed in the WinCC Editor "User Administrator".

- Login credentials for the CMS configuration editor are managed via Windows user accounts and Windows user groups.

3.3 System integrity protection

Patch management

The CMS is patched by means of updates.

Control system backup and restoration

- CMS configuration data can be restored via backup files.
  It is recommended to regularly create CMS backup files.
  See: Recommendation for system hardening (Page 31)
- WinCC archives can be restored via backup files.
  See: WinCC V7.4 SP1 Working with WinCC (https://support.industry.siemens.com/cs/document/109746340) (Chapter 6.4.8 "Archive backup")
- WinCC configuration data can be restored via a backup of the WinCC project file.

3.4 Secure logging and monitoring

3.4.1 Monitoring and viewing CMS log files

CMS

The CMS log files can be opened via a shortcut menu command (right-click the icon displayed in the system tray) when WinCC Explorer is started or the WinCC Runtime is running.

You can find more information under: System: Basic settings (Page 213)

Replay function

A log file is created in the WinCC project directory under ...\CMS\Replay. Events from Replay Runtime and the Replay Configuration Editor are entered here.

WinCC

WinCC log files are available.
See: WinCC V7.4 SP1 Working with WinCC (https://support.industry.siemens.com/cs/document/109746340) (Chapter 1.12.5 "File structure of a project")

3.4.2 Logging of security-related events

You should configure your operating system and the firewalls in such a way that certain events (for example, failed login attempts) are recorded.
See: Recommendation for system hardening (Page 31)

Evaluating the log files at regular intervals will allow you to detect attacks on the security of your system at an early stage, for example unauthorized attempts to access a computer or attacks from the outside.

3.5 Recommendation for system hardening

None of the points mentioned in this chapter can guarantee one hundred percent security. Many different aspects must be considered to protect a complex system. This chapter describes some important aspects which can additionally protect the network.

Following the instructions in the SIMATIC NET SCALANCE manual

- Follow the instructions in the SCALANCE manual.
  SIMATIC NET Industrial Ethernet Security SCALANCE S615 Web Based Management (https://support.industry.siemens.com/cs/document/109751632/) (Chapter 2 "Security recommendation")

Adapting the computer properties of WinCC

- You can make most of the security settings in WinCC Explorer under "Computer settings".
  See: PC configuration of the CMS station (Page 402)

Using a virus scanner

- Use an appropriate virus scanner.
  See: System requirements (Page 19)

⚠ WARNING

INDUSTRIAL SECURITY – system fault due to virus scanner

The automatic deletion or repair of infected files can result in system faults and in potentially dangerous crane motions.

The virus scanner must be set such that detection of a virus is reported **without** automatic repair or deletion of the files.

Note

Notes on the use of virus scanners on WinCC stations

- Deactivate the integrated firewall of the virus scanner or do not install it.
- Do not perform manual or time-controlled scans in runtime operation.
- Only monitor incoming data traffic with the automatic scan.
- Only scan local drives.
- Activate the e-mail scan only on WinCC engineering stations.
- Deactivate the display of dialog messages.

Using an appropriate, up-to-date operating system

- Only use an appropriate operating system.
  See: System requirements (Page 19)
- The operating system should always be kept up to date. Customers are responsible for installing operating system patches. Please contact Siemens Support for SIMOCRANE to find out whether these patches are compatible - applications.cranes.aud@siemens.com

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Note

Also check the SIEMENS Industry Online Support site to find out which Microsoft patches and versions have been tested for SIMATIC WinCC.

WinCC-approved security patches can be installed for CMS/RCMS as well.
We recommend using a backup system for prior testing.

Tested Microsoft patches (https://support.industry.siemens.com/cs/document/18752994)

Monitoring and restricting access to computers and systems

- Restrict access to the computers.
  Keeping the computers in a locked computer room subject to access control can significantly reduce the risk of unauthorized intrusion into the network.
- Remove unnecessary network shares for directories.
- Password-protect your operating system against unauthorized access.
- Only use individual user accounts.
  Never use accounts shared by several users.
- Activate the password-protected screen saver.
  We recommend that you use the default Windows screen saver.
- Users shall only be granted rights which are absolutely necessary for their tasks (for example, only the administrator is entitled to install software or delete Windows events).
- If not absolutely necessary for operation, only the administrator shall have the rights required for connecting USB devices.
- Disable any services that are not required.

Activating the auto log-off function of WinCC

Activate the automatic log-off function of WinCC to avoid situations where unauthorized persons have access to particular functions should the logged-on user forget to log off. For further details, please refer to:

WinCC V7.4 SP1 Working with WinCC (https://support.industry.siemens.com/cs/document/109746340) (Chapter 14.6 "Configuring automatic logout")

Using secure and secret passwords

- The password directives must be set very restrictively and comply with the following minimum requirements:
  - The minimum password length is 8 characters.
  - The password must include uppercase and lowercase letters, numbers, and special characters.
  - Passwords must be changed at least every 90 days.
- Ensure that the passwords are only known to the intended users.
  If in doubt, for example after commissioning, change the passwords and instruct the user to change the password that has been issued to him or her as soon as possible.
- Do not save the password in the browser.

You can find notes regarding assigning and handling passwords here:

- Computer Emergency Response Team (CERT) (Choosing and Protecting Passwords) (https://www.us-cert.gov/ncas/tips/ST04-002)
- SINUMERIK / SIMOTION / SINAMICS Industrial Security ((https://support.industry.siemens.com/cs/ww/en/view/108862708))

Restricting open firewall ports

Any unnecessarily open port is a security risk!

- Only open the required firewall ports.
- If you use a RCMS version that is older than v4.4, you have to enable firewall ports on the CMS station to allow communication with a WinCC-based RCMS server. The same port must also be selected on the RCMS.
  For configuration details, please refer to: Setting of the firewall port (CMS with RCMS (WinCC)) (Page 380)
- The WinCC WebNavigator server / WinCC WebUX server requires an open port on the CMS station for remote access.
  Port "443" is set as default by IIS. This setting can be configured in IIS.
  See: Setting up the SSL certificate for remote access (Page 299)
- CMSFaults Control from the WinCC WebNavigator client requires the open port "24942" on the CMS station.

Activating firewall log files

- Activate the log files of the firewall to be able to log security-relevant events.
  You can find more information in the documentation for your firewall.
  See also: Activation of the log files of the firewall of Windows 7, Windows 8, and Windows Server 2012 (https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2012-r2-and-2012/jj717291(v%3Dws.11))
  See also: Activation of the log files of the firewall of Windows 10 and Windows Server 2016 (https://docs.microsoft.com/en-us/windows/security/threat-protection/windows-firewall/configure-the-windows-firewall-log)

Activating Windows security event logs

The Windows security event logs are deactivated by default.

To activate the Windows security event logs, proceed as follows:

1. Go to Control Panel > Administrative Tools > Local Security Policy.
2. Click on "Local Policies". Click on "Audit Policy".
3. Activate event logging.

According to IEC 62443 3-3, the following events should be logged:

- Access control
- Request errors
- Operating system events
- Control system events
- Backup and restore events
- Configuration changes
- Potential reconnaissance
- Activity and audit log events

Keeping installed software up to date.

- Keep the installed software (including the operating system) up to date.
  You need to update the system with security patches.
- Only install software components which are absolutely required.
  E-mail clients should be avoided.

Note

Also check the SIEMENS Industry Online Support site to find out which Microsoft patches and versions have been tested for SIMATIC WinCC.

Tested Microsoft patches (https://support.industry.siemens.com/cs/document/18752994)

Checking software components and storage media

- Before you install software on a computer, make sure that the software does not include any dangerous elements (for example, viruses or Trojans).
- Only connect data storage devices (CDs and USB sticks) to the computer if you are sure that they do not contain any malware.

Using an HTTPS connection for remote access (WebNavigator)

Only permit HTTPS connections for remote access connections (WebNavigator).

See: Setting up the SSL certificate for remote access (Page 299)

Storage and import of backup files

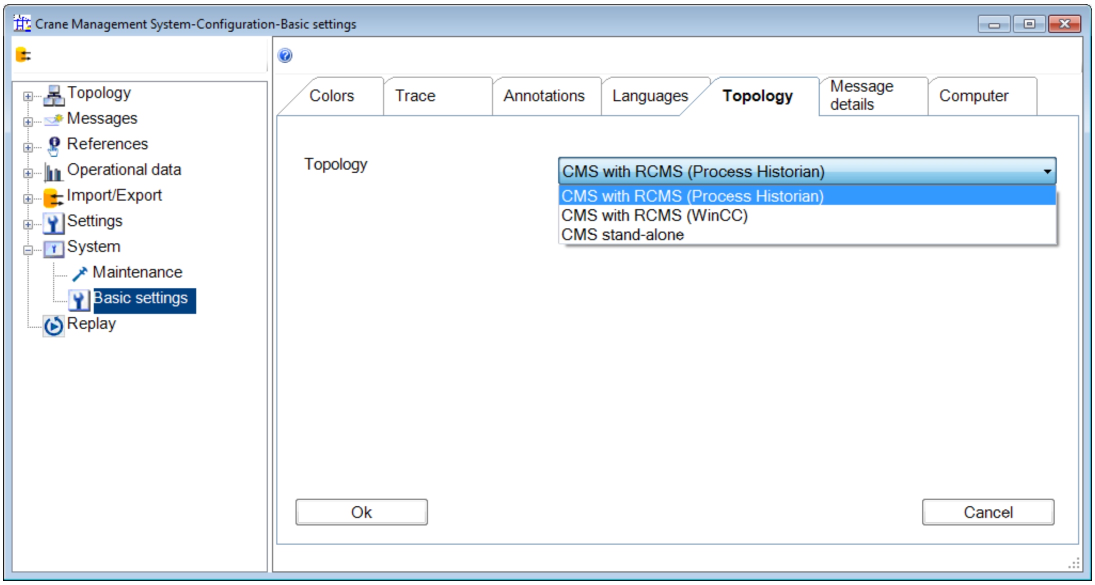
- Only authorized personnel should be able to access backup files.
- Backup files must be stored in an environment with access protection.
- Only use backup files from sources that you know to be trustworthy.

SIMOCRANE CMS - an overview 4

4.1 What is SIMOCRANE CMS

SIMOCRANE CMS is a WinCC-based crane management system. It expands the WinCC basic system to include crane-specific applications.

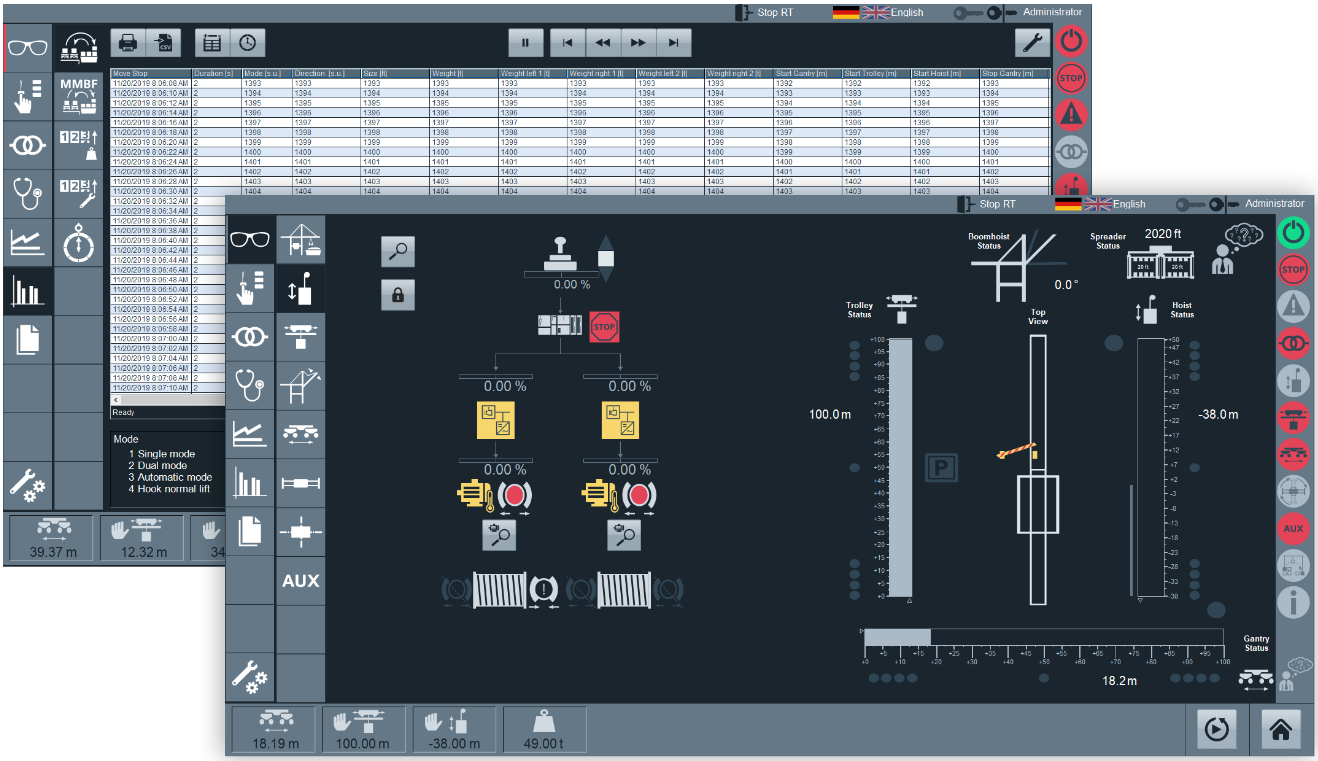
SIMOCRANE CMS includes an editor, which is integrated into WinCC Explorer, and a runtime component (CMS Runtime), as well as a runtime component for the Replay function (Replay Runtime). Graphic controls are provided in the WinCC Graphics Designer.



Topology: CMS with RCMS (Process Historian)

Figure 4-1 The CMS configuration editor

The CMS application provides a comprehensive visualization of the connected crane. It is supplied as an example and can be adapted to suit other applications. The user interface is designed for operation on touch screens.



Move Stop	Duration [s]	Mode [s.u.]	Direction [s.u.]	Size [ft]	Weight [t]	Weight left 1 [t]	Weight right 1 [t]	Weight left 2 [t]	Weight right 2 [t]	Start Gantry [m]	Start Trolley [m]	Start Hoist [m]	Stop Gantry [m]
11/20/2019 8:06:08 AM	2	1393	1393	1393	1393	1393	1393	1393	1393	1392	1392	1392	1393
11/20/2019 8:06:10 AM	2	1394	1394	1394	1394	1394	1394	1394	1394	1393	1393	1393	1394
11/20/2019 8:06:12 AM	2	1395	1395	1395	1395	1395	1395	1395	1395	1394	1394	1394	1395
11/20/2019 8:06:14 AM	2	1396	1396	1396	1396	1396	1396	1396	1396	1395	1395	1395	1396
11/20/2019 8:06:16 AM	2	1397	1397	1397	1397	1397	1397	1397	1397	1396	1396	1396	1397
11/20/2019 8:06:18 AM	2	1398	1398	1398	1398	1398	1398	1398	1398	1397	1397	1397	1398
11/20/2019 8:06:20 AM	2	1399	1399	1399	1399	1399	1399	1399	1399	1398	1398	1398	1399
11/20/2019 8:06:22 AM	2	1400	1400	1400	1400	1400	1400	1400	1400	1399	1399	1399	1400
11/20/2019 8:06:24 AM	2	1401	1401	1401	1401	1401	1401	1401	1401	1400	1400	1400	1401
11/20/2019 8:06:26 AM	2	1402	1402	1402	1402	1402	1402	1402	1402	1401	1401	1401	1402
11/20/2019 8:06:28 AM	2	1403	1403	1403	1403	1403	1403	1403	1403	1402	1402	1402	1403
11/20/2019 8:06:30 AM	2	1404	1404	1404	1404	1404	1404	1404	1404	1403	1403	1403	1404
11/20/2019 8:06:32 AM	2												
11/20/2019 8:06:34 AM	2												
11/20/2019 8:06:36 AM	2												
11/20/2019 8:06:38 AM	2												
11/20/2019 8:06:40 AM	2												
11/20/2019 8:06:42 AM	2												
11/20/2019 8:06:44 AM	2												
11/20/2019 8:06:46 AM	2												
11/20/2019 8:06:48 AM	2												
11/20/2019 8:06:50 AM	2												
11/20/2019 8:06:52 AM	2												
11/20/2019 8:06:54 AM	2												
11/20/2019 8:06:56 AM	2												
11/20/2019 8:06:58 AM	2												
11/20/2019 8:07:00 AM	2												
11/20/2019 8:07:02 AM	2												
11/20/2019 8:07:04 AM	2												
11/20/2019 8:07:06 AM	2												
11/20/2019 8:07:08 AM	2												
11/20/2019 8:07:10 AM	2												

Ready

Mode
1 Single mode
2 Dual mode
3 Automatic mode
4 Hook normal lift

Figure 4-2 Various operator views of the example application for visualizing the connected CMS station

SIMOCRANE CMS provides the following functions:

- Status display of crane components
- Fault diagnostics and references to fault rectification options
- Acquisition of move data
- Calculation of key performance indicators (KPI) and MMBF data
- Acquisition of load and operating hours counters
- Evaluation of operating data
- Reporting
- Replay and analysis of past events
- Import/export functions for bulk data configuration

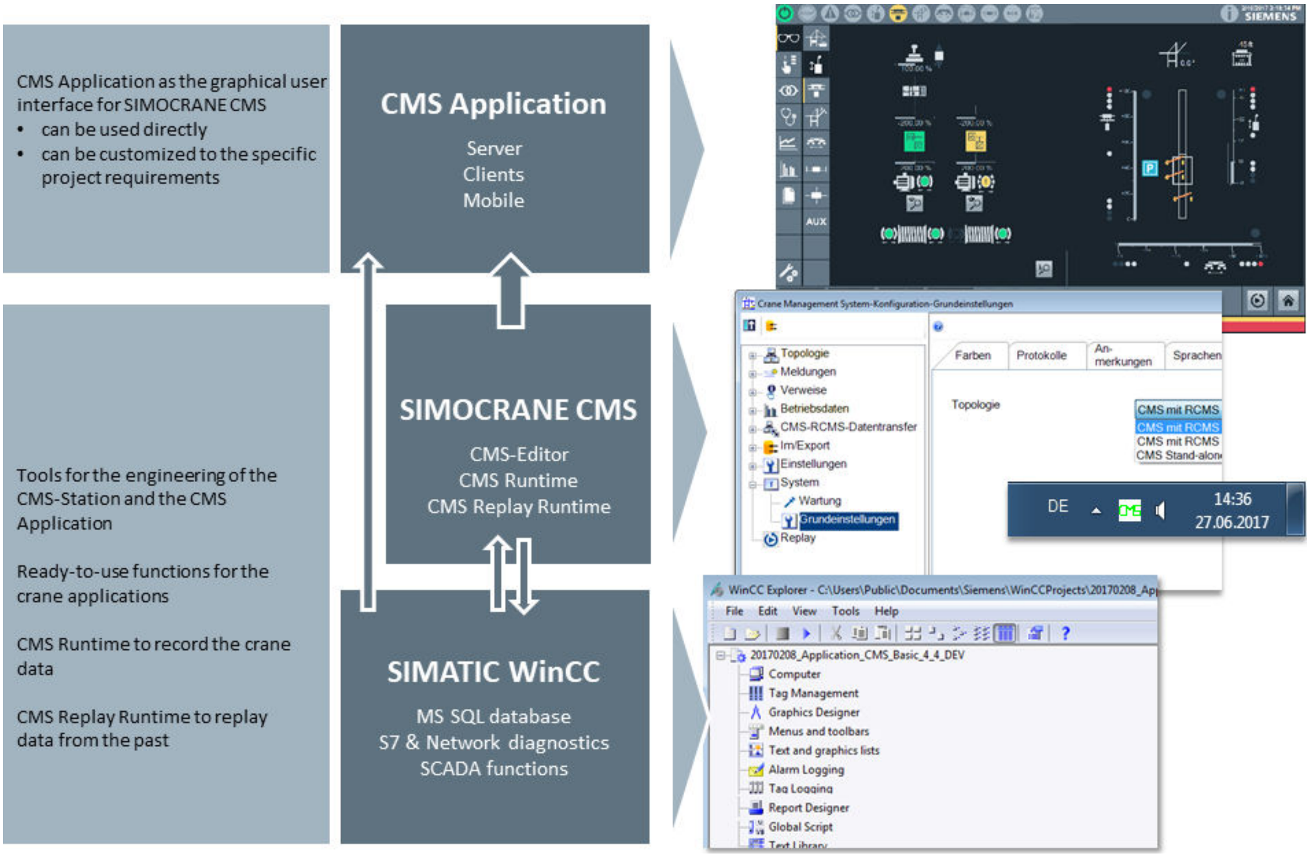
SIMOCRANE CMS can be expanded to include various options and packages:

- SIMOCRANE RCMS
  for a web-based remote crane management system
- SIMATIC WinCC WebNavigator
  for remote access to SIMOCRANE CMS via a web client
- SIMOCRANE CMS Analyzer
  for evaluation of crane data
- SIMOCRANE CMS Fast Trace Viewer
  for visualizing fast trace data

- SIMATIC WinCC Performance Monitor
  for the calculation and visualization of key performance indicators (KPIs) at the crane
- PM-Maint
  for a maintenance plan system

4.2 The components of SIMOCRANE CMS

4.2.1 Overview



CMS Application as the graphical user interface for SIMOCRANE CMS

- can be used directly
- can be customized to the specific project requirements

CMS Application

Server
Clients
Mobile

Tools for the engineering of the CMS-Station and the CMS Application

Ready-to-use functions for the crane applications

CMS Runtime to record the crane data

CMS Replay Runtime to replay data from the past

SIMOCRANE CMS

CMS-Editor
CMS Runtime
CMS Replay Runtime

SIMATIC WinCC

MS SQL database
S7 & Network diagnostics
SCADA functions

Figure 4-3 Design of CMS

The SIMOCRANE CMS product is based on SIMATIC WinCC. It expands the functional scope of WinCC to include crane-specific functions, a CMS configuration editor, as well as CMS Runtime for the acquisition of crane data. The CMS configuration editor is the configuration interface for the CMS station.

The SIMOCRANE CMS application is based on SIMOCRANE CMS and WinCC. It is the human-machine interface for the end user. The SIMOCRANE CMS example application already covers a high level of functionality. It can be adapted to suit customer-specific requirements using the tools of the CMS configuration editor and of WinCC.

4.2.2 SIMATIC WinCC

The SIMATIC WinCC basic software forms the core for the SIMOCRANE CMS crane management system.

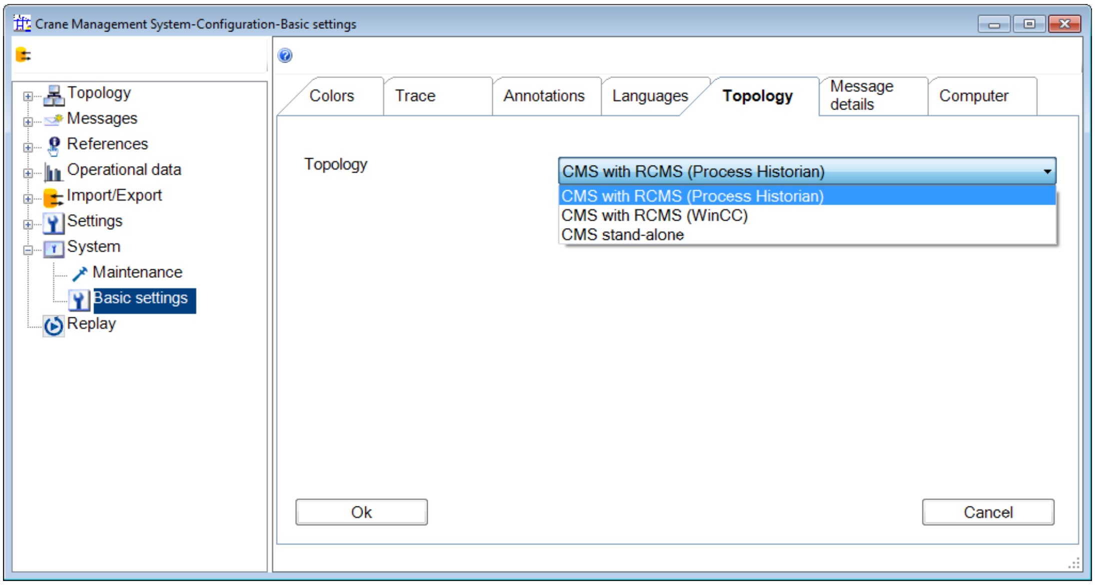
The WinCC basic software offers the most important functions of a SCADA system which are also encountered in crane applications:

- User administration:
  Issuing and checking user access rights both for configuration and the runtime environment. SIMATIC Logon integrates itself into the security system and the user administration of Windows.
- Visualization:
  The WinCC basic software assists with the configuration of bespoke user interfaces by providing standard objects in the CMS application. These include, for example, simple standard objects, such as lines or rectangles, common graphic objects, buttons, input/output fields, picture windows, as well as OLE objects and ActiveX controls.
- Alarm/event system:
  The alarm/event system records process messages and local events and archives them in cyclic archives. The archived messages are displayed in the CMS application by means of an integrated ActiveX control. The type of message procedure and archiving can be configured.
- Process value archiving:
  Historical values and value patterns are saved in process value archives. The type of recording and archiving can be configured.
- Reporting:
  The WinCC Report Designer is used to save or print data from WinCC in fixed layouts as files.
- Bulk data configuration:
  Bulk data configuration is possible directly in WinCC.

SIMOCRANE CMS expands the WinCC basic system to include crane-specific features:

- Expansion of WinCC Alarm Logging to include the option of saving additional information about messages and displaying them in runtime in the graphic controls
- Links to various file sources for messages, e.g. references to PDF documents, videos or jumps to the STEP 7 editor (provided STEP 7 is installed)
- Event-controlled acquisition of operating data (move data, counters) from the crane control system
- Past events on cranes can be analyzed using the "Replay" function. The relevant crane data are stored in the WinCC archive and can be replayed in Replay mode if necessary.
- SIMOCRANE CMS Fast Trace Viewer to display fast trace data (acquisition cycle < 500 ms).
  See also: SIMOCRANE CMS Fast Trace Viewer (optional) (Page 48)

4.2.3 CMS configuration editor



Topology: CMS with RCMS (Process Historian)

CMS with RCMS (Process Historian)
CMS with RCMS (WinCC)
CMS stand-alone

Figure 4-4 CMS configuration editor

The CMS configuration editor is the configuration interface for the CMS station. It is integrated in the WinCC Explorer.

The CMS configuration data are stored in separate tables in the WinCC configuration database.

See also: CMS configuration editor (Page 161)

4.2.4 CMS Runtime

CMS Runtime is a stand-alone program without a user interface. Parameterization is performed in the CMS configuration editor.

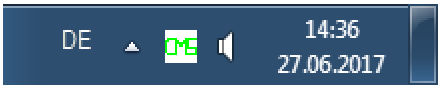


Figure 4-5 Status icon for CMS Runtime in the Windows taskbar

Note

For normal operation, it is recommended that CMS Runtime is started via the WinCC startup list.

Note

Valid license required

CMS Runtime can only be started with a valid license.

To install licenses, see Transferring a license (Automation License Manager) (Page 93).

Tasks of CMS Runtime on the CMS station:

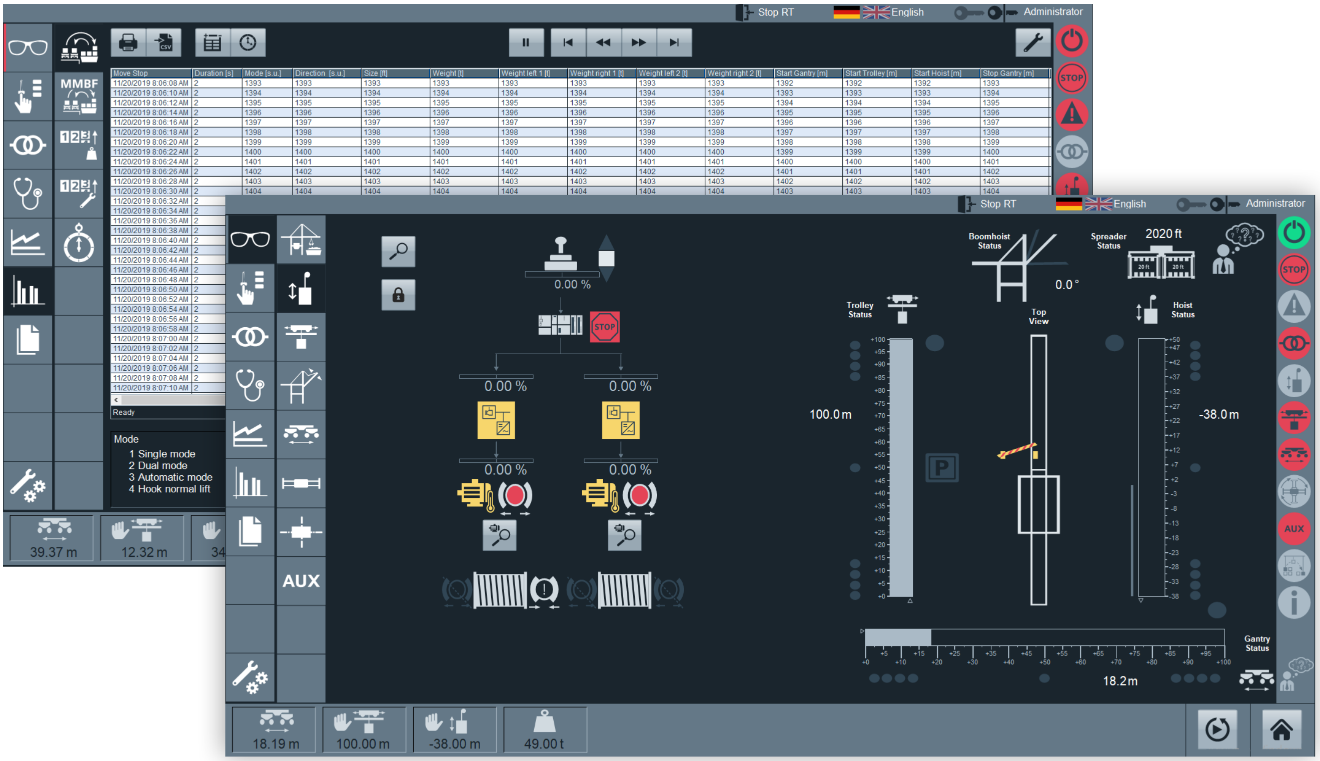
- Provides the required data for the CMS ActiveX objects
- Monitors trigger tags for acquiring move and MMBF data in WinCC (MMBF = Mean Moves Between Failure)
- Acquires operating data and stores this data in WinCC Tag Logging archives
- Monitors and restores counter values (if the new value of a counter is less than the previous value, then this previous value is written back.)
- Generates system tags in the WinCC tag management on the controller as an interface for information in the WinCC Graphics Designer
- Generates system messages in WinCC Alarm Logging for diagnostic functions

Additional tasks of CMS Runtime on the CMS station in the topology "CMS with RCMS (WinCC)"

The following points only apply to CMS stations in conjunction with RCMS V4.3 SP1.
See also: CMS 4.4 with RCMS server 4.3 SP1 (Page 371)

- Uploads configuration data to an RCMS server
- Transfers tag values to the RCMS server
- Generates XML files for the runtime data transfer (acquired operating data, WinCC messages) for an RCMS server (data buffer)
- Transfers XML files to the RCMS server (only RCMS V4.3 SP1)
- Monitors the used storage volume of the XML files on the PC and provides a disk clean up function.

4.2.5 CMS application



Move Stop	Duration [s]	Mode [s.u.]	Direction [s.u.]	Size [ft]	Weight [t]	Weight left 1 [t]	Weight right 1 [t]	Weight left 2 [t]	Weight right 2 [t]	Start Gantry [m]	Start Trolley [m]	Start Hoist [m]	Stop Gantry [m]
11/20/2019 8:06:08 AM	2	1393	1393	1393	1393	1393	1393	1393	1393	1392	1392	1392	1393
11/20/2019 8:06:10 AM	2	1394	1394	1394	1394	1394	1394	1394	1394	1393	1393	1393	1394
11/20/2019 8:06:12 AM	2	1395	1395	1395	1395	1395	1395	1395	1395	1394	1394	1394	1395
11/20/2019 8:06:14 AM	2	1396	1396	1396	1396	1396	1396	1396	1396	1395	1395	1395	1396
11/20/2019 8:06:16 AM	2	1397	1397	1397	1397	1397	1397	1397	1397	1396	1396	1396	1397
11/20/2019 8:06:18 AM	2	1398	1398	1398	1398	1398	1398	1398	1398	1397	1397	1397	1398
11/20/2019 8:06:20 AM	2	1399	1399	1399	1399	1399	1399	1399	1399	1398	1398	1398	1399
11/20/2019 8:06:22 AM	2	1400	1400	1400	1400	1400	1400	1400	1400	1399	1399	1399	1400
11/20/2019 8:06:24 AM	2	1401	1401	1401	1401	1401	1401	1401	1401	1400	1400	1400	1401
11/20/2019 8:06:26 AM	2	1402	1402	1402	1402	1402	1402	1402	1402	1401	1401	1401	1402
11/20/2019 8:06:28 AM	2	1403	1403	1403	1403	1403	1403	1403	1403	1402	1402	1402	1403
11/20/2019 8:06:30 AM	2	1404	1404	1404	1404	1404	1404	1404	1404	1403	1403	1403	1404
11/20/2019 8:06:32 AM	2												
11/20/2019 8:06:34 AM	2												
11/20/2019 8:06:36 AM	2												
11/20/2019 8:06:38 AM	2												
11/20/2019 8:06:40 AM	2												
11/20/2019 8:06:42 AM	2												
11/20/2019 8:06:44 AM	2												
11/20/2019 8:06:46 AM	2												
11/20/2019 8:06:48 AM	2												
11/20/2019 8:06:50 AM	2												
11/20/2019 8:06:52 AM	2												
11/20/2019 8:06:54 AM	2												
11/20/2019 8:06:56 AM	2												
11/20/2019 8:06:58 AM	2												
11/20/2019 8:07:00 AM	2												
11/20/2019 8:07:02 AM	2												
11/20/2019 8:07:04 AM	2												
11/20/2019 8:07:06 AM	2												
11/20/2019 8:07:08 AM	2												
11/20/2019 8:07:10 AM	2												

Ready

Mode
1 Single mode
2 Dual mode
3 Automatic mode
4 Hook normal lift

Figure 4-6 Various operator views of the example application for visualizing the connected CMS station

The supplied applications can be used as a basis for configuring customer-specific systems. They are prepared for the following functions by default:

- Status display of crane components
- Fault diagnostics and references to fault rectification options
- Operating data acquisition
- Calculation of key performance indicators (KPI) and MMBF data
- Evaluation of operating data
- Reporting
- Replay and analysis of past events

The applications "Advanced" and "Lean" are supplied with SIMOCRANE CMS.

- **Lean**
  This application is designed for use on industrial cranes and for RTG/RMG cranes.
- **Advanced**
  This application has an expanded functional scope and is designed for use on harbor cranes, such as STS cranes.

4.2.6 CMS ActiveX controls

As an open system, WinCC features an interface for ActiveX objects. This allows user-defined functions to be added to the function scope of WinCC. CMS ActiveX objects allow access to CMS-specific content from WinCC displays.

In order to ensure that these CMS ActiveX objects can still work, even when the WinCC Web Navigator is used to visualize the WinCC displays on other computers for example, the CMS ActiveX components do not themselves access WinCC data, but instead establish the connection to WinCC using CMS Runtime.

With the CMSFaults control, extended error information is output for the messages from the WinCC Alarm Logging.

4.2.7 SIMATIC WinCC Web Navigator / SIMATIC WinCC WebUX

WinCC Web Navigator and WinCC WebUX extend CMS functionality by providing a remote access option. You can use WinCC Web Navigator and WinCC WebUX to operate and observe a plant comprising various stations via the Intranet or Internet. This does not require any changes to the WinCC project.

WinCC Web Navigator or WinCC WebUX is needed in the crane environment if

- Remote access to the local CMS station is required.
- other HMI devices besides the electrical room PC are needed on the crane itself (crane cabin, checker cabin).

WinCC Web Navigator

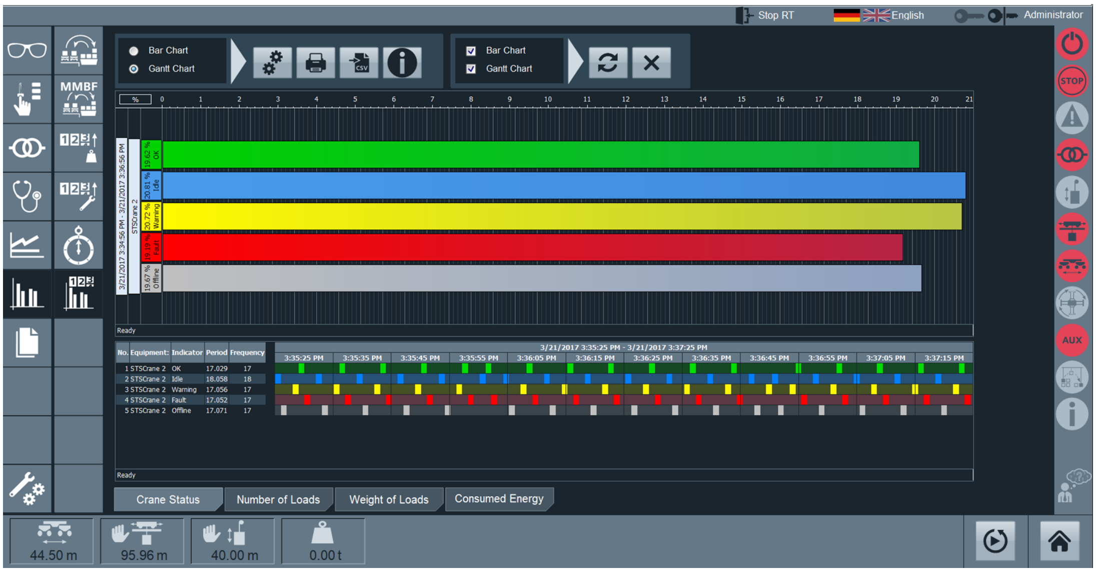
The WebNavigator Server is installed on the CMS station in the crane's electrical room. A WebNavigator Client can be set up on any Windows PC in the network. The web client allows the WinCC project, running on the CMS station, to be operated and visualized from MS Internet Explorer. Just like the WinCC basic operator station, virtually all possible displays and operations are available to the web client.

WinCC WebUX

The WinCC WebUX server is installed on the CMS station in the electrical room of the crane. An HTML5 web browser is required on the remote PC. You also require a WebUX license on the CMS station. Just like the WinCC basic operator station, virtually all possible displays and operations are available to the web client.

You can also start the WebUX web client on mobile devices such as tablets or smartphones.

4.2.8 SIMATIC WinCC / Performance Monitor (optional)



No.	Equipment:	Indicator	Period	Frequency
1	STSCrane 2	OK	17.029	17
2	STSCrane 2	Idle	18.058	18
3	STSCrane 2	Warning	17.056	17
4	STSCrane 2	Fault	17.052	17
5	STSCrane 2	Offline	17.071	17

Figure 4-7 Performance Monitor

You can use the WinCC/Performance Monitor to record and analyze the performance of an entire crane system.

The Performance Monitor was originally developed for machine-oriented or line-oriented manufacturing plants but is also easy to use in a crane environment. It is suitable for use on the CMS station for evaluating the connected crane.

The Performance Monitor can help to answer the following questions:

- What is the actual performance of a crane compared with the planned performance?
- How is load distributed over the cranes (where is there full load and where no-load operation)?
- Why do comparable cranes constantly handle different numbers of containers?

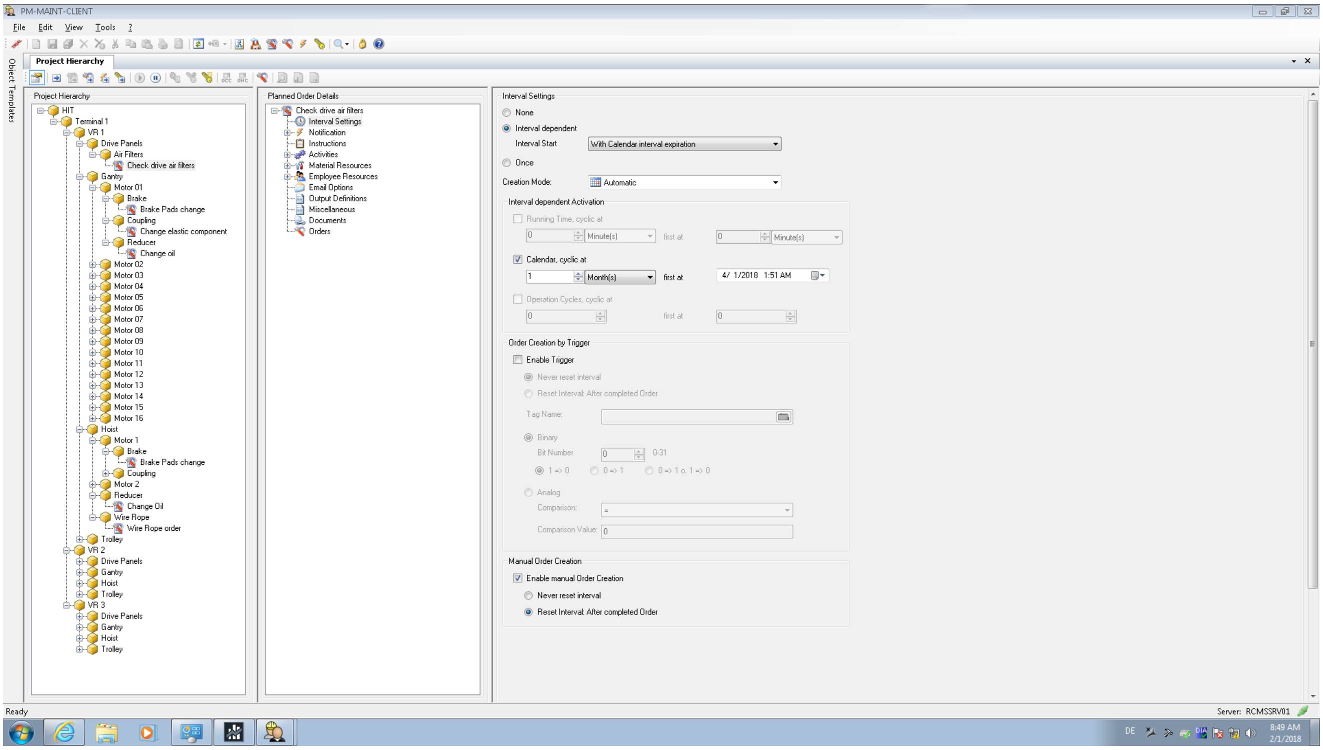
The Performance Monitor acquires downtimes and calculates specific parameters (KPI = Key Performance Indicator) so that crane availability and productivity can be increased in the future.

The system offers various display types for analysis results in WinCC Controls. In the example application, the following controls are used, for example:

- Gantt chart for overview of operating states of cranes in one overview or over different periods
- Bar chart for displaying the key performance indicators, such as availability, performance, productivity (containers per hour)
  The data can be grouped according to context information.

4.2.9 PM-Maint (optional WinCC add-on)

The certified WinCC add-on PM-MAINT is a sector- and technology-neutral tool for maintenance planning.
PM-MAINT is recommended if a project requires this type of functionality.



Project Hierarchy

- HIT
  - Terminal 1
    - VR 1
      - Drive Panels
        - Air Filters
          - Check drive air filters
      - Gantry
        - Motor 01
          - Brake
            - Brake Pads change
          - Coupling
            - Change elastic component
          - Reducer
            - Change oil
        - Motor 02
        - Motor 03
        - Motor 04
        - Motor 05
        - Motor 06
        - Motor 07
        - Motor 08
        - Motor 09
        - Motor 10
        - Motor 11
        - Motor 12
        - Motor 13
        - Motor 14
        - Motor 15
        - Motor 16
      - Hoist
        - Motor 1
          - Brake
            - Brake Pads change
          - Coupling
        - Motor 2
        - Reducer
          - Change Oil
        - Wire Rope
          - Wire Rope order
      - Trolley
    - VR 2
      - Drive Panels
      - Gantry
      - Hoist
      - Trolley
    - VR 3
      - Drive Panels
      - Gantry
      - Hoist
      - Trolley

Planned Order Details

- Check drive air filters
  - Interval Settings
  - Notification
  - Instructions
  - Activities
  - Material Resources
  - Employee Resources
  - Email Options
  - Output Definitions
  - Miscellaneous
  - Documents
  - Orders

Interval Settings

○ None
● Interval dependent
Interval Start: With Calendar interval expiration
○ Once

Creation Mode: Automatic

Interval dependent Activation

□ Running Time, cyclic at 0 Minute(s) first at 0 Minute(s)
☑ Calendar, cyclic at 1 Month(s) first at 4/ 1/2018 1:51 AM
□ Operation Cycles, cyclic at 0 first at 0

Order Creation by Trigger

□ Enable Trigger
● Never reset interval
○ Reset Interval: After completed Order
Tag Name:
● Binary
Bit Number 0 0-31
● 1 => 0 ○ 0 => 1 ○ 0 => 1 o. 1 => 0
○ Analog
Comparison: =
Comparison Value: 0

Manual Order Creation

☑ Enable manual Order Creation
○ Never reset interval
● Reset Interval: After completed Order

Figure 4-8 PM-MAINT certified WinCC add-on

The standard scope of the SIMOCRANE CMS package does not include a maintenance planning system. However, it provides all the data required for a system of this kind (e.g. operating hours counter).

PM-MAINT offers both calendar-controlled and event-controlled maintenance of components on different single cranes. PM-MAINT therefore assists with the timely maintenance of components in order to avoid the cost of premature maintenance or production outage and downtimes.

An import and export function supports the process of configuring bulk data.

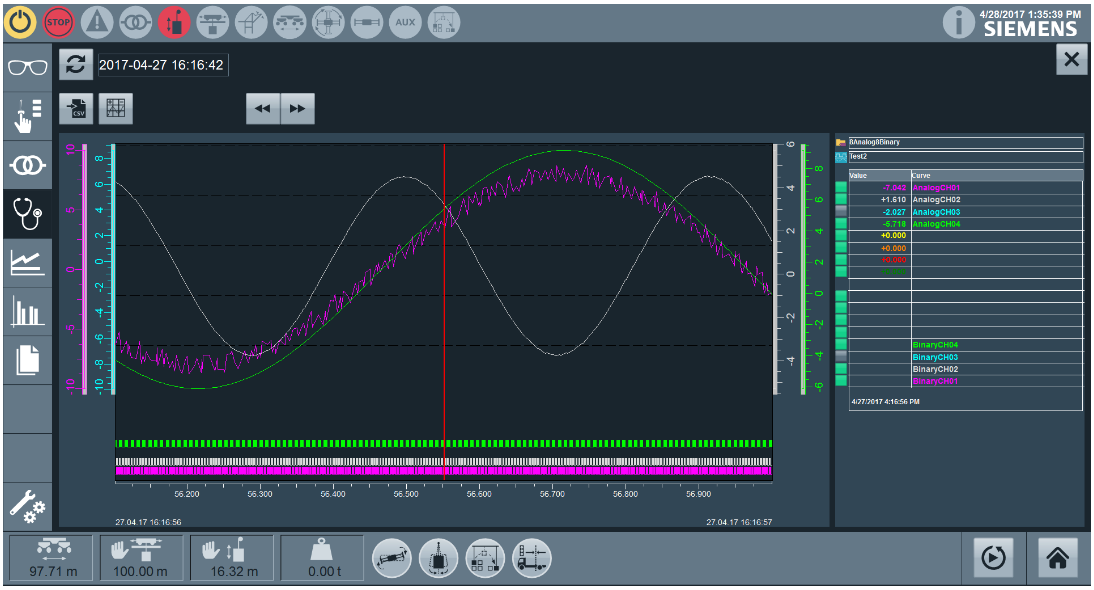
Note

Please note the requirements for installing PM-MAINT!

You can find detailed information on PM-MAINT in the relevant product documentation.

4.2.10 SIMOCRANE CMS Fast Trace Viewer (optional)

SIMOCRANE CMS Fast Trace Viewer is an ActiveX control, which was developed in order to access Fast Trace data from X-Tools. The ActiveX control is embedded in CMS to allow Fast Trace data to be displayed.



8Analog8Binary
Test2

Value	Curve
-7.042	AnalogCH01
+1.610	AnalogCH02
-2.027	AnalogCH03
-5.718	AnalogCH04
+0.000	
+0.000	
+0.000	
+0.000	
	BinaryCH04
	BinaryCH03
	BinaryCH02
	BinaryCH01

4/27/2017 4:16:56 PM

Figure 4-9 CMS Fast Trace Viewer in the CMS

You can find more information about the SIMOCRANE CMS Fast Trace Viewer in document "FAQ_CMSFastTraceViewer.pdf" in folder "SIMOCRANE_CMS_ApplicationExample” on the installation DVD.

The required X-Tools software is provided with CMS. The software is used to configure and evaluate data, which is analyzed in realtime (online data) – or can be archived for subsequent analysis (offline data). X-Tools directly captures the data from SIMATIC S7 and SIMOTION controls using suitable software IONs (input-output nodes).

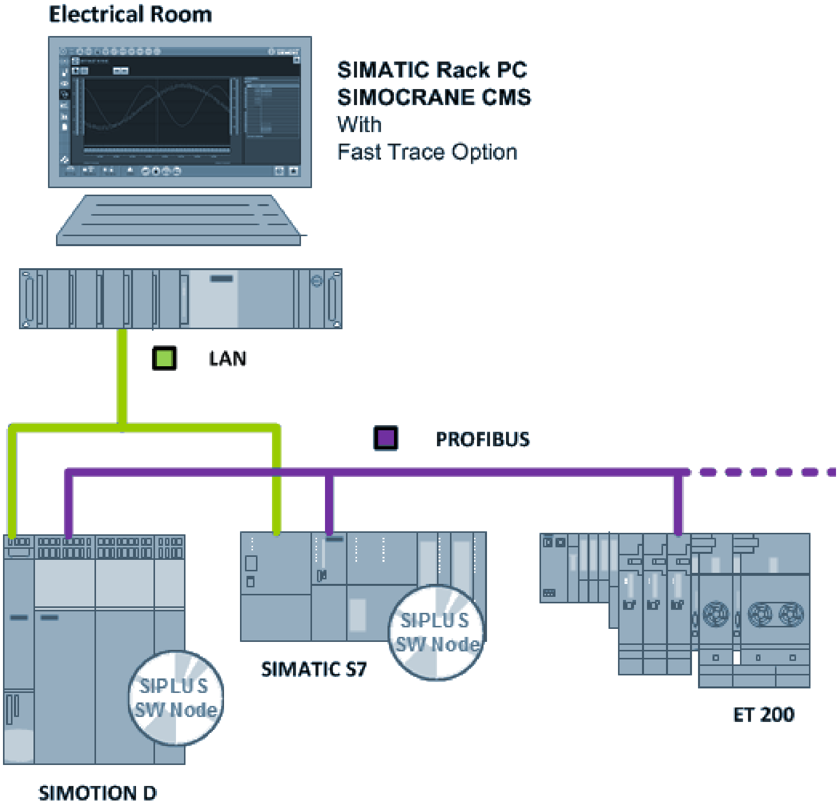
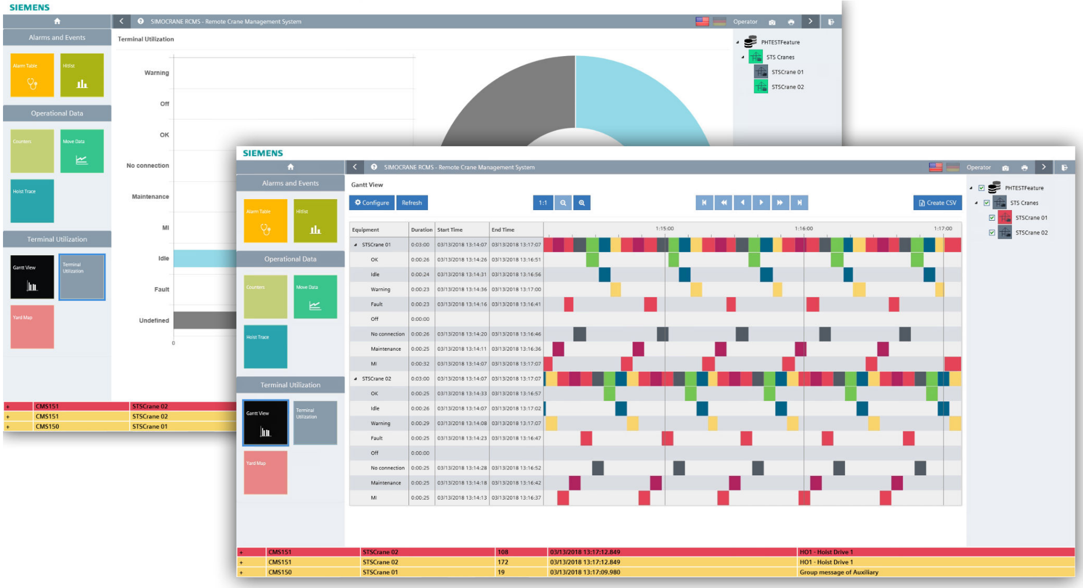


Figure 4-10 Configuration with Fast Trace option

4.2.11 SIMOCRANE RCMS web application (optional)

SIMOCRANE RCMS is a web-based Remote Crane Management System.

You can use the RCMS web application to display and evaluate the data of all the connected CMS stations. You can, for example, view the operational data of selected cranes, or display a general plant overview that shows the current states of the cranes.



Terminal Utilization

Gantt View

Equipment	Duration	Start Time	End Time
STSCrane 01	0:03:00	03/13/2018 13:14:07	03/13/2018 13:17:07
OK	0:00:26	03/13/2018 13:14:26	03/13/2018 13:16:51
Idle	0:00:24	03/13/2018 13:14:31	03/13/2018 13:16:56
Warning	0:00:23	03/13/2018 13:14:36	03/13/2018 13:17:00
Fault	0:00:23	03/13/2018 13:14:16	03/13/2018 13:16:41
Off	0:00:00		
No connection	0:00:26	03/13/2018 13:14:20	03/13/2018 13:16:46
Maintenance	0:00:25	03/13/2018 13:14:11	03/13/2018 13:16:36
MI	0:00:32	03/13/2018 13:14:07	03/13/2018 13:17:07
STSCrane 02	0:03:00	03/13/2018 13:14:07	03/13/2018 13:17:07
OK	0:00:25	03/13/2018 13:14:33	03/13/2018 13:16:57
Idle	0:00:26	03/13/2018 13:14:07	03/13/2018 13:17:02
Warning	0:00:29	03/13/2018 13:14:08	03/13/2018 13:17:07
Fault	0:00:25	03/13/2018 13:14:23	03/13/2018 13:16:47
Off	0:00:00		
No connection	0:00:25	03/13/2018 13:14:28	03/13/2018 13:16:52
Maintenance	0:00:25	03/13/2018 13:14:18	03/13/2018 13:16:42
MI	0:00:25	03/13/2018 13:14:13	03/13/2018 13:16:37

+	CMS151	STSCrane 02	108	03/13/2018 13:17:12.849	HO1 - Hoist Drive 1
+	CMS151	STSCrane 02	172	03/13/2018 13:17:12.849	HO1 - Hoist Drive 1
+	CMS150	STSCrane 01	19	03/13/2018 13:17:09.980	Group message of Auxiliary

Figure 4-11 Various operator views for showing the connected CMS stations

The scope of functions provided by the RCMS web application is as follows:

- General plant overview
- Map view of the terminal
- Crane status display
- Fault diagnostics
- Operating data acquisition
- Data analysis across all connected crane systems
- Availability overview
- Start of remote access to a CMS station in the tree structure
- Tree structure of system with status display and diagnostic data

The RCMS web application consists of an RCMS web server that can be linked to one or more SIMATIC Process Historian systems.
The RCMS web clients are connected to the RCMS web server.

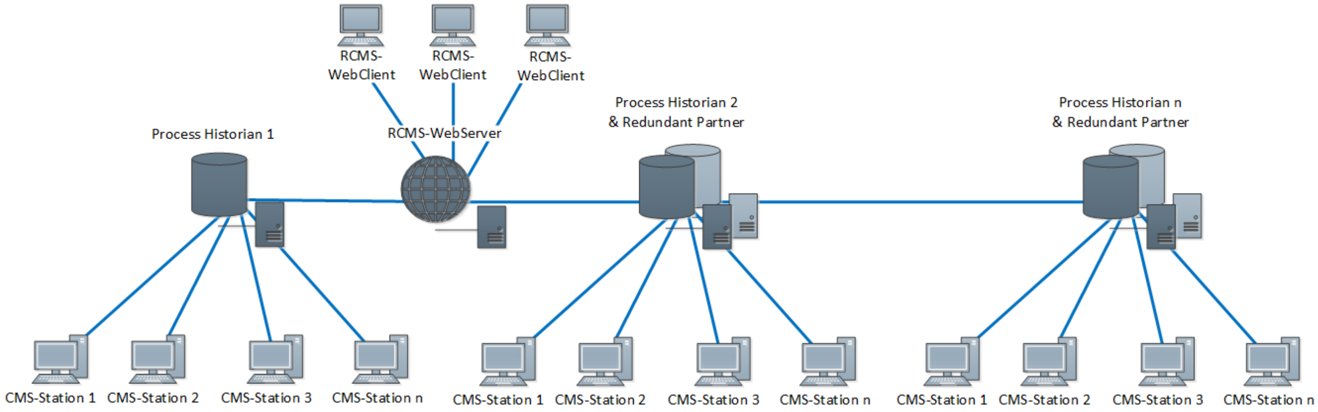


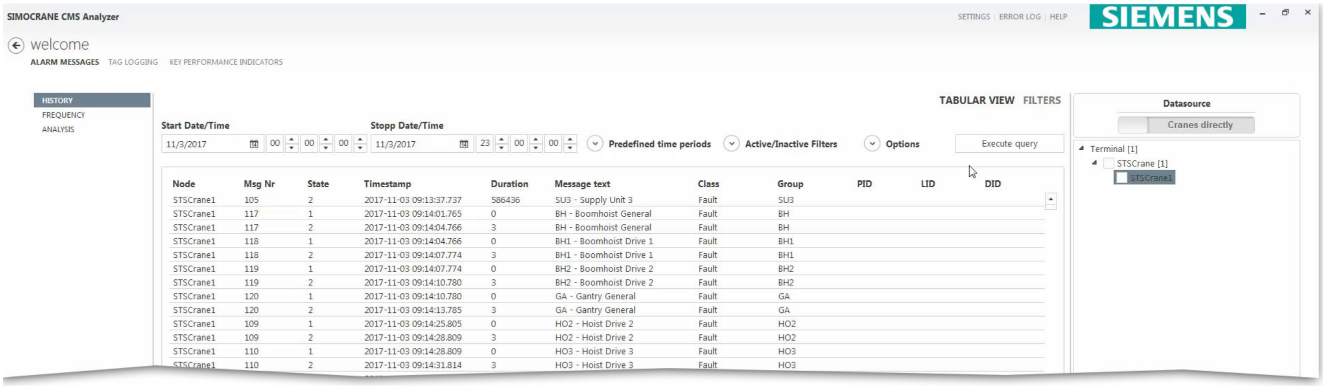
Figure 4-12 RCMS web server with connected Process Historian and RCMS web clients

4.2.12 SIMOCRANE CMS Analyzer

The SIMOCRANE CMS Analyzer is an application to analyze historical CMS data and to generate reports.
The SIMOCRANE CMS Analyzer either accesses data from the Process Historian database – or it directly accesses the WinCC databases of the connected CMS stations.

Note

SIMOCRANE CMS Analyzer shows the historical data!
The data are not shown in realtime.



Start Date/Time: 11/3/2017 00 : 00 : 00

Stopp Date/Time: 11/3/2017 23 : 00 : 00

Node	Msg Nr	State	Timestamp	Duration	Message text	Class	Group	PID	LID	DID
STSCrane1	105	2	2017-11-03 09:13:37.737	586436	SU3 - Supply Unit 3	Fault	SU3			
STSCrane1	117	1	2017-11-03 09:14:01.765	0	BH - Boomhoist General	Fault	BH			
STSCrane1	117	2	2017-11-03 09:14:04.766	3	BH - Boomhoist General	Fault	BH			
STSCrane1	118	1	2017-11-03 09:14:04.766	0	BH1 - Boomhoist Drive 1	Fault	BH1			
STSCrane1	118	2	2017-11-03 09:14:07.774	3	BH1 - Boomhoist Drive 1	Fault	BH1			
STSCrane1	119	1	2017-11-03 09:14:07.774	0	BH2 - Boomhoist Drive 2	Fault	BH2			
STSCrane1	119	2	2017-11-03 09:14:10.780	3	BH2 - Boomhoist Drive 2	Fault	BH2			
STSCrane1	120	1	2017-11-03 09:14:10.780	0	GA - Gantry General	Fault	GA			
STSCrane1	120	2	2017-11-03 09:14:13.785	3	GA - Gantry General	Fault	GA			
STSCrane1	109	1	2017-11-03 09:14:25.805	0	HO2 - Hoist Drive 2	Fault	HO2			
STSCrane1	109	2	2017-11-03 09:14:28.809	3	HO2 - Hoist Drive 2	Fault	HO2			
STSCrane1	110	1	2017-11-03 09:14:28.809	0	HO3 - Hoist Drive 3	Fault	HO3			
STSCrane1	110	2	2017-11-03 09:14:31.814	3	HO3 - Hoist Drive 3	Fault	HO3			

Figure 4-13 SIMOCRANE CMS Analyzer

The SIMOCRANE CMS Analyzer offers the following functions:

- Displays the crane status history
- Displays the move data
- Displays the load and operating hours counters
- Displays and analyzes the message history
- Calculates MMBF data
- Calculates key performance indicators (KPI)
- Exports data as CSV or PDF file

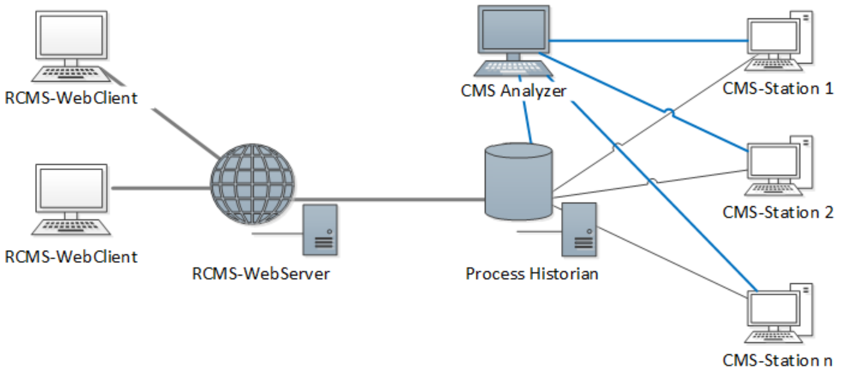


Figure 4-14 SIMOCRANE CMS Analyzer in the network

The SIMOCRANE CMS Analyzer can be installed on any computer in the network that complies with the system requirements (see the documentation on the SIMOCRANE CMS Analyzer). You can also install SIMOCRANE CMS Analyzer on several computers and operate them in parallel. Each SIMOCRANE CMS Analyzer can be connected with the Process Historian database and/or with CMS stations. SIMOCRANE CMS Analyzer retrieves its data either from the Process Historian database or from the WinCC databases of the CMS stations.

An up-to-date RCMS license is required on the connected RCMS web server in order to retrieve data from the Process Historian database.

You can find more information in the online help for the SIMOCRANE CMS Analyzer.

4.3 System design & communication

4.3.1 Internal structure of SIMOCRANE CMS

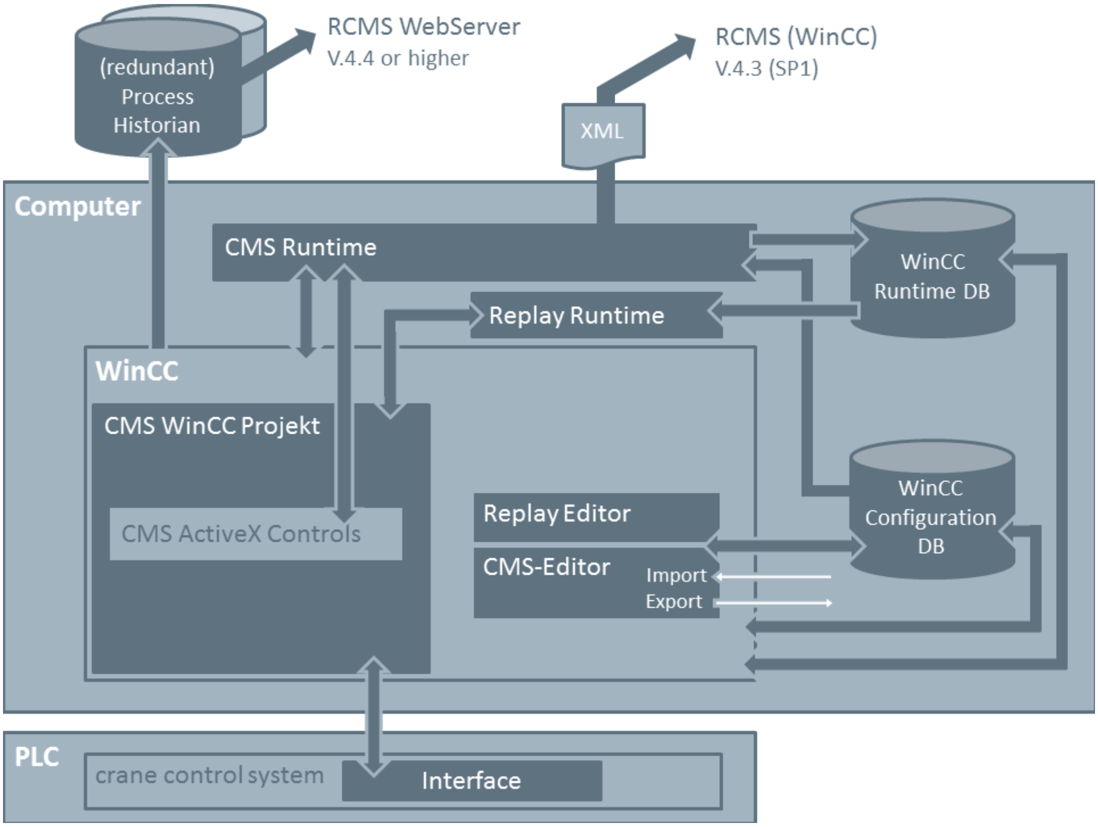


Figure 4-15 Overview of the components of SIMOCRANE CMS

This diagram shows the components and the communication between the individual components of SIMOCRANE CMS:

- The crane control system communicates with the CMS WinCC project via an interface.
- The CMS configuration editor and the Replay Editor are used for configuring the CMS WinCC project and CMS Runtime. The configuration data are stored in the WinCC configuration database.
- During runtime, CMS Runtime communicates with WinCC and the CMS ActiveX controls. It writes the data into the archive of the WinCC Runtime database.
  In Replay mode, Replay Runtime retrieves the data from the WinCC Runtime database.
- If the CMS station is connected to a Process Historian, WinCC sends the data to the Process Historian. The Process Historian makes this data available to the RCMS web server.
  The data are stored in a cache to overcome network fluctuations and to ensure data integrity ("Store and forward").
- If the CMS station is connected to a WinCC-based RCMS (4.3 SP1), CMS Runtime writes the data into XML files and sends these to the RCMS server.

4.3.2 Supported controllers and protocols

SIMOCRANE CMS supports various standard communication protocols on the basis of WinCC. This means that not only can you connect Siemens controllers to the CMS but also controllers from other manufacturers.

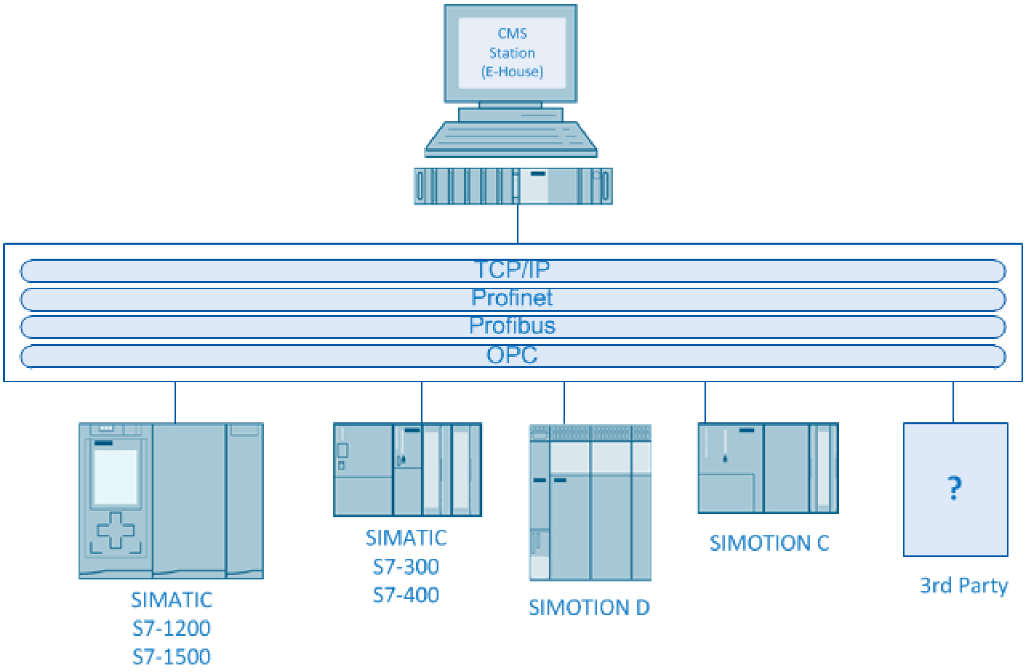


Figure 4-16 Communications with the crane control system

SIMOCRANE CMS supports the following communication protocols:

- TCP/IP
- PROFINET
- PROFIBUS
- OPC

SIMOCRANE CMS supports the following controllers:

- SIMATIC S7 – 300
- SIMATIC S7 – 400
- SIMATIC S7 – 1200 *
- SIMATIC S7 – 1500 *
- SIMOTION D
- SIMOTION C
- Other 3rd party manufacturers

* References to STEP 7 are possible via TIA Portal Step7. See: References to TIA Portal (Page 125)

4.3.3 Data transfer between the CMS station and the RCMS web application

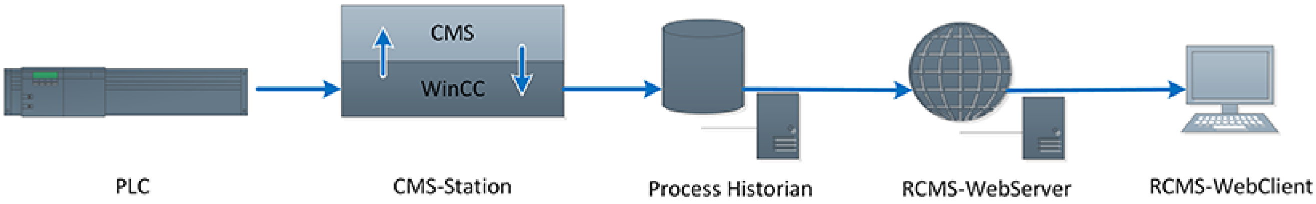


Figure 4-17 Data transfer between the PLC, WinCC, Process Historian, the RCMS web server, and the RCMS web client

Data from the PLC are continuously transferred to WinCC. SIMOCRANE CMS processes the incoming data.

WinCC sends alarm logging and tag logging data to the Process Historian.

The RCMS web server receives the data via TCP/IP from the Process Historian database – and passes it on to the RCMS web client. The RCMS web client on the user device communicates with the RCMS web server via an HTTPS connection.

4.4 Topology

4.4.1 CMS station at the crane (single-user system / multi-user system)

The CMS station is located in the electrical room of the crane. It can be operated as a single-user system or a multi-user system with several client stations, e.g. in the crane cabin or in the checker cabin.

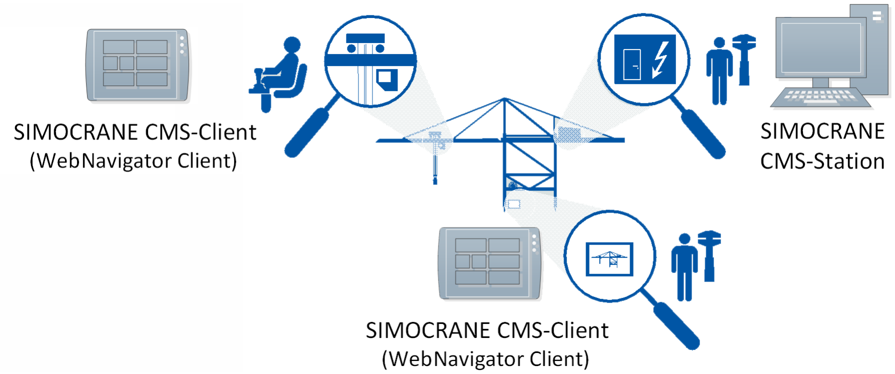


Figure 4-18 CMS station with CMS clients

In this case, the client stations access the CMS station via the WinCC WebNavigator.
See: Remote access (Page 287)

4.4.2 CMS stations with RCMS web application (RCMS 4.4 and higher)

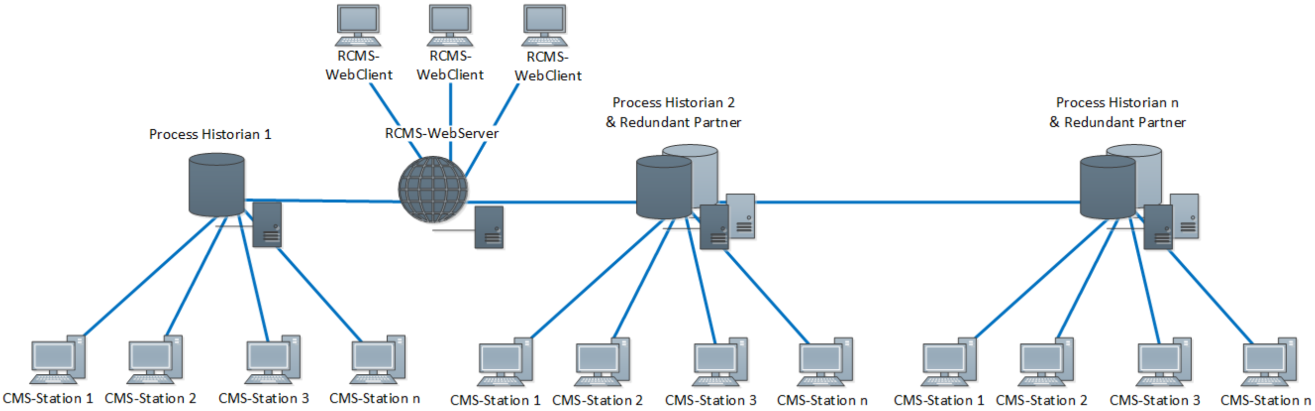


Figure 4-19 CMS stations with RCMS web server (RCMS 4.4 and higher)

In a CMS-RCMS (Process Historian) scenario, the CMS stations are connected to the SIMATIC Process Historian. They send their operating data and messages to the SIMATIC Process Historian, which archives this data.

The RCMS web application accesses the SIMATIC Process Historian database to supply operating data and messages for the crane.
See also: SIMOCRANE RCMS web application (optional) (Page 49)

4.4.3 CMS stations with RCMS (WinCC) - (RCMS 4.3 SP1 and lower)

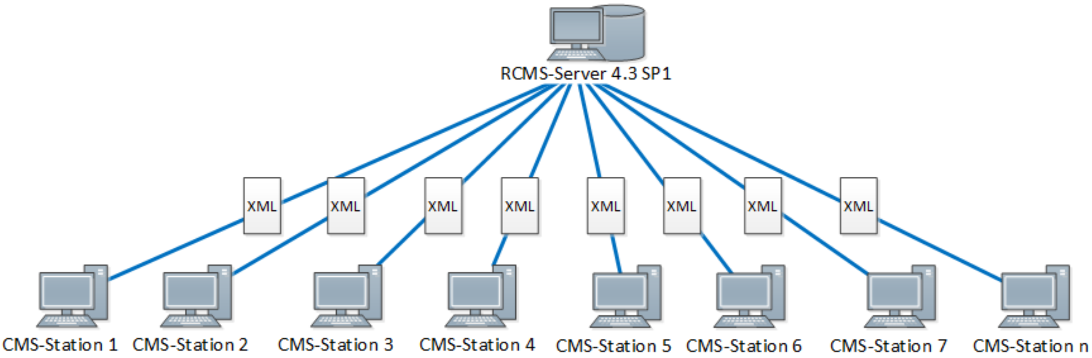


Figure 4-20 CMS stations with RCMS station (RCMS 4.3 SP1)

In a CMS-RCMS (WinCC) scenario, the CMS stations are connected to the RCMS server (4.3 SP1). They send their operating data as XML files. The RCMS server archives this data and accesses the archived data.
See also: CMS 4.4 with RCMS server 4.3 SP1 (Page 371)

CMS application example 5

5.1 Design of user interface

When designing the CMS user interface on the basis of SIMATIC WinCC, the following aspects were especially taken into consideration:

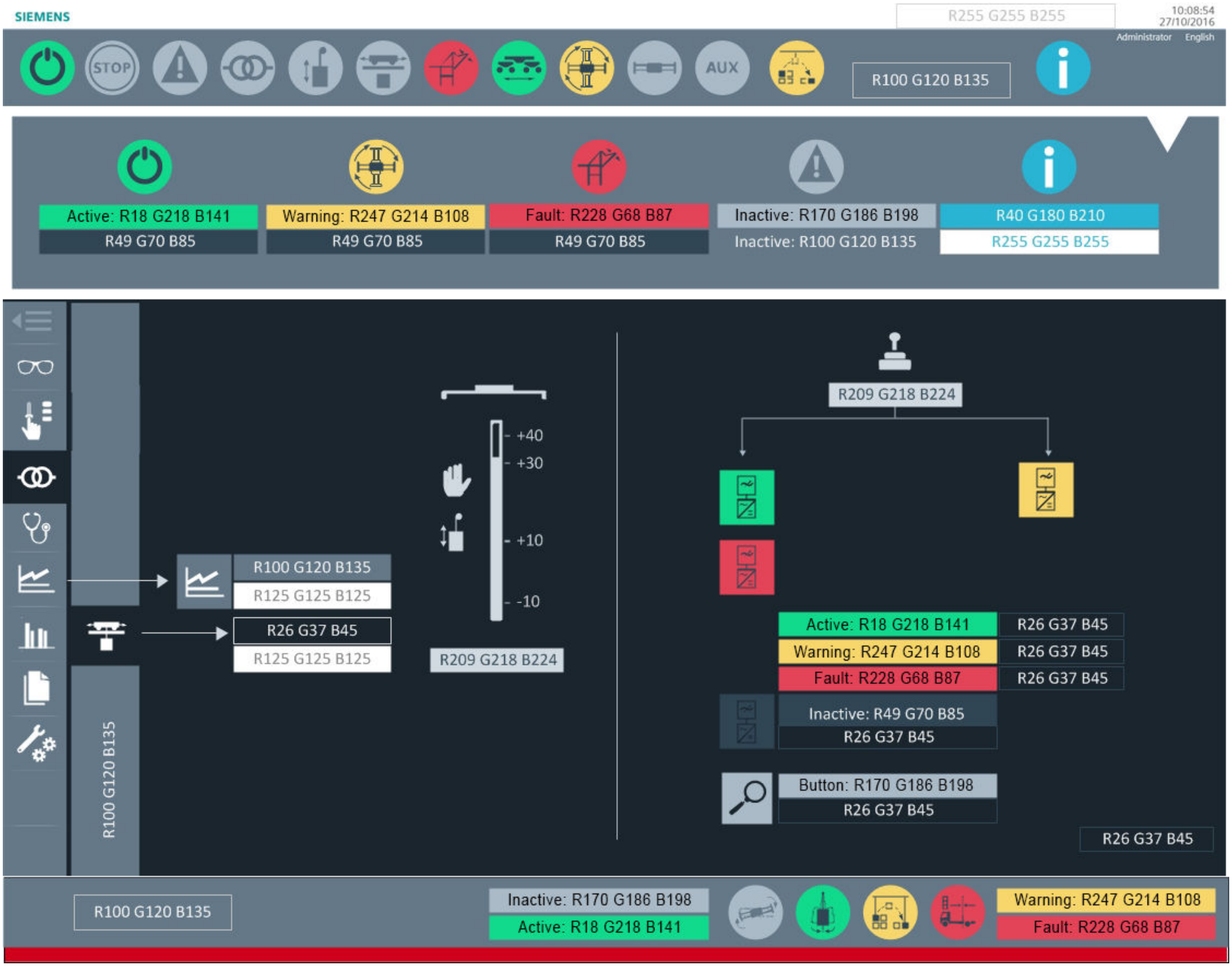
Screen elements

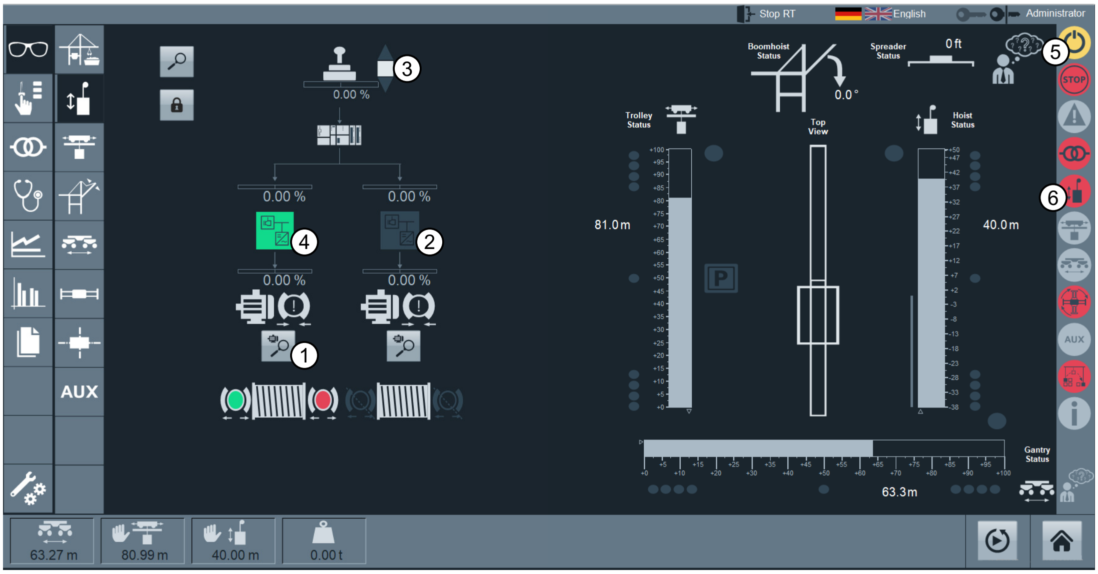
- Symbolic representation instead of realistic graphics:
  One design aspect is the use of simple but significant symbols to display screen objects. An independent look is presented with a few graphical details.
- Touch operation:
  In terms of size, the control elements are large enough that they can be operated in the touch mode.

Color concept

The color range offered by the user interface is reduced to a small selection, so that the user can quickly distinguish between key events (warnings and faults) and the normal operating state.

The color philosophy uses the following color assignments:


SIEMENS
R255 G255 B255
10:08:54
27/10/2016
Administrator
English
STOP
AUX
R100 G120 B135
Active: R18 G218 B141
R49 G70 B85
Warning: R247 G214 B108
R49 G70 B85
Fault: R228 G68 B87
R49 G70 B85
Inactive: R170 G186 B198
Inactive: R100 G120 B135
R40 G180 B210
R255 G255 B255
R100 G120 B135
R125 G125 B125
R26 G37 B45
R125 G125 B125
+40
+30
+10
-10
R209 G218 B224
R100 G120 B135
R209 G218 B224
Active: R18 G218 B141
R26 G37 B45
Warning: R247 G214 B108
R26 G37 B45
Fault: R228 G68 B87
R26 G37 B45
Inactive: R49 G70 B85
R26 G37 B45
Button: R170 G186 B198
R26 G37 B45
R26 G37 B45
R100 G120 B135
Inactive: R170 G186 B198
Active: R18 G218 B141
Warning: R247 G214 B108
Fault: R228 G68 B87



① Control element: Open details page

② Inactive element: Converter is switched off

③ Dynamic element: Direction of motion

④ Active element: Converter is active

⑤ Warning: Warning for trolley is active

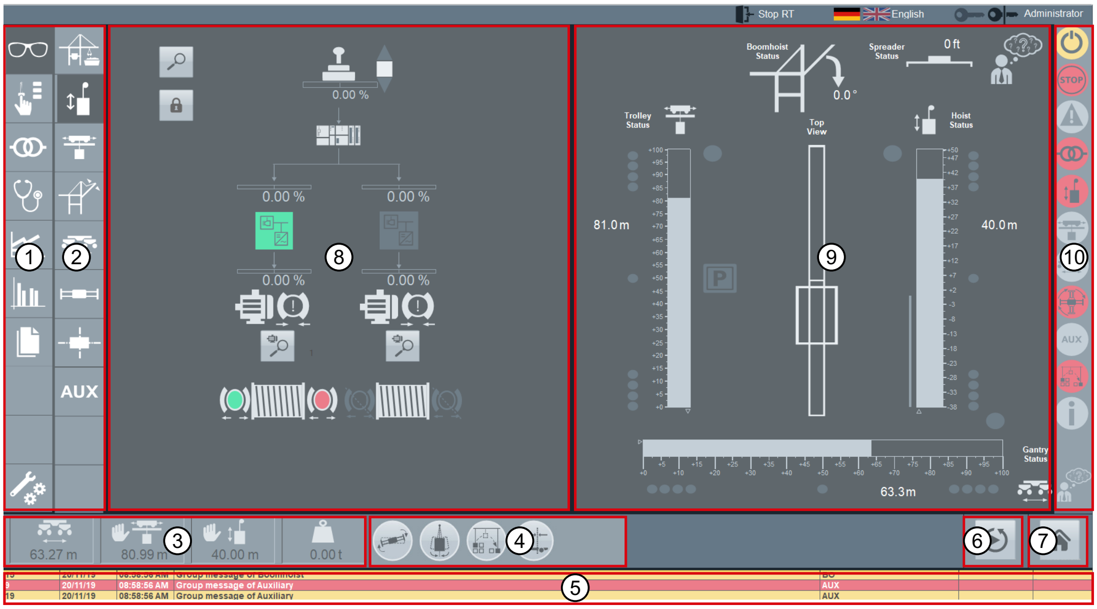
⑥ Faults: General fault active

Figure 5-1 Color philosophy in the CMS

Screen structure

The user interface consists of fixed and dynamic components. The fixed display areas contain status and fault displays, which are always visible. The dynamic screen components enable navigation through detailed information and operating areas.

The following figure illustrates the structure of the user interface.



```
15  20/11/19  08:58:56 AM  Group message of Boomhoist   BO
9   20/11/19  08:58:56 AM  Group message of Auxiliary   AUX
19  20/11/19  08:58:56 AM  Group message of Auxiliary   AUX
```

① Primary navigation bar: For toggling between the main CMS menus

② Secondary navigation bar: Screen changeover within main menus (secondary screen content)

③ Information bar: Displays important load and position data

④ Operating bar: Activation / deactivation of additional technology functions

⑤ Message line: Displays the current message

⑥ Replay button: Activation / deactivation of Replay mode

⑦ HOME button: Selects the CMS start page

⑧+⑨ Screen content; can be switched using the navigation bar

⑧ Primary screen content: Fixed screen section which is permanently displayed within the main menu. Constant primary screen content does not exist in all main CMS menus.

⑨ Secondary screen content: Variable screen section which is switched over using secondary navigation. If there is no fixed primary screen content, all screen content is switched over.

⑩ Group fault bar: Displays general warnings and group faults

Figure 5-2 Screen structure of the CMS user interface

The user can select from three screen levels when switching the screen over. The deeper you navigate into the levels, the more detailed the information. Access to detailed information is linked to the corresponding user rights.

- Level 1: Switching over the main menus (with or without primary screen content ⑩) using the primary navigation bar ②. Each main menu has its own secondary navigation bar.
- Level 2: Switching over secondary screen contents ⑧ using the secondary navigation bar ③.
- Level 3: Displaying detail windows. Detail windows can only be accessed with the corresponding user rights. The detail windows are displayed using control elements within the secondary screen content.

5.2 User groups

A distinction is made between four user groups and different rights are issued for them for the CMS user interfaces:

- Crane operator ("Operator")
- Maintenance personnel ("Maintenance")
- User whose primary objective is to evaluate operating data ("Management")
- Administrator

Table 5-1 CMS / RCMS user interface user groups

User right	User name	Description
Crane driving	Operator	Standard user with few rights. The information displayed focuses on assisting crane operators.
Maintenance	Maintenance	User with higher-level rights. The information displayed focuses on assisting with fault diagnostics and maintenance.
Manage	Management	User with higher-level rights. The information displayed focuses on the operating data.
Administration	Administrator	User with unrestricted rights.

Note

Changing the password

After completing the setup, users must change the initially assigned password.
See: Network access protection (Page 25)
See: Changing passwords (Page 264)

5.3 Condition monitoring

Condition monitoring is simply an indication instrument. The state of the crane components along with the most important electrical, mechanical and hydraulic units for crane operations are graphically displayed, as are the states of the infeed and technology function components.

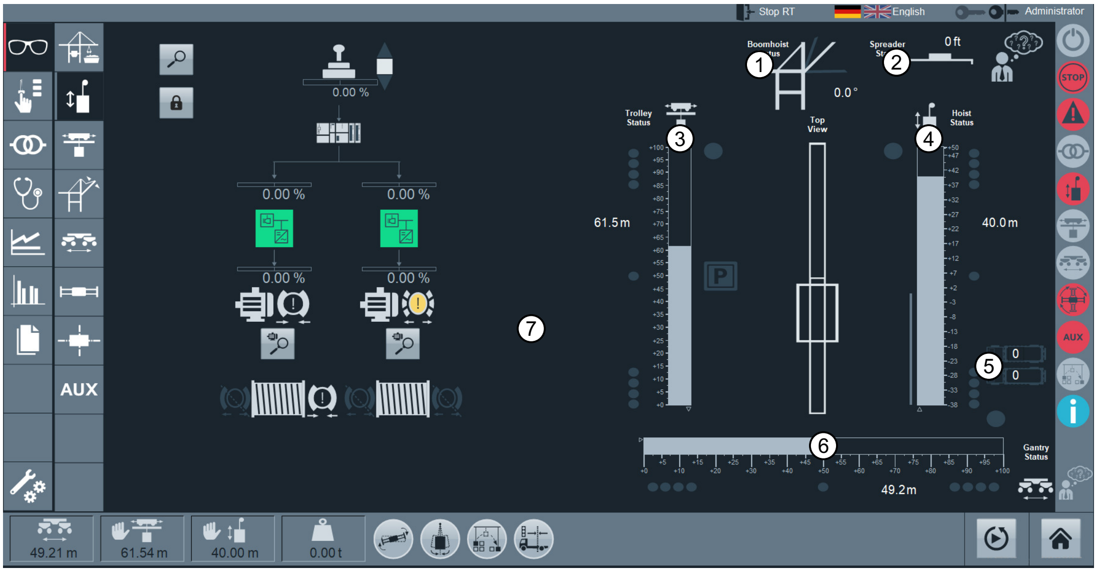
The display is prepared such that components and units are easy to recognize. The state of the elements is clearly shown by the colors used. Purely static screen objects are shown in gray, dynamic elements are blue in normal mode, yellow in a warning state and red in a fault state. It is crucial that the critical states can be recognized at a glance by the color alone.

The information displayed should be kept to a minimum. Precisely the information which the crane operator or service technician needs to reliably perform his work is normally displayed. If necessary, detailed information can be added.

Table 5-2 Status display using a converter as example

Icon	Symbol flashes	Description
⬛	-	Converter inactive / off
⬛	🟩	Converter ready to start
🟩	-	Converter active / on
🟨	-	Converter warning
🟥	-	Converter fault

An overview display shows the crane overview with the crane's main movements. The following screen shows an example of an STS crane. The trolley movement is displayed from the view of the crane operator. Displaying the hoist position helps the crane operator by providing him with a view he would not otherwise have.



① Position of the boom (bottom, top, 45°, or none of the three positions)

② Size and load of the spreader

③ Movement of the trolley with limit switches, operating mode and parking position display

④ Movement of the hoist with limit switches and operating mode

⑤ Positioning of the vehicles and number of the lane (Truck Positioning System)

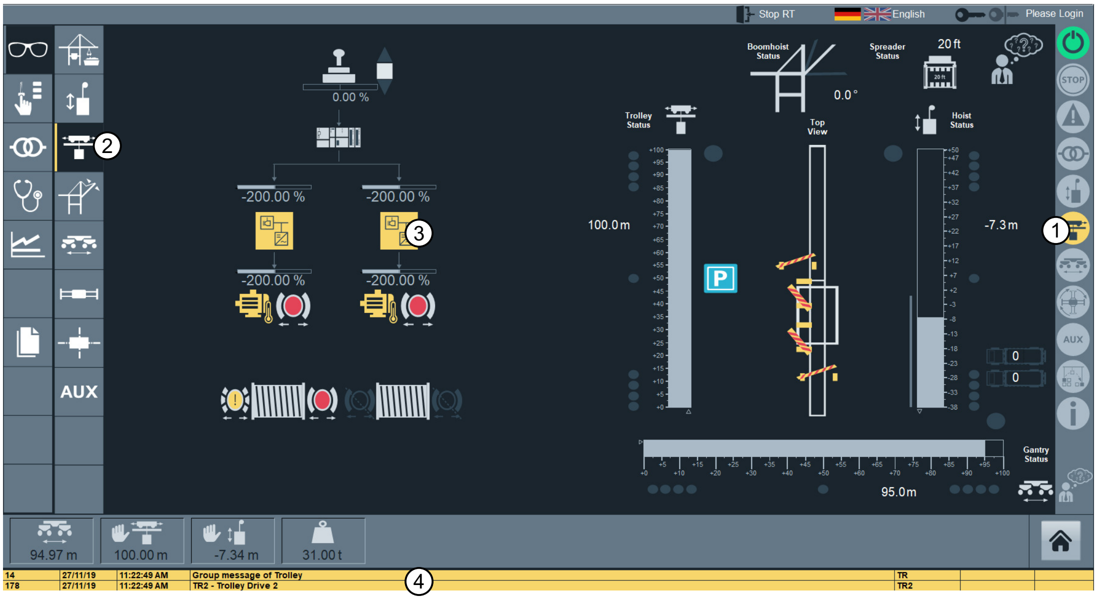
⑥ Movement of the long travel with limit switches and operating mode

⑦ Detailed information about the individual components (here: trolley)

The CMS has a graphic fault display so that faults can be visually localized.

- The group fault display ① at the top edge of the screen shows the faulty component.
- In the secondary navigation bar ②, the button that is assigned to this component flashes.

- The cause of the fault ③ can be taken from the screen activated by pressing button ②.
- The cause of the fault ④ can be investigated in more detail using the associated text message ④.

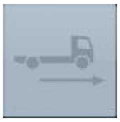


14	27/11/19	11:22:49 AM	Group message of Trolley	TR		
178	27/11/19	11:22:49 AM	TR2 - Trolley Drive 2	TR2		

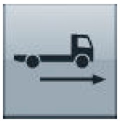
5.4 Process control

In most cases, the CMS is simply used as a tool for displaying operating states. Control of a value on the crane control system by the CMS add-on is protected, which means that the operator has to have the appropriate rights and has to confirm this by acknowledging a security prompt.

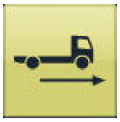
In principle, CMS also offers the option of initiating operator actions by sending control commands to the crane control system (e.g. to switch-on auxiliary systems). Auxiliary systems can be switched on using special operator control buttons with integrated status display. In this case, each operator control button has several states:



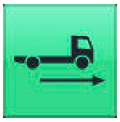
Operation of the function disabled.



Function is not active.



Activation of the function is requested at the controller.



Function is active. Acknowledgment from the controller.

Another example is the option for presetting parameters and counter values.

5.5 Fault diagnostics

The CMS acquires the fault messages from different components of the crane. The messages are archived, and can be displayed and evaluated using different resources:

- Message list in the user interface
- Report in the PDF and CSV format
- Message statistics (hit list)

In order to support maintenance technicians when analyzing faults, various items of information can be called for each message.

5.5.1 Message lists

The current message list provides an overview of the crane's current queued messages. Each message is displayed as a separate message line. Various information about a message can be displayed in a message line. The following is displayed in the example application:

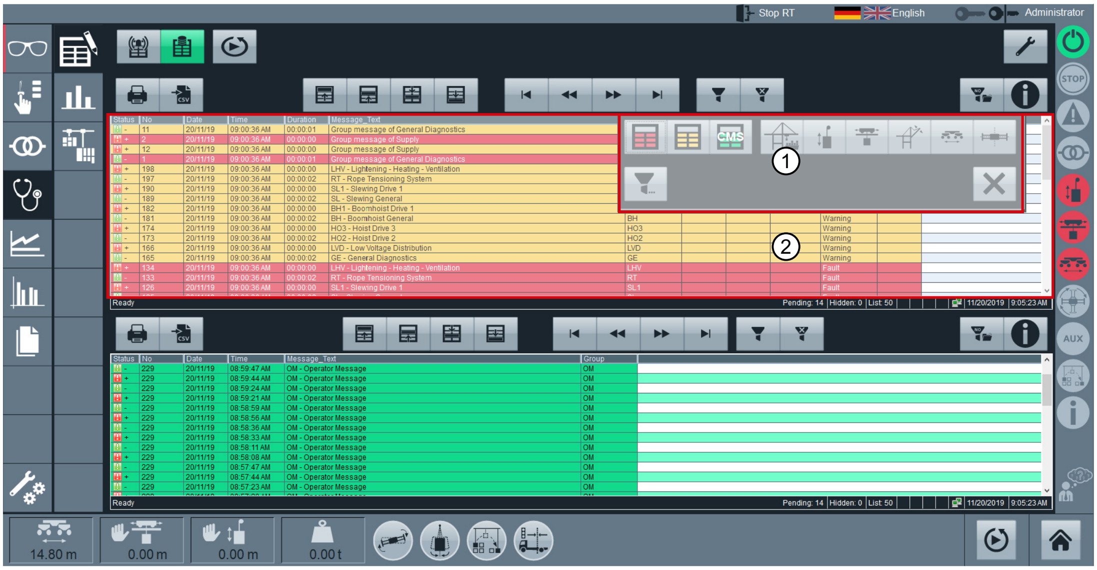
- Message number
- Time stamp
- Message text
- Group
- Plant ID (PID)
- Location ID (LID)
- Device ID (DID)

As soon as the cause of a message has been remedied, the corresponding message line disappears from the current message list.

The message history can be tracked in the archive list. One message line is displayed for an incoming message and one for an outgoing message. The message line is structured in the same way as the message list, but additional items are displayed here:

- Message status (raised: +; cleared: -)
- Length of message

The messages displayed in both the current message list and the archive list can be filtered using a predefined filter bar ①. In the CMS example application, filtering according to different crane components, message number or according to alarm class (fault, warning, event) has been configured.



Status	No	Date	Time	Duration	Message_Text		
-	11	20/11/19	09:00:36 AM	00:00:01	Group message of General Diagnostics		
+	2	20/11/19	09:00:36 AM	00:00:00	Group message of Supply		
+	12	20/11/19	09:00:36 AM	00:00:00	Group message of Supply		
-	1	20/11/19	09:00:36 AM	00:00:01	Group message of General Diagnostics		
+	198	20/11/19	09:00:36 AM	00:00:00	LHV - Lightening - Heating - Ventilation		
-	197	20/11/19	09:00:36 AM	00:00:02	RT - Rope Tensioning System		
+	190	20/11/19	09:00:36 AM	00:00:00	SL1 - Slewing Drive 1		
-	189	20/11/19	09:00:36 AM	00:00:02	SL - Slewing General		
+	182	20/11/19	09:00:36 AM	00:00:00	BH1 - Boomhoist Drive 1		
-	181	20/11/19	09:00:36 AM	00:00:02	BH - Boomhoist General	BH	Warning
+	174	20/11/19	09:00:36 AM	00:00:00	HO3 - Hoist Drive 3	HO3	Warning
-	173	20/11/19	09:00:36 AM	00:00:02	HO2 - Hoist Drive 2	HO2	Warning
+	166	20/11/19	09:00:36 AM	00:00:00	LVD - Low Voltage Distribution	LVD	Warning
-	165	20/11/19	09:00:36 AM	00:00:02	GE - General Diagnostics	GE	Warning
+	134	20/11/19	09:00:36 AM	00:00:00	LHV - Lightening - Heating - Ventilation	LHV	Fault
-	133	20/11/19	09:00:36 AM	00:00:02	RT - Rope Tensioning System	RT	Fault
+	126	20/11/19	09:00:36 AM	00:00:00	SL1 - Slewing Drive 1	SL1	Fault

Ready Pending: 14 | Hidden: 0 | List: 50 | 11/20/2019 | 9:05:23 AM

Status	No	Date	Time	Message_Text	Group
-	229	20/11/19	08:59:47 AM	OM - Operator Message	OM
+	229	20/11/19	08:59:44 AM	OM - Operator Message	OM
-	229	20/11/19	08:59:24 AM	OM - Operator Message	OM
+	229	20/11/19	08:59:21 AM	OM - Operator Message	OM
-	229	20/11/19	08:58:59 AM	OM - Operator Message	OM
+	229	20/11/19	08:58:56 AM	OM - Operator Message	OM
-	229	20/11/19	08:58:36 AM	OM - Operator Message	OM
+	229	20/11/19	08:58:33 AM	OM - Operator Message	OM
-	229	20/11/19	08:58:11 AM	OM - Operator Message	OM
+	229	20/11/19	08:58:08 AM	OM - Operator Message	OM
-	229	20/11/19	08:57:47 AM	OM - Operator Message	OM
+	229	20/11/19	08:57:44 AM	OM - Operator Message	OM
-	229	20/11/19	08:57:23 AM	OM - Operator Message	OM

Ready Pending: 14 | Hidden: 0 | List: 50 | 11/20/2019 | 9:05:23 AM

① Filter bar

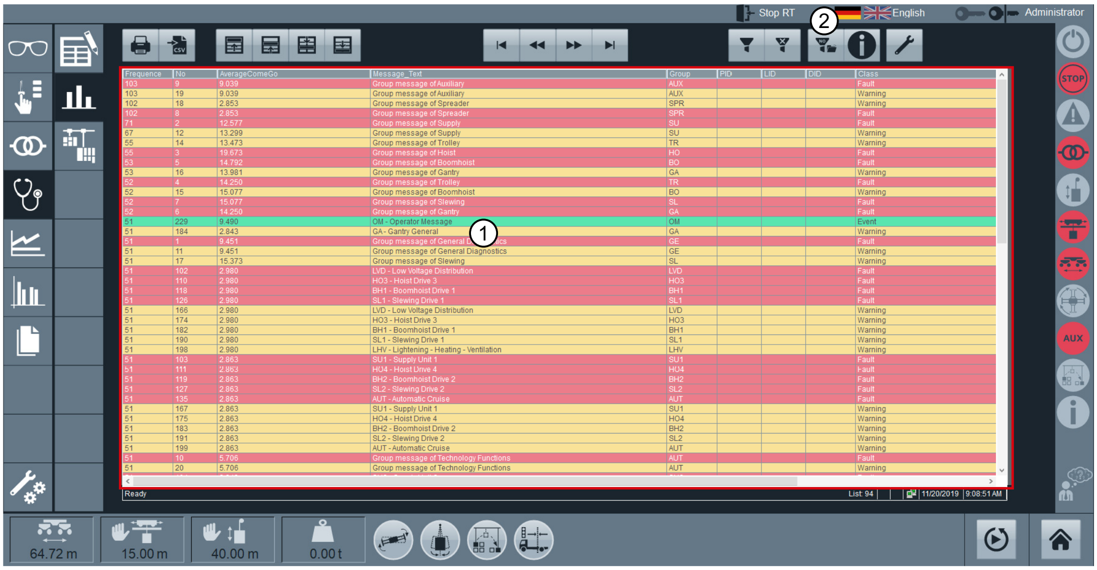
② Message list (actual messages / archive)

Figure 5-3 Archive list of the messages

5.5.2 Message statistics

The message statistics evaluate the frequency and average message length for the messages which have occurred.

The hit list ① shows an overview of the message numbers, displayed in descending order by frequency. For every selected entry of the hit list, an overview of the messages in an archive list can be additionally displayed by pressing button ②.



Frequence	No	AverageComeGo	Message_Text	Group	PID	LID	DID	Class
103	9	9.039	Group message of Auxiliary	AUX				Fault
103	19	9.039	Group message of Auxiliary	AUX				Warning
102	18	2.853	Group message of Spreader	SPR				Warning
102	8	2.853	Group message of Spreader	SPR				Fault
71	2	12.577	Group message of Supply	SU				Fault
67	12	13.299	Group message of Supply	SU				Warning
55	14	13.473	Group message of Trolley	TR				Warning
55	3	19.673	Group message of Hoist	HO				Fault
53	5	14.792	Group message of Boomhoist	BO				Fault
53	16	13.981	Group message of Gantry	GA				Warning
52	4	14.250	Group message of Trolley	TR				Fault
52	15	15.077	Group message of Boomhoist	BO				Warning
52	7	15.077	Group message of Slewing	SL				Fault
52	6	14.250	Group message of Gantry	GA				Fault
51	229	9.490	OM - Operator Message	OM				Event
51	184	2.843	GA - Gantry General	GA				Warning
51	1	9.451	Group message of General Diagnostics	GE				Fault
51	11	9.451	Group message of General Diagnostics	GE				Warning
51	17	15.373	Group message of Slewing	SL				Warning
51	102	2.980	LVD - Low Voltage Distribution	LVD				Fault
51	110	2.980	HO3 - Hoist Drive 3	HO3				Fault
51	118	2.980	BH1 - Boomhoist Drive 1	BH1				Fault
51	126	2.980	SL1 - Slewing Drive 1	SL1				Fault
51	166	2.980	LVD - Low Voltage Distribution	LVD				Warning
51	174	2.980	HO3 - Hoist Drive 3	HO3				Warning
51	182	2.980	BH1 - Boomhoist Drive 1	BH1				Warning
51	190	2.980	SL1 - Slewing Drive 1	SL1				Warning
51	198	2.980	LHV - Lightening - Heating - Ventilation	LHV				Warning
51	103	2.863	SU1 - Supply Unit 1	SU1				Fault
51	111	2.863	HO4 - Hoist Drive 4	HO4				Fault
51	119	2.863	BH2 - Boomhoist Drive 2	BH2				Fault
51	127	2.863	SL2 - Slewing Drive 2	SL2				Fault
51	135	2.863	AUT - Automatic Cruise	AUT				Fault
51	167	2.863	SU1 - Supply Unit 1	SU1				Warning
51	175	2.863	HO4 - Hoist Drive 4	HO4				Warning
51	183	2.863	BH2 - Boomhoist Drive 2	BH2				Warning
51	191	2.863	SL2 - Slewing Drive 2	SL2				Warning
51	199	2.863	AUT - Automatic Cruise	AUT				Warning
51	10	5.706	Group message of Technology Functions	AUT				Fault
51	20	5.706	Group message of Technology Functions	AUT				Warning

Ready

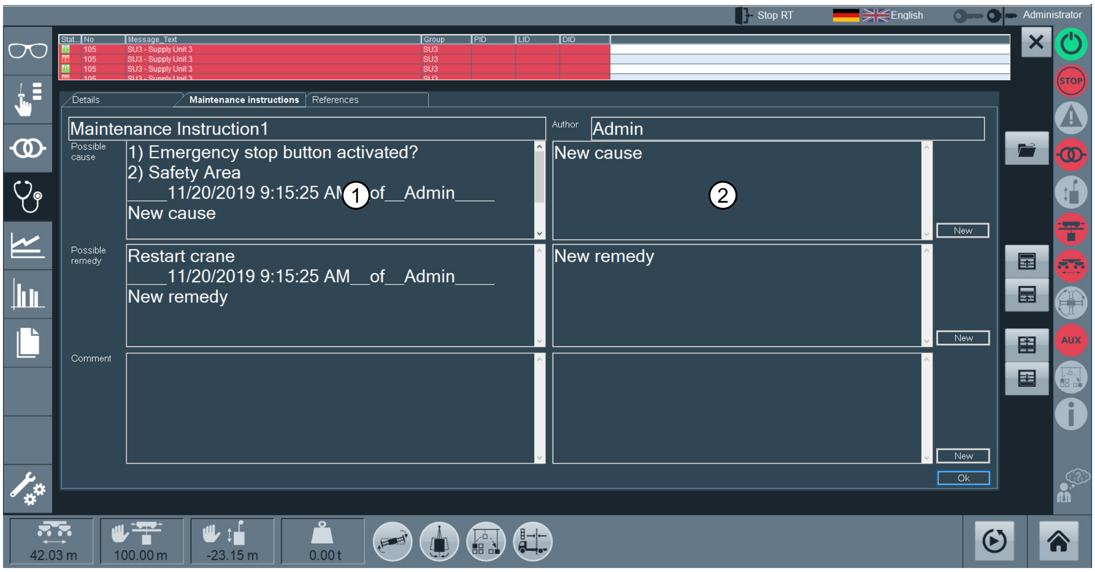
List: 94 | 11/20/2019 | 9:08:51 AM

①	Hit list	Message statistics
②	Button	Opens an archive list

5.5.3 Maintenance instructions and guidelines

You can save maintenance instructions for every message in the CMS. These can then be displayed when the selected message appears. Maintenance instructions can include any information about causes and instructions on how to resolve the fault.

As well as calling up information that has been saved, you can also add inputs to a maintenance instruction during operation, which can also be used by other users in the future.



Stat...	No	Message_Text	Group	PID	LID	DID
	105	SU3 - Supply Unit 3	SU3			
	105	SU3 - Supply Unit 3	SU3			
	105	SU3 - Supply Unit 3	SU3			
	105	SU3 - Supply Unit 3	SU3			

Maintenance Instruction1

Author: Admin

Possible cause:
1) Emergency stop button activated?
2) Safety Area
____11/20/2019 9:15:25 AM__of__Admin____
New cause

New cause

Possible remedy:
Restart crane
____11/20/2019 9:15:25 AM__of__Admin____
New remedy

New remedy

Comment:

① Maintenance instructions — Shows saved maintenance instructions for the message selected

② Remarks — Input of remarks about maintenance instructions

5.5.4 References to additional information

As with the maintenance instructions, you can save references for any message.

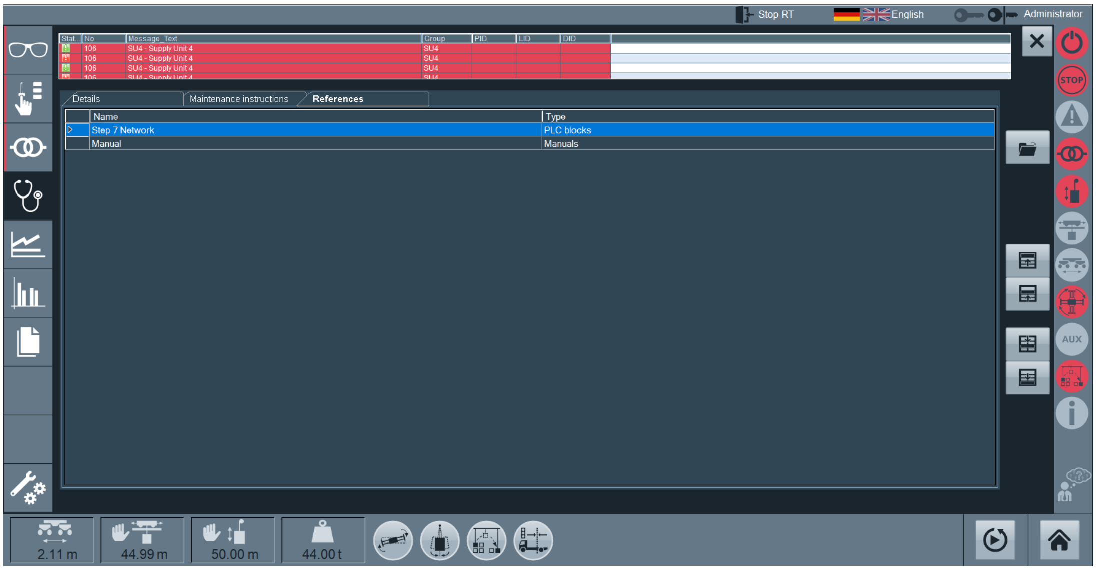
Examples of references to additional information:

- Circuit diagrams
- Symbols and networks in the crane control system's control program
- Programming Manuals
- Web pages
- Drawings
- Videos
- Word and Excel documents
- PowerPoint presentations
- etc.

The references that are displayed depend on the programs installed on the PC. The reference is not opened in the CMS itself, but in a program installed on the PC.

The references available must be in a local path on the CMS station or in a network path which can be accessed from various stations.

As with the maintenance instructions, the list of references available for a message is shown together with an archive list.



Stat...	No	Message_Text	Group	PID	LID	DID
!	106	SU4 - Supply Unit 4	SU4			
!	106	SU4 - Supply Unit 4	SU4			
!	106	SU4 - Supply Unit 4	SU4			
!	106	SU4 - Supply Unit 4	SU4			

	Name	Type
▷	Step 7 Network	PLC blocks
	Manual	Manuals

5.5.5 Web-based diagnostics of components

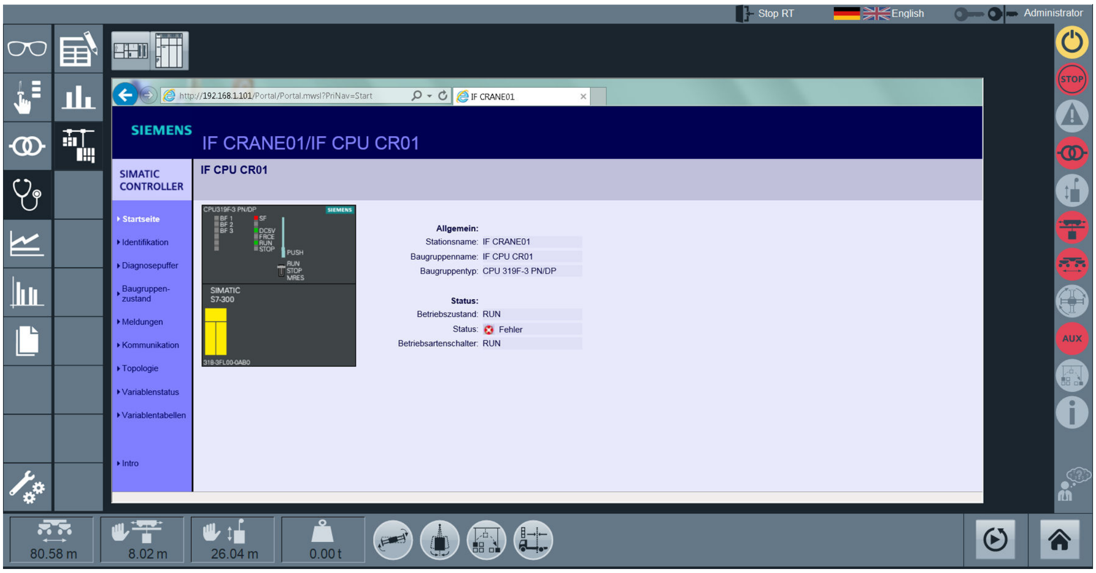
If crane components or subsystems have web-based diagnostics pages, these can be activated directly in the CMS.

Applications for this diagnostic functionality include:

- SIMOTION IT diagnostics
- Components of the SIMATIC family (CPUs with integrated PROFINET interface, Industrial Ethernet Switches)
- SIMATIC PCs; one of the accessories provided with the DiagMonitor package is a web server which offers diagnostics for your PC.
- Spreaders from well-known manufacturers

The web-based diagnostics pages can be integrated in the CMS user interface. For this, the following preconditions must be fulfilled:

- The component involved can be accessed via its IP address.
- The relevant diagnostic pages are enabled on the target device.



http://192.168.1.101/Portal/Portal.mwsl?PriNav=Start

IF CRANE01/IF CPU CR01

IF CPU CR01

Allgemein:
Stationsname: IF CRANE01
Baugruppenname: IF CPU CR01
Baugruppentyp: CPU 319F-3 PN/DP

Status:
Betriebszustand: RUN
Status: ☒ Fehler
Betriebsartenschalter: RUN

Figure 5-4 Web-based diagnostics page

5.6 Operating data and performance analysis

5.6.1 Recording operational data

The operational data that can be acquired with the CMS include:

- Cargo handling data; set of relevant data for a cargo handling operation
- Mean Moves Between Failure (MMBF); the so-called MMBF value reflects the average amount of cargo handling between two faults of relevance to MMBF (cargo handling / fault). The mean value relates to a fixed time range. A fault of relevance to MMBF is a fault which cannot be rectified by a crane driver, but which causes a crane to stop operating.
- Load and operating hours counter values

5.6.2 Move data

You can acquire a set of relevant operating data for each cargo handling operation ("Move") in the CMS. A move data set includes for example:

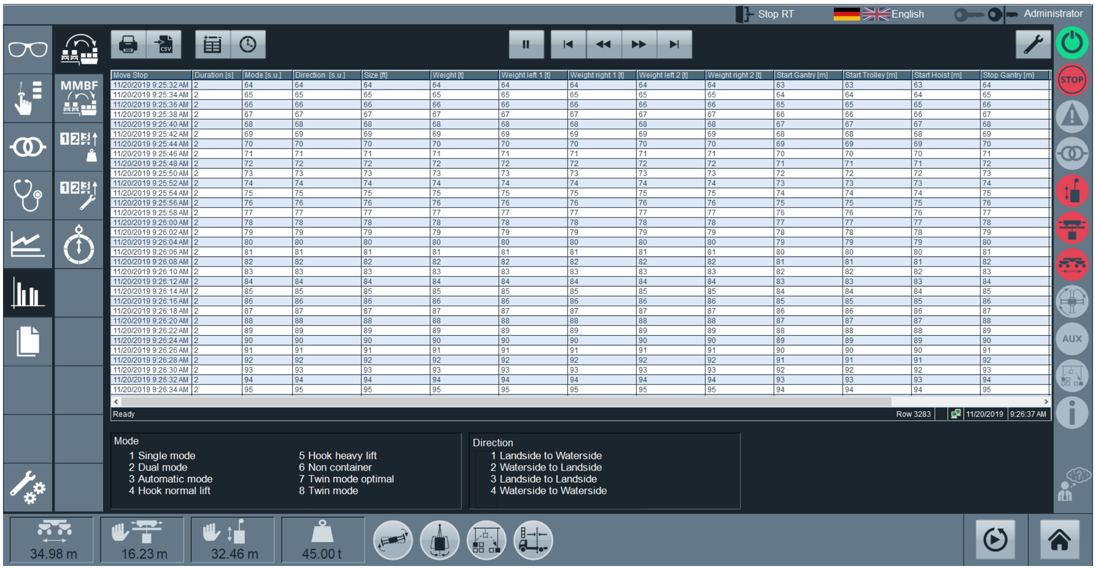
- Weight
- Transport direction
- Operating mode
- Positions
- specific data (e.g. container sizes for container cranes)

A default data set for move data acquisition is initialized in the CMS example application. This default data set can be expanded in any way.

Data is calculated in the control system. The CMS supports two different acquisition modes:

- Direct acquisition of data:
  As soon as the end of one cargo handling operation has been detected on the controller, the event is reported to the CMS which reads the data set and sets the time stamp.
- Buffered data acquisition:
  The controller is initialized for backing up data sets. In this case, the time stamp must be set in the control system and transferred to the CMS with the data set.

The move data is displayed in tables in the CMS example application. You can filter the way the data sets are displayed by different time slices.



Move Stop	Duration [s]	Mode [s.u.]	Direction [s.u.]	Size [ft]	Weight [t]	Weight left 1 [t]	Weight right 1 [t]	Weight left 2 [t]	Weight right 2 [t]	Start Gantry [m]	Start Trolley [m]	Start Hoist [m]	Stop Gantry [m]
11/20/2019 9:25:32 AM	2	64	64	64	64	64	64	64	64	63	63	63	64
11/20/2019 9:25:34 AM	2	65	65	65	65	65	65	65	65	64	64	64	65
11/20/2019 9:25:36 AM	2	66	66	66	66	66	66	66	66	65	65	65	66
11/20/2019 9:25:38 AM	2	67	67	67	67	67	67	67	67	66	66	66	67
11/20/2019 9:25:40 AM	2	68	68	68	68	68	68	68	68	67	67	67	68
11/20/2019 9:25:42 AM	2	69	69	69	69	69	69	69	69	68	68	68	69
11/20/2019 9:25:44 AM	2	70	70	70	70	70	70	70	70	69	69	69	70
11/20/2019 9:25:46 AM	2	71	71	71	71	71	71	71	71	70	70	70	71
11/20/2019 9:25:48 AM	2	72	72	72	72	72	72	72	72	71	71	71	72
11/20/2019 9:25:50 AM	2	73	73	73	73	73	73	73	73	72	72	72	73
11/20/2019 9:25:52 AM	2	74	74	74	74	74	74	74	74	73	73	73	74
11/20/2019 9:25:54 AM	2	75	75	75	75	75	75	75	75	74	74	74	75
11/20/2019 9:25:56 AM	2	76	76	76	76	76	76	76	76	75	75	75	76
11/20/2019 9:25:58 AM	2	77	77	77	77	77	77	77	77	76	76	76	77
11/20/2019 9:26:00 AM	2	78	78	78	78	78	78	78	78	77	77	77	78
11/20/2019 9:26:02 AM	2	79	79	79	79	79	79	79	79	78	78	78	79
11/20/2019 9:26:04 AM	2	80	80	80	80	80	80	80	80	79	79	79	80
11/20/2019 9:26:06 AM	2	81	81	81	81	81	81	81	81	80	80	80	81
11/20/2019 9:26:08 AM	2	82	82	82	82	82	82	82	82	81	81	81	82
11/20/2019 9:26:10 AM	2	83	83	83	83	83	83	83	83	82	82	82	83
11/20/2019 9:26:12 AM	2	84	84	84	84	84	84	84	84	83	83	83	84
11/20/2019 9:26:14 AM	2	85	85	85	85	85	85	85	85	84	84	84	85
11/20/2019 9:26:16 AM	2	86	86	86	86	86	86	86	86	85	85	85	86
11/20/2019 9:26:18 AM	2	87	87	87	87	87	87	87	87	86	86	86	87
11/20/2019 9:26:20 AM	2	88	88	88	88	88	88	88	88	87	87	87	88
11/20/2019 9:26:22 AM	2	89	89	89	89	89	89	89	89	88	88	88	89
11/20/2019 9:26:24 AM	2	90	90	90	90	90	90	90	90	89	89	89	90
11/20/2019 9:26:26 AM	2	91	91	91	91	91	91	91	91	90	90	90	91
11/20/2019 9:26:28 AM	2	92	92	92	92	92	92	92	92	91	91	91	92
11/20/2019 9:26:30 AM	2	93	93	93	93	93	93	93	93	92	92	92	93
11/20/2019 9:26:32 AM	2	94	94	94	94	94	94	94	94	93	93	93	94
11/20/2019 9:26:34 AM	2	95	95	95	95	95	95	95	95	94	94	94	95

Ready   Row 3283   11/20/2019   9:26:37 AM

Mode
1 Single mode
2 Dual mode
3 Automatic mode
4 Hook normal lift
5 Hook heavy lift
6 Non container
7 Twin mode optimal
8 Twin mode

Direction
1 Landside to Waterside
2 Waterside to Landside
3 Landside to Landside
4 Waterside to Waterside

Figure 5-5 Tabular list of the cargo handling operations that have been acquired

5.6.3 MMBF data

The MMBF data set must be calculated in the control system. The CMS only supports capturing values. The control system also reports when a data set is to be read. The following data is for example transferred in the data set:

- Number of faults
- Number of moves
- MMBF value

A default data set for the MMBF data acquisition is initialized in the CMS application example. This default data set can be expanded in any way.

Note

Using the SIMOCRANE CMS Analyzer you can calculate and display your own MMBF data sets.
Additional information is provided in the online help of SIMOCRANE CMS Analyzer.

Data is calculated in the control system. The CMS supports two different acquisition modes:

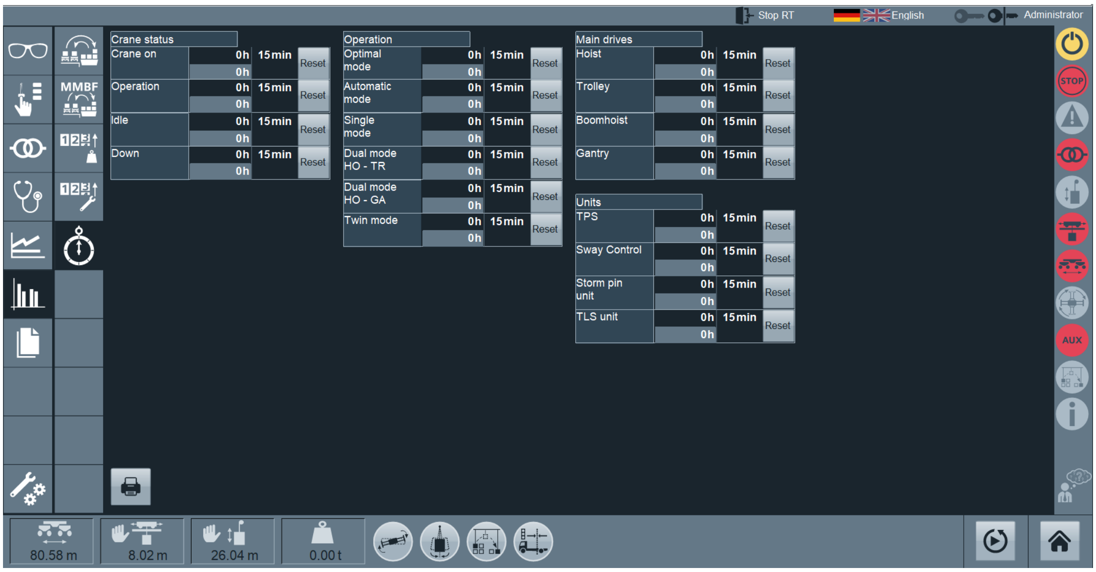
- Direct acquisition of data:
  As soon as the end of one cargo handling operation has been detected on the controller, the event is reported to the CMS which reads the data set and sets the time stamp.
- Buffered data acquisition:
  The controller is initialized for backing up data sets. In this case, the time stamp must be set in the control system and transferred to the CMS with the data set.

The MMBF data is displayed in the CMS user interface in the same way as the move data.

5.6.4 Load and operating hours counter

You can record current counter values on the controller. Time slices can be defined in the CMS. The CMS calculates the counters' differential values for these time slices. The CMS supports automatic counter restoration when the controller is reloaded. Total and section counters can also be used for each counter. You can visualize the total counter and total kilometer reading for your car, as well as the section counter and trip recorder. As with your car's trip recorder, a reset button can be used to reset the crane's section counter.

You can display the absolute values of the counter values in the CMS user interface. Operating hours are displayed in the CMS example application in hours and minutes. The absolute value corresponds to the process value on the controller. You can use the RESET buttons to reset the section counters.



Crane status			
Crane on	0h 0h	15min	Reset
Operation	0h 0h	15min	Reset
Idle	0h 0h	15min	Reset
Down	0h 0h	15min	Reset

Operation			
Optimal mode	0h 0h	15min	Reset
Automatic mode	0h 0h	15min	Reset
Single mode	0h 0h	15min	Reset
Dual mode HO - TR	0h 0h	15min	Reset
Dual mode HO - GA	0h 0h	15min	Reset
Twin mode	0h 0h	15min	Reset

Main drives			
Hoist	0h 0h	15min	Reset
Trolley	0h 0h	15min	Reset
Boomhoist	0h 0h	15min	Reset
Gantry	0h 0h	15min	Reset

Units			
TPS	0h 0h	15min	Reset
Sway Control	0h 0h	15min	Reset
Storm pin unit	0h 0h	15min	Reset
TLS unit	0h 0h	15min	Reset

Figure 5-6 Operating hours display

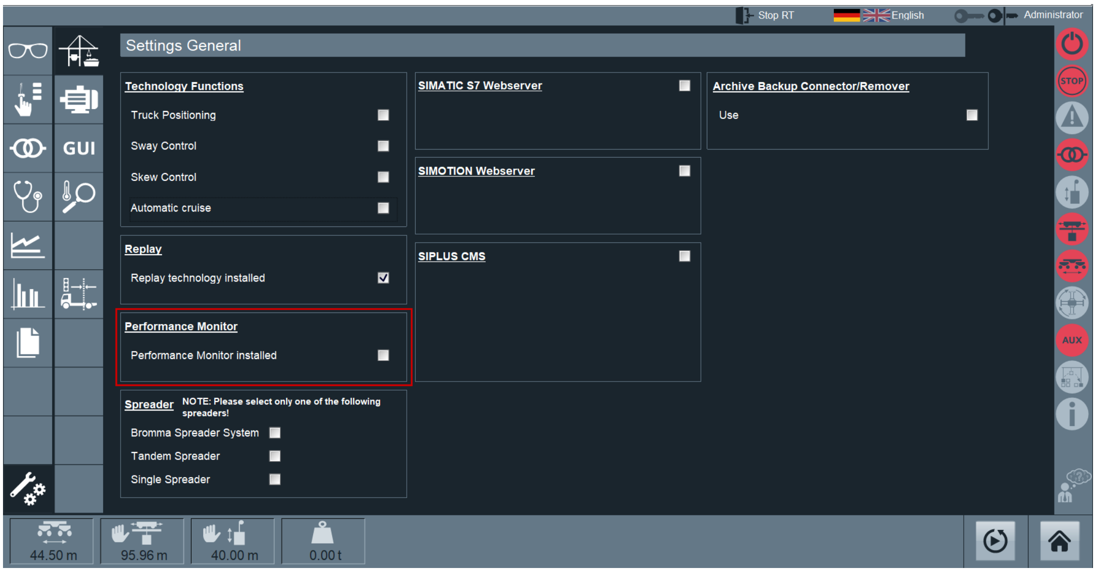
5.6.5 Performance evaluations

Note

This chapter is only relevant to you if you have installed the "Performance Monitor" option for the CMS station in the SIMOCRANE CMS product package.

Based on the crane's status word and the counters, the WinCC Performance Monitor performs calculations to assess the counters and analyze the operating states. It is able to establish key performance indicators (KPI) such as a crane's availability, utilization, performance, and MMBF value. Each crane is set up as equipment in the Performance Monitor. The precondition for performance evaluation is that the performance indicators and operating states have been defined in the form of operands or structured operands in the Performance Monitor Configuration Studio (see Chapter Performance Monitor Configuration (Page 278)).

To be able to call up the images for display of the crane state and the performance indicators, you must first specify in the setting menu that the Performance Monitor software has been installed.



Settings General

Technology Functions

- Truck Positioning □
- Sway Control □
- Skew Control □
- Automatic cruise □

Replay

- Replay technology installed ☑

Performance Monitor

- Performance Monitor installed □

Spreader NOTE: Please select only one of the following spreaders!

- Bromma Spreader System □
- Tandem Spreader □
- Single Spreader □

SIMATIC S7 Webserver □

SIMOTION Webserver □

SIPLUS CMS □

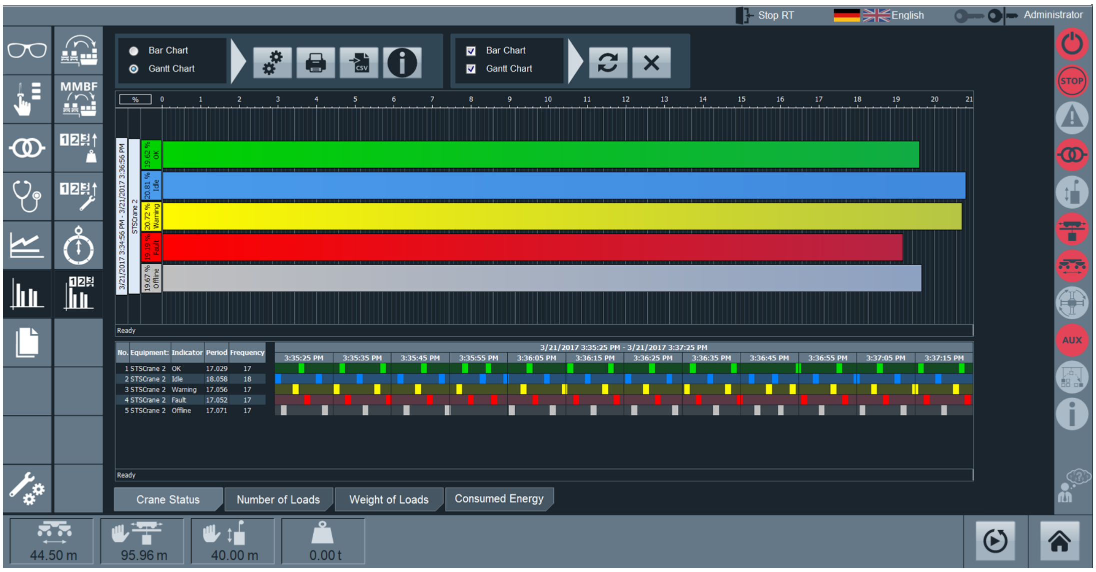
Archive Backup Connector/Remover

- Use □

Figure 5-7 Settings

The CMS example application contains two graphical displays for evaluating the operating states and downtimes based on the definition of the individual values of the crane status word.

- Percentage evaluation of the duration of the individual operating states with reference to the overall period considered.
- Display of the duration and sequence of operating status versus a time axis in the Gantt chart



No.	Equipment:	Indicator	Period	Frequency
1	STSCrane 2	OK	17.029	17
2	STSCrane 2	Idle	18.058	18
3	STSCrane 2	Warning	17.056	17
4	STSCrane 2	Fault	17.052	17
5	STSCrane 2	Offline	17.071	17

Figure 5-8 Crane status

The CMS example application also calculates and displays the following performance data:

- Operating state
- Consumed energy
- Number of containers handled (for each size/weight/direction)
- Weight of the containers handled (for each size/direction)

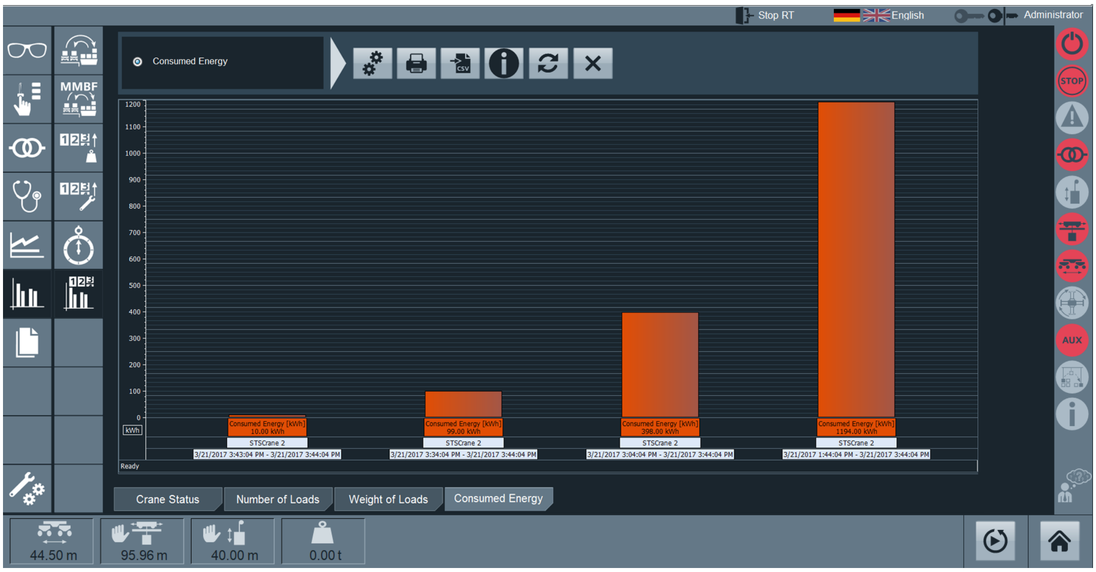


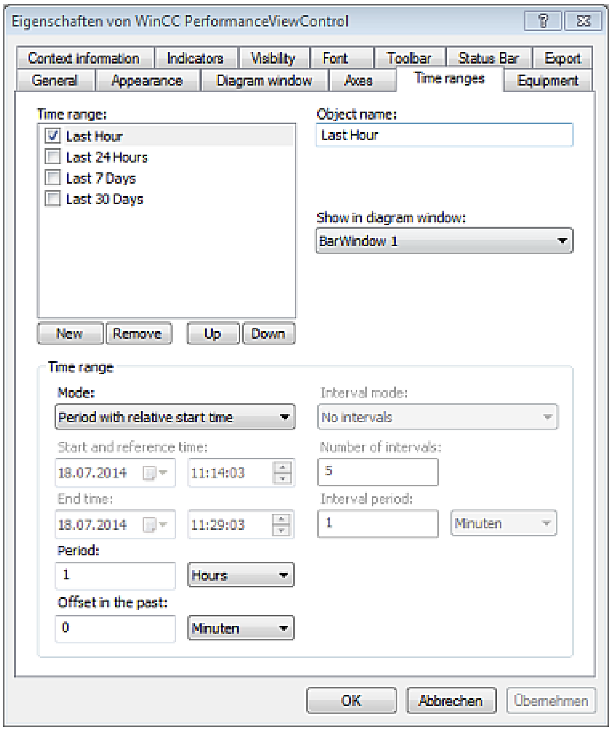
Figure 5-9 Example: Consumed energy

Of course, many other performance indicators can be calculated in the Performance Monitor Configuration Studio, e.g.

- Evaluation of downtimes (maintenance, faults, etc.)
- Performance indicators (efficiency, utilization, availability)

In the visualization, each analysis involves calculations over different time ranges (per hour, day, week, month, year). Select the time ranges to be displayed in the settings of the relevant control:

1. Choose the view to be adapted in the option field.
2. Click the button for opening the settings.
3. Select the time ranges to be displayed on the "Time ranges" tab.



Eigenschaften von WinCC PerformanceViewControl

Time range:

☑ Last Hour
□ Last 24 Hours
□ Last 7 Days
□ Last 30 Days

Object name: Last Hour

Show in diagram window: BarWindow 1

Time range

Mode: Period with relative start time

Start and reference time: 18.07.2014 11:14:03

End time: 18.07.2014 11:29:03

Period: 1 Hours

Offset in the past: 0 Minuten

Interval mode: No intervals

Number of intervals: 5

Interval period: 1 Minuten

Figure 5-10 Selecting the time ranges

Alternately, you can configure an individual time range yourself. When setting the modes and the other possible options, pay attention to the notes in the Performance Monitor documentation, which is also installed.

You will find an overview of the available actions below in the pictures for displaying the crane status and other performance data.

To call the action for the desired view:

1. Choose the view in the option field on the left.
2. Click on one of the following buttons.

⚙	Opens the setting menu of the currently selected view. In the setting menu, you can choose from among the following settings. • Displayed indicators • Time range to be displayed • Appearance of the control • …
🖶	If you have created a print job in the WinCC Report Designer and have connected it to the view, you can print out the current view by clicking this button. **Note:** In the example application, this action is not available by default because no print job has been created in the Report Designer. To assign a print job to the view, perform the following steps: 1. Open the picture to be edited in the Graphics Designer. 2. Select "Configuration dialog..." from the shortcut menu of the control to be configured. 3. Go to the "General" tab and set up the print job under "Print job" in the Report Designer. 4. Click "OK" to close the dialog box of the control. 5. Navigate to "Miscellaneous → Operator-Control Enable" in the object properties and select "yes" for this property. 6. Save and close the picture.
CSV	Exports the data of the selected view into a csv file (e.g. for displaying the data with Microsoft Excel).
ℹ	Opens the help for the selected Performance Monitor Control.
🔄	Updates the displayed data in the selected view. This is necessary, for example, after selecting the time range for display in the view settings.
✕	Cancels updating the data.

Note

No support for the Replay function

The WinCC Performance Monitor Controls do not support the SIMOCRANE CMS Replay function. We therefore recommend not preparing the images for Replay.

5.7 Reporting

5.7.1 Reporting for SIMOCRANE CMS

In SIMOCRANE CMS, you can print out or export data to create reports

Here, you have various options:

- **From the application**
  In the application example, you can do the following:
  - Print move data or export as CSV files
    See: Move data (Page 74)
  - Print MMBF data or export as CSV files
    See: MMBF data (Page 75)
  - Print load and operating hours counter
    See: Load and operating hours counter (Page 76)

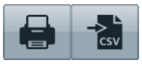


Figure 5-11 Buttons for printing and for the CSV export

- **From the WinCC Performance Monitor (optional)**
  In the WinCC Performance Monitor you can do the following:
  - Calculate and print key performance indicators (KPI) – or export as CSV files.
    See: Performance evaluations (Page 76)

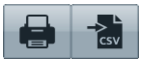


Figure 5-12 Buttons for printing and for the CSV export

- **From the SIMOCRANE CMS Fast Trace Viewer (optional)**
  In the SIMOCRANE CMS Fast Trace Viewer you can do the following:
  - Export trace data as CSV data.
    See: SIMOCRANE CMS Fast Trace Viewer (optional) (Page 48)

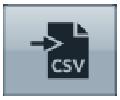
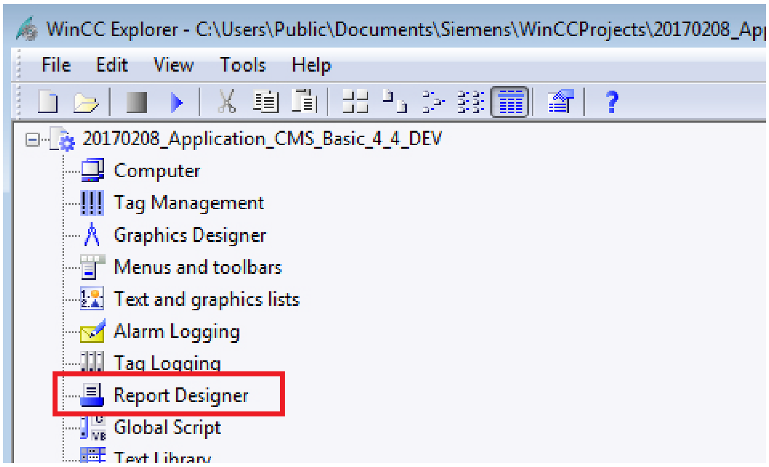


Figure 5-13 Buttons for CSV export

- **Via the WinCC Report Designer**
  You can do the following in the WinCC Report Designer:
  - Print move data or export as CSV files
  - Print operating data or export as CSV files
  - Print MMBF data or export as CSV files

  In the WinCC Report Designer you can set the regular time intervals when data should be automatically printed – or should be exported as CSV.

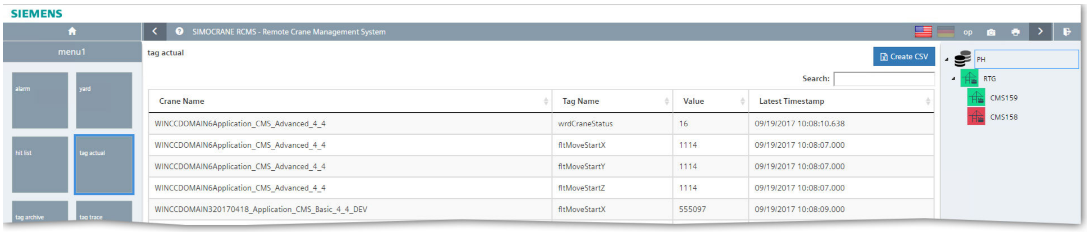


WinCC Explorer - C:\Users\Public\Documents\Siemens\WinCCProjects\20170208_Ap

Figure 5-14 WinCC Explorer > Report Designer

See: WinCC report system (Page 84)

- **Via the SIMOCRANE RCMS web application (optional)**
  You can do the following in the SIMOCRANE RCMS web application:
  - Print messages or export as CSV files
  - Print move data or export as CSV files
  - Print operating data or export as CSV files
  - Print MMBF data or export as CSV files



tag actual

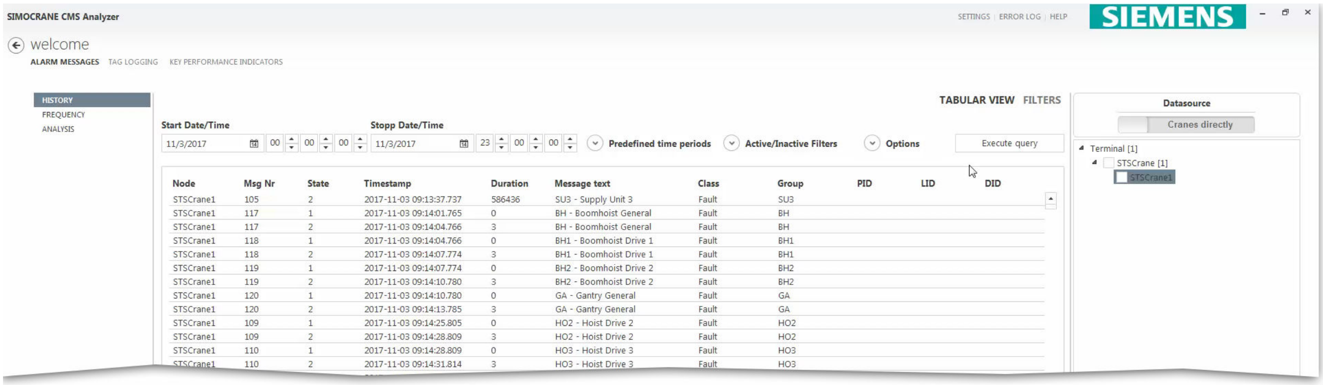
Search:

Crane Name	Tag Name	Value	Latest Timestamp
WINCCDOMAIN6Application_CMS_Advanced_4_4	wrdCraneStatus	16	09/19/2017 10:08:10.638
WINCCDOMAIN6Application_CMS_Advanced_4_4	fltMoveStartX	1114	09/19/2017 10:08:07.000
WINCCDOMAIN6Application_CMS_Advanced_4_4	fltMoveStartY	1114	09/19/2017 10:08:07.000
WINCCDOMAIN6Application_CMS_Advanced_4_4	fltMoveStartZ	1114	09/19/2017 10:08:07.000
WINCCDOMAIN320170418_Application_CMS_Basic_4_4_DEV	fltMoveStartX	555097	09/19/2017 10:08:09.000

Figure 5-15 SIMOCRANE RCMS web application

You can find more information in the SIMOCRANE RCMS System Manual.

- **Via the SIMOCRANE CMS Analyzer**
  You can do the following in the SIMOCRANE CMS Analyzer:
  - Print messages or export as CSV files
  - Print move data or export as CSV files
  - Print operating data or export as CSV files
  - Print calculated MMBF data or export as CSV files
  - Print calculated key performance indicators (KPI) – or export as CSV files



Start Date/Time: 11/3/2017 00 00 00

Stopp Date/Time: 11/3/2017 23 00 00

Node	Msg Nr	State	Timestamp	Duration	Message text	Class	Group	PID	LID	DID
STSCrane1	105	2	2017-11-03 09:13:37.737	586436	SU3 - Supply Unit 3	Fault	SU3			
STSCrane1	117	1	2017-11-03 09:14:01.765	0	BH - Boomhoist General	Fault	BH			
STSCrane1	117	2	2017-11-03 09:14:04.766	3	BH - Boomhoist General	Fault	BH			
STSCrane1	118	1	2017-11-03 09:14:04.766	0	BH1 - Boomhoist Drive 1	Fault	BH1			
STSCrane1	118	2	2017-11-03 09:14:07.774	3	BH1 - Boomhoist Drive 1	Fault	BH1			
STSCrane1	119	1	2017-11-03 09:14:07.774	0	BH2 - Boomhoist Drive 2	Fault	BH2			
STSCrane1	119	2	2017-11-03 09:14:10.780	3	BH2 - Boomhoist Drive 2	Fault	BH2			
STSCrane1	120	1	2017-11-03 09:14:10.780	0	GA - Gantry General	Fault	GA			
STSCrane1	120	2	2017-11-03 09:14:13.785	3	GA - Gantry General	Fault	GA			
STSCrane1	109	1	2017-11-03 09:14:25.805	0	HO2 - Hoist Drive 2	Fault	HO2			
STSCrane1	109	2	2017-11-03 09:14:28.809	3	HO2 - Hoist Drive 2	Fault	HO2			
STSCrane1	110	1	2017-11-03 09:14:28.809	0	HO3 - Hoist Drive 3	Fault	HO3			
STSCrane1	110	2	2017-11-03 09:14:31.814	3	HO3 - Hoist Drive 3	Fault	HO3			

Figure 5-16 SIMOCRANE CMS Analyzer

You can find more information in the online help for the SIMOCRANE CMS Analyzer.

5.7.2 WinCC report system

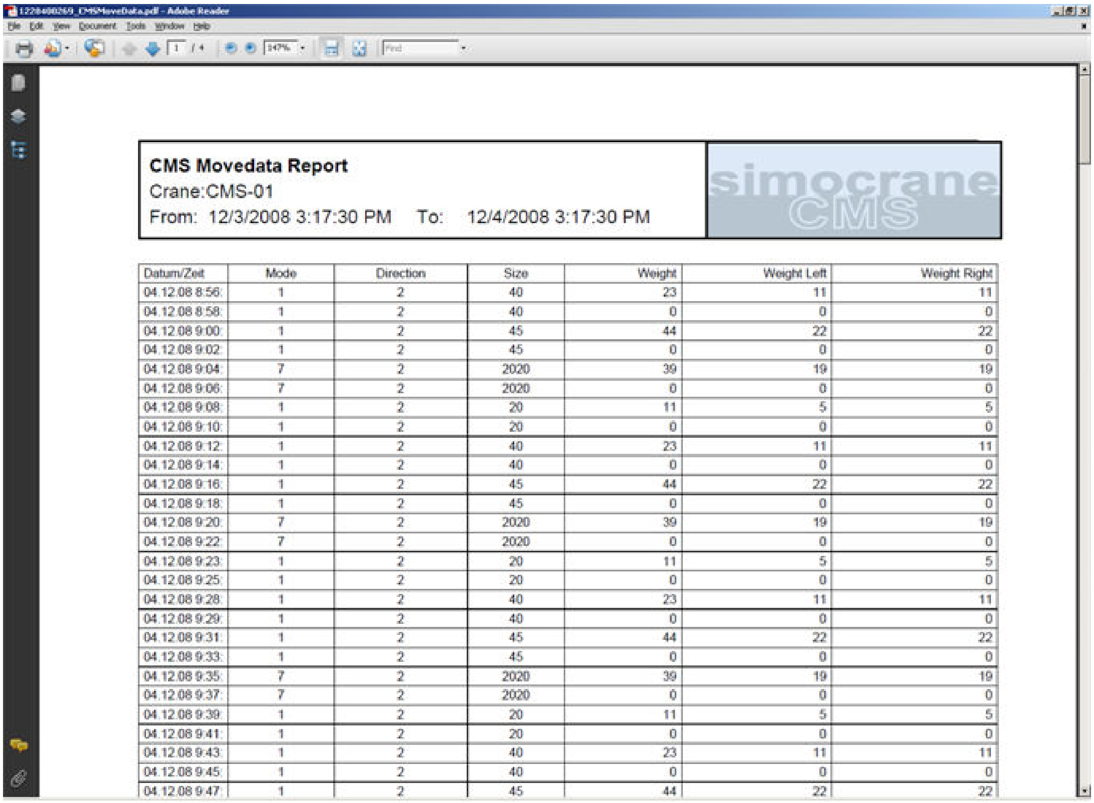
The WinCC protocol system (Report Designer) can be used to prepare data recorded during the runtime in various output formats. The reports can be printed, saved as a file and displayed as a preview on the screen.

The reports are based on configurable templates in which data can be brought together in precise accordance with requirements. Protocols are therefore available for current or archived messages or the operational data displayed.

The example application contains the following reports:

- the current message list
- the alarm log
- the move data
- the MMBF data
- the current counter values

All standard reports are based on a tabulated presentation of the default data in the CMS example application. Note that you have to adapt the data to your project as soon as you have changed requirements.


1228400269_CMSMoveData.pdf - Adobe Reader
File Edit View Document Tools Window Help
1 / 4
147%
Find
simocrane
CMS

CMS Movedata Report
Crane:CMS-01
From: 12/3/2008 3:17:30 PM To: 12/4/2008 3:17:30 PM

Datum/Zeit	Mode	Direction	Size	Weight	Weight Left	Weight Right
04.12.08 8:56:	1	2	40	23	11	11
04.12.08 8:58:	1	2	40	0	0	0
04.12.08 9:00:	1	2	45	44	22	22
04.12.08 9:02:	1	2	45	0	0	0
04.12.08 9:04:	7	2	2020	39	19	19
04.12.08 9:06:	7	2	2020	0	0	0
04.12.08 9:08:	1	2	20	11	5	5
04.12.08 9:10:	1	2	20	0	0	0
04.12.08 9:12:	1	2	40	23	11	11
04.12.08 9:14:	1	2	40	0	0	0
04.12.08 9:16:	1	2	45	44	22	22
04.12.08 9:18:	1	2	45	0	0	0
04.12.08 9:20:	7	2	2020	39	19	19
04.12.08 9:22:	7	2	2020	0	0	0
04.12.08 9:23:	1	2	20	11	5	5
04.12.08 9:25:	1	2	20	0	0	0
04.12.08 9:28:	1	2	40	23	11	11
04.12.08 9:29:	1	2	40	0	0	0
04.12.08 9:31:	1	2	45	44	22	22
04.12.08 9:33:	1	2	45	0	0	0
04.12.08 9:35:	7	2	2020	39	19	19
04.12.08 9:37:	7	2	2020	0	0	0
04.12.08 9:39:	1	2	20	11	5	5
04.12.08 9:41:	1	2	20	0	0	0
04.12.08 9:43:	1	2	40	23	11	11
04.12.08 9:45:	1	2	40	0	0	0
04.12.08 9:47:	1	2	45	44	22	22

Figure 5-17 Form of display for standard reports

In the CMS example application, the standard reports are configured in such a way that they are always printed using the PC's standard printer. You can define the standard printer in your PC's system control panel.

5.7.3 Output formats and interfaces

Depending on the version, the CMS offers different data interfaces with different output formats:

- The CMS WinCC add-on provides operational data (move data, MMBF data, counter values) in XML format.
- The WinCC controls for displaying archive values such as messages, move data and MMBF data support export to CSV format.
- The SIMOCRANE CMS Fast Trace Viewer Control to display trace data from X-Tools supports data export in the CSV format.

Installation 6

6.1 Preconditions

Before you can install SIMOCRANE CMS, the following software must be installed:

- SIMATIC WinCC V7.4 SP1 Update 11
  You may install more recent updates, but you must not install **any service pack other than** SP1!
- Automation License Manager V5.3 SP3 Update 3 or higher
- For further requirements regarding the operating system, service packs, hardware, etc., see also: System requirements (Page 19).

Local administrator rights are needed to install SIMOCRANE CMS.

If administrator functions are to be enabled for a user in SIMOCRANE CMS, the user must be included in the Windows "CMSAdmin" user group. This user group is not set up automatically when the software is installed, but must be created subsequently by a Windows administrator.

NOTICE

Prior to installation: export CMS-specific data with CMS V4.2

Note that you must migrate projects used under CMS V4.2 (WinCC 7.0) and CMS 4.3 (WinCC 7.2) if you wish to continue to use them under CMS V4.4.
First back up the data relevant to CMS using CMS V4.2 or CMS 4.3.

See also: Migration of existing projects (Page 391)

6.2 Installing SIMOCRANE CMS

Install the CMS Setup at the station on the crane that acquires data from the PLC and may transfer these data to an RCMS server.

Installation requirements

The following requirements must be met before installation:

- The system requirements must be fulfilled.
  See also: System requirements (Page 19)
- WinCC V7.4 SP1 Update 11 must be installed.

  Note

  You may install more recent updates for SIMATIC WinCC V7.4 SP1 Update 11, but you must not install **any service pack other than** SP1!
- Local administrator rights are needed to install SIMOCRANE CMS.

Installing additional programs

If the following programs are not already installed, they will be installed at the same time as CMS:

- Siemens Automation License Manager V5.3 SP3 Update 3 or higher
- .NET Framework 4.6.2 or higher
- Microsoft Visual C++ 2015 redistributable

Installation

1. Insert the "SIMOCRANE CMS" DVD into the computer and start the setup: "SIMOCRANE_CMS_Setup\setup.exe"
   If the following programs are not already installed, they will be installed:
   - Siemens Automation License Manager
   - .NET Framework
   - Microsoft Visual C++ 2015 redistributable

   Note

   If the installation process does not continue automatically after a restart, relaunch it by double-clicking on file "setup.exe".

   SIMOCRANE CMS is then installed.

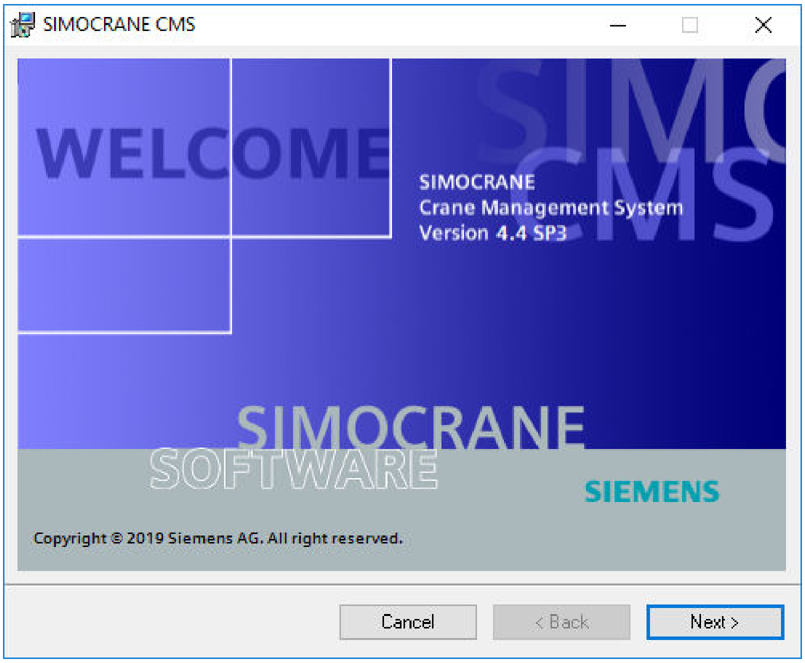
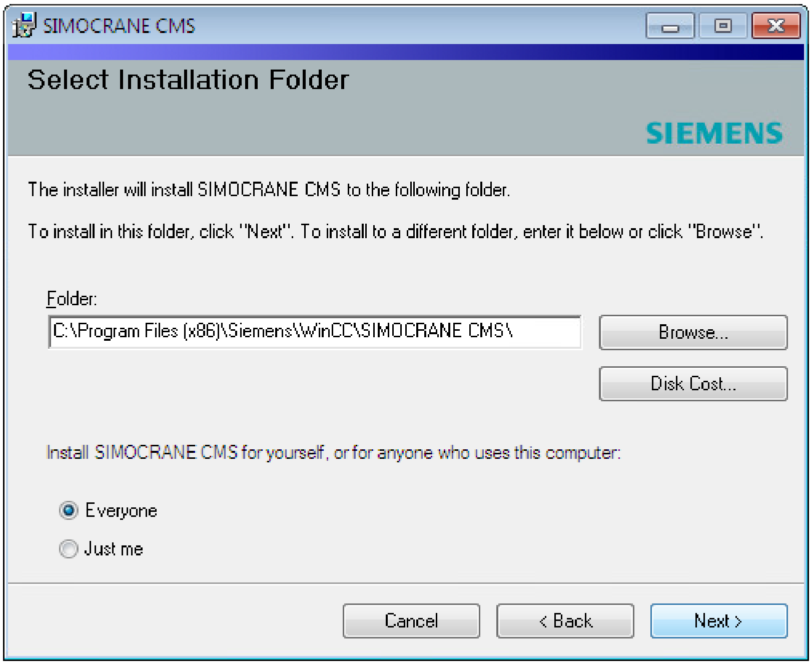


Figure 6-1 SIMOCRANE welcome screen

2. Follow the instructions on the screen.

3. Select the directory in which you want to install CMS.



Select Installation Folder

The installer will install SIMOCRANE CMS to the following folder.

To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".

Folder:
C:\Program Files (x86)\Siemens\WinCC\SIMOCRANE CMS\

Install SIMOCRANE CMS for yourself, or for anyone who uses this computer:

● Everyone

○ Just me

Figure 6-2 Selecting the installation path

The default installation path for CMS is: "C:/SIMOCRANE CMS".
If CMS is already installed, a warning will be displayed and the installation process aborted.
When the software has been successfully installed, a window showing the ReadMe file is displayed.

Note

If the installation process is aborted, CMS files that have already been installed are uninstalled again.

ALM, .NET Framework and the Microsoft Visual C++ 2015 Redistributable Package are not uninstalled.

---

4. Follow the instructions on the screen.
5. Restart the computer to finalize the installation.

Note

Restart required

Before CMS can be started, the computer must be restarted.

Setup is now complete.

Your next steps:

- Transfer the license using the Automation License Manager.
  See Transferring a license (Automation License Manager) (Page 93).

6.3 Installing the SIMOCRANE CMS client

Install the CMS Client Setup on all clients of a CMS station.

The clients of a CMS station display the screens of the connected CMS station. These can be WinCC clients or WebNavigator Clients.

CMS Client Setup must be installed in order to display Active X Controls, for example the CMSFaults Control on the client. Active X Controls such as these are not installed by the WebNavigator Client.

Note

If you wish to use the WebNavigator Client:

Install the Web Navigator Client **before** you install the CMS Client Setup.

Installing additional programs

If the following programs are not already installed, they will be installed at the same time as CMS:

- .NET Framework 4.6.2 or higher
- Microsoft Visual C++ 2015 redistributable

Installation

1. Insert the relevant DVD into the computer and start the setup: "SIMOCRANE_CMS_ClientSetup\setup.exe" on the "SIMOCRANE CMS" DVD
   If the following programs are not already installed, they will be installed:
   - .NET Framework
   - Microsoft Visual C++ 2015 redistributable

   Note

   If the installation process does not continue automatically after a restart, relaunch it by double-clicking on file "setup.exe".

   The SIMOCRANE CMS Client is then installed.

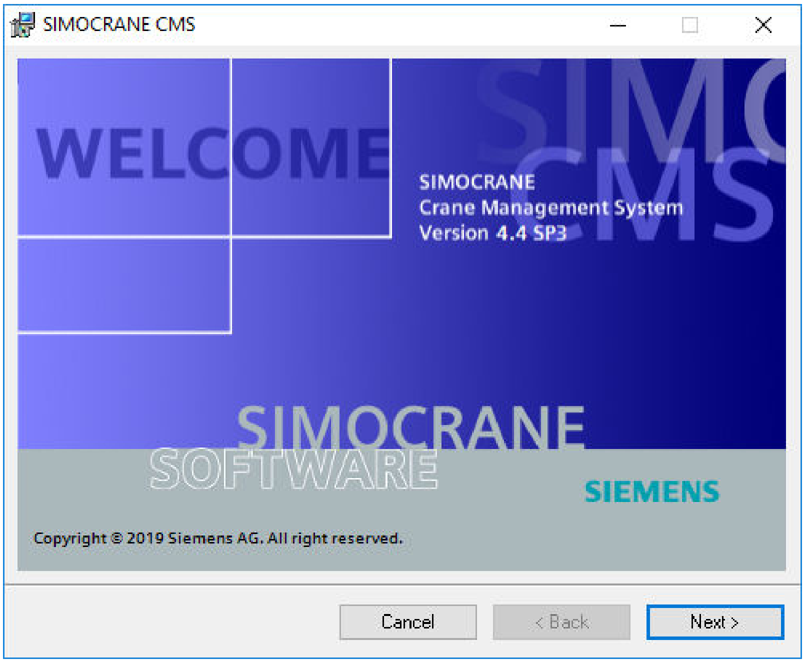


Figure 6-3 SIMOCRANE, window: Welcome page

2. Follow the instructions on the screen.

When the software has been successfully installed, a window showing the ReadMe file is displayed.

6.4 CMS licenses

6.4.1 Licensing concept in CMS

For the CMS station, you require a valid license key for the following:

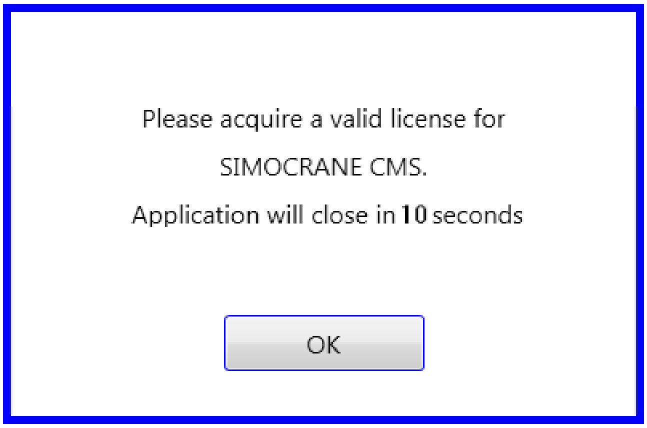
- To start the SIMOCRANE CMS Runtime
- To start the SIMOCRANE CMS Replay Runtime

Note

The license keys for SIMOCRANE CMS 4.4 / 4.4 SP1 / 4.4 SP2 are also valid for SIMOCRANE CMS 4.4 SP3.

You do not have to install new license keys when you update from SIMOCRANE CMS 4.4 / 4.4 SP1 / 4.4 SP2 to SIMOCRANE CMS 4.4 SP3.

You must install both licenses!
If you start the WinCC Runtime software without these licenses, the application, CMS Runtime and CMS Replay Runtime are automatically closed after the countdown has elapsed.



Please acquire a valid license for

SIMOCRANE CMS.

Application will close in 10 seconds

Figure 6-4 Missing license on the CMS station

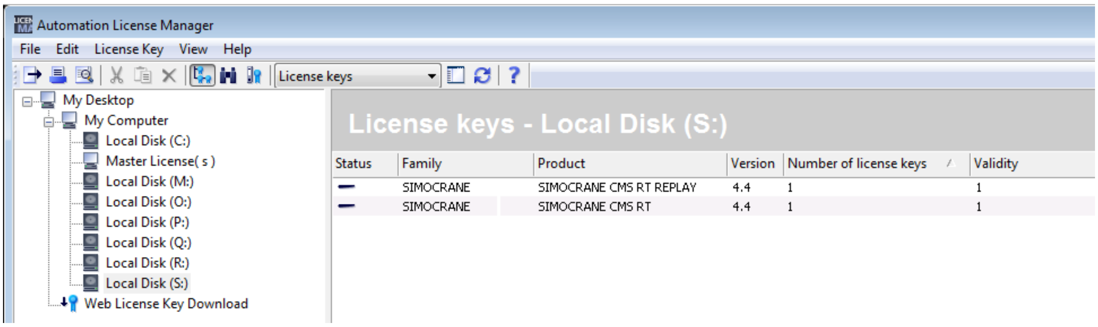
See also: Transferring a license (Automation License Manager) (Page 93)

6.4.2 Transferring a license (Automation License Manager)

For more detailed information on the licenses, see: Licensing concept in CMS (Page 93)

Requirement: USB stick with the license to be transferred.

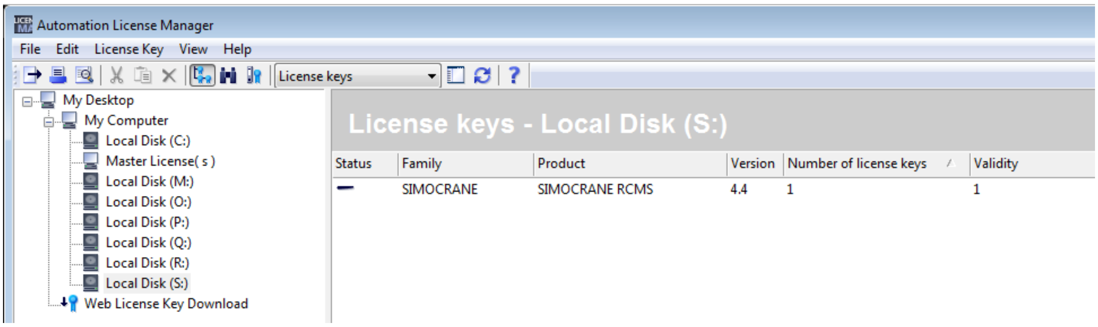
1. Start the Automation License Manager using the icon or the Start menu.
   The Automation License Manager opens.
2. Insert the USB stick.
   A "Removable Disk" appears below "Own Computer".



License keys - Local Disk (S:)

Status	Family	Product	Version	Number of license keys	Validity
—	SIMOCRANE	SIMOCRANE CMS RT REPLAY	4.4	1	1
—	SIMOCRANE	SIMOCRANE CMS RT	4.4	1	1

Figure 6-5 Automation License Manager - licenses for SIMOCRANE CMS Runtime and SIMOCRANE CMS Replay Runtime



License keys - Local Disk (S:)

Status	Family	Product	Version	Number of license keys	Validity
—	SIMOCRANE	SIMOCRANE RCMS	4.4	1	1

Figure 6-6 Automation License Manager - license for SIMOCRANE RCMS

3. Select the entry "Removable Disk" on the left-hand side.
   On the right-hand side you can see the available licenses on the USB stick.
4. Transfer the license by dragging it and dropping it onto the local hard disk or use the right mouse button.
   - OR -
   In the context menu, select "Transfer... ".
5. In the window that opens, select where the license should be transferred to (target).
   After the license has been transferred, it appears on the target drive.

The license has been successfully transferred.

You can find more information about the Automation License Manager in the online help of the Automation License Manager.

6.5 Starting CMS Runtime and/or Replay Runtime automatically on system startup

You can start CMS Runtime and/or Replay Runtime automatically as a service on system startup without having to log in separately.

The precondition here is that it is also possible to start the WinCC project automatically. The WinCC project must be converted to a service project for this purpose.

As a result, the WinCC project, CMS Runtime and Replay Runtime are started automatically when the computer is started up.

Note

A consequence of this procedure is that the system tray icon of CMS Runtime and/or Replay Runtime is no longer visible.

Note

This procedure requires Windows 10!

Note

WinCC service projects do not support additional programs in the WinCC startup list.

Manual startup or termination of the WinCC service project does not result in startup or termination of CMS Runtime and/or Replay Runtime.

In these cases, CMS Runtime and Replay Runtime must be started or terminated manually.

Automatically starting WinCC as service project

The WinCC project must be started automatically in order to start CMS Runtime and/or Replay Runtime automatically on system startup. The WinCC project must run as a service project for this purpose.

1. You must convert the WinCC project to a service project.
2. You must configure automatic start for this service project.

To do this, follow the instructions given in the WinCC documentation.
See: SIMATIC HMI WinCC V7.4 SP1 WinCC: Configurations: Chapter 3.7 "Configuring WinCC ServiceMode"
SIMATIC WinCC configuration (https://support.industry.siemens.com/cs/us/en/view/109746338)

Starting CMS Runtime and/or Replay Runtime automatically

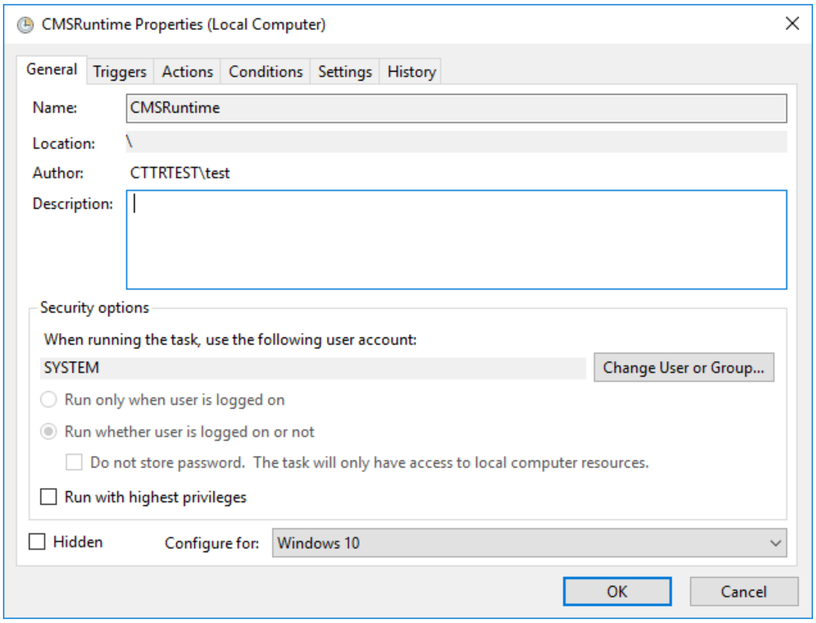
In order to start CMS Runtime and/or Replay Runtime automatically on system startup, you must create a task in the Windows "Task Scheduler" for every runtime to be started.

1. Open the Windows "Task Scheduler".
2. Click "Create Task" to create a new task.

Note

You must create a task for every runtime to be started (one task for CMS Runtime and one task for Replay Runtime).

3. Complete the following steps on the "General" tab:



CMSRuntime Properties (Local Computer)

Name: CMSRuntime

Location: \

Author: CTTRTEST\test

Description:

Security options

When running the task, use the following user account:

SYSTEM

○ Run only when user is logged on

● Run whether user is logged on or not

□ Do not store password. The task will only have access to local computer resources.

□ Run with highest privileges

□ Hidden

Configure for: Windows 10

Figure 6-7 Task Scheduler - General

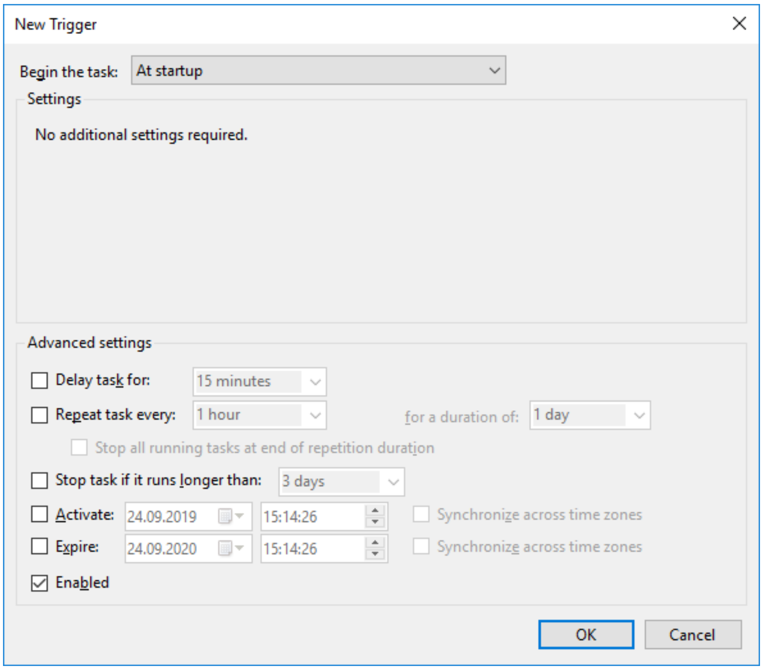
– Enter a name for the task in the "Name" field.

– Enter a description of the task in the "Description" field.

– Click "Change User or Group..."
Enter "SYSTEM" in the "Enter the object name to select" field.
Confirm with OK.

– In the "Configure for" selection list, select "Windows 10".

4. Complete the following steps on the "Triggers" tab:
   – Click "New" to create a new trigger.



New Trigger

Begin the task: At startup

Settings

No additional settings required.

Advanced settings

☐ Delay task for: 15 minutes

☐ Repeat task every: 1 hour   for a duration of: 1 day

☐ Stop all running tasks at end of repetition duration

☐ Stop task if it runs longer than: 3 days

☐ Activate: 24.09.2019 15:14:26 ☐ Synchronize across time zones

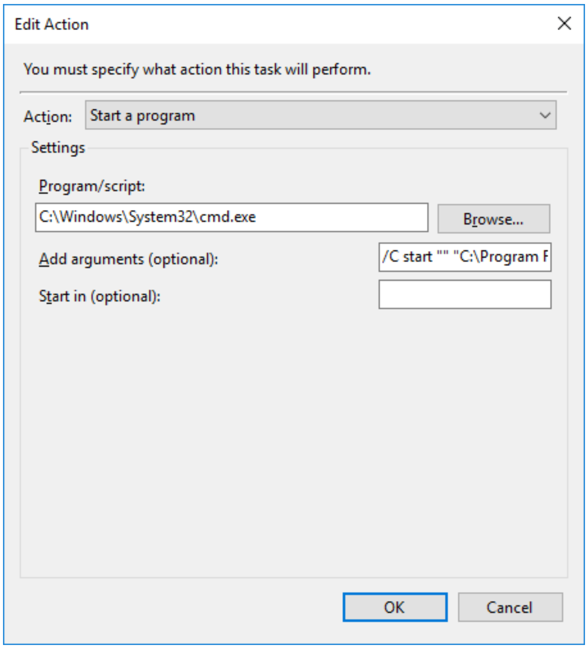
☐ Expire: 24.09.2020 15:14:26 ☐ Synchronize across time zones

☑ Enabled

Figure 6-8 Task Scheduler - New trigger

   – Select "At startup" in the "Begin the task" selection list.
   – Confirm with OK to create the trigger.

5. Complete the following steps on the "Actions" tab:
   – Click "New" to create a new action.



Edit Action

You must specify what action this task will perform.

Action: Start a program

Settings

Program/script: C:\Windows\System32\cmd.exe

Add arguments (optional): /C start "" "C:\Program F

Start in (optional):

Figure 6-9 Task Scheduler - New action

- Select "Start a program" in the "Action" selection list.
- Click "Browse" and select the following program path: "C:\Windows\System32\cmd.exe".
- Enter the following argument in the "Add arguments (optional)" field:
  To start CMS Runtime:
  ```
  /C start "" "C:\Program Files (x86) \Siemens\WinCC\SIMOCRANE CMS
  \CMSRuntime.exe"
  ```
  - or -
  To start Replay Runtime:
  ```
  /C start "" "C:\Program Files (x86) \Siemens\WinCC\SIMOCRANE CMS
  \CMSReplayRuntime.exe"
  ```

The corresponding runtime is started automatically on system startup.

Configuring a CMS station 7

This chapter describes the fundamental settings you need to undertake in the CMS product and CMS example application in order to integrate them into your project environment (crane type settings, network topology, basic settings in WinCC).

This chapter is therefore mainly aimed at people who have to adapt the CMS example application to specific requirements.

7.1 Configuring the CMS product

7.1.1 Starting the CMS Runtime automatically

Ensure that the "CMSRuntime.exe" of the SIMOCRANE CMS WinCC add-on is entered in the WinCC start-up list.

You can check whether the program has been started by the icons on the Windows taskbar. See also: Starting the CMS Runtime (Page 143)

7.1.2 Settings in WinCC

Initial situation

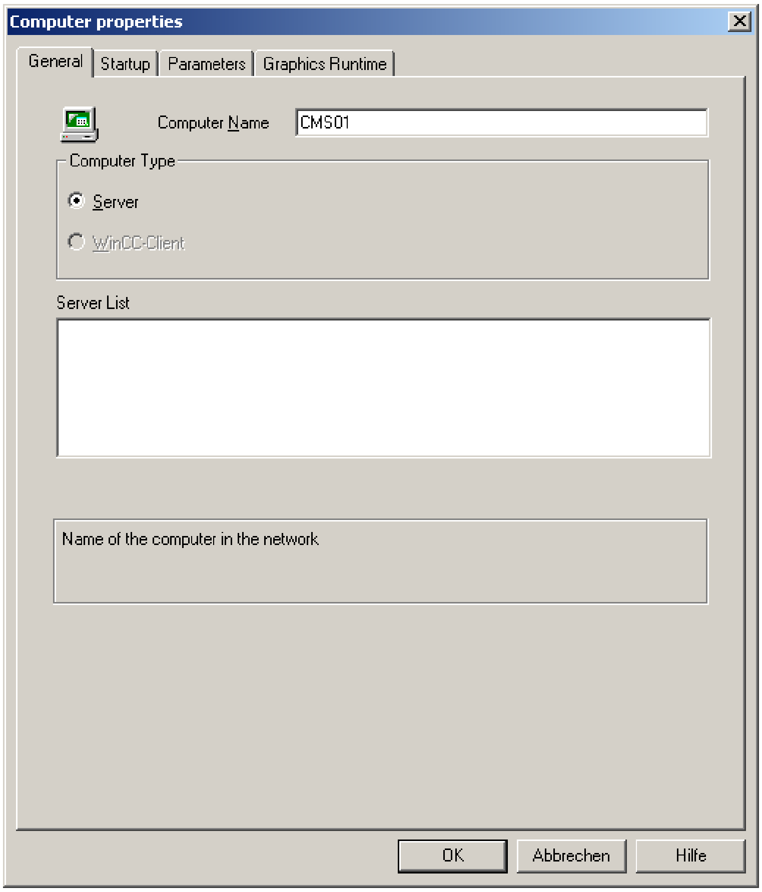
In order to start the example application on your PC, you first have to undertake some basic settings in WinCC so that the example application's defaults can be adapted to your project environment.

Processing steps

1. Enter the name of your PC in WinCC Explorer under "Computer properties", "General" tab.

Note

Please note that the computer name must not be "CMS". You should also observe the WinCC guidelines for the assignment of a computer name. If the computer name should be the same as the crane name, then it may contain letters and numbers only. The first character must be a letter.



Computer properties

General | Startup | Parameters | Graphics Runtime

Computer Name: CMS01

Computer Type

● Server

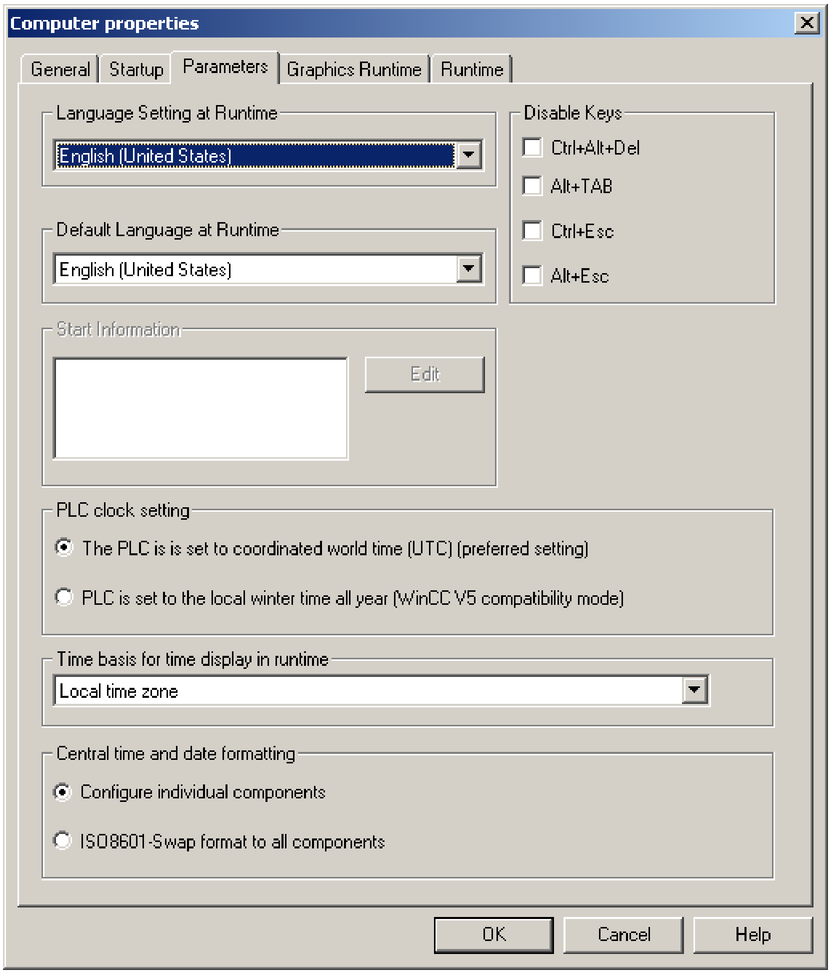
○ WinCC-Client

Server List

Name of the computer in the network

Figure 7-1 PC name setting in WinCC Explorer

2. Check the language settings for WinCC Runtime under the "Parameters" tab. Enter the runtime language required. "English" is the default runtime language in the CMS example application. "German" is offered as the second language in delivery condition.



Language Setting at Runtime: English (United States)

Default Language at Runtime: English (United States)

Disable Keys

□ Ctrl+Alt+Del

□ Alt+TAB

□ Ctrl+Esc

□ Alt+Esc

Start Information

PLC clock setting

● The PLC is is set to coordinated world time (UTC) (preferred setting)

○ PLC is set to the local winter time all year (WinCC V5 compatibility mode)

Time basis for time display in runtime: Local time zone

Central time and date formatting

● Configure individual components

○ ISO8601-Swap format to all components

Figure 7-2 Runtime language setting in WinCC

Result

After restarting WinCC, you can launch the WinCC Runtime.

Note

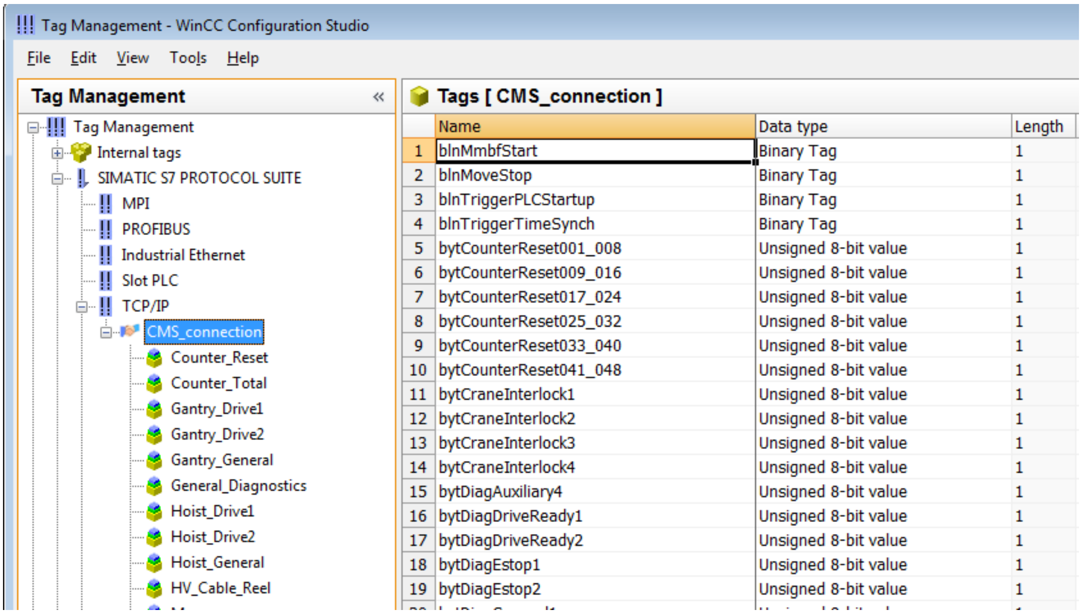
Please note that after changing the computer name you will have to restart WinCC before you can make any further settings in the CMS editor.

7.1.3 Communication between the CMS station and the crane control system

Initial situation

Based on WinCC, the CMS offers various ways of establishing communication with the control level. The channels support various communication drivers. All tags are administered centrally in WinCC in tag management.

You will find the interface to the crane control system in the "SIMATIC S7 PROTOCOL SUITE" communication driver in the "TCP/IP" channel unit in the CMS example application. The connection name is "CMS_connection".



- Tag Management
  - Internal tags
  - SIMATIC S7 PROTOCOL SUITE
    - MPI
    - PROFIBUS
    - Industrial Ethernet
    - Slot PLC
    - TCP/IP
      - CMS_connection
        - Counter_Reset
        - Counter_Total
        - Gantry_Drive1
        - Gantry_Drive2
        - Gantry_General
        - General_Diagnostics
        - Hoist_Drive1
        - Hoist_Drive2
        - Hoist_General
        - HV_Cable_Reel

	Name	Data type	Length
1	blnMmbfStart	Binary Tag	1
2	blnMoveStop	Binary Tag	1
3	blnTriggerPLCStartup	Binary Tag	1
4	blnTriggerTimeSynch	Binary Tag	1
5	bytCounterReset001_008	Unsigned 8-bit value	1
6	bytCounterReset009_016	Unsigned 8-bit value	1
7	bytCounterReset017_024	Unsigned 8-bit value	1
8	bytCounterReset025_032	Unsigned 8-bit value	1
9	bytCounterReset033_040	Unsigned 8-bit value	1
10	bytCounterReset041_048	Unsigned 8-bit value	1
11	bytCraneInterlock1	Unsigned 8-bit value	1
12	bytCraneInterlock2	Unsigned 8-bit value	1
13	bytCraneInterlock3	Unsigned 8-bit value	1
14	bytCraneInterlock4	Unsigned 8-bit value	1
15	bytDiagAuxiliary4	Unsigned 8-bit value	1
16	bytDiagDriveReady1	Unsigned 8-bit value	1
17	bytDiagDriveReady2	Unsigned 8-bit value	1
18	bytDiagEstop1	Unsigned 8-bit value	1
19	bytDiagEstop2	Unsigned 8-bit value	1

Figure 7-3 SIMATIC S7 PROTOCOL SUITE channel

The figure below shows the interface structure of the CMS example application. The interface is split into different modules. Modules comprise both crane components and modules for operating data acquisition.

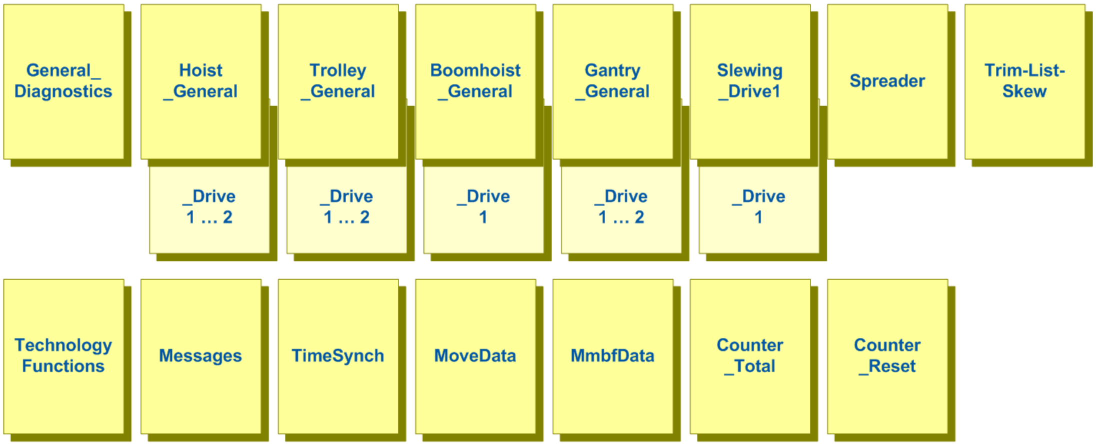


Figure 7-4 Interface overview

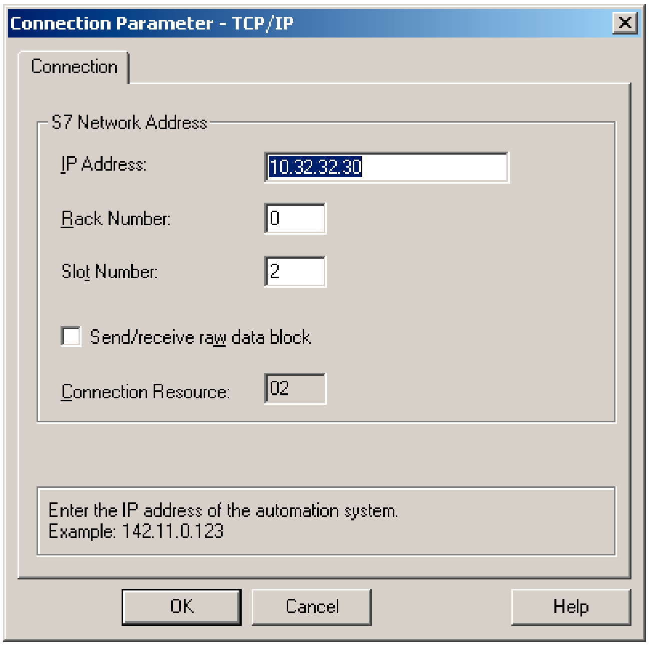
In the SIMATIC S7, a separate data block is defined for every module which forms the interface to the CMS. The data can be addressed in WinCC tag management via the data block and an offset in the corresponding data block. The offset, type and size of the data are described in the interface.

With a few exceptions, binary diagnostic information is read as one byte and not as a word or double word. This should prevent misunderstandings caused by different processor architectures. High and low bytes are swapped within one word for different processor architectures. The interface description is always based on the byte order in WinCC.

Processing steps

You should note the following components when assigning parameters for communication:

1. Establish the physical connection between the automation system, the crane control system and the CMS station's computer.
2. Define the communication driver for your project (e.g. "SIMATIC S7 PROTOCOL SUITE").
3. Define the channel unit (e.g. TCP/IP).
4. Create a logical connection in the channel unit (e.g. CMS_TCPIP).
5. Address the WinCC communications partner in the logical connection and define the connection parameters.



Connection Parameter - TCP/IP

S7 Network Address

IP Address: 10.32.32.30

Rack Number: 0

Slot Number: 2

☐ Send/receive raw data block

Connection Resource: 02

Enter the IP address of the automation system.
Example: 142.11.0.123

Figure 7-5 TCP/IP connection parameters

6. Open tag management in WinCC Explorer.
7. Move (do not copy!) the interface tags from the preassigned "CMS_MPI" connection to your newly created connection.
8. If you have created a connection in a channel outside the SIMATIC S7 PROTOCOL SUITE, you must adapt the addressing the requirements of the corresponding channel unit.
9. Configure the interface tags on the controller side.

7.1.4 Limits for the acquisition of messages and operational data

Limits for the acquisition of messages

The following limits apply to the acquisition of messages for operation of a CMS.

The following performance data from the WinCC documentation must be considered in particular:

Continuous message load without loss (single user/server)	10 messages s^{-1}
Message burst (single user/server)	2000 messages per 10 s^{-1} every 5 min[1)]

[1)] If the interval before the next message burst is under five minutes, messages may be lost.

The WinCC system provides a data buffer that can handle a burst of messages for a short time.

Limits for the acquisition and archiving of operating data

The following limits apply to the archiving of operational data on the CMS for operation of a CMS.

The following performance data from the WinCC documentation must be considered in particular:

Archiving in database for server/single user ("Tag Logging Fast")	5000 s^{-1} [2)]
Archiving in database for server/single user ("Tag Logging Slow")	1000 s^{-1} [2) 3)]

[2)] The stated values apply to archiving without signing-off of data.

[3)] With "Tag Logging Slow," you must expect longer picture selection times for identical quantities than with "Tag Logging Fast."

The example application handles the following data volumes:

Process value archive	Number of tags	Acquisition cycle
MoveData	13	On average 1 move per minute
MMBFData	5	1 x per month
CounterHourly	45	1 x per hour
TimerDaily	18	1 x per day
		Total on the CMS ≈ 0.24 s^{-1}

It can be seen that only a fraction of the performance capacity is used by the CMS example application. This makes it possible to extend the tag logging of the individual CMS stations in the configuration.

Note

The performance limits of SIMATIC WinCC 7.4 also apply to the link between PLC and CMS.

7.1.5 Configuring the topology

7.1.5.1 General information on setting up the topology

In the following description, we assume you have installed the WinCC add-on SIMOCRANE CMS on your computer and entered a valid computer name under "Computer" in the WinCC Explorer.

In CMS 4.4, the following role exists, which the CMS 4.4 computer can take on in the topology.

- CMS station
  The CMS station forms the core of any topology.
  Here, the operational data and messages of the crane are acquired.
  The data can be evaluated on the CMS station

The following forms of topology exist:

- CMS stand-alone
  A CMS station standing alone
  See also: Setting the topology (Page 106)
- CMS with RCMS (Process Historian)
  CMS 4.4 with RCMS 4.4
  See also: Setting the topology (Page 106)
  See also: Connecting CMS station to Process Historian (Page 110)
  CMS 4.2 / 4.3 SP1 with RCMS 4.4
  See also: Backward compatibility (Page 370)
- CMS with RCMS (WinCC)
  CMS 4.4 with RCMS 4.3 SP1
  See also: Backward compatibility (Page 370)
- Remote access to CMS station or RCMS server via the WinCC Web Navigator
  See also: Remote access (Page 287)

7.1.5.2 Setting the topology

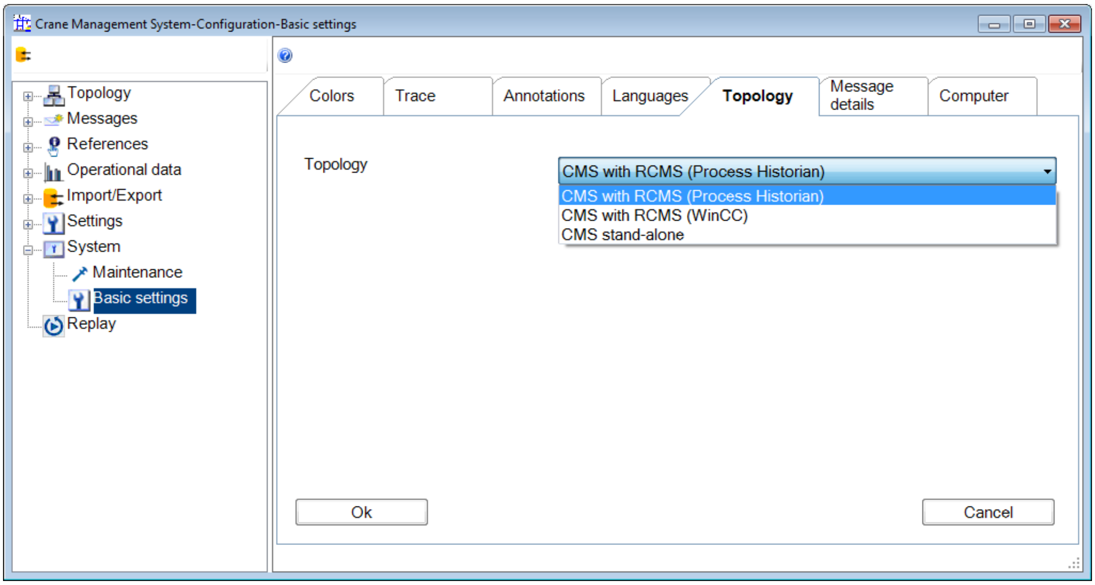
These instructions show you how to set up a CMS station that is either stand-alone or connected to the RCMS web application via the Process Historian.

See also: General information on setting up the topology (Page 106)

You will find more detailed information on the RCMS web application in the SIMOCRANE RCMS Operating Instructions.

Selecting the topology

1. Open the CMS Editor.
2. In the screen form, open "System" → "Basic settings" → "Topology".



Topology: CMS with RCMS (Process Historian)

Figure 7-6 Changing the topology

3. Select the setting "CMS stand-alone" or "CMS with RCMS (Process Historian)"
4. Confirm with "OK".

Note

Close the CMS Editor

To apply the setting, close and re-open the CMS Editor.

Result

You have now defined the topology for a CMS station that is either stand-alone or connected to the RCMS web application.

You now only have to define the equipment type and the crane.
See: Defining the equipment type (Page 108)
See: Defining the crane (Page 109)

To enable the CMS station to connect to an RCMS web application, it must be connected to the Process Historian.
See: Connecting CMS station to Process Historian (Page 110)

7.1.5.3 Defining the equipment type

Each crane must be assigned to a certain equipment type. To do this, you must create an equipment type.

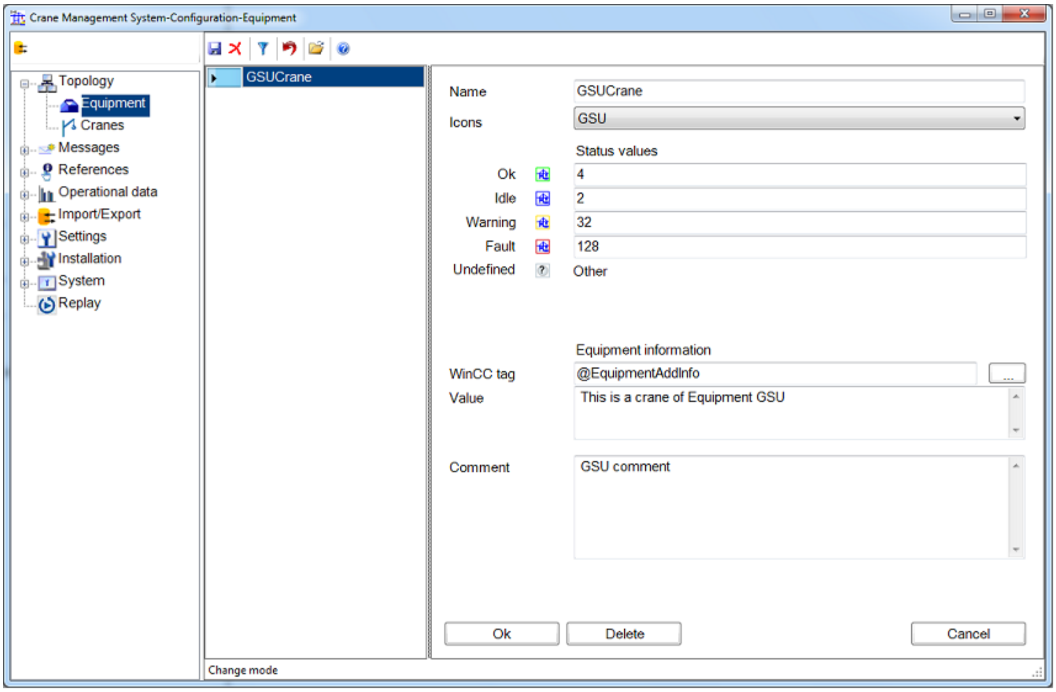
Note

The fields for the status values and icons are only relevant for the topology "CMS with RCMS (WinCC)".
You do not have to fill these fields.

Note

You can only create one equipment type.

1. Open screen form "Topology" → "Equipment".



GSUCrane

Name: GSUCrane
Icons: GSU

Status values
Ok: 4
Idle: 2
Warning: 32
Fault: 128
Undefined: Other

Equipment information
WinCC tag: @EquipmentAddInfo
Value: This is a crane of Equipment GSU

Comment: GSU comment

Figure 7-7 Defining the equipment type

2. Create a name for the equipment type.
   The name of the equipment type must only contain letters and numerals.
   The first character of the name must be a letter.
3. If necessary, under equipment information, select the WinCC tag for outputting the comment typical of the equipment.

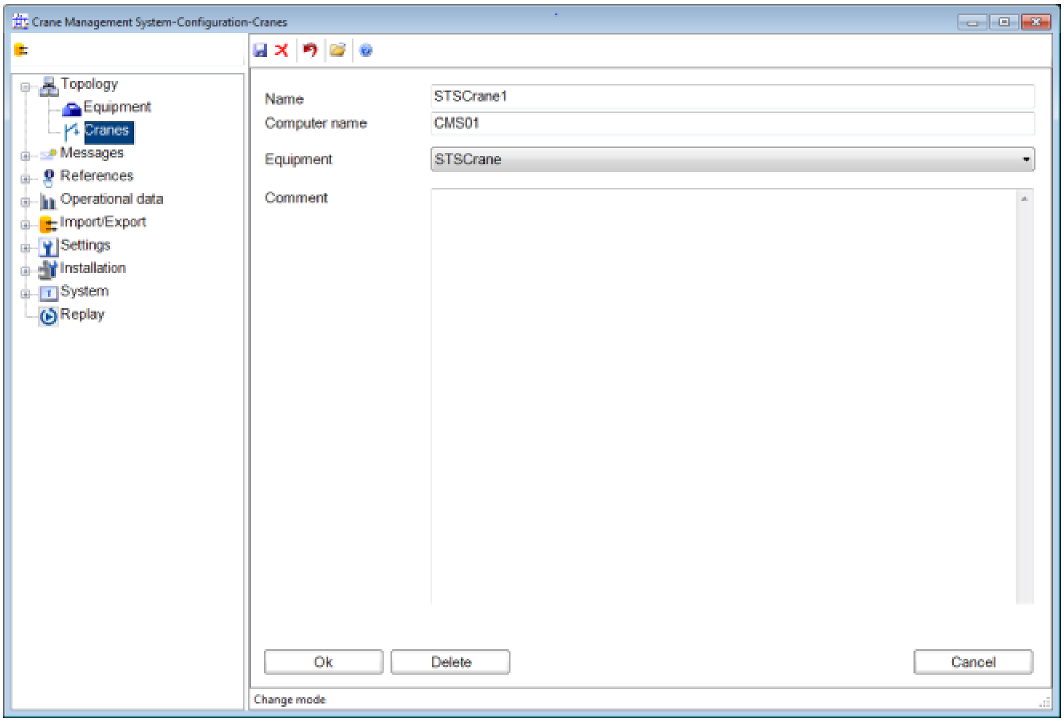
   Note

   The content of the "Value" field is read out when the runtime starts and could be displayed, for example, as information on the status bar of the application.
   The content of the "Comment" field can only be viewed in the editor.
4. Confirm with "OK".

7.1.5.4 Defining the crane

You must define the crane on the CMS station.

1. Open screen form "Topology" → "Cranes".



Name: STSCrane1
Computer name: CMS01
Equipment: STSCrane
Comment:

Figure 7-8 Defining the crane

2. Enter the name of the crane in the "Name" field.
   The name of the crane must only contain letters and numerals.
   The first character of the name must be a letter.
3. Enter the computer name for the CMS station in the "Computer name" field.

Note

The computer name must not be exactly "CMS"!
Also follow the WinCC guidelines for the assignment of computer names.
The computer name and crane name can be identical

4. Select an equipment type in the "Equipment" field.
5. Confirm with "OK".
6. Restart the CMS Runtime to activate the changes to the communication parameters.

7.1.5.5 Connecting CMS station to Process Historian

You can only connect the CMS station to the Process Historian if the following preconditions are met:

- The topology of the CMS station must be "CMS with RCMS (Process Historian)".
  See also: Setting the topology (Page 106)
- "PH-Ready" must have been installed and configured.
  "PH-Ready" is a module of WinCC. You will find it on the Process Historian Installation DVD. You will find more detailed information on the configuration of "PH-Ready" in the documentation of the Process Historian

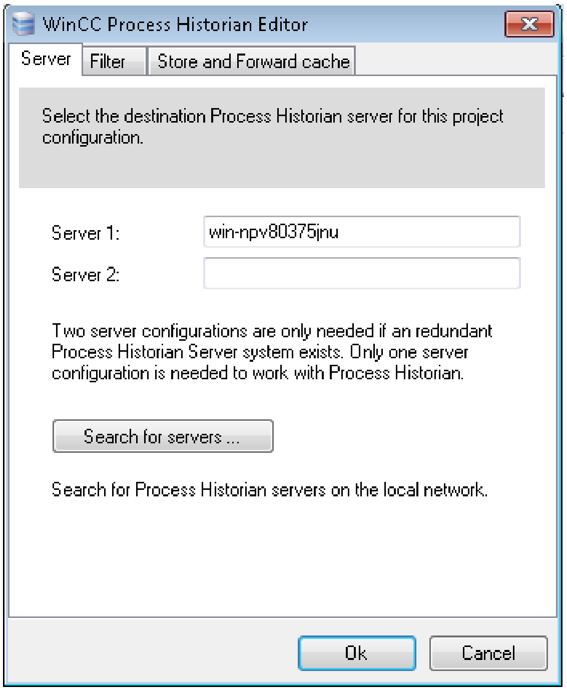
  Note

  The "PH-Ready" version must be compatible with the installed version of WinCC.
  WinCC 7.4 SP1 Update 11 requires PH-Ready 2014 SP3.

- The computer name of the CMS station must meet the following conditions:
  - The following characters are forbidden: .,;:!?“‘^´`~_-+=/\|@*#$%&§°()[]{}<>
  - The name must not contain any spaces.
  - The first character must be a letter.
  - The first 12 characters of the computer name must be unique.
- The user name and password at the CMS station and at the Process Historian must be the same.
- The Process Historian database must be accessible in the network.

Processing steps

1. Open WinCC Explorer.
2. Click "Process Historian".
   The "WinCC Process Historian Editor" opens.



WinCC Process Historian Editor

Select the destination Process Historian server for this project configuration.

Server 1: win-npv80375jnu

Server 2:

Two server configurations are only needed if an redundant Process Historian Server system exists. Only one server configuration is needed to work with Process Historian.

Search for Process Historian servers on the local network.

Figure 7-9 WinCC Process Historian Editor

3. In the "Server 1" field, select the server for the Process Historian.
   If you have implemented the Process Historian redundantly, select the redundant server in the "Server 2" field

Result

The CMS station is connected to the Process Historian.

The data are now acquired by the Process Historian and stored.

7.1.6 Alarm/event system for the CMS station

The CMS alarm/event system is based on WinCC Alarm Logging. Additional crane-specific requirements of the alarm/event system are covered by the CMS add-on for WinCC. While the WinCC messages are displayed in a WinCC Alarm Control, the CMS add-on provides a separate control of additional message information. It has already been integrated into the CMS example application (MessagesInfo.pdl).

You can find a detailed description of this integration in Chapter Inserting CMSFaults control into a picture (Page 258).

7.1.6.1 Message procedures

The WinCC Alarm Logging basically supports two message procedures:

- Bit message procedure (message tag)
- Chronological reporting (message telegram)

The CMS example application uses the bit message procedure. Here the controller signals the occurrence of an event by means of a message tag. The time stamp of the message is issued by WinCC Alarm Logging.

With chronological reporting, the time stamp of an alarm event is issued by the controller and sent to WinCC as a message telegram. This message procedure assumes the appropriate configuration on the controller side.

7.1.6.2 Message blocks

Message blocks are configured in the WinCC Alarm Logging. They contain the information which is displayed in a message.

The table below shows the message blocks that are defined in the CMS example application. You can adjust the message blocks to suit your project requirements. Message block 10 is prepared for displaying the contents of both the process value blocks.

Table 7-1 Message blocks

Name	Category	Number	Size	Description
Date	System block	1	dd:mm:yyyy	Date of time stamp
Time	System block	2	hh:mm:ss	Time of time stamp
Duration	System block	3	dd hh:mm:ss	Period between "incoming" status and "outgoing" status
Status	System block	5	1 char	Message status (incoming, outgoing)
Number	User text block	1	4 char	Fault number
PID	User text block	2	5 char	Plant identification (=xxx)
LID	User text block	3	5 char	Location identification (+xxx)
DID	User text block	4	5 char	Device identification (-xxx)
Message text	User text block	5	90 char	Information about the message
Source	User text block	6	12 char	S7 block / network
Reference	User text block	7	10 char	Reference in circuit diagram
Group	User text block	8	4 char	Message group

Name	Category	Number	Size	Description
Equipment type:: crane name	User text block	10	32 char	Intended for: Equipment::crane name **Note:** Must not be used for other purposes. **Note:** For the topology "CMS with RCMS (WinCC)" only: "@2%s@::@1%s@" must be entered so that the content is entered automatically during runtime.
Crane name	Process value block	1	32 char	Reserved for CMS
Equipment type	Process value block	2	32 char	Reserved for CMS
Process value	Process value block	3	32 char	Process value

7.1.6.3 Message classes and message types

Message classes and message types are configured in the WinCC Alarm Logging.

The table below shows the message classes and message types which are defined in the CMS example application. The message class 16 (CMS) and the subordinate message types are mandatory for use in CMS system messages and may not be changed. The message class is created automatically. You can modify all other message classes and message types.

Table 7-2 Message classes and message types

Class	Class No.	Type	Type No.	Status	Color
Fault	1	Fault in general	1	incoming (+)	R228 G68 B87
				outgoing (-)	R228 G68 B87
Warning	4	Warning in general	49	incoming (+)	R247 G214 B108
				outgoing (-)	R247 G214 B108
Event	7	Info Operator	97	incoming (+)	R18 G218 B141
				outgoing (-)	R18 G218 B141

Class	Class No.	Type	Type No.	Status	Color
MMBF	14	External	209	incoming (+)	R228 G68 B87
				outgoing (-)	R228 G68 B87
		Internal	210	incoming (+)	R228 G68 B87
				outgoing (-)	R228 G68 B87
CMSTime-Zone	15	CMSTimeZone warning	225	incoming (+)	R49 G70 B85 R247 G214 B108
CMS	16	CMS fault	241	incoming (+)	R170 G186 B198 R228 G68 B87
		CMS warning	242	incoming (+)	R49 G70 B85 R247 G214 B108
		CMS info	243	incoming (+)	R170 G186 B198 R0 G0 B0

7.1.6.4 Group messages

In the CMS, each WinCC single message is assigned to a group message. The group messages are configured in the WinCC Alarm Logging and can be structured hierarchically, so that a subordinate group message also initiates the higher-level group message. The diagram below shows the group hierarchy of the CMS example application:

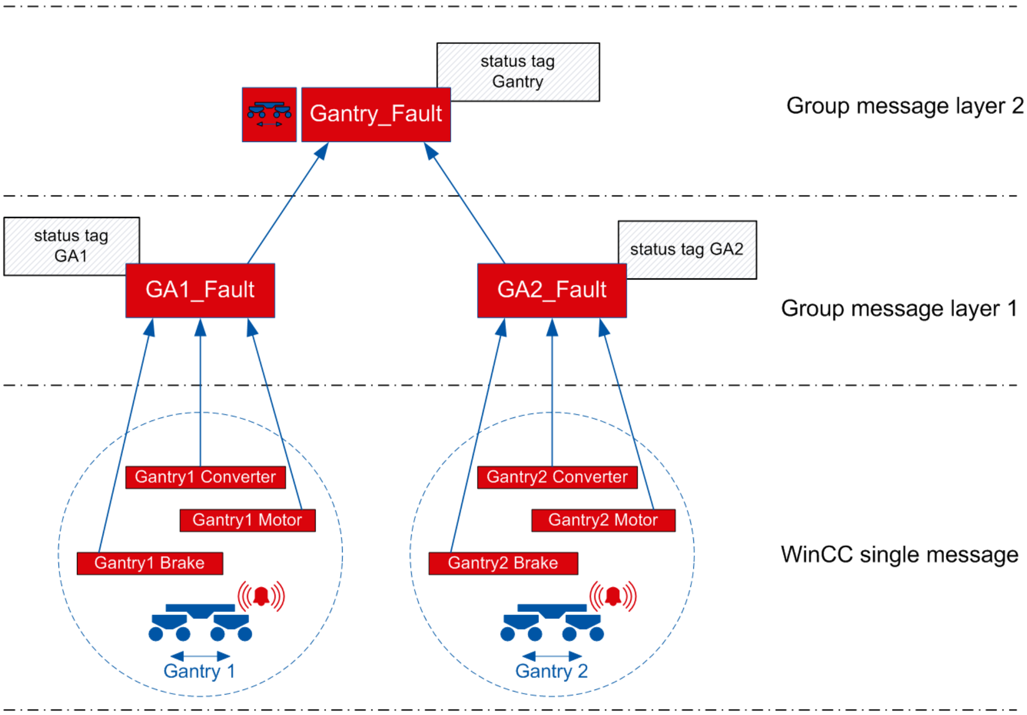


Figure 7-10 Principle of the group message in the CMS

All of the individual messages of class "Faults of gantry 1" are assigned to an alarm group" "GA1_Fault". If such an individual message occurs (e.g. "Gantry1 fault brake"), then the directly assigned group message ("GA1_Fault") and also the higher-level group message ("Gantry_Fault") are output.

A status tag can be defined for each configured group message defined, in which a status bit is set when the group message is initiated.

This status tag can be evaluated in the user interface:

- Configuring a group fault display in the group fault display (e.g. group messages level 2)
- Initiating group messages (e.g. group messages level 1)

A group fault display visualizes the message statuses in a suitable form for the message classes of the example application:

- Inactive (status tag = 0)
- Event (status bit 1 set)
- Warning (status bit 2 set)
- Fault (status bit 3 set)

The status of a group fault display is dynamized using the status tag of the group messages:

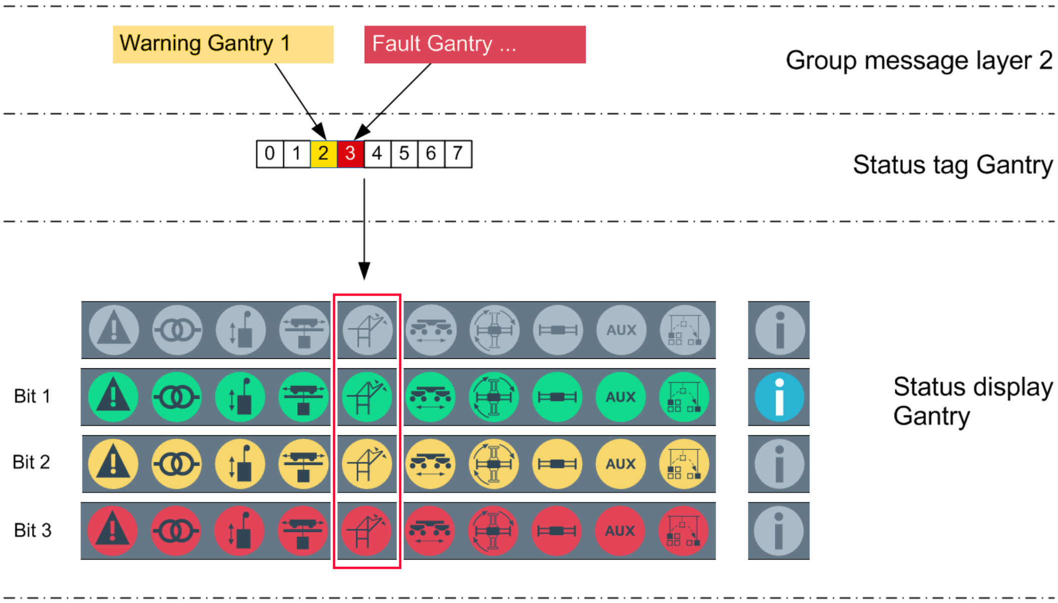


Figure 7-11 Group fault display in the CMS

Fault messages from crane gantry 1 initiate the "Gantry_Fault" group message; see diagram "Principle of the group message in the CMS". When the group message is initiated, bit 3 in the assigned status tags is set.

For individual messages of the class "Warning", there is an analogous hierarchy. The group message, "Gantry_Warning" sets bit 2 in the status tags. For operator messages, there is an additional "Event" state. Bit 1 is set in the assigned status tags. The status displays are configured so that the fault bit has the highest priority.

The following table shows the complete group hierarchy for the message class "Fault". The group hierarchy for the class "Warning" is structured in the same way. For events there is only one group message.

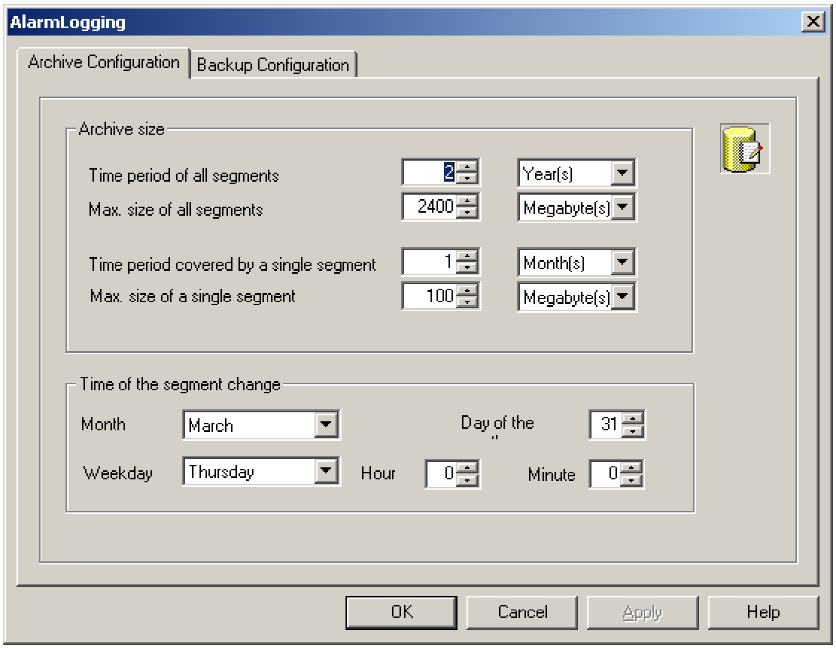
Table 7-3 Group messages for visualizing the group faults

Icon	Display group	Alarm group	Description
⚠	General_Fault	GE_Fault	General crane
	Supply_Fault	LVD_Fault	Low voltage distribution
		SU1_Fault	Supply unit 1
		SU2_Fault	Supply unit 2
		SU3_Fault	Supply unit 3
		SU4_Fault	Supply unit 4
		CRH_Fault	Cable reel high voltage
	Hoist_Fault	HO_Fault	Hoisting gear or holding and closing gear
		HO1_Fault	
		HO2_Fault	
		HO3_Fault	
		HO4_Fault	
	Trolley_Fault	TR_Fault	Trolley or luffing gear
		TR1_Fault	
		TR2_Fault	
		TR3_Fault	
		TR4_Fault	
	Boomhoist_Fault	BH_Fault	Boom-hoist
		BH1_Fault	
		BH2_Fault	
	Gantry_Fault	GA_Fault	Gantry
		GA1_Fault	
		GA2_Fault	
		GA3_Fault	
		GA4_Fault	
	Slewing_Fault	SL_Fault	Slewing gear
		SL1_Fault	
		SL2_Fault	
	Spreader_Fault	SPR_Fault	Spreader
		CRS_Fault	Cable reel spreader

Icon	Display group	Alarm group	Description
AUX	Auxiliary_Fault	AUX_Fault	Other auxiliary gear
		TLS_Fault	Trim list skew
		RT_Fault	Rope tensioning
		LHV_Fault	Lighting, heating, ventilation
	TechFunction_Fault	AUT_Fault	Automatic
		TPS_Fault	"Truck positioning"
ℹ	OM		"Operator messages"

7.1.6.5 Archive configuration

The archive configuration for messages is defined in the WinCC Alarm Logging. Adapt the size and archiving period of the archive and individual segment to the project requirements under "Archive configuration".



AlarmLogging

Archive size

Time period of all segments: 2 Year(s)

Max. size of all segments: 2400 Megabyte(s)

Time period covered by a single segment: 1 Month(s)

Max. size of a single segment: 100 Megabyte(s)

Time of the segment change

Month: March

Day of the: 31

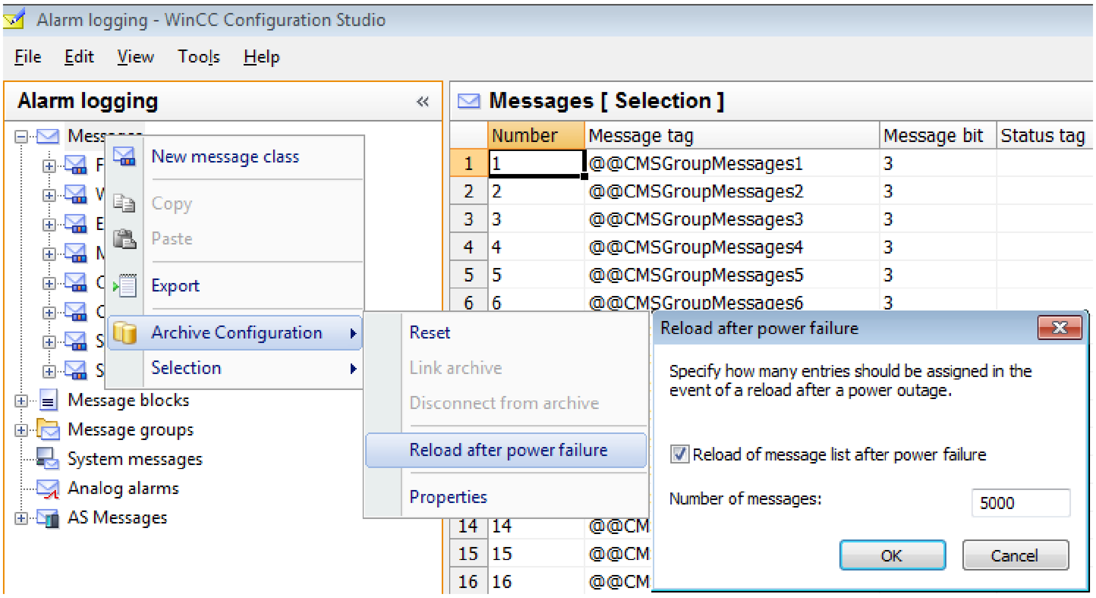
Weekday: Thursday

Hour: 0

Minute: 0

Figure 7-12 Archive configuration of the message archive in the WinCC Alarm Logging editor

You can set how many messages are to be re-established after a power failure under "Reload after power failure". When the system is restarting, pending messages are checked to see if they were received before the power failure.



	Number	Message tag	Message bit	Status tag
1	1	@@CMSGroupMessages1	3	
2	2	@@CMSGroupMessages2	3	
3	3	@@CMSGroupMessages3	3	
4	4	@@CMSGroupMessages4	3	
5	5	@@CMSGroupMessages5	3	
6	6	@@CMSGroupMessages6	3	
14	14	@@CM		
15	15	@@CM		
16	16	@@CM		

Reload after power failure

Specify how many entries should be assigned in the event of a reload after a power outage.

☑ Reload of message list after power failure

Number of messages: 5000

OK Cancel

Figure 7-13 Reloading messages in the case of a power failure

7.1.6.6 Message import in the WinCC Alarm Logging

Initial situation / objective

WinCC Alarm Logging features an import function for individual messages so you don't have to create all the messages manually. The import file must be available in text format (*.txt).

Refer to the WinCC documentation for the structure of the import file and meaning of the parameters.

Processing steps

1. Ensure that all message classes, message types, message blocks and message groups used in the import file are created in the WinCC Alarm Logging.
2. Ensure that all tags used (message and process value tags) are present in the WinCC tag management.
3. Use the "Import messages" dialog to import the messages from the WinCC Alarm Logging toolbar "Messages" → "Import individual messages…".
4. Once the import process is complete, a message appears and you can read the import status off this. You can check here whether the import is free from faults.

7.1.6.7 Maintenance instructions in the CMS configuration editor

Initial situation / objective

You can assign a maintenance instruction to each message that is available in WinCC Alarm Logging. Only one maintenance instruction can be assigned to each WinCC message. But several messages can be assigned to each maintenance instruction.

Below is a description of how to manually configure a maintenance instruction. However, you can also use an import function (xml format). It is best to start by manually configuring and exporting an instruction. Then you can use this template to extend the import file.
See also: Import/export: Import/Export (Page 198)

The following group actions are possible for maintenance instructions:

- Generate new maintenance instructions by copying existing maintenance instructions
- Deleting maintenance instructions

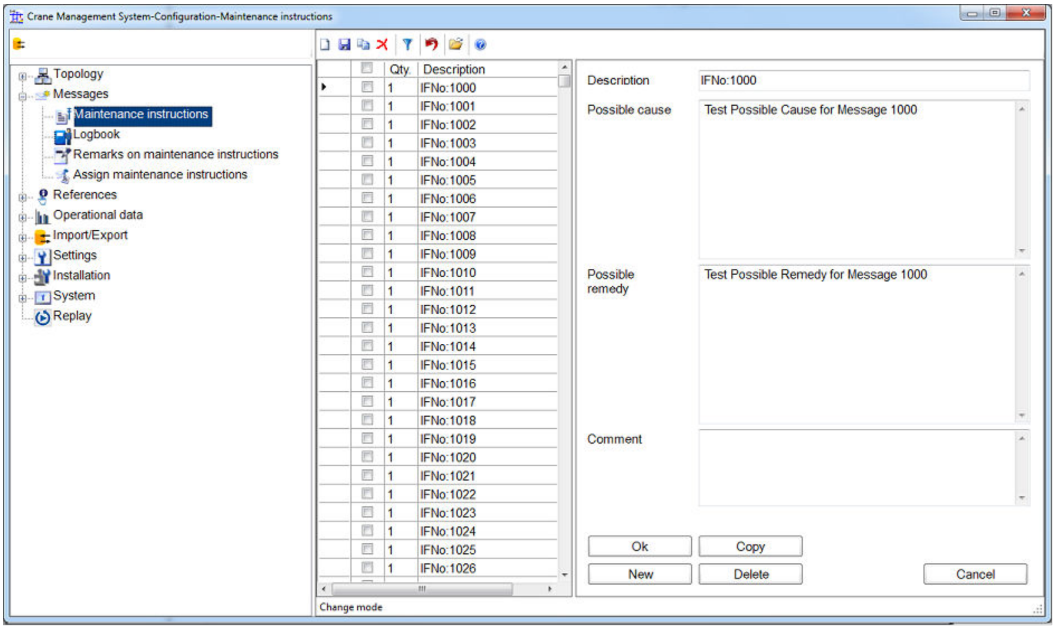
Group actions can be triggered for multiple selected maintenance instructions. With the check box in the header, you can select or deselect all existing maintenance instructions for a group action.

Sequence of steps

Here is an example of how to configure maintenance instructions:

1. Open the CMS editor under "Messages" → "Maintenance instructions"
2. Use "New" to create a new maintenance instruction.
3. Under "Description," enter a name for the maintenance instruction (e.g. Category 0 Stop). The "Description" field is mandatory.

4. In the "Possible cause" and "Possible remedy" fields enter information about a fault's cause and remedy.



□	Qty.	Description
□	1	IFNo:1000
□	1	IFNo:1001
□	1	IFNo:1002
□	1	IFNo:1003
□	1	IFNo:1004
□	1	IFNo:1005
□	1	IFNo:1006
□	1	IFNo:1007
□	1	IFNo:1008
□	1	IFNo:1009
□	1	IFNo:1010
□	1	IFNo:1011
□	1	IFNo:1012
□	1	IFNo:1013
□	1	IFNo:1014
□	1	IFNo:1015
□	1	IFNo:1016
□	1	IFNo:1017
□	1	IFNo:1018
□	1	IFNo:1019
□	1	IFNo:1020
□	1	IFNo:1021
□	1	IFNo:1022
□	1	IFNo:1023
□	1	IFNo:1024
□	1	IFNo:1025
□	1	IFNo:1026

Description: IFNo:1000

Possible cause: Test Possible Cause for Message 1000

Possible remedy: Test Possible Remedy for Message 1000

Comment:

Figure 7-14 Configuring maintenance instructions in the CMS editor

5. Open the dialog for assigning maintenance instructions to a message under "Messages" → "Assign maintenance instructions."
   You will find a list of all existing message numbers on the left.

6. When you select a message, an info text appears along with information from the message text blocks.

7. Select your maintenance instruction from the "Maintenance instructions" list and assign it the message number you want either using drag & drop or the arrow keys.
   On the right-hand side next to the name of maintenance instruction, it is shown how often this note is assigned to a message.

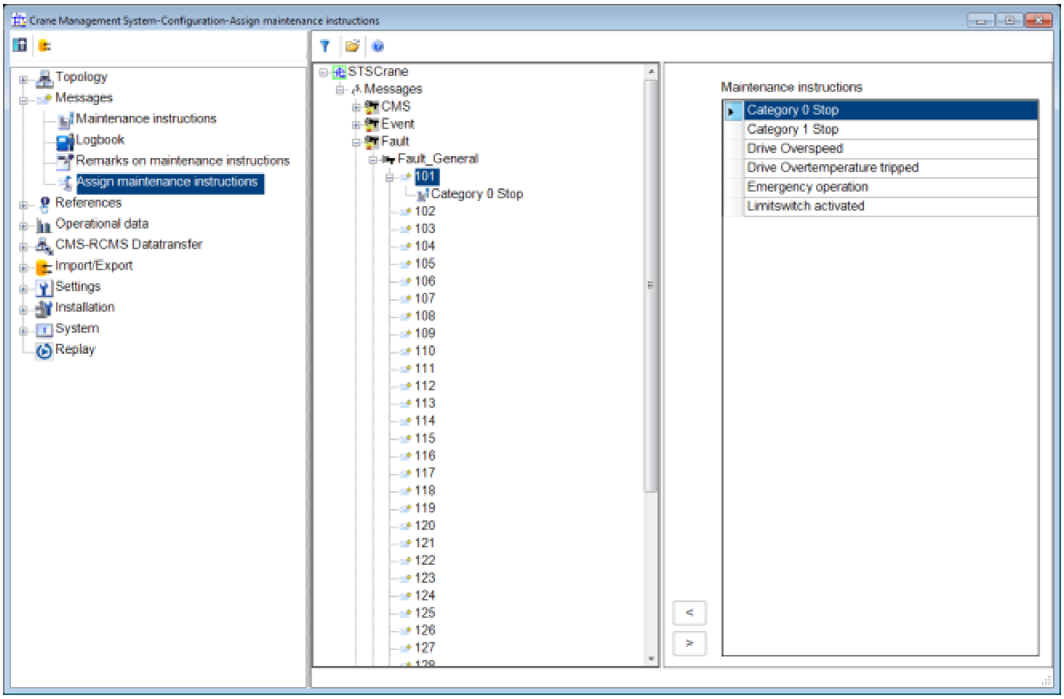
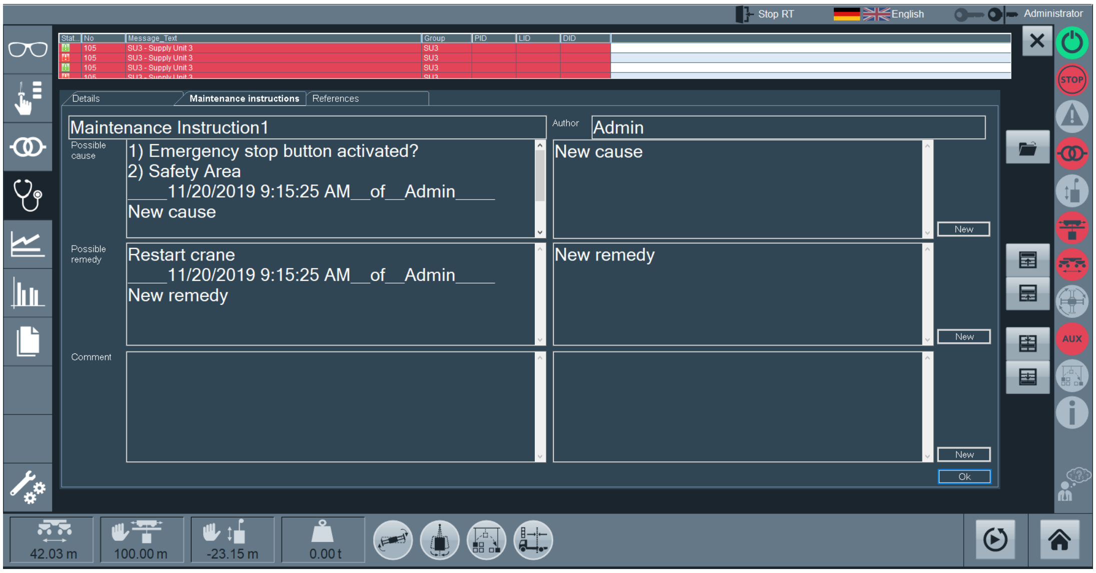


Figure 7-15 Assignment of maintenance instructions to a WinCC message in the CMS editor

7.1.6.8 Remarks on maintenance instructions

Initial situation / objective

In the CMS application, the user can enter additional remarks to existing maintenance instructions in runtime. Such entries appear in the corresponding field along with information about the maintenance instruction already displayed.



Stat...	No	Message_Text	Group	PID	LID	DID
	105	SU3 - Supply Unit 3	SU3			
	105	SU3 - Supply Unit 3	SU3			
	105	SU3 - Supply Unit 3	SU3			
	105	SU3 - Supply Unit 3	SU3			

Details | **Maintenance instructions** | References

Maintenance Instruction1

Author: Admin

Possible cause:
1) Emergency stop button activated?
2) Safety Area
_____11/20/2019 9:15:25 AM__of__Admin_____
New cause

New cause

Possible remedy:
Restart crane
_____11/20/2019 9:15:25 AM__of__Admin_____
New remedy

New remedy

Comment:

Figure 7-16 Remarks on maintenance instructions

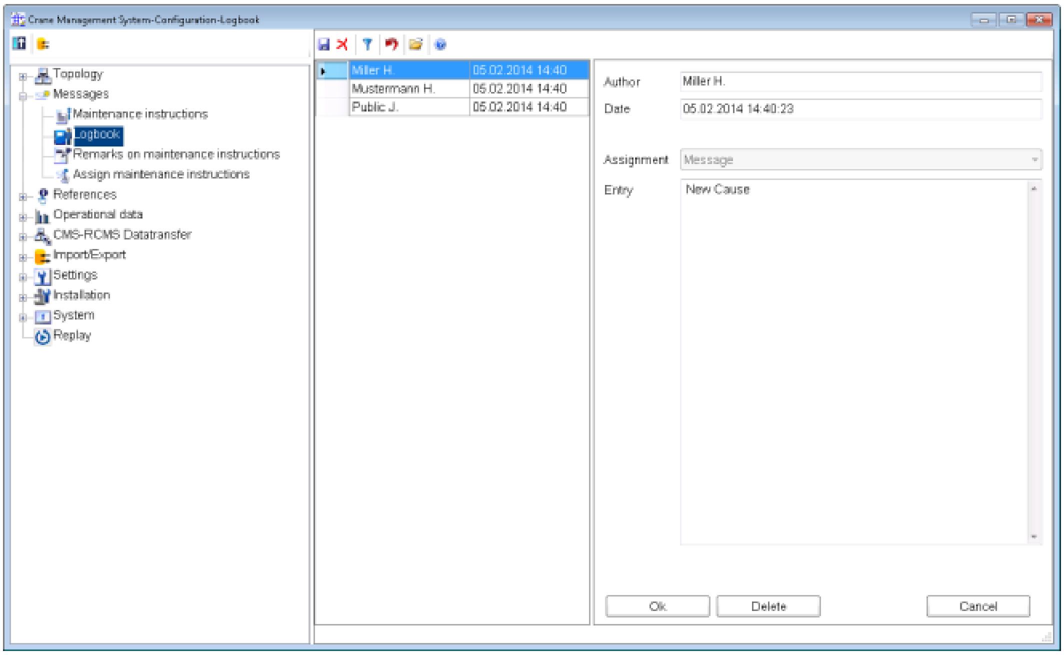
You can define the scope of assignment for the remarks entry for the maintenance instructions. The remarks can be assigned as follows:

- local: Archiving of remark for precisely this message number
- global: Archiving of remark for maintenance instruction; this option is of interest if you have assigned a maintenance instruction to several messages.

All remarks entered can also be displayed or edited in the CMS editor.

Processing steps

1. Open the CMS editor.
2. You can open and edit the texts of remarks entered under "Messages" → "Remarks on maintenance instructions". You will find the remarks in the tree shown at the corresponding message number.
3. An overview of the entries made can be found under "Messages" → "Logbook". This contains a list of who made an entry for the maintenance instructions and when this was done (author and time stamp) in Runtime.



Miller H.	05.02.2014 14:40
Mustermann H.	05.02.2014 14:40
Public J.	05.02.2014 14:40

Author: Miller H.
Date: 05.02.2014 14:40:23
Assignment: Message
Entry: New Cause

Figure 7-17 Logbook for maintenance instructions in the CMS editor

7.1.6.9 References in the CMS editor

As well as being assigned to maintenance instructions, a message in the CMS editor can also be assigned various references. References are links between individual messages and different sources of information. In the event of a fault, the user calls the linked information from the message. For example, this can be a circuit diagram or an operating manual.

You must therefore provide the following information to a reference:

- Program to display the information (for example, Acrobat Reader to display a manual in the PDF format), and special command line operators to the program (e.g. to open a certain page in the PDF document)
  See also: Creating a program call for references (Page 127)
- Path and file name at which the referenced information can be found
  See also: Define the file call for reference (Page 129)
- Assignment of the reference to a message and, if necessary, setting for values for command line operators
  See also: Assigning references (Page 131)

You can assign references both to a message and to a crane or an equipment type.

You can create references in such a way that the linked files can also be called from the CMS client.
See also: Precondition for opening references at CMS clients (Page 127)

You can define macros yourself. These are then entered into the macro list and managed in the dialog "Settings" → "Macros".

In the CMS Editor there are also a few predefined macros; these contain system information, such as the installation path of the CMS. You can use these macros. You cannot change the value.

There is an import function for the references.
See also: Message import in the WinCC Alarm Logging (Page 118)

7.1.6.10 References to STEP 7

References to Step 7 are implemented via the reference type "PLCReference". This reference type is already predefined. The reference type "PLCReference" is similar in function to the WinCC network jump.

Note

For SIMATIC S7 – 1500 PLCs and SIMATIC S7 – 1200 PLCs, you must refer to STEP 7 via the TIA Portal.
See: References to TIA Portal (Page 125)

You can use PLC Reference either to open a STEP 7 block (FB, FC) and jump to a network there (network jump) or you can display the locations where a STEP 7 symbol is used. Use the corresponding call parameters to select between these two options.

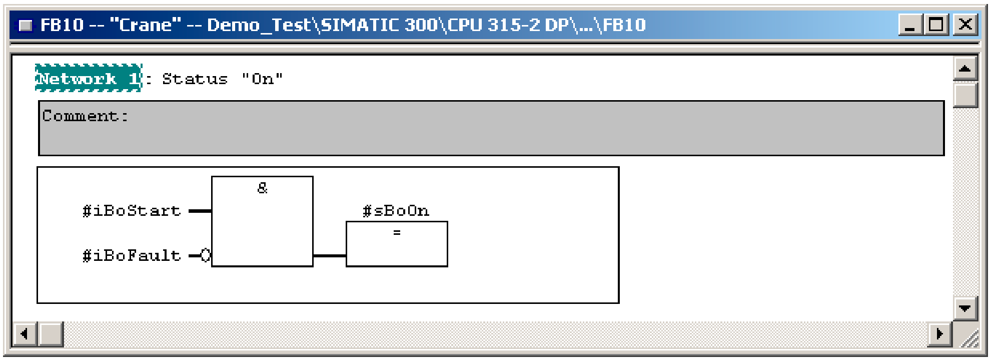
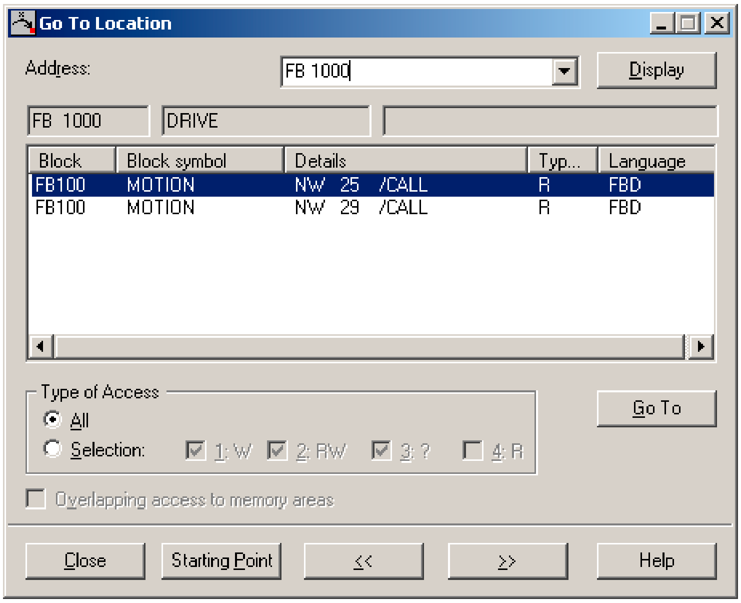

FB10 -- "Crane" -- Demo_Test\SIMATIC 300\CPU 315-2 DP\...\FB10
Network 1: Status "On"
Comment:
&
#iBoStart
#iBoFault
#sBoOn
=

Figure 7-18 Network jump



Address: FB 1000

FB 1000 | DRIVE

Block	Block symbol	Details	Typ...	Language
FB100	MOTION	NW 25 /CALL	R	FBD
FB100	MOTION	NW 29 /CALL	R	FBD

Type of Access
● All
○ Selection: ☑ 1: W ☑ 2: RW ☑ 3: ? □ 4: R

□ Overlapping access to memory areas

Figure 7-19 Points of use symbol

Table 7-4 Call parameters for PLC Reference

Call parameters	Description	Network	Points of use
-p	Path to the STEP 7 project → p[ath] ("")	x	x
-st	Station name in the STEP 7 project → st[ation] ("")	x	x
-c	CPU name in the station → c[pu] ("")	x	x
-b	Name of a block in the CPU program → b[lock]	x	
-n	Network number in the block → n[etwork]	x	
-sy	Symbol name of a symbol in the symbol table in the STEP 7 program → sy[mbol]		x
-d	Data source name of WinCC database for error messages → D[SNName]	x	x

See also

References in the CMS editor (Page 123)

Creating a program call for references (Page 127)

Define the file call for reference (Page 129)

Assigning references (Page 131)

7.1.6.11 References to TIA Portal

References to TIA Portal are made via a reference which calls "CMSPLReferenceTIA.exe". "CMSPLReferenceTIA.exe" has a function similar to the WinCC network jump.

You can find "CMSPLReferenceTIA.exe" on the installation DVD in the folder "CMSPLCReferenceTIA". This folder can be found in the folder for the associated application example.

Note

In addition to the general preconditions for opening references at CMS clients, the following preconditions must also be fulfilled:

- The supplied CMS application example 4.4 SP3 or higher is in use.
  If you are using an older CMS application example, contact the application support for SIMOCRANE.
- The CMS user must be a member of the "SIEMENS TIA Openness" user group.
- "TIA Openness" must be installed on the CMS station as part of the TIA Portal installation.
- TIA Portal 15.1 is in use.
  If you wish to use a higher version of TIA Portal, please contact the application product support for SIMOCRANE.

You can find additional requirements here: Precondition for opening references at CMS clients (Page 127)

You can either open a TIA Portal block (FB, FC) and jump to an available network (network jump) from there, or you can display the locations where a TIA Portal symbol is used. Use the corresponding call parameters to select between these two options.

Table 7-5 Call parameters for TIA Portal reference

Call parameter	Description	Network	Points of use
-p	Path to the TIA Portal project → p[ath] ("")	x	x
-st	Station name in TIA Portal project → st[ation] ("")	x	x
-c	CPU name in the station → c[pu] ("")	x	x
-b	Name of a block in the CPU program → b[lock]	x	
-n	Network number in the block → n[etwork]	x	
-sy	Symbol name of a symbol in the symbol table in the TIA Portal program → sy[mbol]		x

Note

Opening the TIA Portal may take a few minutes after the reference is executed.

Do not use your keyboard or mouse during this time, as the reference may not otherwise be executed correctly!

See also

Creating a program call for references (Page 127)

Define the file call for reference (Page 129)

Assigning references (Page 131)

7.1.6.12 Precondition for opening references at CMS clients

If you remotely access the CMS station (WinCC WebNavigator client), then you must create the infrastructure for the references so that the linked files can also be called-up via the CMS client.

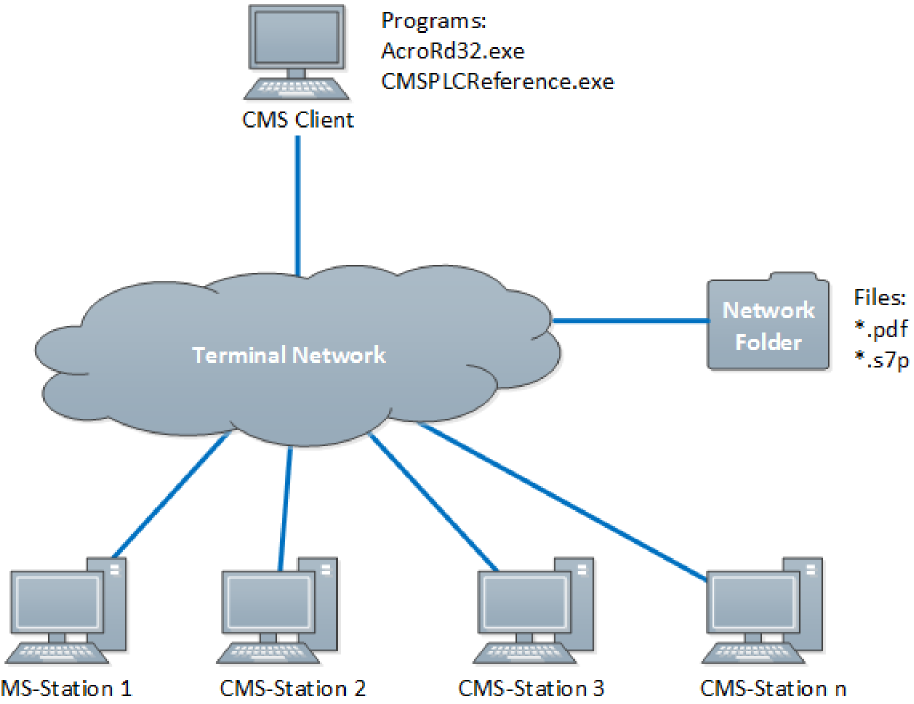


Figure 7-20 CMS client with installed programs; central network drive with files

On the CMS client, all the programs required to open the linked files must be installed, for example, Acrobat, Excel, or Step 7.

Note

For the program call to work on all computers, the programs must be accessible via the same path on all computers. Ideally, you will install the programs at the suggested default storage location.

You can store the linked files centrally on a network drive to which all connected CMS clients have access.

Note

For the file call to work on all computers, the same drive letter must be assigned to the network drive on all computers (for example "Z:")

7.1.6.13 Creating a program call for references

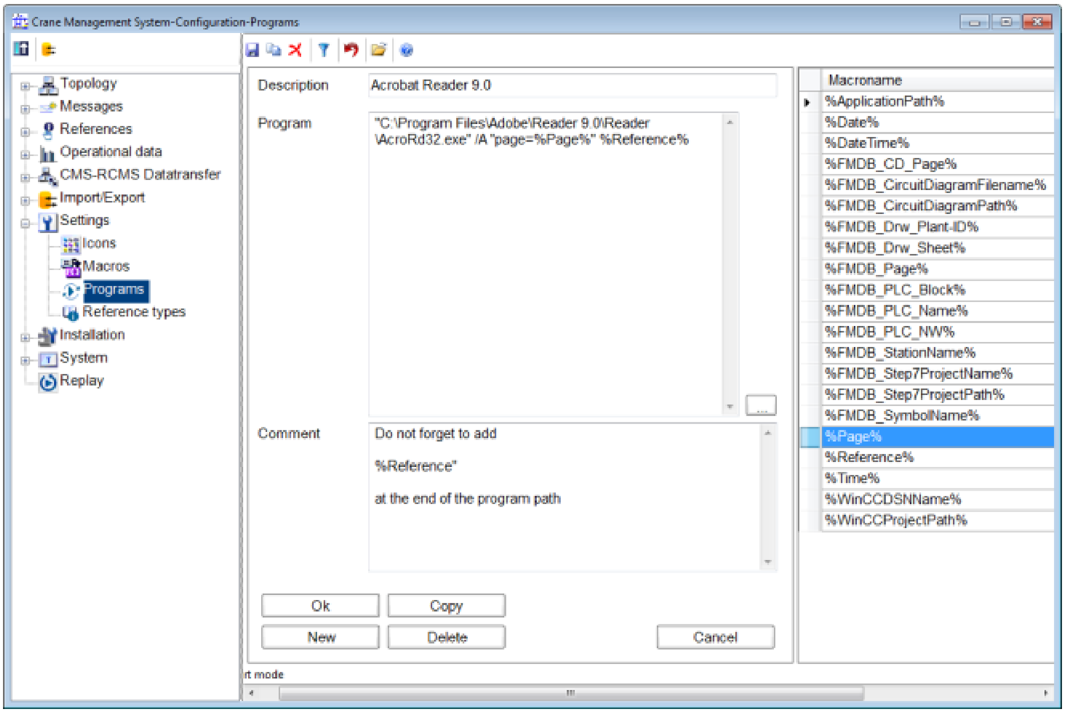
In this step, you define the program call for a reference.

You also define the special command line operators, for example, for opening a certain page in the PDF document.

See also: References in the CMS editor (Page 123)

Sequence of steps

1. Open the screen form "Settings" → "Programs".



Description: Acrobat Reader 9.0

Program: "C:\Program Files\Adobe\Reader 9.0\Reader \AcroRd32.exe" /A "page=%Page%" %Reference%

Comment: Do not forget to add

%Reference"

at the end of the program path

Macroname
%ApplicationPath%
%Date%
%DateTime%
%FMDB_CD_Page%
%FMDB_CircuitDiagramFilename%
%FMDB_CircuitDiagramPath%
%FMDB_Drw_Plant-ID%
%FMDB_Drw_Sheet%
%FMDB_Page%
%FMDB_PLC_Block%
%FMDB_PLC_Name%
%FMDB_PLC_NW%
%FMDB_StationName%
%FMDB_Step7ProjectName%
%FMDB_Step7ProjectPath%
%FMDB_SymbolName%
%Page%
%Reference%
%Time%
%WinCCDSNName%
%WinCCProjectPath%

Figure 7-21 Configuring programs for opening references in the CMS editor

2. Enter any name for the program in the "Description" field, e.g. "Acrobat Reader 11.0".

3. Enter the program path of the program you want in the "Program" field.
   Example program call for Adobe Acrobat Reader:
   ```
   "C:\Program Files (x86)\Adobe\Reader 11.0\Reader\AcroRd32.exe" /A
   "page=%Page%" %Reference%
   ```
   Example program call for Step 7:
   ```
   "%ApplicationPath%CMSPLCReference.exe" %Reference%
   ```

   Note

   On the program path, you must enter the predefined "%Reference%" macro as a wildcard for the document path.
   There must be a space between the path and the macro "%Reference%".

   Note

   If the program path contains a space character it must be between quotation marks.
   We therefore recommend always writing the path in quotation marks.

   Note

   For the "PLC Reference", the path to the program is defined with the help of the %ApplicationPath% system macro. The macro provides the SIMOCRANE CMS installation path.

4. As an option, you can add other macros in the "Program" field.
   For example, the macro "%Page%" for opening a particular page in the PDF.

   Note

   You will find parameter instructions for opening programs in the documentation of the relevant program.

   Note

   You can insert a user-defined macro directly with the notation %macro_name%.
   If the user-defined macro has not yet been defined under "Settings" → "Macros", when you save it you are asked whether you want to transfer the macro to the list of macros or reject it.

Result

You have now defined a program call for a reference. In the further steps, you must do the following:

- Define a reference to the file to be called.
  See also: Define the file call for reference (Page 129)
- Assign the reference to an equipment type, crane, or message and set the specific values for the command line operators.
  See also: Assigning references (Page 131)

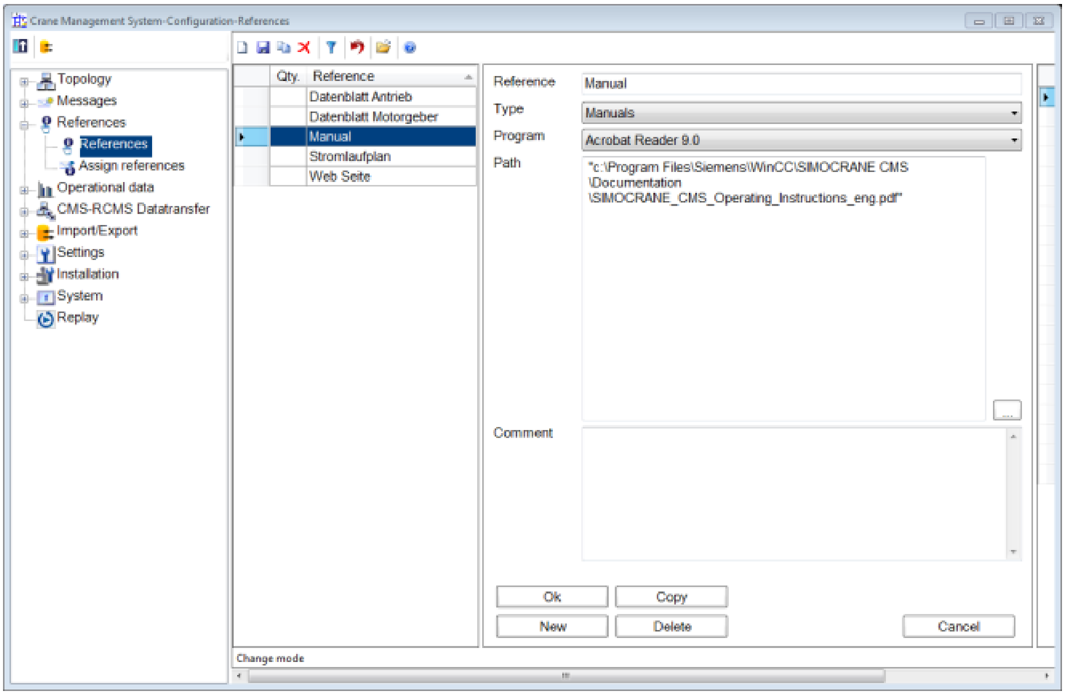
7.1.6.14 Define the file call for reference

In this step, you define the reference to the file to be called.

Requirement: The program call has been defined.
See also: Creating a program call for references (Page 127)

Sequence of steps

1. Open the screen form "References" → "References".



Crane Management System-Configuration-References

Qty.	Reference
	Datenblatt Antrieb
	Datenblatt Motorgeber
	Manual
	Stromlaufplan
	Web Seite

Reference: Manual
Type: Manuals
Program: Acrobat Reader 9.0
Path: "c:\Program Files\Siemens\WinCC\SIMOCRANE CMS \Documentation \SIMOCRANE_CMS_Operating_Instructions_eng.pdf"
Comment:

Change mode

Figure 7-22 Configuring references in the CMS Editor

The reference appears in the "References" list on the right.
The "Qty." column also displays how many times the reference is assigned to a message.

2. Enter any name for the reference in the "Reference" field. For example, "Manual".
3. Under "Program", select the program call you require.

4. Under "Type", select the reference type you require.
5. Enter the path and name of the reference in the "Path" field.
   Example file call for a PDF document:
   ```
   "C:\Program Files (x86)\Siemens\WinCC\SIMOCRANE CMS\Documentation
   \SIMOCRANE_CMS_System_Manual.pdf"
   ```
   Example file call for Step 7:
   ```
   -p "Z:\D\CMS\Applikationen\SimCrane
   V200\SimCraneV200\CMS_Stan.s7p" -st "SIMATIC 319-3 PN/DP" -c "CPU
   319F-3 PN/DP" -b %Block% -n %network% -d %WinCCDSNName%
   ```

Note

- There must be exactly 1 space before and after each call parameter.
- Note the use of inverted commas in your parameters.
  Some parameters require inverted commas; however, in others, they must not be used.
  See also: References to STEP 7 (Page 124)

Note

You can insert a user-defined macro directly with the notation %macro_name%.
If the user-defined macro has not yet been defined under "Settings" → "Macros", when you save it you are asked whether you want to transfer the macro to the list of macros or reject it.

Result

You have now defined a reference to a file.

In a further step, you must assign the reference to an equipment type, crane, or a message.
Here, you define the specific values for the command line operators.
See also: Assigning references (Page 131)

7.1.6.15 Assigning references

Here, you assign the reference to an equipment type, crane, or message. Here, you set the specific values for the special command line operators, for example, for opening a certain page in the PDF document.

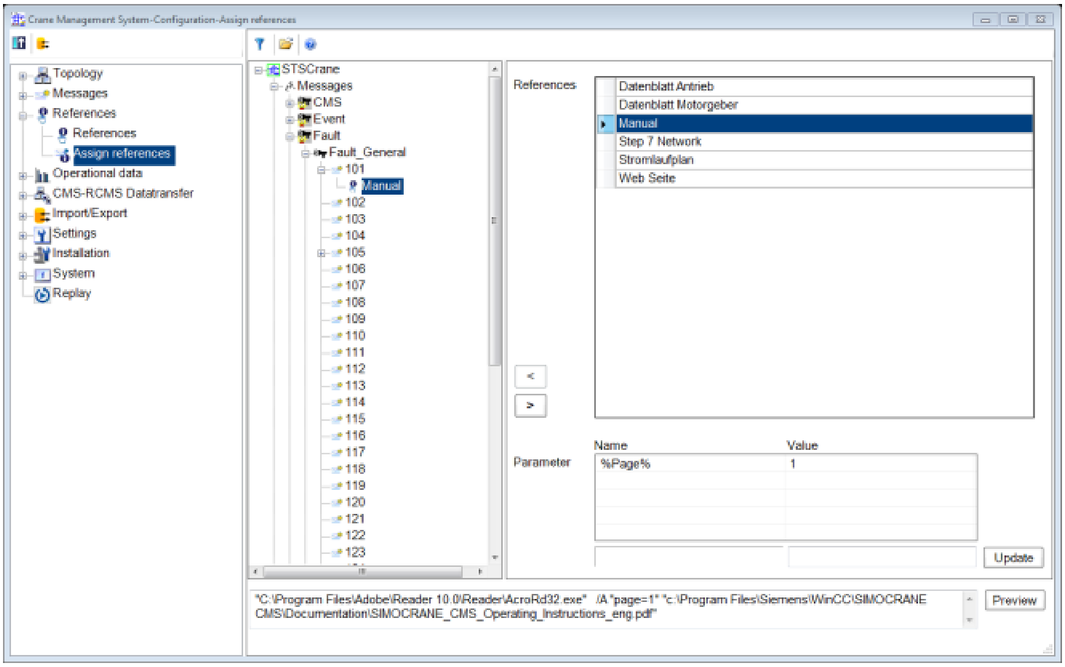
Requirement:

- The program call has been defined.
  See also: Creating a program call for references (Page 127)
- The reference to the file has been defined.
  See also: Define the file call for reference (Page 129)

You can assign a reference multiple times.
The relevant parameters of the reference are set for each assignment.

Sequence of steps

1. Open the screen form "References" → "Assign references".



References

	Datenblatt Antrieb
	Datenblatt Motorgeber
▸	Manual
	Step 7 Network
	Stromlaufplan
	Web Seite

Parameter

Name	Value
%Page%	1

```
"C:\Program Files\Adobe\Reader 10.0\Reader\AcroRd32.exe"   /A "page=1" "c:\Program Files\Siemens\WinCC\SIMOCRANE
CMS\Documentation\SIMOCRANE_CMS_Operating_Instructions_eng.pdf"
```

Figure 7-23 Assignment of references to a WinCC message in the CMS editor

2. Mark the equipment type, crane, or message that you require in the tree structure.
3. Mark a reference.
4. Press the "<" key to assign the reference.

Note

With the ">" key, you can undo the assignment.

5. Assign values to the parameters for this reference in the "Parameters" list. For example, the parameter of the macro %Page% for the number of pages of the PDF.

Note

Macros can also be preset to a fixed value under "Settings" → "Macros". Values are assigned in the "Macro text" field (e.g. "1" for the "%Page%" macro). The value then applies to all the reference's assignments.
The value is however overwritten by entries in the "Parameter" field in the assignment screen form for references.

6. Use the "Preview" button to test that the reference opens.
The button simulates the behavior of the runtime.

7.1.7 Operational data on the CMS station

CMS Runtime records three categories of operational data for a crane:

- Cargo handling data
- Time slices for counter values (operating hours, load and switching cycle counters)
- MMBF data

Each category contains a configurable data set. The data sets are entered in the WinCC Tag Logging archives by the CMS Runtime, depending on the event. The background to event control is that all values can be entered in the archive in synch with a defined time stamp and accessed as a data package for this time stamp later on.

Events include:

- cyclic events
- acyclic events (trigger tag, change in value)

The values entered can be called up in WinCC directly using the WinCC Table Control and displayed in tabular form.

The following steps should be followed for configuration:

- Configuring the data sets in WinCC
- Configuration of types of recording/recording events in the CMS editor

7.1.7.1 Data sets for configuring operational data

Initial situation

The data sets are configured in WinCC.

One data set comprises several WinCC process tags, which are archived in a common WinCC Tag Logging archive.

You will find the following data sets configured in the example application.

Table 7-6 Operational data sets in the CMS example application

Category	Tag group for process tags	WinCC Tag Logging archive	WinCC screen	Description
Move data	MoveData	MoveData	MoveData	Move data set
MMBF data	MMBFData	MMBFData	MMBFData	MMBF data set
Time slices for counter values	CounterTotal	CounterHourly	-	Data set for load and maintenance counters
		TimerDaily	-	Data set for operating hours counter

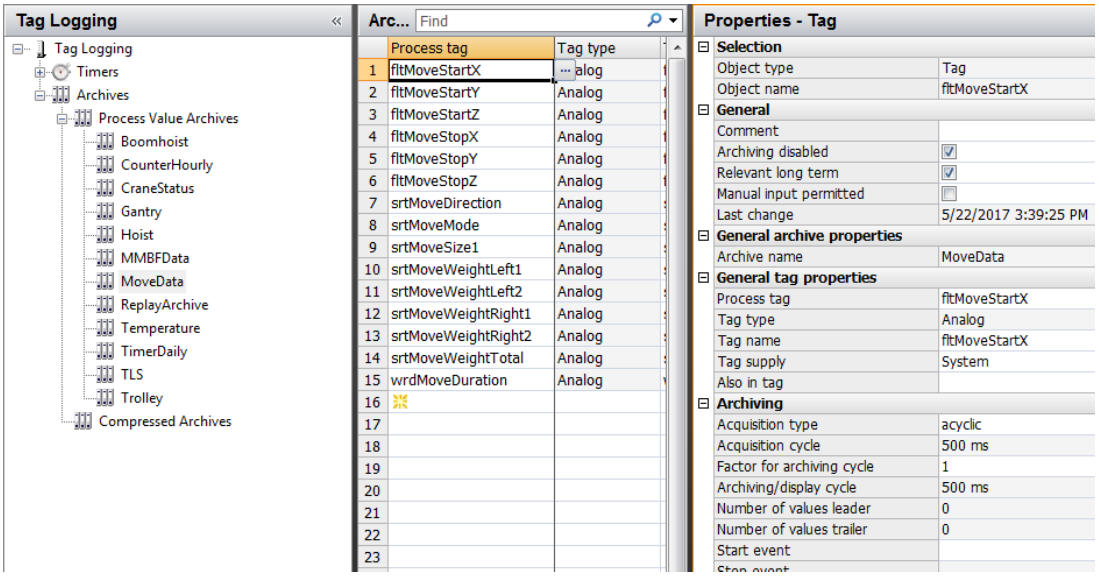
Note

The length of the archive name is limited to 32 characters, the length of the process tag name is limited to 64 characters.

In the following, the move data archive is used to describe how you can extend an existing data set.

Sequence of steps

1. First of all, create all the new values of the data set as process tags in the tag group "MoveData", in the WinCC tag management.
2. Add the new process tags in the WinCC Tag Logging archive "MoveData", or remove values you do not need.
3. Open the properties of the new archive tags.
4. Because the values from the CMS Runtime are subsequently entered in the archive, you need to define the following properties:



Tag Logging

- Tag Logging
  - Timers
  - Archives
    - Process Value Archives
      - Boomhoist
      - CounterHourly
      - CraneStatus
      - Gantry
      - Hoist
      - MMBFData
      - MoveData
      - ReplayArchive
      - Temperature
      - TimerDaily
      - TLS
      - Trolley
    - Compressed Archives

Arc... Find

	Process tag	Tag type
1	fltMoveStartX	··· alog
2	fltMoveStartY	Analog
3	fltMoveStartZ	Analog
4	fltMoveStopX	Analog
5	fltMoveStopY	Analog
6	fltMoveStopZ	Analog
7	srtMoveDirection	Analog
8	srtMoveMode	Analog
9	srtMoveSize1	Analog
10	srtMoveWeightLeft1	Analog
11	srtMoveWeightLeft2	Analog
12	srtMoveWeightRight1	Analog
13	srtMoveWeightRight2	Analog
14	srtMoveWeightTotal	Analog
15	wrdMoveDuration	Analog
16		
17		
18		
19		
20		
21		
22		
23		

Properties - Tag

⊟ **Selection**	
Object type	Tag
Object name	fltMoveStartX
⊟ **General**	
Comment	
Archiving disabled	☑
Relevant long term	☑
Manual input permitted	☐
Last change	5/22/2017 3:39:25 PM
⊟ **General archive properties**	
Archive name	MoveData
⊟ **General tag properties**	
Process tag	fltMoveStartX
Tag type	Analog
Tag name	fltMoveStartX
Tag supply	System
Also in tag	
⊟ **Archiving**	
Acquisition type	acyclic
Acquisition cycle	500 ms
Factor for archiving cycle	1
Archiving/display cycle	500 ms
Number of values leader	0
Number of values trailer	0
Start event	
Stop event	

Figure 7-24 Configuration of archive tags for move data acquisition in the WinCC Tag Logging editor

Table 7-7 Setting for archive tags for operating data acquisition

Option	Setting
Archiving blocked	Activated
Relevant long term	Activated
Acquisition type	Acyclic

- Proceed in the same way for all other data sets which you wish to change.
- You can also define your own archive. Proceed as described above when configuring the archive.

Result

You have now prepared the operational data sets. However, at the moment you cannot record any values. To do this, you must configure the next acquisition steps in the CMS editor. The acquisition dialog differentiates between the three categories of operating data.

7.1.7.2 Acquiring move data

Initial situation / objective

Acquiring move data with CMS Runtime means reading a data set associated with a cargo handling operation and entering it into a WinCC Tag Logging archive with a common time stamp. All the data of the move data set to be acquired must be present as tags in the WinCC tag management and be defined in an archive of the WinCC Tag Logging editor. All the data must be in the same archive. Trigger tags initiate data recording.

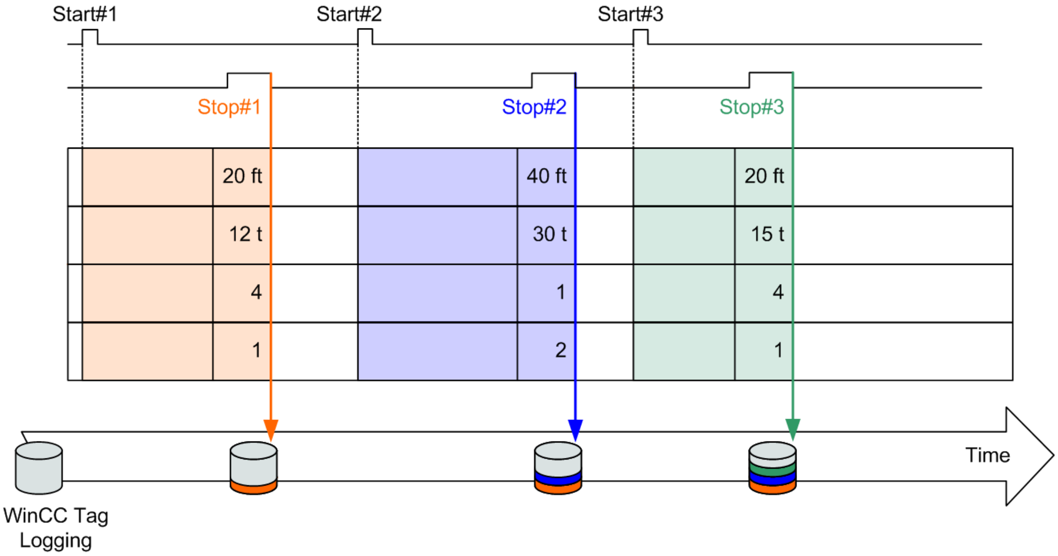


Figure 7-25 Acquiring move data

The following types of move data acquisition are supported by CMS Runtime:

- Direct acquisition:
  The data set time stamp is generated in the CMS. A start and stop event define the time frame of the data set. The data is read during the stop event. The start and stop events are binary tags in the WinCC tag management. If the value is "1", then CMS Runtime reads information and resets the tag to "0". The start time stamp is determined during the start event and during the stop event the stop time stamp is determined, the move data is read and entered into the WinCC Tag Logging archive. The stop event may only be set to "1" if the start event has already been reset to "0".
- Buffered acquisition:
  The time stamp of the data set is generated on the controller and transferred to the CMS with the data set. The mechanism supports the buffering of data on the controller. The time stamp is always transferred from the controller to WinCC split up into individual time components (year, month, day, hour, minute, second). The time components must be defined as tags in the WinCC tag management and written by the controller along with the data set. Time components are byte type tags. The CMS add-on expects and interprets a time stamp with decimal coding on a time basis of 24 hours. A trigger tag from the WinCC tag management uses the "1" status to signal that a new data set can be read. CMS Runtime sets the status to "0" when the data has been read and entered in the Tag Logging archive. A new data set can now be written on the controller.

Note

For the trigger control, it is essential you observe the information in the operating instructions of the CMS add-on for WinCC.

The following criteria are already fulfilled in the CMS example application:

- Process tags for the move data set in the tag group "MoveData".
- Trigger tags in the tag group "MoveData"
- Time stamp tags in the tag group "MoveData"
- Tag Logging archive "MoveData" for saving the data sets
- WinCC screen "MoveData.Pdl" for displaying the data sets in a WinCC OnlineTableControl.

How to configure the acquisition using CMS Runtime is described below.

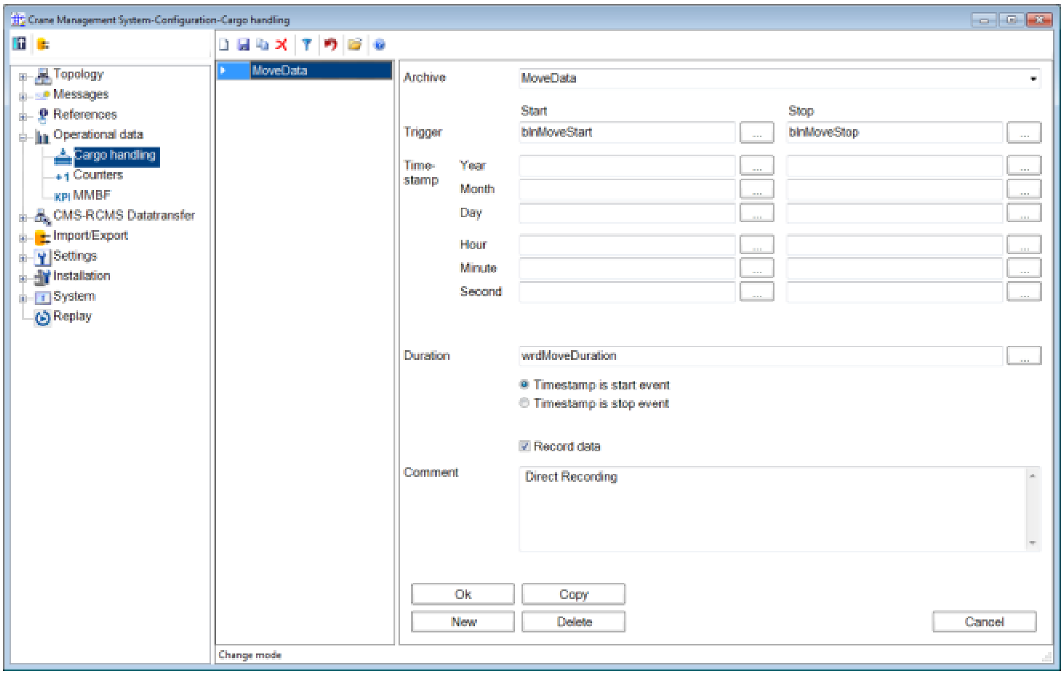
Processing steps – direct acquisition

1. Open the CMS editor.
2. Open the move data dialog under "Operating data" → "Move data".
3. Enter the name of the predefined WinCC Tag Logging archive in the "Archive" field (e.g."MoveData").

The "Trigger" and "Time stamp" fields define the type of data acquisition. You must note the following for the direct acquisition of data:

1. In the "Start" field, enter the WinCC process tag "bInMoveStart" from the tag group "MoveData", which signals the start of the cargo handling operation.
2. In the "Stop" field, enter the WinCC process tag "bInMoveStop" from the tag group "MoveData", which signals the end of the cargo handling operation.

3. The fields for "Time stamp" must remain empty.
4. An internal WinCC tag for the cargo handling duration is entered in the "Duration" field. The duration is calculated by CMS Runtime.
5. Data acquisition is activated with the "Record data" setting. If you remove the check mark, you can shut down the complete processing. No data is transferred and no archive entries or XML files are created.



MoveData

Archive: MoveData

	Start	Stop
Trigger	blnMoveStart	blnMoveStop
Time-stamp Year		
Month		
Day		
Hour		
Minute		
Second		

Duration: wrdMoveDuration

● Timestamp is start event
○ Timestamp is stop event

☑ Record data

Comment: Direct Recording

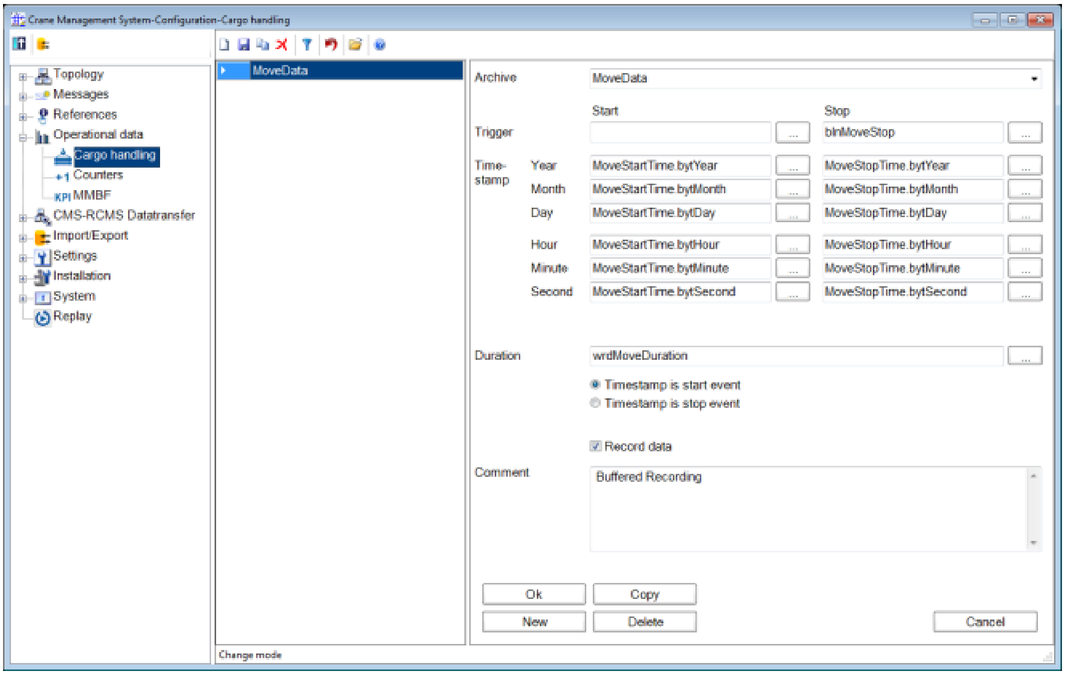
Figure 7-26 Configuration of direct move data acquisition in the CMS editor

Processing steps – buffered acquisition

1. Open the CMS editor.
2. Open the move data dialog under "Operating data" → "Move data".
3. Enter the name of the predefined WinCC Tag Logging archive in the "Archive" field (e.g."MoveData").
   The "Trigger" and "Time stamp" fields define the type of data acquisition. You must note the following for buffered acquisition of data:
4. The "Start" field may remain empty. Otherwise, enter the WinCC process tag "blnMoveStart" from the tag group "MoveData" in this field.
5. In the "Stop" field, enter the WinCC process tag "blnMoveStop" from the tag group "MoveData". This signalizes that a data set can be read.
6. Enter the respective tags for the time components for the start time in the "Time stamp" → "Start" fields.

7. Enter the respective tags for the time components for the stop time in the "Time stamp" → "Stop" fields.
   An internal WinCC tag for the cargo handling duration is entered in the "Duration" field.

8. The duration is calculated by CMS Runtime. With buffered acquisition, you can also send the "Duration" rather than the stop time from the controller.
   Data acquisition is activated with the "Record data" setting. If you remove the check mark, you can shut down the complete processing. No data is transferred and no archive entries or XML files are created.



		Start	Stop
Archive		MoveData	
Trigger			blnMoveStop
Time-stamp	Year	MoveStartTime.bytYear	MoveStopTime.bytYear
	Month	MoveStartTime.bytMonth	MoveStopTime.bytMonth
	Day	MoveStartTime.bytDay	MoveStopTime.bytDay
	Hour	MoveStartTime.bytHour	MoveStopTime.bytHour
	Minute	MoveStartTime.bytMinute	MoveStopTime.bytMinute
	Second	MoveStartTime.bytSecond	MoveStopTime.bytSecond

Duration: wrdMoveDuration

● Timestamp is start event
○ Timestamp is stop event

☑ Record data

Comment: Buffered Recording

Figure 7-27 Configuration of buffered move data acquisition in the CMS editor

7.1.7.3 Acquisition of time slices for counter values

Initial situation / objective

The example application makes a distinction between two types of counter:

- Total counter: Counter for measuring a crane's service life (equivalent to a total kilometer reading in a car)
- Section counter: Counter which can be reset from the CMS user interface (similar to a trip recorder in a car)

The actual counters are located on the crane control system. Both counters must count in tandem. Their current value is defined as a tag in the WinCC tag management. A bit in the CMS user interface triggers the resetting of the section counters on the controller.

Use the following naming convention in the WinCC tag management to make an assignment between a total counter and a section counter:

- Total counter: → "Counter name"
- Section counter to "Counter name": → "Counter nameRes"

This means you will not be able to create a total counter with the ending "Res".

The CMS Runtime handles two tasks for the counter values:

- Calculating differential values for a total counter in defined time slices
- Monitoring actual counter values. The CMS runtime monitors the consistency of all total counter values and the assigned section counters. (Note the naming convention!)

You can define any time slices in the CMS editor. The time slices are stored in WinCC Tag Logging archives. A time slice applies to all values in an archive.

A counter's current values can only be monitored if the total counter is part of an archive dedicated to recording time slices in the CMS editor. The section counter must not be part of the archive. When the value of a total counter changes, the current value is compared with the last counter value stored. If the current value is less than the value last stored, the CMS writes the old value back to the controller. This prevents information from being lost, something which may occur if the control program is reloaded to the CPU after a certain operating time.

Note

A configuration file is created in the WinCC project directory under "…\CMS\Counter" and under "…\CMS\Accumulates" to monitor the counter values and to calculate the difference. If the counter values are to be deleted in full, these two configuration files must be removed.

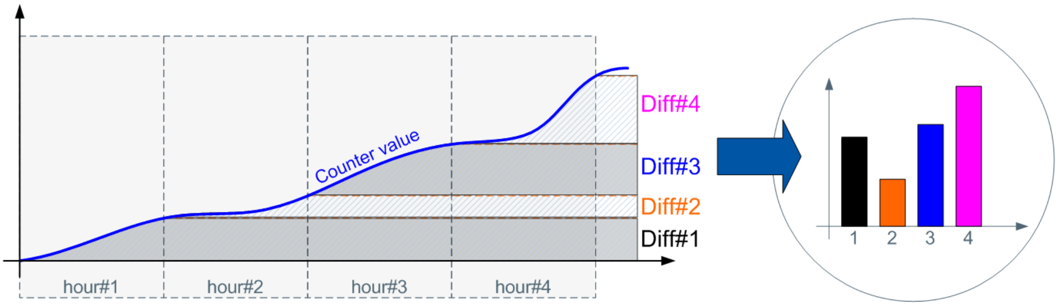


Figure 7-28 Acquisition of time slices for counter values

In the example application, the process tags for the controller's total counter are available in the tag group "Counter_Total," the resettable counters are available in the tag group "Counter_Reset."

Two tag logging archives, "CounterHourly" and "CounterDaily", have been set up to save the time slices.

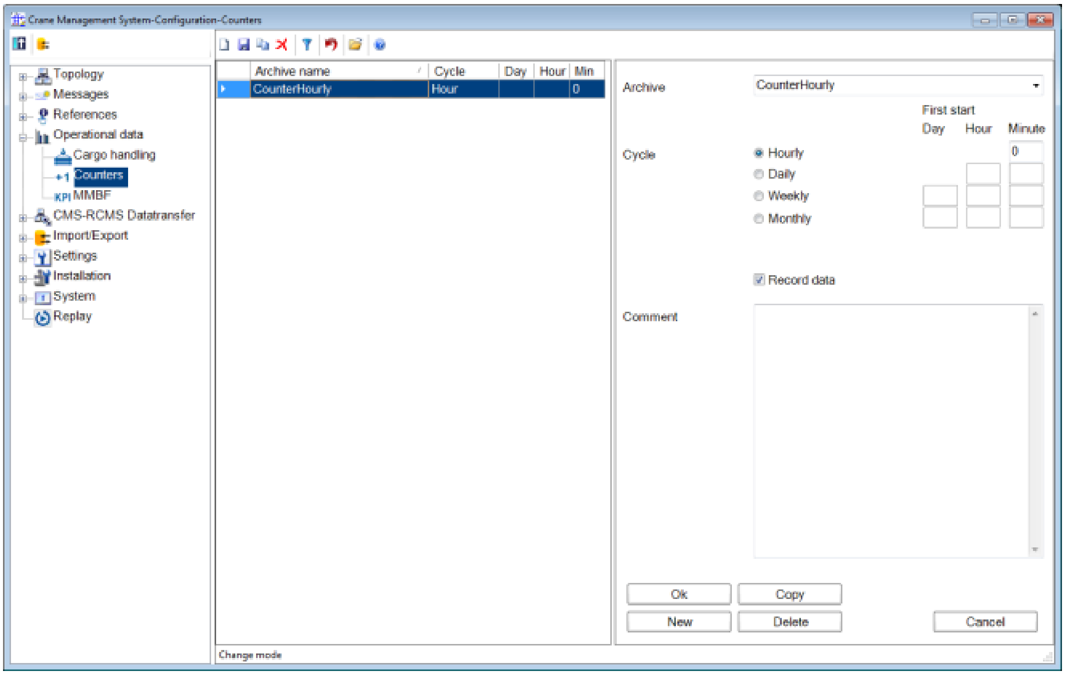
The following criteria are already fulfilled in the CMS example application:

- Process tags in the tag group "Counter_Total.
- Tag logging archives "CounterHourly" and "CounterDaily" for saving the data sets

The following describes how to configure that the time slices for counter values are entered in the CMS editor. The counter restoration is coupled to the acquisition of the counter values.

Sequence of steps

1. Open the CMS editor.
2. Open the counter dialog under "Operating data" → "Counters".
3. Enter the name of one of the predefined WinCC Tag Logging archives in the "Archive" field (e.g."CounterHourly").
4. Select the recording cycle you want under "Cycle". The following options are available:
   – Hourly
   – Daily
   – Weekly
   – Monthly
5. Enter the time for initializing the values under "First start".
   You can use the setting "Switch off processing" to switch off the processing completely. No data is transferred and no archive entries or XML files are created.



Archive name	Cycle	Day	Hour	Min
CounterHourly	Hour			0

Archive: CounterHourly

First start: Day, Hour, Minute: 0

Cycle: ● Hourly ○ Daily ○ Weekly ○ Monthly

☑ Record data

Comment

Figure 7-29 Configuring the acquisition of counter data in the CMS editor

6. Use "New" to create an additional data set and configure the acquisition for all other counter time slice archives (e.g. "CounterDaily") as described above.

Note

Please note that for the initial start, a value initialization must be carried out first. Therefore no values are entered in the archive for the first cycle.

7.1.7.4 Acquisition of MMBF data

Initial situation

The CMS Runtime can acquire what are known as MMBF data which is determined on the controller and configured in the WinCC Tag Logging. The process of reading a MMBF data set is signaled to the CMS Runtime by the controller using a trigger tag. If the trigger tag value is "1", the CMS Runtime reads information, enters the data in a WinCC Tag Logging archive and resets the tag to "0".

As with move data, the CMS Runtime supports the following types of MMBF data acquisition:

- Direct acquisition
  The data set time stamp is generated in the CMS.
- Buffered acquisition
  The time stamp at which the data set was determined on the controller is also set on the controller and transferred to the CMS along with the data set. The mechanism supports the buffering of data on the controller.

The following criteria are already fulfilled in the CMS example application:

- Process tags in the tag group "MmbfData"
- Trigger tags in the tag group "MmbfData"
- Time stamp tags in the tag group "MmbfData"
- Tag Logging archive "MmbfData" for saving the data sets

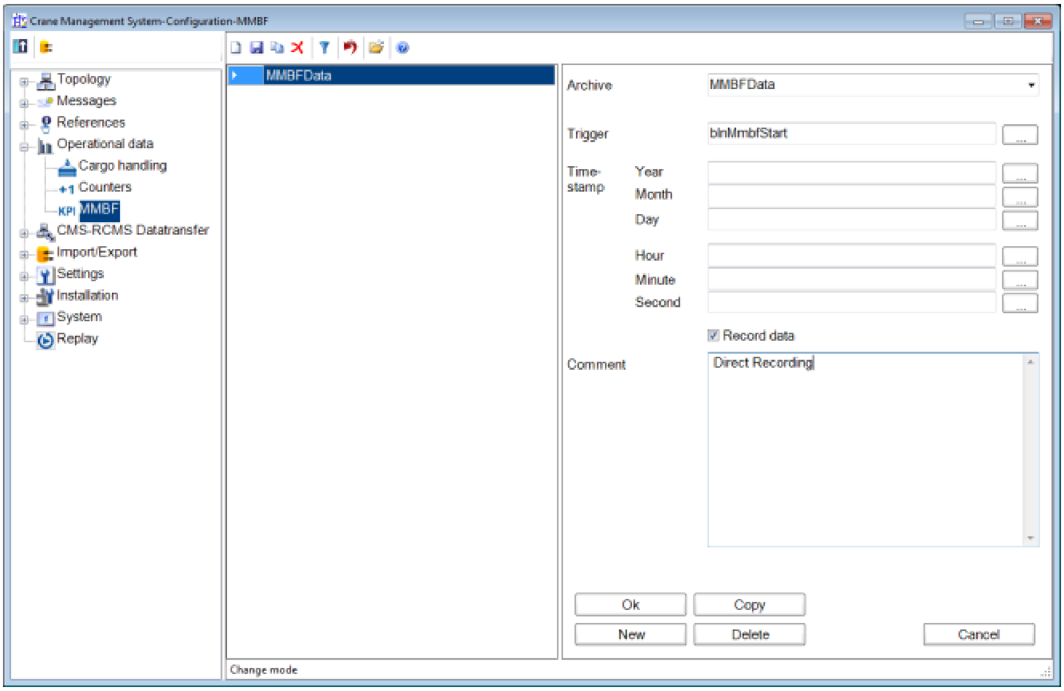
The description below explains how you adapt the existing data set or type of acquisition to your requirements.

Note

You can also evaluate the MMBF data using the CMS Analyzer. No additional configuration of the CMS project is required for this purpose.

Processing steps – direct acquisition

1. Open the CMS editor.
2. Open the MMBF data dialog under "Operational data" → "MMBF data".
3. Enter the trigger tag for reading the MMBF data set in the "Trigger" field.
   The "Time stamp" fields define the type of data acquisition. You must note the following for the direct acquisition of data:
   – The fields for "Time stamp" must remain empty.
   – Data acquisition is activated with the "Record data" setting. If you remove the check mark, you can shut down the complete processing. No data is transferred and no archive entries or XML files are created.



Archive: MMBFData

Trigger: blnMmbfStart

☑ Record data

Comment: Direct Recording

Figure 7-30 Configuration of direct MMBF data acquisition in the CMS editor

Processing steps – buffered acquisition

1. Open the CMS editor.
2. Open the MMBF data dialog under "Operational data" → "MMBF data".
3. Enter the trigger tag for reading the MMBF data set in the "Trigger" field.
   The "Time stamp" fields define the type of data acquisition. You must note the following for buffered acquisition of data:
4. Enter the tags for the time components for the time stamp in the "Time stamp" fields.
   Data acquisition is activated with the "Record data" setting. If you remove the check mark, you can shut down the complete processing. No data is transferred and no archive entries or XML files are created.

7.2 CMS Runtime

7.2.1 General information about operation

7.2.1.1 Starting the CMS Runtime

CMS Runtime has no user interface. The program can either be manually started or it can be started using an entry in Windows or WinCC Startup.

Note

For normal operation, it is recommended that CMS Runtime is started via the Windows Startup.

An icon in the Windows system tray indicates that CMS Runtime has been started.

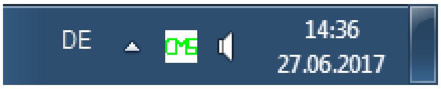


Figure 7-31 CMS Runtime icon

CMS **White with green letters:**
A WinCC project is loaded.
WinCC Runtime has started.

CMS **White with blue letters:**
A WinCC project is loaded.
WinCC Runtime has stopped.

CMS **White with red letters:**
A WinCC project is not loaded.

CMS **Red with black letters:**
A WinCC project is loaded.
The CMS configuration data contain an error.
CMS Runtime has detected a "fata error".
You can find more information about the error in the CMS error file in folder "…\CMS" of the WinCC project directory.

In addition, there is a CMS system tag "@CMSConnectionState", to which the status of CMS Runtime is mapped (see Chapter CMS system tags (Page 153)).

7.2.1.2 Terminating CMS Runtime

CMS Runtime can be terminated via a context menu command (right-click the icon displayed in the system tray).

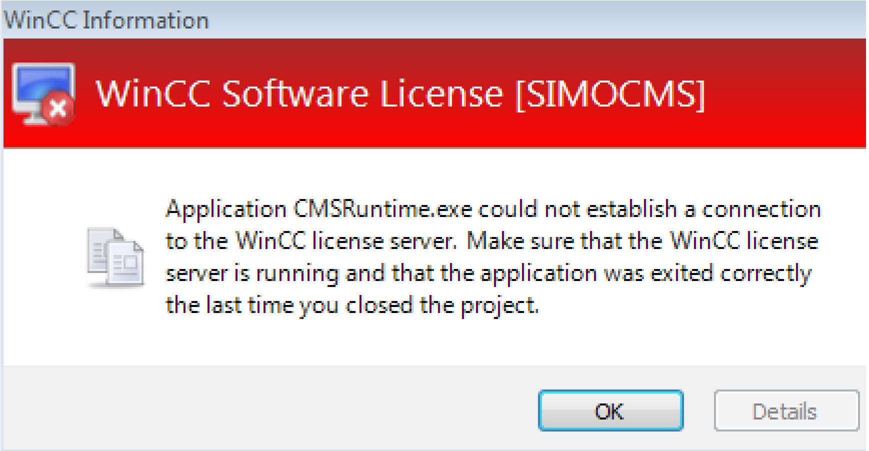
1. Terminate the CMS application, the CMS editor and the WinCC Graphics Designer.

   Note

   Always terminate these programs before you terminate CMS Runtime.
   Otherwise the application or the WinCC Graphics Designer may freeze.

2. Right click the CMS Runtime icon in the system tray and select "Exit" in the shortcut menu.

When the WinCC Runtime has crashed or when shutdown of the WinCC Runtime has been forced by the function "Reset_WinCC", the computer must be restarted. This is the only way to ensure that all processes are correctly restarted. The following error message may otherwise appear:



WinCC Information

WinCC Software License [SIMOCMS]

Application CMSRuntime.exe could not establish a connection to the WinCC license server. Make sure that the WinCC license server is running and that the application was exited correctly the last time you closed the project.

Figure 7-32 WinCC Software License error message

Note

Only use the function "Reset_WinCC" in exceptional cases, i.e. when you cannot find any other way to shut down WinCC.

7.2.2 Process value acquisition

7.2.2.1 Applications

The recording of process values mainly covers two applications:

- Fault analysis when the crane is at a standstill: During the fault analysis, first the trend of various process values should be shown as a fault message. The process values in one time range are shown in relation to the time stamp of the fault message with pre- and posttrigger time period.
- Recording and analysis of continual process values when commissioning the crane

Another criterion for the display accuracy and the quality of the fault analysis is the resolution of the measurement points. The higher the resolution, the more measurement points and the higher the volume of data.

7.2.2.2 WinCC standard process value archiving

With WinCC Tag Logging, values with maximum 500 ms can be recorded and archived. These values are displayed in the CMS example application as continuous trends.

Advantage:

The advantage of WinCC standard process value archiving is that it can be quickly and cheaply implemented.

Disadvantage:

The disadvantage is the low resolution of the trends, since an archiving cycle of 500 ms generates an insufficient number of measurement points for the post mortem analysis. The SIMOCRANE Fast Trace Viewer can be used for this purpose however.
See: SIMOCRANE CMS Fast Trace Viewer (optional) (Page 48)

7.2.2.3 WinCC standard process value archiving with increased resolution

For the following applications, data can be prepared on the controller, collected and sent to WinCC in one telegram:

- Process values with an interval of less than 500 ms are recorded
- Values are acquired with a time stamp from the controller
- Several values can be acquired in time synchronism

The data are entered into a WinCC Tag Logging archive with the time stamp allocated by the controller.

For detailed information, for instance on the telegram structure, refer to the WinCC documentation (WinCC communication manual → SIMATIC S7 PROTOCOL SUITE channel → Special functions).

For SIMATIC S7, there are blocks that can be parameterized for sending a telegram. In the S7-400 automation system, there is the integrated function block SFB 37 "AR_SEND" .

Advantage:

The advantage of this method is that archiving cycles of less than 500 ms are possible in WinCC. High levels of configuration effort are not needed on the HMI side.

Disadvantage:

The high level of configuration effort impacts negatively on the controller side. In particular there is a high level of communication between the automation system and WinCC. When several process values are being transferred, the cycle time and transfer rate of the communications interface must be noted.

7.2.3 Acquiring move data on the CMS station

7.2.3.1 Overview

Certain operating data in the controller are identified in the CMS for the purpose of acquiring information about the utilization of a crane or for performing other statistical analyses. These data are then transferred to the CMS on the computer for storage in the database.

While some of these values are continuously saved, there is a set of data assigned to the movement of a container load. These values are only saved after the movement has been completed. These values will be referred to as cargo handling data from now on.

Cargo handling data includes, e.g. values such as:

- Starting time, finishing time and/or duration of a cargo handling operation
- Container size
- Weight
- Direction of motion
- Specification of a mode or status (for example: Automatic mode, heavy-duty operation, dual-spreader operation ...)

Cargo handling data is stored in WinCC Tag Logging archives. When process values are stored in Tag Logging archives, the tags to be archived are normally acquired by WinCC and stored in archive tags. However, since cargo handling data must fulfill special requirements, it is entered into the archive tags of the Tag Logging archives by CMS Runtime rather than by WinCC.

7.2.3.2 Requirements for correct assignment of time stamps

Requirements to be fulfilled to ensure correct assignment of time stamps:

- Meaningful chronological sequence (start time before stop time)
- Time cannot lie in the future
- Time stamp is a decimal number and is coded in 24h format
- Time format (UTC or local time) is identical on the PLC, CMS and RCMS
- The times are synchronized within an interval of < 1 min

The CMS Runtime compares all incoming time stamps of the PLC with the current PC time. If the incoming time stamps of the PLC are in the future, the current PC time is applied and the time stamp is marked with "u" (uncertain).

If several time stamps in the future are received, the following procedure is applied:

- Time stamp 1 = current PC time
- Time stamp 2 = current PC time + 10 sec.
- Time stamp 3 = current PC time + 20 sec.
- Time stamp 4 = current PC time + 30 sec.
- etc.

Calculating the duration of a cargo handling operation on the basis of time stamps with the attribute "u" (uncertain) can give an unreliable result.

Note

For further information, see Time synchronization (Page 156).

7.2.3.3 Definition of archives

CMS Runtime can acquire move data in two ways:

- Direct acquisition:
  The time stamp for the data set is set by CMS Runtime based on the system time on the computer. A start and stop event define the time frame of the data set.
- Buffered acquisition:
  The time stamp for the data set is set on the controller and transferred to the CMS with the data set.

External tags must be created in the WinCC tag management in order to be able to manage move data. The process values are part of the controller interface (e.g. direction of movement, weight, container size, duration of the cargo handling operation, etc.).

The interface also contains two bits which can be controlled by the controller at the beginning and end of a cargo handling operation (trigger bits). The start trigger is not essential for the buffered acquisition. If data buffering is required, the time stamp will also need to be specified in this interface. The time stamp is always transferred from the controller to WinCC split up into individual time components (year, month, day, hour (24 hours), minute, second) as decimal value.

At least one archive must be created in the WinCC Tag Logging for long-term storage of move data. This archive must be registered with the CMS in the CMS Editor. Further, the two bits to signal start or stop and/or the tags for time acquisition must also be specified in this function.

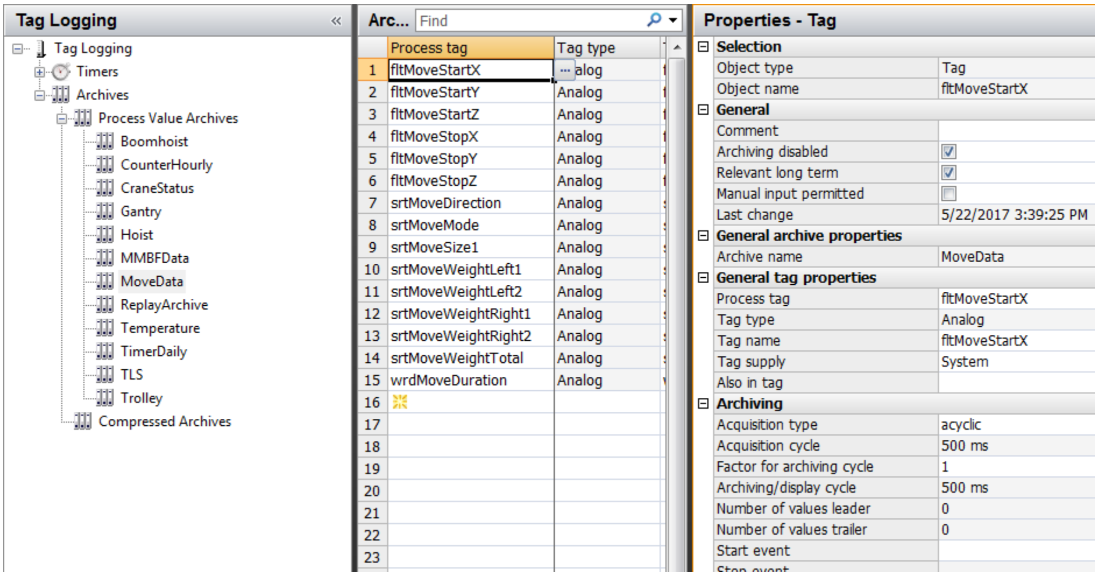
The archive tags in the Tag Logging archives are not written by WinCC (if this were the case, the timing of the write operations of individual archive tags would not be synchronous); instead they are triggered by the stop bit. They are then read from the crane control system using the external tags and are written by CMS Runtime to the archives with a common time stamp. The start or end time of the cargo handling operation can be selected as time stamp.

The archive tags in the Tag Logging archives for managing move data must have the following settings – this is mandatory:

Property	Value	Meaning
Name	Name of the archive tag	Mandatory field in WinCC; required when displaying move data via the WinCC Report function
Name of the process variable	External tags in the WinCC tag management system	The value of the specified tag is read by CMS Runtime from the controller and entered in the archive.
Tag supply	System	Manually input values are not currently supported by WinCC
Archiving	Disabled	As the values are written from CMS Runtime by a program, the writing of values from WinCC must be disabled.
Acquisition type	Acyclic	Values can be entered at times chosen by the user.

Note

The length of the archive name is limited to 32 characters, the length of the process tag name is limited to 64 characters.



Tag Logging

- Tag Logging
  - Timers
  - Archives
    - Process Value Archives
      - Boomhoist
      - CounterHourly
      - CraneStatus
      - Gantry
      - Hoist
      - MMBFData
      - MoveData
      - ReplayArchive
      - Temperature
      - TimerDaily
      - TLS
      - Trolley
    - Compressed Archives

Arc... Find

	Process tag	Tag type
1	fltMoveStartX	alog
2	fltMoveStartY	Analog
3	fltMoveStartZ	Analog
4	fltMoveStopX	Analog
5	fltMoveStopY	Analog
6	fltMoveStopZ	Analog
7	srtMoveDirection	Analog
8	srtMoveMode	Analog
9	srtMoveSize1	Analog
10	srtMoveWeightLeft1	Analog
11	srtMoveWeightLeft2	Analog
12	srtMoveWeightRight1	Analog
13	srtMoveWeightRight2	Analog
14	srtMoveWeightTotal	Analog
15	wrdMoveDuration	Analog
16		
17		
18		
19		
20		
21		
22		
23		

Properties - Tag

Selection	
Object type	Tag
Object name	fltMoveStartX
General	
Comment	
Archiving disabled	☑
Relevant long term	☑
Manual input permitted	□
Last change	5/22/2017 3:39:25 PM
General archive properties	
Archive name	MoveData
General tag properties	
Process tag	fltMoveStartX
Tag type	Analog
Tag name	fltMoveStartX
Tag supply	System
Also in tag	
Archiving	
Acquisition type	acyclic
Acquisition cycle	500 ms
Factor for archiving cycle	1
Archiving/display cycle	500 ms
Number of values leader	0
Number of values trailer	0
Start event	

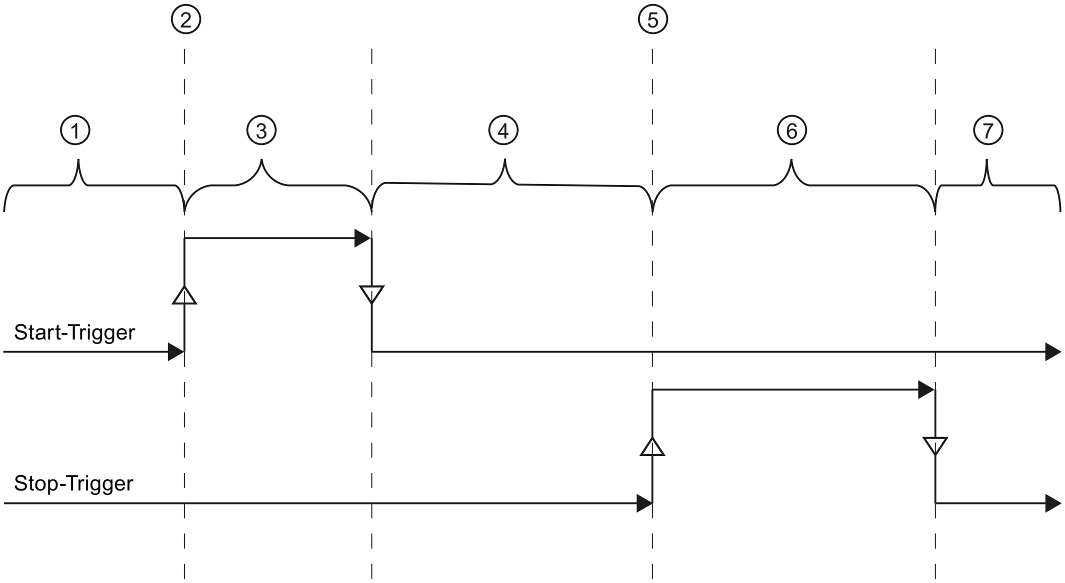
Figure 7-33 Properties of an archive tag

7.2.3.4 Execution in runtime

When CMS Runtime starts up, it reads the names of the archives and trigger tags from the configuration file and initializes processing of the move data. In this case, all archive tags of the relevant archive are read out for each parameterized archive and the external tag linked to the archive tag is determined. Furthermore, an information function is activated; this can activate a CMS Runtime function every time the status of one of the trigger tags changes.

If the information function detects an incoming edge for one of the two monitored trigger tags, one of the two processing functions is activated:

- Start of the cargo handling operation
  When the cargo handling operation starts, only the time stamp at which the start was detected is stored. The bit for signaling the start of cargo handling is then reset again by CMS Runtime. The start may not be required. In this case, the time stamp tags for the start time are also acquired at the end of cargo handling sequence.
- End of the cargo handling operation
  When the cargo handling operation ends, the time stamp, at which the status change in the trigger tag was detected, is initially saved. With a synchronous read task, all external tags of the individual archive tags are read from the controller. After the actual values have been acquired from the controller, they are written with the same time stamp to the Tag Logging archives by CMS Runtime. Archive entries are usually written to the archives with the time stamp recorded at the movement start. The time stamp to be used for writing archive data, i.e. the one for the start or end event, can be configured separately for each archive in the CMS Editor.
  The trigger bit is reset to complete the writing of move data. Once this has happened, the process of writing move data on the interface is reenabled on the controller.



① Writing of data enabled by the controller.
Reading of data disabled by CMS Runtime

② Start of the cargo handling operation

③ Reading of start time stamp by CMS Runtime.
Writing of data disabled by the controller

④ Writing of data enabled by the controller.
Reading of data disabled by CMS Runtime

⑤ End of the cargo handling operation

⑥ Reading of stop time stamp and move data by CMS Runtime.
Writing of data disabled by the controller

⑦ Writing of data enabled by the controller.
Reading of data disabled by CMS Runtime

Figure 7-34 Protocol for acquisition of move data

The controller disables the writing of data when one of the two trigger bits is set. This ensures that the data set acquired is always consistent. Conversely, CMS Runtime disables the reading of values when the trigger bits are not set.

The CMS sample application provided contains predefined archives for storing move data with a basic set of archive tags. The user can adapt these archives to meet his own requirements if necessary.

7.2.4 Acquiring counter differences at the CMS station

7.2.4.1 Overview

The counters are located in the controller. The CMS only manages the counters' process values. The counter values are part of the controller interface (e.g. counts for the number of cargo handling operations, the total weight, etc.).

CMS Runtime distinguishes between two types of counters:

- Total counter: Counters which are valid for the crane's life cycle (equivalent to an odometer in a car)
- Section counter: Counter which can be reset from the CMS user interface (trip odometer in a car)

Both counters must count in parallel.

Use the following naming convention in the WinCC tag management to make an assignment between a total counter and a section counter:

- Total counter: → "Counter name"
- Section counter to "Counter name": → "Counter nameRes"

This means you will not be able to create a total counter with the ending "Res".

The actual values of the total counters are monitored by CMS Runtime. The actual values of a counter can only be monitored if the total counter is a part of an archive used to record counter differences in the CMS Editor. The section counter must not be part of the archive. When the value of a total counter changes, the actual value is compared with the last counter value stored. If the actual value is less than the value last stored, the CMS writes the old value back to the controller. This prevents information from being lost, something which may occur if the control program is reloaded to the CPU after a certain operating time.

Note

A configuration file is created in the WinCC project directory under "…\CMS\Counter" and under "…\CMS\Accumulates" to monitor the counter values and to calculate the difference. If the counter values are to be completely reset, then these two configuration files must be removed.

7.2.4.2 Definition of archives

Long-term storage of counter differences is only possible if at least one archive has been created in the WinCC Tag Logging and this has been registered with the CMS in the CMS Editor via the dialog for counter acquisition. The time slice for the counter differences must also be defined in the same dialog.

The archive values are written to the Tag Logging archives by CMS Runtime. The time that the counter differences are acquired is used as time stamp. The time of acquisition is obtained from the acquisition cycle, which is set in the CMS Editor. It is essential that the archive tags in the Tag Logging archives for managing the counters have the same settings as the archive tags of the cargo handling data archives (see Chapter Definition of archives (Page 147)).

7.2.4.3 Execution in runtime

The CMS Runtime handles two tasks for the counter values:

- Calculating differential values for a total counter in defined time slices
- Monitoring actual counter values. The CMS Runtime monitors all total counter values and their assigned section counters for consistency (please note the naming convention).

When CMS Runtime starts up, it reads the names of the archives and acquisition cycles from the configuration file and initializes processing of counter data. The archive tag values from each parameterized archive are fetched and the external tag linked to the archive tag is determined. This gives users the freedom to adapt the type and scope of the stored data to suit their own requirements by creating new, individual archive tags or amending/deleting existing ones. If users want to exclude entire archives from processing (or include them), they can make the necessary changes in the CMS Editor.

A cyclic function is started in the CMS Runtime which monitors the acquisition cycles for the counter archives. Once an acquisition cycle for an archive is complete, all the process tags of this archive are read. The difference between the current count and the count for the previous cycle is established. Finally, the difference is entered in the Tag Logging archive.

An information function is also started, which is triggered whenever a counter changes. This function compares the current value with the last value. If the current value is less than the old value, CMS Runtime writes the old value back to the controller

7.2.5 Acquiring MMBF data at the CMS station

7.2.5.1 Overview

Like the acquisition of cargo handling data, the acquisition of MMBF data supports both direct acquisition and burrered acquisition. The controller has to specify the time stamp under which the data set is to be stored in the Tag Logging archive.

When the controller has to specify the time stamp, the relevant WinCC process tags for reading the time stamp must be specified in the function for defining MMBF data in the CMS Editor.

External tags must be configured in the WinCC tag management system before MMBF data can be managed. MMBF data is part of the controller interface (e.g. number of cargo handling operations, number of errors, calculated MMBF value, etc.).

The interface also has a bit which is set by the controller after a specific period (e.g. one month) has passed (trigger).

7.2.5.2 Definition of archives

At least one archive must be created in the WinCC Tag Logging for long-term storage of MMBF data. This archive must be registered with the CMS in the CMS Editor. The trigger bit and, if necessary, the time stamp tags also need to be defined in the dialog.

Note

Do not create string tags in the MMBF archive.

String tags are not supported for MMBF data!

Here too, data is written to the archives by CMS Runtime. The time at which WinCC detected the change in the trigger bit is used as time stamp, or the time stamp, transferred from the controller to the data set. It is essential that the archive tags in the Tag Logging archives for managing the MMBF data have the same settings as the archive tags of the cargo handling data archives (see Chapter Definition of archives (Page 147)).

7.2.5.3 Execution in runtime

When CMS Runtime starts up, it reads the names of the archives and trigger tags from the configuration file and initializes processing of MMBF data. The archive tags from each parameterized archive are fetched and the external tag linked to the archive tag is determined. Furthermore, an information function is activated; this can activate a CMS Runtime function every time the status of the trigger tag changes. This gives users the freedom to adapt the type and scope of the stored data to suit their own requirements by creating new, individual archive tags or amending/deleting existing ones. If users want to exclude entire archives from processing (or include them for processing), they can make the necessary changes in the CMS Editor.

If the information function detects an incoming edge of the monitored trigger tag, then for further processing the MMBF event is started.

First, the time stamp at which the status change in the trigger tag was detected is stored. With a synchronous read task, all external tags of the individual archive tags are read from the controller. If these values on the controller are only written when the trigger bit is reset and provided the trigger bit is only set when all values have been successfully written, it can be ensured that only those values relating to the current MMBF data set are read from the controller and transferred to internal tags.

After the actual values have been acquired from the controller, they are written with the same time stamp to the Tag Logging archives by CMS Runtime.

The trigger bit is reset to complete the writing of MMBF data. Once this has happened, writing MMBF data on the interface is re-enabled on the controller.

7.2.6 CMS system tags

The CMS Runtime creates a series of system tags with the prefix "@CMS". The tags in the "CMS" group are created at the CMS station.

Their content is entered in runtime, e.g. from the information of the CMS editor (Topology → Cranes).

Table 7-8 CMS system tags

Tag name	Data type	Bit	Description
@CMSProgramVersion	Text tag 16-bit character set	-	Version of the CMS Runtime
@CMSDatabaseVersion	Text tag 16-bit character set	-	Version of the CMS database
@CMSCraneName	Text tag 8-bit character set	-	Name of the crane
@CMSEquipment	Text tag 8-bit character set	-	Equipment type to which the crane belongs
@CMSIPAddress	Text tag 8-bit character set	-	IP address of the CMS station
@CMSConnectionState	Unsigned 16-bit value	0	When the CMS Runtime started, no major errors occurred. All local functions are active.
		1	When the CMS Runtime started, no major errors occurred. All local functions are active.
		7	CMS Runtime cannot run. When starting CMS Runtime, a fault has occurred that prevents CMS Runtime from being executed (e.g. WinCC Runtime has not been started, a crane has not been defined in the CMS editor, a wrong computer name has been entered into the CMS editor, ...). You can find more information on this fault in the CMS error file in the folder …\CMS of the WinCC project directory.

7.2.7 System messages

CMS Runtime displays general execution and error information in the CMS system messages. These system messages use reserved message classes that are created in the WinCC Alarm Logging. The messages of these classes only use the status "came in".

Message class 15 "CMSTimeZone"

This message class contains the following message type:

- CMSTimeZoneWarning: Message type 225

Message class 16 "CMS"

This message class contains the following message types:

- CMS_Fault: Message type 241
- CMS_Warning: Message type 242
- CMS_Info: Message type 243

The system messages have an offset of 50000 in the WinCC Alarm Logging.

Table 7-9 CMS system messages

Message number	Message type	Message text (user text block 5)
Additional messages at the CMS station		
50212	CMS_Info	Connection to WinCC Runtime established.
50213	CMS_Info	Connection to WinCC Runtime aborted.
Time zone warnings		
50400	CMSTimeZoneWarning:	MMBF: PLC time stamp invalid, replaced by current PC time.
50401	CMSTimeZoneWarning:	MoveData: PLC time stamp invalid, replaced by current PC time.

See also

System messages (CMS with RCMS (WinCC)) (Page 389)

7.3 Time synchronization

7.3.1 General

Time synchronization between the participating hardware modules is crucial in SIMOCRANE CMS/RCMS systems.

Time synchronization is performed hierarchically as follows: CMS > PLC.

If you read data from the crane control system with a time stamp, you must ensure that the time is kept in UTC (Universal Time Coordinated) on the control system, or that the data transferred from the crane control system to the CMS are transferred with a UTC-based time stamp. All the necessary tags and scripts are already provided in the CMS example application. You only have to adapt the programs and data blocks in the crane control system.

In practice, a synchronization interval of 1 minute has proven successful.

You can find more information on time synchronization in the document "Standard PLC Blocks" (S7_Standard_Blocks_SIMOCRANE_CMS.pdf) on the installation DVD.

7.3.2 Setting up time synchronization on the crane control system

You must set up time synchronization on the crane control system.

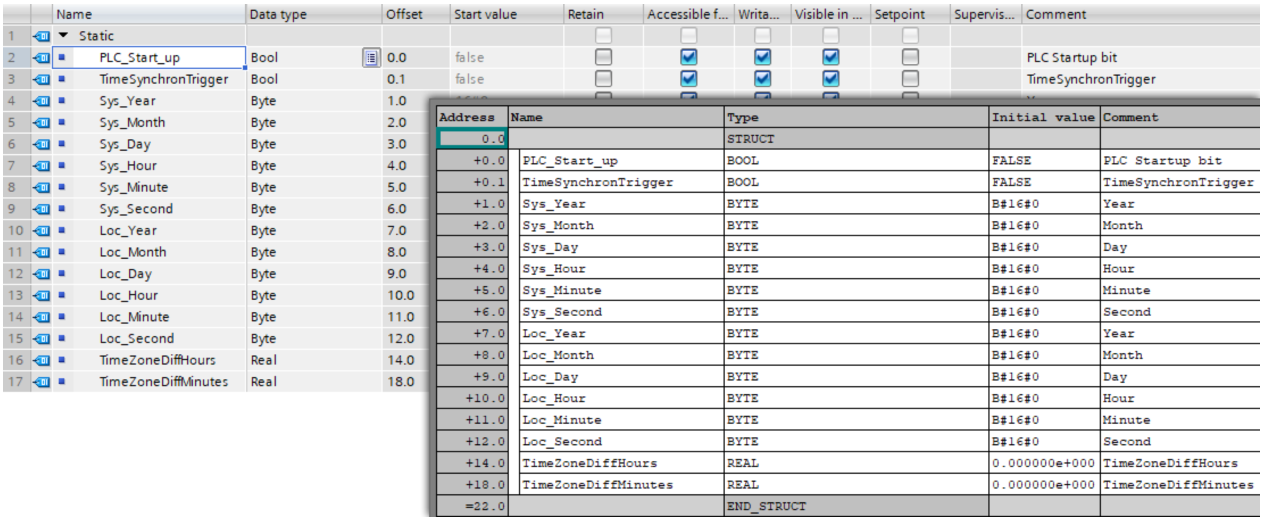
To do this, you must copy the following data blocks and functions into your SIMATIC S7 project:

- Data block DB_CMS_TIMESYNC (DB1909)
- Function CMS_TIMESYNC (FC1909)
- System function SET_CLK (SFC0)

You can find the data block and the functions in the following libraries on the installation DVD:

- S7 SIMATIC Manager project: "CMS_StandardBlocks_Vxx_Library.zip"
- S7 TIA Portal: "CMS_StandardBlocks_Vxx_Library.zap15.1"

The data block "DB_CMS_TIMESYNC" handles communication between the crane control system and the CMS station for the purposes of time synchronization.



	Name	Data type	Offset	Start value	Retain	Accessible f...	Writa...	Visible in ...	Setpoint	Supervis...	Comment
1	▼ Static				□	□	□	□	□		
2	PLC_Start_up	Bool	0.0	false	□	☑	☑	☑	□		PLC Startup bit
3	TimeSynchronTrigger	Bool	0.1	false	□	☑	☑	☑	□		TimeSynchronTrigger
4	Sys_Year	Byte	1.0								
5	Sys_Month	Byte	2.0								
6	Sys_Day	Byte	3.0								
7	Sys_Hour	Byte	4.0								
8	Sys_Minute	Byte	5.0								
9	Sys_Second	Byte	6.0								
10	Loc_Year	Byte	7.0								
11	Loc_Month	Byte	8.0								
12	Loc_Day	Byte	9.0								
13	Loc_Hour	Byte	10.0								
14	Loc_Minute	Byte	11.0								
15	Loc_Second	Byte	12.0								
16	TimeZoneDiffHours	Real	14.0								
17	TimeZoneDiffMinutes	Real	18.0								

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	PLC_Start_up	BOOL	FALSE	PLC Startup bit
+0.1	TimeSynchronTrigger	BOOL	FALSE	TimeSynchronTrigger
+1.0	Sys_Year	BYTE	B#16#0	Year
+2.0	Sys_Month	BYTE	B#16#0	Month
+3.0	Sys_Day	BYTE	B#16#0	Day
+4.0	Sys_Hour	BYTE	B#16#0	Hour
+5.0	Sys_Minute	BYTE	B#16#0	Minute
+6.0	Sys_Second	BYTE	B#16#0	Second
+7.0	Loc_Year	BYTE	B#16#0	Year
+8.0	Loc_Month	BYTE	B#16#0	Month
+9.0	Loc_Day	BYTE	B#16#0	Day
+10.0	Loc_Hour	BYTE	B#16#0	Hour
+11.0	Loc_Minute	BYTE	B#16#0	Minute
+12.0	Loc_Second	BYTE	B#16#0	Second
+14.0	TimeZoneDiffHours	REAL	0.000000e+000	TimeZoneDiffHours
+18.0	TimeZoneDiffMinutes	REAL	0.000000e+000	TimeZoneDiffMinutes
=22.0		END_STRUCT		

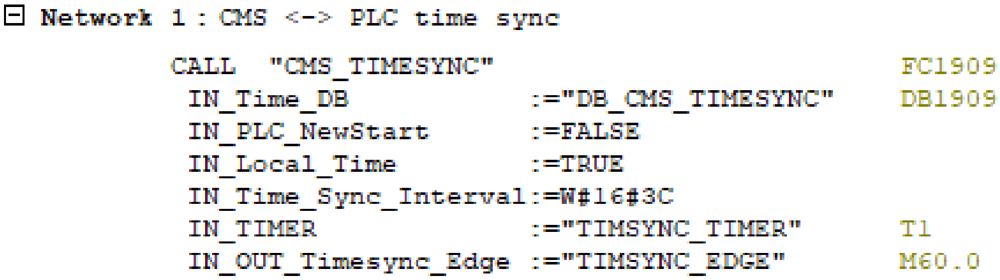
Figure 7-35 Data block DB_CMS_TIMESYNC (DB1909) - Step 7 TIA Portal / Step 7 SIMATIC Manager

You must adapt the CMS_TIMESYNC function (FC1909).
You must adapt the S7 project such that the CMS_TIMESYNC function (FC1909) is called.

You can find more information on time synchronization in the document "Standard PLC Blocks" (S7_Standard_Blocks_SIMOCRANE_CMS.pdf) on the installation DVD.

Procedure

1. Copy the following data blocks and functions from the appropriate library ("CMS_StandardBlocks_Vxx_Library") into your S7 project.
   - Data block DB_CMS_TIMESYNC (DB1909)
   - Function CMS_TIMESYNC (FC1909)
   - System function SET_CLK (SFC0)
2. Open the CMS_TIMESYNC function (FC1909).



```
⊟ Network 1 : CMS <-> PLC time sync

          CALL  "CMS_TIMESYNC"                                FC1909
           IN_Time_DB             :="DB_CMS_TIMESYNC"         DB1909
           IN_PLC_NewStart        :=FALSE
           IN_Local_Time          :=TRUE
           IN_Time_Sync_Interval:=W#16#3C
           IN_TIMER               :="TIMSYNC_TIMER"           T1
           IN_OUT_Timesync_Edge   :="TIMSYNC_EDGE"            M60.0
```

Figure 7-36 CMS_TIMESYNC function

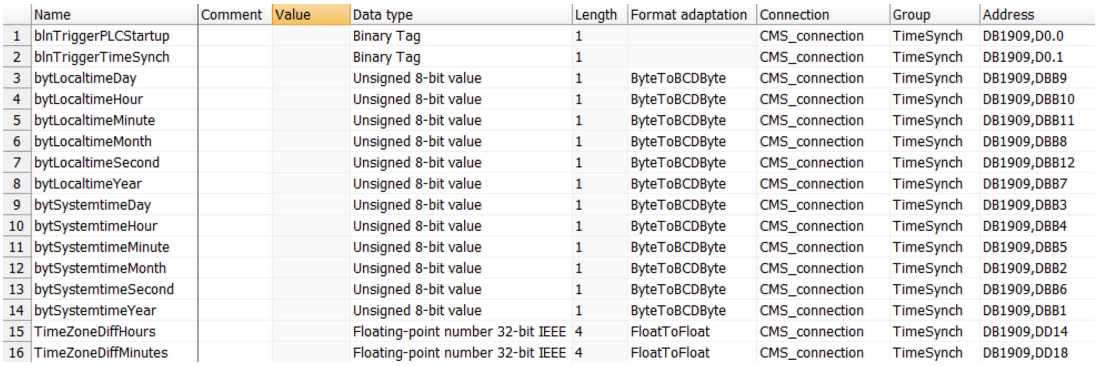
3. Adapt the following tags:

Tag	Setting
IN_Local_Time	Set the value to "FALSE" if move data and MMBF data are to be acquired. Move data and MMBF data require UTC time.
IN_Time_Sync_Interval	The value is preset to 60 seconds. This synchronization interval has proven successful in practice. Adapt this value if necessary. Note: The value is hexadecimal.
IN_TIMER	Make sure that the preset tag is used exclusively by this function. Otherwise you must use a different tag.
IN_OUT_Time-sync_Edge	Make sure that the preset tag is used exclusively by this function. Otherwise you must use a different tag.

4. Adapt the S7 project such that the CMS_TIMESYNC function (FC1909) is called.

7.3.3 WinCC tags for time synchronization

The following tags are created in the external tags of the TimeSynchInternal group and participate in time synchronization between the CMS station and the crane control system:



	Name	Comment	Value	Data type	Length	Format adaptation	Connection	Group	Address
1	blnTriggerPLCStartup			Binary Tag	1		CMS_connection	TimeSynch	DB1909,D0.0
2	blnTriggerTimeSynch			Binary Tag	1		CMS_connection	TimeSynch	DB1909,D0.1
3	bytLocaltimeDay			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB9
4	bytLocaltimeHour			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB10
5	bytLocaltimeMinute			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB11
6	bytLocaltimeMonth			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB8
7	bytLocaltimeSecond			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB12
8	bytLocaltimeYear			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB7
9	bytSystemtimeDay			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB3
10	bytSystemtimeHour			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB4
11	bytSystemtimeMinute			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB5
12	bytSystemtimeMonth			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB2
13	bytSystemtimeSecond			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB6
14	bytSystemtimeYear			Unsigned 8-bit value	1	ByteToBCDByte	CMS_connection	TimeSynch	DB1909,DBB1
15	TimeZoneDiffHours			Floating-point number 32-bit IEEE	4	FloatToFloat	CMS_connection	TimeSynch	DB1909,DD14
16	TimeZoneDiffMinutes			Floating-point number 32-bit IEEE	4	FloatToFloat	CMS_connection	TimeSynch	DB1909,DD18

Figure 7-37 WinCC tags of the TimeSynch group

Make sure that tags containing a time and date are transferred in the correct data format. You can verify whether this has been correctly implemented, for example, by simulating a time stamp and checking it afterward in WinCC.

Note

For further details, see the WinCC Online Help.

7.3.4 WinCC time synchronization script

The time synchronization is performed by the PLC. Time synchronization is not the task of the SIMOCRANE CMS.

The trigger tag "TimeSynchronTrigger" exists in the PLC. This can assume the states "0" ("False") and "1" ("True"). In WinCC, the same tag is called "blnTriggerTimeSync". You can see from the addressing (DB1909, D0.1) that it is the same tag.

The "GetTimeZoneBias.pas" action has the job of providing the date values to the PLC in the CMS example application.

The required script is already implemented as an example in the supplied CMS example application.

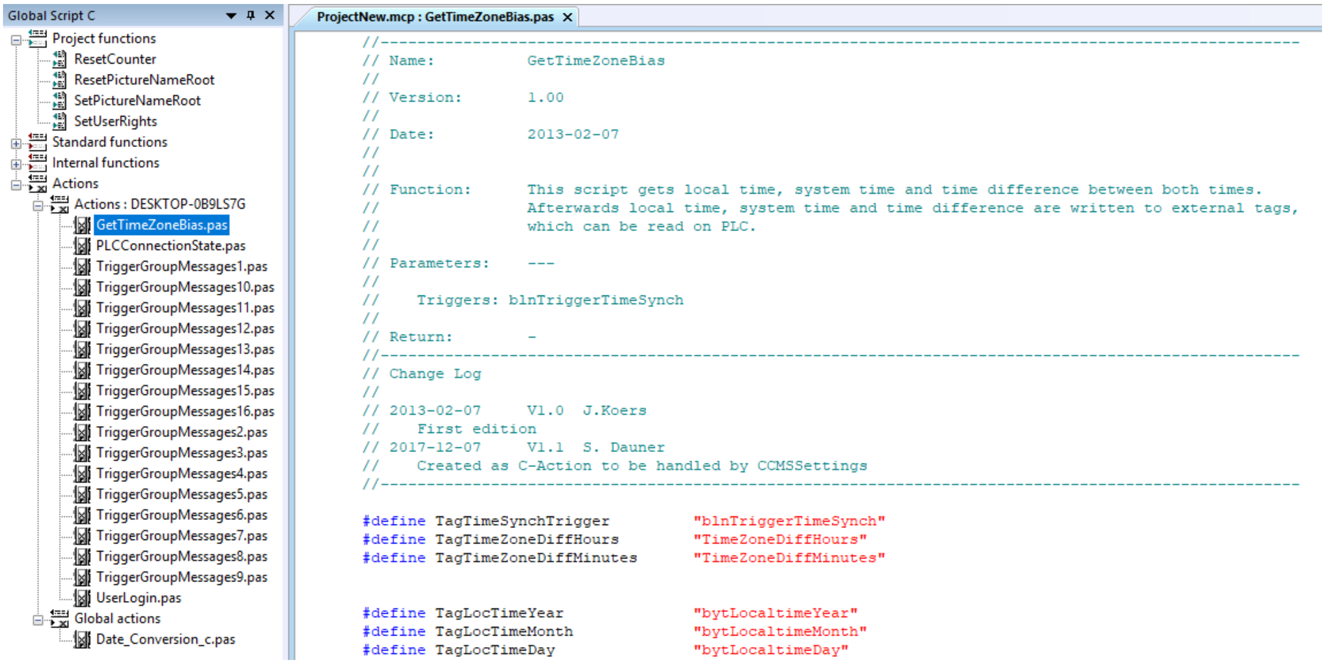
This action is triggered by the "blnTriggerTimeSynch" tag trigger. It checks whether the trigger value coming from the crane control system is 0. If it is, the time values are created and written into DB 1909. The trigger is then set to 1.

Note

The date and time is only updated in DB1909 of the PLC if the trigger tag changes from "1" to "0", not if it changes from "0" to "1".

Time synchronization is performed in the following sequence:

1. PLC sets the trigger tag from "1" to "0" (cyclically, e.g. once per minute).
2. The script "GetTimeZoneBias.pas" in WinCC recognizes the status change in the trigger tag; the script is run. The UTC time, the local time, and the difference between the two times are read by the Windows system of the CMS computer and written into the time synchronization data block.
3. The script sets the trigger tag in the PLC from "0" back to "1."


Global Script C
Project functions
ResetCounter
ResetPictureNameRoot
SetPictureNameRoot
SetUserRights
Standard functions
Internal functions
Actions
Actions : DESKTOP-0B9LS7G
GetTimeZoneBias.pas
PLCConnectionState.pas
TriggerGroupMessages1.pas
TriggerGroupMessages10.pas
TriggerGroupMessages11.pas
TriggerGroupMessages12.pas
TriggerGroupMessages13.pas
TriggerGroupMessages14.pas
TriggerGroupMessages15.pas
TriggerGroupMessages16.pas
TriggerGroupMessages2.pas
TriggerGroupMessages3.pas
TriggerGroupMessages4.pas
TriggerGroupMessages5.pas
TriggerGroupMessages6.pas
TriggerGroupMessages7.pas
TriggerGroupMessages8.pas
TriggerGroupMessages9.pas
UserLogin.pas
Global actions
Date_Conversion_c.pas
ProjectNew.mcp : GetTimeZoneBias.pas

```
//----------------------------------------------------------------------------------------------------
// Name:          GetTimeZoneBias
//
// Version:       1.00
//
// Date:          2013-02-07
//
//
// Function:      This script gets local time, system time and time difference between both times.
//                Afterwards local time, system time and time difference are written to external tags,
//                which can be read on PLC.
//
// Parameters:    ---
//
//    Triggers: blnTriggerTimeSynch
//
// Return:        -
//----------------------------------------------------------------------------------------------------
// Change Log
//
// 2013-02-07     V1.0   J.Koers
//    First edition
// 2017-12-07     V1.1   S. Dauner
//    Created as C-Action to be handled by CCMSSettings
//----------------------------------------------------------------------------------------------------

#define TagTimeSynchTrigger        "blnTriggerTimeSynch"
#define TagTimeZoneDiffHours       "TimeZoneDiffHours"
#define TagTimeZoneDiffMinutes     "TimeZoneDiffMinutes"


#define TagLocTimeYear             "bytLocaltimeYear"
#define TagLocTimeMonth            "bytLocaltimeMonth"
#define TagLocTimeDay              "bytLocaltimeDay"
```

Figure 7-38 Time synchronization WinCC action

7.4 CMS configuration editor

7.4.1 CMS Editor

In principle, the Editor always has the same structure, regardless of the system topology that has been set. The following topologies can be set:

- CMS stand-alone
- CMS with RCMS (Process Historian)
  (RCMS 4.4 and higher)
- CMS with RCMS (WinCC)
  (up to RCMS 4.3 SP1)

The system topology is initially configured in the basic settings of the editor.
See also: System: Basic settings (Page 213)

The following dialogs are used in the CMS Editor to maintain master data:

- Equipment type
  With the topology "CMS with RCMS (WinCC)", the equipment type is used for grouping the data for evaluations. Messages can be directly assigned to an equipment type. Messages assigned to a specific equipment type are "inherited" by all cranes of this type and do not need to be acquired separately for each crane.
- Cranes
  Information about various cranes that CMS requires is managed in this table.
- Maintenance instructions
  Information and instructions designed to help the maintenance engineer to diagnose and eliminate faults are stored in this table. These include both information about possible causes of failures as well as instructions on how to eliminate them.
- Logbook
  Remarks on the maintenance instructions are provided in this table.
- References
  Additional information relating to equipment types, cranes and messages can be collected for access by maintenance engineers requiring troubleshooting support. However, information of this type is not stored in the database itself, the table provides references to a document containing the information.
  Which documents can be displayed is determined by the display programs installed on the computer. The name of the program with which the relevant information can be displayed is therefore stored with the reference.
  For the purpose of simplicity, the terms "reference" and "referenced information" will be used synonymously in the remainder of this document.
- Move data
  The data to acquire cargo handling operations is configured in this dialog box. For every cargo handling operation that the crane makes, a data set, called move data, is entered into a WinCC Tag Logging archive prepared for this purpose.

- MMBF data
  (Mean Moves Between Failures)
  The MMBF acquisition data is configured in this dialog box. On a trigger event from the PLC, a data set is entered into a WinCC Tag Logging archive prepared for this purpose.
- Counters
  The counters are defined in this dialog box. For each counter, a difference value is written to a WinCC Tag Logging archive prepared for this purpose at constant time intervals. The difference value is obtained from the actual value of the counter to the value of the same counter at the last acquisition. All counters that are defined here are monitored simultaneously by CMS Runtime to avoid unwanted resetting of the counters (for example, when the control program is reloaded).
- Transfer of messages (for topology "CMS with RCMS (WinCC)" only)
  All messages whose configuration and runtime data are transferred to the RCMS 4.3 SP1 server are selected in this dialog box. The selection can be made according to message classes.
- Transfer of tag list (for topology "CMS with RCMS (WinCC)" only)
  All tags whose values will be transferred to the RCMS 4.3 SP1 server, either when a value changes or cyclically, are defined in this dialog box.
- Transmission of operating data (for topology "CMS with RCMS (WinCC)" only)
  All operating data archives whose configuration and runtime data are transferred to the RCMS 4.3 SP1 server (move data, counters, MMBF data) are defined in this dialog box.
- Icons (for topology "CMS with RCMS (WinCC)" only)
  Terminals, equipment types and cranes are generally selected in a "tree" for editing in the respective data entry dialog boxes of an RCMS 4.3 SP1 server. The icons by which the corresponding objects are represented in the tree are stored in this table.
- Macros
  This table defines text blocks used as place holder in references.
- Programs
  This table is used to register the programs available for displaying references with the CMS.
- Reference types
  The information in this table is used to clearly group the references for display in the CMSFaults control. This is the sole function of the data in this table.
- User texts
  Texts to be displayed in the runtime for different languages are configured in this dialog box.

The topology of the system is defined by the data for terminals, equipment types and cranes. They are used to display the tree structure in the CMSNodeTree Control of an RCMS 4.3 SP1.

The data for maintenance instructions and references are used to display supplementary message information in the CMSFaults control.

The data in the help table for the icons is used to visualize individual objects in the tree structure of an RCMS 4.3 SP1 to display the system topology.

The data in the auxiliary tables for reference types, macros, and programs is needed to display supplementary message information in the CMSFaults control.

7.4.2 General information about operation

Note

If you have made changes in the CMS editor, you should always restart CMS Runtime to ensure that your changes are accepted.

7.4.2.1 User roles

When starting the CMS Editor, a distinction is made between two user roles with different rights. These roles are controlled on the basis of Windows user groups.

- User
  User is the role automatically assigned to anyone who starts the CMS Editor. A user has only restricted access to the functions in the CMS Editor.
- CMS Administrator
  A CMS Administrator has to be a member of the Windows user group "CMSAdmin". CMS administrators have unrestricted access to the functions of the CMS Editor.

7.4.2.2 Launching from WinCC Explorer

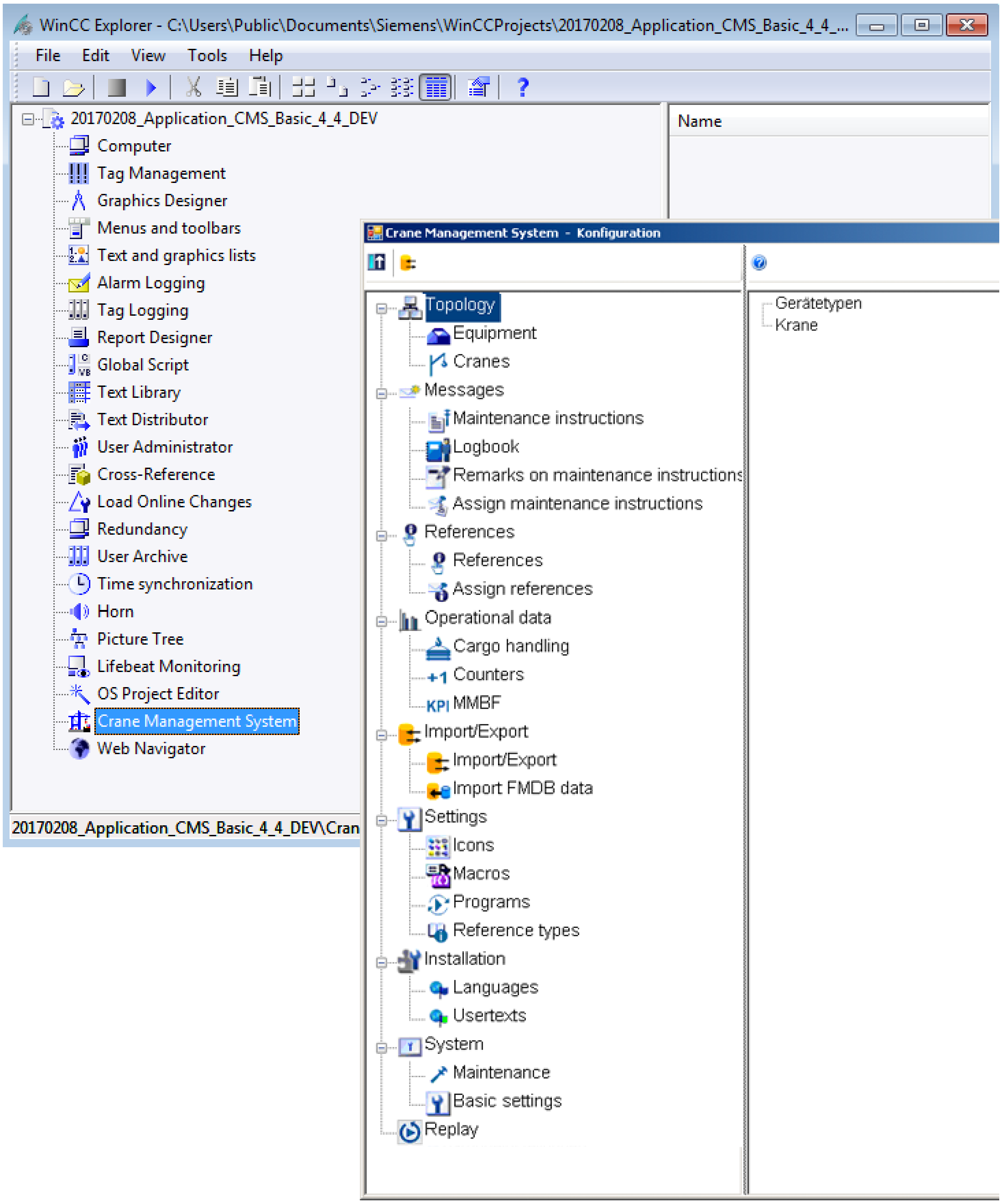


Figure 7-39 Integration in WinCC Explorer

The functions for acquiring CMS master data are launched either directly by a double click on the "Crane Management System" entry or in the WinCC Explorer following a right click on the corresponding command in the context menu.

7.4.2.3 Function selection

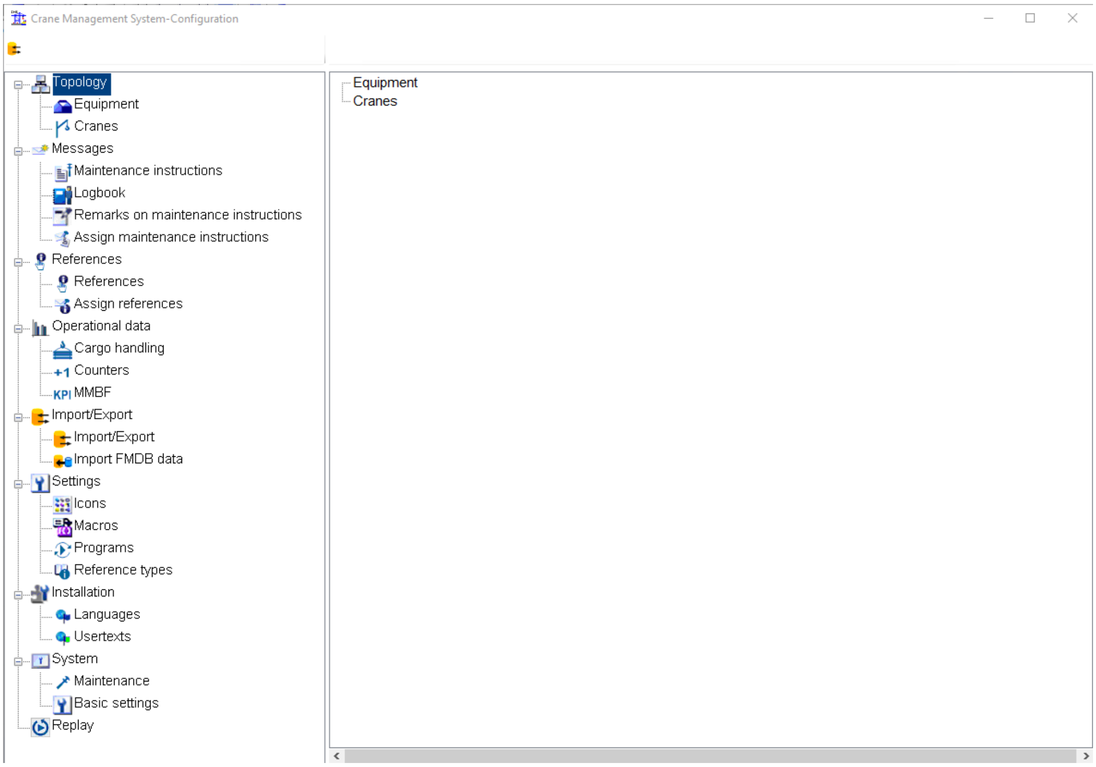


Figure 7-40 Functions in the CMS editor

All available parameterization functions can be accessed via the tree display in the left-hand window of the CMS Editor (function tree). The parameterization functions are grouped together using a number of categories.

When a parameterization function is selected in the tree display, the associated dialog will appear in the right-hand window of the Editor.

When a category is selected in the tree display, all parameterization functions belonging to this category are displayed in the right-hand window. The associated dialog can then be called by double-clicking the parameterization function in the right-hand window.

Note

You must first define the topology in the dialogs Terminal, Equipment type and Cranes, to enable all additional configuration functions.

The structure of the tree display for the available parameterization functions makes a distinction between two modes, depending on the user role: Administrator and users

In the administrator mode, in addition to the parameterization functions of the user mode, the parameterization functions for creating and maintaining of reference types, changing symbols and adapting displayed message details in the CMSFaults Control are also available.

In addition, the structure of the tree display for the available parameterization functions also makes a distinction based on the topology selected.

Table 7-10 Toolbar of the function selection

Icon	Meaning
⬆	Upload Opens the "Upload" screen form **Note:** Only available for the topology "CMS with RCMS (WinCC)"
⇆	Im/Export Opens the "Import/Export" screen form

See also

System: Basic settings (Page 213)

7.4.2.4 Context menu

All dialogs in the CMS Editor are basically identical in terms of functional structure. They differ only in the scope of the editor functions offered by the dialog.

All available functions can be called by means of a context menu. Alternatively, most functions can also be called via a toolbar in the header of the acquisition dialog. Very frequently used functions can be called via a button menu. The footer of the dialog contains a status bar which shows, for example, the current text entry mode (insert or overwrite mode).

There are three different dialog types in the CMS Editor:

- Dialogs for acquiring basic data (acquisition dialogs)
- Dialogs for linking different sets of basic data (assignment dialogs)
- Dialogs for activating functions

Each of these dialog types has its own scope of functions, but only the data acquisition dialogs feature the entire range of functions. The assignment dialogs do not include the functions "New" or "Edit" as these are always executed directly in these dialogs. The dialogs for activating functions contain only the help function.

Table 7-11 Context menu toolbar

Icon	Meaning	Acquisition dialog	Assignment dialog	Starts functions
🗋	New	yes	no	no
💾	Save	yes	no	no
⧉	Copy	yes	no	no
✗	Delete	yes	no	no
▼	Filter	yes	yes	no
⊠	Remove filter	yes	yes	no

Icon	Meaning	Acquisition dialog	Assignment dialog	Starts functions
↶	Abort	yes	no	no
📂	Import/export	yes	yes	no
?	Help	yes	yes	yes

7.4.2.5 Button menu

The button menu contains the following buttons:

- Overwrite
  In insert mode, a new data record with the displayed data is created; in overwrite mode, the displayed data record with the displayed data is overwritten.
- Copy
  The currently displayed data record is saved under the new name.
- New
  All fields in the acquisition screen are deleted, insert mode is activated.
- Delete
  The displayed data record is deleted.
- Abort
  In insert mode, all input fields are deleted again; in overwrite mode, the currently displayed data record is imported from the database again. This resets all changes which have already been made.

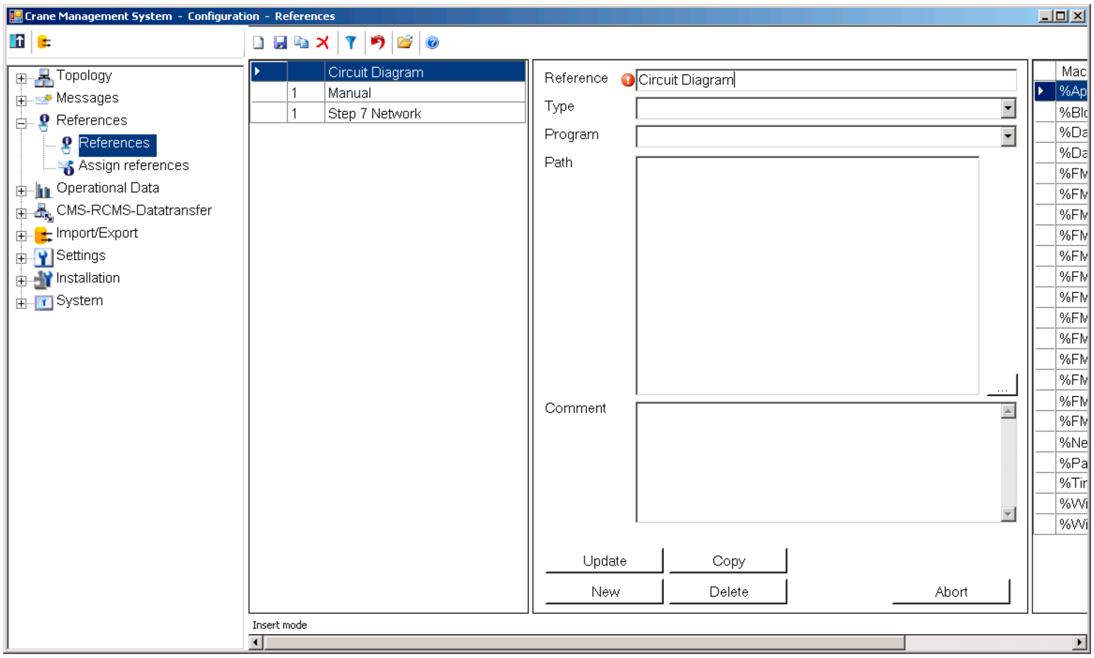
7.4.2.6 Status bar

The status bar shows the current status of the insert or overwrite mode during editing. After a button has been pressed, a message (e.g. "Data set deleted") will be briefly displayed (10 seconds) confirming that the action triggered has been successfully completed.

7.4.2.7 Validity checks

❗

Validity checks are performed on every user input. An input error icon is displayed next to the line containing an input error.



▸		Circuit Diagram
	1	Manual
	1	Step 7 Network

Reference: Circuit Diagram

Type:

Program:

Path:

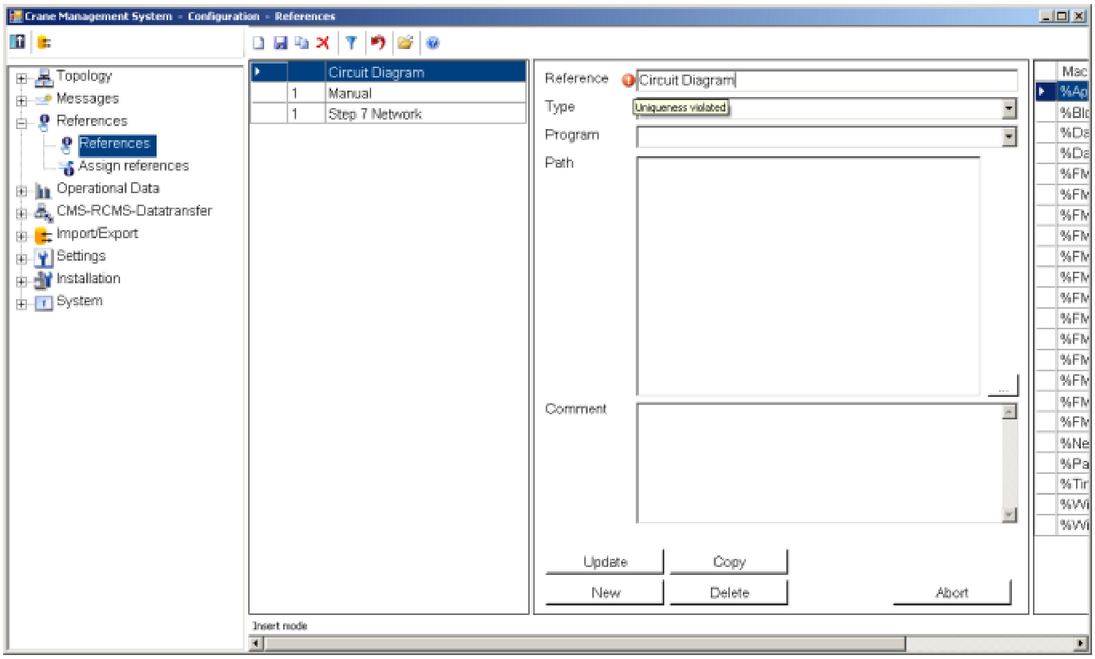
Comment:

Insert mode

Figure 7-41 Signaling of input errors

The appropriate error message is displayed in the tool tip text for the input error icon. The icon continues to be displayed until no further errors are detected.

A data record which contains an error cannot be stored.



▸		Circuit Diagram
	1	Manual
	1	Step 7 Network

Reference: Circuit Diagram

Type: Uniqueness violated

Program:

Path:

Comment:

Insert mode

Figure 7-42 Signaling of input errors (tool tip)

7.4.2.8 Filtering

The acquisition dialog opens in a separate window for the specification of filter criteria. The list of data records displayed for acquisition is filtered by the inputs in the search window. The filter icon in the toolbar changes to indicate that the filter is activated. To indicate that the filter can be disabled, the filter icon is displayed with a line through it.

The wildcards "*" (any sequence of any characters) and "?" (exactly 1 character of choice) may be used in the filter criteria input fields. However, only one of these characters in each case may be specified at the beginning and/or end of the search string. These wildcard characters must not be specified within the search string.

Search strings must also not contain any of the following characters:

#, [,], ~, (,), \, /, =, >, <, +, -, %, _, &, |, ^, ', "

Searches for wildcards cannot be executed in selection fields. Selection fields can either remain empty, or a search can be executed for an exact value in the selection field.

As long as the filter is selected, all other functions in the relevant acquisition dialog are performed on the filtered data records. This mechanism can be used, for example, to export a data extract.

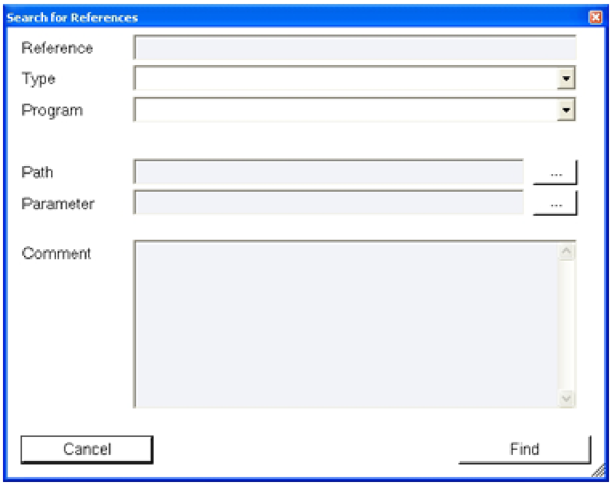


Figure 7-43 Dialog for entering filter criteria

The filter dialog is structured differently in the dialogs for assigning maintenance instructions or references or in the dialog for managing the comments on maintenance instructions. While search criteria can be entered in a standardized dialog in the data-input dialogs, additional input fields are provided in the assignment dialogs and the dialog for comment management.

Each of these dialogs basically consists of the tree for navigating around the system topology on the left-hand side of the acquisition dialog and, on the right-hand side, of the list of assignable information or the dialog for editing the acquired data.

The dialogs for acquiring filter criteria are also structured in two halves. The selection criteria for the data displayed in the navigation tree can be entered in the top half. The acquisition dialog is displayed again in the bottom half; the criteria for searching for assignable information can be entered in this dialog.

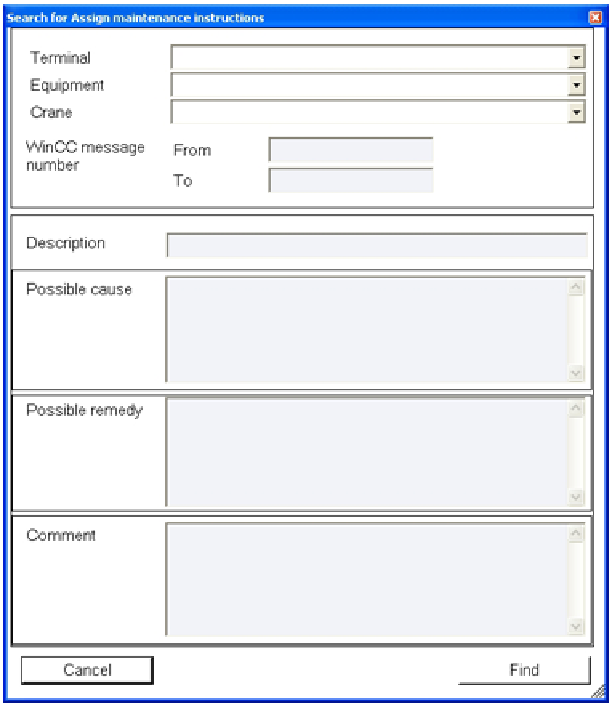


Figure 7-44 Dialog for entering filter criteria (assignment dialogs)

7.4.2.9 Import/export

Import and export functions are provided for all CMS data. These functions can be called from two locations.

On one hand, a dialog can be called to start the export functions from the function tree or the function can be selected from the toolbar. This dialog offers the full range of import and export functions and is therefore suitable as a direct access point from which multiple import and/or export operations can be started at the same time.

However, if the user wishes to import or export the data of one particular type only, this can be done from the relevant acquisition dialog. A dialog for selecting an import or export function and for entering the path to the import or export file can be called via the toolbar or the context menu.

From the central import or export dialog, it is only possible to export all the data from the selected table. If an export operation is started from the relevant acquisition dialog, the data to be exported can be filtered.

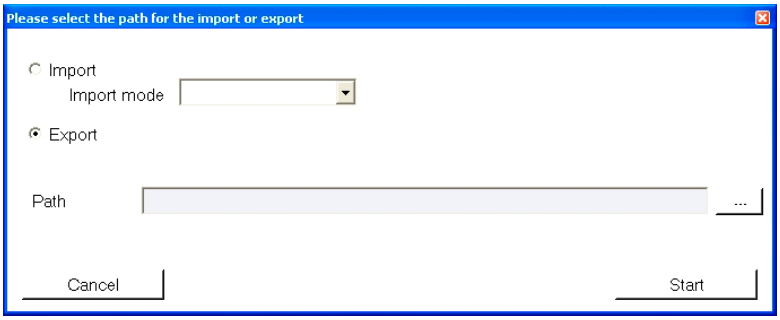
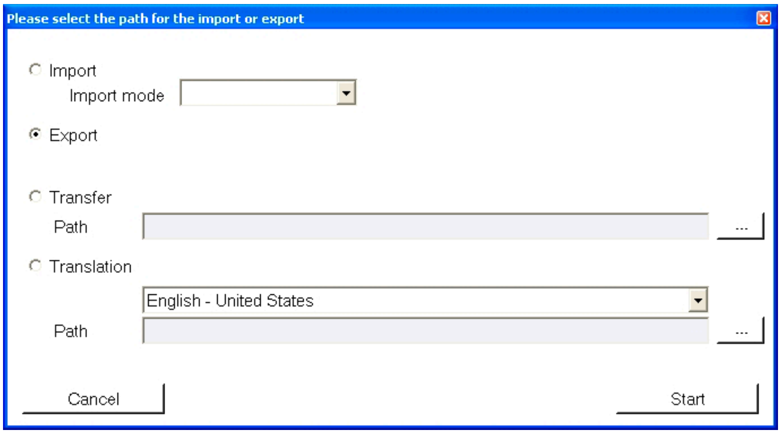


Figure 7-45 Starting an import / export operation from the acquisition dialog



Please select the path for the import or export

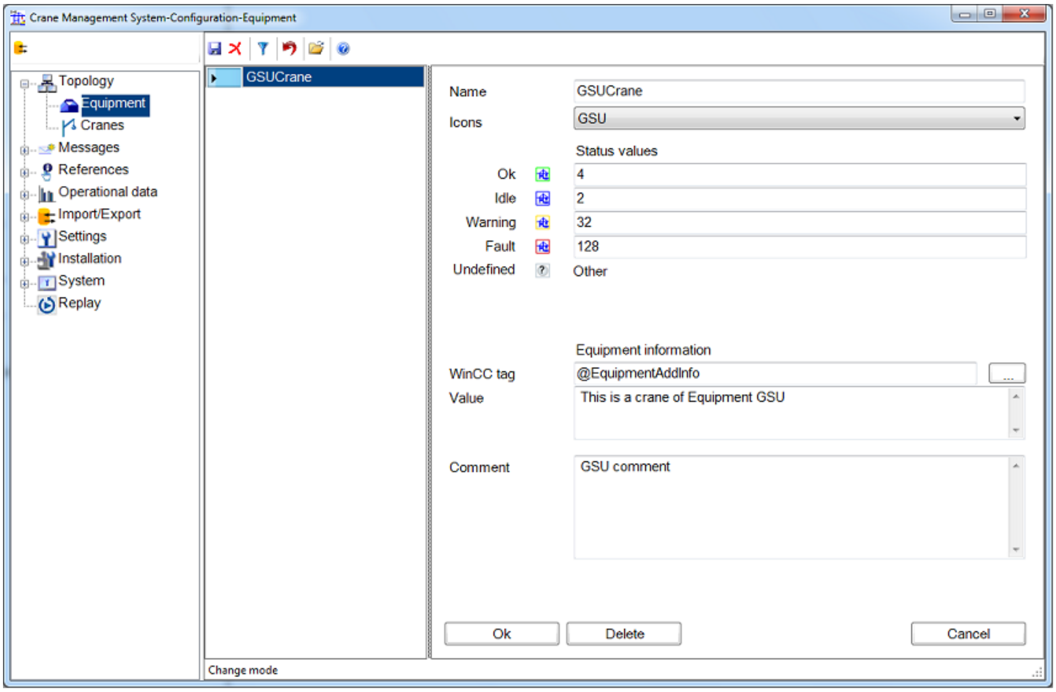
○ Import
Import mode
● Export
○ Transfer
Path
○ Translation
English - United States
Path

Figure 7-46 Starting an import / export operation from the acquisition dialog (languages)

7.4.3 Configuration

This chapter describes individual parameterization functions. The individual parameterization functions are listed in the order in which they are displayed for selection in the function tree.

7.4.3.1 Topology: Equipment types



Crane Management System-Configuration-Equipment

Name: GSUCrane
Icons: GSU

Status values

Ok	4
Idle	2
Warning	32
Fault	128
Undefined	Other

Equipment information
WinCC tag: @EquipmentAddInfo
Value: This is a crane of Equipment GSU

Comment: GSU comment

Figure 7-47 Acquisition of equipment types

For the topologies "CMS stand-alone" and "CMS with RCMS (Process Historian)"

For CMS stations with the topologies "CMS stand-alone" and "CMS with RCMS (Process Historian)", the following fields are relevant:

Table 7-12 Equipment types

Input field	Meaning	Unique	Mandatory field
Name	Name of the equipment type The name of the equipment type must not be exactly "CMS". Moreover, it must only contain letters and numbers. The first character of the name must be a letter.	yes	yes
WinCC tag	Name of a WinCC tag for displaying an equipment-specific comment	no	no
Value	Equipment-specific comment to be displayed in a WinCC screen The content of the "Value" field is written to the WinCC tag when the runtime starts and could be displayed, for example, as information on the status bar of the application	no	no
Comment	Optional comment. This comment can only be seen in the editor.	no	no

Note

You can only create one equipment type.

For the topology "CMS with RCMS (WinCC)"

In addition, the following fields are relevant for operating a CMS in the topology "CMS with RCMS (WinCC)":

Table 7-13 Equipment types

Input field	Meaning	Unique	Mandatory field
Icon	Identifier of icons assigned to the equipment type	no	yes
OK status value	Range of numbers for "OK" status *	no	no
Idle status value	Range of numbers for "Idle" status *	no	no
Warning status value	Range of numbers for "Warning" status *	no	no
Fault status value	Range of numbers for "Fault" status *	no	no

*) You may enter several values or intervals separated by ",". Intervals are coupled by "-". The interval is defined exclusively by the start and stop values. Spaces are allowed and the length of the number range is limited to 255 characters.
Example: 2; 8; 32-128

Status values can be defined for each equipment type. These can be used to control the display of a crane in the CMSNodeTree control on the RCMS server.

The icons defined in this dialog are used to represent the operating state of this equipment type and all associated cranes of this equipment type in the crane selection tree of the CMS Editor and in the CMSNodeTree control in the CMS Runtime application. The icons must first be entered in a separate dialog; (see Chapter Settings: Icons (Page 203)).

In the CMSNodeTree control, the current operating status of the crane shown will determine which of the icons for displaying cranes, equipment types, and terminals appears in the tree. The value of a WinCC tag entered in the data entry dialog box for the crane data is used to determine a crane's operating state. The fields for acquiring the number ranges for the status values in this dialog are used to assign the value of this tag to the various operating states.

The WinCC messages of each equipment type must be available in the WinCC Alarm Logging of the RCMS server. When uploading configuration data, the messages are automatically generated in the WinCC Alarm Logging. In this case, the set offset is added to the message numbers. Non-existent message classes, message types, message blocks, and group messages are created. For each equipment type, such a set of messages is created in the WinCC Alarm Logging of the RCMS server. For the runtime transfer of messages from the CMS station, the offset defined in this dialog is automatically added to the message number as well as the crane name in process value 1 and the equipment type in process value 2 of the message. Using the crane name in process value 1, the assignment of the configured instance message to the crane is established on which this message was initiated.

Note

You can only create one equipment type.

7.4.3.2 Topology: Cranes

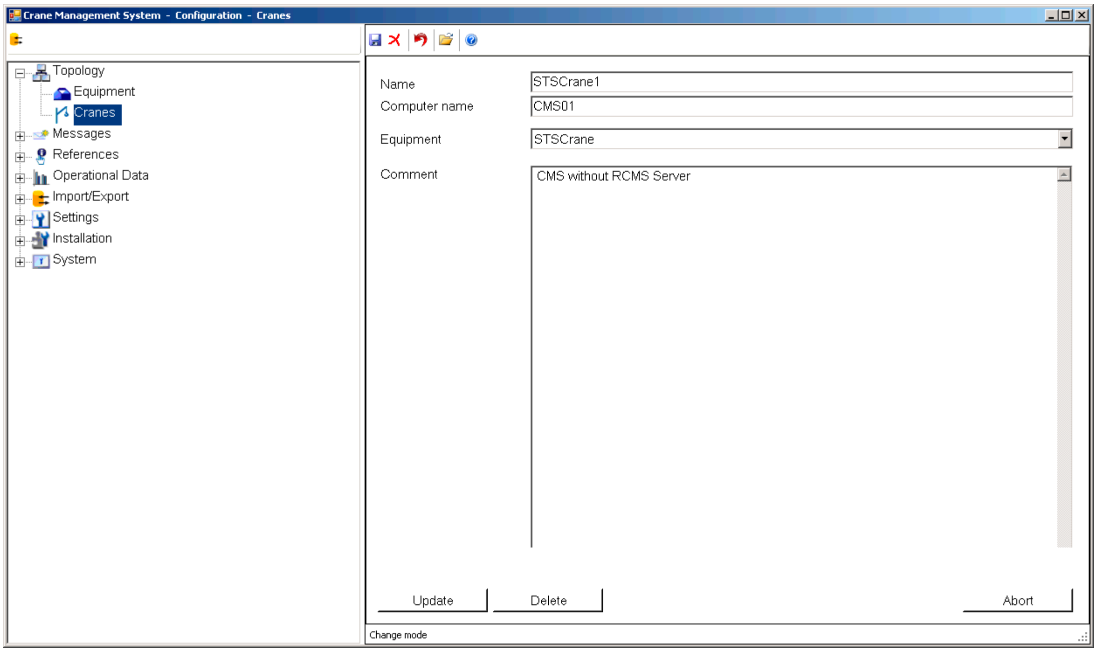
Note

This section describes the screen form "Cranes" for the topologies "CMS stand-alone" and "CMS with RCMS (Process Historian)"

A crane corresponds to a CMS station, at which messages and operational data are recorded. A crane must always be assigned to an equipment type.

The crane has access to the data of the WinCC tag management.

Input field	Meaning	Unique	Mandatory field
Name	Name of the crane A crane's name must be unique. The name of the crane must not be exactly "CMS". Moreover, it must only contain letters and numbers. The first character of the name must be a letter.	yes	yes
Equipment type	Identifier of the equipment type to which the crane is assigned The equipment type must already have been created in the dialog box "Topology" → "Equipment types".	no	yes
Computer name	Name of the computer on which the CMS is running	yes	yes
Comment	Optional comment	no	no



Name: STSCrane1

Computer name: CMS01

Equipment: STSCrane

Comment: CMS without RCMS Server

Figure 7-48 Acquisition of the crane

7.4.3.3 Topology: Cranes (CMS with RCMS (WinCC))

Note

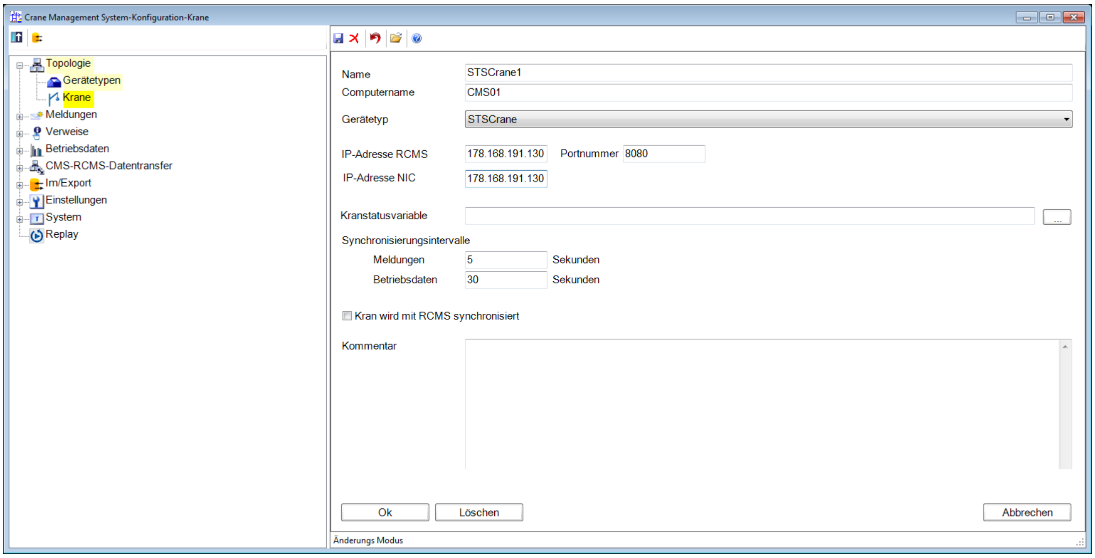
This section describes the screen form "Cranes" for the topology "CMS with RCMS (WinCC)".

A crane corresponds to a CMS station, at which messages and operational data are recorded. A crane must always be assigned to an equipment type. The communication parameters between CMS station and RCMS server are defined at the crane. The crane also has access to the data of the WinCC tag management.

Using the crane name, the acquired runtime data are assigned at the RCMS server.

Table 7-14 General parameters (CMS with RCMS (WinCC))

Input field	Meaning	Unique	Mandatory field
Name	Name of the crane A crane's name must be unique. The name of the crane must not be exactly "CMS". Moreover, it must only contain letters and numbers. The first character of the name must be a letter.	yes (per terminal)	yes
Equipment type	Identifier of the equipment type to which the crane is assigned The equipment type must already have been created in the dialog box "Topology" → "Equipment types".	no	yes
Computer name	Name of the computer on which the CMS is running	yes	yes
Comment	Optional comment	no	no
IP address RCMS	IP address of the RCMS server	yes	yes
IP address NIC	This setting is only required if the PC of the CMS station has multiple network cards. The IP address of the network adapter via which communication is established to the RCMS server is then in this setting.	yes	no
Port number	Number of the port used for communication with the RCMS server The port number must be the same on the RCMS server and all connected CMS stations.	no	yes
Crane status tag	Name of a WinCC tag that can be used to read the crane status for controlling the display of the crane in the CMSNodeTree control.	yes	no
Synchronization interval for messages	Interval during which messages are transferred to the RCMS server; specified in seconds	no	yes
Synchronization interval for operational data	Interval during which operating data (such as move data, MMBF data, etc.) is transferred to the RCMS server; specified in seconds	no	yes
Crane is synchronized with RCMS.	Synchronization with the RCMS server is active.	no	no



Name: STSCrane1
Computername: CMS01
Gerätetyp: STSCrane
IP-Adresse RCMS: 178.168.191.130 Portnummer: 8080
IP-Adresse NIC: 178.168.191.130
Kranstatusvariable:
Synchronisierungsintervalle
Meldungen: 5 Sekunden
Betriebsdaten: 30 Sekunden
☐ Kran wird mit RCMS synchronisiert
Kommentar:

Figure 7-49 Acquisition of the crane

In the CMSNodeTree Control at the RCMS server, the acquired cranes can be displayed depending on their actual status. To enable this status to be evaluated in the CMSNodeTree control, the name of a WinCC tag in which the current crane status is encrypted is acquired in this dialog. How the values of this tag are assigned to the various crane states is defined for the equipment type; see Chapter Topology: Equipment types (Page 171) The tag acquired here is automatically transferred to the RCMS server.

Short synchronization intervals may decrease system performance especially at a high synchronization data amount. Particularly for messages, depending on the acquisition cycle or the message frequency, it must be weighed up just how short these synchronization intervals must be selected for an individual case.

In terms of synchronizing operating data, it is important to note that writing values to the WinCC Tag Logging archives requires quite a lot of effort. Having said this, there is little impact on performance if more than one value is written simultaneously. Therefore, it is better, for example, to transfer as many data sets as possible to the RCMS at the same time.

Note

If the communication settings are changed, CMS Runtime will need to be exited and restarted in order that these modified settings become effective.

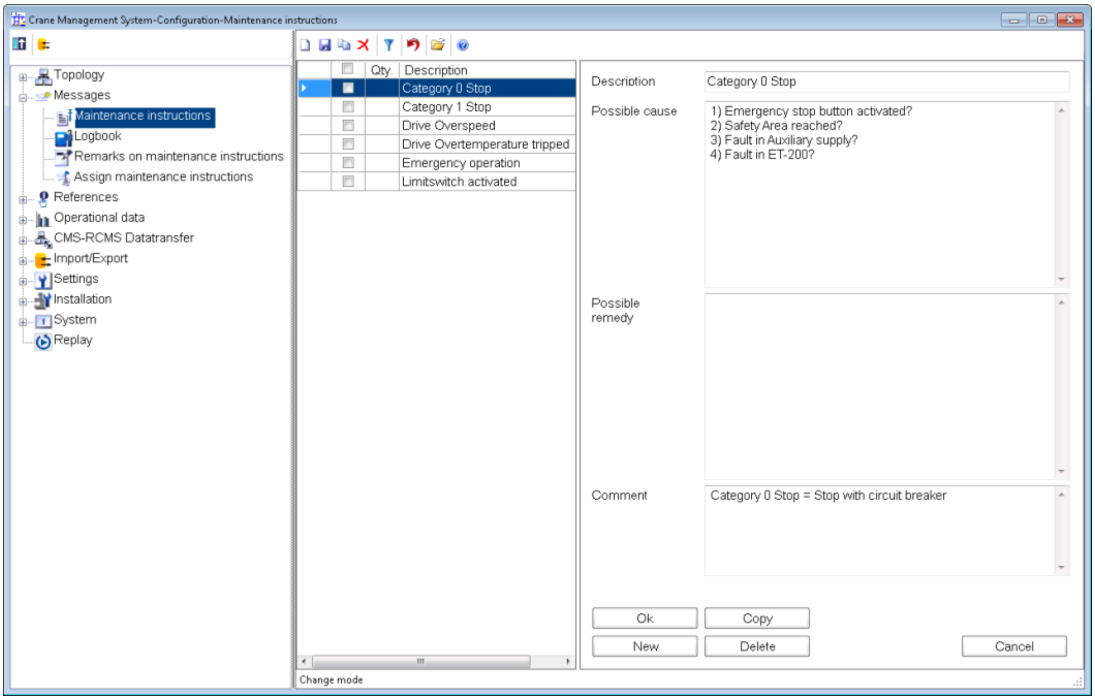
7.4.3.4 Messages: Maintenance instructions

Maintenance instruction texts are descriptions which can be displayed in conjunction with a message in the CMSFaults control for the purpose of assisting maintenance staff with diagnostics and fault elimination.

These can include both information about possible causes as well as instructions on how to eliminate faults.

Table 7-15 Maintenance instructions

Input field	Meaning	Unique	Mandatory field
Description	Maintenance instruction text	yes	yes
Possible cause	Description of the possible cause of the fault	no	no
Possible remedy	Description of a possible repair measure	no	no
Comment	Comment on the maintenance instruction, is also displayed in CMSFaults.	no	no



	Qty.	Description
▶	□	Category 0 Stop
	□	Category 1 Stop
	□	Drive Overspeed
	□	Drive Overtemperature tripped
	□	Emergency operation
	□	Limitswitch activated

Description: Category 0 Stop

Possible cause:
1) Emergency stop button activated?
2) Safety Area reached?
3) Fault in Auxiliary supply?
4) Fault in ET-200?

Possible remedy:

Comment: Category 0 Stop = Stop with circuit breaker

Figure 7-50 Acquisition of maintenance instructions

The available maintenance instructions are listed in a table on the left-hand side of the dialog. The numeric value in the center table column indicates how often the maintenance instruction is assigned to a message.

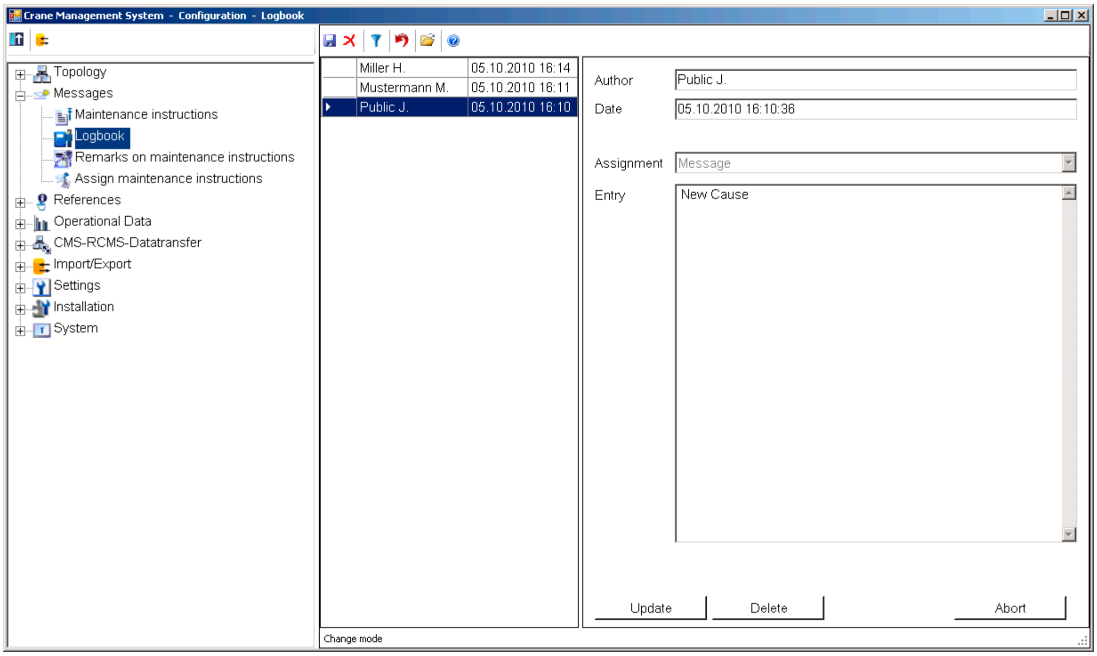
Maintenance instructions, which are assigned to a message or an equipment type, cannot be deleted directly. If an attempt is made to delete an instruction text which is already assigned, a message stating the number of existing assignments is displayed. The user then has the option of aborting the delete operation, or of deleting the maintenance instruction including all assignments and logbook entries if any exist.

7.4.3.5 Messages: Logbook

The remarks on maintenance instructions can be maintained/updated in this dialog.

Table 7-16 Logbook

Input field	Meaning	Unique	Mandatory field
Author	Name of the author	yes, with date	yes
Entry date	Date of acquisition; is preset to the current date for new entries	yes, with author	yes
Assignment	Indicates whether the comment is assigned to a message or a maintenance instruction text.	no	yes
Entry	Comment text or logbook entry text	no	no



Miller H.	05.10.2010 16:14
Mustermann M.	05.10.2010 16:11
Public J.	05.10.2010 16:10

Author: Public J.
Date: 05.10.2010 16:10:36
Assignment: Message
Entry: New Cause

Figure 7-51 Editing / acquisition of individual logbook entries

Entries that come from the CMSFaults Control are identified under "Assignment" with "Message". The assignment cannot be edited.

No new remarks on maintenance instructions (assignment "Message") can be generated in this dialog.

Note

The difference between this and the function for maintaining remarks on maintenance instructions (see Chapter Messages: Remarks on maintenance instructions (Page 179)) is that this function displays all existing remarks in a list which is sorted according to author and date. With the function for maintaining remarks on maintenance instructions, the remarks are selected via the objects to which the remarks are assigned.

7.4.3.6 Messages: Remarks on maintenance instructions

Maintenance instructions relating to a specific message can be displayed in the CMSFaults control. These instruction texts cannot be modified in the CMSFaults control, but this control can be used to acquire remarks on the instructions, such as information about maintenance work performed, unforeseen difficulties or feedback as to whether the instruction was useful, etc.

Table 7-17 Adaptation of remarks on maintenance instructions

Input field	Meaning	Unique	Mandatory field
Author	Name of the author	yes, with date	yes
Date	Date of acquisition; displays the current date per default for new entries.	yes, with author	yes
Field	Specifies the field in the CMSFaults control for which the displayed remark was acquired (cannot be edited).		
Remark	Remark text	no	no

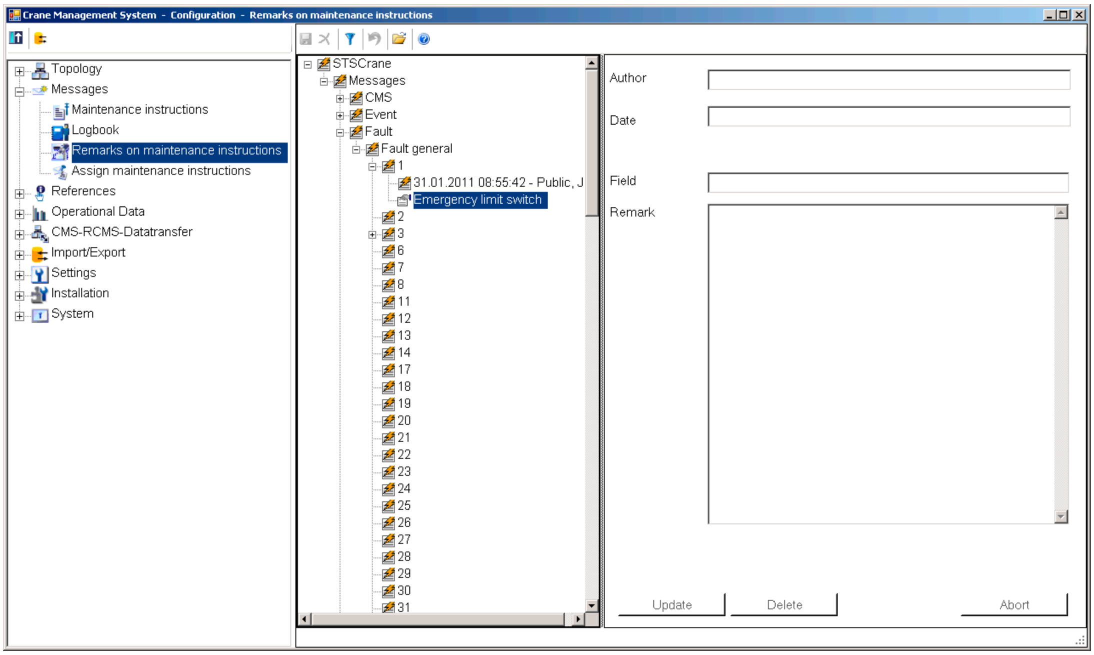


Figure 7-52 Editing of remarks on maintenance instructions in systems with multiple terminals

If remarks on maintenance instructions are acquired in the CMSFaults control, they cannot be subsequently edited in this control. This measure has been taken so that the complete history of such entries can be traced.

However, this dialog can be used to edit unnecessary or inaccurate remarks on maintenance instructions.

To allow the selection of remarks that require editing, a tree is created which displays terminals, equipment types and cranes as well as the assigned maintenance instructions and messages. The two nodes for maintenance instructions and messages, which are directly assigned to an equipment type, are listed below the relevant equipment type.

The instruction texts or messages are inserted below the nodes for maintenance instructions. If remarks have been acquired for these instructions or messages, they will be displayed directly below the corresponding node. Remarks are displayed in a chronological order, with the latest entry listed right at the top.

To edit or delete a remark, it must be selected in the tree. The data of the remark is then shown in the detail view on the right of the dialog window.

Meaning of individual icons in the remark selection tree:

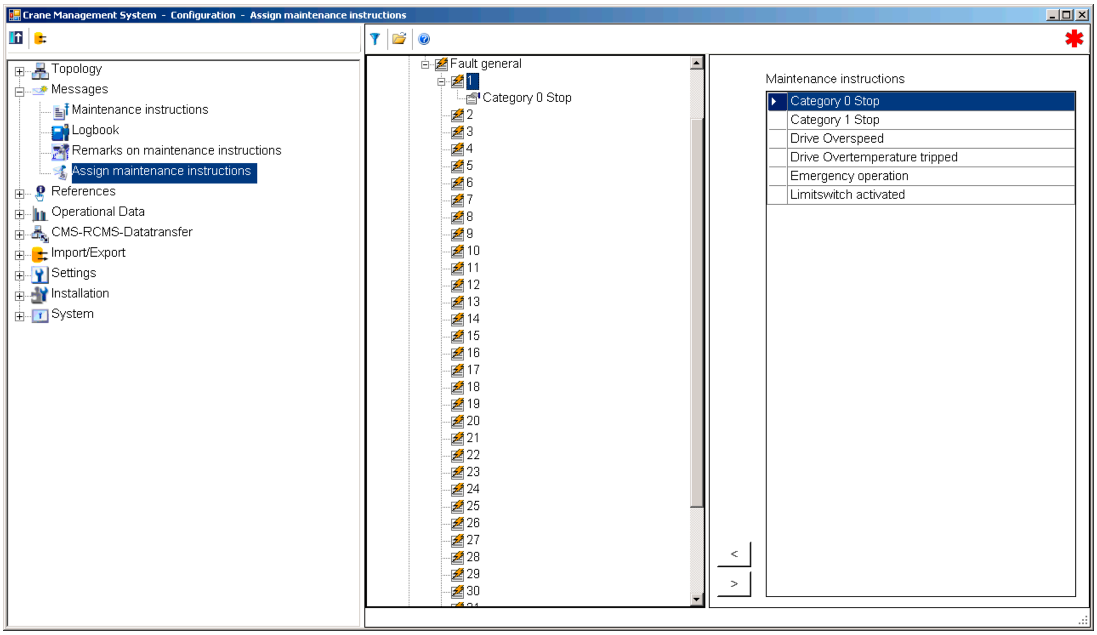
Table 7-18 Icons in assignment dialogs

Icon	Meaning
📄	Maintenance instruction
ℹ	Reference
✎	Remark on a maintenance instruction

Icon	Meaning
✉	Message
	Message class

7.4.3.7 Messages: Assignment of maintenance instructions

In this menu, the created maintenance instructions can be assigned to the messages in WinCC Alarm Logging. The maintenance instructions can then be displayed during WinCC Runtime via the CMSFaults Control.



Crane Management System - Configuration - Assign maintenance instructions

Maintenance instructions

Maintenance instructions
Category 0 Stop
Category 1 Stop
Drive Overspeed
Drive Overtemperature tripped
Emergency operation
Limitswitch activated

Figure 7-53 Assignment of maintenance instructions to messages or cranes

A tree for assigning maintenance instruction texts is displayed on the left-hand side of the dialog. This contains nodes for the messages in addition to terminals, equipment types and cranes. The existing maintenance instructions are displayed in a table on the right-hand side. The numeric value in the center table column indicates how often the maintenance instruction is assigned to a message.

Maintenance instruction texts can be dragged and dropped at the required message in the tree. Alternatively, the required message in the tree can be selected and the maintenance instruction assigned to it by means of a button. The messages are assigned to the equipment type in the tree.

With the drag and drop assignment method, closed nodes in the tree automatically expand when the cursor is positioned either on the icon or the label of the closed node.

The icon on the left is displayed whenever the cursor is positioned over a node to which maintenance instructions cannot be assigned. For example, a maximum of one maintenance instruction text can be assigned to a message. If an attempt is made to drag and drop an instruction text onto a message which already has an assignment, this icon is displayed to signal that no further text can be allocated to this particular message.

At all nodes which are free for the assignment of a maintenance instruction text, the icon on the left is displayed whenever a text is dragged and dropped on them.

There are three different methods by which maintenance instruction assignments can be canceled again, i.e.

- by selecting the maintenance instruction and then deleting it with the Del key.
- Click on the appropriate button in the dialog.
- by using drag and drop to remove the instruction from the tree.

This function does not require any special command buttons for saving changes to assignments. Instead, assignment changes are entered directly in the database.

7.4.3.8 References: References

Supplementary information for display in the CMSFaults control can be acquired for equipment types, cranes, and messages. This information can be accessed by maintenance personnel when they require troubleshooting guidance.

However, only references to this troubleshooting guidance information are stored in the database, rather than the information itself.

In order to offer the option, for example to globally change the path to several references, macros can be used to define these references. In this context, a macro is a wildcard character entered during parameter assignment and subsequently replaced by a stored value during runtime.

Table 7-19 References

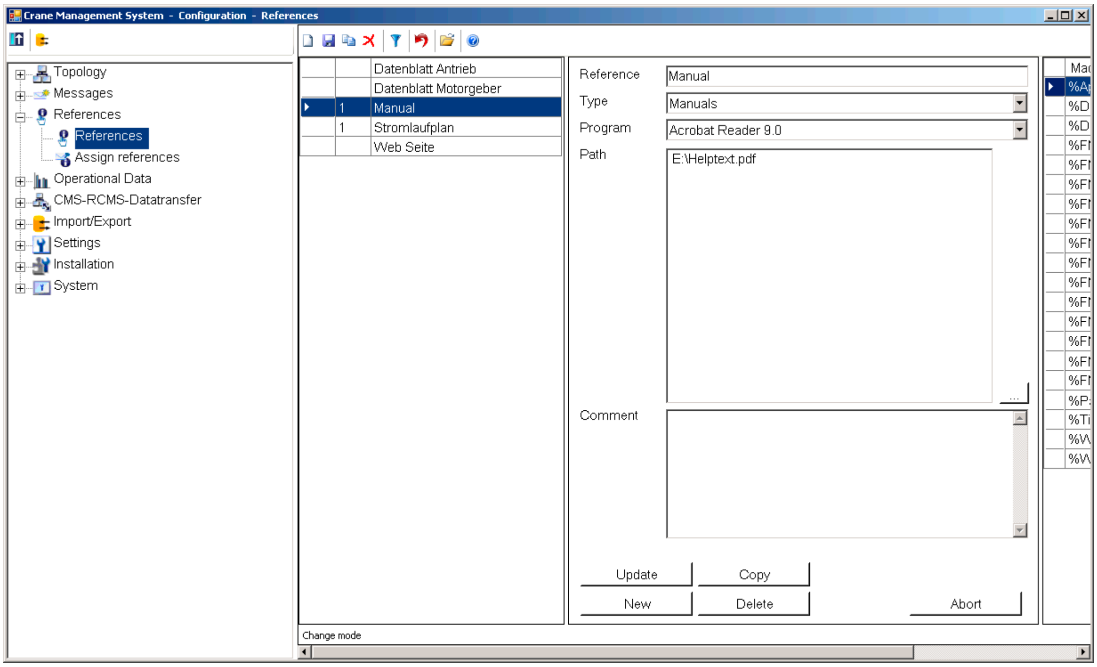
Input field	Meaning	Unique	Mandatory field
Reference	Description of the reference	yes	yes
Reference type	Type of reference	no	yes
Program	Program with which the reference can be displayed.	no	yes
Path	Path for accessing the reference	no	no
Parameters	Name of the reference with any parameters which may be needed to open the reference	no	yes
Comment	Optional comment	no	no

In contrast to maintenance instructions, which can only be assigned to a message, a reference can also be assigned to a crane and an equipment type.

- References, which are assigned to one message, are displayed for this message, for all cranes of the same equipment type.
- References, which are assigned to an equipment type, are displayed for each message, for all cranes of the relevant equipment type.
- References, which are assigned to a crane, are displayed for each message, for this crane.

The references that have been created are listed in a table on the left-hand side of the dialog. The numeric value in the center table column indicates how often the reference is assigned to one message.

References which are still assigned to messages, equipment types or cranes cannot be deleted directly. If an attempt is made to do so, a message is displayed indicating the number of active assignments. The user then has the option of aborting the delete operation, or of deleting the reference and all its assignments.



		Datenblatt Antrieb
		Datenblatt Motorgeber
▸	1	Manual
	1	Stromlaufplan
		Web Seite

Reference: Manual
Type: Manuals
Program: Acrobat Reader 9.0
Path: E:\Helptext.pdf
Comment:

Figure 7-54 Acquisition of references

Each individual reference is assigned to a specific reference type. This reference type is displayed as additional information in the CMSFaults control. Otherwise, this parameter has no further significance.

To acquire a reference, it is necessary either to directly select a program, which has been specified in the program acquisition dialog, or enter the predefined input <empty> in this field to indicate that no program is to be specified for this particular reference. When a program is specified, the relevant program is launched to display the reference.

If the field "Program" is left empty (entry: <empty> because a value has to be selected), the information required to display the reference is determined from the CMSFaults control using the file extension of the reference file and the associated Windows link. In this case as well, a program with the reference file as the launch parameter is ultimately called.

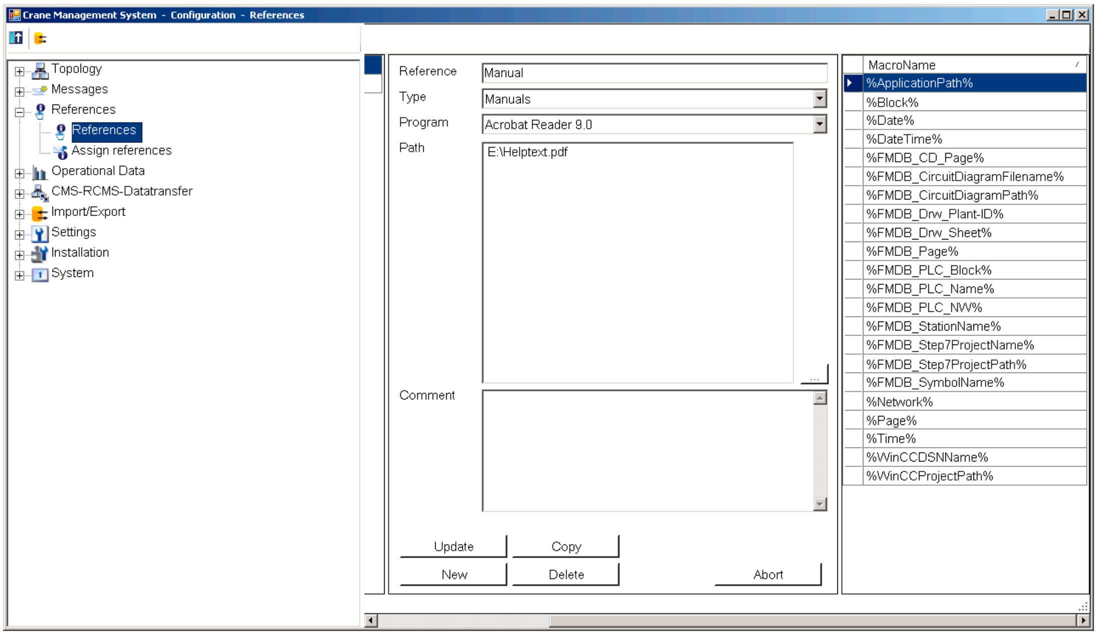
When specifying paths, it is important to ensure that the reference file to be opened can be accessed even if the relevant directory is stored on another computer. Furthermore, the programs for displaying the references must be installed on the computer on which the relevant reference file is to be displayed.

Macros can be selected from a list and inserted via drag & drop. Alternatively, they can be inserted manually into the reference. Where a manually entered macro is not yet available in the macro table, it can be entered into the database directly once you have responded to the relevant prompt. A macro is defined using the following notation: %Macroname%

Macros can be edited, as required, as part of the function for managing macros.

Note

If spaces are used in the reference, please note that spaces in a command are interpreted as separators. Where necessary, the reference should be enclosed within inverted commas.



Reference: Manual

Type: Manuals

Program: Acrobat Reader 9.0

Path: E:\Helptext.pdf

Comment:

MacroName
%ApplicationPath%
%Block%
%Date%
%DateTime%
%FMDB_CD_Page%
%FMDB_CircuitDiagramFilename%
%FMDB_CircuitDiagramPath%
%FMDB_Drw_Plant-ID%
%FMDB_Drw_Sheet%
%FMDB_Page%
%FMDB_PLC_Block%
%FMDB_PLC_Name%
%FMDB_PLC_NW%
%FMDB_StationName%
%FMDB_Step7ProjectName%
%FMDB_Step7ProjectPath%
%FMDB_SymbolName%
%Network%
%Page%
%Time%
%WinCCDSNName%
%WinCCProjectPath%

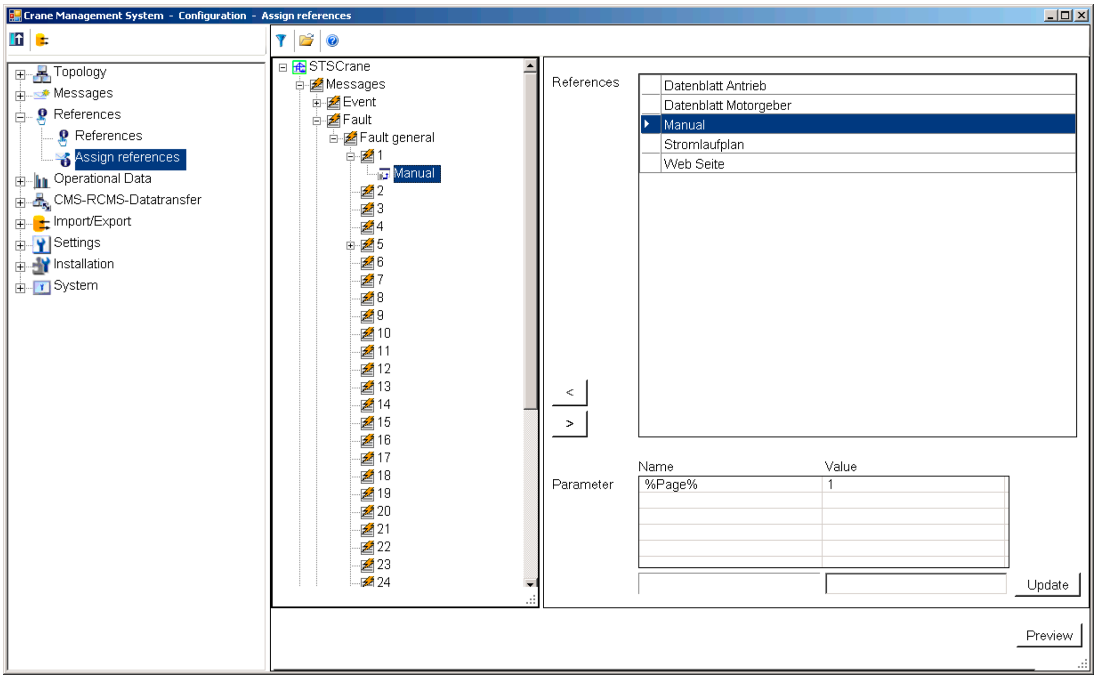
Figure 7-55 Acquisition of references (macros)

The diagram above shows the acquisition dialog for references with macro table. The macro selected in the table can be dragged and dropped to the required location.

7.4.3.9 References: Assignment of references

In this dialog assign the references to one or more messages, a crane or an equipment type.

If macros have been used to define references or the program needed to display the reference, the actual values of the macros to be used when displaying the reference must also be acquired. These actual values are then stored along with the assignment. This means, for example, that a single reference can be called for each message with a different parameter in each case.



References:

- Datenblatt Antrieb
- Datenblatt Motorgeber
- Manual
- Stromlaufplan
- Web Seite

Name	Value
%Page%	1

Figure 7-56 Assignment of references to messages, equipment types or cranes

References can be assigned to cranes, equipment types or WinCC messages. Unlike maintenance instruction texts, however, there is no restriction on the number of references which can be assigned.

A tree for assigning references is displayed on the left-hand side of the dialog. This contains nodes for the references and messages in addition to terminals, equipment types and cranes. The existing references are displayed in a table on the right-hand side.

To assign references, they can be dragged and dropped at the required position in the tree. Alternatively, the required position in the tree can be selected and the reference assigned to it by means of a button.

With the drag and drop assignment method, closed nodes in the tree automatically expand when the cursor is positioned either on the icon or on the label of the closed node.

The icon on the left is displayed whenever the cursor is positioned over a node to which a reference cannot be assigned.

At all nodes where a maintenance instruction can be assigned, this is displayed with the adjacent icon when making the assignment by dragging and dropping.

Reference assignments can be canceled in three different ways, i.e. by selecting the reference and deleting it with the Del key, by clicking on the Delete button in the dialog or by dragging the reference out of the tree.

The following algorithm is used to acquire the actual macro parameters:

- Clicking a reference in the table containing all the available references will cause those macros used for display to appear. At this stage, it is not yet possible to enter the actual parameters in the table containing the available references. The sole purpose of this macro list is to provide the user with an overview of which macros were specified when the reference was being defined. However, it also displays the macros used for defining the program.
- Once a reference has been assigned to a terminal, equipment type, or crane, the available macros for the current assignment are displayed along with any values which may have already been specified. The macro details can also be displayed for a preexisting assignment. Clicking the macro name in the parameter list copies the contents of the line in the list to the line for acquiring the macro value. Once the value has been changed, it can be saved by clicking "Update".

Whenever an actual parameter of a macro has been changed, the resulting command used to display the reference appears in a field at the bottom of the dialog. Clicking "Preview" shows whether the reference can be displayed after all the macro values have been substituted or, if no macros are being used, whether the reference will be displayed correctly.

This function does not require any special command buttons for saving changes to assignments. Instead, assignment changes are entered directly in the database. Changes only need to be confirmed during acquisition of actual macro values.

7.4.3.10 Operating data: Move data

Note

Move data, for example, movement data, MMBF, counters, time stamps as well as messages to SIMATIC S7 communication blocks are supplied separately as an application. Details are available on the Siemens support pages – or you can contact the CMS hotline (see Chapter Preface (Page 3)).

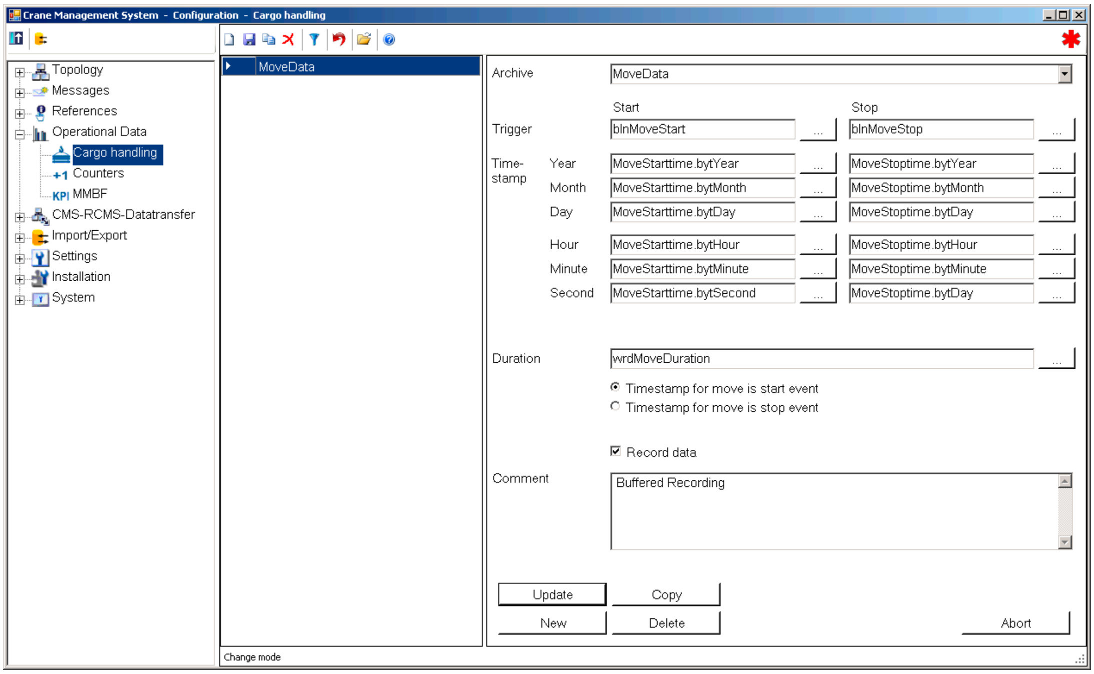
Operational data can be acquired on the CMS station. This includes data such as move data, MMBF data, as well as basic data acquired to evaluate counters (also see Chapter Acquiring move data on the CMS station (Page 146)).

This dialog is used to acquire the parameters required to control the acquisition of move data by CMS Runtime.

Table 7-20 Move data

Input field	Meaning	Unique	Mandatory field
Archive	Name of the WinCC Tag Logging archive for acquisition of move data	yes	yes
Start trigger	Binary WinCC tag for starting acquisition of move data	no	no
Stop trigger	Binary WinCC tag for ending acquisition of move data	no	yes
Start time stamp	WinCC tags for acquisition of the time stamp for starting a cargo handling operation from WinCC	no	no

Input field	Meaning	Unique	Mandatory field
Stop time stamp	WinCC tags for acquisition of the time stamp for ending a cargo handling operation from WinCC	no	no
Start Location	WinCC tag for acquisition of a character string at the start of a cargo handling operation	no	no
Stop Location	WinCC tag for acquisition of a character string at the end of a cargo handling operation	no	no
Duration	WinCC tag for managing the duration of a cargo handling operation	no	no
Definition time stamp	Used to select whether the start or stop time is stored as the time stamp	no	yes



Archive: MoveData

		Start	Stop
Trigger		blnMoveStart	blnMoveStop
Time-stamp	Year	MoveStarttime.bytYear	MoveStoptime.bytYear
	Month	MoveStarttime.bytMonth	MoveStoptime.bytMonth
	Day	MoveStarttime.bytDay	MoveStoptime.bytDay
	Hour	MoveStarttime.bytHour	MoveStoptime.bytHour
	Minute	MoveStarttime.bytMinute	MoveStoptime.bytMinute
	Second	MoveStarttime.bytSecond	MoveStoptime.bytDay

Duration: wrdMoveDuration

● Timestamp for move is start event
○ Timestamp for move is stop event

☑ Record data

Comment: Buffered Recording

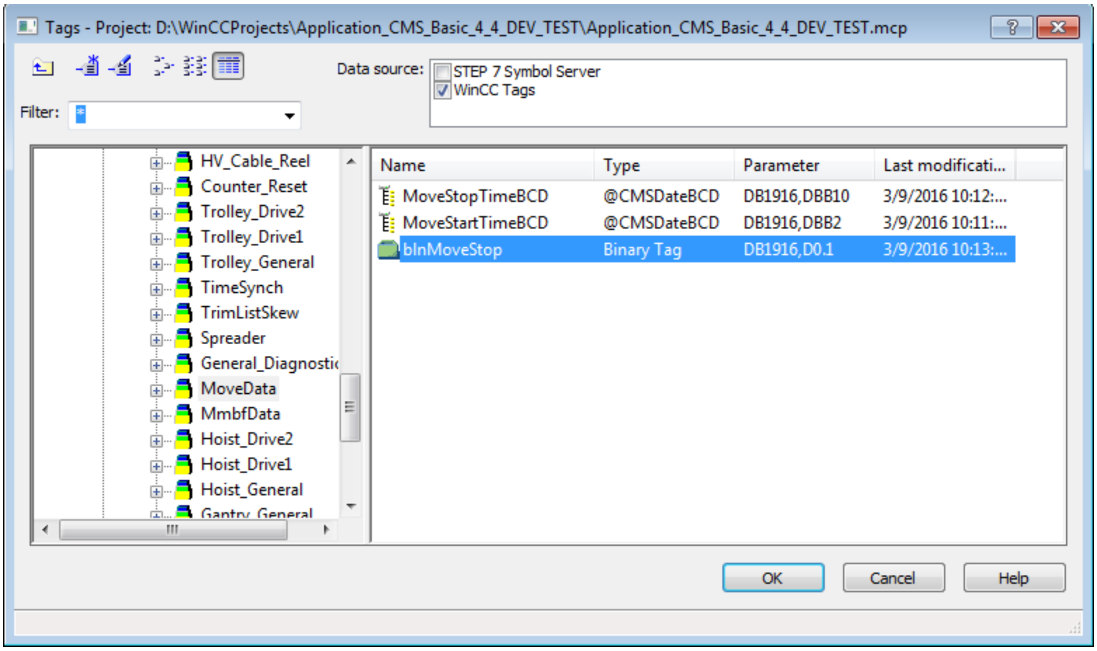
Figure 7-57 Acquisition of move data

When this dialog is opened, all existing Tag Logging archives are read out of the active WinCC project and displayed in the selection field for the archives. Unlike all the other selection fields in the CMS, the user can also enter names in this selection field. This means that archives which do not yet exist can be defined.

Furthermore, the binary WinCC tags, which the CMS monitors so that it can detect the point at which a cargo handling operation starts or stops, must also be defined as part of the acquisition process for move data. These names can be entered via the keyboard; alternatively, the "..." button can be used to open the WinCC dialog for selecting WinCC tags. In this case, the display is automatically restricted to binary tags.

The start trigger is not required where WinCC tags are specified for reading the WinCC time stamp. In this case, the start time stamp is read if the stop trigger has been detected by CMS Runtime.

It is also possible to specify the time stamp which will be stored with the move data. This can be selected as either the start time or end time of a cargo handling operation.



Tags - Project: D:\WinCCProjects\Application_CMS_Basic_4_4_DEV_TEST\Application_CMS_Basic_4_4_DEV_TEST.mcp

Data source: ☐ STEP 7 Symbol Server ☑ WinCC Tags

Filter: *

- HV_Cable_Reel
- Counter_Reset
- Trolley_Drive2
- Trolley_Drive1
- Trolley_General
- TimeSynch
- TrimListSkew
- Spreader
- General_Diagnostic
- MoveData
- MmbfData
- Hoist_Drive2
- Hoist_Drive1
- Hoist_General
- Gantry_General

Name	Type	Parameter	Last modificati...
MoveStopTimeBCD	@CMSDateBCD	DB1916,DBB10	3/9/2016 10:12:...
MoveStartTimeBCD	@CMSDateBCD	DB1916,DBB2	3/9/2016 10:11:...
bInMoveStop	Binary Tag	DB1916,D0.1	3/9/2016 10:13:...

Figure 7-58 Acquisition of move data (acquisition of WinCC tags)

- Time stamp
  On the controller, the time stamp for transfer must be split into its constituent parts (year, month, day, etc.). WinCC tags can then be specified in the fields for the time stamps. These tags are used to transfer the start and stop time stamps for a cargo handling operation to the PC. CMS Runtime expects and interprets a time stamp with decimal coding on a time basis of 24 hours.
  If no tags are specified, the time stamps are determined from the system time on the PC as soon as the relevant trigger bit has been read.
- Duration
  It is not possible to store two time stamps in WinCC Tag Logging archives. In view of this, a time stamp and the duration of a cargo handling operation are stored in the Tag Logging archives in the CMS. This field is used to store the name of the tag that enables the duration of a cargo handling operation to be read from the controller.
  Pay particular attention to the following aspect: If both the start and stop time stamps for a cargo handling operation are read from the controller, it is possible to calculate the duration of a cargo handling operation from the time stamps and enter the duration thus calculated into the Tag Logging archive.

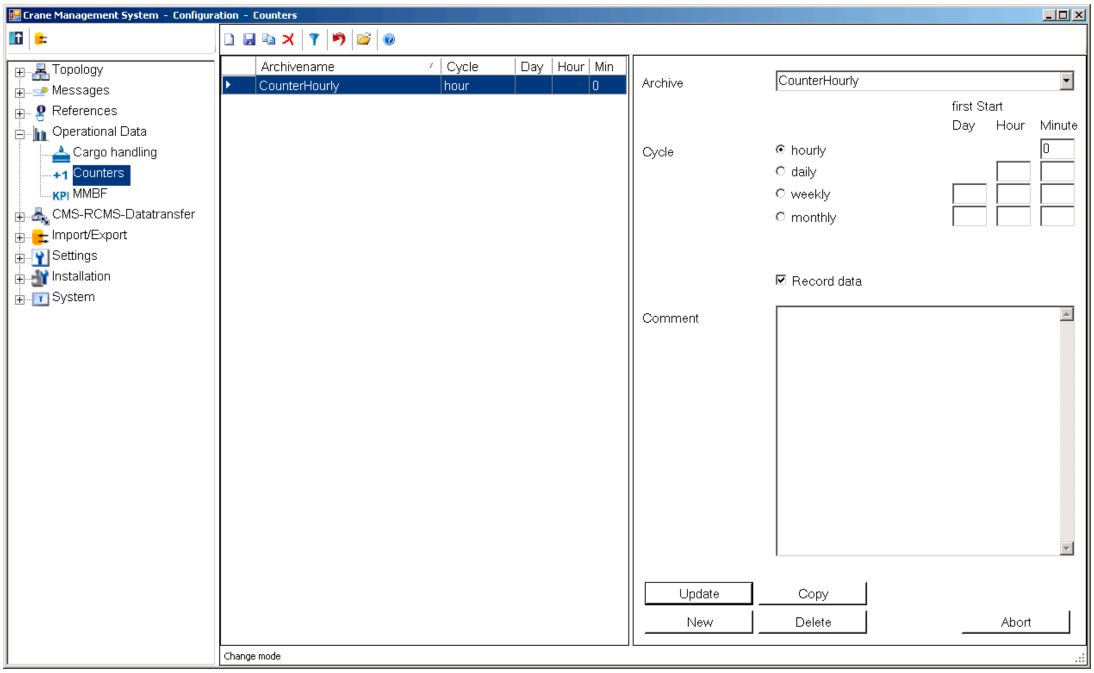
As soon as you have selected the topology "CMS with RCMS (WinCC)", you can transfer configuration data and runtime data for this archive. You can make the settings for the transfer operations in a separate dialog box; see Chapter CMS-RCMS data transfer: Transfer operational data (Page 194).

7.4.3.11 Operating data: Counters

During entry of basic data for counter analysis, differences between the counter values, read from the controller, are calculated cyclically and stored in WinCC Tag Logging archives (also see Chapter Acquiring counter differences at the CMS station (Page 150)).

Table 7-21 Counters

Input field	Meaning	Unique	Mandatory field
Archive	Name of the WinCC Tag Logging archive for storing counter differences	yes (archive, first start)	yes
Cycle	Used to select the cycle for acquiring differences	no	yes
First start	Used to specify the part of the cycle when initial analysis begins	yes (archive, first start)	yes
Acquire data	Select whether data acquisition is activated.	no	no



	Archivename	Cycle	Day	Hour	Min
▸	CounterHourly	hour			0

Archive: CounterHourly

first Start: Day / Hour / Minute

Cycle: ● hourly ○ daily ○ weekly ○ monthly — Minute: 0

☑ Record data

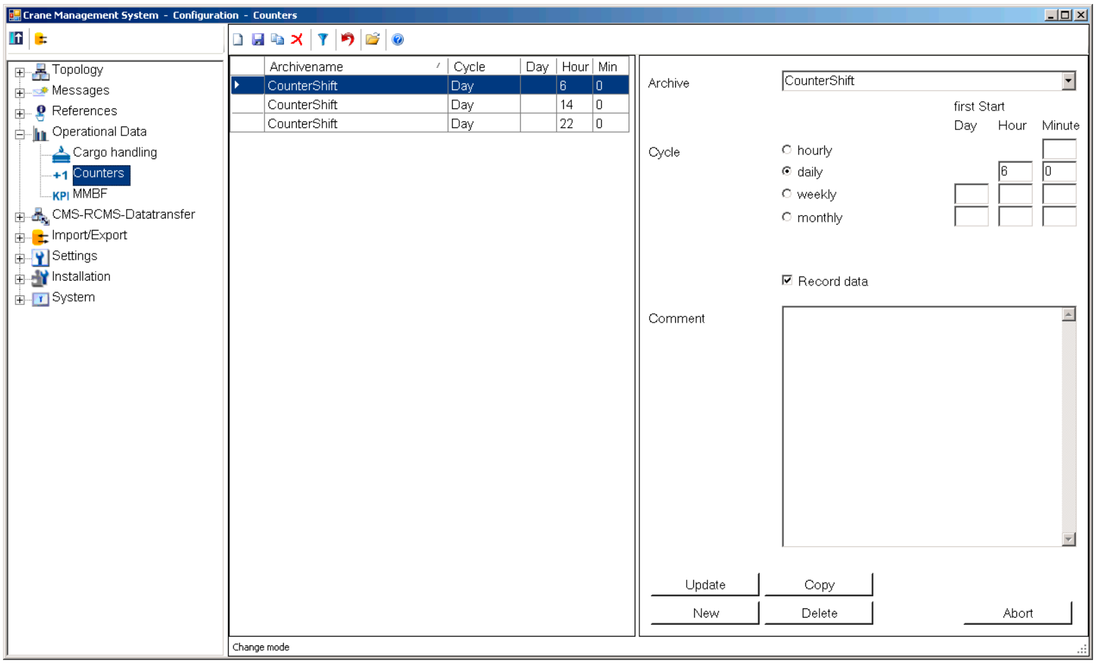
Comment

Figure 7-59 Acquisition of counters

When this dialog is opened, all existing Tag Logging archives are read out of the active WinCC project and displayed in the selection field for the archives. Unlike all the other selection fields in the CMS, the user can also enter names in this selection field. This means that archives which do not yet exist can be defined.

To have the additional option of performing an analysis outside the current clearly defined intervals (e.g. a shift analysis to be performed every 8 hours as opposed to hourly, daily, weekly, or monthly), archives can also be entered more than once with the same cycle but different start times. In these cases, the system calculates the difference between the actual

PLC value and the last processed counter value from the previous start-time (shift). In the following diagram, a "CounterShift" Tag Logging archive parameterization illustrates this point. This archive is specified three times with a daily cycle and start times of 06:00, 14:00, and 22:00. If the analysis is started at 22:00, the difference in counter values at 22:00 (value currently read) and 14:00 (value of this archive when last evaluated) is formed.



Archivename	Cycle	Day	Hour	Min
CounterShift	Day		6	0
CounterShift	Day		14	0
CounterShift	Day		22	0

Archive: CounterShift

first Start: Day, Hour, Minute

Cycle: ○ hourly ● daily (Hour 6, Minute 0) ○ weekly ○ monthly

☑ Record data

Comment

Figure 7-60 Shift evaluation

The counters run on the controller. The raw counter values are acquired as WinCC tags. The values of all WinCC tags that are defined in these archives are also monitored each time a value changes, regardless of the evaluation time. If the new value of a tag is less than the previous value, then this previous value is written back.

As soon as you have selected the topology "CMS with RCMS (WinCC)", you can transfer configuration data and runtime data for this archive. You can make the settings for the transfer operations in a separate dialog box; see Chapter CMS-RCMS data transfer: Transfer operational data (Page 194).

Note

With a weekly cycle, the first start is calculated from the first day of the week stored in the operating system and the value specified.

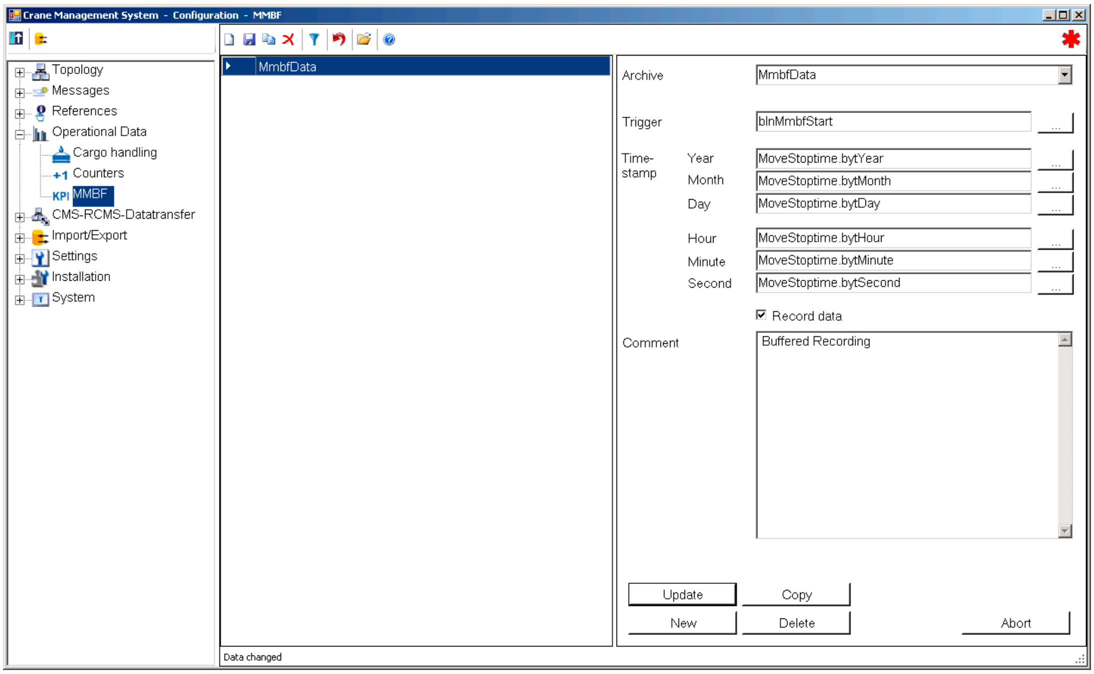
With a monthly cycle, the analysis is always performed on the same day of the month concerned. Cycle lengths will vary, depending on how many days there are in a month. Similarly, a monthly cycle due to begin on the 30th of each month will never be performed in February.

7.4.3.12 Operating data: MMBF

This dialog box is used to enter the parameters required to control the acquisition of MMBF data by CMS Runtime (MMBF = Mean Moves Between Failures); also see Acquiring MMBF data at the CMS station (Page 152).

Table 7-22 MMBF data

Input field	Meaning	Unique	Mandatory field
Archive	Name of the WinCC Tag Logging archive for acquisition of MMBF data	yes	yes
Trigger	Binary WinCC tag for starting acquisition of MMBF data	no	no
Time stamp	WinCC tags for acquisition of the WinCC time stamp	no	no
Acquire data	Select whether data acquisition is activated.	no	no


Crane Management System - Configuration - MMBF

Archive: MmbfData

Trigger: blnMmbfStart

Time-stamp:
- Year: MoveStoptime.bytYear
- Month: MoveStoptime.bytMonth
- Day: MoveStoptime.bytDay
- Hour: MoveStoptime.bytHour
- Minute: MoveStoptime.bytMinute
- Second: MoveStoptime.bytSecond

☑ Record data

Comment: Buffered Recording

Data changed

Figure 7-61 Acquisition of MMBF data

When this dialog is opened, all existing Tag Logging archives are read out of the active WinCC project and displayed in the selection field for the archives. Contrary to all of the selection fields in the CMS Editor, the user can also enter names in this selection field. This means that archives which do not yet exist can be defined.

The following values can be acquired in this dialog:

- Trigger
  This WinCC tag is set by the controller in order to signal to the CMS that an MMBF data set is to be written. The tag is reset by CMS Runtime once the data set has been written.
- Time stamp
  If the time stamp for the MMBF data set is calculated on the controller, the WinCC tags can be specified in the fields for the time stamp. These tags are used to transfer the time stamp to the PC, as a WinCC time stamp cannot be read directly from the controller.
  If no tags are specified, the time stamp is calculated from the system time on the PC.

As soon as you have selected the topology "CMS with RCMS (WinCC)", you can transfer configuration data and runtime data for this archive. You can make the settings for the transfer operations in a separate dialog box; see Chapter CMS-RCMS data transfer: Transfer operational data (Page 194).

7.4.3.13 CMS-RCMS data transfer: Transfer messages

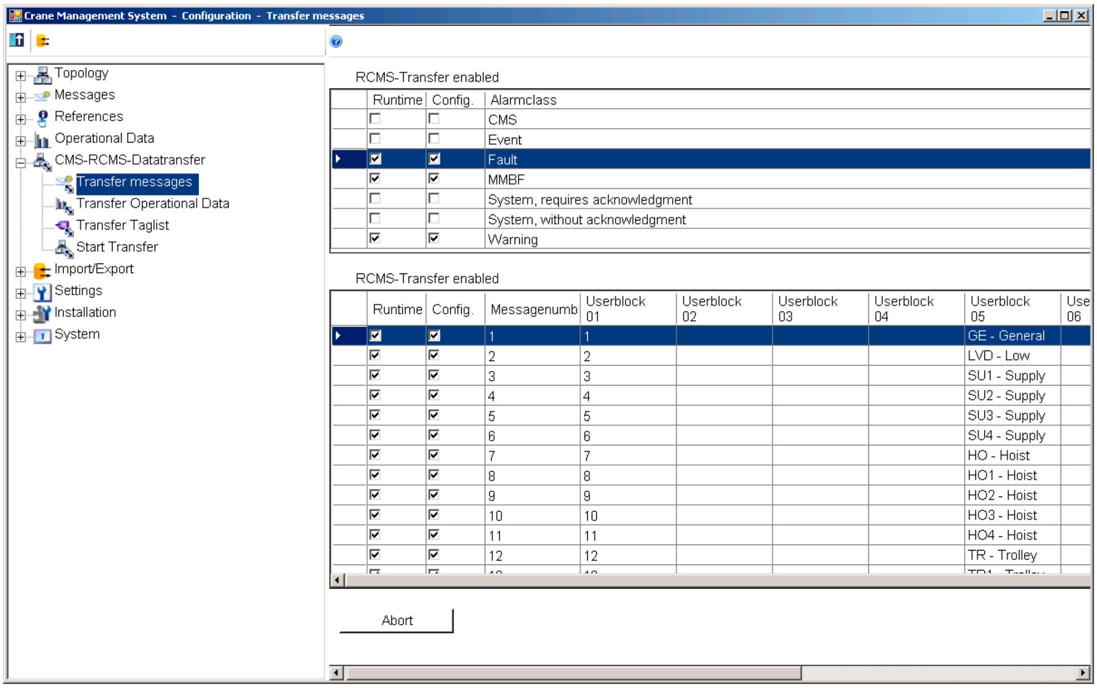
Note

This dialog box is only available in the topology "CMS with RCMS (WinCC)".

In this dialog box, you can activate or deactivate the transfer of configuration and runtime data for the messages that exist in WinCC. In this way, you can activate or deactivate entire message classes or individual messages.

Table 7-23 Transferring messages

Input field	Meaning	Unique	Mandatory field
Configuration	The setting determines whether the configuration data should be transferred to the RCMS server (only for message classes).	yes	no
Runtime	The setting determines whether the runtime data should be transferred to the RCMS server.	yes	no



RCMS-Transfer enabled

	Runtime	Config.	Alarmclass
	□	□	CMS
	□	□	Event
▶	☑	☑	Fault
	☑	☑	MMBF
	□	□	System, requires acknowledgment
	□	□	System, without acknowledgment
	☑	☑	Warning

RCMS-Transfer enabled

	Runtime	Config.	Messagenumb	Userblock 01	Userblock 02	Userblock 03	Userblock 04	Userblock 05	Use 06
▶	☑	☑	1	1				GE - General	
	☑	☑	2	2				LVD - Low	
	☑	☑	3	3				SU1 - Supply	
	☑	☑	4	4				SU2 - Supply	
	☑	☑	5	5				SU3 - Supply	
	☑	☑	6	6				SU4 - Supply	
	☑	☑	7	7				HO - Hoist	
	☑	☑	8	8				HO1 - Hoist	
	☑	☑	9	9				HO2 - Hoist	
	☑	☑	10	10				HO3 - Hoist	
	☑	☑	11	11				HO4 - Hoist	
	☑	☑	12	12				TR - Trolley	

Figure 7-62 Settings for the transfer of messages

The list of all message classes, for which messages are available in WinCC Alarm Logging, are shown in the table above. If you select a message class in the list, then the associated messages are shown in the table below.

You can deactivate the transfer of configuration and runtime data, either for an entire message class or for individual messages. If the transfer of the class is deactivated, then the transfer of all messages within the class is also deactivated.

As soon as you have activated the configuration data transfer for a message class, you can generate this archive on the RCMS server with an upload. There you can overwrite the instance messages for the equipment type to which this crane is assigned. The message offset that you defined for the equipment type under topology in the CMS Editor (see Chapter Topology: Equipment types (Page 171)) is added to the message number. A download from the RCMS server is also possible.

As soon as you have activated the runtime data transfer for the messages, an XML file is written for each message that is acquired. The file is stored in the WinCC project directory under …`\CMS\Messages\Files\yyyy-mm-dd`. Once the file has been transferred, it is deleted from the directory. If an error occurs during the transfer, the file is moved to the folder …`\CMS\Messages\Errors\yyyy-mm-dd` . At transfer, the crane name defined in the topology is transferred in process value 1 in order to assign the message to the crane at the RCMS.

In the directories …`\Files` and …`\Errors` , a new subdirectory is generated every day with the current date to limit the data volume in a directory. You can define a disk clean-up in a dedicated dialog box to delete old XML files (see System: Basic settings (Page 213)).

7.4.3.14 CMS-RCMS data transfer: Transfer operational data

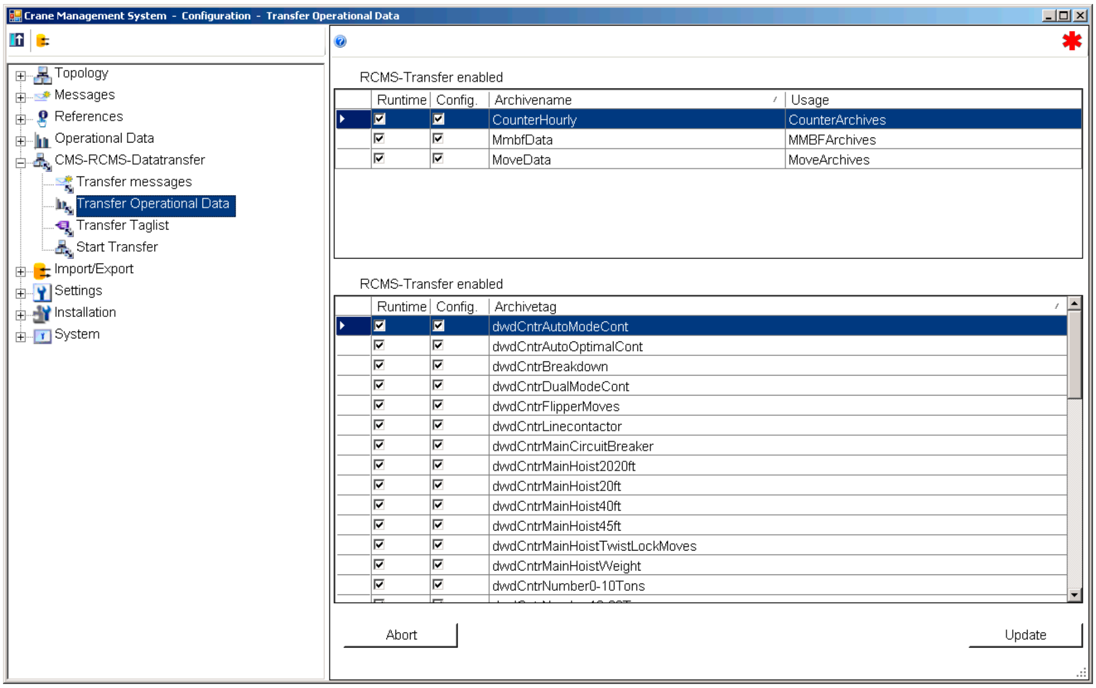
Note

This dialog box is only available in the topology "CMS with RCMS (WinCC)".

In this dialog, you can activate or deactivate the transfer of configuration and runtime data for the acquired operating data archives (move data, counters, MMBF data).

Table 7-24 Transfer of operational data

Input field	Meaning	Unique	Mandatory field
Configuration	The setting determines whether configuration data should be transferred to the RCMS server.	yes	no
Runtime	The setting determines whether runtime data should be transferred to the RCMS server.	yes	no



RCMS-Transfer enabled

Runtime	Config.	Archivename	Usage
☑	☑	CounterHourly	CounterArchives
☑	☑	MmbfData	MMBFArchives
☑	☑	MoveData	MoveArchives

RCMS-Transfer enabled

Runtime	Config.	Archivetag
☑	☑	dwdCntrAutoModeCont
☑	☑	dwdCntrAutoOptimalCont
☑	☑	dwdCntrBreakdown
☑	☑	dwdCntrDualModeCont
☑	☑	dwdCntrFlipperMoves
☑	☑	dwdCntrLinecontactor
☑	☑	dwdCntrMainCircuitBreaker
☑	☑	dwdCntrMainHoist2020ft
☑	☑	dwdCntrMainHoist20ft
☑	☑	dwdCntrMainHoist40ft
☑	☑	dwdCntrMainHoist45ft
☑	☑	dwdCntrMainHoistTwistLockMoves
☑	☑	dwdCntrMainHoistWeight
☑	☑	dwdCntrNumber0-10Tons

Figure 7-63 Settings for the transfer of operational data

The list of all operational data archives is shown in the table above. If you select an archive in the list, then the associated tags are shown in the table below.

You can deactivate the transfer of the complete archive as well as the transfer of individual tags of an archive. If the transfer of the archive is deactivated, then the transfer of all tags within the archive is also deactivated.

As soon as you have activated the configuration data transfer for an archive, you can generate this archive on the RCMS server with an upload. There, the archive is created with the crane name, followed by "_", as prefix (`crane name_archive name`). The names of the archive tags remain unchanged. The process tags are generated as internal tags in the tag group

"Crane name" and have the crane name, followed by "_", as prefix. A download from the RCMS server is not possible.

As soon as you have activated the runtime data transfer for the archive / the archives for acquiring cargo handling operations, an XML file is written for each cargo handling operation that is acquired. The file is stored in the WinCC project directory under …`\CMS\Moves\Files\yyyy-mm-dd`.

Once the file has been transferred, it is deleted from the directory. If an error occurs during the transfer, the file is moved to the folder …`\CMS\Moves\Errors\yyyy-mm-dd` .

As soon as you have activated the runtime data transfer for the archive / the archives for acquiring counter differences, an XML file is written for each time slice that is acquired. The file is stored in the WinCC project directory under …`\CMS\Accumulates\Files\yyyy-mm-dd`.

Once the file has been transferred, it is deleted from the directory. If an error occurs during the transfer, the file is moved to the folder …`\CMS\Accumulates\Errors\yyyy-mm-dd` .

As soon as you have activated the runtime data transfer for the archive / the archives for acquiring MMBF data, an XML file is written for each MMBF data set that is acquired. This XML file is stored in the WinCC project directory under …`\CMS\MMBFs\Files\yyyy-mm-dd`.

Once the file has been transferred, it is deleted from the directory. If an error occurs during the transfer, the file is moved to the folder …`\CMS\MMBFs\Errors\yyyy-mm-dd` .

In the directories …`\Files` and …`\Errors` , a new subdirectory is generated every day with the current date to limit the data volume in a directory. You can define a disk clean-up in a dedicated dialog box to delete old XML files (see System: Basic settings (Page 213)).

7.4.3.15 CMS-RCMS data transfer: Transfer Taglist

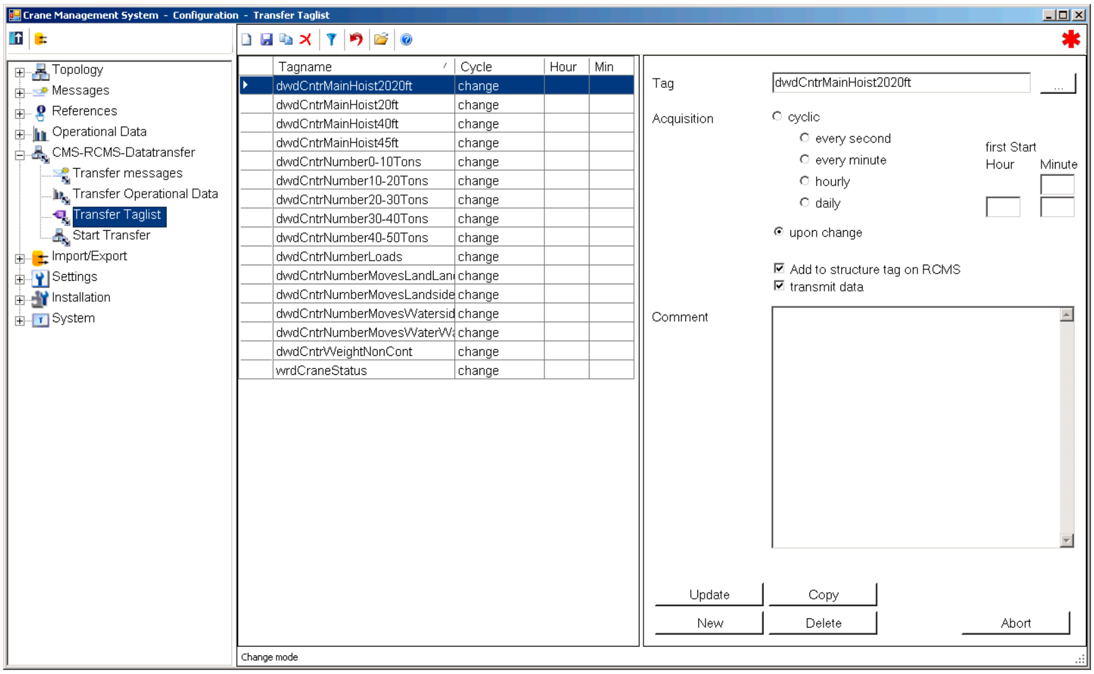
Note

This dialog box is only available in the topology "CMS with RCMS (WinCC)".

The "Taglist" is used to transfer the values of individual WinCC tags. The transfer of the WinCC tags to the RCMS server can either be triggered cyclically or when changes are made.

Table 7-25 Transfer of the tag list

Input field	Meaning	Unique	Mandatory field
Tag	Name of the WinCC tag to be transferred	yes	yes
Acquisition	Selects in which cycle the tag should be read	no	yes
First start	Specifies when the tag should be read for the first time	no	yes
Add to structure tag on RCMS	Selects whether the tag is part of the structure instance at the RCMS	no	no
Transferring data	Selects whether runtime data is to be transferred	no	no



Crane Management System - Configuration - Transfer Taglist

	Tagname	Cycle	Hour	Min
▶	dwdCntrMainHoist2020ft	change		
	dwdCntrMainHoist20ft	change		
	dwdCntrMainHoist40ft	change		
	dwdCntrMainHoist45ft	change		
	dwdCntrNumber0-10Tons	change		
	dwdCntrNumber10-20Tons	change		
	dwdCntrNumber20-30Tons	change		
	dwdCntrNumber30-40Tons	change		
	dwdCntrNumber40-50Tons	change		
	dwdCntrNumberLoads	change		
	dwdCntrNumberMovesLandLan	change		
	dwdCntrNumberMovesLandside	change		
	dwdCntrNumberMovesWatersid	change		
	dwdCntrNumberMovesWaterW	change		
	dwdCntrWeightNonCont	change		
	wrdCraneStatus	change		

Tag: dwdCntrMainHoist2020ft

Acquisition:
○ cyclic
○ every second
○ every minute
○ hourly
○ daily
first Start Hour / Minute
● upon change

☑ Add to structure tag on RCMS
☑ transmit data

Comment

Change mode

Figure 7-64 Acquisition of tag lists

- WinCC tag
  Name of the WinCC tag to be transferred.
- Acquisition
  - Cyclic
    With cyclic processing, all the values specified in the cycle are read and transferred to the RCMS server. With hourly or daily transfers, the start of the cycle can also be specified with greater precision. With hourly acquisition, it is possible to specify the minute when the cycle will start; with daily acquisition, it is possible to specify both the hour and the minute when the cycle will start.
  - Upon change
    For every change exactly the changed values are transferred.

As soon as you have tags defined in the list and set the check mark "Add to structure tag on RCMS", you can generate these tags on the RCMS server by performing an upload. There, a structure type with "`@CMS`" and the equipment type defined under topology as prefix is generated (`@CMSequipment type`). Existing structures are overwritten. In addition, a structure instance with the crane name as a prefix is generated in the crane name tag group.

As soon as you have set the check mark "Transfer data", the values of these tags are transferred to the RCMS server according to the selected acquisition type. Tag values are not buffered on the CMS.

7.4.3.16 CMS-RCMS data transfer: Upload (CMS station)

Note

This dialog box is only available in the topology "CMS with RCMS (WinCC)".

You can start an upload in the upload dialog box on the CMS station.

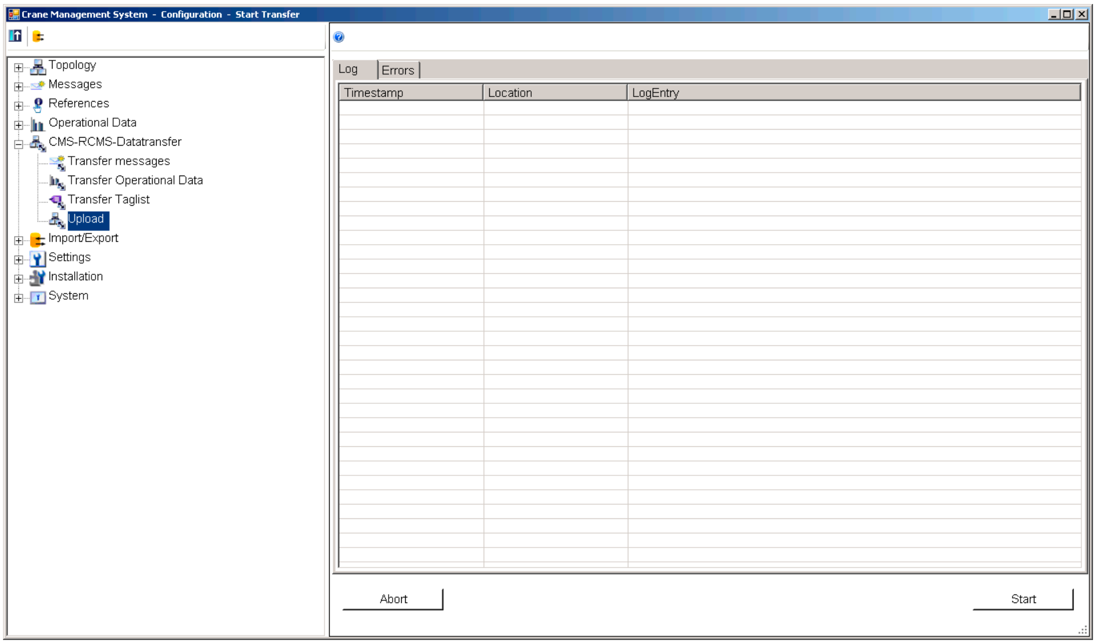


Figure 7-65 Upload of configuration data (CMS station)

During the upload, the data from one crane or multiple cranes is transferred to the RCMS server. There is always only one data set per equipment type. The upload overwrites the data of the equipment type at the RCMS with that of the crane, whose data are transferred. If the upload is initiated from a CMS station, then no second upload is possible in parallel from another CMS station.

Note

After data has been uploaded to the RCMS server, at the RCMS you must check as to whether the data of the other cranes of this equipment type are still consistent. You can initiate a download at the RCMS server to adapt data of cranes that are not consistent.

In the editor function tree, using the markings of the functions, you can identify whether data at the CMS station have been changed, which must be uploaded to the RCMS server for data alignment.

To perform an upload, the following preconditions must first be available:

- It must be possible to access the RCMS server via TCP/IP
- Setting up the communication parameters in the dialog (Topology → Crane) on the CMS station

- Setting up the communication parameters in the dialog (Topology → Crane) on the RCMS server
- CMS Runtime active on the CMS station
- CMS Runtime active on the RCMS server
- WinCC Runtime has been exited on the RCMS server!
- WinCC editors on the RCMS server are closed!

When the dialog is opened and there is no connection to the RCMS server, then you receive a corresponding message.

The upload dialog has two tabs. Outputs (information) for the current upload processes are listed under the "Log" tab. Errors during the upload are listed under the "Errors" tab.

Start the upload using the Start button at the lower right edge of the screen.

Note

All of the data for this equipment type available in the RCMS server will be overwritten.

Note

Do not interrupt the upload. This can result in loss of data.

Note

If there is a large number of messages in the WinCC Alarm Logging, the upload/download process can take several minutes.

If the upload is finished with errors, then you must start a new upload after resolving these errors. An error description can be found under the "Errors" tab.

You receive a message as soon as the upload has been successfully completed. The marking of the changed data in the function tree disappears.

7.4.3.17 Import/export: Import/Export

A rough distinction is made between user and system data in relation to imports and exports.

User data include data which are generally acquired or changed in normal operation, such as

- Equipment
- Cranes
- Maintenance instructions
- Assignments between messages of an equipment type and maintenance instructions
- Log (remarks on maintenance instructions)
- Assignments between messages of an equipment type, maintenance instructions and logs (remarks on maintenance instructions)
- References
- Assignments between equipment types, cranes, messages and references

- Settings for the move data
- Settings for acquiring MMBF data
- Settings for acquiring counter differences
- Tag list

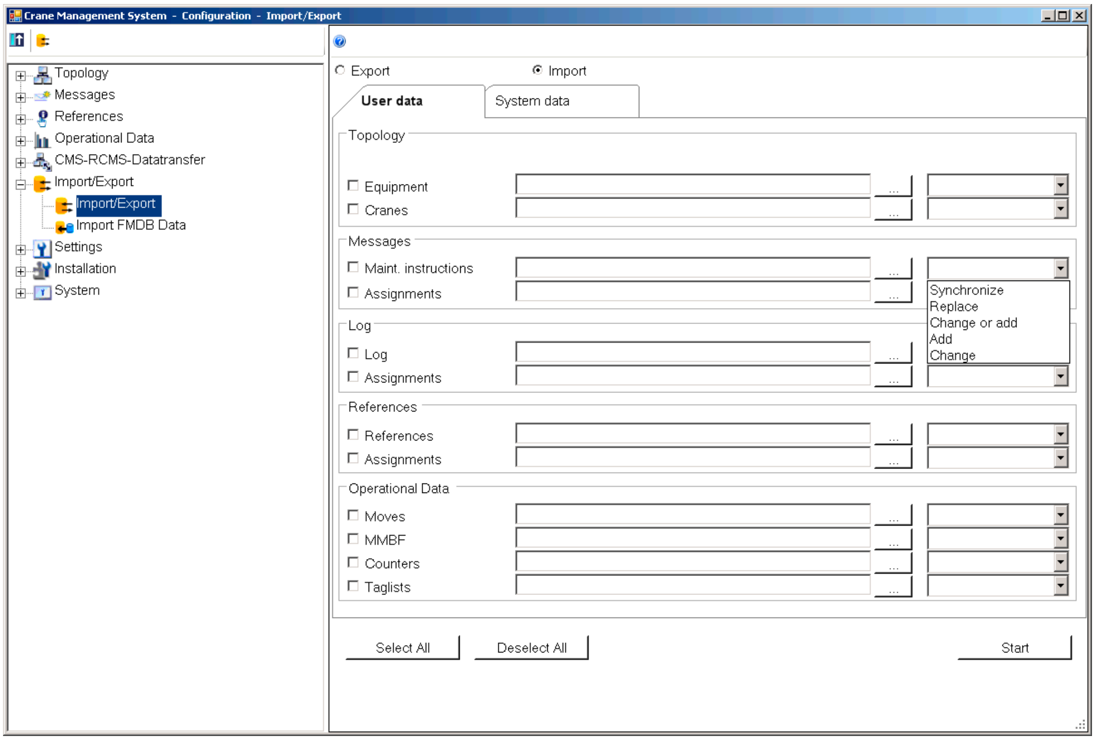
System data basically include data that are provided as defaults during installation, or data that are acquired during commissioning and seldom changed once the system is running, such as:

- Icons
- Programs
- Macros
- Reference types

Two different import and export functions are provided under "Setup" for language-specific information in the CMS:

- Transfer
- Translation

The transfer functions are used to exchange language-specific information between different installations. In this case, all the information such as installed languages, component names etc. are processed. The translation functions only handle data that is required for translation purposes. Furthermore, only the data for one language at a time can be displayed for translation.



Crane Management System - Configuration - Import/Export

○ Export ● Import

User data | System data

Topology
□ Equipment
□ Cranes

Messages
□ Maint. instructions
□ Assignments

Log
□ Log
□ Assignments

References
□ References
□ Assignments

Operational Data
□ Moves
□ MMBF
□ Counters
□ Taglists

Figure 7-66 Import / export of user data

The "Select All" button can be used to activate all the check boxes for the import/export function at the same time. If necessary, the selection can be changed again at a later time. Once the import has been started, all the successfully processed data types are deselected by the system. If errors or warnings occurred when data was being imported or exported, the data concerned will not be deselected. This enables data export or import to recommence as soon as the necessary corrections have been made. The "Deselect All" button can be used to deactivate all the check boxes at the same time.

Note

The checkmarks to select the individual options cannot be used if you have still not defined an equipment type in the dialog used to acquire equipment types.

Before user data are imported, it must be considered whether system data need to be adapted first. If, for example, new terminal or equipment type data are to be imported which contain symbols that do not yet exist in the CMS, these icons would need to be imported first or entered in the icon acquisition dialog before the topology data import can be started. The same applies to the import of references. In this case, it may be necessary to specify additional reference types or programs first.

Data is imported and exported in an XML format. A complete description of the format can be found in the appendix.

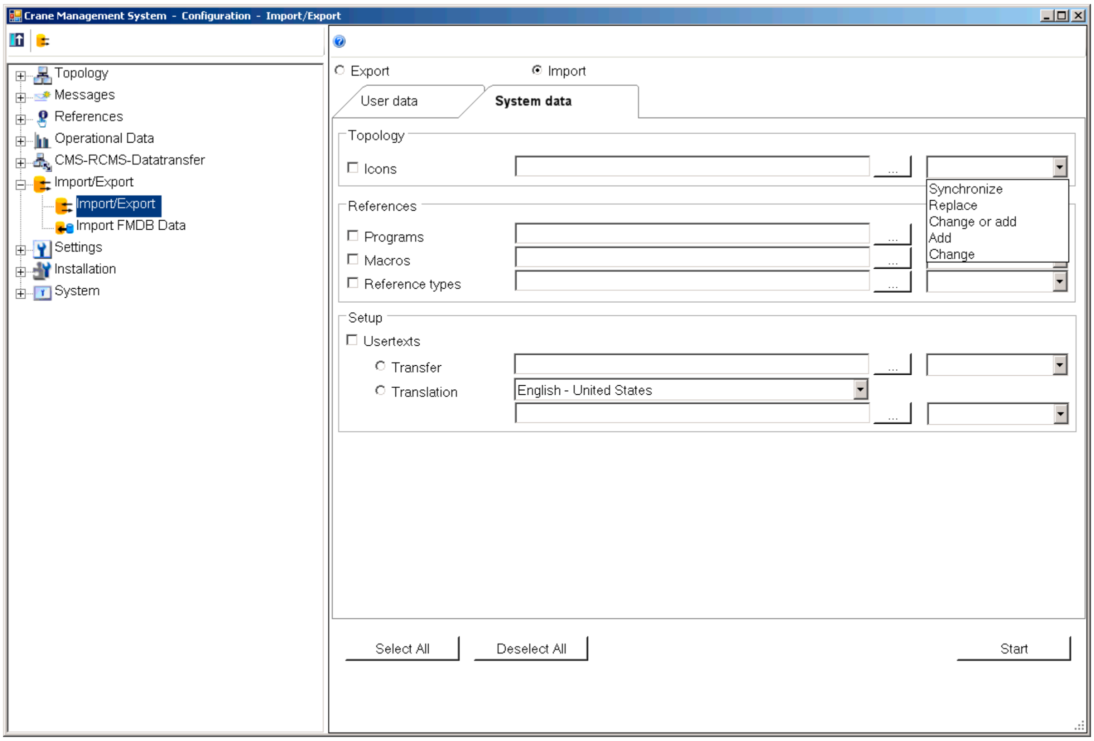


Figure 7-67 Import / export of system data

Two different functions are used to import and export languages. The import/export transfer function is used primarily to transfer the complete, language-specific database. With an export transfer operation, all information about the implemented languages, the available dialog or message components and the acquired language-specific information are bundled together in an export file or are expected in a file for import.

When language-specific information is imported / exported for translation, only the data pertaining to one language is exported. Furthermore, only the information which is required for translation purposes is exported. This data includes

- identification of the component
- text to be translated
- comment on the component (if stored)

The following import functions are provided:

- **Replace**
  All existing data are deleted and replaced by the imported data.
- **Change**
  Only existing data are changed. Newly imported data are ignored.
- **Add**
  Existing data are not changed. Only new data are accepted.
- **Change or add**
  Existing data are changed. New data are accepted.
- **Synchronize**
  Existing data are changed and new data are accepted. Data which are not found in the import file are deleted.

Data import with "Replace" or "Synchronize"?

In "Replace" mode, all data are first deleted from the table. However, data with assigned references cannot be deleted. In this case, the import operation will be aborted with an error message. In "Synchronize" mode, the existing data are matched to the data to be imported. As long as this operation does not cause any entries in the existing database with assigned references to be changed or deleted, the import operation will proceed successfully. The import process will be aborted with an error message only if the existing database contains entries with assigned references which will be changed or deleted by the synchronize operation.

If no references are assigned to the import data, the "Replace" import mode should be used as the computer resources used by this function are significantly lower.

For data which do not contain references to other tables, the functions "Replace" and Synchronize" are identical. The functions differ only in relation to data which are referenced by other tables. An example of this data type are the entries in the icons table which are references, for example, from the tables for terminals or equipment types.

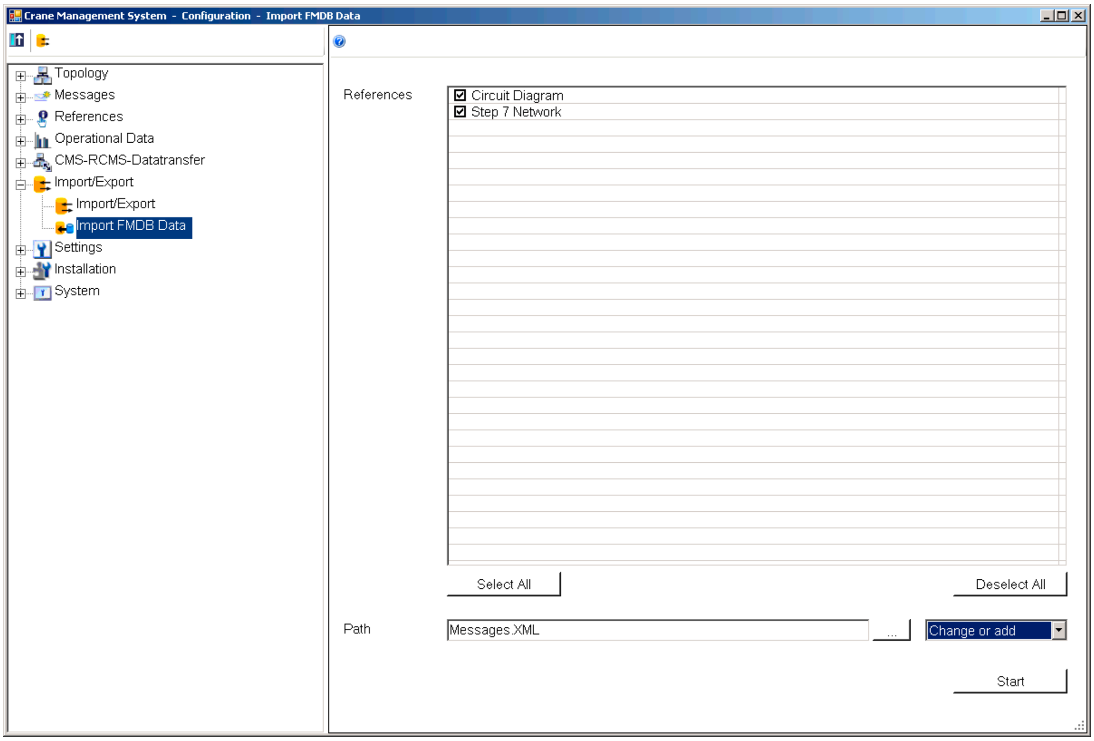
Data is imported and exported in an XML format. A complete description of the format can be found in the appendix.

7.4.3.18 Import/export: Importing FMDB data

Importing FMDB data (FMDB: Fault Message Database) is available for bulk data handling of the additional error information.

When importing using this function, several operations are combined:

- Creating maintenance instructions and assigning these to the existing messages.
- Creating assignments to references containing special macros (see below). In this case, these references must have already been created. Here, only assignments are created, whereby the actual values of the macros, acquired in the import file, are saved in the assignment sets.



References
☑ Circuit Diagram
☑ Step 7 Network

Path: Messages.XML
Change or add

Figure 7-68 Import/export of FMDB data

An XML file is used to import data into the CMS Editor. The table below shows all the XML tags with a fixed meaning in the CMS:

Table 7-26 XML tags in FMDB data

Name	Description	Application in the CMS	Length in the CMS, type
IFNo	Error number	Key	Long integer
InstructionText	Instruction text 1, possible cause	Maintenance instruction	2,000 characters
TestText	Instruction text 2, possible remedy, test instruction	Maintenance instruction	2,000 characters

Special macros are used for the automatic assignment of references during the import of FMDB data. At the start of the import, all the references in which this type of special macro is used directly (via the reference entry) or indirectly (via the program entry) are brought together in a list. Before the import starts, the user can select from this list the references for which assignment sets are to be created as part of the import process.

A selection of these special macros is preinstalled along with the CMS. The user can supplement these with additional special macros.

This type of special macro always begins with the character string "`%FMDB_`", followed by the name of the XML tag whose contents are to be used as a macro value when the reference is displayed.

Table 7-27 Predefined macros for FMDB import

Macro name	Meaning
%FMDB_CircuitDiagramFilename%	File name of the circuit diagram
%FMDB_CircuitDiagramPath%	Path to the file for the circuit diagram
%FMDB_Drw_Plant-ID%	Higher level designation in the circuit diagram
%FMDB_Drw_Sheet%	Page in a circuit diagram sheet
%FMDB_CD_Page%	Absolute page in the circuit diagram
%FMDB_PLC_Block%	Block of a program in the STEP 7 project
%FMDB_PLC_NW%	Network of a block in the STEP 7 project
%FMDB_Step7ProjectName%	File name of the STEP 7 project
%FMDB_Step7ProjectPath%	Path to the file of the STEP 7 project

7.4.3.19 Settings: Icons

Note

This dialog box is only available for the topology "CMS with RCMS (WinCC)".

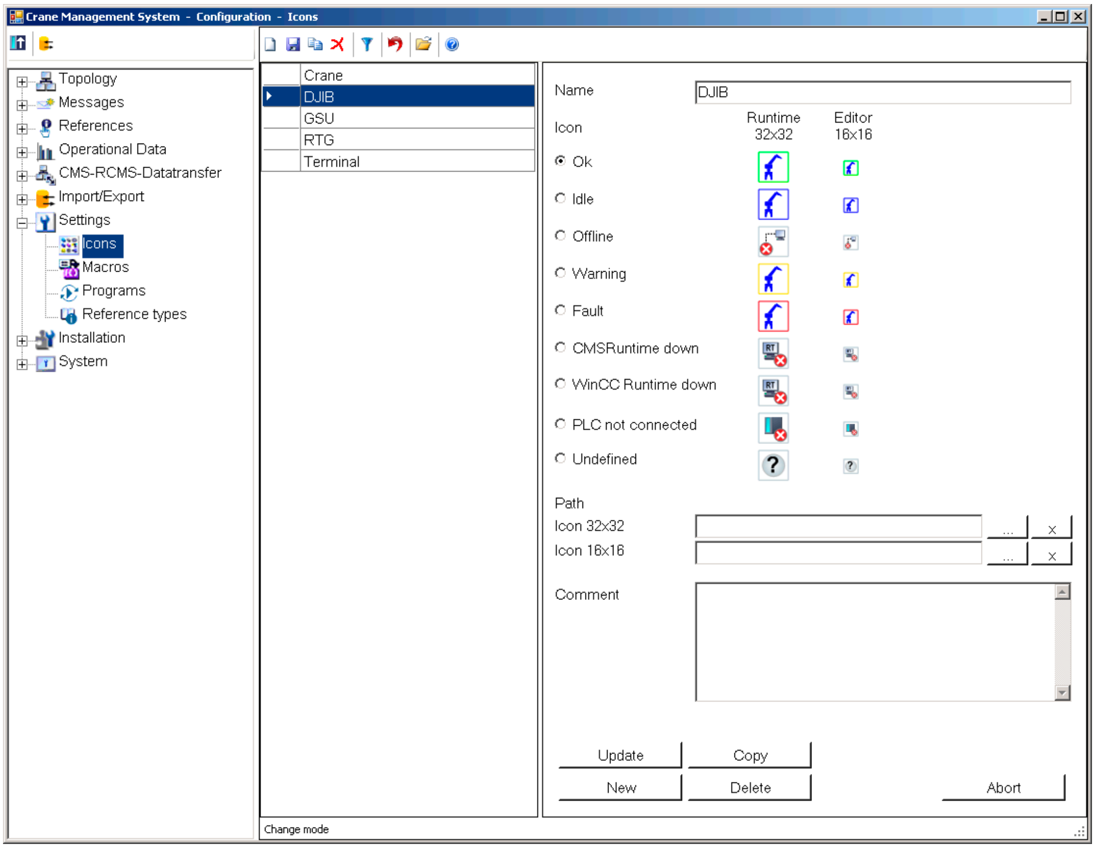
This dialog is accessible only to users who belong to the Windows user group "CMSAdmin".

Terminals, equipment types and cranes are generally selected in a tree display. For this purpose, individual terminals and equipment types can be represented by different icons. The icons, with which the corresponding objects are represented in the tree, are stored in this dialog.

Table 7-28 Icons

Input field	Meaning	Unique	Mandatory field
Name	Name of the icon	yes	yes
"OK" icon	Path to the icon for displaying the "OK" status.	no	yes
"Idle" icon	Path to the icon for displaying the "Idle" status	no	yes
"Offline" icon	Path to the icon for displaying the "Offline" status	no	yes
"Warning" icon	Path to the icon for displaying the "Warning" status	no	yes
"Fault" icon	Path to the icon for displaying the "Fault" status	no	yes
"CMSRuntime down" icon	Path to the icon for displaying the "CMS Runtime down" status	no	yes
"WinCC Runtime down" icon	Path to the icon for displaying the "Win Runtime down" status	no	yes
"PLC cannot be accessed" icon	Path to the icon for displaying the "PLC cannot be accessed" status	no	yes

Input field	Meaning	Unique	Mandatory field
"Undefined" icon	Path to the icon for displaying the status if none of the other options apply	no	yes
Comment	Optional comment	no	yes



Name: DJIB

Icon:
● Ok
○ Idle
○ Offline
○ Warning
○ Fault
○ CMSRuntime down
○ WinCC Runtime down
○ PLC not connected
○ Undefined

Icon 32x32:
Icon 16x16:
Comment:

Figure 7-69 Acquisition of icons

It is important to note that graphic symbols of any size can be specified in the icon acquisition dialog, but that the graphics will be either scaled or truncated depending on format if they are too large. The size for displaying icons in the control elements is optimized for 16 x 16 or 32 x 32 pixels. All popular graphics formats such as bmp, jpg, gif, png, ico, emf, etc. can be selected as file formats.

The displayed icon path is the same as the path used to load the icons. Since the graphics themselves are also stored in the database, this path information is later merely a comment indicating the load path of the icons.

The appropriate "x" button can be used to delete an icon from the acquisition dialog.

7.4.3.20 Settings: Macros

In the CMS macros are named text blocks. The names of these macros can be used as wildcards in the functions for managing programs and references. Special macros are used in the function for importing FMDB data to automatically create links to references.

When references are displayed, these wildcard characters are replaced by the relevant macro values.

Macros are acquired in this dialog:

- Macro name
  The macro name must start and end with the `%` character.
  Example: `%Page%`
- Macro text
  Here, you can assign a fixed value to a macro, which is then applicable to all locations where it is used. An example is the path to certain documents.
  In the other case, only assign the macro with a value if the reference or a program that uses it is assigned a message or equipment type. An example for a macro of this type is the page in a circuit diagram.

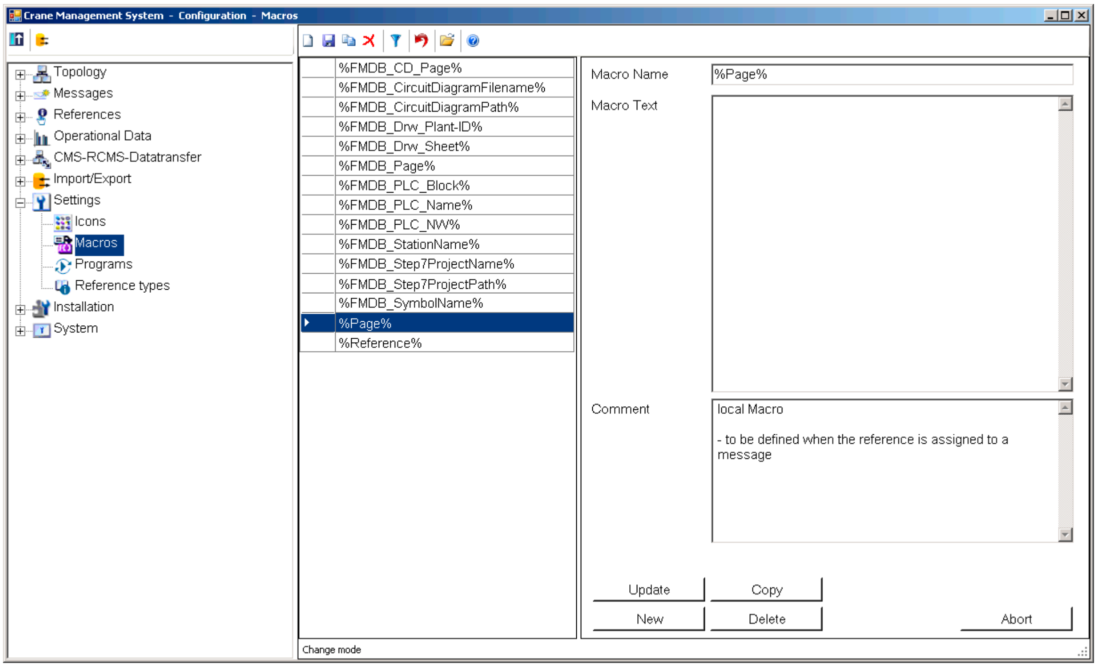
In the CMS Editor, there are also special FMDB macros as well as some predefined macros that contain system information such as, e.g. the installation path of the CMS.

You can use the macros for system information. You cannot change the value. This is the reason that they do not appear in this dialog, but only in the dialog to acquire references and to acquire programs. Special FMDB macros are used for FMDB import (see Chapter Import/export: Importing FMDB data (Page 201)).

In the CMSFaults control, as part of the function for displaying the information referred to in the reference entries, the macro names in the reference and program entries are replaced by the contents of the text blocks (current values of the macros). The resulting command is then sent to the operating system in order to display the information.

Table 7-29 Macros

Input field	Meaning	Unique	Mandatory field
Macro name	Name of the macro	yes	yes
Macro text	Text to be used instead of the name when the placeholder is replaced	no	no
Comment	Comment on the macro	no	no



%FMDB_CD_Page%
%FMDB_CircuitDiagramFilename%
%FMDB_CircuitDiagramPath%
%FMDB_Drw_Plant-ID%
%FMDB_Drw_Sheet%
%FMDB_Page%
%FMDB_PLC_Block%
%FMDB_PLC_Name%
%FMDB_PLC_NW%
%FMDB_StationName%
%FMDB_Step7ProjectName%
%FMDB_Step7ProjectPath%
%FMDB_SymbolName%
%Page%
%Reference%

Macro Name: %Page%

Macro Text:

Comment: local Macro

- to be defined when the reference is assigned to a message

Figure 7-70 Acquisition of macros

Macros are acquired in this dialog, although system-defined macros are not displayed here.

Note

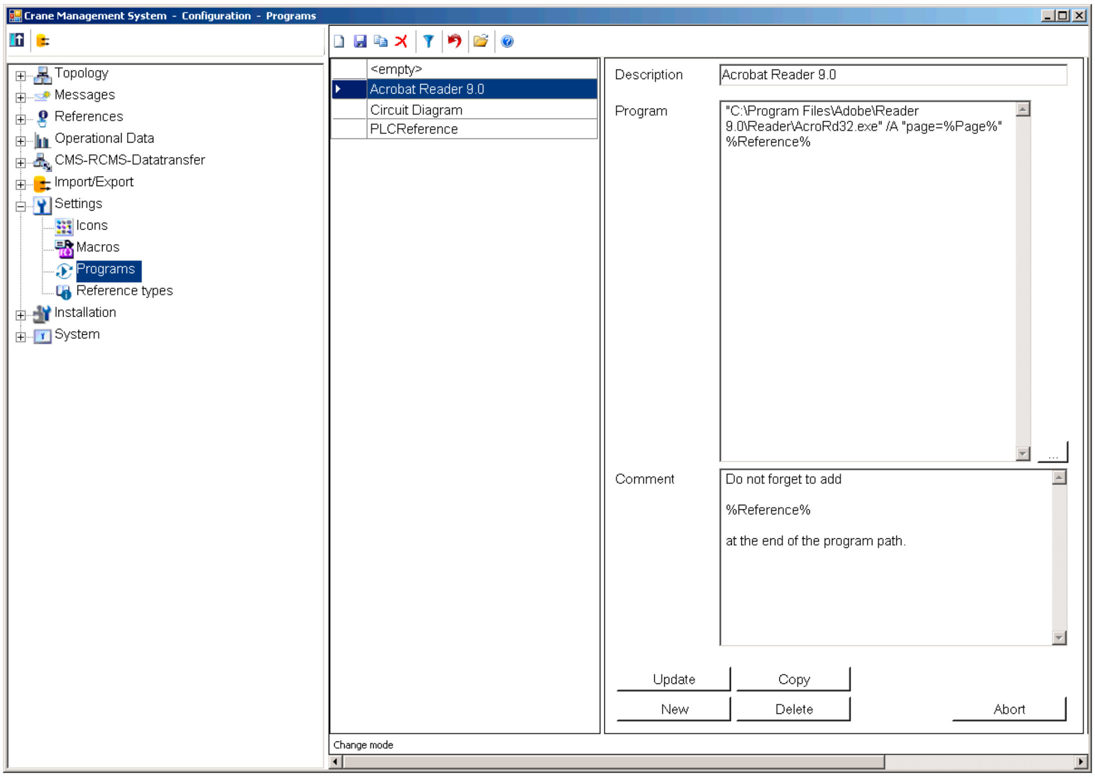
If spaces are used in macro texts, please note that spaces may be interpreted as separators in commands when the Windows program is called.

7.4.3.21 Settings: Programs

In this dialog, the CMS is notified about the programs with their special parameters, which are used to display referenced information ("References").

Table 7-30 Programs

Input field	Meaning	Unique	Mandatory field
Description	Name of the program as it is displayed in the selection fields	yes	yes
Program	Text of the command to be used to start the program.	no	yes
Comment	Optional comment	no	no



Description: Acrobat Reader 9.0

Program: "C:\Program Files\Adobe\Reader 9.0\Reader\AcroRd32.exe" /A "page=%Page%" %Reference%

Comment: Do not forget to add

%Reference%

at the end of the program path.

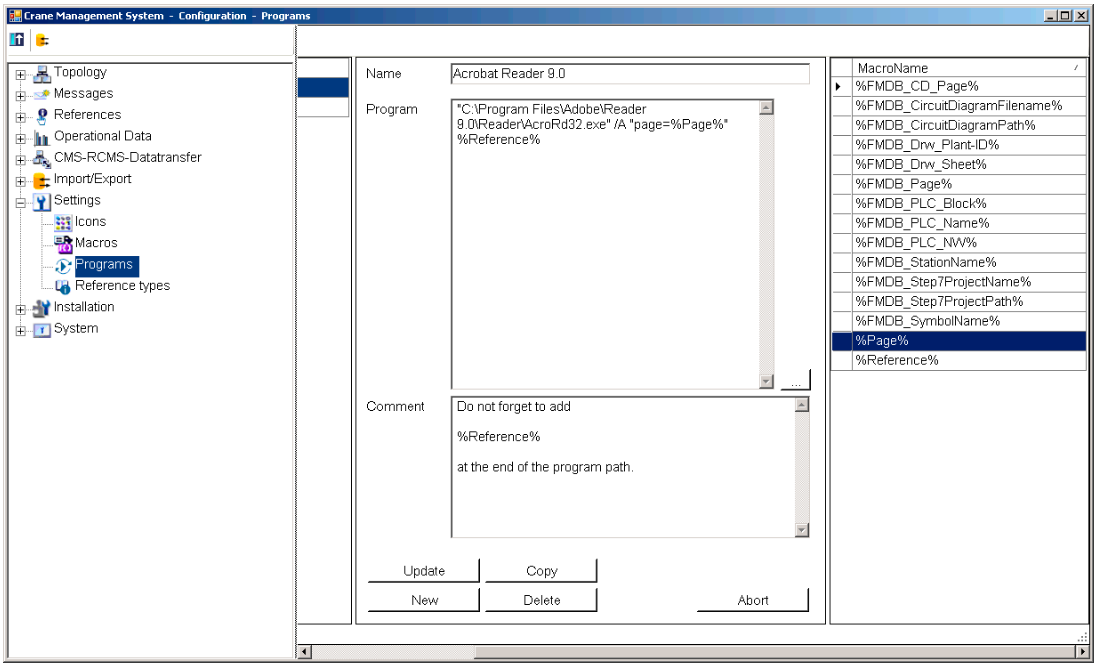
Figure 7-71 Acquisition of programs

As long as the referenced file is of a type known to Windows and no additional parameters are required to display the information, no entries need to be made in this dialog. In this case, the reference can be launched directly via the Windows link.

In the case of programs which can be launched via the Windows search path, no path needs to be specified.

The part of the command where the reference is to be subsequently inserted needs to be identified by means of the symbolic name "%Reference%".

Additional macros can also be manually entered in the command string to call a program. If a manually entered macro is not yet available in the macro table, it can be entered into the database directly after a corresponding dialog.



Name: Acrobat Reader 9.0

Program: "C:\Program Files\Adobe\Reader 9.0\Reader\AcroRd32.exe" /A "page=%Page%" %Reference%

Comment: Do not forget to add

%Reference%

at the end of the program path.

MacroName
%FMDB_CD_Page%
%FMDB_CircuitDiagramFilename%
%FMDB_CircuitDiagramPath%
%FMDB_Drw_Plant-ID%
%FMDB_Drw_Sheet%
%FMDB_Page%
%FMDB_PLC_Block%
%FMDB_PLC_Name%
%FMDB_PLC_NW%
%FMDB_StationName%
%FMDB_Step7ProjectName%
%FMDB_Step7ProjectPath%
%FMDB_SymbolName%
%Page%
%Reference%

Figure 7-72 Acquisition of programs (macros)

In the dialogs, the existing macros are displayed in a table on the right-hand side. The macro selected in the table can be dragged and dropped to the required location.

Note

If spaces are used in the command string, please note that spaces are interpreted as separators. Where necessary, the command should be enclosed within inverted commas.

Note

It is possible to use the same program more than once with different parameters, but a unique name must then be assigned for each program invocation. Alternatively, macros can also be used here.

7.4.3.22 Settings: Reference types

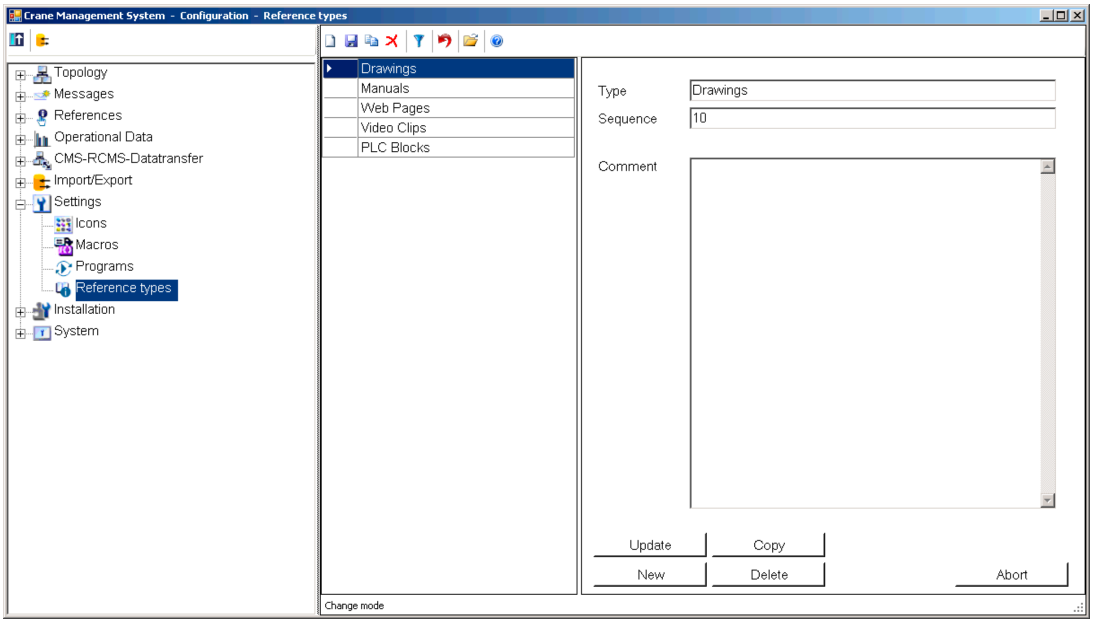
Note

This dialog is accessible only to users who belong to the Windows user group "CMSAdmin".

The information acquired in this dialog is used to create clear groups of references for display in the CMSFaults control. These reference types are displayed in the CMSFaults control as supplementary information to the reference name in the reference list. This dialog can also be used to define the order in which reference types are displayed in the CMSFaults control. A certain basic inventory of reference types is installed with the CMS package. This basic inventory, which is listed in the screen below, can be adapted or extended in this dialog.

Table 7-31 Reference types

Input field	Meaning	Unique	Mandatory field
Reference type	Language code for the reference type	yes	yes
Sequence	Sort identifier	no	yes
Comment	Optional comment	no	no



Drawings
Manuals
Web Pages
Video Clips
PLC Blocks

Type: Drawings
Sequence: 10
Comment:

Figure 7-73 Acquisition of reference types

If a new reference type is set up in this dialog, an entry in the table for language-specific texts is automatically created for each language implemented. The code identifier entered in this dialog is the default entry for the text.

The display texts can be modified under the dialog name "`ReferenceTypes`" in the language table.

7.4.3.23 Installation: Usertexts

Note

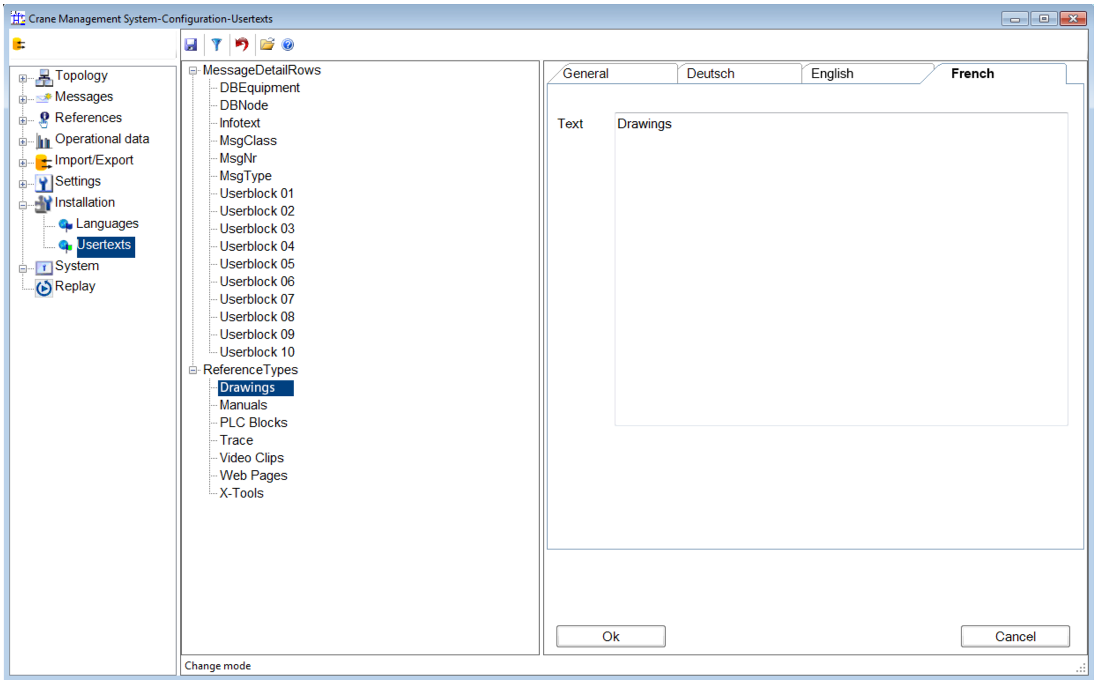
This dialog is accessible only to users who belong to the Windows user group "CMSAdmin".

None of the texts used in the CMS controls and none of the messages output from the CMS are stored in the dialogs themselves, nor are they an integral component of the program. Instead, they are loaded from the database.

As this information is automatically loaded when the CMS is installed, normally you don't have to make any entries in this dialog. However, if there are additional application-specific reference types, then manual postprocessing is required.

Table 7-32 Usertexts

Input field	Meaning	Unique	Mandatory field
Component name	Name of the dialog component, language code value or message identifier	yes	yes
Usertext Name	Name of the usertext	no	yes
Comment	Optional comment	no	no
Text	Language-specific text	no	yes



Text: Drawings

Figure 7-74 Acquisition of user texts

7.4.3.24 Installation: Languages

Note

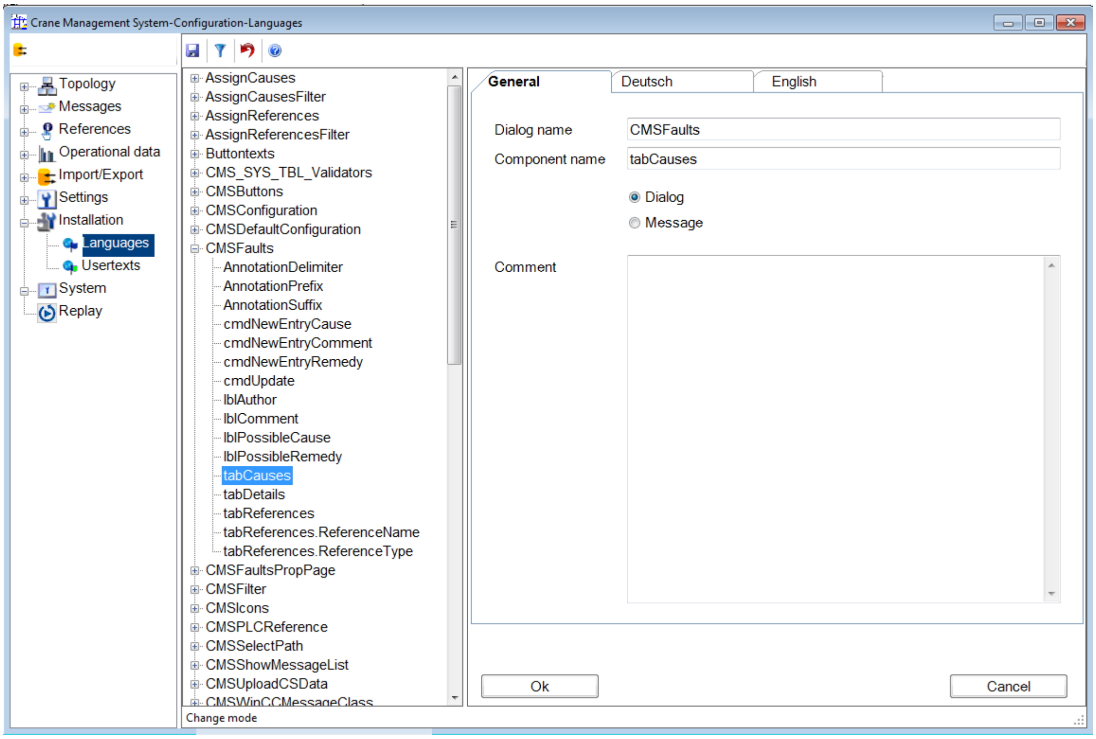
This dialog is accessible only to users who belong to the Windows user group "CMSAdmin".

You edit the texts of the SIMOCRANE CMS language in this dialog.

The SIMOCRANE CMS language defines the CMS editor texts and specific texts of the SIMOCRANE CMS Runtime application. It also includes ActiveX Controls texts.

Table 7-33 Languages - general

Input field	Meaning	Unique	Mandatory field
Dialog name	Name of the dialog, data type or message group	yes	yes
Component name	Name of the dialog component, language code value or message identifier	yes	yes
Dialog/message	Switch defining whether the text for a field is acquired in a dialog or a message	no	yes
Comment	Optional comment	no	no



Dialog name: CMSFaults

Component name: tabCauses

● Dialog

○ Message

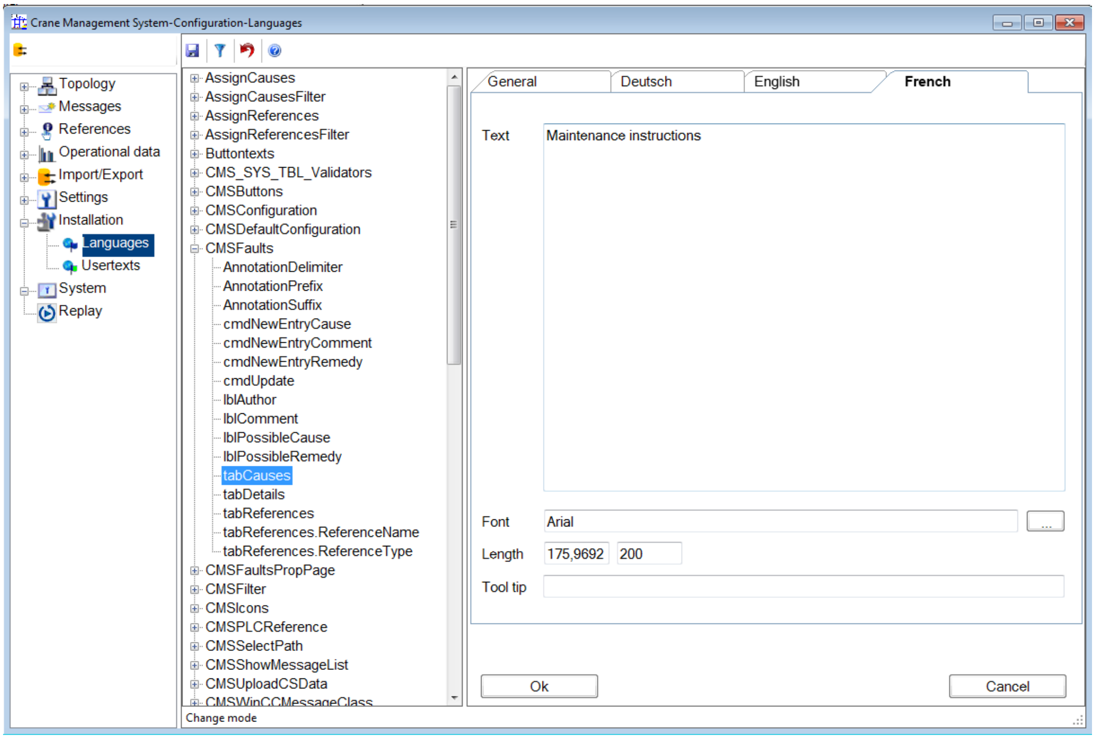
Comment

Figure 7-75 Acquisition of language-specific texts - general

Table 7-34 Languages - language

Input field	Meaning	Unique	Mandatory field
Text	Language-specific text	no	yes
Font	Display font for the language-specific text (for dialog fields only)	no	yes (only for dialogs)

Input field	Meaning	Unique	Mandatory field
Length	Length of the dialog field and current length of the entered text. The field is read-only. The lengths are specified in pixels.	no	yes (only for dialogs)
Tooltip	Language-specific tooltip text (implemented only for context menu entries in the current version.)	no	no
Icon	Language-specific icon (for messages only) The optimized size for the display of icons in message dialogs is 32 x 32 pixels. The display size of icons in Treeview control elements is limited to 16 x 16 pixels.	no	no



Text: Maintenance instructions

Font: Arial

Length: 175,9692 200

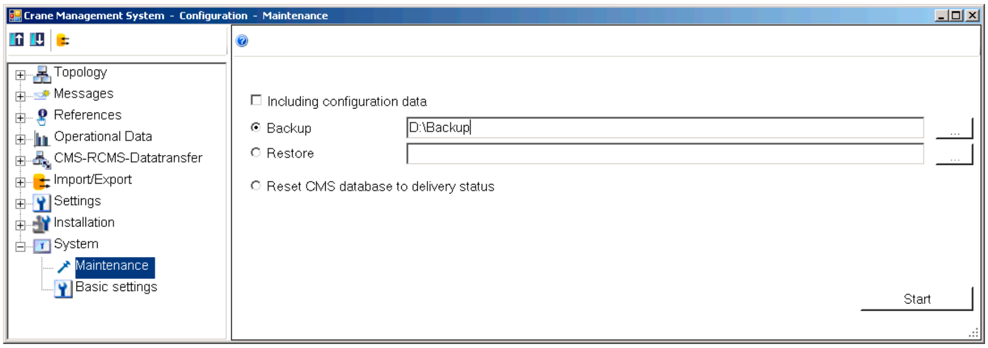
Tool tip:

Figure 7-76 Acquisition of language-specific texts

The text display dialog screen shows both the dynamic length of the text and the static length of the text display label. The dynamic length is calculated on the basis of the selected font. The static length is defined when the dialog is implemented. Both these lengths are displayed in pixels.

7.4.3.25 System: Maintenance

The primary purpose of this function is to prevent data loss caused by hard disk failures, parameterization errors, etc. It can also be used to copy the entire master database of a CMS between different computers. It is also capable of restoring the database to its original installation state.



□ Including configuration data
● Backup D:\Backup
○ Restore
○ Reset CMS database to delivery status

Figure 7-77 Maintenance (backup / restore)

This dialog contains the functions for database maintenance. For all functions, a parameter can be used to determine whether the configuration file should be included in the function as well (see Chapter System: Basic settings (Page 213)).

When a backup is performed, the contents of all tables are always copied to the target directory. Data cannot be selected more specifically. In order to ensure that data of different database dates are not mixed, all data from a previous backup operation are deleted from the target directory before the next backup is performed.

The function for resetting the database to its delivery state is used to empty all tables of their contents and fill them up again with the data provided during installation.

7.4.3.26 System: Basic settings

In the acquisition dialog for modifying basic settings, the contents of the CMS configuration file can be adapted to meet specific requirements. A template for this configuration file is installed with the CMS software.

When the CMS Editor is launched for the first time, this template is copied to the CMS directory within the WinCC project directory. This means that these settings can be adapted specifically for each WinCC project. However, no provision is made for user-specific settings.

"Colors" tab

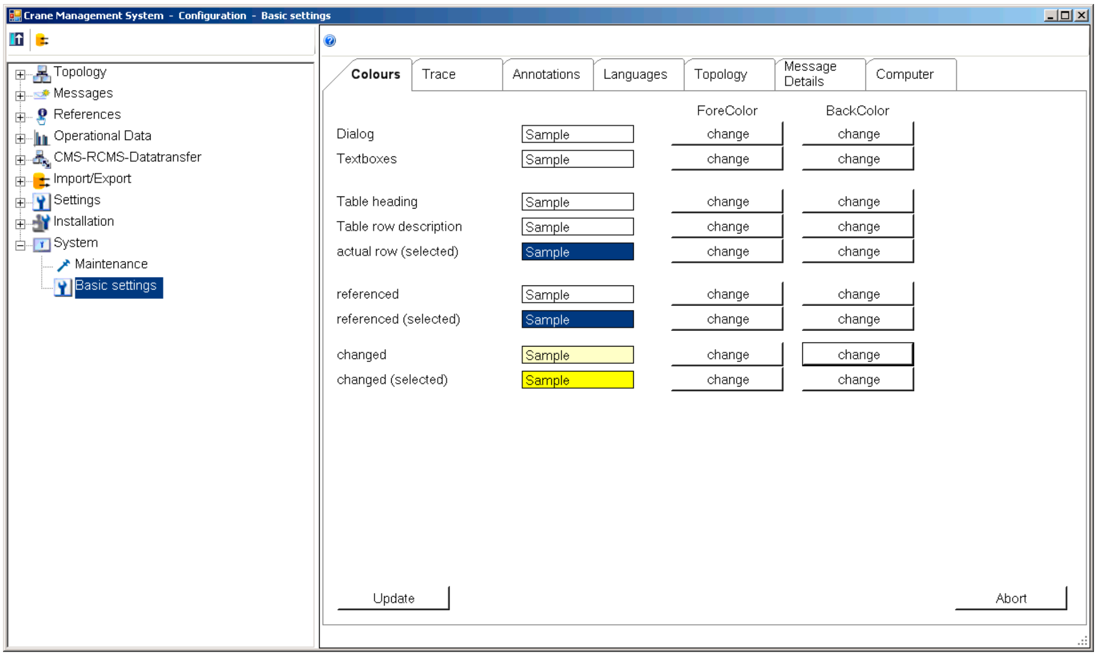
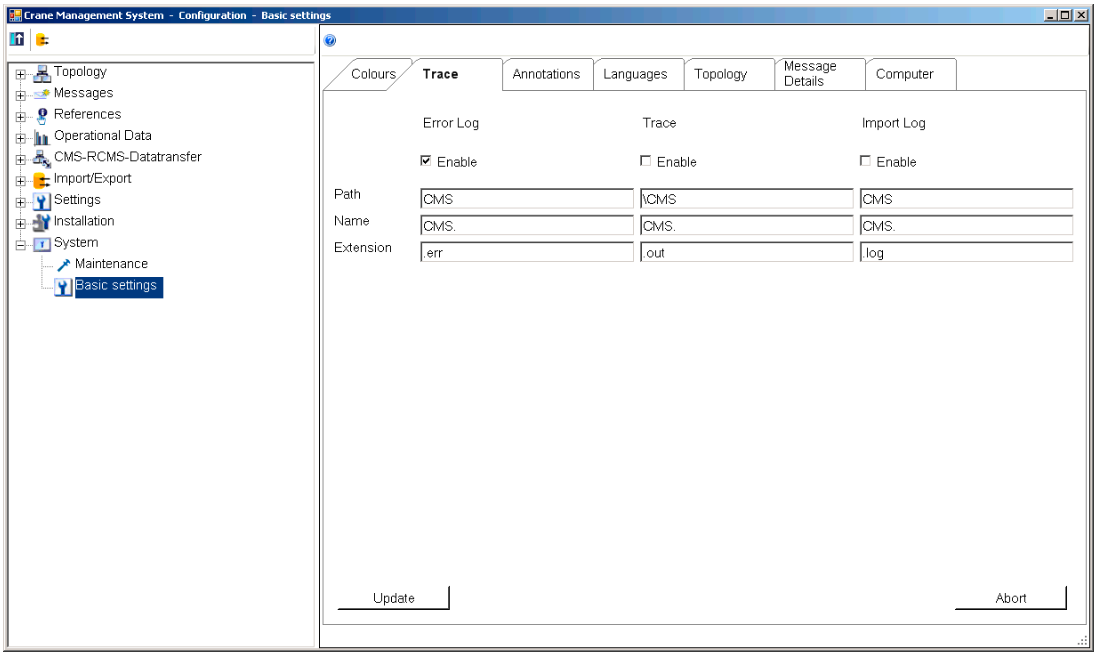


Figure 7-78 Changing the basic settings: Colors

All relevant colors for displaying CMS objects can be set on the "Colors" tab. Before the colors for all objects are accepted, they can be viewed in the example fields.

- Dialog: The colors of the dialogs for acquisition of data
- Testboxes: The colors of all input fields
- Table heading: The color of the table captions
- Table row description: The color of the row labeling in the tables
- actual row(selected): Marking a selected element
- referenced: Color of an element if there are references for this element
- referenced(selected): Marking of a selected element if there are assignments to this element
- changed: Color of an element if something has been changed
- changed(selected): Marking of a selected element if this element has been changed

"Logs" tab



	Error Log	Trace	Import Log
	☑ Enable	☐ Enable	☐ Enable
Path	CMS	\CMS	CMS
Name	CMS.	CMS.	CMS.
Extension	.err	.out	.log

Figure 7-79 Changing the basic settings: Trace

The settings for the CMS Trace functions are selected under the "Trace" tab. The format of log file names is generally as follows:

```
<path>\<name>.<year>.<month>.<extension>
```

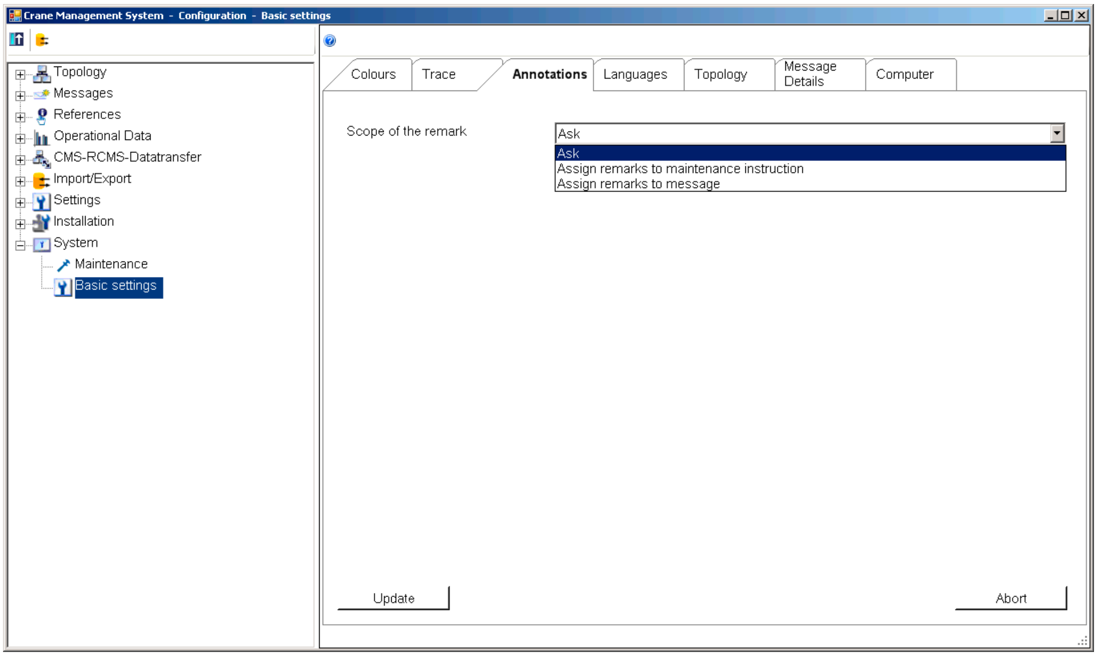
This means that a new log file is created every month. Log files are always extended. They must be deleted by the user as no function has been implemented to delete them automatically.

As soon as a log file has reached a certain size, the logged status up until then is backed up with a consecutive number as a supplement. The current file is deleted and then continued with the actual outputs.

The following log files can be provided by the system:

- Error log
  The error log records all internal errors which occur in the CMS system. If no WinCC project is open or if the function is not enabled, then these entries are written to the Windows event log.
- Execution log
  The execution log stores a large quantity of internal information about the CMS execution history. The primary purpose of this file is to provide detailed troubleshooting information when required. However, as it can become very long over a relatively short period and a considerable amount of time is required to write the log, this log should be activated only if its diagnostic functions are really needed.
- Import log
  All errors and warnings relating to imports are always displayed in a dialog. In addition to this dialog, errors and warnings relating to imports can also be logged in a file.

"Comments" tab



Scope of the remark: Ask

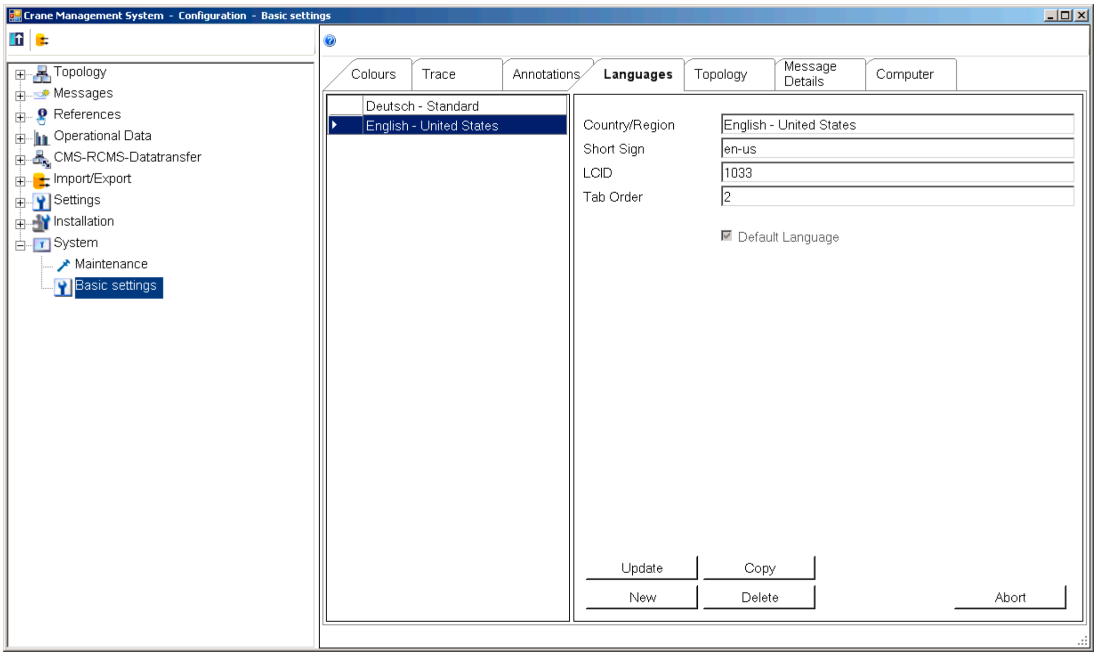
Ask
Assign remarks to maintenance instruction
Assign remarks to message

Figure 7-80 Changing the basic settings: Validity of remarks

The response of the CMSFaults control to the input of remarks on maintenance instructions can be defined on the "Annotations" tab.

- Ask
  Every time a remark is stored, a dialog is displayed in which the user can define the validity of the entered remark.
- Global
  All entered remarks are assigned to the maintenance instruction itself. Since a maintenance instruction text can be assigned to multiple WinCC messages as well as multiple cranes or equipment types, an assigned remark is displayed at every location at which the instruction text is used.
- Local
  All entered remarks are assigned to the WinCC message.

"Languages" tab



Country/Region: English - United States
Short Sign: en-us
LCID: 1033
Tab Order: 2
☑ Default Language

Figure 7-81 Changing the basic settings: Acquisition of languages

The languages which are available for use in the CMS can be maintained on the "Languages" tab. If a new language is set up here, the language-specific information of the default language is copied for the new one. Using the export functions, this information can then be exported for translation and finally imported again.

In order to ensure that one language is always designated as the default, the tick next to the default language can never be removed directly. To define a different language as the default, the new default language must be selected and ticked as the default. The system then automatically removes the tick from the default language checkbox on the other language.

The language-specific texts to be loaded from the database for displaying CMS objects are defined by the LCID and the code. The LCID is determined by WinCC ODK functions and the language-specific texts are then selected on the basis of the code. For a description of these data, please refer to WinCC Help, Description of VBS Fundamentals, item "Local ID (LCID) Chart".

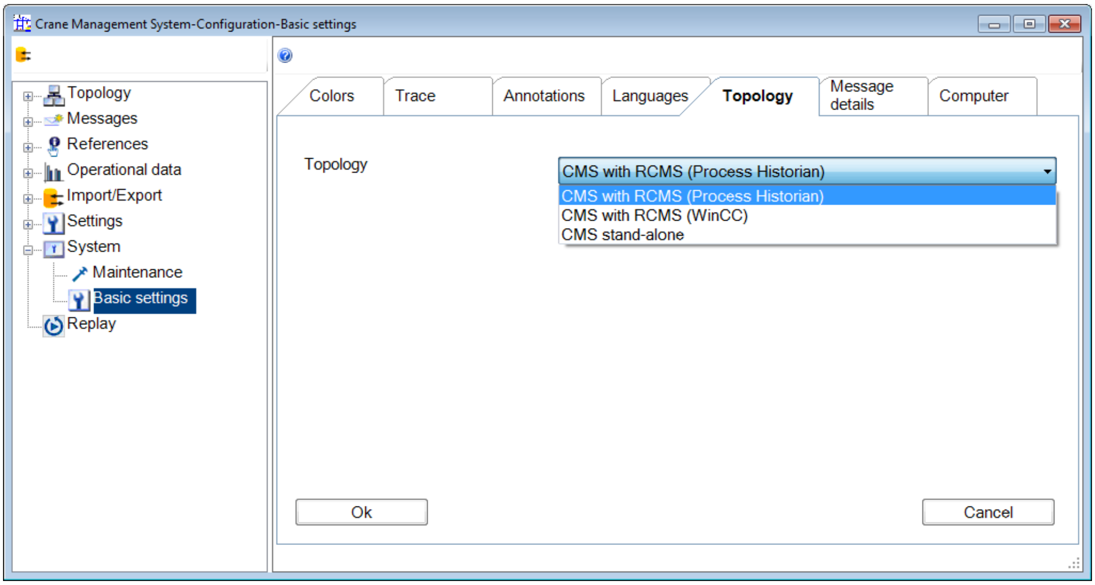
The tab sequence merely controls the sequence in which the tabs for individual languages are displayed in the dialog for maintaining language-specific texts.

Mandatory fields:

- Country / Region
- Code
- LCID
- Tab sequence

The changes on this tab are stored only with the buttons which are displayed on the tab itself. The buttons at the bottom of the dialog have no function in this tab.

"Topology" tab



Topology: CMS with RCMS (Process Historian)

Figure 7-82 Changing the basic settings: Topology

The topology of the system can be defined on the "Topology" tab. The following settings can be selected:

- CMS stand-alone
- CMS with RCMS (Process Historian)
- CMS with RCMS (WinCC)

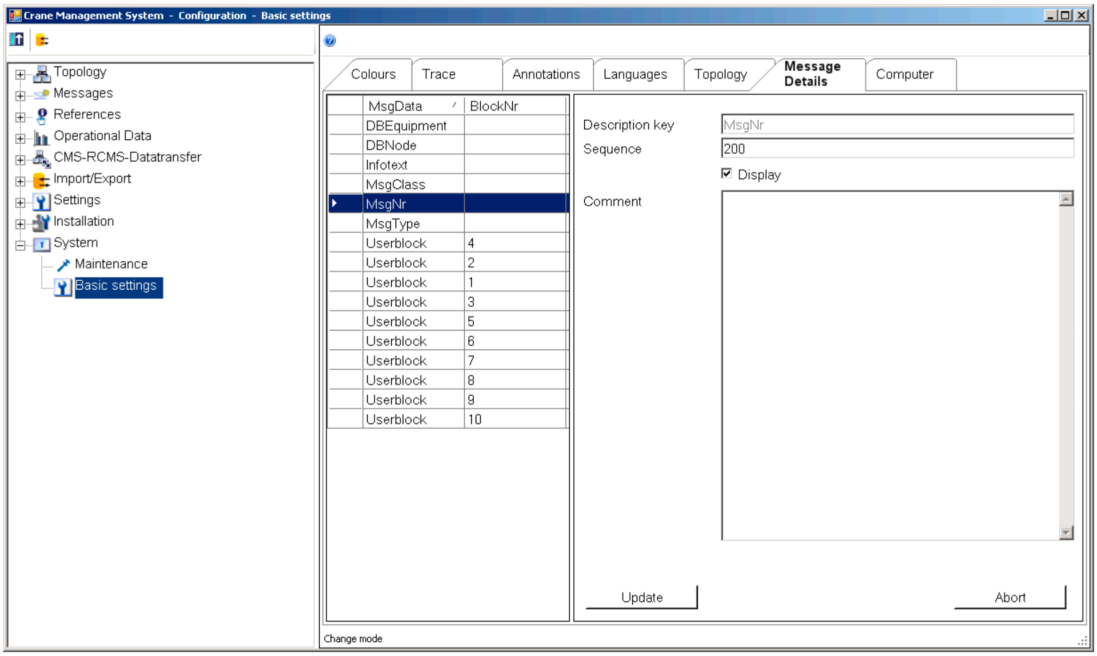
There must be precisely one equipment type and one crane.

Note

Every time the topology settings are changed, the CMS Editor must be closed so that the changes can be applied in the editor.

For the changed settings to be applied, the CMS Editor and CMS Runtime must be ended and restarted.

"Message Details" tab



MsgData	BlockNr
DBEquipment	
DBNode	
Infotext	
MsgClass	
MsgNr	
MsgType	
Userblock	4
Userblock	2
Userblock	1
Userblock	3
Userblock	5
Userblock	6
Userblock	7
Userblock	8
Userblock	9
Userblock	10

Description key: MsgNr
Sequence: 200
☑ Display
Comment:

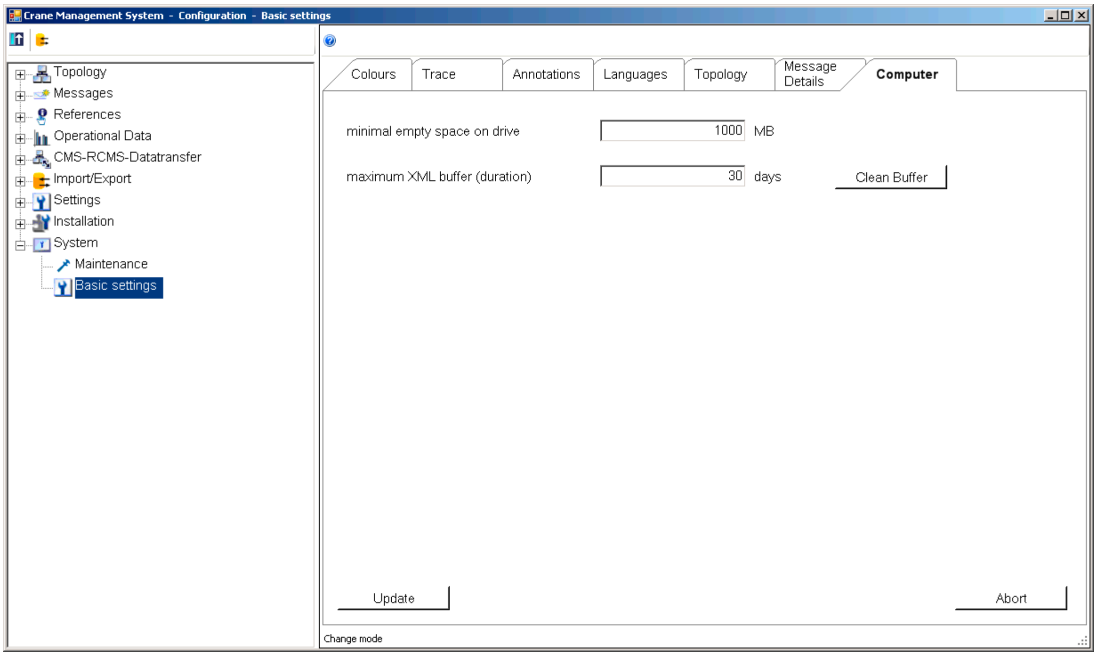
Figure 7-83 Changing the basic settings: Message details

In the "Message details" tab, the display of message details (message text blocks) from the WinCC Alarm Logging can be controlled in the CMSFaults Control.

Table 7-35 Basic settings: Message details

Input field	Meaning	Unique	Mandatory field
Sequence	Numeric value to control the sequence in the display in the CMSFaults Control. The block with the lowest value is displayed first.	no	yes
Display	Select whether data acquisition is activated.	no	no
Comment	Optional comment	no	no

"Computer" tab



minimal empty space on drive 1000 MB

maximum XML buffer (duration) 30 days

Figure 7-84 Changing the basic settings: Computer

Note

This tab is only available for the topology "CMS with RCMS (WinCC)".

You can specify the following settings under the "Computer" tab:

- Minimum free hard disk space on the CMS station:
  If the free disk space falls below this lower limit when an XML file is written (data transferred to the RCMS server), the function for writing XML files will be stopped. From this point, data will only be entered in the crane's Tag Logging archives.
- Maximum buffer time for XML files:
  Once XML files become older than a certain number of days, these files, including the date-based folder, are deleted.

Note

Do not use any method other than the "Clear buffer" button to delete the XML files and transfer directories. By doing this, you ensure that the system can continue to generate XML files.

If you delete the transfer directories manually, you might also delete the directory required for current XML files. This directory is created only once per day or when the CMS is restarted.

Configuring the CMS application 8

8.1 Important note about adapting the CMS application

This chapter describes the configuration work you need to perform in the CMS example application in order to adapt the example application to your specific requirements. It describes configuration work which is specific to the CMS example application. It is assumed that you are generally familiar with WinCC.

Note

Technical requirements for adapting the example application:

- Very good knowledge of WinCC
- Detailed knowledge of the Replay function
- If scripts have to be written:
  Experience with writing scripts (VB scripts and/or C scripts)

Note

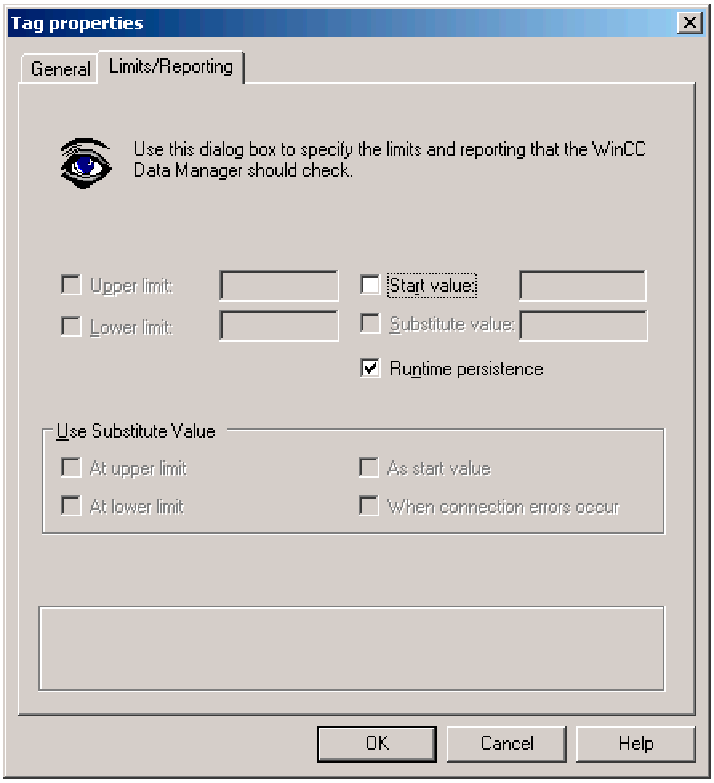
Note the design information provided in the appendix when undertaking configuration work.

8.2 Default settings in the example application

Initial situation

Some parameters that are required in the status display of the example application (limits for traveling distances) can be parameterized in the runtime interface, without changing the WinCC screens in the editor. This parameter assignment can be performed during system runtime and does not require a restart.

The settings you undertake in the runtime are written to internal WinCC tags. You can find all tags that contain settings in the internal WinCC tag group "Settings". The property "Runtime Persistence" is set for all tags of this tag group. This means that the value that this tag had before WinCC Runtime was stopped the last time, is re-established the next time that the runtime is started.



Tag properties

General | Limits/Reporting

Use this dialog box to specify the limits and reporting that the WinCC Data Manager should check.

□ Upper limit:
□ Lower limit:
□ Start value:
□ Substitute value:
☑ Runtime persistence

Use Substitute Value
□ At upper limit
□ At lower limit
□ As start value
□ When connection errors occur

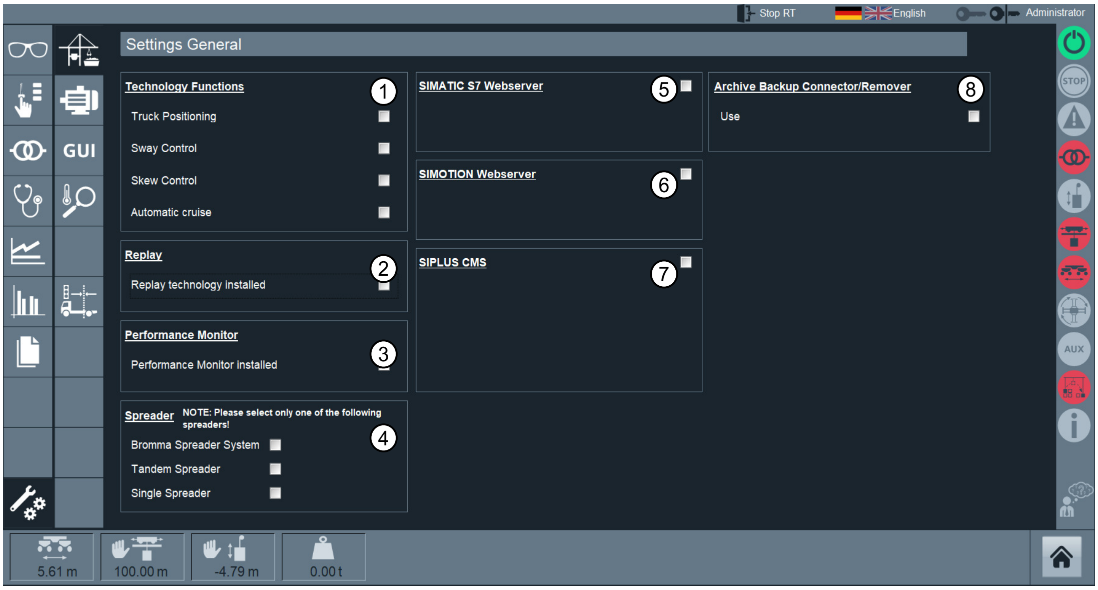
Figure 8-1 Runtime persistency

Processing steps

1. Start the WinCC Runtime.
2. Log onto the start page of the CMS user interface as an administrator.
3. Open the "Settings" menu and define your parameters in the individual tabs of the menu.

8.2.1 "Settings General" tab

The following display provides an overview of the setting options available in the "General" tab.



Settings General

Technology Functions ①
Truck Positioning □
Sway Control □
Skew Control □
Automatic cruise □

Replay ②
Replay technology installed □

Performance Monitor ③
Performance Monitor installed

Spreader NOTE: Please select only one of the following spreaders! ④
Bromma Spreader System □
Tandem Spreader □
Single Spreader □

SIMATIC S7 Webserver ⑤ □

SIMOTION Webserver ⑥ □

SIPLUS CMS ⑦ □

Archive Backup Connector/Remover ⑧
Use □

① Technology functions — Select the technology functions present. Enter the computer name (if present) of the WebNavigator Client PC in the crane cabin if you want to restrict operation of the technology functions to this PC.

② Replay — To be able to use the Replay function on the user interface of the CMS, select "Replay technology installed."

③ Performance Monitor — To be able to use the Performance Monitor function on the user interface of the CMS, select "Performance Monitor installed."

④ Spreader — Check the box of the crane spreader you want to use.

⑤ SIMATIC S7 web server — Select whether in your project the web server on the SIMATIC S7 CPU is activated. Then enter the IP address of your S7.

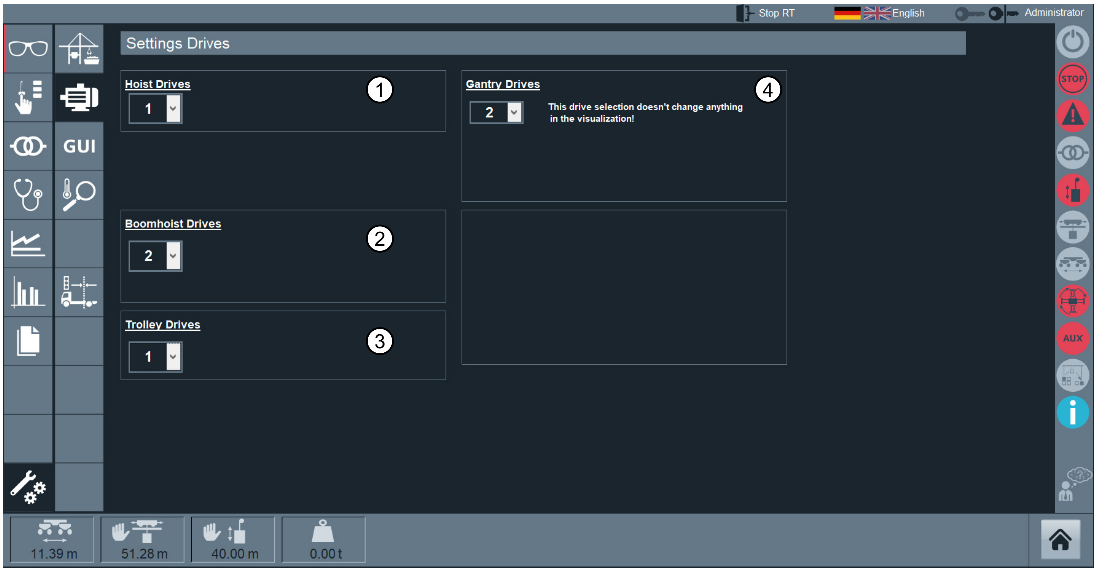
⑥ SIMOTION web server — Select whether in your project the web server on SIMOTION is activated. Then enter the IP address of your SIMOTION.

⑦ SIPLUS CMS — Select whether the SIPLUS Trace Viewer is to be used in your project. Then enter the IP address and the port number of the Trace Viewer server.

⑧ Archive Backup Connector/ Remover — Check this box if you want to link WinCC backup archives with the application.

8.2.2 "Settings Drives" tab

The following display provides an overview of the setting options available in the "Drives" tab.



Settings Drives

Hoist Drives: 1

Gantry Drives: 2

This drive selection doesn't change anything in the visualization!

Boomhoist Drives: 2

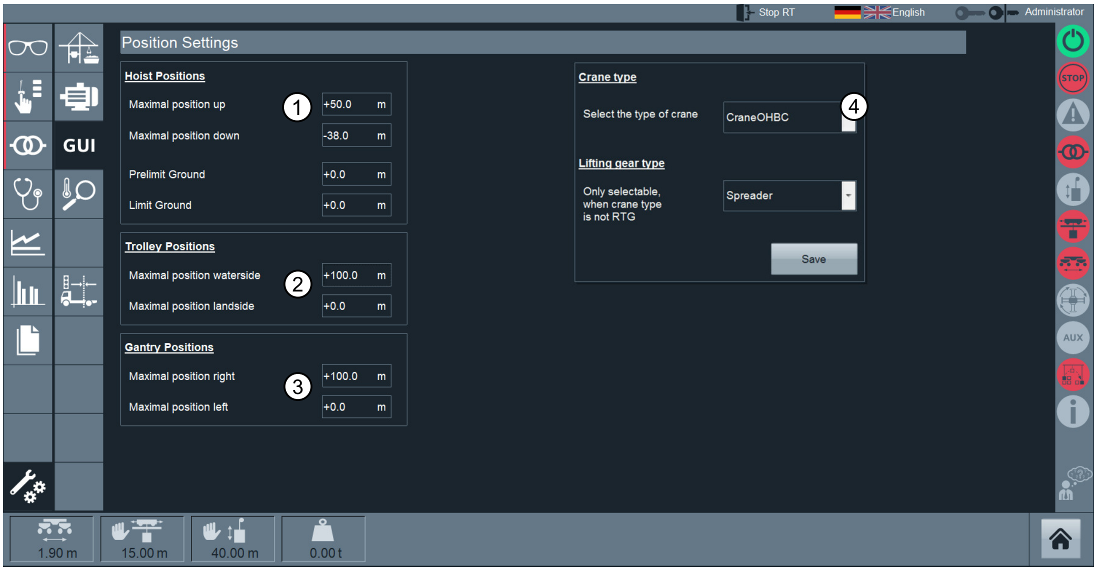
Trolley Drives: 1

11.39 m | 51.28 m | 40.00 m | 0.00 t

① Hoist Drives	Enter the number of hoist drives.
② Boomhoist Drives	Enter the number of boom-hoist drives.
③ Trolley Drives	Enter the number of trolley drives.
④ Gantry Drives	Enter the number of gantry drives.

8.2.3 "GUI Settings" tab

The following display provides an overview of the setting options available in the "GUI Settings" tab.



Position Settings

Hoist Positions

Maximal position up +50.0 m

Maximal position down -38.0 m

Prelimit Ground +0.0 m

Limit Ground +0.0 m

Trolley Positions

Maximal position waterside +100.0 m

Maximal position landside +0.0 m

Gantry Positions

Maximal position right +100.0 m

Maximal position left +0.0 m

Crane type

Select the type of crane CraneOHBC

Lifting gear type

Only selectable, when crane type is not RTG Spreader

Save

① Hoist Positions

"Maximal position up":
Specify the maximum traversing position of the hoist in the upward direction.

"Maximal position down":
Specify the maximum traversing position of the hoist in the downward direction.

"Prelimit Ground":
Specify the height of the hoist above the ground as of which a visual warning status is displayed (yellow).

"Limit Ground":
Specify the height of the hoist above the ground as of which a visual fault status is displayed (red).

② Trolley Positions

"Maximal position waterside":
Specify the maximum traversing position of the trolley on the waterside.

"Maximal position landside":
Specify the maximum traversing position of the trolley on the landside.

③ Gantry Positions

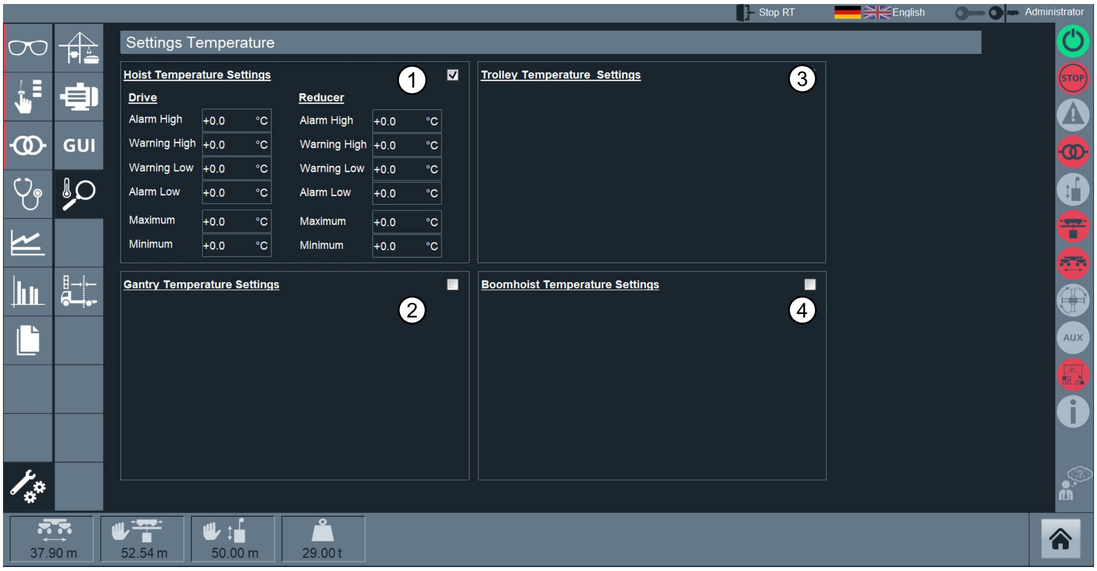
"Maximal position right":
Specify the maximum traversing position of the gantry towards the right.

"Maximal position left":
Specify the maximum traversing position of the gantry towards the left.

④ Crane type & hoist equipment	Depending on the selection, the appearance of the crane changes in the start picture. Note: *This selection is only for the application example "Lean"*! Note: *In WinCC, you can create additional crane types and hoist equipment in the selection list.* *You must create a picture <crane type>_<hoist equipment>.pdl for each possible combination of crane type and hoist equipment.* *Ensure that <crane type> and <hoist equipment> are written precisely the same in the list and in the picture names.* "Crane type": Select the crane type. "Hoist equipment": Select the hoist equipment being used. "Save": Saves the selection of the crane type and the hoist equipment type.

8.2.4 "Settings Temperature" tab

The following display provides an overview of the setting options available in the "Temperature" tab.



Settings Temperature

Hoist Temperature Settings ☑

Drive			Reducer		
Alarm High	+0.0	°C	Alarm High	+0.0	°C
Warning High	+0.0	°C	Warning High	+0.0	°C
Warning Low	+0.0	°C	Warning Low	+0.0	°C
Alarm Low	+0.0	°C	Alarm Low	+0.0	°C
Maximum	+0.0	°C	Maximum	+0.0	°C
Minimum	+0.0	°C	Minimum	+0.0	°C

Trolley Temperature Settings

Gantry Temperature Settings □

Boomhoist Temperature Settings □

① Hoist Temperature Settings

Temperature settings for the drives and brakes of the hoist.

The bar chart display is activated when you check the box.

"Alarm High":
Specify the temperature as of which an excess temperature alarm must be output.

"Warning High":
Specify the temperature as of which an excess temperature warning must be output.

"Warning Low":
Specify the temperature as of which a low temperature warning must be output.

"Alarm Low":
Specify the temperature as of which a low temperature alarm must be output.

"Maximum":
Enter the upper limit for the bar chart here.

"Minimum":
Enter the lower limit for the bar chart here.

② Gantry Temperature Settings

Temperature settings for the drives and brakes of the gantry.

The bar chart display is activated when you check the box.

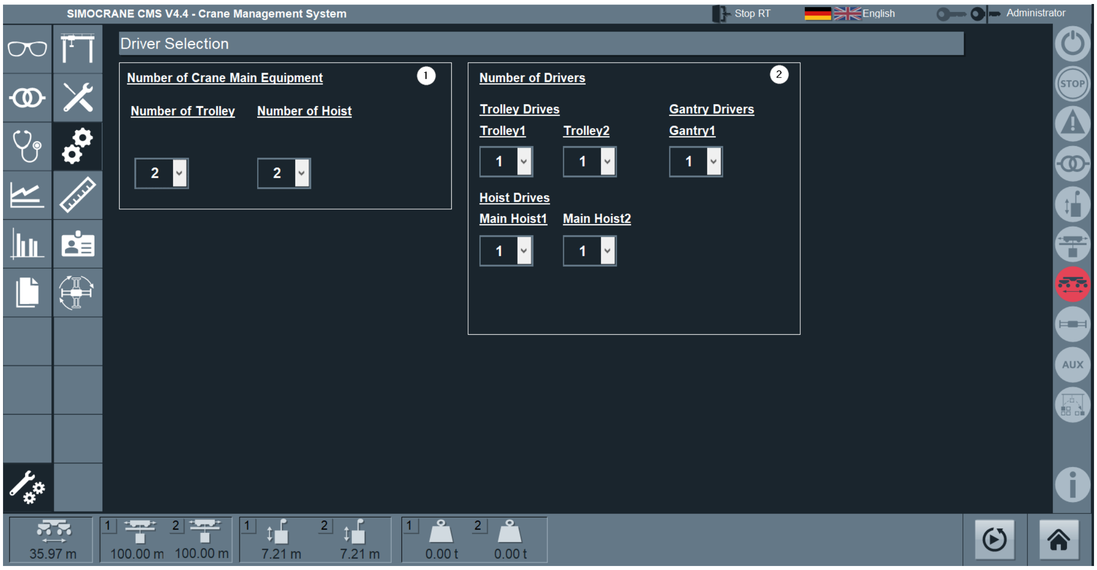
See ① for settings.

③ Trolley Temperature Settings — Temperature settings for the drives and brakes of the trolley.
The bar chart display is activated when you check the box.
See ① for settings.

④ Boomhoist Temperature Settings — Temperature settings for the drives and brakes of the boom-hoist.
The bar chart display is activated when you check the box.
See ① for settings.

8.2.5 "Drive Selection" tab

The following display provides an overview of the setting options available in the "Drive Selection" tab.



Driver Selection

Number of Crane Main Equipment ①
Number of Trolley: 2
Number of Hoist: 2

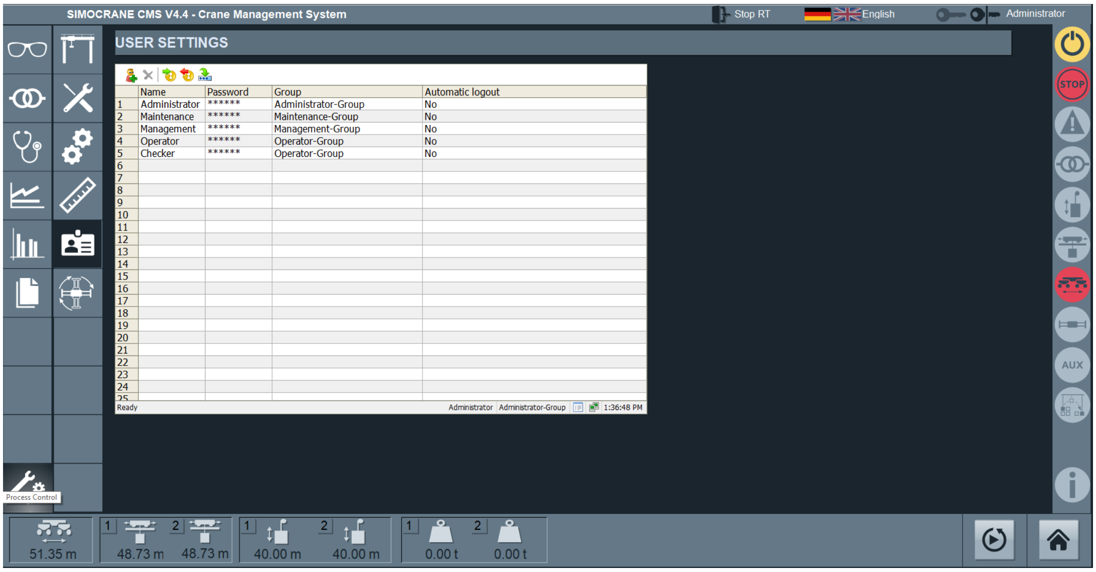
Number of Drivers ②
Trolley Drives
Trolley1: 1
Trolley2: 1
Gantry Drivers
Gantry1: 1
Hoist Drives
Main Hoist1: 1
Main Hoist2: 1

① Number of Crane Main Equipment — Select the number of trolleys and hoists.

② Number of Drives — Select the number of drives for trolleys, hoists and gantry.

8.2.6 "User settings" tab

The following display provides an overview of the setting options available in the "User settings" tab.



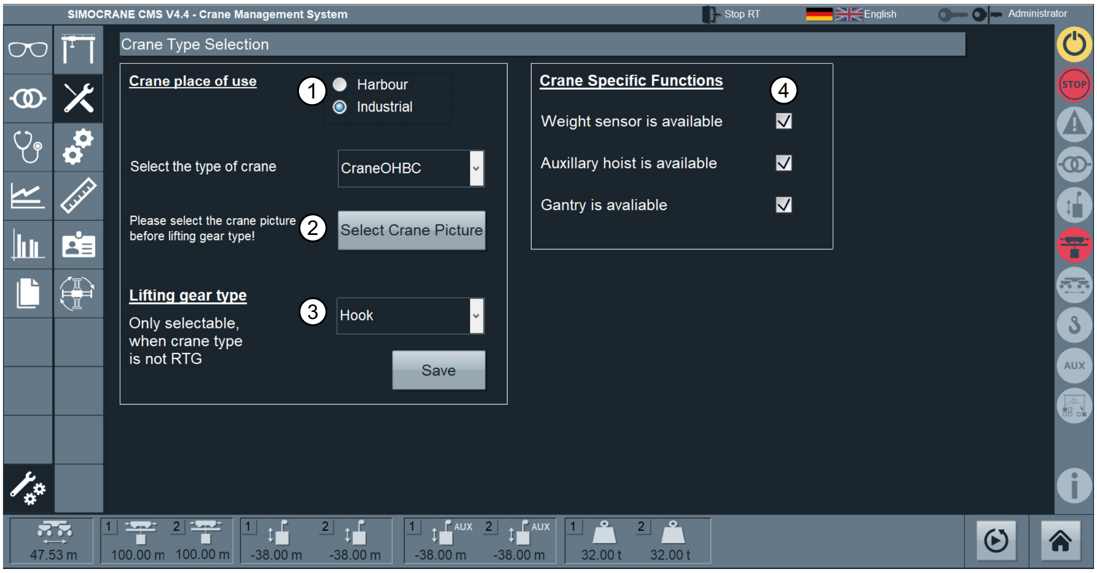
	Name	Password	Group	Automatic logout
1	Administrator	******	Administrator-Group	No
2	Maintenance	******	Maintenance-Group	No
3	Management	******	Management-Group	No
4	Operator	******	Operator-Group	No
5	Checker	******	Operator-Group	No
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Ready Administrator Administrator-Group 1:36:48 PM

You can create and delete users, and you can change user names and passwords.

8.2.7 "Crane Type Selection" tab

The following display provides an overview of the setting options available in the "Crane Type Selection" tab.



Crane Type Selection

Crane place of use
○ Harbour
● Industrial

Select the type of crane: CraneOHBC

Please select the crane picture before lifting gear type!

Lifting gear type
Only selectable, when crane type is not RTG: Hook

Crane Specific Functions
Weight sensor is available ☑
Auxillary hoist is available ☑
Gantry is avaliable ☑

① Crane place of use: Select the location where the crane is in use.

You can select different crane types depending on the place of use:

- Harbor:
  RTG
  RMG
- Industrial:
  OHBC

② Select crane picture: Select the crane picture that is to be displayed on the CMS home screen and diagnostics pages.

③ Lifting gear type: Select the hoist equipment of the crane.

④ Crane-specific functions: Select the properties of the crane:

- Weight sensor
- Auxiliary hoist
- Gantry

8.3 Windows and window contents

8.3.1 Window layout in the example application

All permanently visible picture windows in the example application are shown in the following figure

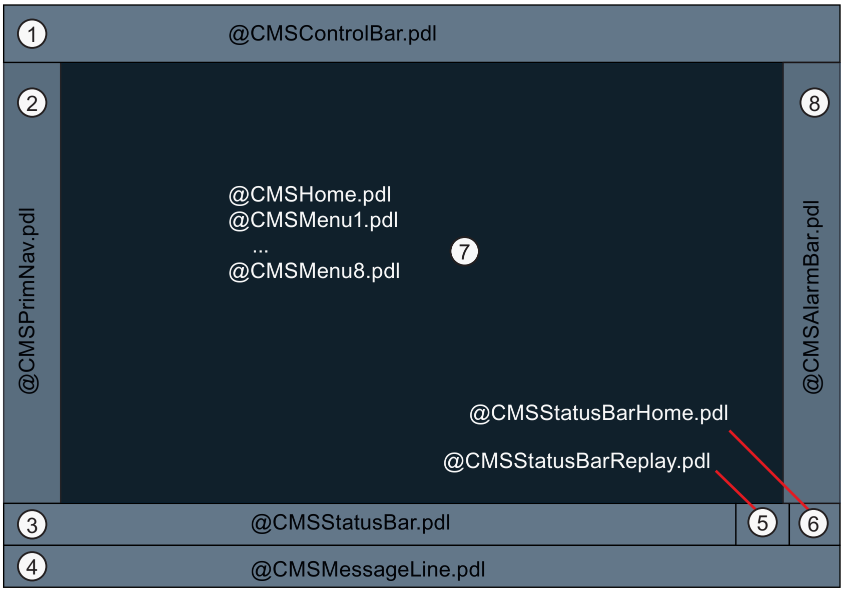


Figure 8-2 Window layout in the example application

No.	Description
①	Control bar
②	Primary navigation bar
③	Status bar window
④	Message line
⑤	Replay button
⑥	Home button
⑦	Menu window
⑧	Group display

A picture tag is assigned to each picture window with a dynamized picture name (Picture name property).

8.3.2 General information about picture navigation

Screen navigation is based on internal WinCC tags.

- Status tag: Status of navigation bars (Type Byte)
- Picture tag: Screen name of a picture window (Type Text-8)
- Display tag: Visibility of detail and dialog windows

A picture tag is assigned to each picture window with a dynamized picture name (Picture name property). The figure below illustrates how picture tags are used to switch between screens and how the three navigation levels are interconnected:

- The main screen is shown in ①. The menu window is colored blue, since it is a picture window with picture tags.
- The first button of the primary navigation is pressed in ②. The menu window is assigned to the main screen of the first menu via the picture tag. The main screen contains one or two picture windows and a navigation window. The first menu contains two picture windows and a navigation bar window for the secondary navigation. The secondary navigation dynamizes the picture tags of one of the picture windows.
- ③ indicates that the first button in the secondary navigation bar assigns a screen to the picture window (GeneralDiagnostics.Pdl).

The screens contain one or more magnifying glass pushbuttons. The magnifying glass button can be used to open a detail screen ④. When this happens, the display tag for the detail window is set to"TRUE" in the main screen and a picture name is assigned to the picture tag.

The same procedure applies to all the other menus.

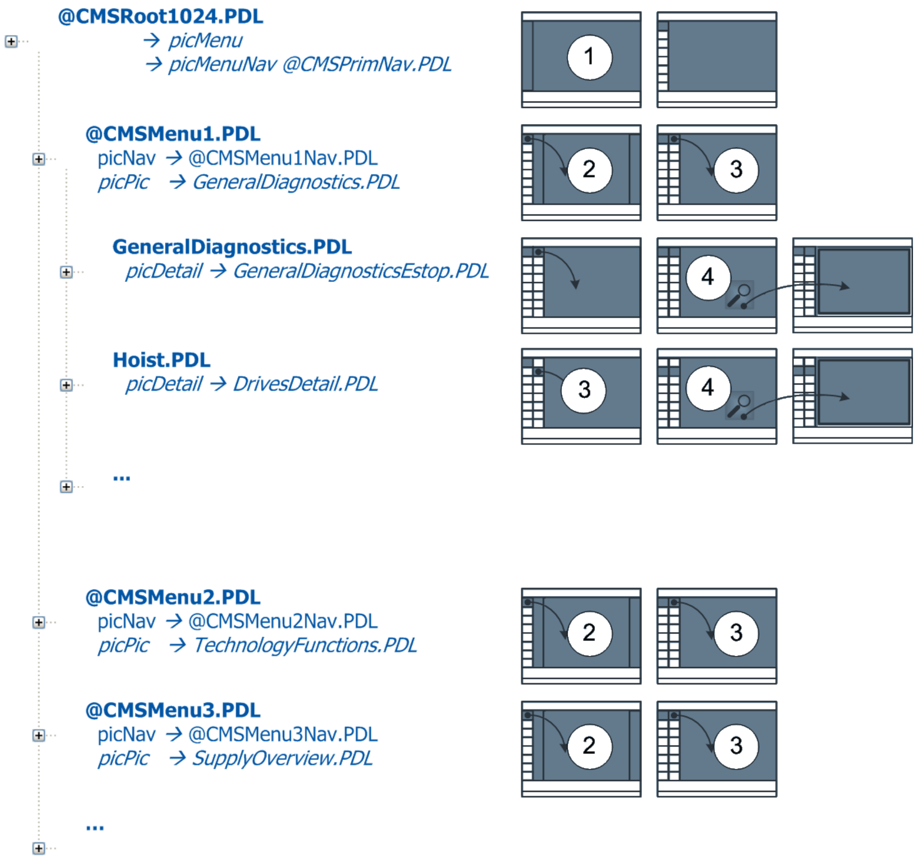

@CMSRoot1024.PDL
→ picMenu
→ picMenuNav @CMSPrimNav.PDL
1
@CMSMenu1.PDL
picNav → @CMSMenu1Nav.PDL
picPic → GeneralDiagnostics.PDL
2
3
GeneralDiagnostics.PDL
picDetail → GeneralDiagnosticsEstop.PDL
4
Hoist.PDL
picDetail → DrivesDetail.PDL
3
4
...
@CMSMenu2.PDL
picNav → @CMSMenu2Nav.PDL
picPic → TechnologyFunctions.PDL
2
3
@CMSMenu3.PDL
picNav → @CMSMenu3Nav.PDL
picPic → SupplyOverview.PDL
2
3
...

Figure 8-3 Principle of screen navigation

There is an internal tag for each navigation bar and this features the selection status of the entire navigation bar (selection status tag). The tag changes its value as soon as a button is pressed in the navigation bar. Every button is assigned a selection status where the button is active. The buttons are WinCC status displays (see next section).

8.3.3 General information on detail pictures and buttons on detail pictures

Within a picture, you can create a button for opening a detail picture. When this happens, the display tag for the detail window is set to "TRUE" in the main screen and the picture name for the detail picture is assigned to the picture tag.

Naming convention for detail pictures

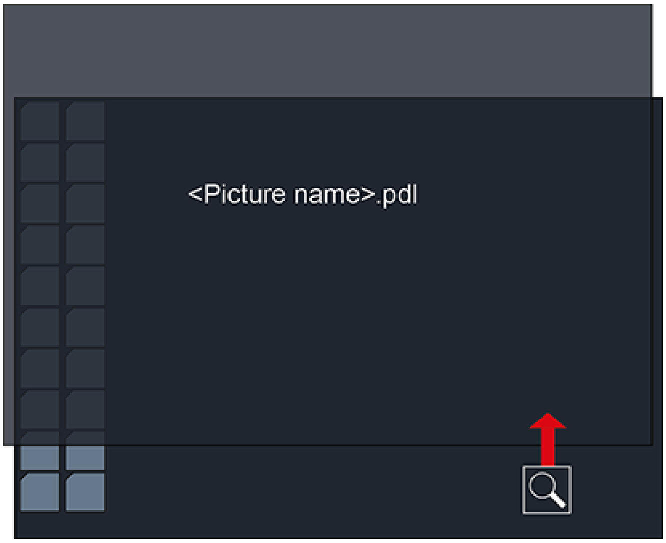
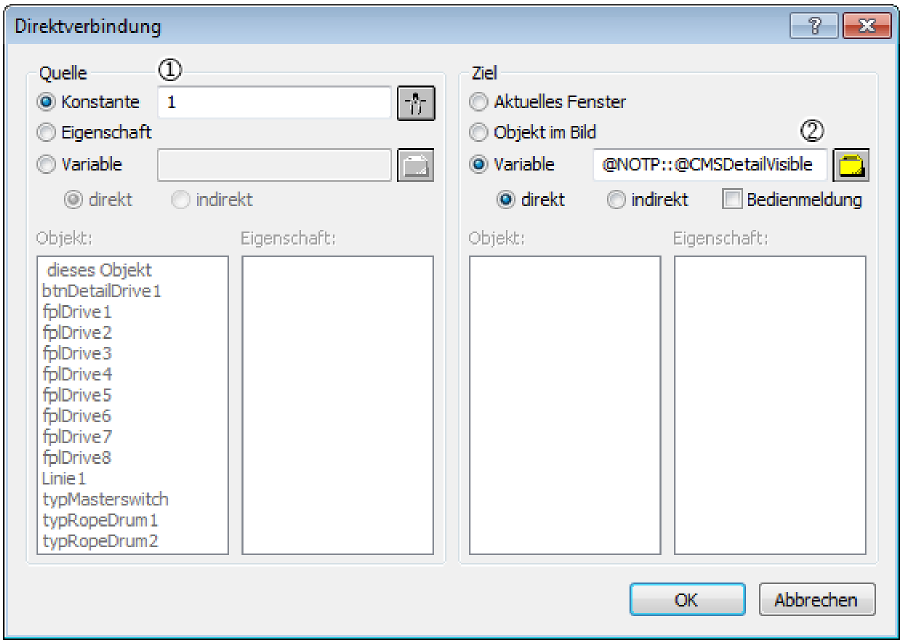


Figure 8-4 Naming convention for detail pictures

- Name of the detail picture:
  Except for the following restriction, you can freely select the name of the detail picture: The name of the detail picture must not start with "@".
- Name of the detail picture tag:
  @CMSDetailPic
- Name of the display tag for detail pictures:
  @CMSDetailVisible

Actions for the mouse click

For the mouse click on the button that opens the detail picture, you should have actions executed for the following events.
"Object properties" → "Event tab" → "Mouse" → "Mouse click"



Direktverbindung

Quelle ①
● Konstante 1
○ Eigenschaft
○ Variable
● direkt ○ indirekt

Objekt:
dieses Objekt
btnDetailDrive1
fplDrive1
fplDrive2
fplDrive3
fplDrive4
fplDrive5
fplDrive6
fplDrive7
fplDrive8
Linie1
typMasterswitch
typRopeDrum1
typRopeDrum2

Eigenschaft:

Ziel
○ Aktuelles Fenster
○ Objekt im Bild ②
● Variable @NOTP::@CMSDetailVisible
● direkt ○ indirekt □ Bedienmeldung

Objekt:

Eigenschaft:

OK Abbrechen

Figure 8-5 Object properties of the button for detail pictures

Event	Tag ①	Constant ②	Description
Mouse click	"@CMSDetailVisible"	"1"	This makes the detail picture visible.
Press Left	"@CMSDetailPic"	<picture name>.pdl	The name of the detail picture is entered here.
Release Left	"@CMSTagPrefix"	<tags prefix>	Only assign a tag prefix if it is required.

Note

To ensure that buttons also work in Replay mode, you must place the prefix @NOTP:: in front of the tags.

See: The tag prefix mechanism (Page 309)

8.4 Navigation bars and navigation buttons

8.4.1 General information on navigation bars and navigation buttons

With SIMOCRANE CMS, you can implement up to 10 primary navigation buttons and 10 secondary navigation buttons - in total therefore, up to 110 navigation buttons.

General information about navigation

Screen navigation is based on internal WinCC tags.

- Status tag: Status of navigation bars (Type Word)
- Picture tag: Screen name of a picture window (Type Text-8)
- Display tag: Visibility of detail and dialog windows

See also

Naming convention for pictures and secondary navigation bars (Page 237)

Naming convention of navigation buttons and visible tags for Replay (Page 237)

Navigation bar: Status tag (Page 238)

Navigation button: VB script for mouse click (Page 239)

Navigation bar: Creating a secondary bar (Page 240)

Creating a navigation button (Page 241)

Navigation button: Adapting the position (Page 243)

Navigation button: Adapting the link destination (Page 245)

Adapting navigation button for Replay (Page 334)

8.4.2 Naming convention for pictures and secondary navigation bars

The following naming conventions apply to the main pictures and their secondary navigation bars.

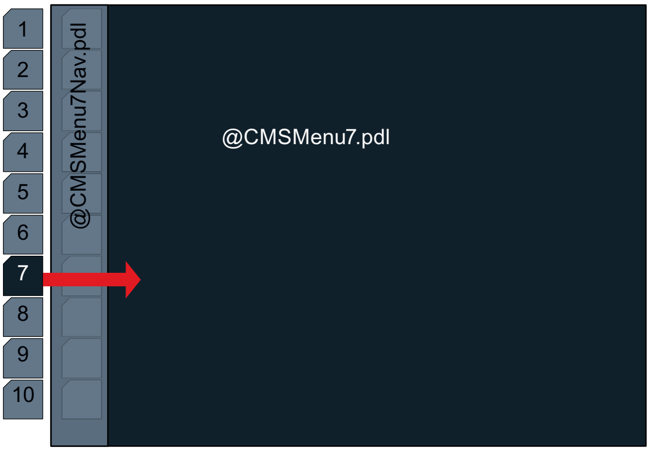


Figure 8-6 Naming convention for main pictures and secondary navigation bars

- Name of the picture "@CMSMenuX.pdl"
- Name of the picture tag: "@CMSMenuXPic"
- Name of the secondary navigation bar: "CMSMenuXNav.pdl"
- Status tag of the navigation bar: "@CMSMenuXSelection"

"X" is the position of the button of the primary navigation bar that calls the window with the navigation bar.

8.4.3 Naming convention of navigation buttons and visible tags for Replay

The following naming conventions apply to the navigation buttons and their visible tags.

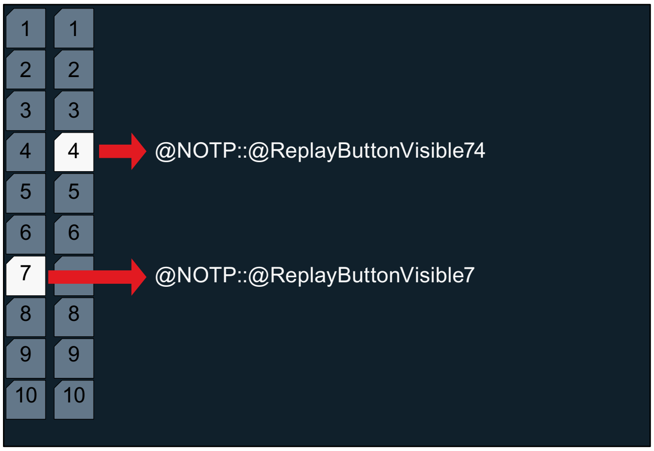


Figure 8-7 Button_visible, position of new buttons on the primary and secondary navigation bar

Name and visible tag of 7th button on the primary navigation bar:

- Name of the primary navigation button: "Button7"
- Name of the visible tag: "@NOTP::@ReplayButtonVisible7"

Name and visible tag of the 4th button on the secondary navigation bar that is called via the 7th button of the primary navigation bar.

- Name of the secondary navigation button: "Button7_PictureName"
- Name of the visible tag: "@NOTP::@ReplayButtonVisible74"

To ensure that navigation bars are correctly shown and hidden in Replay mode, the navigation buttons must be named according to the following convention:

- Names of the primary navigation buttons:
  "ButtonX", where "X" is a number between 1 and 10 and indicates the position of the navigation button in the primary navigation bar.
  The name must not contain an underscore character "_"!
- Names of the secondary navigation buttons:
  "ButtonX_Bildname", where "X" is the number of the level-1 button (number between 1 and 10) and "PictureName" is the name of the picture to be called without the file extension ".pdl".
  The name must not contain an underscore character "_"! The underscore character "_" is interpreted as a separator and must therefore not be used in the picture name.

8.4.4 Navigation bar: Status tag

Each navigation bar has its own internal status tag that represents the selection status of the entire navigation bar.

The tag changes its value as soon as a button is pressed in the navigation bar. Every navigation button is assigned a selection status where the button is active.

- Status tag of the primary navigation bar:
  @CMSPrimSelection
- Status tag of the secondary navigation bars:
  @CMSMenuXSelection; where X is a number between 1 and 10.

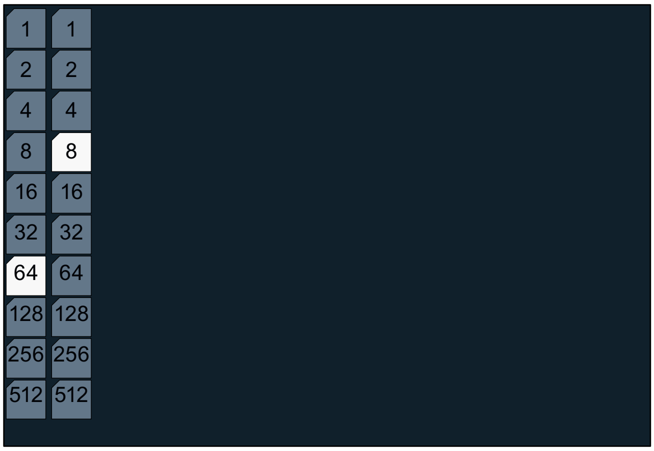


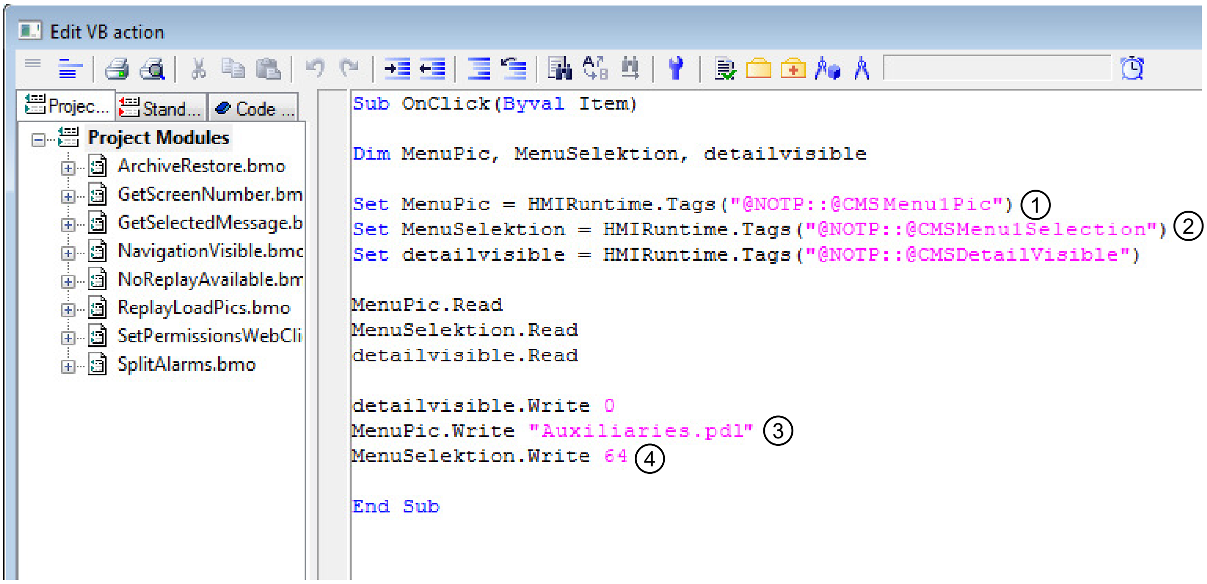
Figure 8-8 Values for the status tags of the primary and secondary navigation bars

The values for the status tags are displayed in the graphic. For example, the highlighted navigation button would have value "64" for the seventh position in the navigation bar.

To ensure that the navigation button graphic can be displayed correctly depending on status (selected, not selected), you must assign the position of the navigation button to the associated status tag.
See: "Navigation button: VB script for mouse click (Page 239)"

8.4.5 Navigation button: VB script for mouse click

You may have to adapt the VB script for the mouse click on a navigation button to the following aspects.



```
Sub OnClick(Byval Item)

Dim MenuPic, MenuSelektion, detailvisible

Set MenuPic = HMIRuntime.Tags("@NOTP::@CMSMenu1Pic") ①
Set MenuSelektion = HMIRuntime.Tags("@NOTP::@CMSMenu1Selection") ②
Set detailvisible = HMIRuntime.Tags("@NOTP::@CMSDetailVisible")

MenuPic.Read
MenuSelektion.Read
detailvisible.Read

detailvisible.Write 0
MenuPic.Write "Auxiliaries.pdl" ③
MenuSelektion.Write 64 ④

End Sub
```

Figure 8-9 NaviButtonClickScript

No.	Description
①	Picture tag that defines the image structure to be opened. • Primary navigation bar: `@CMSPrimPic` • Secondary navigation bars: `@CMSMenuXPic`; where X is a number between 1 and 10.
②	Status tag for the navigation bar Each navigation bar has its own status tag • Primary navigation bar: `@CMSPrimSelection` • Secondary navigation bars: `@CMSMenuXSelection`; where X is a number between 1 and 10.
③	Link destination (picture name) to which the navigation button is linked. • Primary navigation bar: `@CMSMenuX.pdl`; where X is a number between 1 and 10. • Secondary navigation bars: `<PictureName>.pdl`; for example, `Auxiliaries.pdl`
④	Sets the state of the status tag of the navigation bar. The value corresponds to the position of the navigation button on the navigation bar. See: "Navigation bar: Status tag (Page 238)"

8.4.6 Navigation bar: Creating a secondary bar

This section describes how to create a secondary navigation bar.

You must perform these steps if you want to insert a navigation bar into an existing window or if you want to create a new window with the navigation bar.

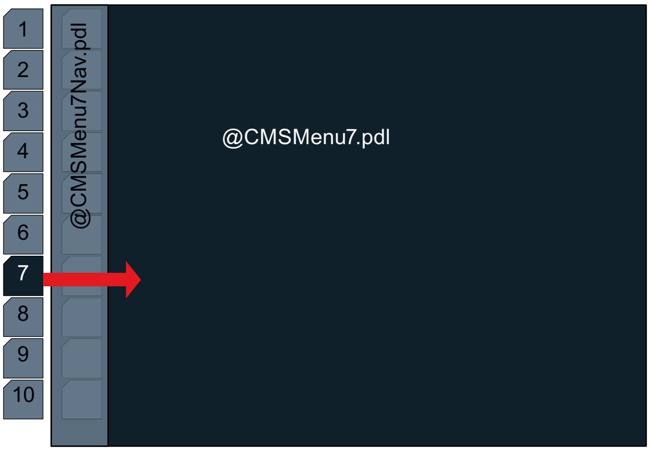


Figure 8-10 Naming convention for main pictures and secondary navigation bars

1. Create the window by applying the new navigation bar in accordance with the conventions for windows and navigation bars.
   See: "Naming convention for pictures and secondary navigation bars (Page 237)"

   Note

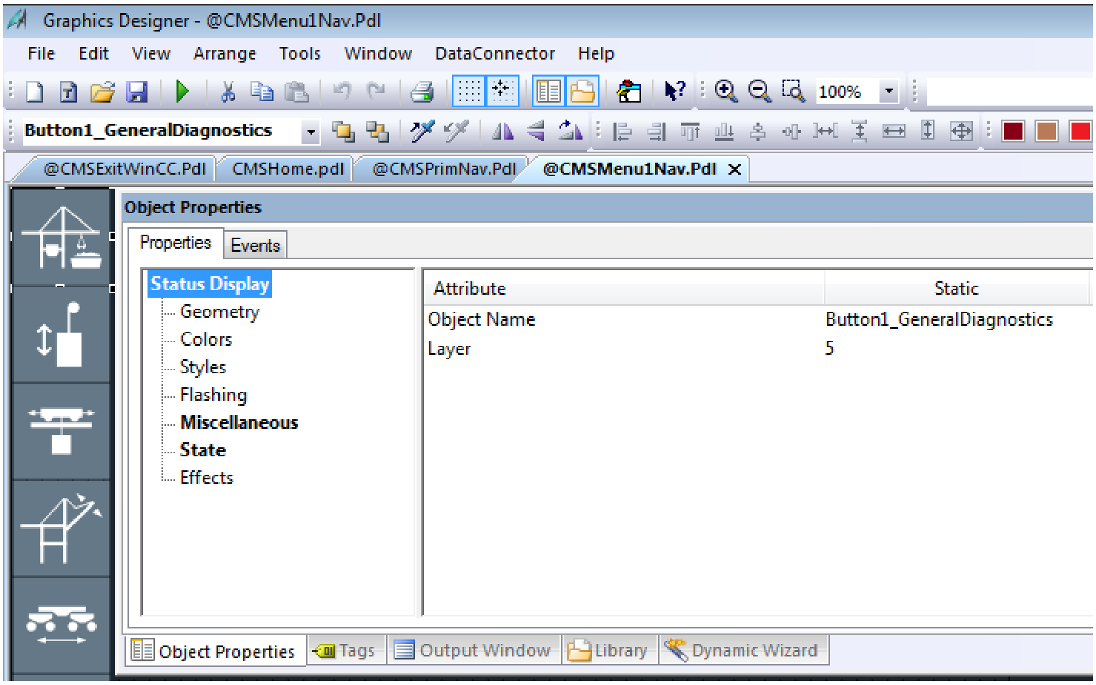
   You may have to create new picture window tags in the tag management.

2. Copy an existing navigation bar and give it an appropriate name.
3. Adapt the status tags of the navigation bar for all buttons:
   "Object properties" → "Event tab" → "Mouse" → "Mouse click"
   Adapt the status tag to the associated navigation bar.
   Example of the 7th secondary navigation bar:
   "subMenuSelektion = HMIRuntime.Tags ("@NOTP::@CMSMenu7Selection")"
4. Adapt the name and the visible tags of the navigation buttons.
   See: "Adapting navigation button for Replay (Page 334)"
5. Define the link destination of the navigation button.
   See: "Navigation button: Adapting the link destination (Page 245)"
6. Assign suitable graphics to the navigation button.
   See: "Navigation button: Adapting a graphic (Page 241)"

8.4.7 Creating a navigation button

This section describes how to create a navigation button on a primary or secondary navigation bar.

1. Use the shortcuts "Ctrl" + "C" and "Ctrl" + "V" in the Graphics Designer to duplicate an existing navigation button.
2. Adapt the name of the navigation button:
   "Object properties" → "Properties tab" → "Status display" → "Object name"
   For primary navigation buttons: "ButtonX"
   For secondary navigation buttons: "ButtonX_PictureName"
   See: "Naming convention of navigation buttons and visible tags for Replay (Page 237)"



Attribute	Static
Object Name	Button1_GeneralDiagnostics
Layer	5

Figure 8-11 Object name of secondary navigation buttons

3. Position the navigation button on the navigation bar and adapt it according to its position on the navigation bar.
   See: "Navigation button: Adapting the position (Page 243)"
4. Define the link destination of the navigation button.
   See: "Navigation button: Adapting the link destination (Page 245)"
5. Assign suitable graphics to the navigation button.
   See: "Navigation button: Adapting a graphic (Page 241)"

8.4.8 Navigation button: Adapting a graphic

This section describes how to change the graphics of a navigation button.

You can create your own graphics for buttons. These should have the following properties:

- Square format
- File format: .svg

Note

.svg graphics created with Visio are not correctly displayed in WinCC.

If necessary, application support for SIMOCRANE can provide a tool that prepares .svg graphics created with Visio for correct display in WinCC.

- Storage location: Project folder "GraCS" (<<WinCCProjectPath>>\GraCS)

Adaptation is described as exemplified by navigation button "Button2" of the primary navigation bar.

1. Open the navigation bar in Graphics Designer (in this example "@CMSPrimNav.Pdl").

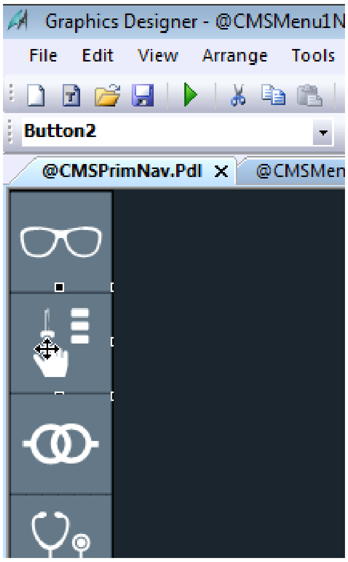
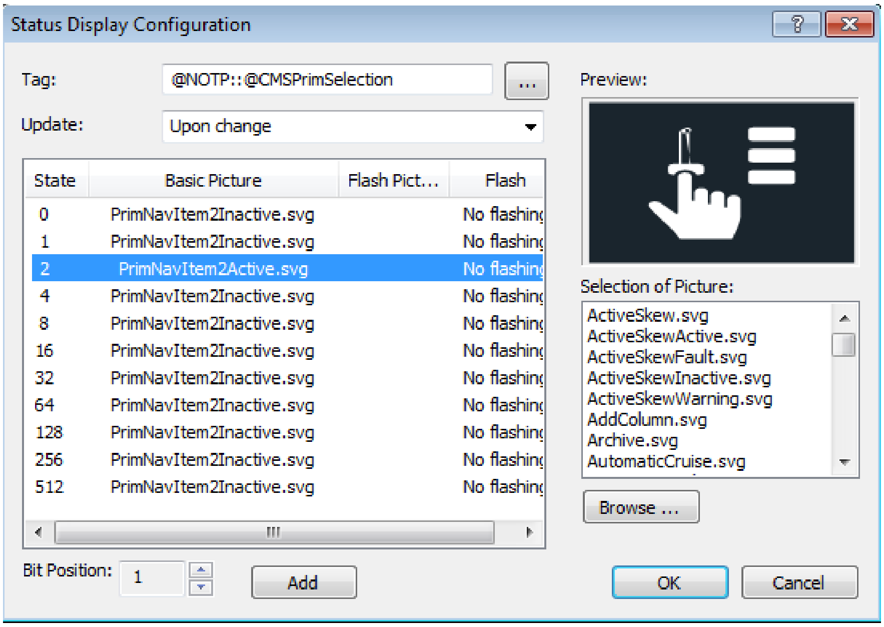


Figure 8-12 Graphic of the navigation bar "@CMSPrimNav.Pdl"

2. Right-click on Button2.
   A "Status Display Configuration" dialog box for Button2 opens.
3. Assign the graphics that will be displayed depending on the navigation button's status to the navigation button.
4. Select a suitable tag for the navigation bar in the "Tag" field.

5. Assign the graphic for "inactive" to all values in which the button is not selected.
6. Assign the graphic for "activated" to the value of the active status.



Status Display Configuration

Tag: @NOTP::@CMSPrimSelection

Update: Upon change

State	Basic Picture	Flash Pict...	Flash
0	PrimNavItem2Inactive.svg		No flashin
1	PrimNavItem2Inactive.svg		No flashin
2	PrimNavItem2Active.svg		No flashin
4	PrimNavItem2Inactive.svg		No flashin
8	PrimNavItem2Inactive.svg		No flashin
16	PrimNavItem2Inactive.svg		No flashin
32	PrimNavItem2Inactive.svg		No flashin
64	PrimNavItem2Inactive.svg		No flashin
128	PrimNavItem2Inactive.svg		No flashin
256	PrimNavItem2Inactive.svg		No flashin
512	PrimNavItem2Inactive.svg		No flashin

Bit Position: 1

Preview:

Selection of Picture:
ActiveSkew.svg
ActiveSkewActive.svg
ActiveSkewFault.svg
ActiveSkewInactive.svg
ActiveSkewWarning.svg
AddColumn.svg
Archive.svg
AutomaticCruise.svg

Figure 8-13 Adapting the graphics of a navigation button

8.4.9 Navigation button: Adapting the position

This section describes how you must adapt the functionality of a navigation button in accordance with its position on the navigation bar if you want to move it or copy it to another position.

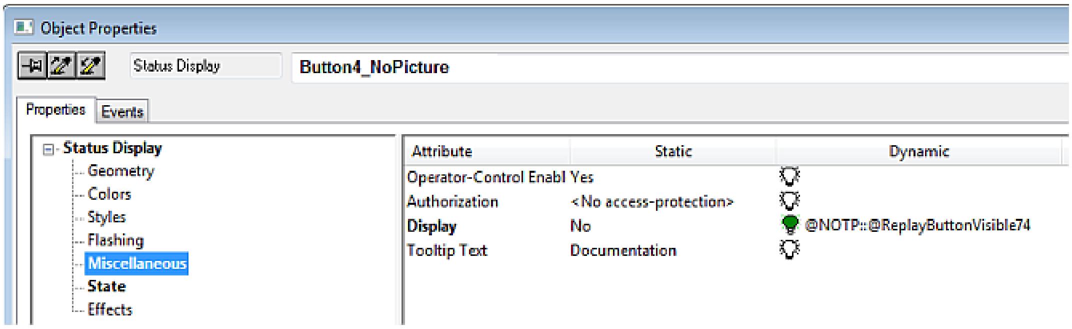
Note

The naming conventions must be followed so that navigation buttons on the primary and secondary navigation bars can be shown and hidden depending on the pictures prepared in the Replay Configuration Editor.

You will find detailed information about the naming convention and visible tag here: "Naming convention of navigation buttons and visible tags for Replay (Page 237)".

1. In Graphics Designer, position the navigation button at the required position on the navigation bar.
2. Adapt the name of the navigation button in accordance with its position on the navigation bar:
   "Object properties" → "Properties tab" → "Status display" → "Object name"
   For primary navigation buttons: "ButtonX"
   For secondary navigation buttons: "ButtonX_PictureName"
   "X" indicates the position of the navigation button in the navigation bar (values: 1..10).

3. Assign a visible tag to the button for display in Replay mode:
   "Object properties" → "Properties tab" → "Miscellaneous" → "Display"
   For primary navigation buttons: "@NOTP::@ReplayButtonVisibleX"
   For secondary navigation buttons: "@NOTP::@ReplayButtonVisibleXY"
   "X" indicates the position of the navigation button in the primary navigation bar (values: 1..10).
   "Y" indicates the position of the navigation button in the secondary navigation bar (values: 1..10).



Attribute	Static	Dynamic
Operator-Control Enabl	Yes	
Authorization	<No access-protection>	
Display	No	@NOTP::@ReplayButtonVisible74
Tooltip Text	Documentation	

Figure 8-14 Property display button 74

4. If necessary, adapt the status tag to the navigation bar in which the button is used.
   "Object properties" → "Event tab" → "Mouse" → "Mouse click"
   Adapt the status tags to the associated navigation bar.
   Example of the 7th secondary navigation bar:
   "subMenuSelektion = HMIRuntime.Tags ("@NOTP::@CMSMenu7Selection")"

5. Write the value of the status tag:
   "Object properties" → "Event tab" → "Mouse" → "Mouse click"
   With "MenuSelection.Write", specify the value for the position of the navigation button on the navigation bar.
   Example: "MenuSelection.Write = 64" for position 7 in the navigation bar

   Note

   This value must be a power of two between 1 and 512.
   See: "Navigation bar: Status tag (Page 238)"

6. Assign the graphics that will be displayed depending on the navigation button's status to the navigation button.
   See: "Navigation button: Adapting a graphic (Page 241)"

8.4.10 Navigation button: Adapting the link destination

This section describes how to adapt the link destination of a navigation button.

Note

The naming conventions must be followed so that navigation buttons on the primary and secondary navigation bars can be shown and hidden depending on the pictures prepared in the Replay Configuration Editor. You will find detailed information about the naming convention and visible tag in Section: "Naming convention of navigation buttons and visible tags for Replay (Page 237)"

1. Create the link destination in the object properties for the mouse click:
   "Object properties" → "Event tab" → "Mouse" → "Mouse click"
   Example: MenuPic.Write "@CMSMenu5.pdl".
2. For navigation buttons on the secondary navigation bars, adapt the name of the navigation button according to the link destination:
   "Object properties" → "Properties tab" → "Status display" → "Object name"
   Example: "ButtonX_PictureName"; where "PictureName" is the name of the picture to be called without the file name extension ".pdl".

8.4.11 Screen initialization

Initial situation / objective

Screen navigation is based on internal WinCC tags. The navigation variables must be initialized when starting the runtime.

The following initializations are carried out in the example application:

- The selection state for all navigations is set to 1.
- The picture tags of the main navigation and of the individual menus are initialized in the starting value of the picture tags with the name of the first screen in the menu.

How to change the screen initialization is described below.

Processing steps

1. Open the tag group "Screens" in the WinCC tag management / internal tags.
2. Open the properties of a picture tag (e.g. @CMSMenu4Pic).
3. In the Start value of the tags, replace e.g. the first screen of the 4th menu ("Fault-Diagnostics" → "Messages.PDL") with a new screen, e.g. "MessageList.PDL".
4. Save the change.

8.5 Group fault bar

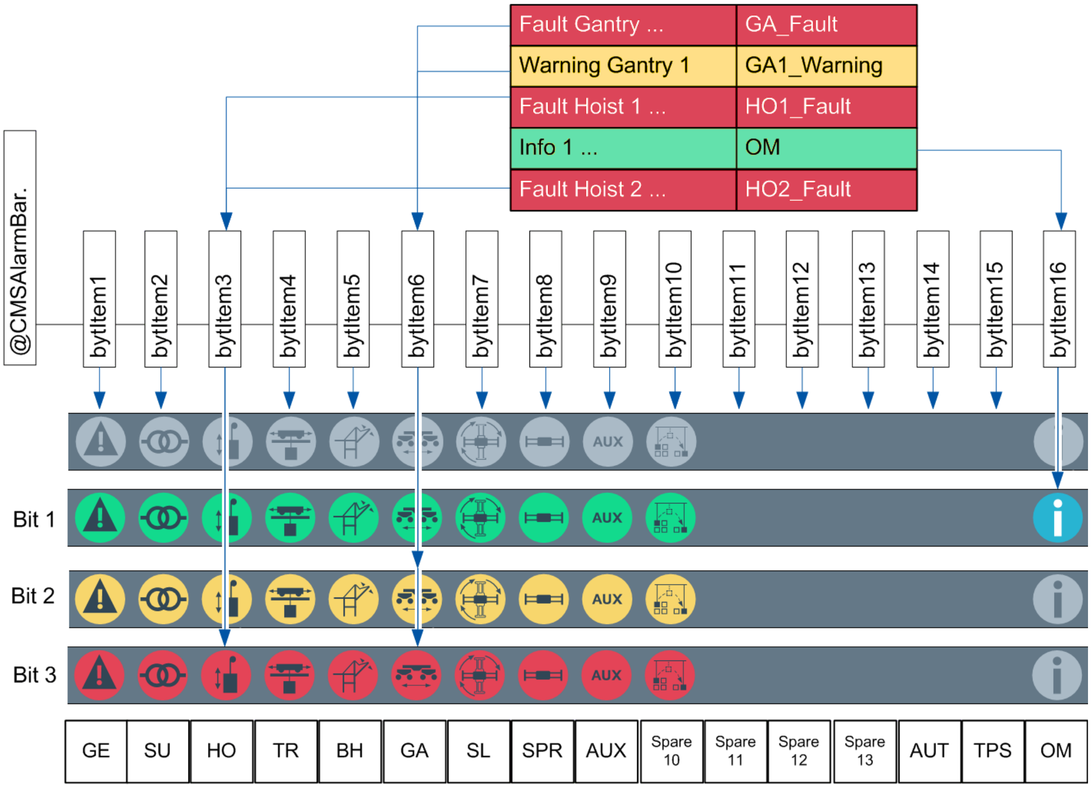
8.5.1 General information about the group fault bar

Initial situation / objective

The state of the group fault bar is formed via group messages in the WinCC Alarm Logging. See: Group messages (Page 114)).

Each element in the group fault bar has three possible states

- Bit 1: Inactive (not a fault, not a warning)
- Bit 2: Warning
- Bit 3: Fault



Fault Gantry ...	GA_Fault
Warning Gantry 1	GA1_Warning
Fault Hoist 1 ...	HO1_Fault
Info 1 ...	OM
Fault Hoist 2 ...	HO2_Fault

Figure 8-15 Principle of the group fault display

There are only two states for operating messages:

- Inactive
- Active

See also

Adding elements to the group fault bar (Page 247)

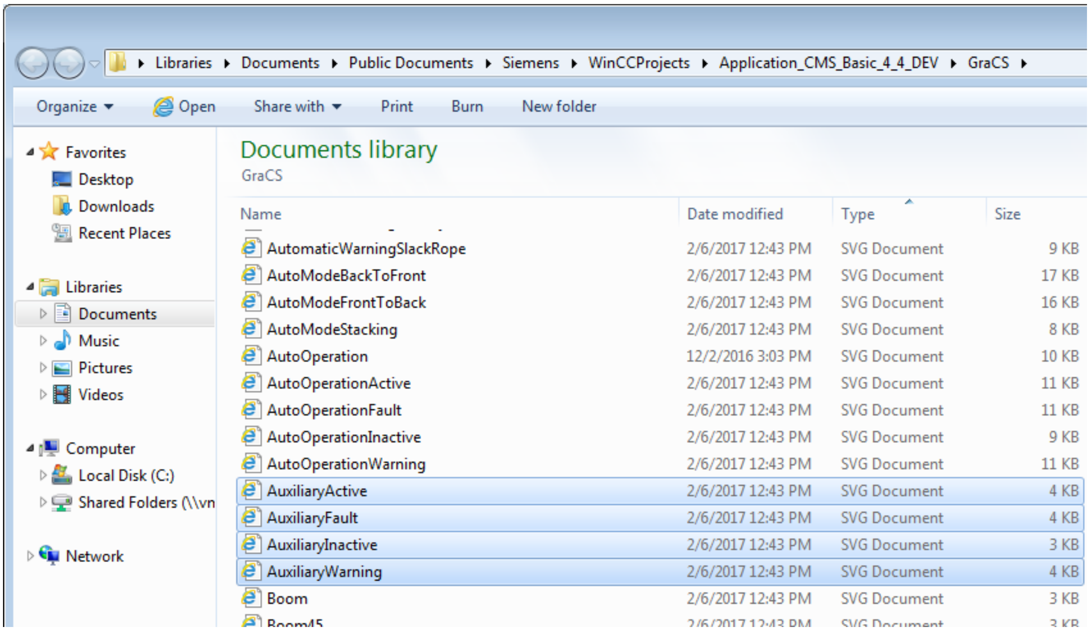
8.5.2 Adding elements to the group fault bar

Processing steps

These instructions show the steps required to add an element to the group fault bar.

See also: General information about the group fault bar (Page 246)

1. Create four graphics (inactive, active, warning, fault) for the display element.
   File format: .svg
   Storage location: Project folder "GraCS" (<<WinCCProjectPath>>\GraCS)

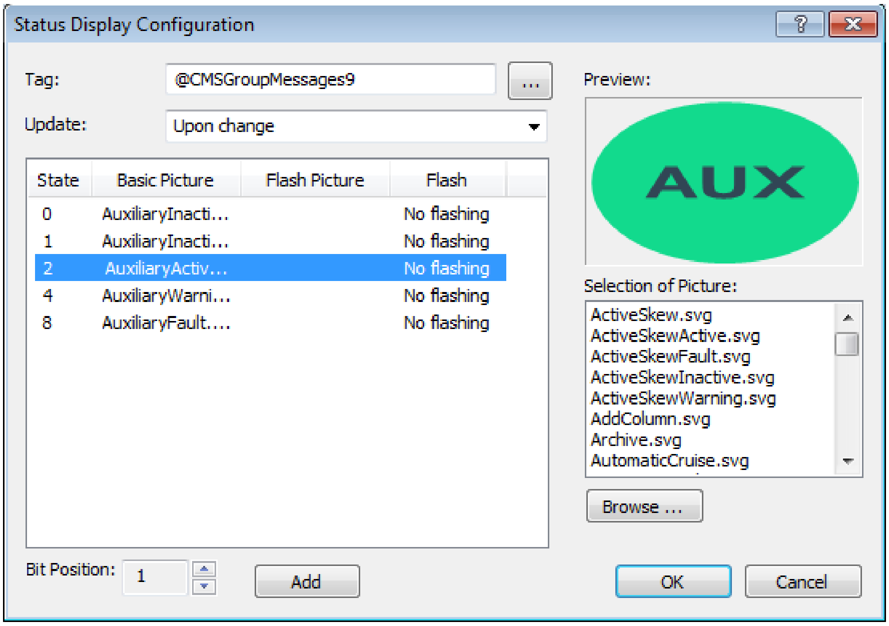


Documents library
GraCS

Name	Date modified	Type	Size
AutomaticWarningSlackRope	2/6/2017 12:43 PM	SVG Document	9 KB
AutoModeBackToFront	2/6/2017 12:43 PM	SVG Document	17 KB
AutoModeFrontToBack	2/6/2017 12:43 PM	SVG Document	16 KB
AutoModeStacking	2/6/2017 12:43 PM	SVG Document	8 KB
AutoOperation	12/2/2016 3:03 PM	SVG Document	10 KB
AutoOperationActive	2/6/2017 12:43 PM	SVG Document	11 KB
AutoOperationFault	2/6/2017 12:43 PM	SVG Document	11 KB
AutoOperationInactive	2/6/2017 12:43 PM	SVG Document	9 KB
AutoOperationWarning	2/6/2017 12:43 PM	SVG Document	11 KB
AuxiliaryActive	2/6/2017 12:43 PM	SVG Document	4 KB
AuxiliaryFault	2/6/2017 12:43 PM	SVG Document	4 KB
AuxiliaryInactive	2/6/2017 12:43 PM	SVG Document	3 KB
AuxiliaryWarning	2/6/2017 12:43 PM	SVG Document	4 KB
Boom	2/6/2017 12:43 PM	SVG Document	3 KB
Boom45	2/6/2017 12:43 PM	SVG Document	3 KB

Figure 8-16 Editing the status graphics of a group display

2. Right-click a placeholder on the group fault bar and select "Configuration dialog" from the shortcut menu to open the "Status Display Configuration" window.



Status Display Configuration

Tag: @CMSGroupMessages9

Update: Upon change

State	Basic Picture	Flash Picture	Flash
0	AuxiliaryInacti...		No flashing
1	AuxiliaryInacti...		No flashing
2	AuxiliaryActiv...		No flashing
4	AuxiliaryWarni...		No flashing
8	AuxiliaryFault....		No flashing

Preview:

Selection of Picture:
ActiveSkew.svg
ActiveSkewActive.svg
ActiveSkewFault.svg
ActiveSkewInactive.svg
ActiveSkewWarning.svg
AddColumn.svg
Archive.svg
AutomaticCruise.svg

Bit Position: 1

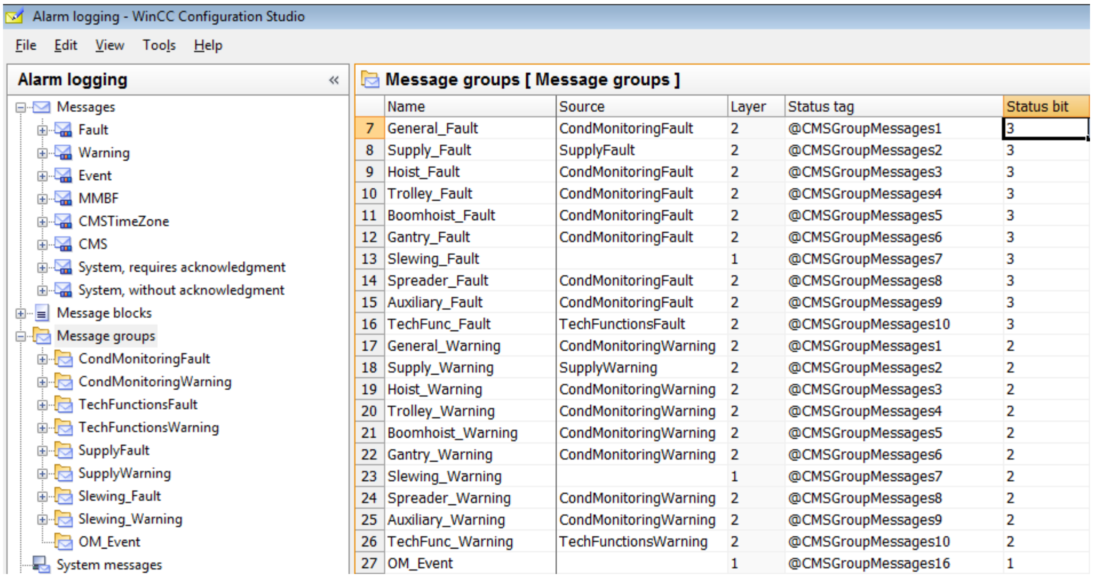
Figure 8-17 Status tag of a group display

3. Assign the graphics for the "Warning" status to status 4 (bit position 2).

4. Assign the graphics for the "Fault " status to status 8 (bit position 3).

5. Select the appropriate status tag in the "Tag" field.
   You must now link this tag to bit 2 and bit 3 of the associated group signal.

6. Open the alarm logging.
   Link bit 2 and bit 3 of the appropriate group signal to the status tag of the element.



	Name	Source	Layer	Status tag	Status bit
7	General_Fault	CondMonitoringFault	2	@CMSGroupMessages1	3
8	Supply_Fault	SupplyFault	2	@CMSGroupMessages2	3
9	Hoist_Fault	CondMonitoringFault	2	@CMSGroupMessages3	3
10	Trolley_Fault	CondMonitoringFault	2	@CMSGroupMessages4	3
11	Boomhoist_Fault	CondMonitoringFault	2	@CMSGroupMessages5	3
12	Gantry_Fault	CondMonitoringFault	2	@CMSGroupMessages6	3
13	Slewing_Fault		1	@CMSGroupMessages7	3
14	Spreader_Fault	CondMonitoringFault	2	@CMSGroupMessages8	3
15	Auxiliary_Fault	CondMonitoringFault	2	@CMSGroupMessages9	3
16	TechFunc_Fault	TechFunctionsFault	2	@CMSGroupMessages10	3
17	General_Warning	CondMonitoringWarning	2	@CMSGroupMessages1	2
18	Supply_Warning	SupplyWarning	2	@CMSGroupMessages2	2
19	Hoist_Warning	CondMonitoringWarning	2	@CMSGroupMessages3	2
20	Trolley_Warning	CondMonitoringWarning	2	@CMSGroupMessages4	2
21	Boomhoist_Warning	CondMonitoringWarning	2	@CMSGroupMessages5	2
22	Gantry_Warning	CondMonitoringWarning	2	@CMSGroupMessages6	2
23	Slewing_Warning		1	@CMSGroupMessages7	2
24	Spreader_Warning	CondMonitoringWarning	2	@CMSGroupMessages8	2
25	Auxiliary_Warning	CondMonitoringWarning	2	@CMSGroupMessages9	2
26	TechFunc_Warning	TechFunctionsWarning	2	@CMSGroupMessages10	2
27	OM_Event		1	@CMSGroupMessages16	1

Figure 8-18 Assigning bit 2 and bit 3 of the group signal to the status tag of the group display

Note

You can also organize the group signals hierarchically. The lower-level messages can also trigger the higher-level group signal.

8.6 WinCC Alarm Control and CMSFaults Control

8.6.1 Message filter in the WinCC Alarm Control

In the CMS example application, the messages are displayed in the WinCC Alarm Control. The messages displayed can be filtered according to various criteria in the CMS example application using predefined buttons on a filter bar.

The filter buttons transmit an SQL filter string to the WinCC Alarm Control property "MsgFilterSQL". The reset button passes an empty string to the WinCC alarm control.

You will find the filter bar on the "MessagesFilter.PDL" screen. The following filter strings are available in the example application:

Icon	Name	Filter string	Description
🟥	Fault	"CLASS=1"	Only messages of message class 1 → Fault
🟨	Warnings	"CLASS=4"	Only messages of message class 4 → Warning
CMS	CMS system messages	"CLASS=16"	Only messages of message class 16 → CMS
	General	"TEXT8 LIKE 'GE'"	Only messages with the group abbreviation "GE" in the user text block 8.
	Hoisting gear	"TEXT8 LIKE 'HO"	Only messages with the group abbreviation "HO" in the user text block 8.
	Trolley	"TEXT8 LIKE 'TR"	Only messages with the group abbreviation "TR" in the user text block 8.
	Boom-hoist	"TEXT8 LIKE 'BH"	Only messages with the group abbreviation "BO" in the user text block 8.
	Gantry	"TEXT8 LIKE 'GA"	Only messages with the group abbreviation "GA" in the user text block 8.
	Spreader	"TEXT8 LIKE 'SPR"	Only messages with the group abbreviation "SPR" in the user text block 8.
✕	Reset Filter	""	The filter is reset.

8.6.2 General information about CMSFaults control

The CMSFaults control is an ActiveX object for displaying crane-specific information relating to WinCC messages.

Note

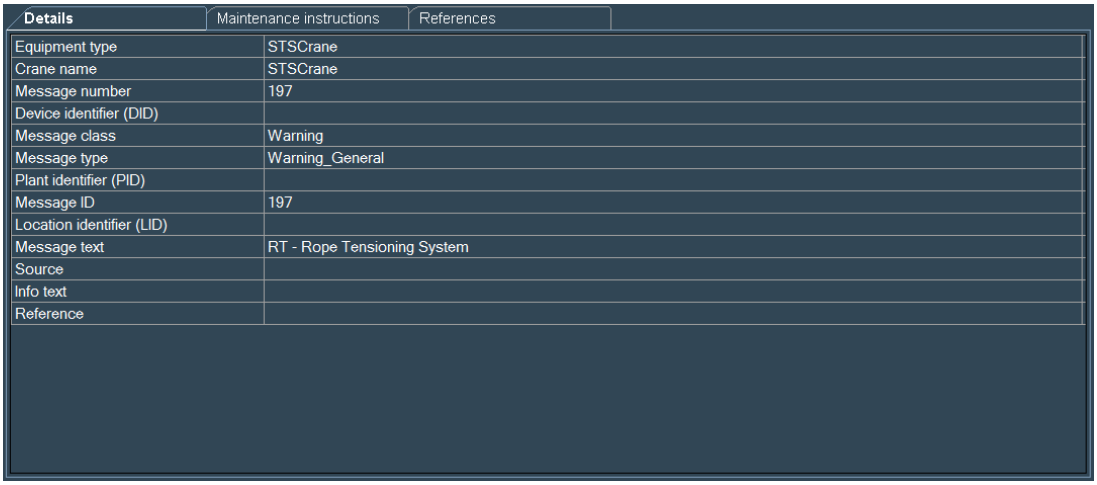
The CMSFaults control just displays the maintenance instruction that is assigned to the WinCC message.

Maintenance instructions assigned to the equipment type or crane are not shown

The CMSFaults Control is already integrated in the CMS example application. You will find the integrated CMSFaults Control in the "MessagesInfo.Pdl" picture.

Message numbers and message timestamps for the currently selected message are read out using a VBS project module. Depending on the message number, the information assigned to this message in the WinCC Alarm Logging and CMS Editor is displayed.

The ActiveX control CMSFaults has no direct access to WinCC, the database or the data in the configuration file. All data are read by CMS Runtime. An appropriate message is therefore displayed if CMS Runtime is not running. This message is unalterably stored in English in the program and cannot be altered.



Equipment type	STSCrane
Crane name	STSCrane
Message number	197
Device identifier (DID)	
Message class	Warning
Message type	Warning_General
Plant identifier (PID)	
Message ID	197
Location identifier (LID)	
Message text	RT - Rope Tensioning System
Source	
Info text	
Reference	

Figure 8-19 CMSFaults Control (display of the runtime)

CMSFaults Control consists of three tabs:

- Tab 1: "Details"
  Displays the message details in tabular form.
  The information comes from the message blocks in the WinCC Alarm Logging.
- Tab 2: "Maintenance instructions"
  Displays the maintenance instruction assigned to the message.
  Fields for entering comments can also be offered to the user.
- Tab 3: "References"
  Displays the references assigned to the message.
  In the example application, this tab is only enabled for users of the "Maintenance" group.

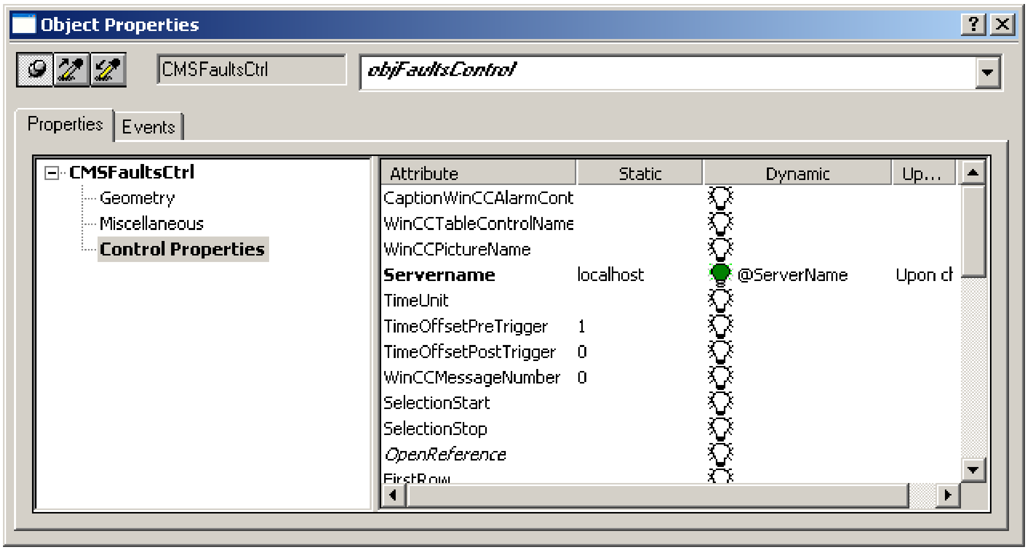
To facilitate operation of the CMSFaults control on touch panels (activating functions with a double click on touch panels, for example, can be problematic), it is possible to execute all commands, such as scrolling through tabs, navigating round tables or opening reference files, by buttons in the WinCC application. In this case, commands are written to properties of the CMSFaults control.

Note

No references are available on the WebNavigator Client because access to the local hard disk of the web server is not possible.

8.6.3 WinCC object properties of the CMSFaults Control

Below you will find a description of the WinCC object properties of the CMSFaults Control.



Attribute	Static	Dynamic	Up...
CaptionWinCCAlarmCont			
WinCCTableControlName			
WinCCPictureName			
Servername	localhost	@ServerName	Upon cl
TimeUnit			
TimeOffsetPreTrigger	1		
TimeOffsetPostTrigger	0		
WinCCMessageNumber	0		
SelectionStart			
SelectionStop			
OpenReference			
FirstRow			

Figure 8-20 CMSFaults Control object properties

With the following WinCC object properties, you can have actions executed:

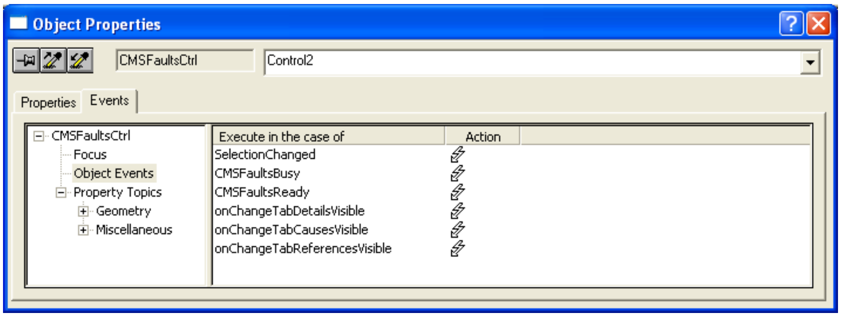
Command	Function
WinCCMessageNumber	WinCC message number
OpenReference	Open the currently selected reference
FirstRow	Position on the first row in the reference table
PreviousRow	Position on the previous row in the reference table
NextRow	Position on the next row in the reference table
LastRow	Position on the last row in the reference table
FirstTab	Position on the first tab in the CMSFaults control
PreviousTab	Position on the previous tab in the CMSFaults control
NextTab	Position on the next tab in the CMSFaults control
LastTab	Position on the last tab in the CMSFaults control
Command	Find the information for the message currently selected in the WinCC Alarm control

Command	Function
NewLogEntryCause	Clear the window for entering a new comment for the displayed maintenance instruction text (possible fault cause)
NewLogEntryRemedy	Clear the window for entering a new comment for the displayed maintenance instruction text (possible remedy)
NewLogEntryComment	Clear the window for entering a new comment for the displayed maintenance instruction text (comment)
UpdateLog	Save the entered comments

With the following WinCC object properties, you can read out information:

Setting	Function
CaptionWinCCAlarmControl	Window caption of the WinCC Alarm Control
Server name	Name or IP address of the computer on which the WinCC project is running.
WinCCTableControlName	Name of an optional WinCC online table or online trend control (no longer evaluated)
WinCCPictureName	Name of the WinCC screen containing an optional WinCC Online Table or WinCC Online Trend control (no longer analyzed)
TimeUnit	Unit of time interval
TimeOffsetPreTrigger	Time interval before trigger
TimeOffsetPostTrigger	Time interval after trigger
SelectionStart (ReadOnly)	Time stamp of the displayed message, offset by the pretrigger time interval
SelectionStart (ReadOnly)	Time stamp of the displayed message, offset by the posttrigger time interval
EnableLog	True: Entering comments on maintenance instructions has been released.
EnableLogButtons	True: Buttons for entering comments on maintenance instructions are visible.
EnableLogCauses	True: Field for entering causes is visible.
EnableLogRemedies	True: Field for entering remedies is visible.
EnableLogComments	True: Field for entering comments is visible.
EnableTabDetails	True: The "Message details" tab is visible.
EnableTabCauses	True: The "Maintenance instructions" tab is visible.
EnableTabReferences	True: The "References" tab is visible.

8.6.4 WinCC events of the CMSFaults Control



Execute in the case of	Action
SelectionChanged	
CMSFaultsBusy	
CMSFaultsReady	
onChangeTabDetailsVisible	
onChangeTabCausesVisible	
onChangeTabReferencesVisible	

Figure 8-21 WinCC events of CMSFaults

Table 8-1 Events of CMSFaults

Event	Function	Parameter
SelectionChanged	Triggered if the message selected changes	SelectionStart: Time stamp of the selected message, minus the interval before the trigger, expressed as `yyyy-MM-dd HH:mm:ss` SelectionStop: Time stamp of the selected message, plus the interval after the trigger, expressed as `yyyy-MM-dd HH:mm:ss`
CMSFaultsBusy	Triggered if an action is performed	-
CMSFaultsReady	Triggered if the action is ended	-
onChangeTabDetailsVisible	Triggered if the "Details" tab becomes visible or invisible.	0: Tab is invisible. Anything else: Tab is visible.
onChangeTabCausesVisible	Triggered if the "Maintenance instructions" tab becomes visible or invisible.	0: Tab is invisible. Anything else: Tab is visible.
onChangeTabReferencesVisible	Triggered if the "References" tab becomes visible or invisible.	0: Tab is invisible. Anything else: Tab is visible.

8.6.5 CMSFaults Control properties

Below you will find a description of the properties of the CMSFaults Control.

You can open the CMSFaults Control properties by double-clicking the CMSFaults Control in Graphics Designer.

Colors

The color settings of the CMSFaults Control can be changed on this property page.

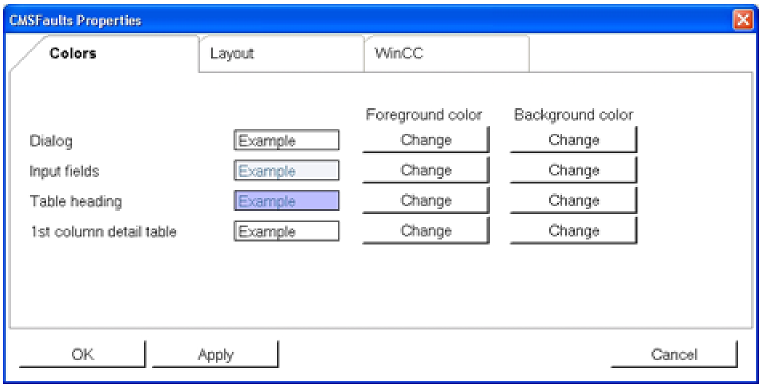


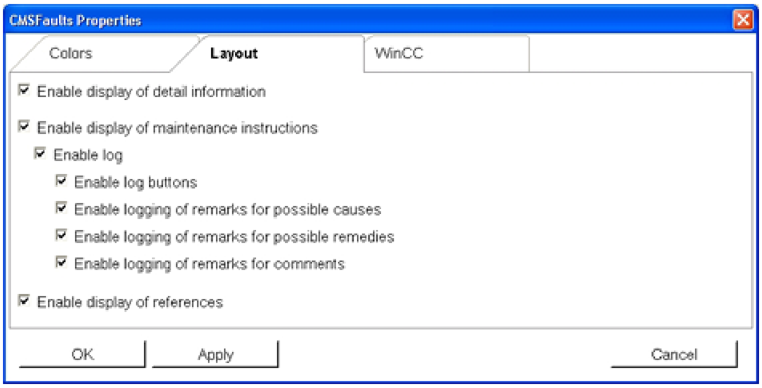
Figure 8-22 CMSFaults properties page, colors

Layout

The display features of the CMSFaults ActiveX can be adjusted on this property page. In this case, each of the three tabs can be completely enabled or disabled. At least one tab, however, must always be visible.

Note

You can also make these entries in the WinCC properties dialog box by deactivating the setting with "0" or "false". Any other input will activate the corresponding setting.



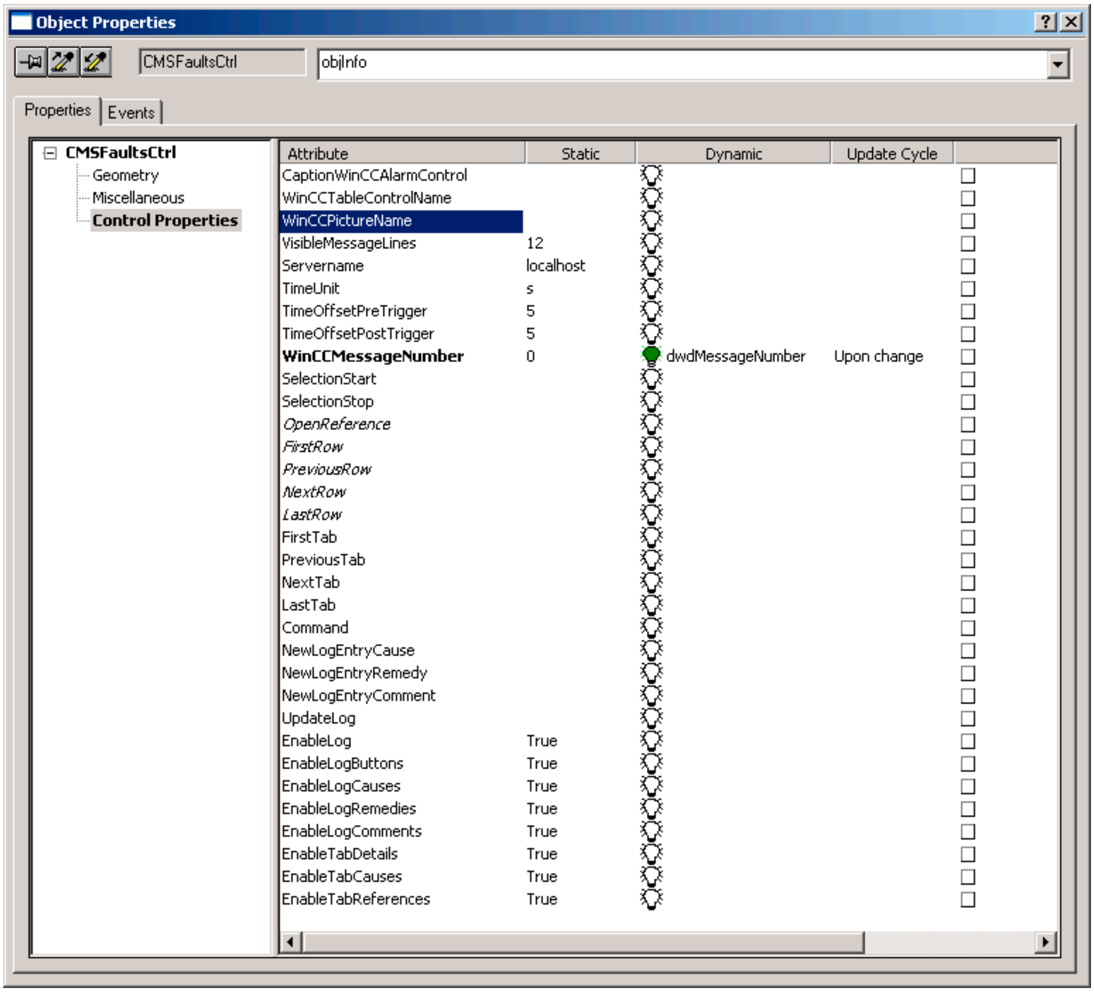
- ☑ Enable display of detail information
- ☑ Enable display of maintenance instructions
  - ☑ Enable log
    - ☑ Enable log buttons
    - ☑ Enable logging of remarks for possible causes
    - ☑ Enable logging of remarks for possible remedies
    - ☑ Enable logging of remarks for comments
- ☑ Enable display of references

Figure 8-23 CMSFaults properties page, layout

- Enable log
  Activates / deactivates the input fields for entering comments for maintenance instructions together with associated control buttons.
  If the log is disabled, only the information stored in the CMS is displayed in CMSFaults Control.
- Enable log buttons
  Activates / deactivates buttons for deleting the content of the field, for creating a new entry, and for saving changes.
  You can hide the buttons with this property. You must then trigger the actions that are linked to these buttons by writing particular properties of the CMSFaults Control.
- Enable the field for entering possible causes
  Activates / deactivates an input field for entering the possible cause.
- Enable the field for entering possible remedies
  Activates / deactivates an input field for entering the possible remedy.
- Enable the field for entering comments
  Activates / deactivates an input field for entering the comments.

WinCC

The connection to WinCC can be configured on this property page.



Attribute	Static	Dynamic	Update Cycle	
CaptionWinCCAlarmControl				□
WinCCTableControlName				□
WinCCPictureName				□
VisibleMessageLines	12			□
Servername	localhost			□
TimeUnit	s			□
TimeOffsetPreTrigger	5			□
TimeOffsetPostTrigger	5			□
WinCCMessageNumber	0	dwdMessageNumber	Upon change	□
SelectionStart				□
SelectionStop				□
OpenReference				□
FirstRow				□
PreviousRow				□
NextRow				□
LastRow				□
FirstTab				□
PreviousTab				□
NextTab				□
LastTab				□
Command				□
NewLogEntryCause				□
NewLogEntryRemedy				□
NewLogEntryComment				□
UpdateLog				□
EnableLog	True			□
EnableLogButtons	True			□
EnableLogCauses	True			□
EnableLogRemedies	True			□
EnableLogComments	True			□
EnableTabDetails	True			□
EnableTabCauses	True			□
EnableTabReferences	True			□

Figure 8-24 CMSFaults properties page, WinCC connection

- Server Name
  Name or IP address of the server on which the WinCC project is running. This server name is used to establish communication with CMS Runtime if you wish to use the control on a Web Client.

  Note

  Note:
  The following properties are obsolete and should not be used:
  - Window Caption of the WinCC Alarm Control
  - Name of the WinCC Picture
  - Name of the WinCC Table Control
  - Time Interval before Trigger / after Trigger
  - Unit of Time Interval

- Window Caption of the WinCC Alarm Control
  Title of the WinCC message window in which the message is selected.

  Note

  This setting does not involve the name of the Alarm Control, but the window caption that can be entered as a property.

  Note

  The WinCC function for determining messages via the window caption of the Alarm Control is case sensitive.

- Name of the WinCC screen
  Name of the WinCC screen in which Alarm Control and Trend Control are located
- Name of the WinCC Table Control
  Name of the Trend or Table Control in which the curve values are to be displayed.

  Note

  WinCC Alarm Control and WinCC Table / Trend Control must be in the same WinCC screen.

- Time Interval before or after the Trigger
  Number of time units before the trigger instant (time before the event) as well as number of time units after the trigger instant (time after the event). This results in start and finish times for the display of the archived measured values in the WinCC Table / Trend Control.
- Unit of Time Interval
  Unit of the time by which the start or finish time is corrected. The following are possible:
  h: Hours
  m: Minutes
  s: Seconds

8.6.6 Inserting CMSFaults control into a picture

These instructions show the steps required to insert a CMSFaults Control into a picture of your own.

Note

The CMS Runtime must be running when you link the control so that the colors from the CMS configuration file are applied.

If the CMS Runtime is not active when the control is integrated, the colors must be adapted manually.

Automatic comparison with the configuration file of the CMS at a later time is not possible.

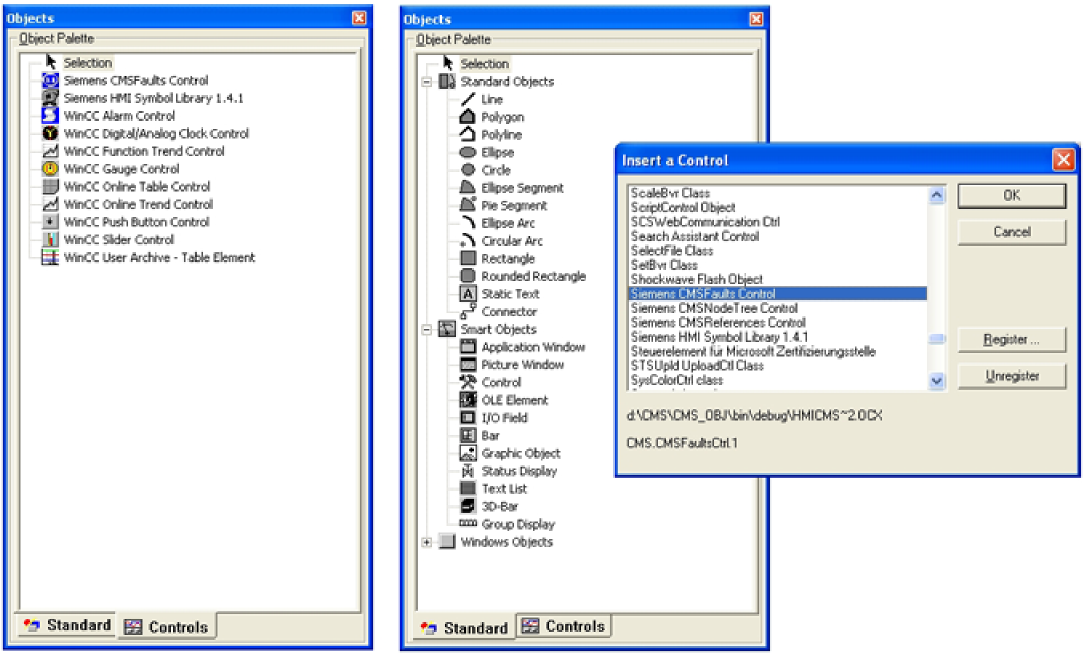
When the CMSFaults Control is linked into a WinCC picture, the following occurs:

- All tabs implemented in the CMSFaults Control are activated.
- Input of logbook entries is activated.
- Control via buttons is activated.

All these settings can be adjusted later.

Sequence of steps

1. Insert the CMSFaults Control into the picture using the object pallet "Controls". You will find the control under "Siemens CMSFaults Control".

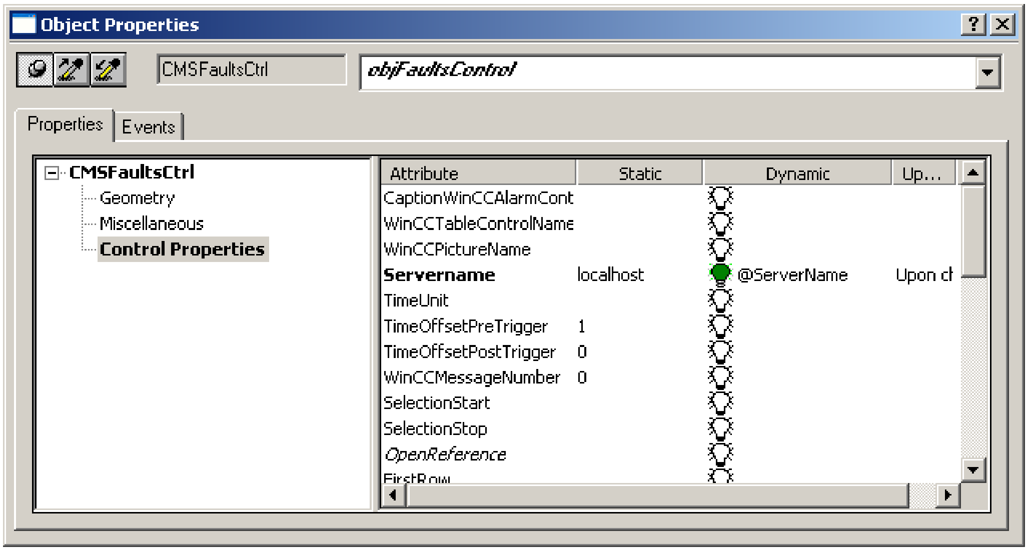


d:\CMS\CMS_OBJ\bin\debug\HMICMS~2.OCX

CMS.CMSFaultsCtrl.1

Figure 8-25 Insert the CMSFaults Control in WinCC Graphics designer

2. Open the object properties of the CMSFaults Control.
   See: WinCC object properties of the CMSFaults Control (Page 252)



CMSFaultsCtrl | *objFaultsControl*

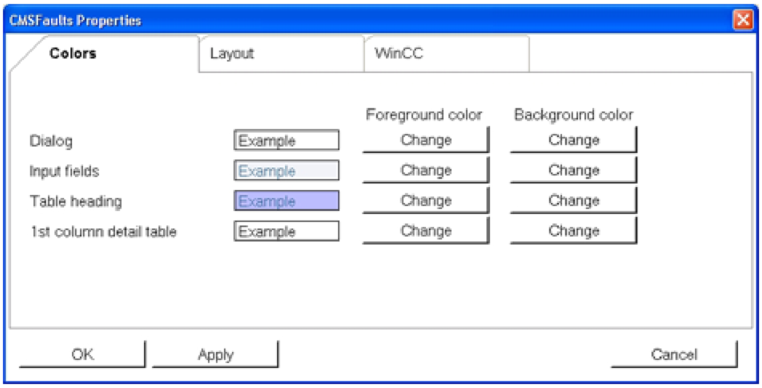
Attribute	Static	Dynamic	Up...
CaptionWinCCAlarmCont			
WinCCTableControlName			
WinCCPictureName			
Servername	localhost	@ServerName	Upon ch
TimeUnit			
TimeOffsetPreTrigger	1		
TimeOffsetPostTrigger	0		
WinCCMessageNumber	0		
SelectionStart			
SelectionStop			
OpenReference			
FirstRow			

Figure 8-26 CMSFaults Control object properties

3. Assign the IP address of the computer to the "server names" property.
   To enable the CMSFaults control to work on web clients, too, enter a tag here:
   server name = @NOTP::@CMSServerIPAddress

4. Assign the message number of the currently selected message in the WinCC Alarm Control to the "WinCCMessageNumber" property.
   You can also use the VBS project module "GetSelectedMessageNumber.bmo" to read out the message number and message time stamp.

5. Open the properties of the CMSFaults Control by double-clicking.
   See: CMSFaults Control properties (Page 254)



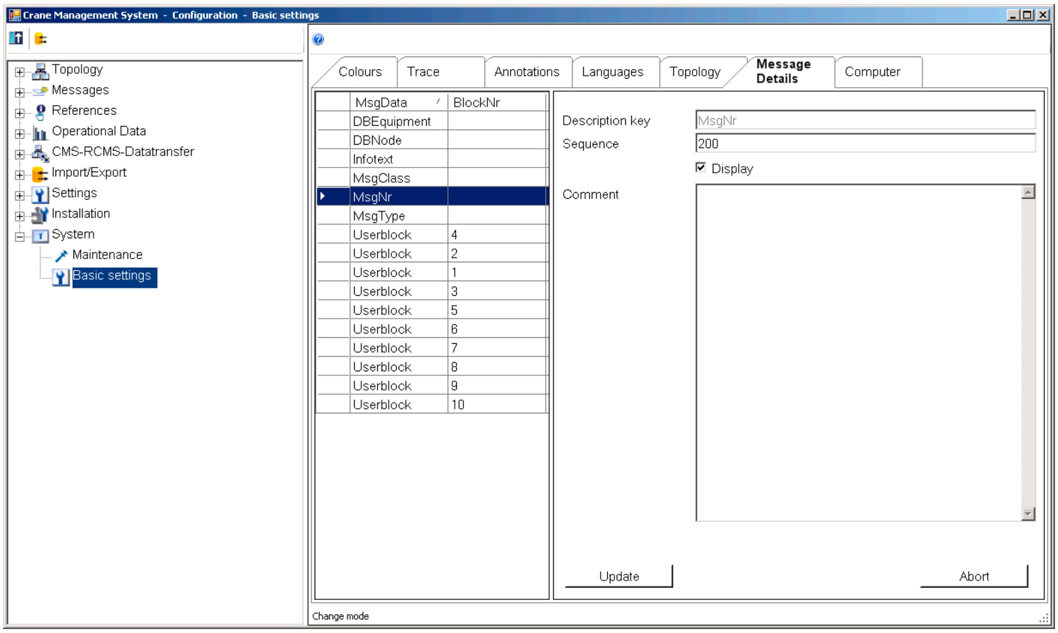
CMSFaults Properties

		Foreground color	Background color
Dialog	Example	Change	Change
Input fields	Example	Change	Change
Table heading	Example	Change	Change
1st column detail table	Example	Change	Change

Figure 8-27 CMSFaults properties page, colors

- "Colours" tab:
  Here, you make changes to the displayed colors.
- "WinCC" tab:
  Here, you adapt the connection to WinCC.
  Here, you configure the display of curve values in a TrendControl in the same picture.
- "Layout" tab:
  Here, you activate / deactivate display of the three tabs.
  You can disable the option for entering remarks for the maintenance instructions.

6. Open the CMS editor to adapt the display and sequence of information.
   "System" → "Basic settings" → "Message details" tab



Crane Management System - Configuration - Basic settings

MsgData	BlockNr
DBEquipment	
DBNode	
Infotext	
MsgClass	
MsgNr	
MsgType	
Userblock	4
Userblock	2
Userblock	1
Userblock	3
Userblock	5
Userblock	6
Userblock	7
Userblock	8
Userblock	9
Userblock	10

Description key: MsgNr
Sequence: 200
☑ Display
Comment

Figure 8-28 Configuring message details in the CMS editor

- "Sequence" field
  Here, you can configure the order of information in the "Details" tab in the CMSFaults Control.
  The lower the value entered, the further up the list the information is.
- "Display" check box
  Here, you can activate / deactivate display of information on the "Details" tab in the CMSFaults Control.

8.7 User groups

Four user types with different rights are configured in the WinCC User Administrator in the example applications; see User groups (Page 63).

Table 8-2 Default WinCC user types in the example applications

Name	Password	Logon	Rights in the WinCC User Administrator
Operator	Operator	• CMS: possible • Web client: possible	• Screen changeover • Restricted scope of navigation • Operation of sub-system screens
RCOSOperator	RCOSOperator	• CMS: Possible • Web client: Possible	• Screen changeover • Restricted scope of navigation • Operation of sub-system screens • Operation of RCOS relevant screens
Maintenance	Maintenance	• CMS: possible • Web client: possible	• Screen changeover • Minimum restricted scope of navigation • Operation of sub-system screens • Counter reset • PLC Reference
Management	Management	• CMS: possible • Web client: possible	• Screen changeover • Minimum restricted scope of navigation • Operation of sub-system screens
Administrator	Administrator	• CMS: possible • Web client: possible	Unrestricted rights: • Screen changeover • Unrestricted scope of navigation • Operation of sub-system screens • Counter reset • Make basic settings • Terminating the WinCC Runtime

When a user logs on in the CMS example application, an internal authorization tag is initially set to "1". This tag controls whether the user can see user-specific elements in the user interface.

On the WinCC start page, standard WinCC functions are used to log on.

8.7.1 Changing passwords

Initial situation / objective

Passwords can be changed in the WinCC Editor "User Administrator"

Note

Ensure that the passwords are only known to the intended users!

If in doubt, for example after commissioning, change the passwords so that you do not put network security at risk.

Processing steps

1. Open the WinCC User Administrator.
2. You can change the password in the toolbar under "User" → "Change password".

8.7.2 Automatic user log-off

Initial situation

An automatic log-off function is available in the CMS example application, but is not activated.

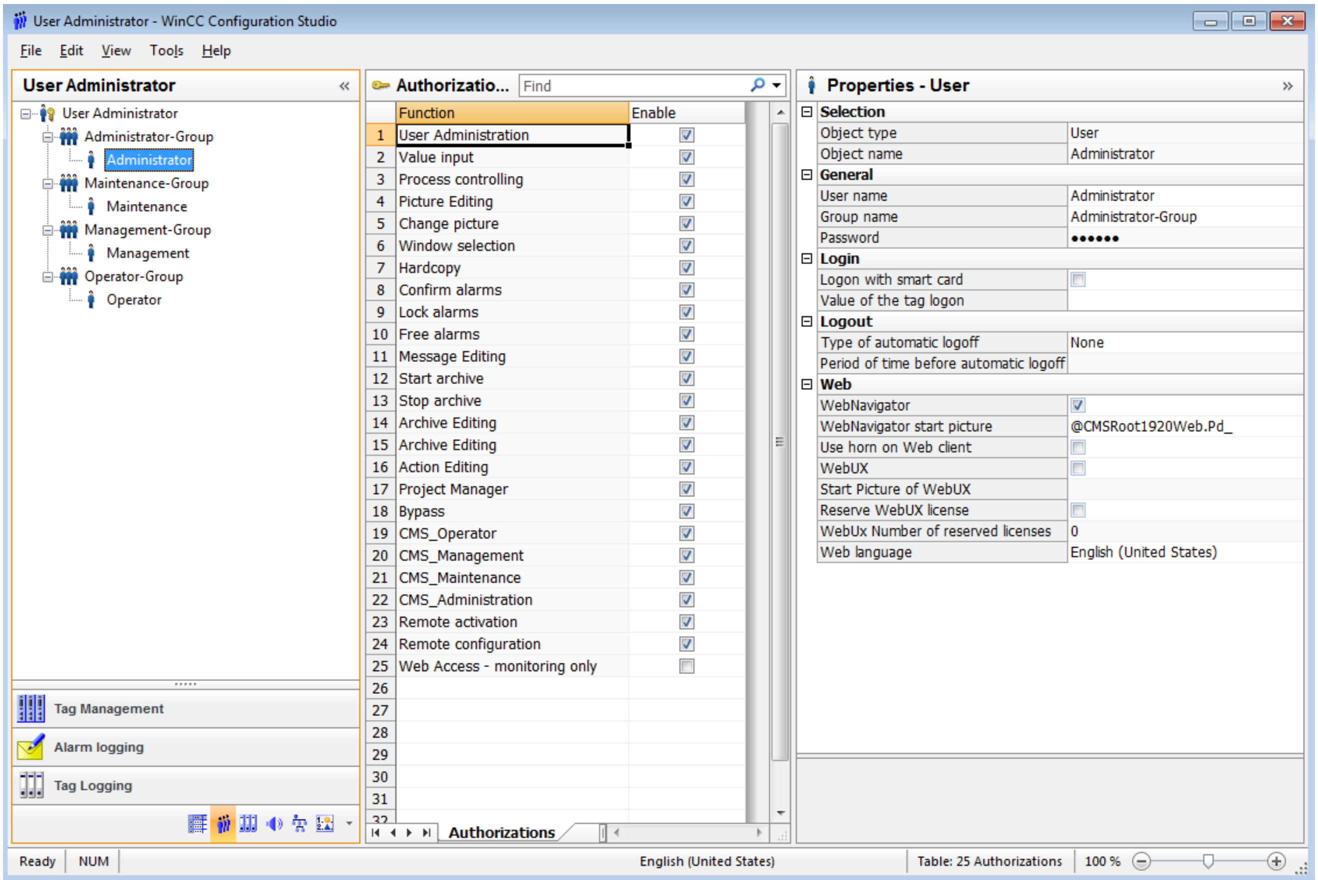
Automatic user log-off is a standard function of WinCC. A global action in the CMS example application ensures that

- The corresponding internal user tag is reset to "0".
- The standard user is logged on.
- Navigation is reset to the initial situation.

Processing steps

1. Open the WinCC User Administrator.
2. Select the user for whom you want to set up automatic log-off on the left.

3. Under "Automatic logout" in the field "after" … "minutes", enter the number of minutes after which the user is to be logged off.



	Function	Enable
1	User Administration	☑
2	Value input	☑
3	Process controlling	☑
4	Picture Editing	☑
5	Change picture	☑
6	Window selection	☑
7	Hardcopy	☑
8	Confirm alarms	☑
9	Lock alarms	☑
10	Free alarms	☑
11	Message Editing	☑
12	Start archive	☑
13	Stop archive	☑
14	Archive Editing	☑
15	Archive Editing	☑
16	Action Editing	☑
17	Project Manager	☑
18	Bypass	☑
19	CMS_Operator	☑
20	CMS_Management	☑
21	CMS_Maintenance	☑
22	CMS_Administration	☑
23	Remote activation	☑
24	Remote configuration	☑
25	Web Access - monitoring only	□
26		
27		
28		
29		
30		
31		

Selection	
Object type	User
Object name	Administrator
General	
User name	Administrator
Group name	Administrator-Group
Password	••••••
Login	
Logon with smart card	□
Value of the tag logon	
Logout	
Type of automatic logoff	None
Period of time before automatic logoff	
Web	
WebNavigator	☑
WebNavigator start picture	@CMSRoot1920Web.Pd_
Use horn on Web client	□
WebUX	□
Start Picture of WebUX	
Reserve WebUX license	□
WebUx Number of reserved licenses	0
Web language	English (United States)

Figure 8-29 WinCC User Administrator

4. Select whether the log-off is to be performed after "absolute time" or after "idle time".

Result

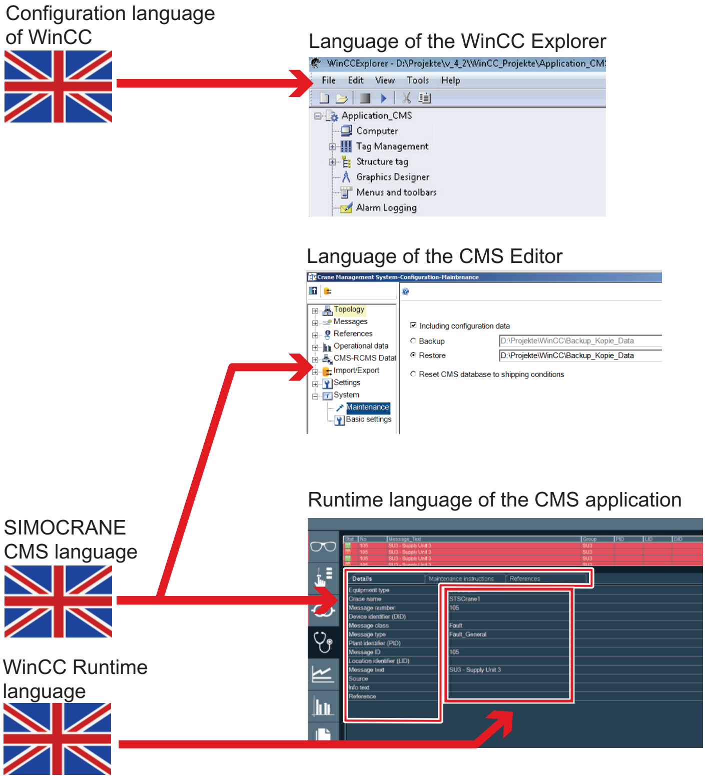
After a certain time interval, a user whom you have defined is automatically logged off. This allows you to avoid situations where unauthorized persons have access to particular functions when the logged-on user forgets to log off.

8.8 Languages

8.8.1 General information about language management in CMS

There are three different sources for language-dependent texts in SIMOCRANE CMS:

- The WinCC configuring language
  This is the source of the texts displayed in the WinCC Explorer.
- The SIMOCRANE CMS language
  This is the source of CMS Editor texts and specific texts in the SIMOCRANE CMS Runtime application. It also includes ActiveX Controls texts.
- The WinCC Runtime language
  This is the source of texts displayed from the WinCC Runtime application.


Configuration language of WinCC
Language of the WinCC Explorer
WinCCExplorer - D:\Projekte\v_4_2\WinCC_Projekte\Application_CMS
File Edit View Tools Help
Application_CMS
Computer
Tag Management
Structure tag
Graphics Designer
Menus and toolbars
Alarm Logging
Language of the CMS Editor
Crane Management System-Configuration-Maintenance
Topology
Messages
References
Operational data
CMS-RCMS Data
Import/Export
Settings
System
Maintenance
Basic settings
Including configuration data
Backup
Restore
Reset CMS database to shipping conditions
Runtime language of the CMS application
Details
Maintenance instructions
References
SIMOCRANE CMS language
WinCC Runtime language

The SIMOCRANE CMS application retrieves its texts from the WinCC Runtime language and the SIMOCRANE CMS language.

If the WinCC Runtime language is switched over, then the language for the ActiveX Controls of CMS is also switched over. In this case, the SIMOCRANE CMS language must be defined and translated.

Unlike the texts for the WinCC Runtime language, SIMOCRANE CMS language texts are not stored in the text library, but in a separate CMS database.

Maintenance instructions and references in the CMS editor can only be displayed in one language. This language must be defined during configuration.

The example applications are supplied in English and German as standard.

Please first check whether the language you need can be displayed by WinCC.

You can find instructions for defining the runtime language for your project here: Settings in WinCC (Page 100)

See also

Button for changing the runtime language of the CMS application (Page 267)

Setting the WinCC configuring language (Page 268)

Adding and translating the WinCC Runtime language (Page 268)

Adding and translating the SIMOCRANE CMS language (Page 271)

8.8.2 Button for changing the runtime language of the CMS application

To be able to switch over the runtime language in the CMS application, create a button for changing the language, e.g. in the "CMSHome.pdl" screen.

This button must activate the following VB script for a mouse click event.

```
' WINCC:TAGNAME_SECTION_START
' Const TagNameInAction = "TagName"
Const tagLanguage = "@NOTP::@CMSStatusLanguage"
' WINCC:TAGNAME_SECTION_END
Dim lngLanguage  lngLanguage = 1033 '1033 = English (USA)
HMIRuntime.Language = lngLanguage 'set Runtime language
hmiruntime.Tags(tagLanguage).write lngLanguage 'store value to tag
```

Note

The number "1033" is the LCID code for English (USA) and may need to be replaced by the appropriate LCID code of the alternative language. LCID (Local ID) is the numerical code defined by Microsoft for national languages.

You can find a list of LCID codes under keyword "LCID" in the WinCC Online Help.

See also

General information about language management in CMS (Page 266)

Adding and translating the SIMOCRANE CMS language (Page 271)

Adding and translating the WinCC Runtime language (Page 268)

8.8.3 Setting the WinCC configuring language

The configuring language defines the language of the WinCC Explorer.

Languages are installed at the same time as WinCC.

SIMOCRANE CMS is available in English and German as standard. New languages can be added at any time.

Note

The configuration language can only be changed if the required language was installed while WinCC was being installed.

1. To change the language, select "Tools" → "Languages" in the WinCC Explorer and then choose a different language.

WinCC Explorer will then be displayed in the language you have chosen.

See also

General information about language management in CMS (Page 266)

Adding and translating the WinCC Runtime language (Page 268)

Adding and translating the SIMOCRANE CMS language (Page 271)

8.8.4 Adding and translating the WinCC Runtime language

8.8.4.1 Adding the WinCC Runtime language

Initial situation

The WinCC Runtime language defines the language of the WinCC Runtime elements. These include, for example, message texts, tooltips or texts that are configured in the Graphics Designer.

Note

Texts specific to SIMOCRANE CMS are not included with the WinCC Runtime language.

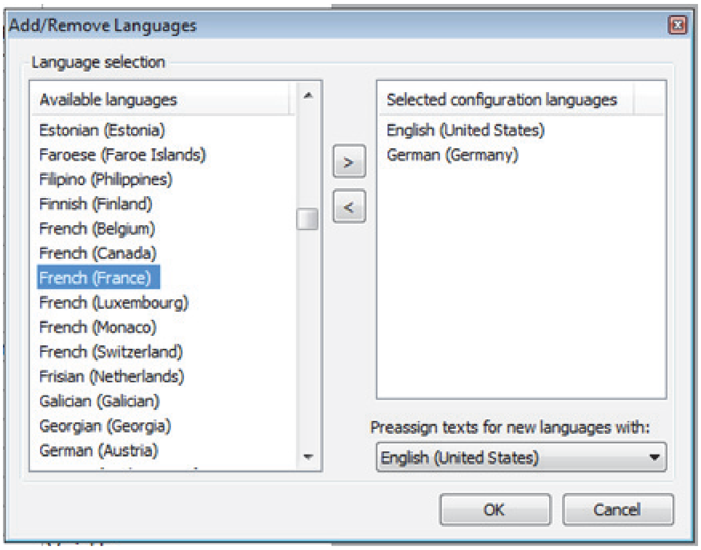
To ensure that all elements of your project can be displayed in the target language, you must also add / change the SIMOCRANE CMS language.

See: Adding and translating the SIMOCRANE CMS language (Page 271)

In order to add a new WinCC Runtime language, you must add a new language in the WinCC Text Library.

Sequence of steps

1. Open the "Text Library" in "WinCC Explorer".
2. Select "Language" → "Add/Remove" in the "Text Library" in order to open the "Add/Remove Languages" dialog.



Add/Remove Languages

Language selection

Available languages	Selected configuration languages
Estonian (Estonia)	English (United States)
Faroese (Faroe Islands)	German (Germany)
Filipino (Philippines)	
Finnish (Finland)	
French (Belgium)	
French (Canada)	
French (France)	
French (Luxembourg)	
French (Monaco)	
French (Switzerland)	
Frisian (Netherlands)	
Galician (Galician)	
Georgian (Georgia)	
German (Austria)	

Preassign texts for new languages with: English (United States)

3. Add a language in the "Add/Remove Languages" dialog.
4. Choose the WinCC Runtime language to be preassigned to texts in the new WinCC Runtime language in the box "Preassign texts for new languages with".
   The language you choose must already be a WinCC Runtime language. We recommend that you assign texts in English to the texts.
5. Click "OK" to create the new WinCC Runtime language.

Result

The new WinCC Runtime language has now been created.

You now need to translate the texts of the new WinCC Runtime language.

See: Translating the texts of the WinCC Runtime language (Page 269)

See also

General information about language management in CMS (Page 266)

8.8.4.2 Translating the texts of the WinCC Runtime language

Initial situation

You can export texts of the WinCC Runtime language using the WinCC Text Distributor and then translate the WinCC Runtime language. You then reimport the translated WinCC Runtime language.

You can also edit the alarm/event system texts directly in the WinCC Text Library.

Note

Texts specific to SIMOCRANE CMS are not included with the WinCC Runtime language. To ensure that all elements of your project can be displayed in the target language, you must also add and translate the SIMOCRANE CMS language.

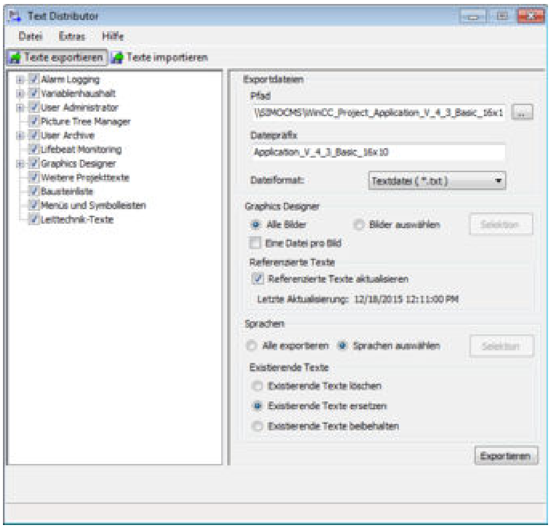
See: Adding and translating the SIMOCRANE CMS language (Page 271)

Sequence of steps

1. Start the WinCC Text Distributor and select all the elements to be exported.

   Note

   If you do not export all the elements, you may have problems when you try to import them again!



☑ Alarm Logging
☑ Variablenhaushalt
☑ User Administrator
☑ Picture Tree Manager
☑ User Archive
☑ Lifebeat Monitoring
☑ Graphics Designer
☑ Weitere Projekttexte
☑ Bausteinliste
☑ Menüs und Symbolleisten
☑ Leittechnik-Texte

Exportdateien
Pfad: \\SIMOCMS\WinCC_Project_Application_V_4_3_Basic_16x1
Dateipräfix: Application_V_4_3_Basic_16x10
Dateiformat: Textdatei (*.txt)

Graphics Designer
● Alle Bilder ○ Bilder auswählen
□ Eine Datei pro Bild

Referenzierte Texte
☑ Referenzierte Texte aktualisieren
Letzte Aktualisierung: 12/18/2015 12:11:00 PM

Sprachen
○ Alle exportieren ● Sprachen auswählen

Existierende Texte
○ Existierende Texte löschen
● Existierende Texte ersetzen
○ Existierende Texte beibehalten

2. Export one or more existing languages in the txt or csv format.
   Depending on the size of the project it may take several minutes to export the language texts.
3. Open the export file in MS Excel using "File" → "Open".
4. Select the exported csv file under "File name" and text files (*.prn, *.txt, *.csv) under "File format". In this way you can ensure that MS Excel correctly interprets the dividers in the file.
5. Make sure that the file format is retained during translation.
6. Once translated, save the file in csv format.
7. Import the edited file using the WinCC Text Distributor.
   Again here you can choose which language you want to import.

Result

The translated texts of the WinCC Runtime language are now available.

See also

General information about language management in CMS (Page 266)

8.8.5 Adding and translating the SIMOCRANE CMS language

8.8.5.1 Adding the SIMOCRANE CMS language

Initial situation

The SIMOCRANE CMS language defines the language of the CMS editor texts and specific texts of the SIMOCRANE CMS Runtime application. It also includes ActiveX Controls texts.

Note

To ensure that all elements of your project can be displayed in the target language, you must also add / change the WinCC Runtime language.

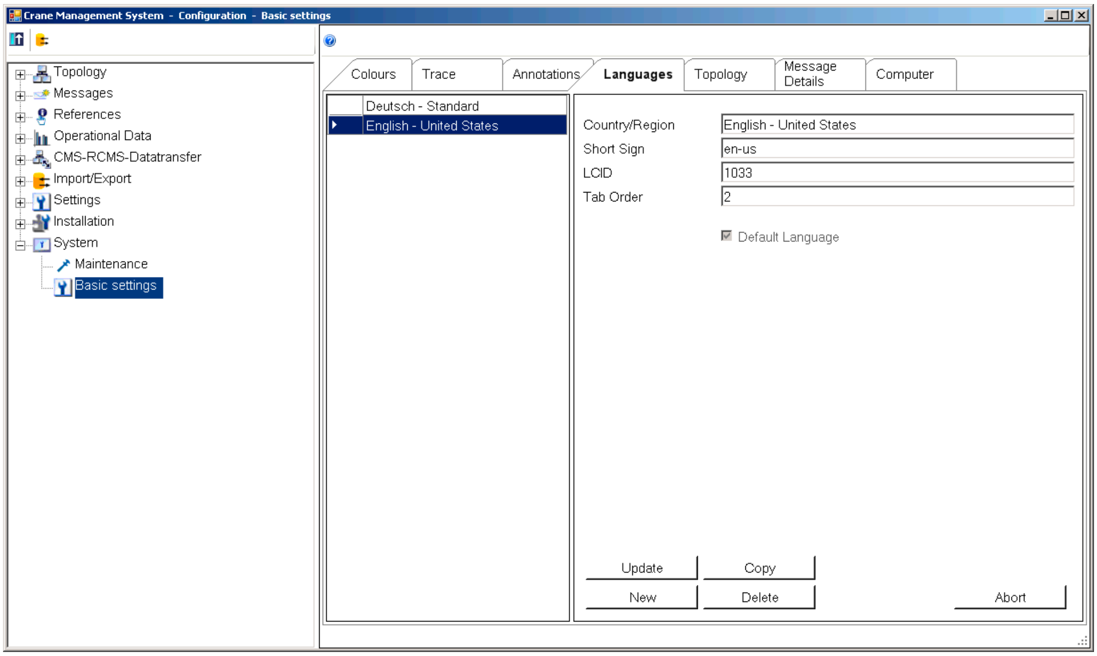
See: Adding and translating the WinCC Runtime language (Page 268)

Create a new SIMOCRANE CMS language in the CMS editor.

Texts in the standard language are preassigned to the new language.

Sequence of steps

1. Open the "Basic settings" dialog.
   "System" → "Basic settings" → "Languages"



Deutsch - Standard
English - United States

Country/Region: English - United States
Short Sign: en-us
LCID: 1033
Tab Order: 2
☑ Default Language

2. From the list of languages, select the SIMOCRANE CMS language to be assigned to texts in the new SIMOCRANE CMS language, and activate the "Standard language" checkbox.
3. Click on the button "New" to create a new language.
4. Enter the following settings:
   "Country/Region" box:
   Enter the name of the new language in this box.

   ### Note

   You can find a list of LCID codes and the matching abbreviation under keyword "LCID" in the WinCC documentation.

   "Short Sign" box:
   Enter the associated language code for the new language here. The language code must match the LCID code.
   "LCID" box:
   Enter the correct Local ID for the new language. This is the numerical code defined by Microsoft for national languages.
   "Tab Order" box:
   Here, define in which sequence the tabs are to be displayed on the screen forms "Installation" → "Language" and "Installation" → "User texts".
   Enter a number between 0 and 255.
5. Click "OK" to create the new SIMOCRANE CMS language.

Result

You can now translate the texts.

See: Translating the SIMOCRANE CMS language (Page 273)

See also

General information about language management in CMS (Page 266)

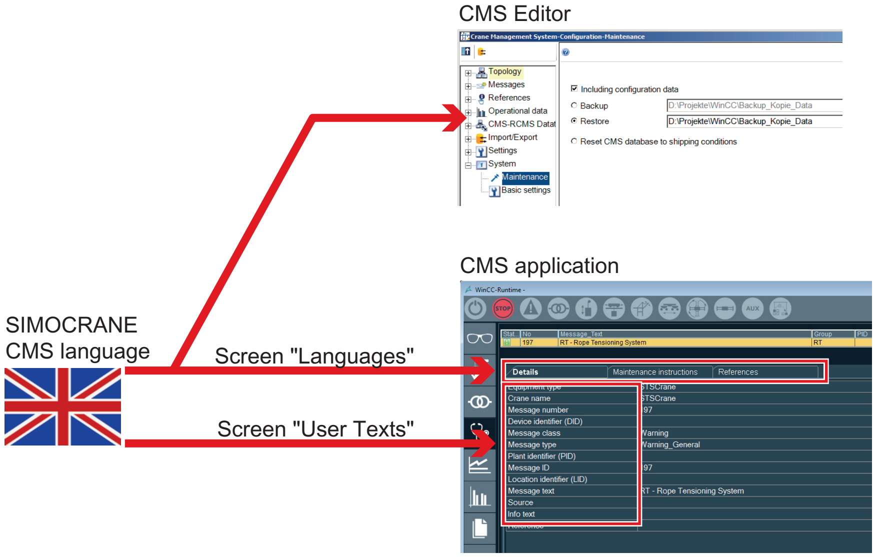
8.8.5.2 Translating the SIMOCRANE CMS language

Initial situation

The SIMOCRANE CMS language to be translated has already been created.
See: Adding the SIMOCRANE CMS language (Page 271)

When creating the new SIMOCRANE CMS language, the SIMOCRANE CMS language was already preassigned with the entries of the SIMOCRANE CMS standard (default) language. You can now translate the new SIMOCRANE CMS language.

The SIMOCRANE CMS language is managed on the "Languages" and "User texts" screen forms. The "Languages" screen form manages those texts that are also used in the CMS Editor. The "User texts" screen form only manages those texts that are used in the application itself.



☑ Including configuration data
○ Backup D:\Projekte\WinCC\Backup_Kopie_Data
● Restore D:\Projekte\WinCC\Backup_Kopie_Data
○ Reset CMS database to shipping conditions

Stat...	No	Message_Text	Group	PID
	197	RT - Rope Tensioning System	RT	

Details | Maintenance instructions | References

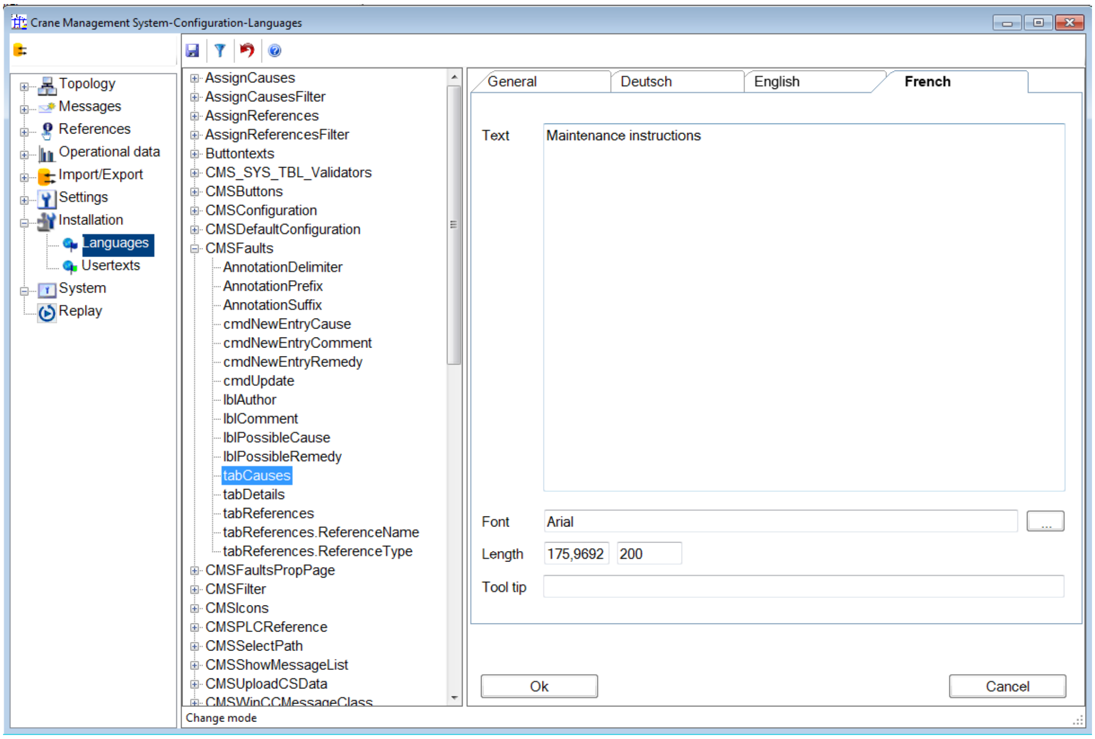
Equipment type	STSCrane
Crane name	STSCrane
Message number	197
Device identifier (DID)	
Message class	Warning
Message type	Warning_General
Plant identifier (PID)	
Message ID	197
Location identifier (LID)	
Message text	RT - Rope Tensioning System
Source	
Info text	

Figure 8-30 SIMOCRANE CMS language

Translating texts in the screen "Languages"

You translate CMS editor texts and specific texts of the SIMOCRANE CMS Runtime application in the screen "Languages".

1. Open the "Languages" dialog.
   "Installation" → "Languages"



Text: Maintenance instructions

Font: Arial

Length: 175,9692 200

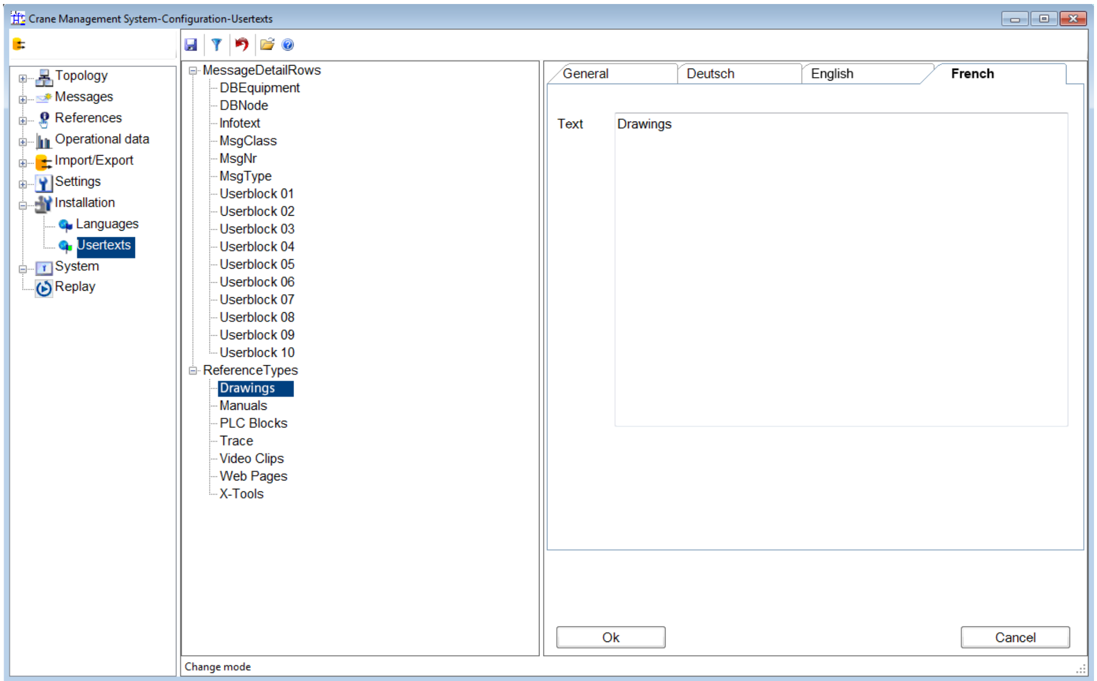
Tool tip:

Figure 8-31 Acquisition of language-specific texts - "Languages" screen

2. Select the tab for the language that you wish to translate.
3. Select an entry from the list and translate it.
4. Perform this operation for all entries from the list.

Translating texts in the screen "Usertexts"

1. Open the "Usertexts" dialog.
   "Installation" → "Usertexts"



Text: Drawings

Figure 8-32 Acquisition of language-specific texts - "Usertexts" screen

2. Select the tab for the language that you wish to translate.
3. Select an entry from the list and translate it.
4. Perform this operation for all entries from the list.

Result

The new SIMOCRANE CMS language has now been translated to the target language.

See also

General information about language management in CMS (Page 266)

Installation: Languages (Page 210)

8.9 Integrating web-based documentation

Initial situation / objective

The CMS example application provides an example of web-based documentation in the "Documentation" menu. This only contains a few sample documents. You can integrate any number of your own pieces of documentation. Note the following information.

Processing steps

1. Produce web-based documentation, and name the start page "index.htm".
2. Open the folder for the web-based documentation in the "…\CMS\CMS_Documentation" project directory.
3. Delete the entire contents of the "CMS_Documentation" folder.
4. Copy your web-based documentation into the "CMS_Documentation" folder
5. Ensure that the "index.htm" start page is in the folder.
6. Check the accessing of documentation in the CMS example application, "Documentation" menu.

Result

The web-based documentation that you have produced is displayed in the CMS example application.

8.10 Bulk data configuration in WinCC

You can use the Configuration Tool to create a totally new WinCC project using MS Excel or to edit the data of an existing project. All the tools available in MS Excel can be used to edit the data. For example, the Configuration Tool provides drop-down list fields, a function for automatically completing data, and input instructions during configuration. The Configuration Tool is particularly useful when editing the tag management or Text Library.

If the Configuration Tool is installed, you can use the toolbar in Excel to produce special folders, known as WinCC project folders.

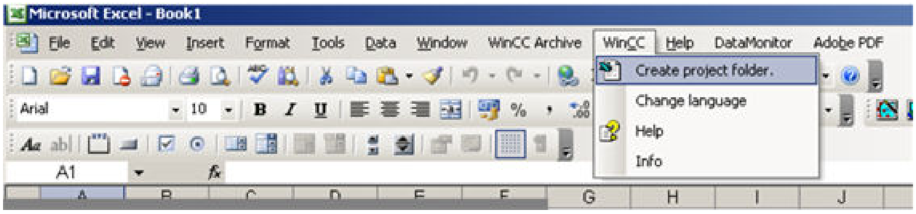


Figure 8-33 WinCC Configuration Tool add-in in MS Excel

You can find information on operating and using the Configuration Tool in the WinCC documentation.

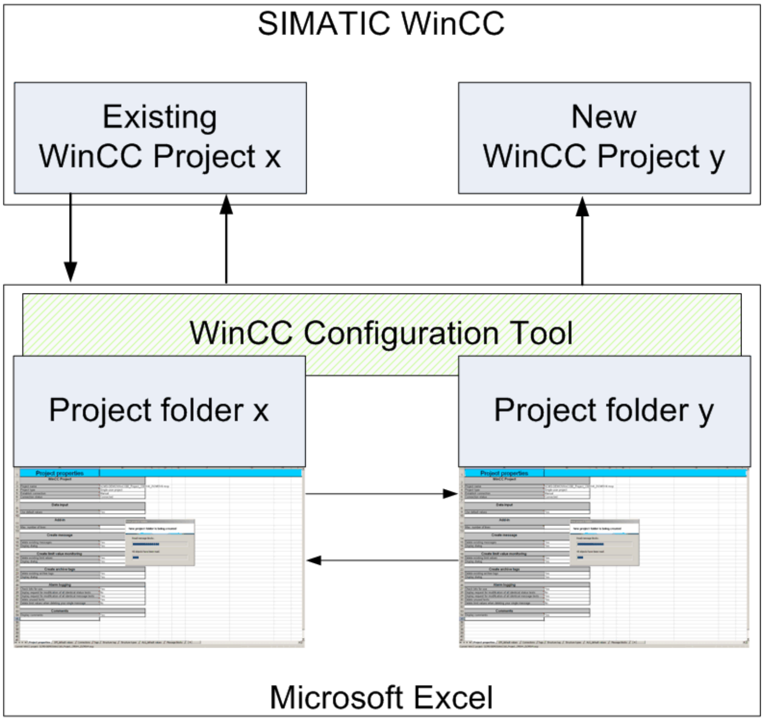


Figure 8-34 WinCC Configuration Tool

8.11 Performance Monitor configuration

In the CMS example application, the Performance Monitor acquires the following basic data from the CMS station tag management:

- Operating states of all connected cranes
- Counter values of the connected cranes

All operating states and counter values are read from the WinCC tags that are directly connected to the process.

The Performance Monitor project data are automatically also copied when the WinCC project is copied. The following provides a short overview of the configured operands and KPIs in the Performance Monitor Configuration Studio.

Note

For a better understanding of this chapter, first read the Performance Monitor documentation, which is also installed, and the Getting Started document, which is available on the product support pages of Siemens. This recommendation also applies in respect of possible changes to the configuration of the Performance Monitor.

Note

License for 30 operands

The SIMOCRANE CMS product package for the CMS station contains a license for up to 30 operands. If more operands are required to analyze your crane, you require an upgrade license, which you must order separately.

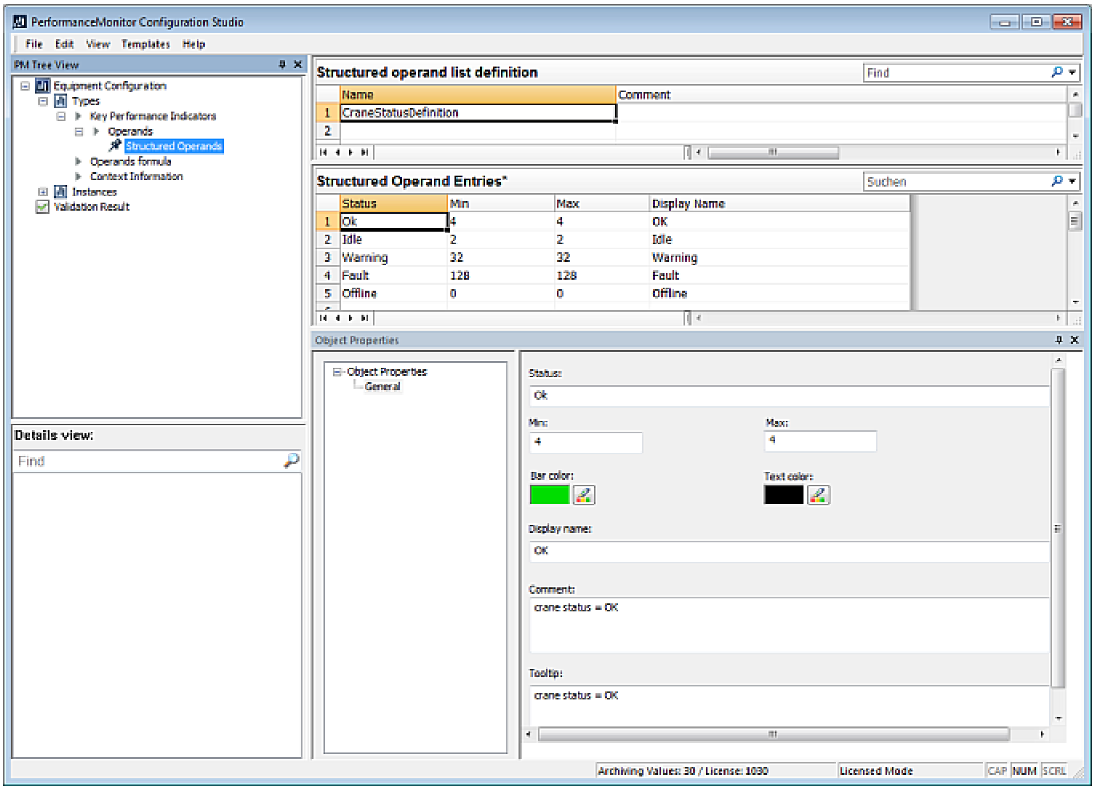
The Performance Monitor works with operands and KPIs, which can be calculated from the operands. The object model is used for this. This means that all necessary operands and KPIs first have to be created without defining the process connection directly, too. You can then generate an instance from the created KPI, in which you then configure the connection with the process tags. In this way, you can generate multiple instances from one created KPI, which are then supplied with values via different tags.

8.11.1 Evaluation of the crane status

The crane status is displayed by the variable "wrdCraneStatus" in the WinCC tag management. In the example application, the values of the tags have the following meanings:

4	OK
2	Idle
32	Warning
128	Fault
0	Offline

First create a structured operand to map this value assignment in the Performance Monitor. If additional statuses are configured in the control or the values of the tags "wrdCraneStatus" have other meanings, you must adapt the structure operand accordingly.



Structured operand list definition

	Name	Comment
1	CraneStatusDefinition	
2		

Structured Operand Entries*

	Status	Min	Max	Display Name
1	Ok	4	4	OK
2	Idle	2	2	Idle
3	Warning	32	32	Warning
4	Fault	128	128	Fault
5	Offline	0	0	Offline

Status: Ok

Min: 4

Max: 4

Bar color: 🟩

Text color: ⬛

Display name: OK

Comment: crane status = OK

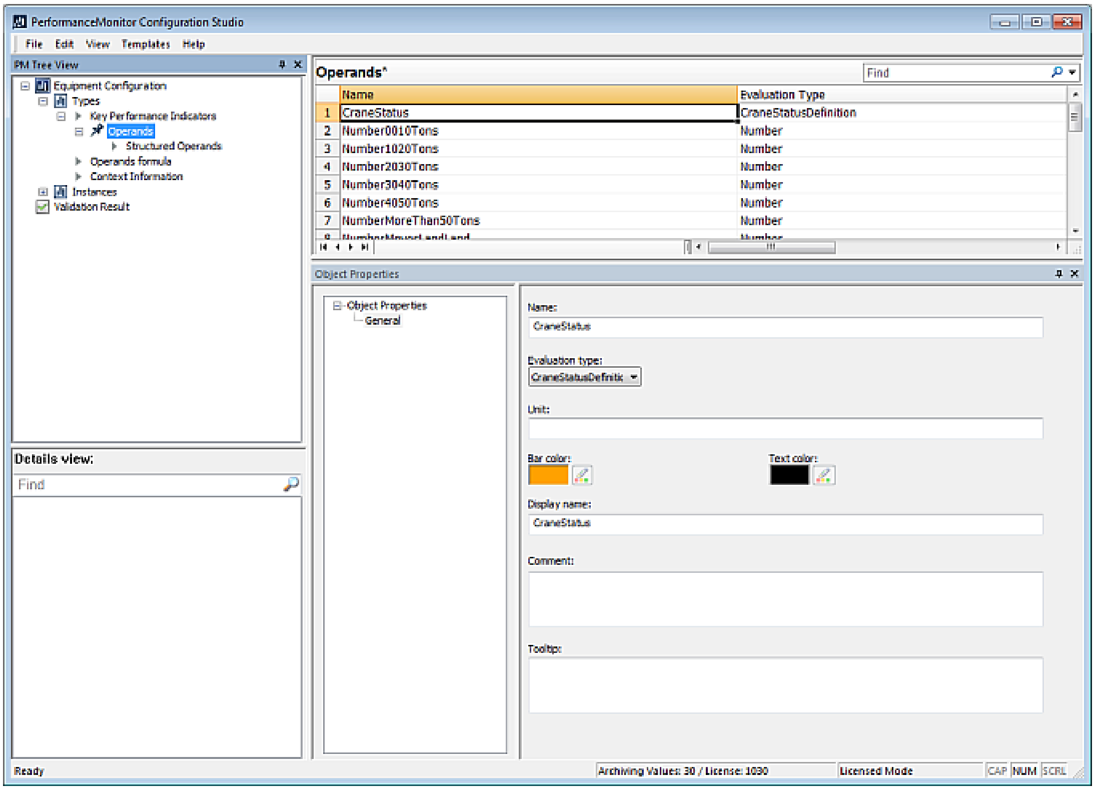
Tooltip: crane status = OK

Archiving Values: 30 / License: 1030

Licensed Mode

Figure 8-35 Configuration of the crane status: Creating a structured operand

Then create from this definition an operand with the name "CraneStatus" whose evaluation type is the previously created structured operand.



	Name	Evaluation Type
1	CraneStatus	CraneStatusDefinition
2	Number0010Tons	Number
3	Number1020Tons	Number
4	Number2030Tons	Number
5	Number3040Tons	Number
6	Number4050Tons	Number
7	NumberMoreThan50Tons	Number
8	NumberMovedLandLand	Number

Name: CraneStatus

Evaluation type: CraneStatusDefinitic

Unit:

Bar color: 🟧

Text color: ⬛

Display name: CraneStatus

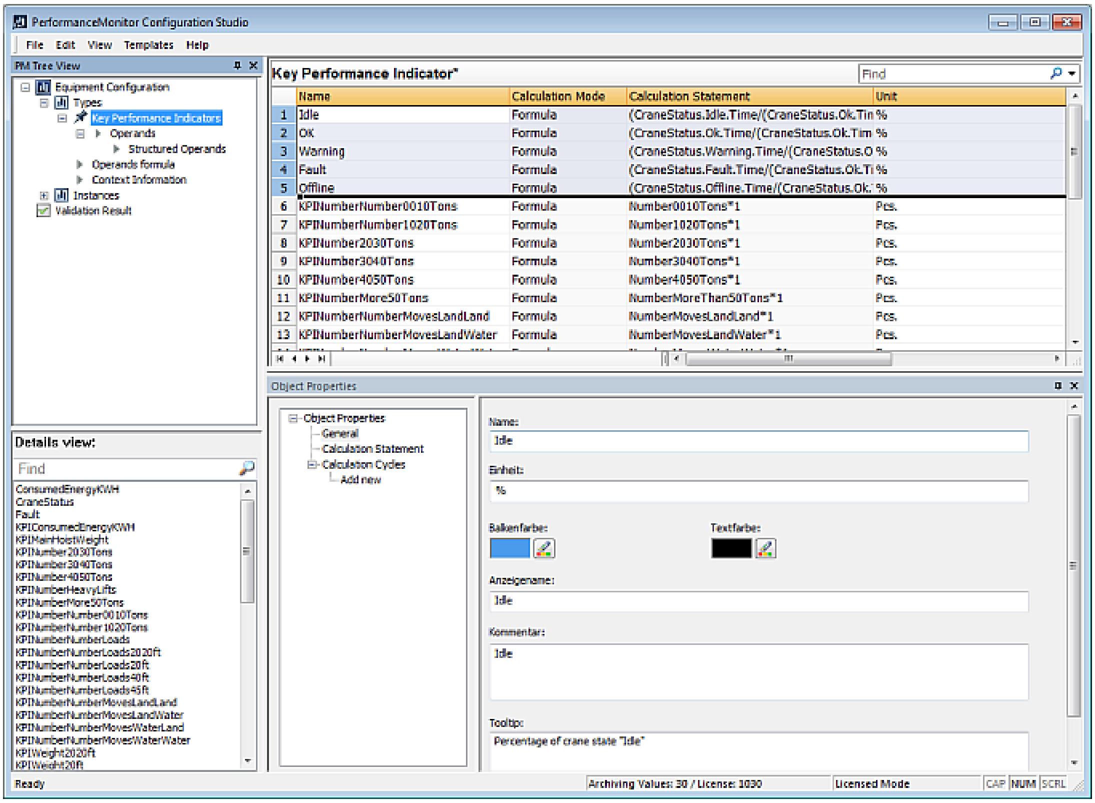
Comment:

Tooltip:

Figure 8-36 Configuration of the crane status: Creating an operand

For the percentage evaluation of the duration of the different operating status, with reference to the total period under consideration, the following KPIs are also considered.

OK	(CraneStatus.Ok.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time +CraneStatus.Warning.Time+CraneStatus.Fault.Time+CraneStatus.Offline.Time))*100
Idle	(CraneStatus.Idle.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time +CraneStatus.Warning.Time+CraneStatus.Fault.Time+CraneStatus.Offline.Time))*100
Warning	(CraneStatus.Warning.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time+CraneStatus.Warning.Time+CraneStatus.Fault.Time+CraneStatus.Offline.Time))*100
Fault	(CraneStatus.Fault.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time +CraneStatus.Warning.Time+CraneStatus.Fault.Time+CraneStatus.Offline.Time))*100
Offline	(CraneStatus.Offline.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time +CraneStatus.Warning.Time+CraneStatus.Fault.Time+CraneStatus.Offline.Time))*100



Key Performance Indicator*

	Name	Calculation Mode	Calculation Statement	Unit
1	Idle	Formula	(CraneStatus.Idle.Time/(CraneStatus.Ok.Tin	%
2	OK	Formula	(CraneStatus.Ok.Time/(CraneStatus.Ok.Tim	%
3	Warning	Formula	(CraneStatus.Warning.Time/(CraneStatus.O	%
4	Fault	Formula	(CraneStatus.Fault.Time/(CraneStatus.Ok.Ti	%
5	Offline	Formula	(CraneStatus.Offline.Time/(CraneStatus.Ok.	%
6	KPINumberNumber0010Tons	Formula	Number0010Tons*1	Pcs.
7	KPINumberNumber1020Tons	Formula	Number1020Tons*1	Pcs.
8	KPINumber2030Tons	Formula	Number2030Tons*1	Pcs.
9	KPINumber3040Tons	Formula	Number3040Tons*1	Pcs.
10	KPINumber4050Tons	Formula	Number4050Tons*1	Pcs.
11	KPINumberMore50Tons	Formula	NumberMoreThan50Tons*1	Pcs.
12	KPINumberNumberMovesLandLand	Formula	NumberMovesLandLand*1	Pcs.
13	KPINumberNumberMovesLandWater	Formula	NumberMovesLandWater*1	Pcs.

Details view:

ConsumedEnergyKWH
CraneStatus
Fault
KPIConsumedEnergyKWH
KPIMainHoistWeight
KPINumber2030Tons
KPINumber3040Tons
KPINumber4050Tons
KPINumberHeavyLifts
KPINumberMore50Tons
KPINumberNumber0010Tons
KPINumberNumber1020Tons
KPINumberNumberLoads
KPINumberNumberLoads2020ft
KPINumberNumberLoads20ft
KPINumberNumberLoads40ft
KPINumberNumberLoads45ft
KPINumberNumberMovesLandLand
KPINumberNumberMovesLandWater
KPINumberNumberMovesWaterLand
KPINumberNumberMovesWaterWater
KPIWeight2020ft
KPIWeight20ft

Object Properties
- General
- Calculation Statement
- Calculation Cycles
  - Add new

Name: Idle

Einheit: %

Balkenfarbe: 🟦

Textfarbe: ■

Anzeigename: Idle

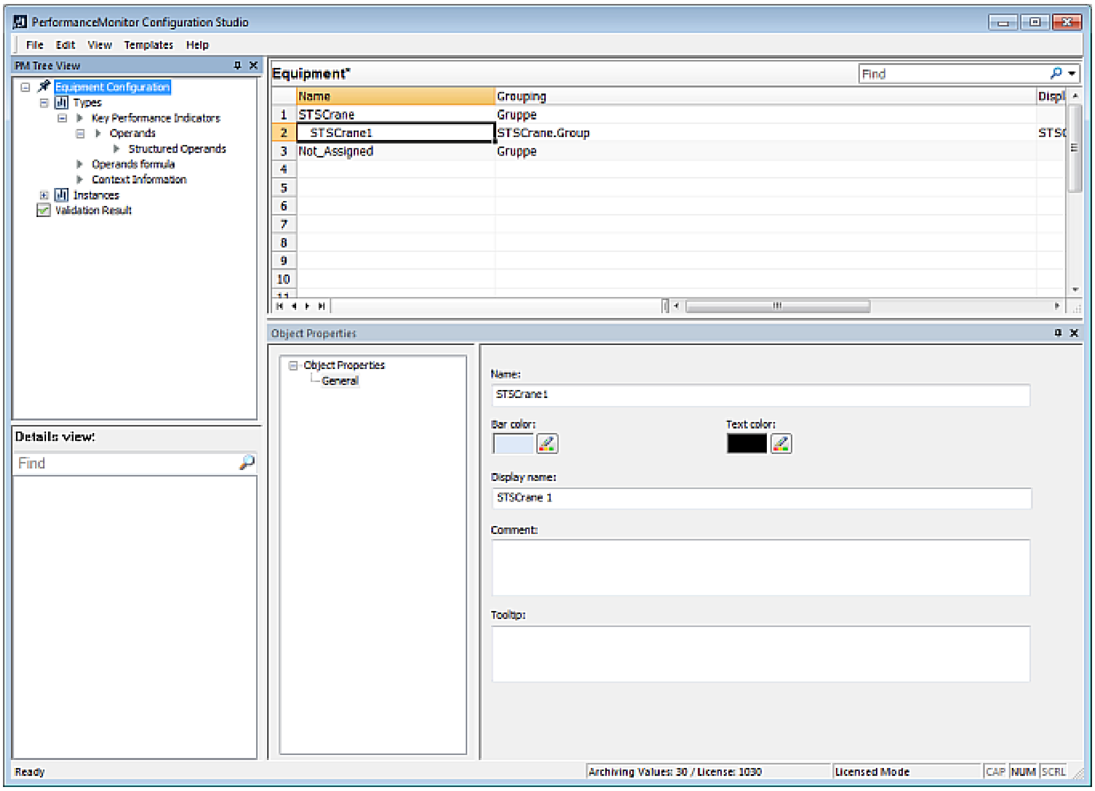
Kommentar: Idle

Tooltip: Percentage of crane state "Idle"

Archiving Values: 30 / License: 1030 | Licensed Mode

Figure 8-37 Configuration of the crane status: Creating key performance indicators

Now define an item of equipment. In this example, this is "STSCrane1" in the group "STSCrane." The equipment is automatically also created in the area of the instances.



Equipment*

	Name	Grouping	Displ
1	STSCrane	Gruppe	
2	STSCrane1	STSCrane.Group	STSC
3	Not_Assigned	Gruppe	
4			
5			
6			
7			
8			
9			
10			

Name: STSCrane1

Bar color:

Text color: ■

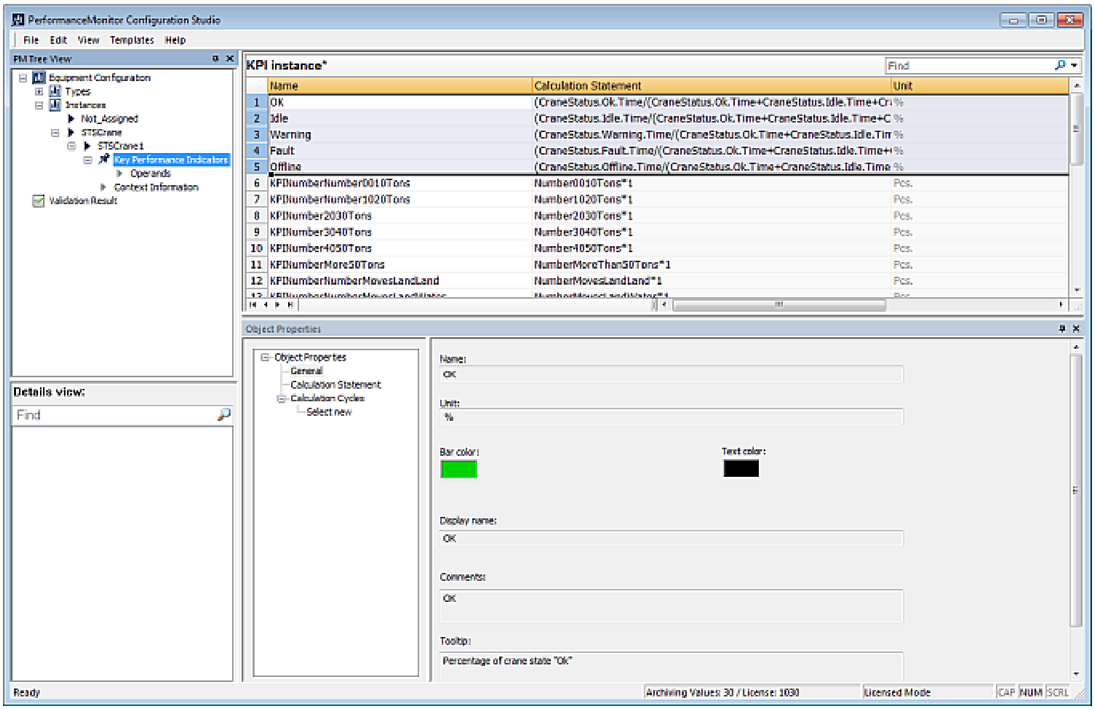
Display name: STSCrane 1

Comment:

Tooltip:

Figure 8-38 Configuration of the crane status: Defining the equipment

Now drag the KPIs under "Instances" → "STSCrane" → "STSCrane1" → "Key Performance Indicators" out of the "Details view" (left) into the list (right). In this way, you create an instance of the KPI. The result is illustrated in the diagram below.



KPI instance*

	Name	Calculation Statement	Unit
1	OK	(CraneStatus.Ok.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time+Cr	%
2	Idle	(CraneStatus.Idle.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time+C	%
3	Warning	(CraneStatus.Warning.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Tim	%
4	Fault	(CraneStatus.Fault.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time+	%
5	Offline	(CraneStatus.Offline.Time/(CraneStatus.Ok.Time+CraneStatus.Idle.Time	%
6	KPINumberNumber0010Tons	Number0010Tons*1	Pcs.
7	KPINumberNumber1020Tons	Number1020Tons*1	Pcs.
8	KPINumber2030Tons	Number2030Tons*1	Pcs.
9	KPINumber3040Tons	Number3040Tons*1	Pcs.
10	KPINumber4050Tons	Number4050Tons*1	Pcs.
11	KPINumberMore50Tons	NumberMoreThan50Tons*1	Pcs.
12	KPINumberNumberMovesLandLand	NumberMovesLandLand*1	Pcs.
13	KPINumberNumberMovesLandWater	NumberMovesLandWater*1	Pcs.

Name: OK

Unit: %

Bar color: 🟩

Text color: ■

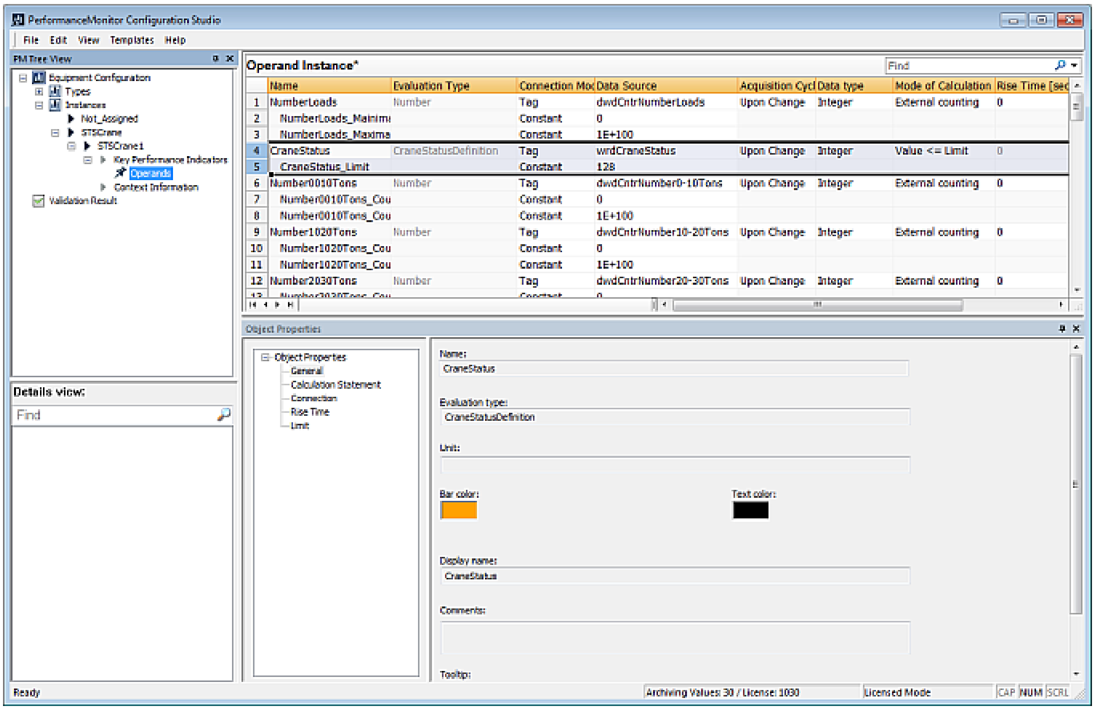
Display name: OK

Comments: OK

Tooltip: Percentage of crane state "OK"

Figure 8-39 Configuration of the crane status: New KPI instance

Then connect the operands required for calculation of the KPI instances under "Instances" → "STSCrane" → "STSCrane1" → "Key Performance Indicators" → "Operands" to the process. The data source is "wrdCraneStatus" in this case.



Operand Instance*

	Name	Evaluation Type	Connection Mo	Data Source	Acquisition Cycl	Data type	Mode of Calculation	Rise Time [sec
1	NumberLoads	Number	Tag	dwdCntrNumberLoads	Upon Change	Integer	External counting	0
2	NumberLoads_Mainimu		Constant	0				
3	NumberLoads_Maxima		Constant	1E+100				
4	CraneStatus	CraneStatusDefinition	Tag	wrdCraneStatus	Upon Change	Integer	Value <= Limit	0
5	CraneStatus_Limit		Constant	128				
6	Number0010Tons	Number	Tag	dwdCntrNumber0-10Tons	Upon Change	Integer	External counting	0
7	Number0010Tons_Cou		Constant	0				
8	Number0010Tons_Cou		Constant	1E+100				
9	Number1020Tons	Number	Tag	dwdCntrNumber10-20Tons	Upon Change	Integer	External counting	0
10	Number1020Tons_Cou		Constant	0				
11	Number1020Tons_Cou		Constant	1E+100				
12	Number2030Tons	Number	Tag	dwdCntrNumber20-30Tons	Upon Change	Integer	External counting	0
13	Number2030Tons_Cou		Constant	0				

Name: CraneStatus

Evaluation type: CraneStatusDefinition

Unit:

Bar color: 🟧 Text color: ■

Display name: CraneStatus

Comments:

Tooltip:

Figure 8-40 Configuration of the crane status: New instance

After storage of the configuration, the crane status can be displayed in runtime with the WinCC PerformanceGanttControl. You can also display the percentage evaluation of the duration of the individual operating states with the WinCC PerformanceViewControl.

8.11.2 Counters

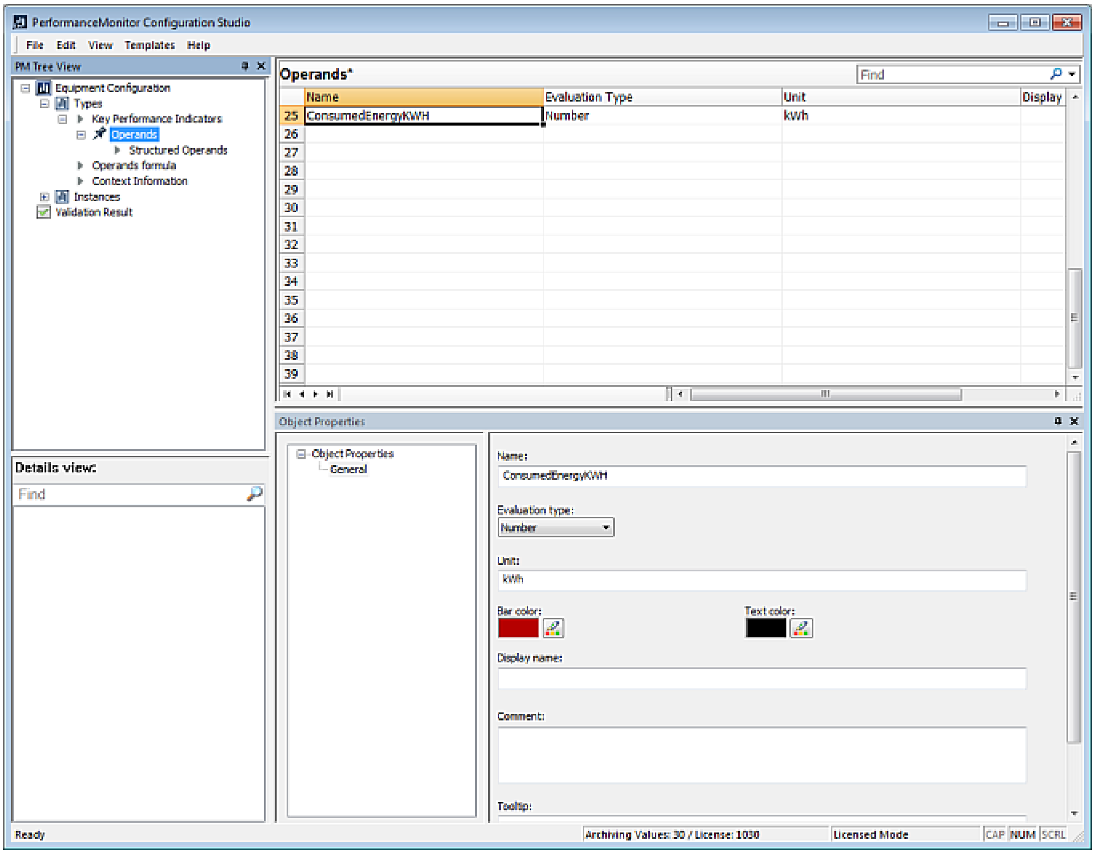
For the counters calculated in the control, operands, KPIs, and the corresponding instance must also have been created. Because the counters are already calculated in the control, you must create the counters as external counters. Creation of a counter in the Performance Monitor Configuration Studio using the counter for the energy consumed is shown below by way of example. All other counters must be created in an analogous way.

Requirements:

- The equipment has been created as described in Chapter Evaluation of the crane status (Page 278).

Procedure:

First create an operand with the evaluation type "Number" for the counter.



Operands*

	Name	Evaluation Type	Unit	Display
25	ConsumedEnergyKWH	Number	kWh	
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				

Name: ConsumedEnergyKWH

Evaluation type: Number

Unit: kWh

Bar color: 🟥

Text color: ■

Display name:

Comment:

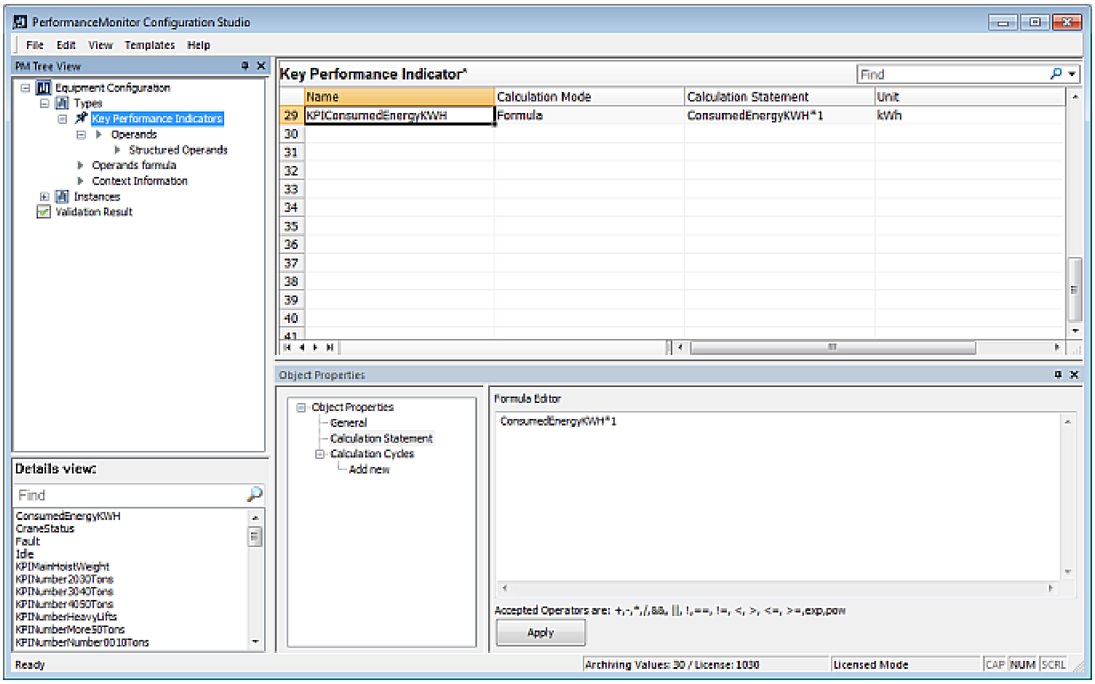
Tooltip:

Archiving Values: 30 / License: 1030

Licensed Mode

Figure 8-41 Configuration of a counter: Creating an operand

Then create a KPI. Because the counter is already calculated in the control, the operand only has to be multiplied by one to take over the value unchanged from the control.



Key Performance Indicator*

	Name	Calculation Mode	Calculation Statement	Unit
29	KPIConsumedEnergyKWH	Formula	ConsumedEnergyKWH*1	kWh
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				

Details view:

ConsumedEnergyKWH
CraneStatus
Fault
Idle
KPIMainHoistWeight
KPINumber2030Tons
KPINumber3040Tons
KPINumber4050Tons
KPINumberHeavyLifts
KPINumberMore50Tons
KPINumberNumber0010Tons

Formula Editor

ConsumedEnergyKWH*1

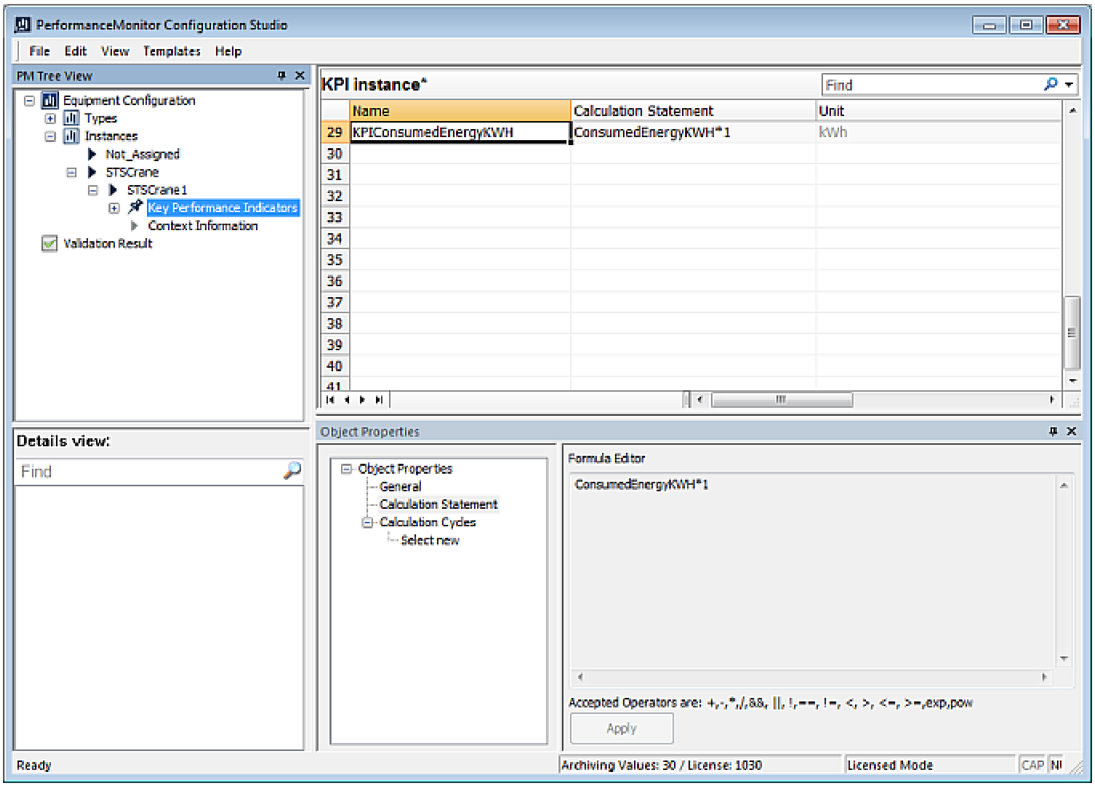
Accepted Operators are: +,-,*,/,&&, ||, !,==, !=, <, >, <=, >=,exp,pow

Archiving Values: 30 / License: 1030

Licensed Mode

Figure 8-42 Configuration of a counter: Creating a KPI

To ensure that the counter is acquired for the crane, generate from the created KPI under "Instances -> STSCrane -> STSCrane1 -> Key Performance Indicators" and instance in the corresponding equipment. To this by dragging the KPI out of the detailed view (left) into the list of the KPI instances (right). The result is shown in the following screenshot.



KPI instance*

	Name	Calculation Statement	Unit
29	KPIConsumedEnergyKWH	ConsumedEnergyKWH*1	kWh
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			

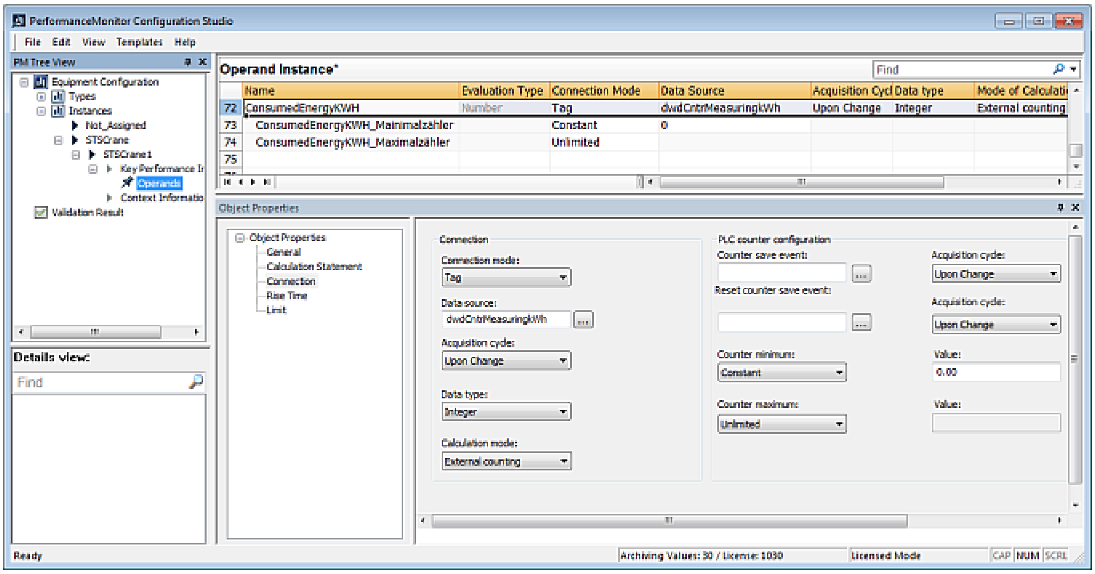
Formula Editor: ConsumedEnergyKWH*1

Accepted Operators are: +,-,*,/,&&, ||, !,==, !=, <, >, <=, >=,exp,pow

Ready | Archiving Values: 30 / License: 1030 | Licensed Mode | CAP | NI

Figure 8-43 Configuration of a counter: Generating a new KPI instance

Define under "Instances -> STSCrane -> STSCrane1 -> Key Performance Indicators -> Operands" the process connection and the type of the counter. Select external counting as the "Type of calculation."



Operand Instance*

	Name	Evaluation Type	Connection Mode	Data Source	Acquisition Cycl	Data type	Mode of Calculati
72	ConsumedEnergyKWH	Number	Tag	dwdCntrMeasuringkWh	Upon Change	Integer	External counting
73	ConsumedEnergyKWH_Mainimalzähler		Constant	0			
74	ConsumedEnergyKWH_Maximalzähler		Unlimited				
75							

Connection

Connection mode: Tag

Data source: dwdCntrMeasuringkWh

Acquisition cycle: Upon Change

Data type: Integer

Calculation mode: External counting

PLC counter configuration

Counter save event:

Acquisition cycle: Upon Change

Reset counter save event:

Acquisition cycle: Upon Change

Counter minimum: Constant

Value: 0.00

Counter maximum: Unlimited

Value:

Archiving Values: 30 / License: 1030

Figure 8-44 Configuration of a counter: Process connection and counter type of the new instance

After storage of the configuration, the counter can be displayed in runtime, for example, with the WinCC PerformanceViewControl.

Remote access 9

9.1 General information about remote access to CMS stations

With remote access, the screens of the CMS station can be viewed via a remote PC in the network. Typical examples of remote PCs include touch operator panels in the operator's cabin or in the checker cabin or a service PC in a maintenance building.

The precondition for remote access is a TCP/IP connection between the CMS station and the remote PC.

Remote access can be implemented using two different methods:

- WinCC WebNavigator
  The WinCC WebNavigator server runs on the CMS station. The WinCC WebNavigator client runs on the remote PC.
  For remote access via the WebNavigator, the WinCC WebNavigator server must be installed on the CMS stations. You also require a WebNavigator license on the CMS station.
  The WinCC WebNavigator client and the SIMOCRANE CMS client must be installed on the remote PC.
  The accessed CMS station is displayed by the program "WinCCViewerRT" or via a web browser.
- WinCC WebUX
  The WinCC WebUX server runs on the CMS station.
  An HTML5 web browser is required on the remote PC.
  You also require a WebUX license on the CMS station.

You have the same operating options as at the CMS Station:

- Navigating through the screens
  This navigation does not influence the screen displayed at the CMS station.
- Activating or deactivating functions
- Exporting data from the CMS station
- With various tools, CMS station data can be analyzed and locally saved.
- Starting and exiting Replay mode (WebNavigator only!)

In case of a fault, diagnostic information can be called up beforehand. In the best case scenario, a fault can be resolved in this way.

This configuration is especially suitable for simple solutions for cranes in industrial applications.

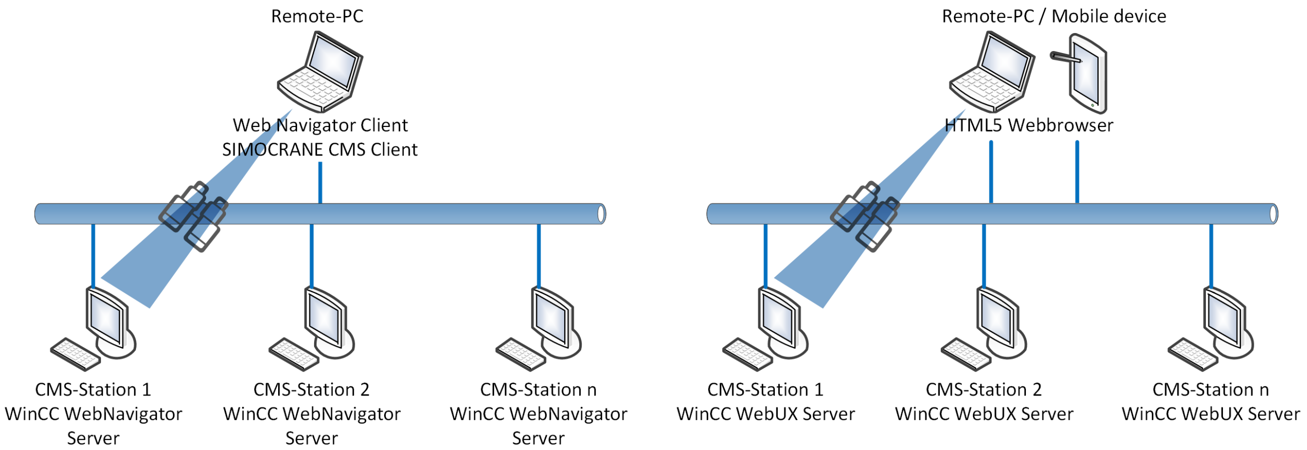


Figure 9-1 Remote access to CMS stations (left: WinCC WebNavigator; right: WinCC WebUX)

Note

Carefully observe the installation notes provided in the system manual for WinCC WebNavigator for commissioning and for important security notes.

See: WinCC WebNavigator system manual (https://support.industry.siemens.com/cs/document/109746337/wincc-basic-options-v7-4-sp1%3A-webnavigator-datamonitor-webux-connectivity-pack?dti=0&lc=de-WW
// XmlEditor.InternalXmlClipboard:6dee0b4b-053f-882a-ed66-a9c49964538d)

Note

Use an HTTPS connection

For network security reasons, we urgently recommend that it is only possible to establish remote access via a secure HTTPS connection in the case of remote access via WinCC WebNavigator.

A secure HTTPS connection is essential for remote access via WinCC WebUX.

See: Setting up the SSL certificate for remote access (Page 299)

See also

Remote access via web browser (WebNavigator) (Page 294)

Setting up remote access (WebNavigator) (Page 289)

Remote access via WinCCViewerRT (Page 292)

9.2 WebNavigator

9.2.1 Setting up remote access (WebNavigator)

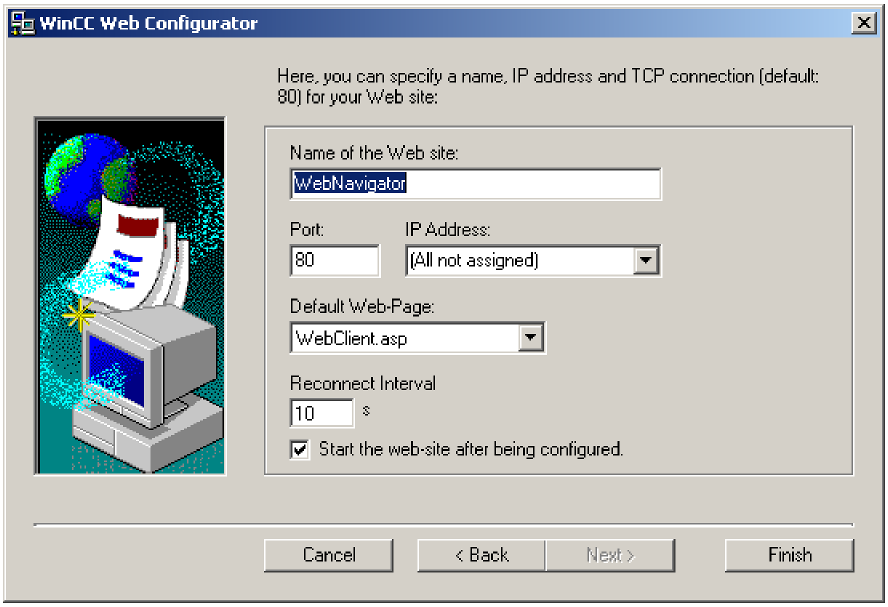
Initial situation / objective

The WinCC WebNavigator server runs on the CMS station for remote access via the WinCC WebNavigator. The WinCC WebNavigator client runs on the remote PC.

See also: General information about remote access to CMS stations (Page 287)

Installing the WinCC WebNavigator server (CMS station)

1. Establish a LAN connection between the local CMS station and the remote PC.
2. Start the WinCC Explorer and open the project for which you want to configure remote access.
3. Choose "WebConfigurator" from the shortcut menu of the WebNavigator.



Here, you can specify a name, IP address and TCP connection (default: 80) for your Web site:

Name of the Web site: WebNavigator

Port: 80

IP Address: (All not assigned)

Default Web-Page: WebClient.asp

Reconnect Interval: 10 s

☑ Start the web-site after being configured.

Figure 9-2 Configuring the WebNavigator server

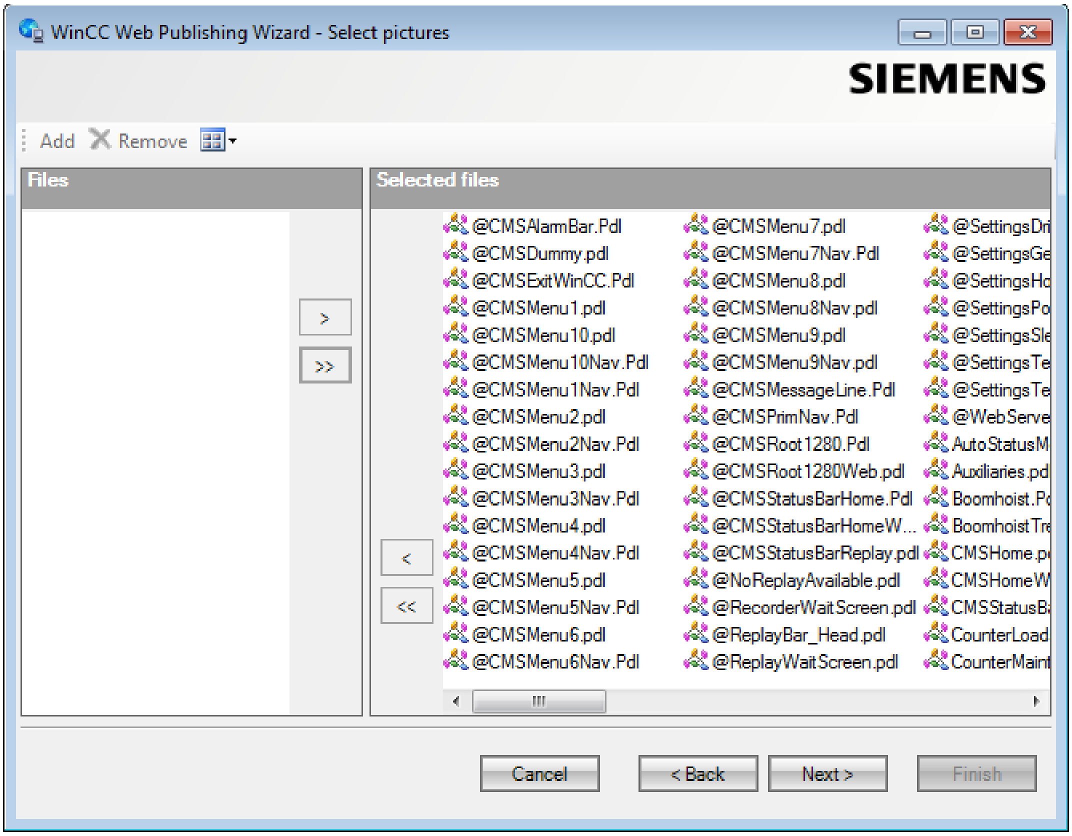
4. Configure the WinCC WebNavigator server on the local CMS station.

Note

Restart required

To complete configuration, you must restart the system.

5. Launch the "Web-View Publisher" in WinCC Explorer and follow the instructions on the screen.



@CMSAlarmBar.Pdl
@CMSDummy.pdl
@CMSExitWinCC.Pdl
@CMSMenu1.pdl
@CMSMenu10.pdl
@CMSMenu10Nav.Pdl
@CMSMenu1Nav.Pdl
@CMSMenu2.pdl
@CMSMenu2Nav.Pdl
@CMSMenu3.pdl
@CMSMenu3Nav.Pdl
@CMSMenu4.pdl
@CMSMenu4Nav.Pdl
@CMSMenu5.pdl
@CMSMenu5Nav.Pdl
@CMSMenu6.pdl
@CMSMenu6Nav.Pdl
@CMSMenu7.pdl
@CMSMenu7Nav.Pdl
@CMSMenu8.pdl
@CMSMenu8Nav.pdl
@CMSMenu9.pdl
@CMSMenu9Nav.pdl
@CMSMessageLine.Pdl
@CMSPrimNav.Pdl
@CMSRoot1280.Pdl
@CMSRoot1280Web.pdl
@CMSStatusBarHome.Pdl
@CMSStatusBarHomeW...
@CMSStatusBarReplay.pdl
@NoReplayAvailable.pdl
@RecorderWaitScreen.pdl
@ReplayBar_Head.pdl
@ReplayWaitScreen.pdl
@SettingsDri
@SettingsGe
@SettingsHo
@SettingsPo
@SettingsSle
@SettingsTe
@SettingsTe
@WebServe
AutoStatusM
Auxiliaries.pd
Boomhoist.Pd
BoomhoistTre
CMSHome.pd
CMSHomeW
CMSStatusB
CounterLoad
CounterMaint

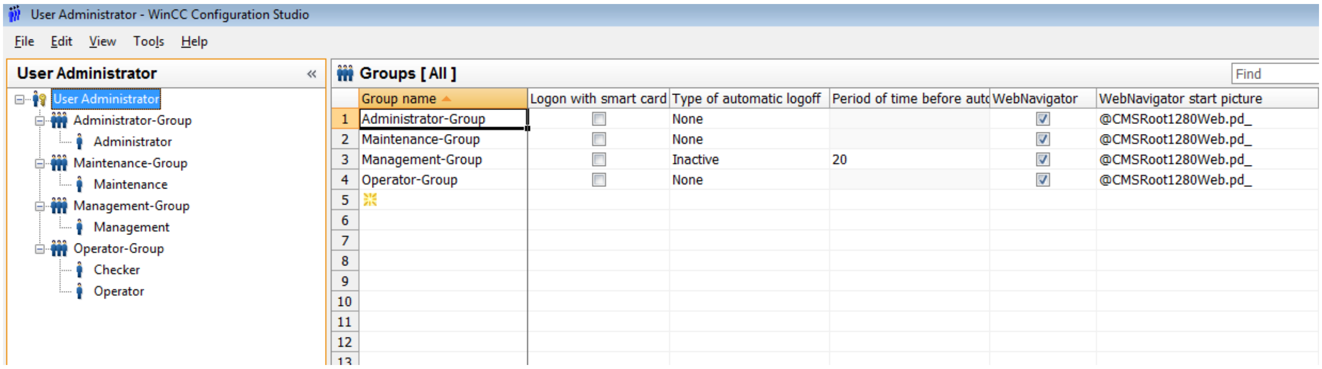
Figure 9-3 WinCC WebNavigator: Web View Publisher

6. Create the users who will have access to the WinCC WebNavigator in your CMS project.

7. Activate access to the WinCC WebNavigator for these users under "User Administration" in the WinCC Explorer.
Define the start picture.

Note

If you want to use an alternative start screen for users in the WinCC WebNavigator, you must define this start screen in the WinCC user administrator under "Start Picture".



User Administrator
- Administrator-Group
  - Administrator
- Maintenance-Group
  - Maintenance
- Management-Group
  - Management
- Operator-Group
  - Checker
  - Operator

	Group name	Logon with smart card	Type of automatic logoff	Period of time before autc	WebNavigator	WebNavigator start picture
1	Administrator-Group	□	None		☑	@CMSRoot1280Web.pd_
2	Maintenance-Group	□	None		☑	@CMSRoot1280Web.pd_
3	Management-Group	□	Inactive	20	☑	@CMSRoot1280Web.pd_
4	Operator-Group	□	None		☑	@CMSRoot1280Web.pd_

Figure 9-4 WinCC User Administrator

If you are using functions in WinCC screens that are not executable in the WinCC WebNavigator, you will need to prevent them from running in WinCC using preprocessor instructions for C scripts. The same applies to displaying objects which trigger these functions. The following preprocessor instructions can be used:

Table 9-1 Preprocessor applications for C scripts in WinCC

Variant	Notation

1	`#ifdef RUN_ON_WEBNAVIGATOR`
	`<< instructions, which run on the WebNavigator >>`
	`#else`
	`<< instructions, which do not run on the WebNavigator >>`
	`#endif`

2	`#ifndef RUN_ON_WEBNAVIGATOR`
	`<< instructions, which do not run on the WebNavigator >>`
	`#else`
	`<< instructions, which run on the WebNavigator >>`
	`#endif`

Installing the WinCC WebNavigator client (remote PC)

1. Install the WinCC WebNavigator client and SIMOCRANE CMS client on the remote PC.

Enabling the firewall port

The WinCC WebNavigator server requires an open port on the CMS station for remote access.

Port "443" is set as default by IIS.

1. Enable the port for the WinCC WebNavigator server.

This setting can be configured in IIS.
See: Setting up the SSL certificate for remote access (Page 299)

Result

The WinCC WebNavigator server is configured for access by the WebNavigator client. The WinCC WebNavigator client is set up on the remote PC.

You must now create an SSL certificate in order to facilitate secure access via HTTPS.
See: Setting up the SSL certificate for remote access (Page 299)

To test, you can start the WinCC WebNavigator client on the remote PC.
See: Remote access via WinCCViewerRT (Page 292)
See: Remote access via web browser (WebNavigator) (Page 294)

For details of how to configure the remote PC for the WinCC WebNavigator Client, see Section PC configuration of the web client station (Page 406).

9.2.2 Remote access via WinCCViewerRT

You can open the WinCCViewerRT on a remote PC and have read access to the user interfaces of the connected CMS stations without affecting local operation at the CMS station.

On the remote PC, the WinCC option "WebNavigator Client", and the "SIMOCRANE CMS Client" must be installed.

NOTICE
Danger of blocking Replay mode!
If you close remote access while Replay mode is active, Replay mode will remain blocked for all other users. The blockage remains effective until you log on again and end Replay mode.
It is essential that you end Replay mode before you close remote access.

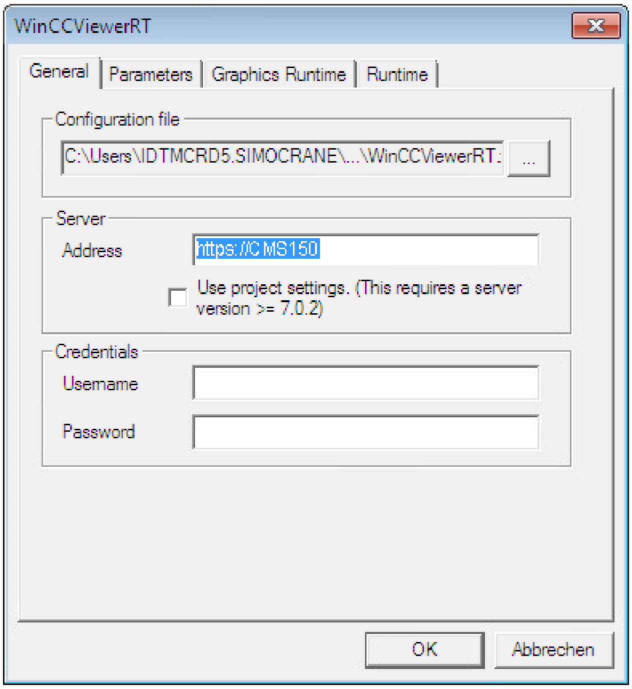
See also: General information about remote access to CMS stations (Page 287)

Preconditions

- Remote access to CMS stations has been set up.
  See: Setting up remote access (WebNavigator) (Page 289)
- The SSL certificate for remote access has been created
  See: Setting up the SSL certificate for remote access (Page 299)
- The WinCC WebNavigator client suitable for the CMS station has been installed.
- The SIMOCRANE CMS client suitable for the CMS station has been installed.

Processing steps

1. Open the WinCCViewerRT on the remote PC.
   The WinCCViewerRT properties are opened when establishing the connection for the first time.



Configuration file: C:\Users\IDTMCRD5.SIMOCRANE\...\WinCCViewerRT:

Server
Address: https://CMS150
□ Use project settings. (This requires a server version >= 7.0.2)

Credentials
Username:
Password:

Figure 9-5 WinCCViewerRT properties

Note

You can call the WinCCViewerRT properties using the key combination "Ctrl + Alt + P". Additional information is provided in the WinCC WebNavigator documentation.

2. Enter the IP address of the CMS station to which you want to have read access in the login dialog box.
   Enter the user name and the password.

You will be given read access to the required CMS station. You can now navigate through the images on the CMS station.

9.2.3 Remote access via web browser (WebNavigator)

You can open a web browser on a remote PC and have read access via the WinCC WebNavigator to the user interfaces of the connected CMS stations without influencing local operation at the CMS station.

Note

We recommend using the WinCCViewerRT for remote access.

See also: Remote access via WinCCViewerRT (Page 292)

NOTICE
Danger of blocking Replay mode!
If you close remote access while Replay mode is active, Replay mode will remain blocked for all other users. The blockage remains effective until you log on again and end Replay mode.
It is essential that you end Replay mode before you close remote access.

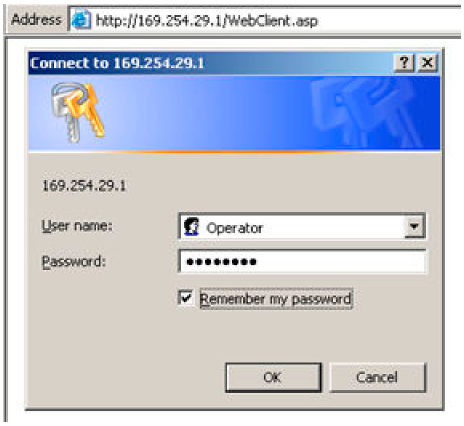
See also: General information about remote access to CMS stations (Page 287)

Preconditions

- Remote access to CMS stations has been set up.
  See: Setting up remote access (WebNavigator) (Page 289)
- The SSL certificate for remote access has been created
  See: Setting up the SSL certificate for remote access (Page 299)
- The WinCC WebNavigator client suitable for the CMS station has been installed.
- The SIMOCRANE CMS client suitable for the CMS station has been installed.

Processing steps

1. Open Internet Explorer on the remote PC and enter
   `<<IP address of local CMS station>>/WebClient.asp`
   in the address bar.

   Address http://169.254.29.1/WebClient.asp

   Connect to 169.254.29.1

   169.254.29.1

   User name: Operator

   Password: ••••••••

   ☑ Remember my password

   Figure 9-6 Opening the WebNavigator client on a remote PC

   If any problems arise with ActiveX controls, consider the following FAQs: What does the message "You must enable ActiveX Controls on your browser" mean? (https://support.industry.siemens.com/cs/document/8957877=en-WW)

2. Enter an existing user name and the corresponding password in the login dialog box.

You will be given read access to the required CMS station. You can now navigate through the images on the CMS station.

9.3 WebUX

9.3.1 Setting up remote access (WebUX)

Initial situation / objective

The WinCC WebUX server runs on the CMS station for remote access via WinCC WebUX. An HTML5-capable web browser is required on the remote PC.

See also: General information about remote access to CMS stations (Page 287)

WebUX client (terminal device)

You only need one HTML5-capable web browser, e.g. Chrome, Firefox, Internet Explorer or Safari, on a terminal device which accesses the WebUX server.

Note

Browser-dependent display

Differences in display and behavior are possible with different browser versions.

To display a configured character set, for example, it must also be available in the browser or on the device.

Installing the WebUX server

You can also install WinCC/WebUX during the WinCC installation.

Proceed as follows to install the WebUX server retrospectively:

1. Start the WinCC installation DVD.
2. Select "Custom Installation" as the "Installation Type".
3. Select the "WinCC WebUX" entry in the "WinCC" group of the "Programs" dialog box.
4. Transfer the WebUX licenses.
   See also:Transferring a license (Automation License Manager) (Page 93)

The WinCC WebUX Configurator opens after the installation and a PC restart.

You can find information about configuring WebUX here: WinCC Basic Options V7.4 SP1: WebNavigator, DataMonitor, WebUX, Connectivity Pack (https://support.industry.siemens.com/cs/ww/en/view/109746337)

Enabling the firewall port

The WinCC WebUX server requires an open port on the CMS station for remote access.

Port "443" is set as default by IIS.

1. Enable the port for the WinCC WebUX server.

This setting can be configured in IIS.
See: Setting up the SSL certificate for remote access (Page 299)

Result

The WinCC WebUX server is configured for access via an HTML5-capable web browser.

You must now create an SSL certificate in order to facilitate secure access via HTTPS.
See: Setting up the SSL certificate for remote access (Page 299)

See also

Transferring a license (Automation License Manager) (Page 93)

9.3.2 Remote access via web browser (WebUX)

You can open a web browser on a remote PC and have read access via WinCC WebUX to the user interfaces of the connected CMS stations without influencing local operation at the CMS station.

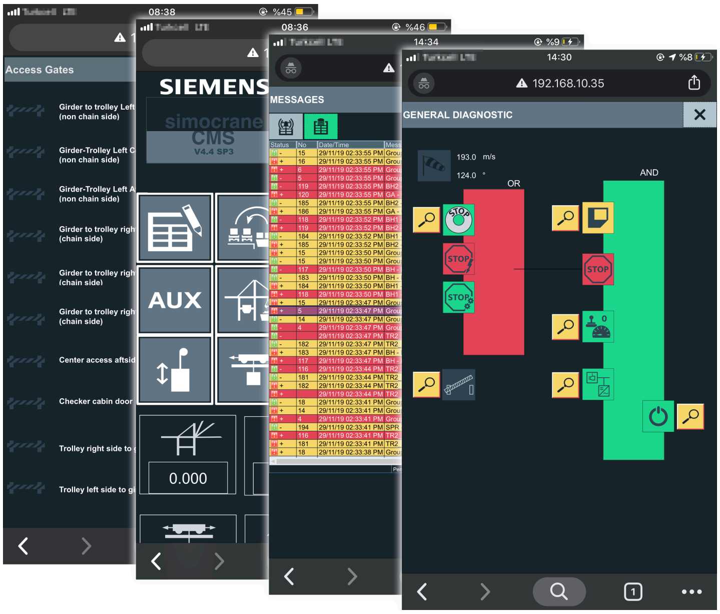


Figure 9-7 Remote access via WebUX

Note

No Replay mode!

Replay mode is not possible via WinCC WebUX.

You need the WebNavigator in order to be able to start Replay mode via remote access.

Note the following:

- Close the session before you exit the browser to free up an assigned license.
- Close the browser, especially in the case of mobile devices, to reduce power consumption and the amount of data that is transferred.
  If a process screen is open in the browser, the display will be updated continuously.
- Avoid the following operations, as the session will otherwise be terminated:
  - Browser navigation (Back / Forward)
  - Reloading web page (Refresh or <F5>)

Preconditions

- Remote access to CMS stations via WebUX has been set up.
  See: Setting up remote access (WebUX) (Page 296)
- The SSL certificate for remote access has been created
  See: Setting up the SSL certificate for remote access (Page 299)
- An HTML5 web browser is in use

Processing steps

1. Enter the address of the WebUX server in the address line of the browser:
   - https://<servername>

   If you are not using the default port, add the port number in the URL:
   - https://<servername>:<portnumber>

   If you are using a virtual folder instead of a website, add the name of the virtual web folder:
   - https://<servername>/<directoryname>
2. Enter the user name and password.

You will be given read access to the required CMS station. You can now navigate through the images on the CMS station.

9.4 Setting up the SSL certificate for remote access

The CMS station is remotely accessed via a secure HTTPS connection.
To do this, an SSL certificate must be created on the CMS station.

Preconditions

- The CMS station is prepared for remote access.
  See also: Setting up remote access (WebNavigator) (Page 289)

Processing steps

1. Start the "Microsoft Internet Information Services (IIS) Manager" on the CMS server.
2. Select "Server Certificates"

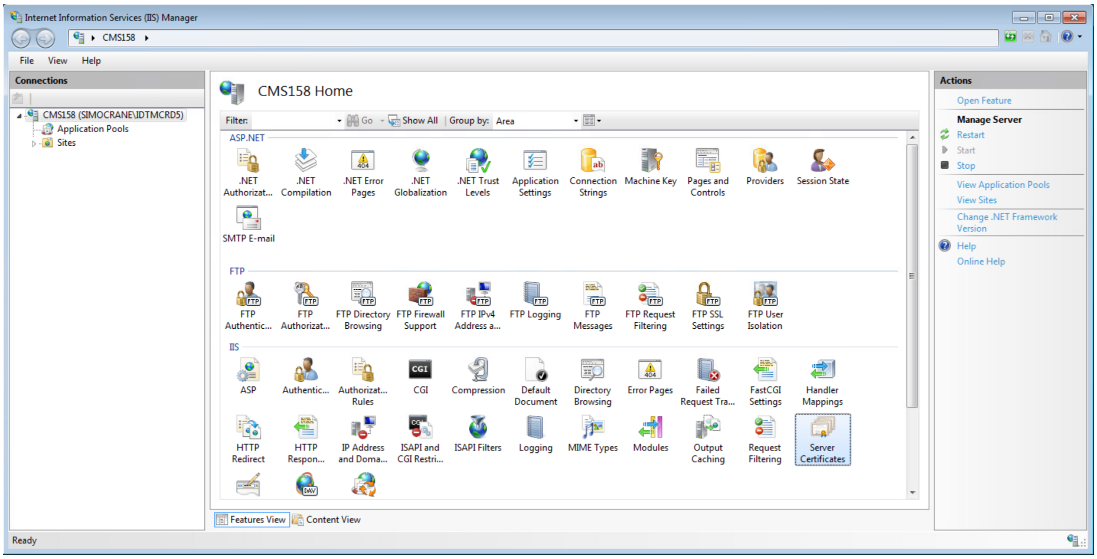
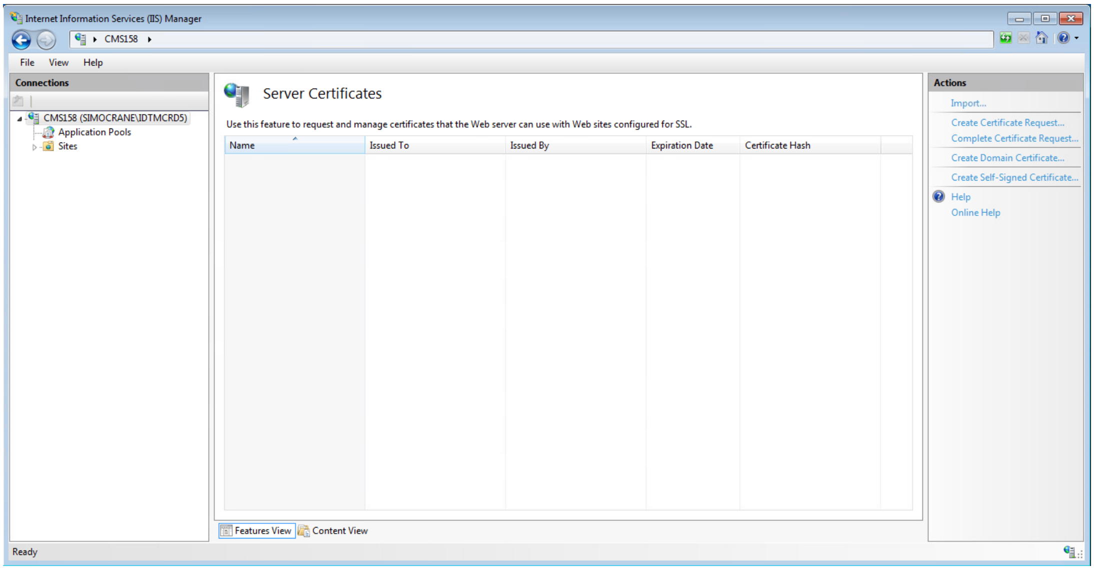


Figure 9-8 Deleting the IIS SSL certificate

3. Select "Create Self-Signed Certificate..." and create a new SSL certificate with the name "WebNavigator".


Internet Information Services (IIS) Manager
CMS158
File View Help
Connections
CMS158 (SIMOCRANE\DTMCRD5)
Application Pools
Sites
Server Certificates
Name
Issued To
Issued By
Expiration Date
Certificate Hash
Features View
Content View
Actions
Import...
Create Certificate Request...
Complete Certificate Request...
Create Domain Certificate...
Create Self-Signed Certificate...
Help
Online Help
Ready

Use this feature to request and manage certificates that the Web server can use with Web sites configured for SSL.

Figure 9-9 Server Certificates

A default SSL certificate is created.

4. Select "Sites" → "WebNavigator" and then select "Bindings".

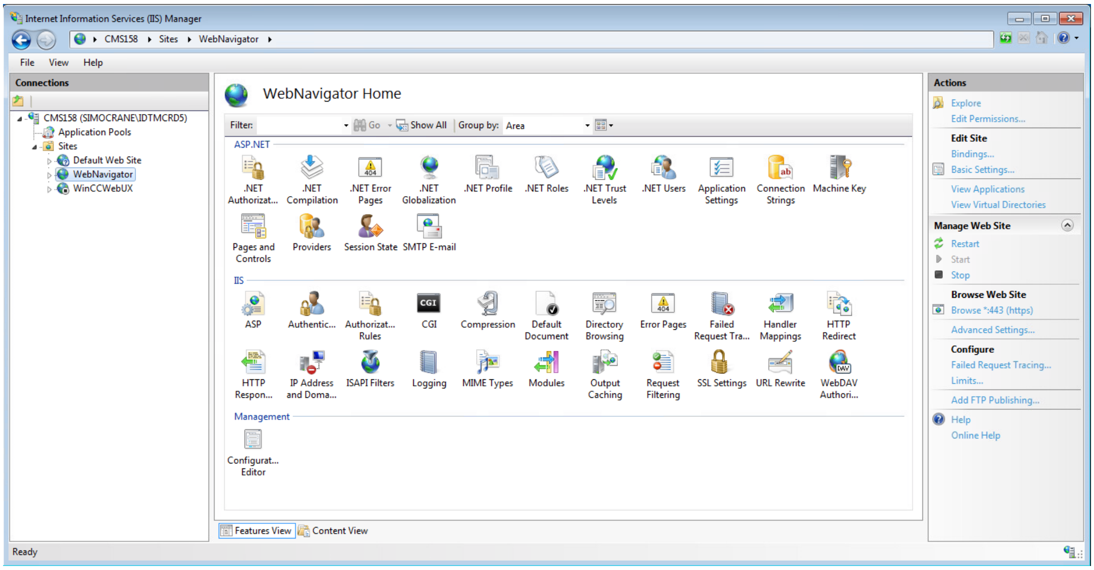
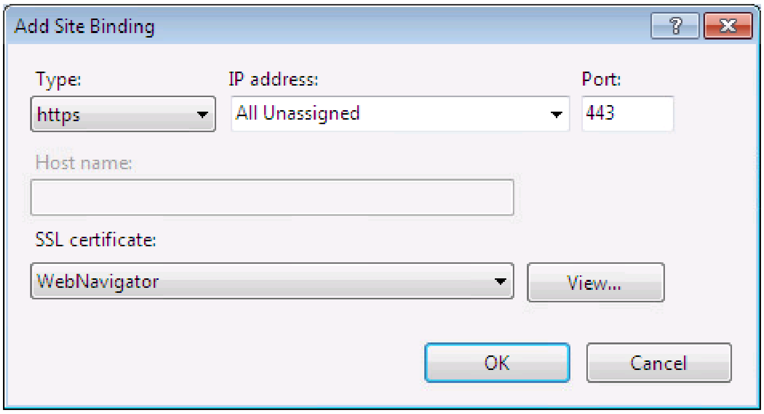


Figure 9-10 WebNavigator Home

5. Select "Add..." and then select connection type "https", the port and the newly created SSL certificate.



Add Site Binding

Type: https

IP address: All Unassigned

Port: 443

Host name:

SSL certificate: WebNavigator

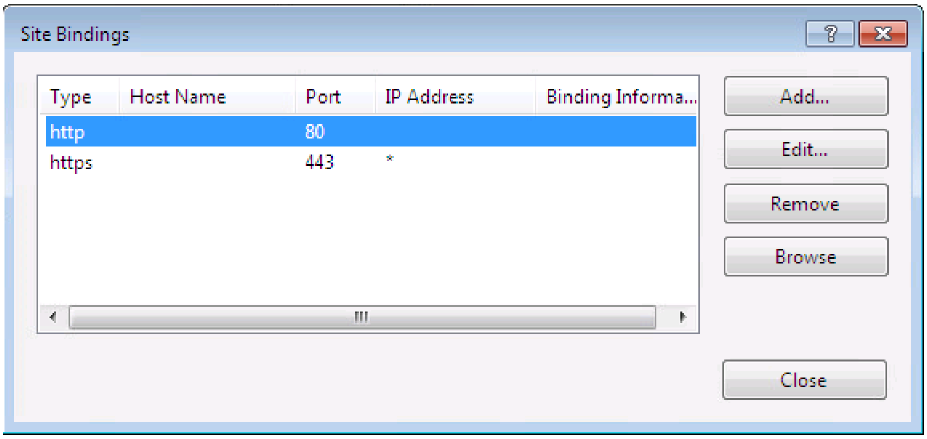
Figure 9-11 Add Site Bindings

Note

Port 443 is the default port – however, you can select any other free port.

The port must be enabled in the firewall of the CMS station, otherwise the WebNavigator will not be able to run.

6. Click on "OK" to assign the SSL certificate to the WebNavigator and to select the connection type involved.



Site Bindings

Type	Host Name	Port	IP Address	Binding Informa...
http		80		
https		443	*	

Figure 9-12 Site Bindings

7. Delete connection type "http" to prevent remote access via a non-secure HTTP connection.

You can now access the WebNavigator of the CMS station via HTTPS.

Note

When configuring the crane in the "Edit crane" dialog box of the RCMS web application, the URL in field "CMS station URL" must match the specified URL in the SSL certificate of the CMS station!

If problems occur with the SSL certificate, check that the two URLs precisely match.

The Replay function 10

10.1 General information about the Replay function

10.1.1 About the Replay function

With the Replay function, SIMOCRANE CMS can replay data from the past. The crane data are stored unchanged in the WinCC archive and can be replayed in Replay mode if necessary.

In Replay mode, you can:

- replay the crane data or the archived data any number of times,
- choose the period to replay,
- control the replay speed,
- pause replay.

This enables you to reproduce crane events that caused problems and reduce their causes.

For detailed analysis of problematic processes on the crane, you still have to evaluate the crane data.

The Replay function can only be used on the CMS station. The Replay function is not installed on an RCMS server.

The use of all other CMS functionalities is not restricted by the Replay function.

Replay Configuration Editor and Replay Runtime

The Replay function comprises two components:

- Replay Configuration Editor (see Section The Replay Configuration Editor (Page 315)):
  With the Replay Configuration Editor, you can prepare, check, and repair pictures from a WinCC application for Replay.
- Replay Runtime (see Section Replay Runtime (Page 327)):
  Replay Runtime is responsible for preparing and replaying historical Replay data.

Before you can use Replay Runtime, the following conditions must be met:

- WinCC Runtime has been activated.
- CMS Runtime has been activated.
- Replay Runtime has been activated.
- Crane data has been archived for the period to be replayed with Replay.

Note

Valid license required

The Replay function can only be used with a valid license

10.1.2 General information about configuring the Replay function

The Replay Configuration Editor is available for adapting the Replay function to your requirements and to the particular features of your crane.

The following figure provides a general view of how Replay is configured:

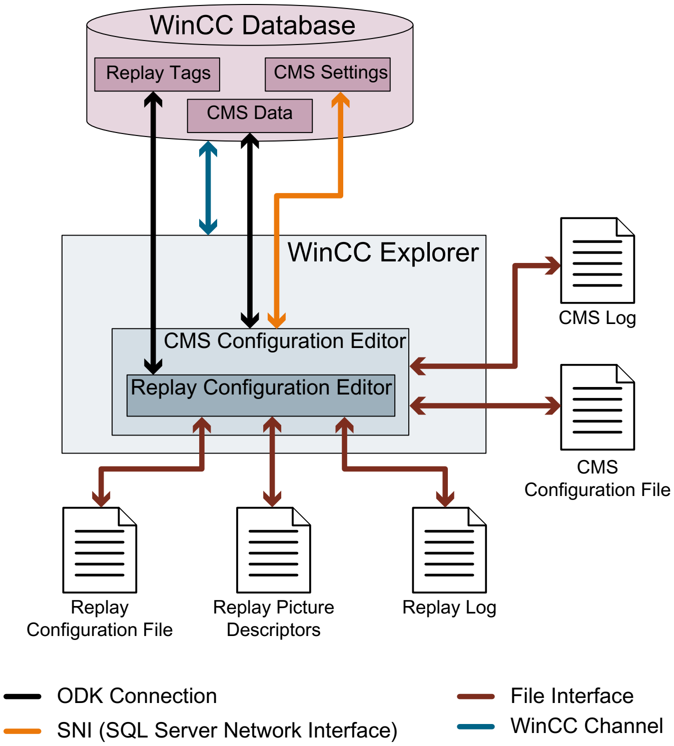


Figure 10-1 Overview: Replay configuration

Note

Do not make any changes to the configuration files and descriptor files in folder "CMS\Replay" of the WinCC project directory otherwise Replay will not function correctly.

With the Replay Configuration Editor, you can make the following settings required for Replay:

- Specify the maximum number of archive tags
- Select the pictures to be prepared for Replay

- Check one/all pictures prepared for Replay
- Repair pictures prepared for Replay
- Clean up tags that are no longer needed
- Deselect pictures

See: "The Replay Configuration Editor (Page 315)"

You may need to modify the application in various ways for Replay.

- Adapt navigation buttons for Replay
- Create a button for activating/deactivating Replay mode
- Un-nest picture windows
- Insert controls in a Replay picture
- Adapt and trigger C and VB scripts for Replay

See: "Adapt the CMS application for the Replay function (Page 332)"

10.1.3 Restrictions

The following restrictions apply to the Replay function:

- Not all object types are supported by Replay.
  See: "Picture objects supported by Replay (Page 364)"
- The maximum duration for replaying with Replay is limited to 60 minutes.
- The inner pictures of a main picture are supported up to the 1st level.
  Nested inner pictures are not processed while the main picture is being prepared.
  The same inner pictures can be processed several times side by side in different picture windows in the main picture.
- The maximum number of pictures whose historical data can be loaded and retained at any one time for Replay is limited to 20.
- WinCC Graphics Designer and the Replay Editor cannot be used concurrently. The Replay Editor might then not work correctly. In this case, an error message will appear on the screen.
- Events are not supported (e.g. a script that is run when a button is clicked).
- The resolution of Replay Runtime is limited to 500 ms.
- The archiving period is limited depending on how the cyclic archive has been configured.
- The maximum number of archive tags depends on your WinCC license.

10.1.4 Required tags, structures, and archives

Tags and structures

The Replay function requires the following tags and structures:

- ReplayControl structure
- Tags of the "ReplayControl" group with ReplayControl structure tags
- Tags of the "Screens" group that are relevant for Replay
- Tags of the "Settings" group that are relevant for Replay
- Tags of the ReplayTags group

Moreover, the following structures and tags are created automatically:

- Structure ReplayControl
- @ReplayControl instance of the ReplayControl structure
- Picture selector tags

Archives

The following archives are required in the TagLogging database of WinCC:

- ReplayArchive

The Replay Configuration Editor automatically creates the Replay archive tags for the Replay function when it prepares pictures.

For each picture, a descriptor file is created (picture name e.g. "Hoist.pdl"; name of the descriptor file: "Hoist.xml").

All tag-related information is stored in the descriptor file.

The ReplayArchive is automatically created in the TagLogging of WinCC as soon as the first picture is prepared for Replay. It contains the ReplayArchive tags required to query historical data from the database in order to replay the picture in Replay mode.

See also

The tag prefix mechanism (Page 309)

10.1.5 Requirements for the pictures

All pictures are made available with the file extension "*.pdl" for preparation in the Replay Configuration Editor.

Note

All pictures listed in the Replay Configuration Editor that start with the string "@..." are pictures used, for example, for navigation within the WinCC project or in which settings for the visualization interface can be made. These pictures are irrelevant to user-specific configuration of Replay.

Main pictures and inner pictures

A main picture can contain picture windows. The images displayed in these windows are referred to as “inner pictures".

The Replay Configuration Editor can process main pictures with one or more inner pictures.

Note

You need to adapt the main picture accordingly for inner pictures with dynamic picture names.

See: "Working with dynamic picture windows (Page 338)"

Nested inner pictures

Inner pictures must not contain further inner pictures because these are not prepared for Replay mode. If a main picture is prepared with an impermissible structure, a warning is output.

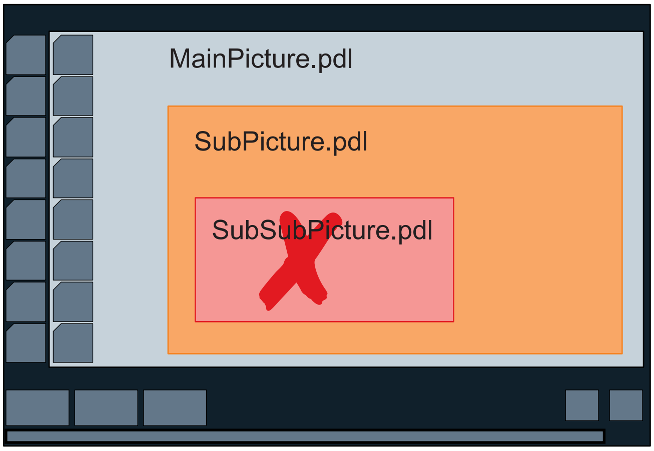


Figure 10-2 Main picture with nested inner pictures

Multiple copies of an inner picture

Multiple copies of an inner picture can be inserted in the same main picture. To ensure that inner pictures are nevertheless correctly addressed, tag prefixes are used. In the tag list of the Replay Editor, the names of the tags are displayed in the inner pictures as soon as preparation of the main picture for Replay has been completed.

Links to pictures that are not integrated in a main picture

If a button is linked to a picture that is included in the main picture, the Replay Configuration Editor cannot separate the link.

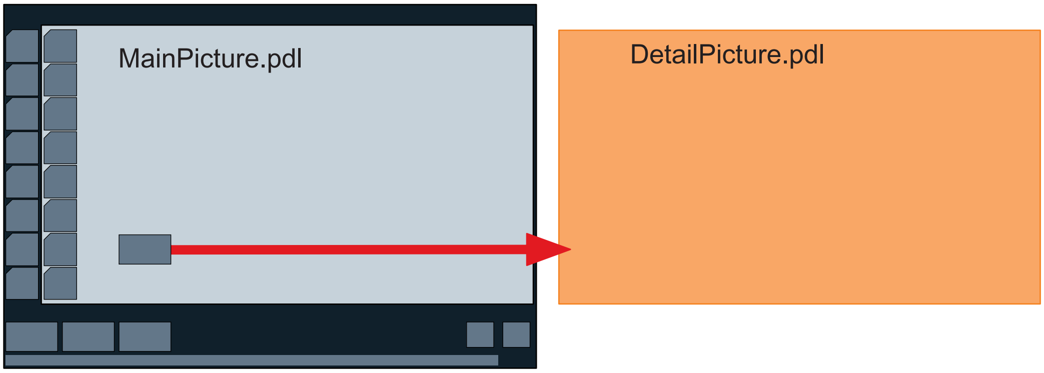


Figure 10-3 Button in picture.pdl linked to detail_picture.pdl

For instructions on how to adapt these buttons, please see: "Adapt buttons in Replay pictures (Page 336)"

10.1.6 Maximum number of archive tags

A different number of archive tags will be available to you depending on your WinCC license. 512 archive tags (with CMS Lean) or 1500 archive tags (with CMS Advanced) are supplied as standard. For higher requirements, other WinCC licenses with a greater number of archive tags can be provided as a license upgrade.

You must enter this maximum number of archive tags in the Replay Configuration Editor in the input field of the "Maximum number of archive tags" menu. This enables the Replay Configuration Editor to output a warning when the maximum number of archive tags has been reached.

The number of archive tags that can be used for the Replay function is determined by the number of available archive tags (depends on the license), minus the archive tags already in use.

Note

The Replay function reserves archive tags for archiving operational data (move data, counters, MMBFs). These cannot be used for the Replay function.

See also

Replay pictures: Cleaning up tags (Page 325)

Specify the maximum number of archive tags (Page 319)

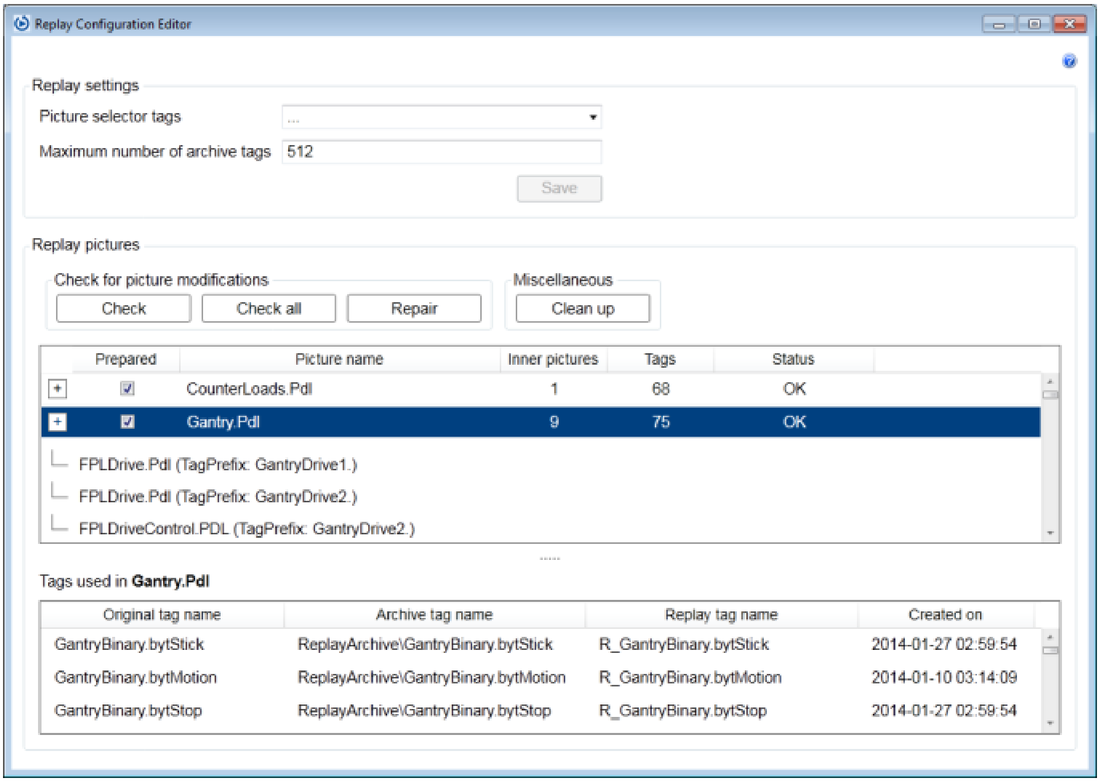
10.1.7 The tag prefix mechanism

The objects inside a picture can be supplied from two data sources:

- in productive mode from process tags of the crane control system
- in Replay mode from Replay tags whose values originated from the ReplayArchive

The Replay tag prefix "R_"

An internal Replay tag is created for each process tag relevant for Replay and stored in an appropriate archive. The names of these Replay tags start with the prefix "R_".



Picture selector tags: ...

Maximum number of archive tags: 512

	Prepared	Picture name	Inner pictures	Tags	Status
+	☑	CounterLoads.Pdl	1	68	OK
+	☑	Gantry.Pdl	9	75	OK

FPLDrive.Pdl (TagPrefix: GantryDrive1.)
FPLDrive.Pdl (TagPrefix: GantryDrive2.)
FPLDriveControl.PDL (TagPrefix: GantryDrive2.)

Tags used in **Gantry.Pdl**

Original tag name	Archive tag name	Replay tag name	Created on
GantryBinary.bytStick	ReplayArchive\GantryBinary.bytStick	R_GantryBinary.bytStick	2014-01-27 02:59:54
GantryBinary.bytMotion	ReplayArchive\GantryBinary.bytMotion	R_GantryBinary.bytMotion	2014-01-10 03:14:09
GantryBinary.bytStop	ReplayArchive\GantryBinary.bytStop	R_GantryBinary.bytStop	2014-01-27 02:59:54

Figure 10-4 Archive tag name and Replay tag name in the Replay Configuration Editor

In Replay mode, the Replay tag prefix "R_" is automatically appended to the front of all tags relevant for Replay of the PDL files that are called.

Example

Original tag name	Replay tag name	Archive tag name in the ReplayArchive
myTag	R_myTag	myTag
innerpicPrefix.myInnerTag	R_innerpicPrefix.myInnerTag	innerpicPrefix.myInnerTag
innerpicPrefix2.myInnerTag	R_innerpicPrefix2.myInnerTag	innerpicPrefix2.myInnerTag

The tag prefix mechanism in picture windows

When you assign a tag prefix to a picture window, a tag prefix is appended to the front of each tag in the picture window. This ensures that a picture that is integrated in a picture window has access to its own tags.

Example:

- Productive mode:
  In a picture window, the "fltSpeedSetpoint" tag is requested on an object. The tag prefix is "HoistDrive1".
  Result: "HoistDrive1.fltSpeedSetpoint"
- Replay mode:
  In Replay mode, the Replay tag prefix "R_" is also added.
  Result: "R_HoistDrive1.fltSpeedSetpoint"

The prefix "@NOTP::" (no tag prefix)

Some tags must remain unchanged in Replay mode. In other words, a Replay tag prefix must not be assigned to them. This is prevented by appending the prefix "@NOTP::" to the front of these tags.

For example, the login dialog and navigation must work independently of Replay mode. In this case, for example, the tag "@ReplayButtonVisibleXY," which controls visibility of navigation buttons, must not be used with the Replay prefix. The preceding string "@NOTP::" prevents the Replay prefix from being appended to the front of the tag (e.g. "@NOTP::@ReplayButtonVisibleXY").

The string "@NOTP::" can be used in all properties, events, and scripts.

Note

"@NOTP::" must not be used in the CMS example application in the property "tag prefix" of picture windows or main windows.

See: "Runtime data in Replay mode (@NOTP::) (Page 332)"

Picture window of the example application with the tag prefix mechanism

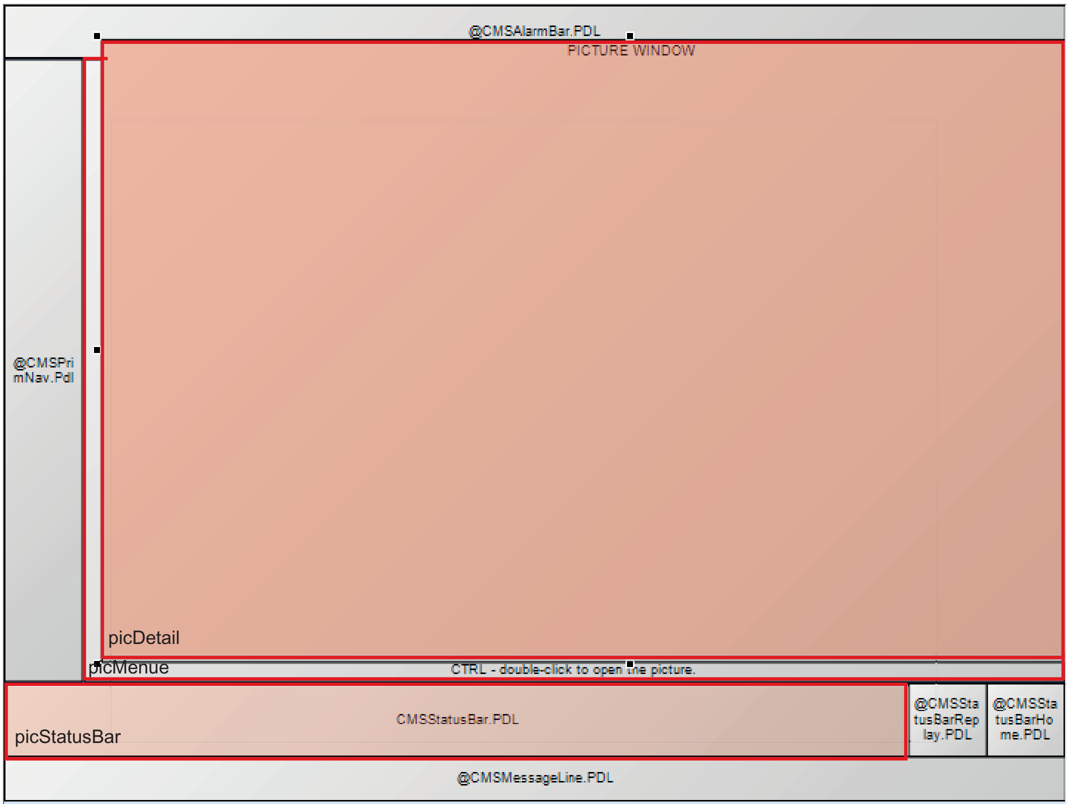


Figure 10-5 Tag prefix mechanism is active in the picture windows marked red

The picture windows of the example application in which the tag prefix mechanism is used are marked red in the figure. The following picture windows contain the tag prefix for Replay mode:

- picMenue
- picDetail
- picStatusBar

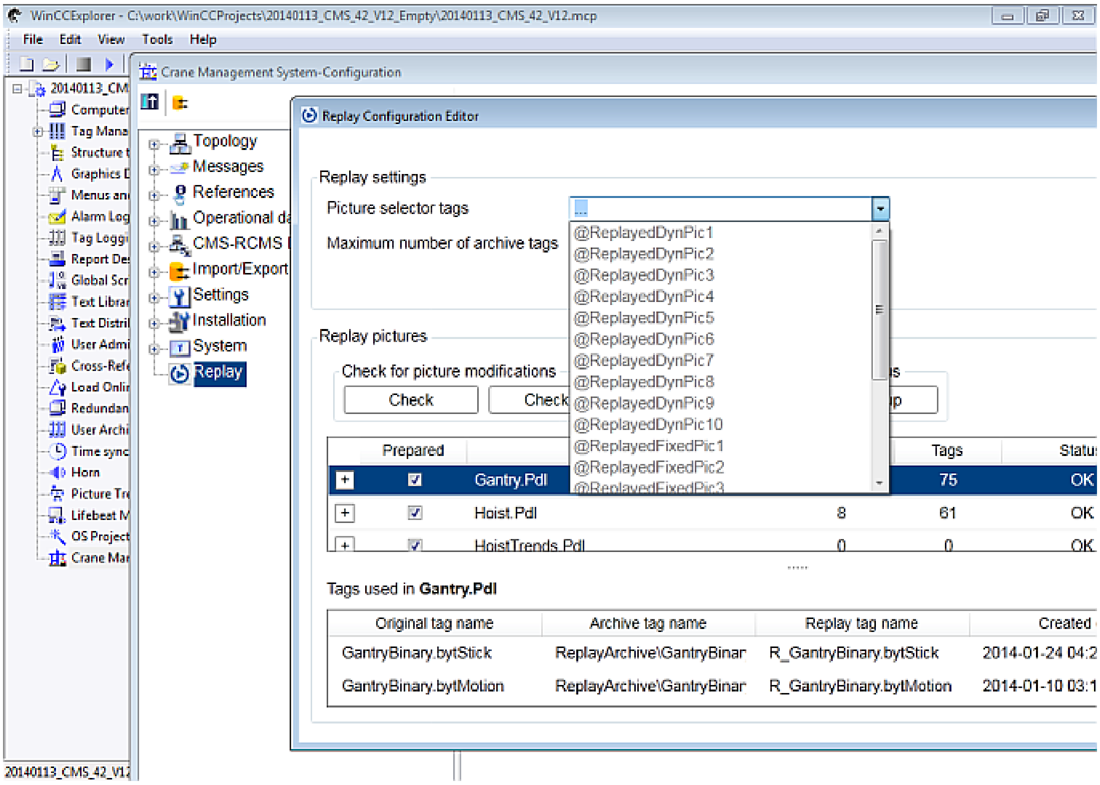
If you want to change the standard picture window, see Chapter "Important note about adapting the CMS application (Page 332).

See also

Adapt the CMS application for the Replay function (Page 332)

10.1.8 The picture selector tags

For the Replay function, Replay Runtime requires the "picture selector tags" described below. They are automatically created when a picture is prepared or repaired in the Replay Configuration Editor.



Picture selector tags: ...

Maximum number of archive tags

@ReplayedDynPic1
@ReplayedDynPic2
@ReplayedDynPic3
@ReplayedDynPic4
@ReplayedDynPic5
@ReplayedDynPic6
@ReplayedDynPic7
@ReplayedDynPic8
@ReplayedDynPic9
@ReplayedDynPic10
@ReplayedFixedPic1
@ReplayedFixedPic2
@ReplayedFixedPic3

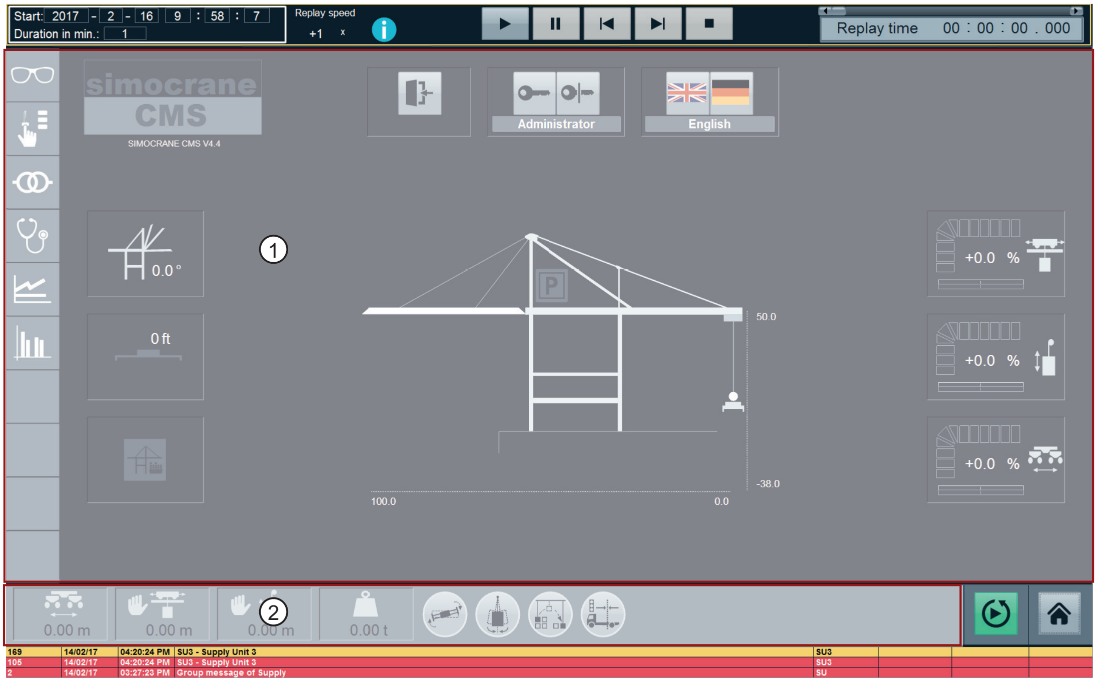
	Prepared			Tags	Statu
+	☑	Gantry.Pdl		75	OK
+	☑	Hoist.Pdl	8	61	OK
+	☑	HoistTrends.Pdl	0	0	OK

Tags used in **Gantry.Pdl**

Original tag name	Archive tag name	Replay tag name	Created
GantryBinary.bytStick	ReplayArchive\GantryBinar	R_GantryBinary.bytStick	2014-01-24 04:2
GantryBinary.bytMotion	ReplayArchive\GantryBinar	R_GantryBinary.bytMotion	2014-01-10 03:1

Figure 10-6 Picture selector tags

From these picture selector tags, Replay Runtime reads which tags are to be loaded into the Replay buffer from which pictures.



Start: 2017 - 2 - 16 9 : 58 : 7
Duration in min.: 1

Replay speed +1 x

Replay time 00 : 00 : 00 . 000

169	14/02/17	04:20:24 PM	SU3 - Supply Unit 3	SU3
105	14/02/17	04:20:24 PM	SU3 - Supply Unit 3	SU3
2	14/02/17	03:27:23 PM	Group message of Supply	SU

Figure 10-7 CMS standard window PictureSelectorTags

① Currently loaded main picture (via "@ReplayedDynPic1" in the buffer)

② Status bar added as standard (via "@ReplayedFixedPic1" in the buffer)

Dynamic PictureSelectorTags "@ReplayedDynPicX"

The tags with the names "@ReplayedDynPic1" to "@ReplayedDynPic10" contain the names of the current pictures loaded into the buffer.

In this case, "@ReplayedDynPic1" is always the currently loaded main picture including the inner pictures linked to it.
For detailed information about inner pictures in main pictures, please see: "Requirements for the pictures (Page 306)"

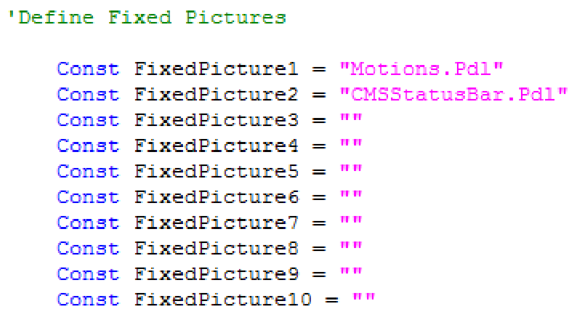
The project module "ReplayLoadPic.bmo" fills tags "@ReplayedDynPic1" to "@ReplayedDynPic10" with values. It is normally only the tag "@ReplayedDynPic1" that is filled.

In the example application, the module is called by means of the unused picture properties "Background Colour" of the corresponding navigation bar. You can fill the other PictureSelectorTags here.

Static PictureSelectorTags "@ReplayedFixedPicX"

The "@ReplayedFixedPic1" to "@ReplayedFixedPic10" tags contain permanently defined pictures, which are always visible in Replay mode (e.g. status bar). These pictures are always loaded to the Replay buffer.

In the CMS example application, the two tags "@ReplayedFixedPic1" and "@ReplayedFixedPic2" are already defined in the script "ReplayLoadPic.bmo". In this script, you can edit the pictures that always have to be loaded (FixedPicture1 ... FixedPicture10).



```
'Define Fixed Pictures

    Const FixedPicture1 = "Motions.Pdl"
    Const FixedPicture2 = "CMSStatusBar.Pdl"
    Const FixedPicture3 = ""
    Const FixedPicture4 = ""
    Const FixedPicture5 = ""
    Const FixedPicture6 = ""
    Const FixedPicture7 = ""
    Const FixedPicture8 = ""
    Const FixedPicture9 = ""
    Const FixedPicture10 = ""
```

Figure 10-8 Definition of the pictures to be loaded in the script "ReplayLoadPic.bmo"

10.2 The Replay Configuration Editor

10.2.1 About the Replay Configuration Editor

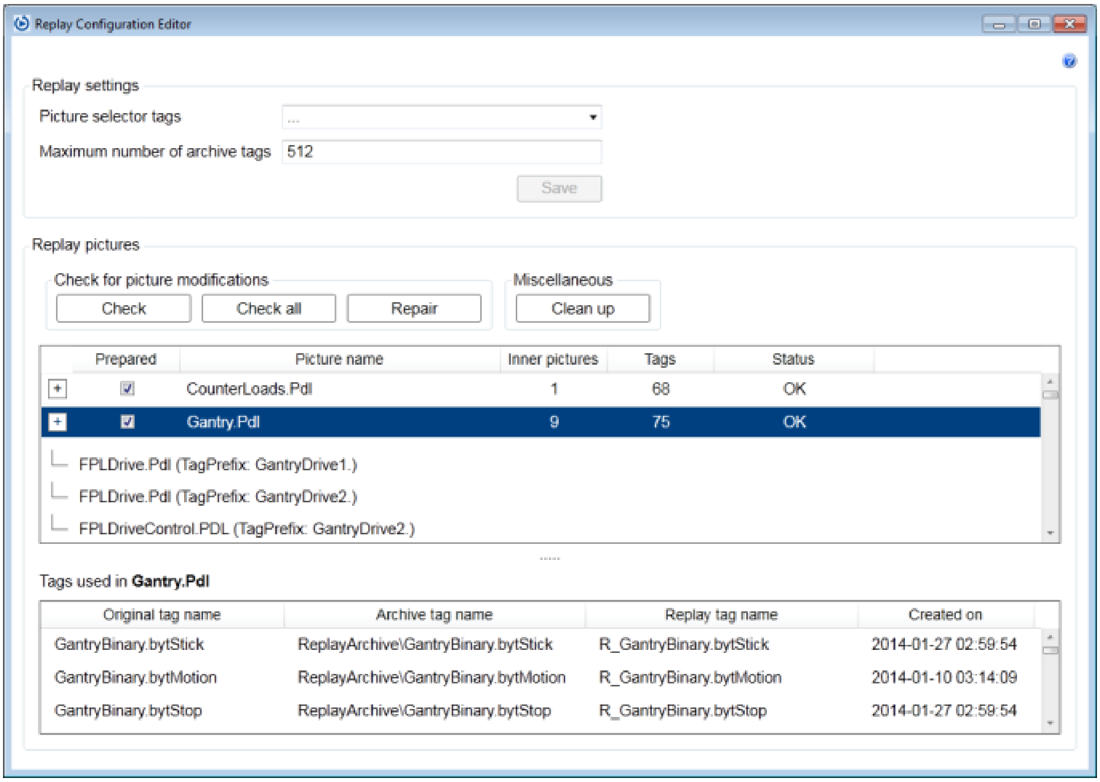
The Replay Configuration Editor is part of the CMS Configuration Editor.

With the Replay Configuration Editor, you can make the following settings required for Replay:

- Define the maximum number of archive tags
  see: "Maximum number of archive tags (Page 308)"
- Select and deselect the pictures to be prepared for Replay
  see: "Replay pictures: Preparing pictures (Page 320)"
- Check one/all pictures prepared for Replay
  see: "Replay pictures: Checking prepared pictures (Page 322)"
- Repair pictures prepared for Replay
  see: "Replay pictures: Repairing prepared pictures (Page 324)"
- Clean up tags that are no longer needed
  see: "Replay pictures: Cleaning up tags (Page 325)"

For further information about configuring the Replay function, see: "Adapt the CMS application for the Replay function (Page 332)".

The Replay Configuration Editor automatically creates the Replay archive tags for the Replay function when it prepares pictures.



Picture selector tags: ...

Maximum number of archive tags: 512

	Prepared	Picture name	Inner pictures	Tags	Status
+	☑	CounterLoads.Pdl	1	68	OK
+	☑	Gantry.Pdl	9	75	OK

└ FPLDrive.Pdl (TagPrefix: GantryDrive1.)
└ FPLDrive.Pdl (TagPrefix: GantryDrive2.)
└ FPLDriveControl.PDL (TagPrefix: GantryDrive2.)

Tags used in **Gantry.Pdl**

Original tag name	Archive tag name	Replay tag name	Created on
GantryBinary.bytStick	ReplayArchive\GantryBinary.bytStick	R_GantryBinary.bytStick	2014-01-27 02:59:54
GantryBinary.bytMotion	ReplayArchive\GantryBinary.bytMotion	R_GantryBinary.bytMotion	2014-01-10 03:14:09
GantryBinary.bytStop	ReplayArchive\GantryBinary.bytStop	R_GantryBinary.bytStop	2014-01-27 02:59:54

Figure 10-9 Replay Configuration Editor

10.2.2 Start the Replay Configuration Editor

The Replay Configuration Editor can be launched via the CMS configuration editor.

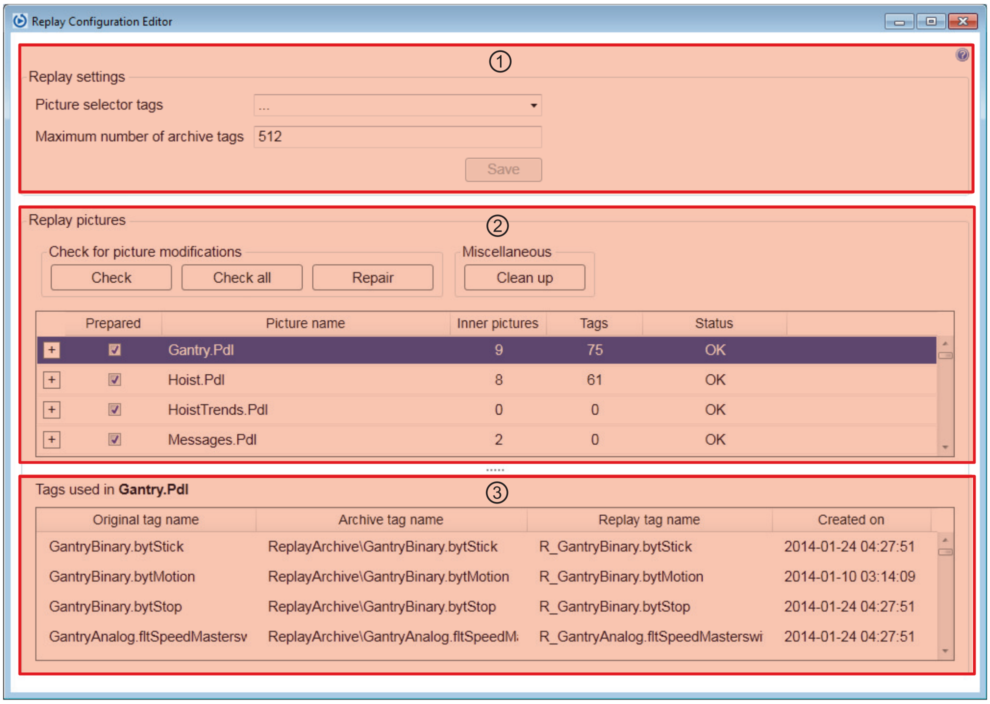
Note

The functions in the Replay Configuration Editor are only available if WinCC Runtime is deactivated. If the Replay Configuration Editor is opened while WinCC Runtime is activated, a corresponding message will appear.

1. Deactivate WinCC Runtime.
2. Select the menu entry "Replay" in the CMS configuration editor.

The Replay Configuration Editor opens and shows all pictures in the WinCC project.

10.2.3 The user interface of the Replay Configuration Editor



Picture selector tags: ...

Maximum number of archive tags: 512

	Prepared	Picture name	Inner pictures	Tags	Status
+	☑	Gantry.Pdl	9	75	OK
+	☑	Hoist.Pdl	8	61	OK
+	☑	HoistTrends.Pdl	0	0	OK
+	☑	Messages.Pdl	2	0	OK

Tags used in **Gantry.Pdl**

Original tag name	Archive tag name	Replay tag name	Created on
GantryBinary.bytStick	ReplayArchive\GantryBinary.bytStick	R_GantryBinary.bytStick	2014-01-24 04:27:51
GantryBinary.bytMotion	ReplayArchive\GantryBinary.bytMotion	R_GantryBinary.bytMotion	2014-01-10 03:14:09
GantryBinary.bytStop	ReplayArchive\GantryBinary.bytStop	R_GantryBinary.bytStop	2014-01-24 04:27:51
GantryAnalog.fltSpeedMastersv	ReplayArchive\GantryAnalog.fltSpeedM:	R_GantryAnalog.fltSpeedMasterswi	2014-01-24 04:27:51

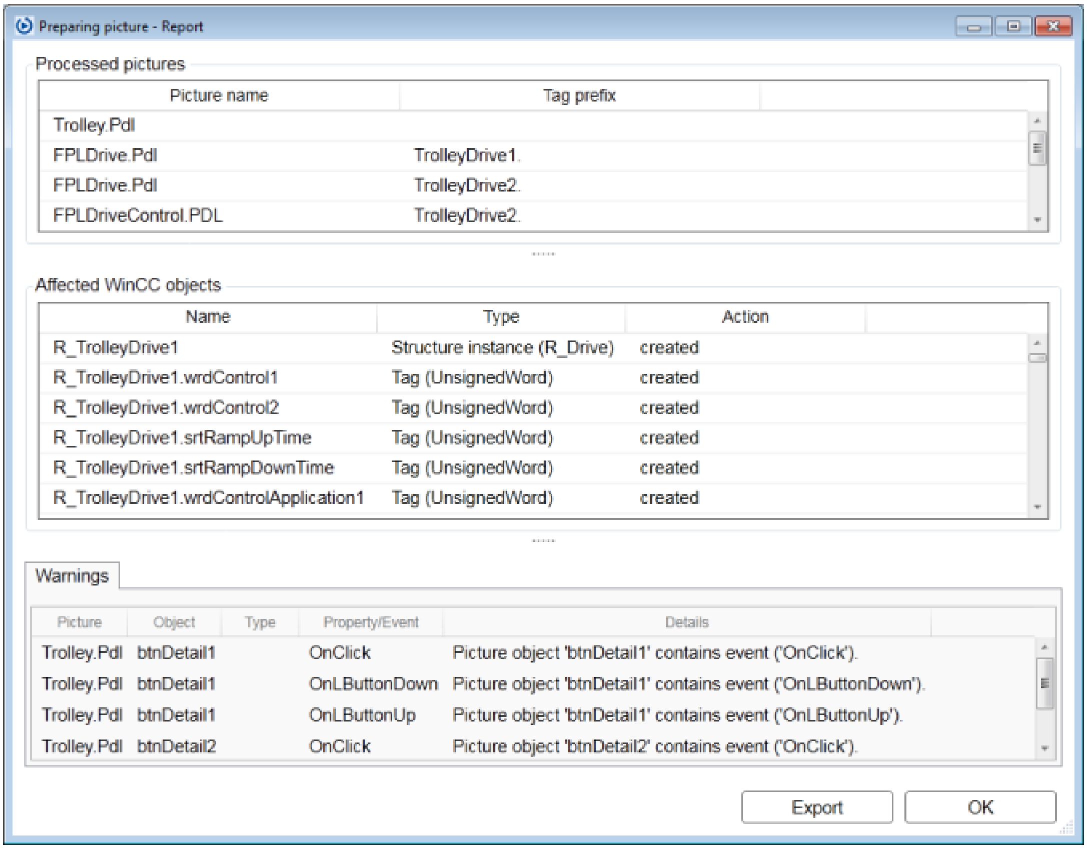
Figure 10-10 User interface of the Replay Configuration Editor

No.	Description
①	You can make the general settings in this area: • "Picture Selector Tags" "Read Only" list of the created picture selector tags. These tags are automatically created when the very first picture is prepared for replay. See: "Internal tags (Page 356)" • "Maximum number of archive tags" Notifies the Replay Configuration Editor of the maximum number of available archive tags. This number must be calculated by the user. As soon as this number is reached, the Replay Configuration Editor issues a warning. See: Specify the maximum number of archive tags (Page 319)
②	In this area, you will find all Replay-specific information for the pictures. • "Check" button: Checks a prepared picture for integrity and compatibility. See: "Replay pictures: Checking prepared pictures (Page 322)" • "Check All" button: Checks all prepared pictures for integrity and compatibility. • "Repair" button: Resolves conflicts when a picture is changed retrospectively. See: "Replay pictures: Repairing prepared pictures (Page 324)" • "Clean up" button: Removes superfluous Replay tags and archive tags. See: "Replay pictures: Cleaning up tags (Page 325)" • List of the pictures available in the WinCC project: Prepared: Specifies whether a picture is prepared for Replay. Picture name: Shows the picture name. Inner pictures: Shows the number of inner pictures. Tags: Shows the number of successfully processed tags. Status: Shows the status. See: "The various picture statuses (Page 319)"
③	In this area, you will find a table of the tags and archives of a picture prepared for Replay: • "Original tag name" Name of the original WinCC tag • "Archive tag name" Name of the archive tag in which the historical data required for Replay are stored. • "Replay tag name" Replay Tag Name, originated from the original tag name. An object of a picture is supplied via this tag instead of the original tag in Replay mode. • "Created on": Creation date

10.2.4 The report window / exporting a report

After completion of one of the following operations, the report window opens with the current results:

- Select a picture for Replay
- Deselect a Replay picture
- Check a picture prepared for Replay
- Check all pictures prepared for Replay
- Repair a picture prepared for Replay
- Clean up superfluous information of all pictures prepared for Replay



Processed pictures

Picture name	Tag prefix
Trolley.Pdl	
FPLDrive.Pdl	TrolleyDrive1.
FPLDrive.Pdl	TrolleyDrive2.
FPLDriveControl.PDL	TrolleyDrive2.

Affected WinCC objects

Name	Type	Action
R_TrolleyDrive1	Structure instance (R_Drive)	created
R_TrolleyDrive1.wrdControl1	Tag (UnsignedWord)	created
R_TrolleyDrive1.wrdControl2	Tag (UnsignedWord)	created
R_TrolleyDrive1.srtRampUpTime	Tag (UnsignedWord)	created
R_TrolleyDrive1.srtRampDownTime	Tag (UnsignedWord)	created
R_TrolleyDrive1.wrdControlApplication1	Tag (UnsignedWord)	created

Warnings

Picture	Object	Type	Property/Event	Details
Trolley.Pdl	btnDetail1		OnClick	Picture object 'btnDetail1' contains event ('OnClick').
Trolley.Pdl	btnDetail1		OnLButtonDown	Picture object 'btnDetail1' contains event ('OnLButtonDown').
Trolley.Pdl	btnDetail1		OnLButtonUp	Picture object 'btnDetail1' contains event ('OnLButtonUp').
Trolley.Pdl	btnDetail2		OnClick	Picture object 'btnDetail2' contains event ('OnClick').

Figure 10-11 Report window

Export a report

Layout of the report window:

- Processed Pictures:
  In the case of main pictures, the picture names and in the case of inner pictures, picture names and tag prefixes are displayed.
- Affected WinCC Objects:
  Name of the tags, type of tags, and action detected / processed by the Replay Configuration Editor (missing, created, deleted)
- Warnings:
  Contain information about the picture affected, the object affected, or the action affected.

You can export the report as a "*.csv file".

1. Click the "Export" button in the report window.

10.2.5 The various picture statuses

In the list of pictures in the Replay Configuration Editor, the status of each picture is shown in the "Status" column. The pictures can have one of the following statuses:

- N/A (grayed out):
  The status of the picture is not known. If a picture has not been prepared for Replay, it has this status.
- OK:
  The picture has been prepared for Replay. The picture can be used for Replay.
- Changed (yellow background):
  The picture has been changed after the last Replay preparation in the Graphics Designer
- Conflict (red background):
  The assignment of tags to the picture has been changed since the last Replay preparation. A picture can only have this status if it has first been checked for picture changes.

10.2.6 Specify the maximum number of archive tags

In the Replay Configuration Editor, you must enter the maximum number of archive tags that are provided to you by your WinCC license.

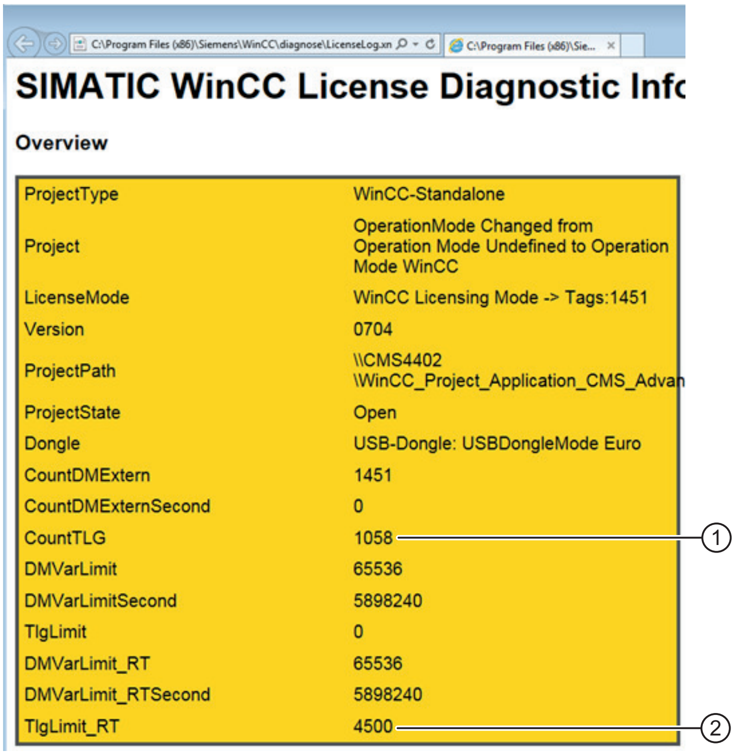
This enables the Replay Configuration Editor to output a warning when the maximum number of archive tags is reached.

1. Open the WinCC project.

Note

The WinCC project must be open so that the maximum number of tags in use can be calculated.

2. Open "<WinCC installation folder>\diagnose\LicenseLog.xml".



C:\Program Files (x86)\Siemens\WinCC\diagnose\LicenseLog.xn
C:\Program Files (x86)\Sie...
①
②

SIMATIC WinCC License Diagnostic Infc

Overview

ProjectType	WinCC-Standalone
Project	OperationMode Changed from Operation Mode Undefined to Operation Mode WinCC
LicenseMode	WinCC Licensing Mode -> Tags:1451
Version	0704
ProjectPath	\\CMS4402 \WinCC_Project_Application_CMS_Advan
ProjectState	Open
Dongle	USB-Dongle: USBDongleMode Euro
CountDMExtern	1451
CountDMExternSecond	0
CountTLG	1058
DMVarLimit	65536
DMVarLimitSecond	5898240
TlgLimit	0
DMVarLimit_RT	65536
DMVarLimit_RTSecond	5898240
TlgLimit_RT	4500

① Number of archive tags currently used

② Number of archive tags available in total

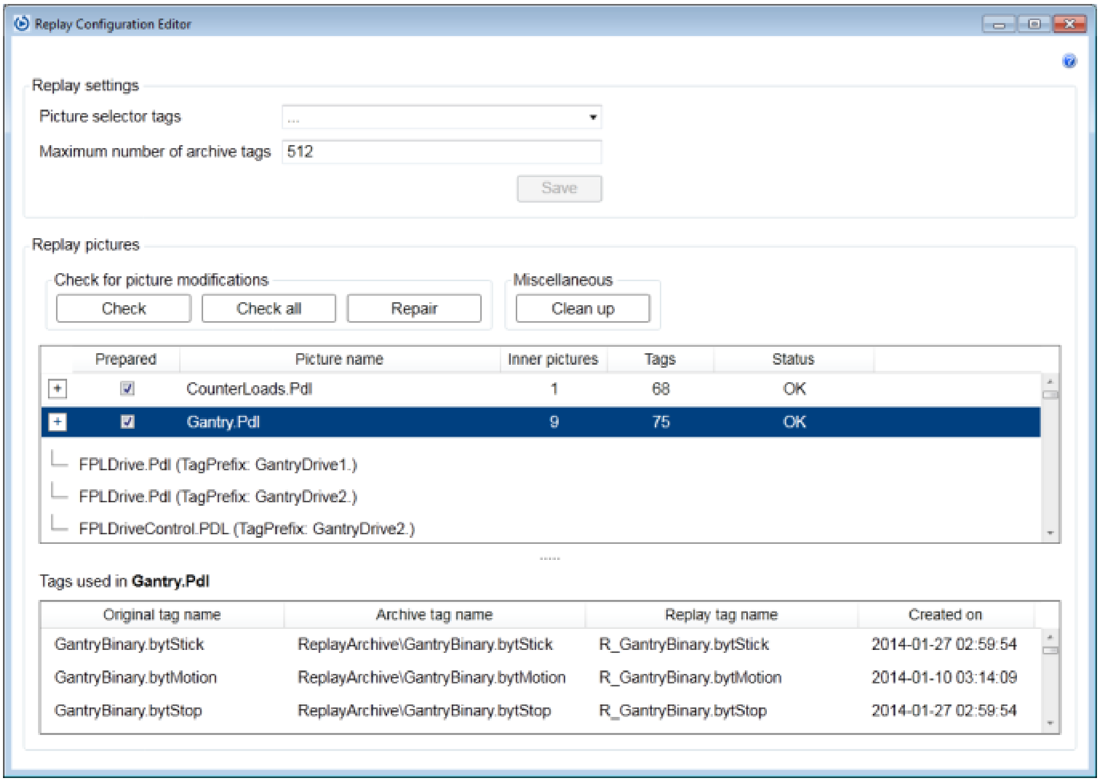
Displayed only if WinCC Runtime has been started

Figure 10-12 Calculating the maximum number of archive tags

10.2.7 Replay pictures: Preparing pictures

A picture must be prepared for replay before it can be viewed using the Replay function. This process creates all the necessary tags and structures.
See: "Required tags, structures, and archives (Page 306)"

1. Open the Replay Configuration Editor.
   The Replay Configuration Editor shows all the pictures (with extension .pdl) in the WinCC project. Faceplates are not shown in the list.



Picture selector tags: ...

Maximum number of archive tags: 512

	Prepared	Picture name	Inner pictures	Tags	Status
+	☑	CounterLoads.Pdl	1	68	OK
+	☑	Gantry.Pdl	9	75	OK

FPLDrive.Pdl (TagPrefix: GantryDrive1.)
FPLDrive.Pdl (TagPrefix: GantryDrive2.)
FPLDriveControl.PDL (TagPrefix: GantryDrive2.)

Tags used in **Gantry.Pdl**

Original tag name	Archive tag name	Replay tag name	Created on
GantryBinary.bytStick	ReplayArchive\GantryBinary.bytStick	R_GantryBinary.bytStick	2014-01-27 02:59:54
GantryBinary.bytMotion	ReplayArchive\GantryBinary.bytMotion	R_GantryBinary.bytMotion	2014-01-10 03:14:09
GantryBinary.bytStop	ReplayArchive\GantryBinary.bytStop	R_GantryBinary.bytStop	2014-01-27 02:59:54

Figure 10-13 Preparing pictures

2. Select the checkbox for the relevant picture in the "Prepared" column in the list of Replay pictures.
   The "Prepare picture" window appears.

   ### Note

   If the selected picture (e.g. "Hoist.pdl") contains a detail window (e.g. "HoistDetails.pdl"), that was integrated into the picture in way that is suitable for Replay (as described in Chapter 1.4.5), the two pictures "Hoist.pdl" and "HoistDetails.pdl" are prepared for Replay. "HoistDetails.pdl" is subordinate to the "Hoist.pdl" picture after preparation and does not need to be selected again in the list of pictures in the Replay Editor.

3. Click "OK" to start preparing the picture.
   The picture is checked for Replay capability.

This operation can be canceled.

If an insufficient number of archive tags is available, preparation of this picture will be canceled and an appropriate message displayed.

If any objects or scripts are found that are not supported, a warning will appear. These warnings are also included later in the report.

A report about this operation is displayed and can be exported as required. For details about the report, see: "The report window / exporting a report (Page 318)".

Note

Depending on the number of tags used in the picture (incl. the tags used in the inner pictures), this operation may take a few minutes.

All required tags and structures are created.

The picture is marked as "Prepared".

If you now select the Replay picture in the Replay Configuration Editor, all its Replay-specific information will be displayed:

10.2.8 Replay pictures: Checking prepared pictures

Changes to a picture (e.g. opening and saving the picture in Graphics Designer) are marked in the Replay Configuration Editor. The picture name has a yellow background and the status is marked as "Changed".

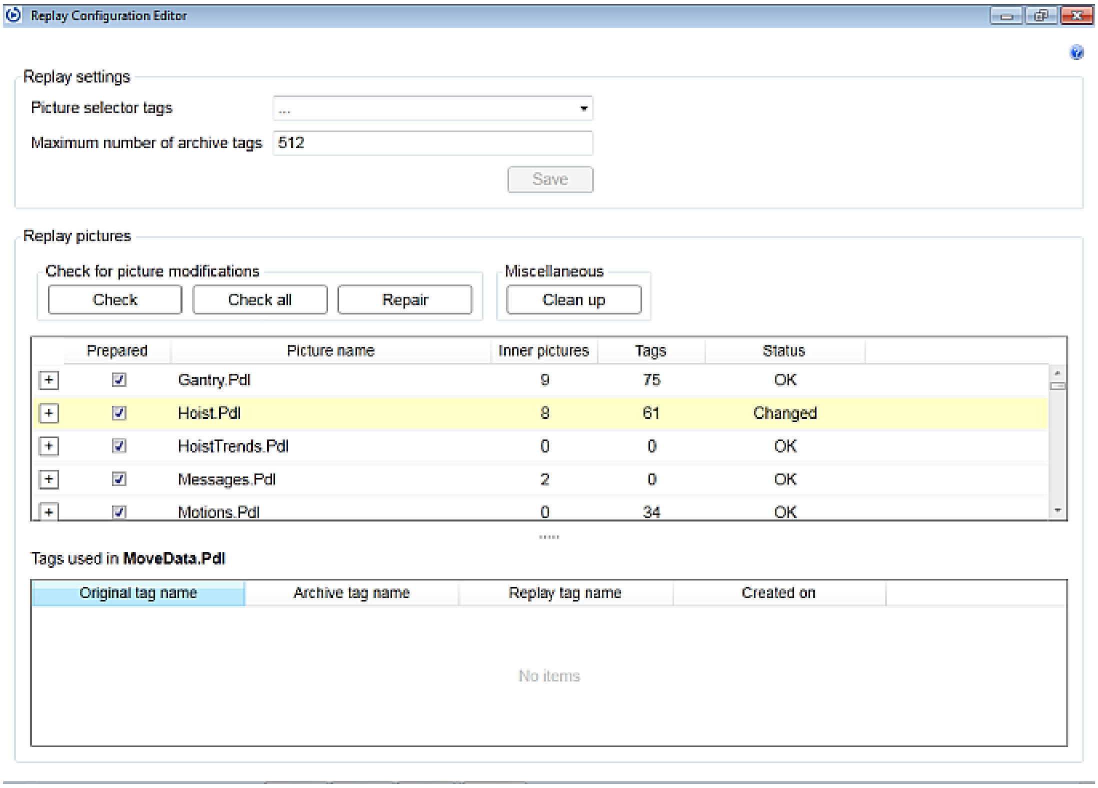
Note

Changes to the ReplayArchive or to the WinCC tag management are not automatically recognized by the Replay Configuration Editor!

If a picture displays the status "OK" but does not run correctly in the Runtime, the picture must be analyzed with "Check." The problem will then be displayed.

You can find additional information about various picture statuses here: "The various picture statuses (Page 319)".

1. Open the Replay Configuration Editor.
   The Replay Configuration Editor shows all the pictures in the WinCC project and their status.



Picture selector tags: ...

Maximum number of archive tags: 512

	Prepared	Picture name	Inner pictures	Tags	Status
+	☑	Gantry.Pdl	9	75	OK
+	☑	Hoist.Pdl	8	61	Changed
+	☑	HoistTrends.Pdl	0	0	OK
+	☑	Messages.Pdl	2	0	OK
+	☑	Motions.Pdl	0	34	OK

Tags used in **MoveData.Pdl**

Original tag name	Archive tag name	Replay tag name	Created on

No items

Figure 10-14 Replay Configuration Editor

2. In the list of Replay pictures, select the picture that you want to check

3. Click the "Check" button.
   The picture is then checked and an appropriate status assigned to it.

This operation can be canceled.

Note

Using the "Check all" function, you can check the changes to all pictures.

A report about this operation is displayed and can be exported as required. For details about the report, see: "The report window / exporting a report (Page 318)".

You can use the "Repair" button to repair any pictures that have the "Conflict" status. See: "Replay pictures: Repairing prepared pictures (Page 324)"

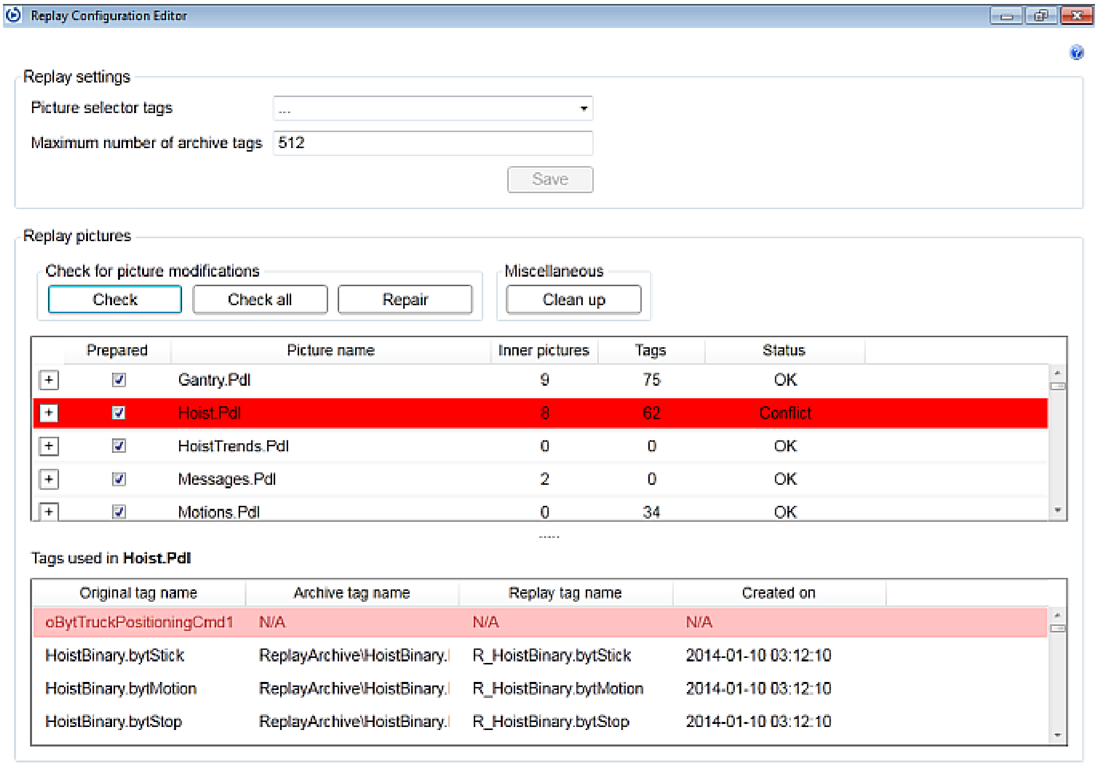
10.2.9 Replay pictures: Repairing prepared pictures

An existing picture that has been modified or has "Conflict" status can be repaired with the "Repair" button so that it can be replayed. Any missing Replay tags and Replay archives are created during the repair process.

Note

However, Replay tags and archives that are no longer needed are not deleted, but they can be removed with the "Clean up" function.
See: "Replay pictures: Cleaning up tags (Page 325)"

1. Open the Replay Configuration Editor.
   The Replay Configuration Editor shows all the pictures in the WinCC project and their status.



Replay settings

Picture selector tags: ...

Maximum number of archive tags: 512

Replay pictures

Check for picture modifications

	Prepared	Picture name	Inner pictures	Tags	Status
+	☑	Gantry.Pdl	9	75	OK
+	☑	Hoist.Pdl	8	62	Conflict
+	☑	HoistTrends.Pdl	0	0	OK
+	☑	Messages.Pdl	2	0	OK
+	☑	Motions.Pdl	0	34	OK

Tags used in **Hoist.Pdl**

Original tag name	Archive tag name	Replay tag name	Created on
oBytTruckPositioningCmd1	N/A	N/A	N/A
HoistBinary.bytStick	ReplayArchive\HoistBinary.	R_HoistBinary.bytStick	2014-01-10 03:12:10
HoistBinary.bytMotion	ReplayArchive\HoistBinary.	R_HoistBinary.bytMotion	2014-01-10 03:12:10
HoistBinary.bytStop	ReplayArchive\HoistBinary.	R_HoistBinary.bytStop	2014-01-10 03:12:10

Figure 10-15 Picture with the "Conflict" status

2. In the list of replay pictures, select the picture with the "Conflict" status and click on "Repair".
   The picture is then repaired.

This operation can be canceled.

A report about this operation is displayed and can be exported as required. For details about the report, see: "The report window / exporting a report (Page 318)".

10.2.10 Replay pictures: Cleaning up tags

Deleting tags in a picture does not automatically delete the associated internal Replay tags and archive tags. It results in unused tags.

The "Clean up" function checks whether internal tags or archive tags created for Replay are used in the pictures. Unused tags are deleted

Note

Potential loss of data

If required, the historical data of unused tags may be retained in the archive or recorded so that they can subsequently be integrated into a picture again without any loss of data.

The "Clean up" function permanently deletes the historical data of unused tags!

1. Open the Replay Configuration Editor.
   The Replay Configuration Editor shows all the pictures in the WinCC project and their status.
2. Click on "Clean up".
   Unused tags and archives are deleted.

This operation can be canceled.

A report about the operation is displayed and can be exported. You will find a detailed description in Section: "The report window / exporting a report (Page 318)".

Note

If you need to make more tags available, check the configuration of your Replay pictures to determine whether you can evaluate and manually delete archive tags.

See also

Maximum number of archive tags (Page 308)

10.2.11 Deselect pictures

A picture prepared for Replay can be deselected by clearing the checkmark in the "Prepared" column. This process deletes all Replay-specific information, tags and archives of the picture that are not being used by any other picture.

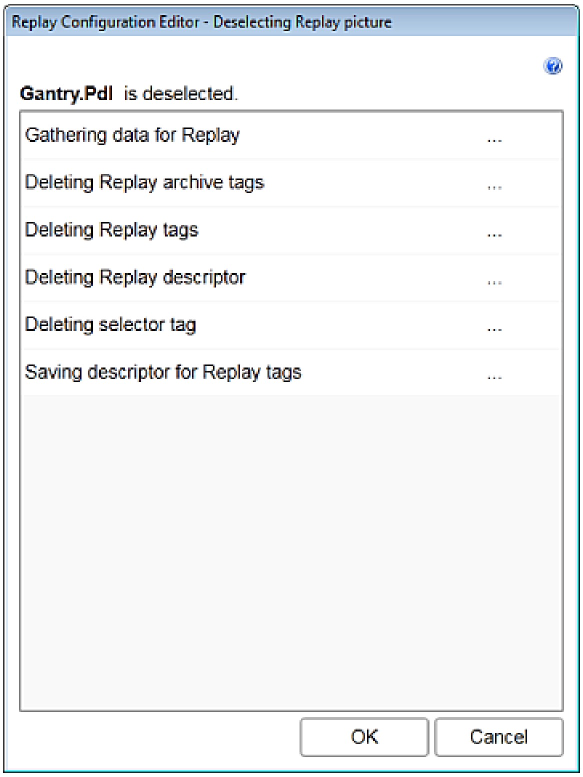
Note

Potential loss of data!

It is possible that the historical data of the picture may be retained in the archive or be recorded for display at a later time.

When you deselect a picture, the historical data of unused tags are permanently deleted!

1. Open the Replay Configuration Editor.
   The Replay Configuration Editor shows all the pictures in the WinCC project and their status.
2. Clear the checkmark in the "Prepared" column for the relevant picture in the list of Replay pictures.
   The window "Replay picture will be deselected" appears.



Replay Configuration Editor - Deselecting Replay picture

Gantry.Pdl is deselected.

Gathering data for Replay	...
Deleting Replay archive tags	...
Deleting Replay tags	...
Deleting Replay descriptor	...
Deleting selector tag	...
Saving descriptor for Replay tags	...

3. Click "OK" to start the deselection process.
   The picture is deselected and is assigned "N/A" status. Unused Replay-specific information, tags and archives as well as the descriptor file are deleted.

This operation can be canceled.

A report about this operation is displayed and can be exported as required. For details about the report, see: "The report window / exporting a report (Page 318)".

10.3 Replay Runtime

10.3.1 About Replay Runtime

Replay Runtime is responsible for preparing and replaying historical Replay data.

You will find information about preparing the pictures for Replay here:
The Replay Configuration Editor (Page 315)
Adapt the CMS application for the Replay function (Page 332)

To ensure that Replay Runtime is launched automatically, it must be entered in the start list of WinCC Runtime.
See: "Set the Replay Runtime autostart function (Page 331)"

This icon in the Windows taskbar indicates that Replay Runtime is running.

In Replay mode, Replay Runtime reads the recorded data out of the Replay archive and replays them in the corresponding Replay pictures. Recording of current data continues.

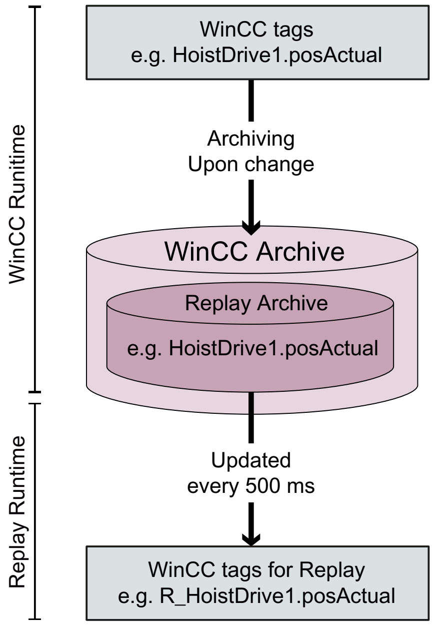


Figure 10-16 Overview: Replay Runtime communication

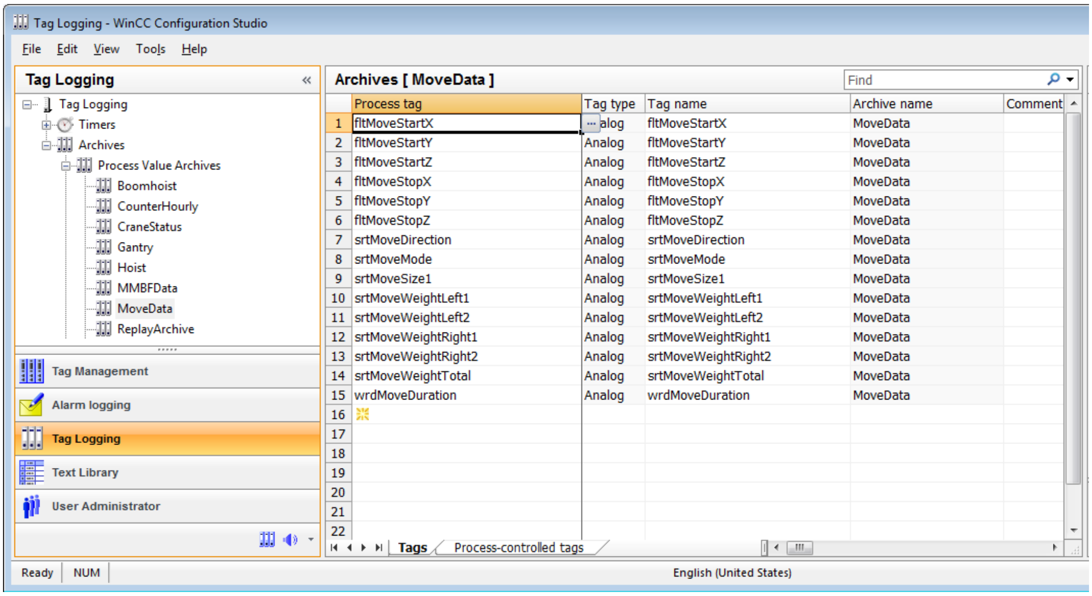
Note

For a detailed interface description, please see: "Internal tags (Page 356)".

Archiving

The process values to be archived are stored in a configurable cyclic archive in the archive database. The Replay archive is part of the WinCC TagLogging database. If the configured size of a segment of the cyclic archive is reached or the time period is exceeded, a transition to the next segment is made. When all segments are full, the process data in the first segment are overwritten again.

To protect process data from being overwritten, they can be exported to an external medium. You will find more information on this topic in the WinCC documentation.



Archives [MoveData]

	Process tag	Tag type	Tag name	Archive name	Comment
1	fltMoveStartX	alog	fltMoveStartX	MoveData	
2	fltMoveStartY	Analog	fltMoveStartY	MoveData	
3	fltMoveStartZ	Analog	fltMoveStartZ	MoveData	
4	fltMoveStopX	Analog	fltMoveStopX	MoveData	
5	fltMoveStopY	Analog	fltMoveStopY	MoveData	
6	fltMoveStopZ	Analog	fltMoveStopZ	MoveData	
7	srtMoveDirection	Analog	srtMoveDirection	MoveData	
8	srtMoveMode	Analog	srtMoveMode	MoveData	
9	srtMoveSize1	Analog	srtMoveSize1	MoveData	
10	srtMoveWeightLeft1	Analog	srtMoveWeightLeft1	MoveData	
11	srtMoveWeightLeft2	Analog	srtMoveWeightLeft2	MoveData	
12	srtMoveWeightRight1	Analog	srtMoveWeightRight1	MoveData	
13	srtMoveWeightRight2	Analog	srtMoveWeightRight2	MoveData	
14	srtMoveWeightTotal	Analog	srtMoveWeightTotal	MoveData	
15	wrdMoveDuration	Analog	wrdMoveDuration	MoveData	
16					
17					
18					
19					
20					
21					
22					

Figure 10-17 TagLogging database

Note

For more details about WinCC TagLogging functionality and configuring archives, see the WinCC documentation.

The log file

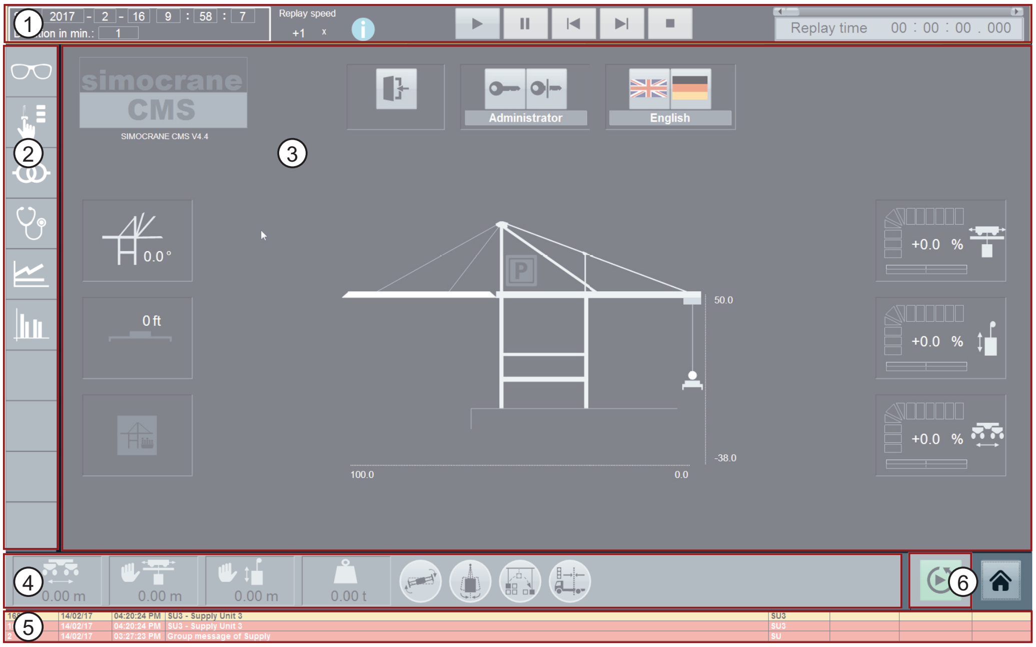
A log file is created in the WinCC project directory under ...\CMS\Replay. Events from Replay Runtime and the Replay Configuration Editor are entered here.

The data buffer

To speed up reading data from the Replay archive, Replay Runtime also administers a data buffer. If replay of the data is started on the Replay operating bar, the Replay data will first be transferred into this buffer in the background and the buffer status will be displayed on the operating bar.

10.3.2 The Replay user interface in the CMS example application

In the CMS example application, the user interface in Replay mode consists of the following elements:



16… 14/02/17 04:20:24 PM SU3 - Supply Unit 3 SU3
1… 14/02/17 04:20:24 PM SU3 - Supply Unit 3 SU3
2… 14/02/17 03:27:23 PM Group message of Supply SU

Figure 10-18 CMS standard window in Replay mode

No.	Description
①	Replay operating bar See: "The Replay operating bar of the CMS example application (Page 329)"
②	Primary navigation bar for switching over and starting main windows
③	Replay window
④	Status bar
⑤	Lines with current messages. Note: Current operational messages are also displayed during Replay mode.
⑥	Replay button (to start and exit Replay mode)

10.3.3 The Replay operating bar of the CMS example application

The CMS example application includes a Replay operating bar with the following functions:

For further information about the scripts and tags of the individual operator controls in this Replay operating bar, please see: "Application components in the WinCC project (Page 356)"

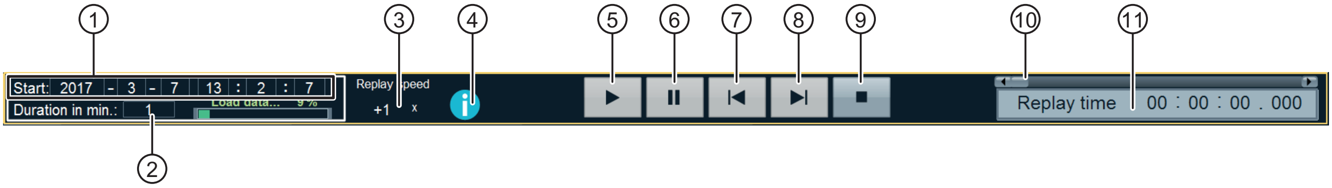


Figure 10-19 Replay operating bar

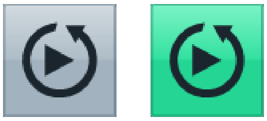
No.	Description
①	Enter start time. Format: Year, month, day, hour, minute, second YYYY,MM,DD,hh,mm,ss
②	Enter Replay time. Format: Minutes, 1 .. 60
③	Enter Replay speed. If an "-" is entered in front of the number, Replay data are replayed backwards. Factor: -999 .. 999
④	Display (tooltip) of the status of Replay Runtime by messages from the Replay operating bar.
⑤	Start button for loading Replay data and starting Replay.
⑥	Pause button for pausing Replay.
⑦	Reverse button, can be operated after the pause button has been pressed, jumps 500 ms backward in time when pressed.
⑧	Forward button, can be operated after the pause button has been pressed, jumps 500 ms forward in time when pressed.
⑨	Stop button for canceling buffering or stopping Replay.
⑩	Slider of the Replay operating bar. Slider can be moved to jump to any Replay times between the Replay start time and end time.
⑪	Display of current Replay time.

10.3.4 Start/stop Replay mode.

Note

In the CMS example application supplied, the Replay function is not available to users with the "operator" role. To use the Replay function, you must have logged onto the CMS with one of the roles "maintenance," "management," or "administrator."

Requirement: Replay Runtime has been activated.



The Replay button is gray in live mode and green in Replay mode.

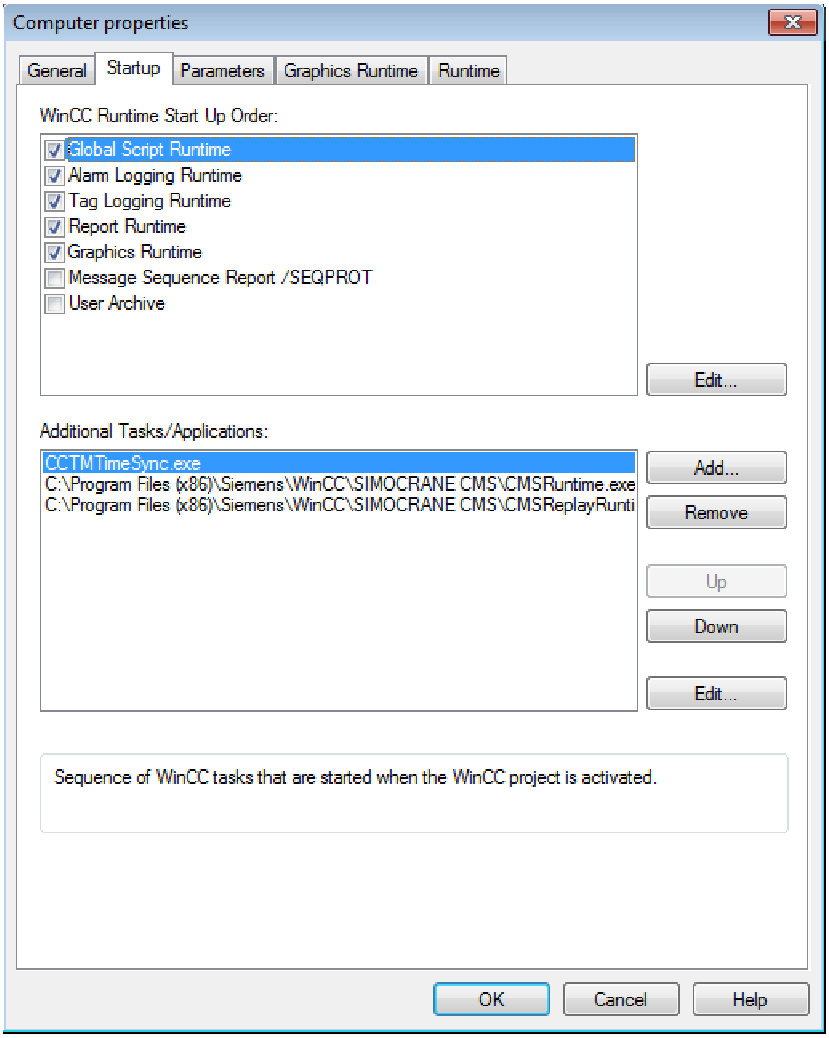
1. You can switch from live mode to Replay mode by pressing the "Replay button".
   Press the "Replay button" again to exit Replay mode.

The Replay operating bar is displayed at the top in the CMS example application. In the primary and secondary navigation, only the buttons whose picture objects have been prepared for Replay will be displayed.

10.3.5 Set the Replay Runtime autostart function

If you add Replay to the start list of WinCC Runtime, Replay Runtime will always be activated and deactivated with WinCC Runtime.

For further information about setting the autostart function, please refer to the WinCC documentation.



WinCC Runtime Start Up Order:

☑ Global Script Runtime
☑ Alarm Logging Runtime
☑ Tag Logging Runtime
☑ Report Runtime
☑ Graphics Runtime
☐ Message Sequence Report /SEQPROT
☐ User Archive

Additional Tasks/Applications:

CCTMTimeSync.exe
C:\Program Files (x86)\Siemens\WinCC\SIMOCRANE CMS\CMSRuntime.exe
C:\Program Files (x86)\Siemens\WinCC\SIMOCRANE CMS\CMSReplayRunti

Sequence of WinCC tasks that are started when the WinCC project is activated.

Figure 10-20 Add Replay Runtime to WinCC start list

10.4 Adapt the CMS application for the Replay function

10.4.1 Important note about adapting the CMS application

Note

Technical requirements for adapting the example application:

- Very good knowledge of WinCC
- Detailed knowledge of the Replay function
- If scripts have to be written: Experience with writing scripts (VB scripts and/or C scripts)

Required VBS project modules

To be able to adapt the Replay function to your needs, the following VBS project modules are needed.

- NavigationVisible.bmo
  Required for switchover between live and Replay mode.
  Responsible for showing/hiding navigation buttons that are available or unavailable for Replay depending on how Replay is configured.
- NoReplayAvailable.bmo
  Required if the WinCC runtime was not activated for the time replayed in Replay. No archive data are available either. In this case, the message "No replay data available during the actual replayed time" is displayed.
- ReplayLoadPics.bmo
  In this script, you can edit the pictures that always have to be loaded.
  See:The picture selector tags (Page 312)

You will find the VBS project modules in the example application in the project folder "ScriptLib".

- or -

You can edit the modules via the WinCC Explorer under GlobalScript / VBS Editor.

10.4.2 Runtime data in Replay mode (@NOTP::)

You can prevent tags from being supplied with Replay data in Replay mode. Instead, you can set the system so that tags are supplied with current runtime data.

1. Use the prefix "@NOTP::" for all tags that are to be supplied with runtime data.

The string "@NOTP::" can be used in all properties, events, and scripts. All tags that have the prefix "@NOTP::" will also be supplied with the current process values instead of Replay data during replay in Replay mode.

Note

The Replay Configuration Editor does not create a replay tag nor an archive tag in the ReplayArchive for tags that have the prefix "@NOTP::".

Example: "@NOTP::" in VB script

```
Dim elapsed_ms
Dim ReplaySpeed
Dim replayTime
Dim startTime
elapsed_ms      =
HMIRuntime.Tags("@NOTP::@ReplayControl.Out_Elapsed_ms").Read()
ReplaySpeed     =
HMIRuntime.Tags("@NOTP::@ReplayControl.In_ReplaySpeed").Read()
```

Example: "@NOTP::" in C script

```
// WINCC:TAGNAME_SECTION_START
    // syntax: #define TagNameInAction "DMTagName"
    // next TagID: 1
    #define wrdStarttimeYear "@NOTP::@ReplayControl.In_StartYear"
    #define bytStarttimeMonth "@NOTP::@ReplayControl.In_StartMonth"
    #define bytStarttimeDay "@NOTP::@ReplayControl.In_StartDay"
    #define bytStarttimeHour "@NOTP::@ReplayControl.In_StartHour"
    #define bytStarttimeMinute "@NOTP::@ReplayControl.In_StartMinute"
    #define bytStarttimeSecond "@NOTP::@ReplayControl.In_StartSecond"
    #define chrStarttime "@NOTP::@ReplayStartTime"
    // #define chrMoveStoptime "@CMSMoveTableStoptime"
// WINCC:TAGNAME_SECTION_END
```

10.4.3 Creating a Replay button

This section describes how to create a Replay button.

This button switches between the current process visualization (live mode) and visualization of Replay data (Replay mode).

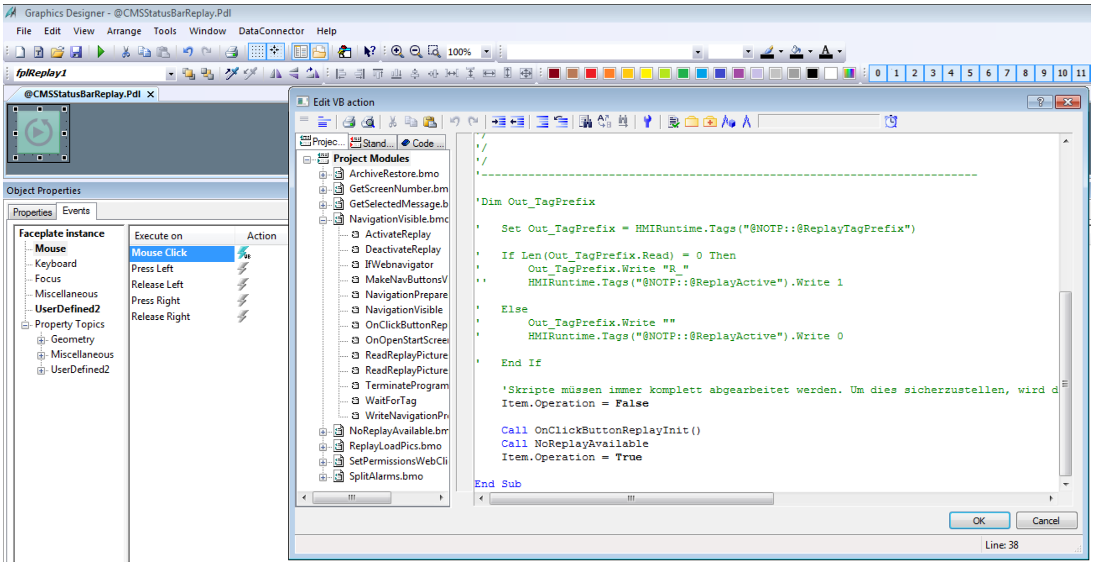
Note

In the CMS example application, the Replay button has already been created in the picture "@CMSStatusBarReplay.pdl".

Create a button that executes the following commands or calls scripts when clicked:

```
[Code]
Item.Operation = FALSE
Call OnClickButtonReplayInit()
Call NoReplayAvailable
Item.Operation = TRUE
[/Code]
```

The script "OnClickButtonReplayInit" is part of the project module "NavigationVisible.bmo". The script "NoReplayAvailable" is part of the project module "NoReplayAvailable.bmo".



```
'/
'/
'------------------------------------------------------------------------

'Dim Out_TagPrefix

'   Set Out_TagPrefix = HMIRuntime.Tags("@NOTP::@ReplayTagPrefix")

'   If Len(Out_TagPrefix.Read) = 0 Then
'       Out_TagPrefix.Write "R_"
''      HMIRuntime.Tags("@NOTP::@ReplayActive").Write 1

'   Else
'       Out_TagPrefix.Write ""
'       HMIRuntime.Tags("@NOTP::@ReplayActive").Write 0

'   End If

    'Skripte müssen immer komplett abgearbeitet werden. Um dies sicherzustellen, wird d
    Item.Operation = False

    Call OnClickButtonReplayInit()
    Call NoReplayAvailable
    Item.Operation = True

End Sub
```

Figure 10-21 Configuration of the Replay button

10.4.4 Adapting navigation button for Replay

This section describes how to get a navigation button on a primary or secondary navigation bar to work with Replay mode.

Note

The navigation buttons of the example application are already prepared for Replay.

@NOTP:: Tags

In the object properties of the navigation buttons, the string "@NOTP::" must be placed in front of each tag.

Adapt the name and visible tag of the navigation button for Replay

The following condition must be met so that navigation buttons in the primary and secondary navigation bars can be shown and hidden depending on the pictures prepared in the Replay Configuration Editor:

- The button names must conform to the relevant naming convention.
- The tags for visibility control must be assigned to the buttons.

You will find detailed information about the naming convention and visible tag here: "Naming convention of navigation buttons and visible tags for Replay (Page 237)".

1. Adapt the name of the navigation buttons:
   "Object properties" → "Properties tab" → "Status display" → "Object name"
   For primary navigation buttons: "ButtonX"
   For secondary navigation buttons: "ButtonX_PictureName"
2. Assign a visible tag to the button:
   "Object properties" → "Properties tab" → "Miscellaneous" → "Display
   for primary navigation buttons: "@NOTP::@ReplayButtonVisibleX"
   for secondary navigation buttons: "@NOTP::@ReplayButtonVisibleXY"
   "X" indicates the position of the navigation button in the primary navigation bar (values: 1..10).
   "Y" indicates the position of the navigation button in the secondary navigation bar (values: 1..10).

Adapt the script for Replay

Depending on whether or not a navigation button is required in Replay mode, it is displayed or hidden by the project module "NavigationVisible.bmo".

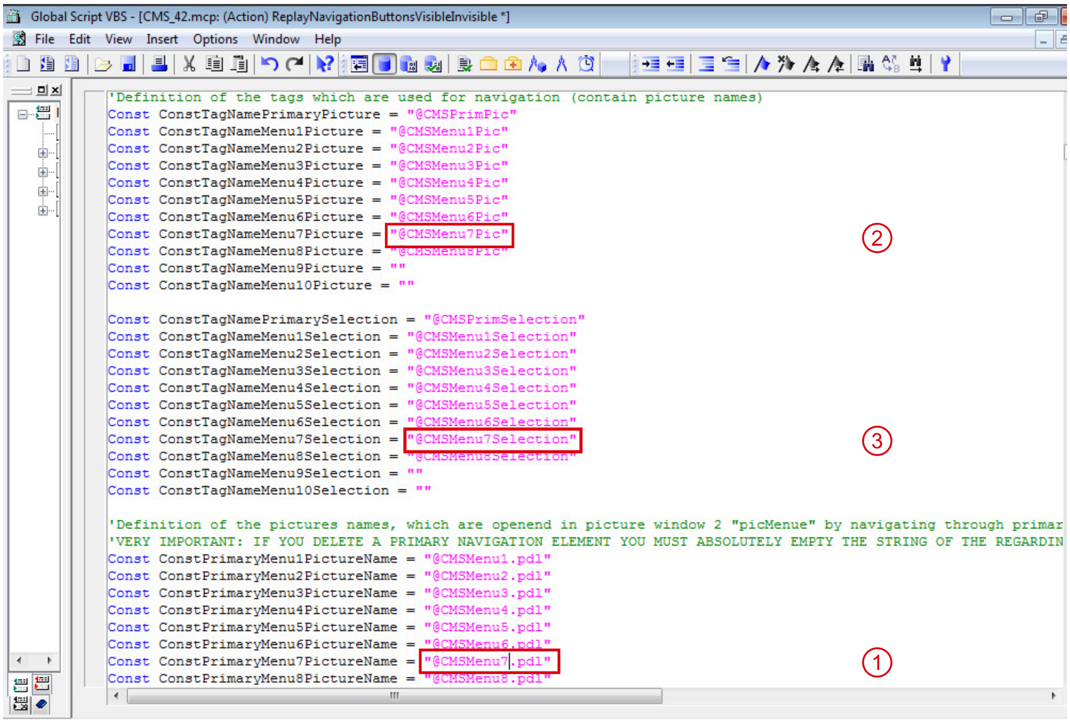
This script requires the visible tag "@ReplayButtonVisibleX" or "@ReplayButtonVisibleXY".

Before adapting the script, read Chapter Important note about adapting the CMS application (Page 332)

Note

You can leave the script unchanged for navigation buttons of the secondary navigation bar.

1. Insert the name of the picture that is called with the button of the primary navigation bar (here: "@CMSMenu7.pdl").
2. Insert the tag for the secondary navigation bar (here: "@CMSMenu7Pic").
   You can find the name of this tag by checking the object property "Picture name" of the picture window of the secondary navigation bar.
3. Insert the status tag that is responsible for the color change of the buttons (here: "@CMSMenu7Selection").


Global Script VBS - [CMS_42.mcp: (Action) ReplayNavigationButtonsVisibleInvisible *]
File
Edit
View
Insert
Options
Window
Help
②
③
①

```
'Definition of the tags which are used for navigation (contain picture names)
Const ConstTagNamePrimaryPicture = "@CMSPrimPic"
Const ConstTagNameMenu1Picture = "@CMSMenu1Pic"
Const ConstTagNameMenu2Picture = "@CMSMenu2Pic"
Const ConstTagNameMenu3Picture = "@CMSMenu3Pic"
Const ConstTagNameMenu4Picture = "@CMSMenu4Pic"
Const ConstTagNameMenu5Picture = "@CMSMenu5Pic"
Const ConstTagNameMenu6Picture = "@CMSMenu6Pic"
Const ConstTagNameMenu7Picture = "@CMSMenu7Pic"
Const ConstTagNameMenu8Picture = "@CMSMenu8Pic"
Const ConstTagNameMenu9Picture = ""
Const ConstTagNameMenu10Picture = ""

Const ConstTagNamePrimarySelection = "@CMSPrimSelection"
Const ConstTagNameMenu1Selection = "@CMSMenu1Selection"
Const ConstTagNameMenu2Selection = "@CMSMenu2Selection"
Const ConstTagNameMenu3Selection = "@CMSMenu3Selection"
Const ConstTagNameMenu4Selection = "@CMSMenu4Selection"
Const ConstTagNameMenu5Selection = "@CMSMenu5Selection"
Const ConstTagNameMenu6Selection = "@CMSMenu6Selection"
Const ConstTagNameMenu7Selection = "@CMSMenu7Selection"
Const ConstTagNameMenu8Selection = "@CMSMenu8Selection"
Const ConstTagNameMenu9Selection = ""
Const ConstTagNameMenu10Selection = ""

'Definition of the pictures names, which are openend in picture window 2 "picMenue" by navigating through primar
'VERY IMPORTANT: IF YOU DELETE A PRIMARY NAVIGATION ELEMENT YOU MUST ABSOLUTELY EMPTY THE STRING OF THE REGARDIN
Const ConstPrimaryMenu1PictureName = "@CMSMenu1.pdl"
Const ConstPrimaryMenu2PictureName = "@CMSMenu2.pdl"
Const ConstPrimaryMenu3PictureName = "@CMSMenu3.pdl"
Const ConstPrimaryMenu4PictureName = "@CMSMenu4.pdl"
Const ConstPrimaryMenu5PictureName = "@CMSMenu5.pdl"
Const ConstPrimaryMenu6PictureName = "@CMSMenu6.pdl"
Const ConstPrimaryMenu7PictureName = "@CMSMenu7.pdl"
Const ConstPrimaryMenu8PictureName = "@CMSMenu8.pdl"
```

Figure 10-22 Work steps in the script "NavigationVisible.bmo"

See also

Creating a navigation button (Page 241)

Navigation button: Adapting the position (Page 243)

Navigation button: Adapting the link destination (Page 245)

10.4.5 Adapt buttons in Replay pictures

This section describes how you can adapt a button that links to an inner picture for use with the Replay function.

You will find information on dynamic link destinations here: "Working with dynamic picture windows (Page 338)"

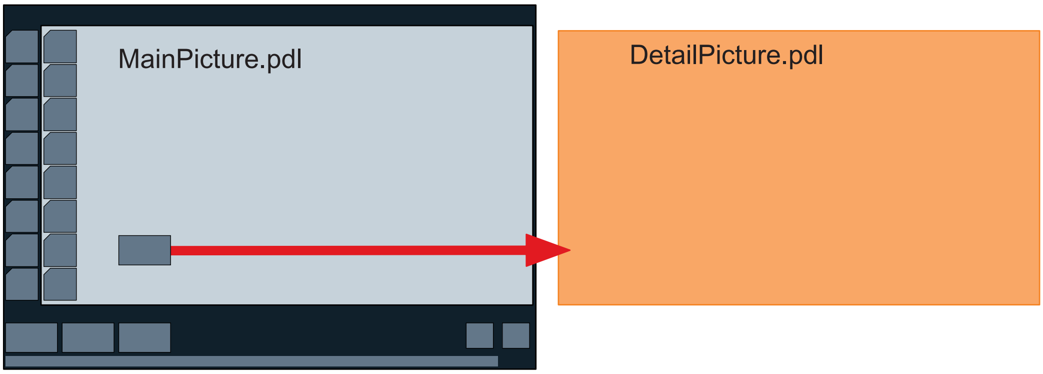


Figure 10-23 Button in "MainPicture.pdl" links to "DetailPicture.pdl"

The Replay Configuration Editor recognizes a linked picture only when it is integrated into the main picture as a picture window. To do this, you can integrate the image into the main picture as an invisible picture window.

If you prepare a main picture with a linked inner picture in the Replay Configuration Editor although the inner picture is not integrated in the main picture, a warning is output.

Example: A button is linked to a detail picture "DetailPicture.pdl" in the picture "MainPicture.pdl".

If you integrate the linked picture ("DetailPicture.pdl") as an invisible picture window into the main picture ("MainPicture.pdl"), the picture ("DetailPicture.pdl) can be recognized by the Replay Configuration Editor and included in preparation. As a consequence, the button link will also work correctly in Replay mode.

1. Make sure that the prefix "@NOTP::" has been appended to the button tags so that the link will also work in Replay mode.
   To do this, select the button and click on Object properties > Event > Mouse and then check the tags in the corresponding actions.
2. Create a picture window and position it wherever you like.

   Note

   This picture window can be as large as you wish. What matters is that it is included in the picture.

3. Enter the following settings for the picture window under "Object properties > Properties > Picture window > Miscellaneous":
   Attribute "Picture name": Enter here the name of the picture to which the button is linked.
   Attribute "Tag prefix": If a detail picture for multiple components or objects of the same type (HoistMotor1 and HoistMotor2, for example) are used or called, the tag prefix must be entered in the attributes of the associated picture window object.
   Attribute "Display": Select the value "No" so that this picture window is not visible during runtime.
4. Prepare the picture for replay.
   See: "Replay pictures: Preparing pictures (Page 320)"
5. Check whether the link works in Replay mode.

10.4.6 Working with dynamic picture windows

This section describes how you adapt dynamic picture windows for Replay.

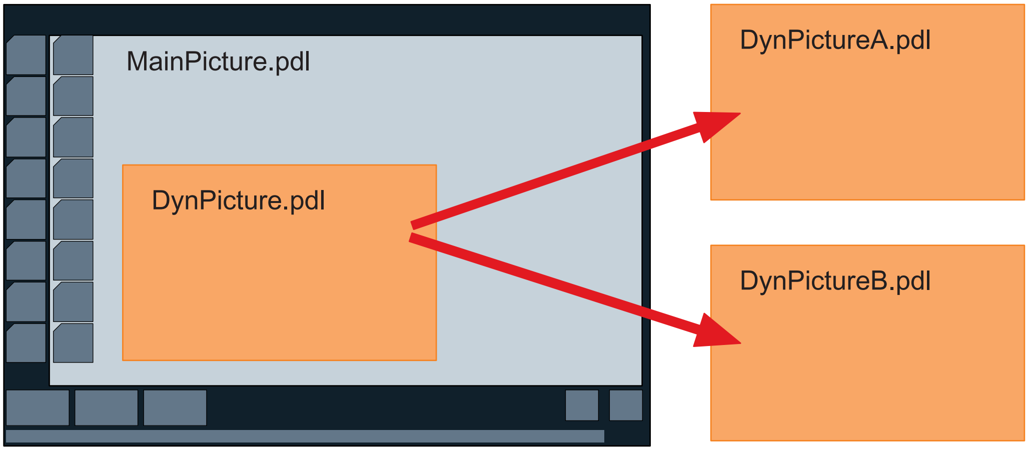


Figure 10-24 Main picture with dynamic inner picture

The Replay Configuration Editor cannot automatically prepare the images of a picture window ("DynPicture") if this picture window can call different pictures ("DynPictureA" or "DynPictureB"). If you prepare such a picture for Replay, a warning is output.

For a main picture with a dynamic picture window to be prepared, you must work out which inner pictures are called. Link each of these inner pictures in an invisible picture window into the main picture ("MainPicture.pdl"). If you do this, all inner pictures that are called ("DynPictureA" and "DynPictureB") can be recognized by the Replay Configuration Editor and included in the preparation process.

Example

The following figure shows the picture "Gantry.PDL" from the example application. It contains 3 inner pictures (i.e. 3 PictureWindow objects) used for direct display of a further picture within the main picture. The picture "Gantry.PDL" also contains 6 further picture windows that are not visible in the WinCC runtime.
Background: The pictures that are opened by clicking a button cannot be recognized by the Replay Configuration Editor in the normal way because they are configured in the events of the buttons. For that reason, further picture windows that are invisible in the WinCC runtime are inserted containing the names of the pictures that can be called via the buttons. This ensures that all pictures that can be opened with the buttons are prepared for Replay at the same time as the picture "Gantry.PDL."

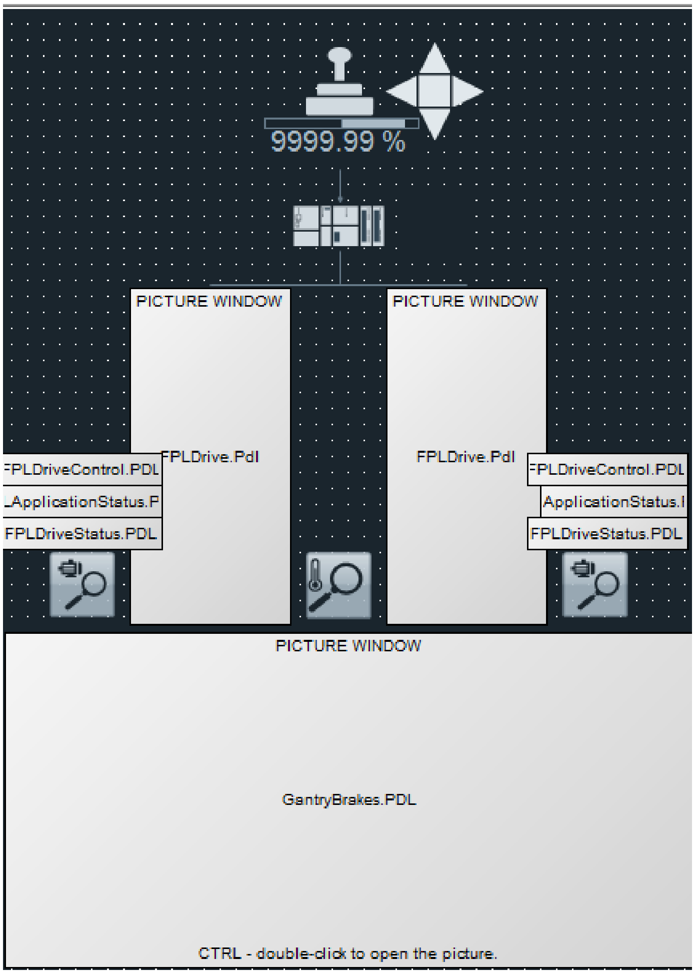


Figure 10-25 Gantry.PDL with three inner pictures in FPLDrive.PDL

Analyzing link destinations (using the example of Gantry.PDL)

1. Open the button whose content you want to process in Replay to look at the linked events.

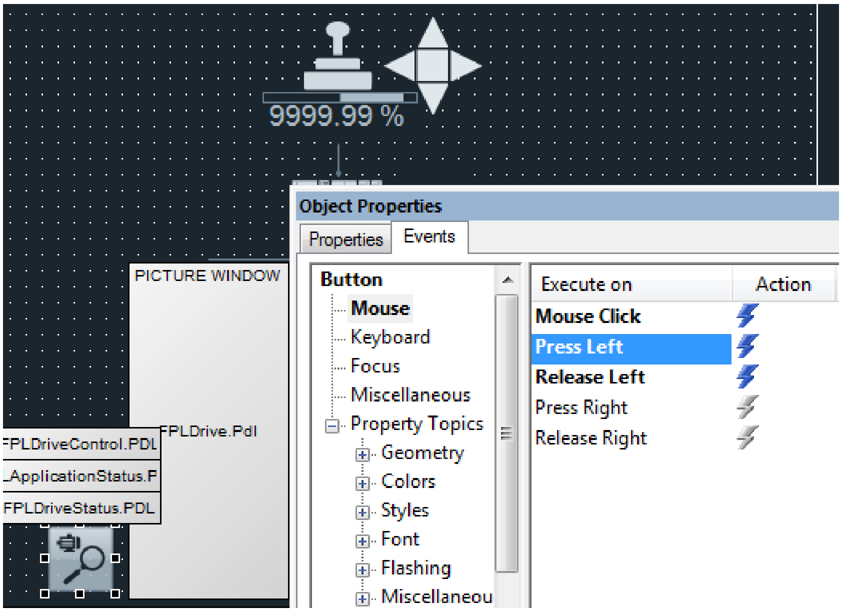
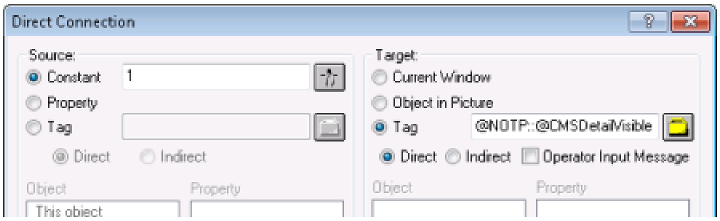


Figure 10-26 Linked events

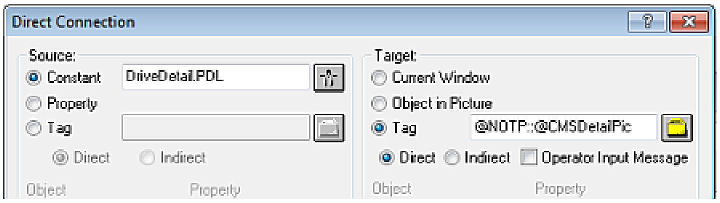
– Event "mouse click":
The value "1" is written into the tag "@CMSDetailVisible." This makes the picture window "picDetail" of the start picture "@CMSRoot1920.pdl" visible in the foreground:



Source:
● Constant 1
○ Property
○ Tag
● Direct ○ Indirect
Object: This object
Property

Target:
○ Current Window
○ Object in Picture
● Tag @NOTP::@CMSDetailVisible
● Direct ○ Indirect □ Operator Input Message
Object
Property

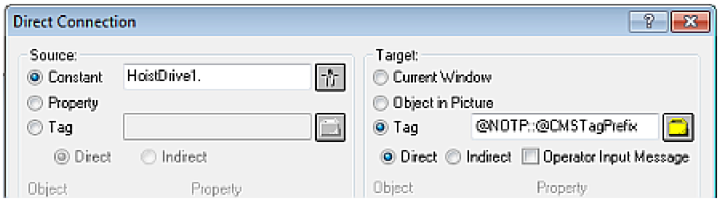
– Event "Press left":
The picture name "DriveDetail.PDL" is written into the tag "@CMSDetailPic." The picture window "picDetail" of the start picture "@CMSRoot1920.pdl" takes over the picture name in its object property "Picture name" and displays the picture "DriveDetail.PDL":



Source:
● Constant DriveDetail.PDL
○ Property
○ Tag
● Direct ○ Indirect
Object
Property

Target:
○ Current Window
○ Object in Picture
● Tag @NOTP::@CMSDetailPic
● Direct ○ Indirect □ Operator Input Message
Object
Property

– Event "Release left":
The "HoistDrive1." prefix is written into the "@CMSTagPrefix" tag for further use in the picture "DriveDetail.PDL":

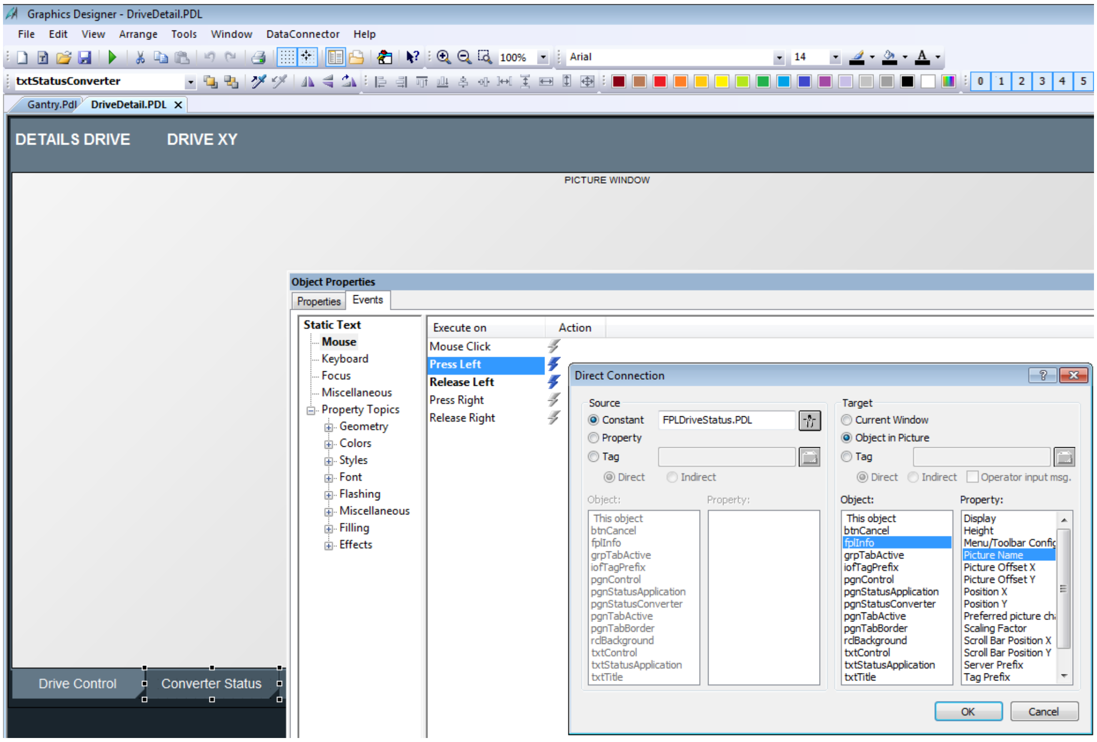

Direct Connection

Source:
● Constant: HoistDrive1.
○ Property
○ Tag
● Direct ○ Indirect

Target:
○ Current Window
○ Object in Picture
● Tag: @NOTP::@CMSTagPrefix
● Direct ○ Indirect □ Operator Input Message

Make sure that the prefix "@NOTP::" is used for linked events on which you write to tags.

2. Check whether the linked picture (in this example: "DriveDetail.pdl") is addressed by one or more pictures.


Graphics Designer - DriveDetail.PDL

Object Properties – Events: Static Text – Mouse

Execute on	Action
Mouse Click	
Press Left	
Release Left	⚡
Press Right	
Release Right	

Direct Connection

Source:
● Constant: FPLDriveStatus.PDL
○ Property
○ Tag

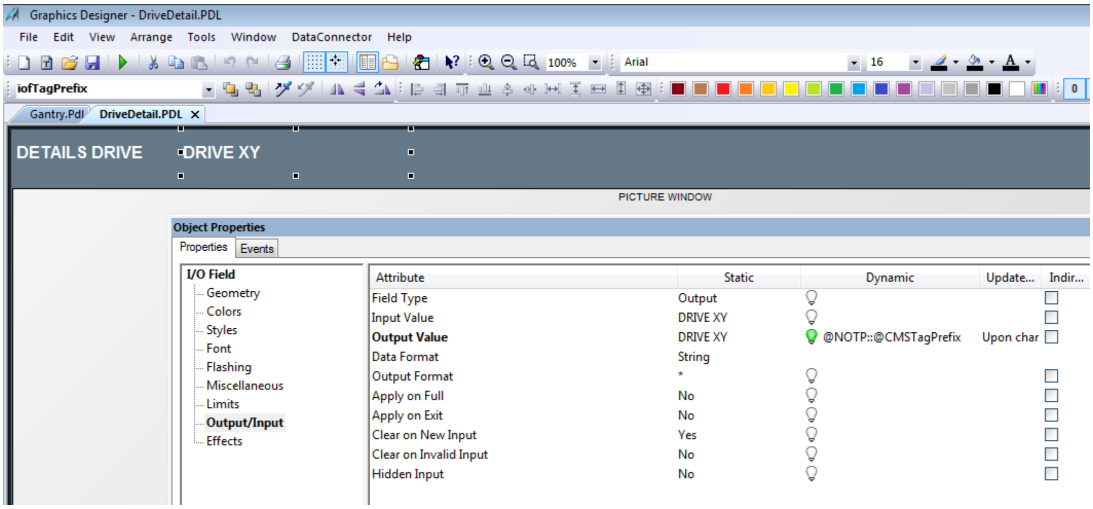
Target:
○ Current Window
● Object in Picture
○ Tag

Object: fplInfo
Property: Picture Name

Figure 10-27 Addressed images

The example shows that you can navigate through three pictures in this picture. The names of the pictures contained in the picture window are dynamically addressed via a mouse click event. For this reason, they are not picked up by Replay. Therefore note the names of the three called pictures (FPLDriveControl.PDL, FPLDriveStatus.PDL, FPLApplicationStatus.PDL).

3. Examine the "DriveDetail.PDL" picture for further elements that may be affected by Replay. One example is the "iofTagPrefix" output field. The "@CMSTagPrefix" tag linked behind it is only described if the detail button is pressed (see Step 1.) Then, the name of the drive addressed in the picture window is to be displayed (here: HoistDrive1.). Append "@NOTP::" to the front of the tag linked in the output value so that the drive name is correct in Replay mode.



Attribute	Static	Dynamic	Update...	Indir...
Field Type	Output			□
Input Value	DRIVE XY			□
Output Value	DRIVE XY	@NOTP::@CMSTagPrefix	Upon char	□
Data Format	String			
Output Format	*			□
Apply on Full	No			□
Apply on Exit	No			□
Clear on New Input	Yes			□
Clear on Invalid Input	No			□
Hidden Input	No			□

Figure 10-28 Output field "iofTagPrefix" - Adapting the output value

Creating invisible picture windows

1. Create a picture window for each inner picture and position it wherever you like.

   Note

   This picture window can be as large as you wish. What matters is that it is included in the picture.

2. Enter the following settings for the picture window under "Object properties" → "Properties" → "Picture window" → "Miscellaneous":
   Attribute "Picture name": Enter here the name of the nested picture.
   Attribute "Tag prefix": Specify the necessary tag prefix here if applicable.
   Attribute "Display": Select the value "No" so that this picture window is not visible during runtime.

3. Prepare the picture for replay.
   See: "Replay pictures: Preparing pictures (Page 320)"

4. Check the picture in Replay mode.

10.4.7 Insert an alarm control in a Replay picture

To switch between productive and Replay mode in a picture using alarm controls, you require 2 alarm controls. One alarm control is used to display the current messages in productive mode and the other to display the messages in Replay mode. These controls are then shown or hidden depending on which mode is selected.

Duplicate an alarm control

The following instructions assume that you have already created a picture for productive mode that is functional to display messages with an alarm control.

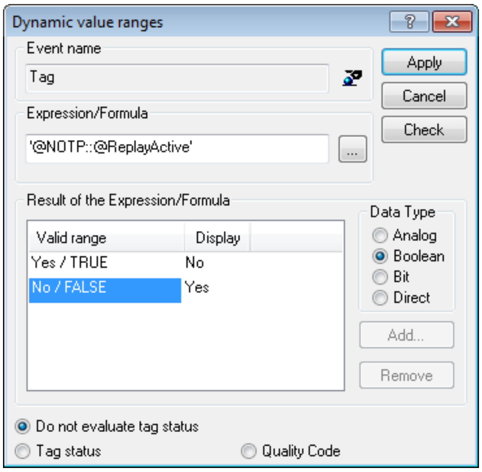
1. Use the shortcuts "Ctrl" + "C" and "Ctrl" + "V" in Graphics Designer to duplicate an already configured alarm control.

This gives you 2 alarm controls:

- Runtime AlarmControl: This is required to display alarms in productive mode.
- Replay AlarmControl: This is required to display alarms in Replay mode.

Adapt Runtime AlarmControl

1. Configure Runtime AlarmControl so that it is displayed during productive mode.
   Select: "Object properties" → "Miscellaneous" → "Display"
   Show when @ReplayActive = FALSE
   Hide when @ReplayActive = TRUE



Event name: Tag

Expression/Formula: '@NOTP::@ReplayActive'

Result of the Expression/Formula

Valid range	Display
Yes / TRUE	No
No / FALSE	Yes

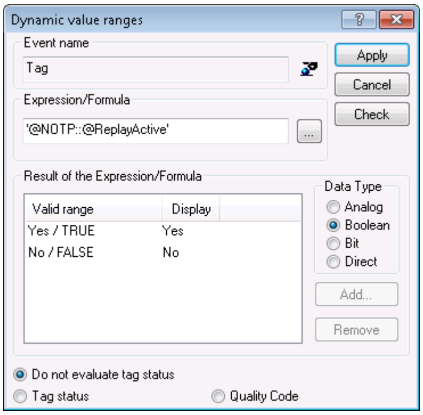
Data Type
○ Analog
● Boolean
○ Bit
○ Direct

● Do not evaluate tag status
○ Tag status ○ Quality Code

Figure 10-29 Dynamic value ranges - Runtime AlarmControl

Adapt Replay AlarmControl

1. Configure Replay AlarmControl so that it is displayed during Replay mode.
   Select: "Object properties" → "Miscellaneous" → "Display"
   Show when @ReplayActive = TRUE
   Hide when @ReplayActive = FALSE



Event name: Tag

Expression/Formula: '@NOTP::@ReplayActive'

Result of the Expression/Formula

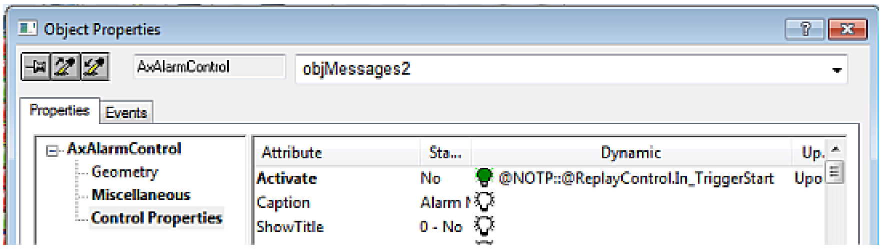
Valid range	Display
Yes / TRUE	Yes
No / FALSE	No

Data Type: ○ Analog ● Boolean ○ Bit ○ Direct

● Do not evaluate tag status
○ Tag status ○ Quality Code

Figure 10-30 Dynamic value ranges - Replay AlarmControl

2. Configure Replay AlarmControl so that it is not activated until replay of data is started in Replay mode.
   Select: "Object properties" → "Control properties" → "Activate"
   Activate with "@ReplayControl.In_TriggerStart"



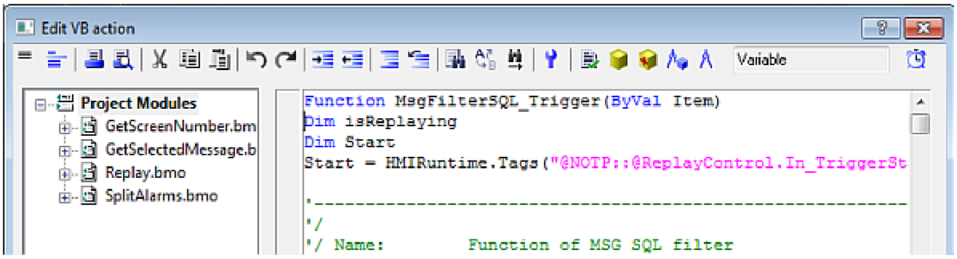
AxAlarmControl objMessages2

- AxAlarmControl
  - Geometry
  - Miscellaneous
  - Control Properties

Attribute	Sta...	Dynamic	Up.
Activate	No	@NOTP::@ReplayControl.In_TriggerStart	Upo
Caption	Alarm N		
ShowTitle	0 - No		

Figure 10-31 Activate Replay AlarmControl

3. Configure Replay AlarmControl so that it is supplied with the necessary SQL statements. Select: "Object properties" → "Control properties" → "MsgFilterSQL"

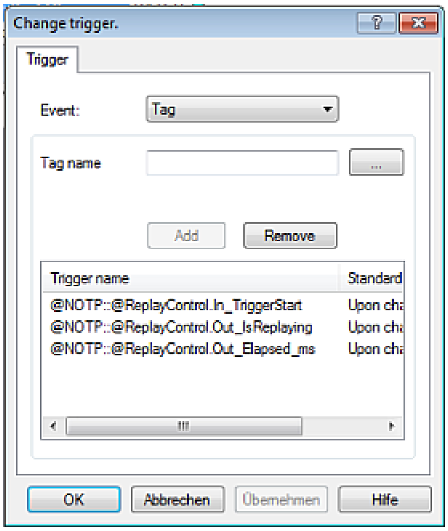


```
Function MsgFilterSQL_Trigger(ByVal Item)
Dim isReplaying
Dim Start
Start = HMIRuntime.Tags("@NOTP::@ReplayControl.In_TriggerSt

'------------------------------------------------------------
'/
'/ Name:          Function of MSG SQL filter
```

Figure 10-32 SQL script for Replay AlarmControl

The required script is already implemented as an example in the supplied CMS example application in picture "Messages.pdl."

4. Set the trigger of this script to the following tags:
"@NOTP::@ReplayControl.In_TriggerStart"
"@NOTP::@ReplayControl.Out_IsReplaying"
"@NOTP::@ReplayControl.Out_Elapsed_ms"



Event: Tag

Tag name

Trigger name	Standard
@NOTP::@ReplayControl.In_TriggerStart	Upon cha
@NOTP::@ReplayControl.Out_IsReplaying	Upon cha
@NOTP::@ReplayControl.Out_Elapsed_ms	Upon cha

Figure 10-33 Trigger for Replay AlarmControl

The script calls up contents from the "SplitAlarms.bmo" project module from the VB Script Editor to read alarms out of the archive and display them in blocks. The required script/ project module is implemented in the CMS example application supplied.

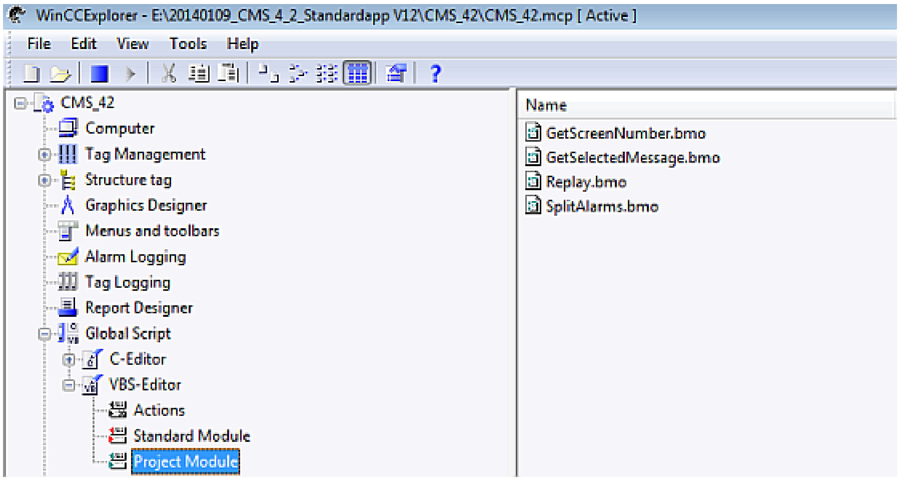


Figure 10-34 Project modules

10.4.8 Insert the online table control in a Replay picture

The online table control is found in the pictures "MoveData.pdl" and "MMBFData.pdl." In the WinCC CMS example application, these have already been prepared for Replay.

Duplicate the online table control

1. Use the shortcuts "Ctrl" + "C" and "Ctrl" + "V" in Graphics Designer to duplicate the already configured Online Table Control and its buttons.

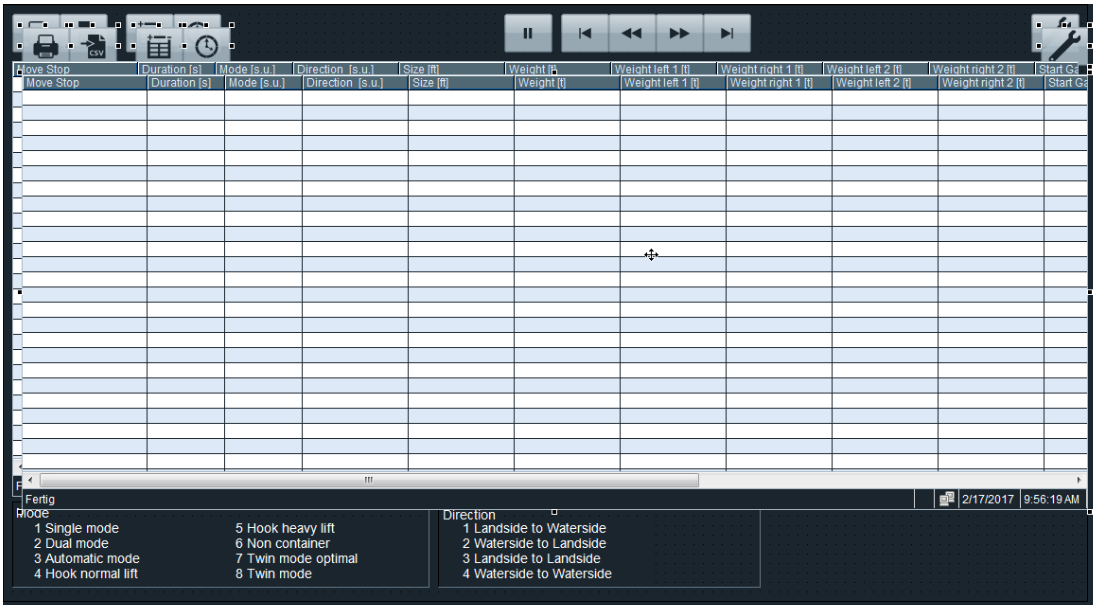


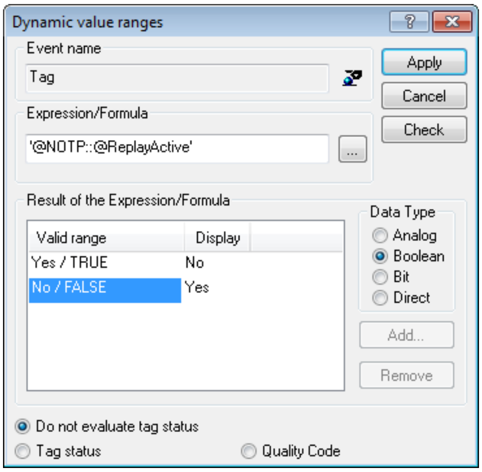
Figure 10-35 Duplicate the online table control

You now have 2 online table controls:

- Runtime Online Table Control: This is required to display values in productive mode.
- Replay Online Table Control: This is required to display values in Replay mode.

Adapt the Runtime Online Table Control

1. Configure the Runtime Online Table Control and its buttons so that it is displayed during productive mode.
   Select: Object properties > Miscellaneous > Display:
   Show when @ReplayActive = FALSE
   Hide when @ReplayActive = TRUE



Dynamic value ranges

Event name: Tag

Expression/Formula: '@NOTP::@ReplayActive'

Result of the Expression/Formula

Valid range	Display
Yes / TRUE	No
No / FALSE	Yes

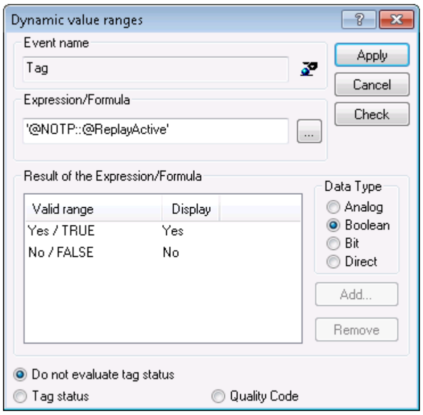
Data Type: ○ Analog ● Boolean ○ Bit ○ Direct

● Do not evaluate tag status
○ Tag status ○ Quality Code

Figure 10-36 Dynamic value ranges - Runtime Online Table Control

Adapt the Replay Online Table Control

1. Configure the Replay Online Table Control and its buttons so that it is displayed during Replay mode.
   Select: Object properties > Miscellaneous > Display:
   Show when @ReplayActive = TRUE
   Hide when @ReplayActive = FALSE



Dynamic value ranges

Event name: Tag

Expression/Formula: '@NOTP::@ReplayActive'

Result of the Expression/Formula

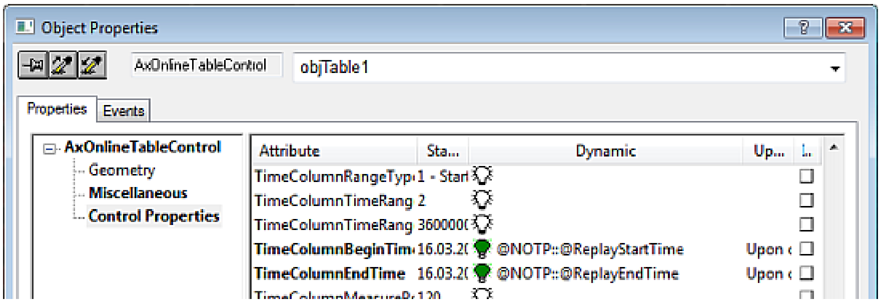
Valid range	Display
Yes / TRUE	Yes
No / FALSE	No

Data Type: ○ Analog ● Boolean ○ Bit ○ Direct

● Do not evaluate tag status
○ Tag status ○ Quality Code

Figure 10-37 Dynamic value ranges - Replay Online Table Control

2. To ensure that only those data that are important for Replay are displayed in the Replay Online Table Control, set the time range to "start to end time".
   Select: Object properties > Control properties
   TimeColumnBeginTime = @NOTP::@ReplayStartTime
   TimeColumnEndTime = @NOTP::@ReplayEndTime



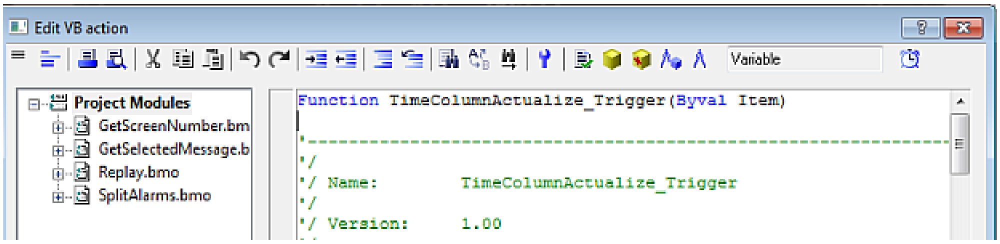
Object Properties

AxOnlineTableControl objTable1

Attribute	Sta...	Dynamic	Up...	I...
TimeColumnRangeTyp	1 - Start			□
TimeColumnTimeRang	2			□
TimeColumnTimeRang	360000(			□
TimeColumnBeginTim	16.03.2(	@NOTP::@ReplayStartTime	Upon (	□
TimeColumnEndTime	16.03.2(	@NOTP::@ReplayEndTime	Upon (	□
TimeColumnMeasureP	120			□

Figure 10-38 Settings of time range for object properties (Online Table Control)

3. Insert the script that marks the line of the move data that matches the Replay time. Select: Object properties > Control properties > TimeColumnActualize

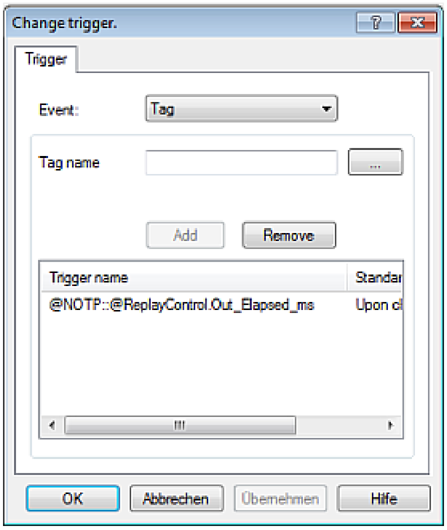


```
Function TimeColumnActualize_Trigger(Byval Item)

'-----------------------------------------------------------------
'/
'/ Name:        TimeColumnActualize_Trigger
'/
'/ Version:     1.00
```

Figure 10-39 Adapt the online table control script

In the CMS example application supplied, the required script is already contained in the pictures "MoveData.Pdl" and "MMBFData.Pdl".

4. Set the trigger of this script to the "@NOTP::@ReplayControl.Out_Elapsed_ms" tag.



Event: Tag

Tag name

Trigger name	Standar
@NOTP::@ReplayControl.Out_Elapsed_ms	Upon cl

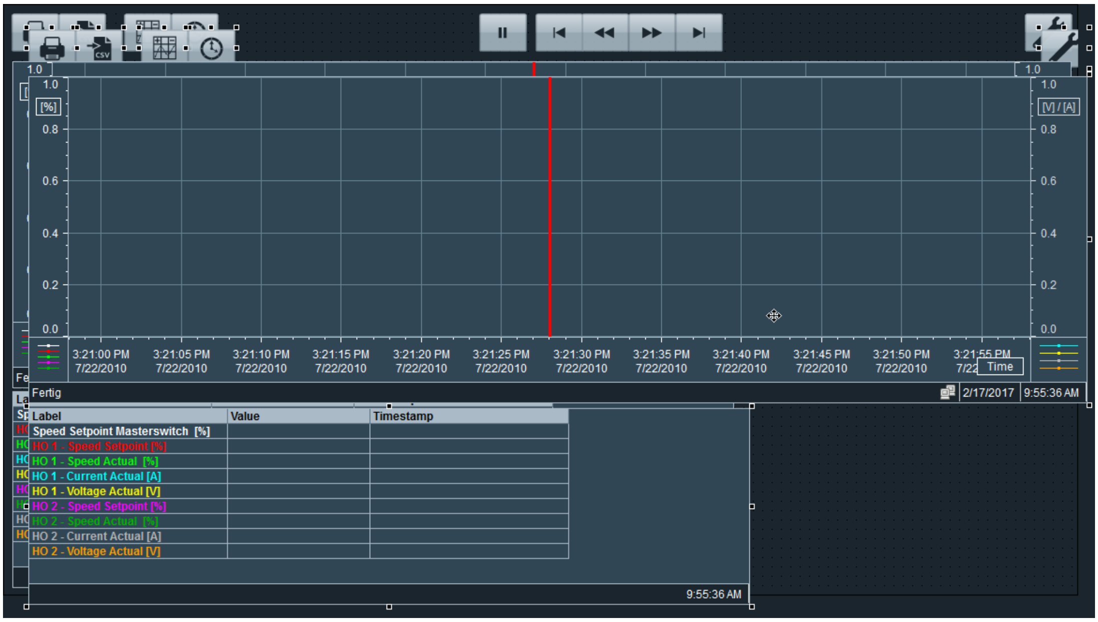
Figure 10-40 Trigger for the Replay Online Table Control

10.4.9 Insert an online trend control in a Replay picture

The online trend control shows the curve values for the complete Replay period. To configure this, perform the steps described below.

Duplicate the online trend control

1. Use the shortcuts "Ctrl" + "C" and "Ctrl" + "V" in Graphics Designer to duplicate an already configured Online Trend Control and its buttons.



Label	Value	Timestamp
Speed Setpoint Masterswitch [%]		
HO 1 - Speed Setpoint [%]		
HO 1 - Speed Actual [%]		
HO 1 - Current Actual [A]		
HO 1 - Voltage Actual [V]		
HO 2 - Speed Setpoint [%]		
HO 2 - Speed Actual [%]		
HO 2 - Current Actual [A]		
HO 2 - Voltage Actual [V]		

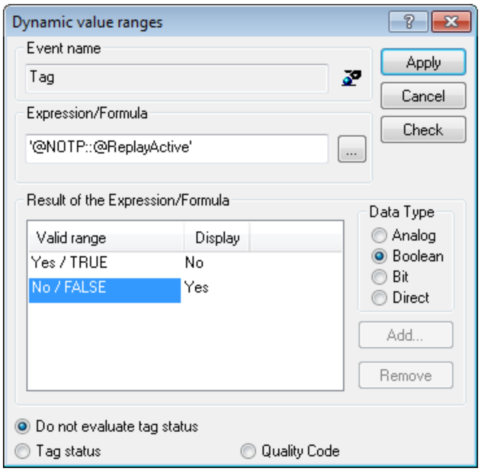
Figure 10-41 Duplicating the online trend control

You now have 2 online trend controls:

- Runtime Online Trend Control: This is required to display values in productive mode.
- Replay Online Trend Control: This is required to display values in Replay mode.

Adapt the Runtime Online Trend Control

1. Configure the Runtime Online Trend Control and its buttons so that they are displayed in live mode.
   Select: "Object properties" → "Miscellaneous" → "Display"
   - Show when @ReplayActive = FALSE
   - Hide when @ReplayActive = TRUE



Dynamic value ranges

Event name: Tag

Expression/Formula: '@NOTP::@ReplayActive'

Result of the Expression/Formula

Valid range	Display
Yes / TRUE	No
No / FALSE	Yes

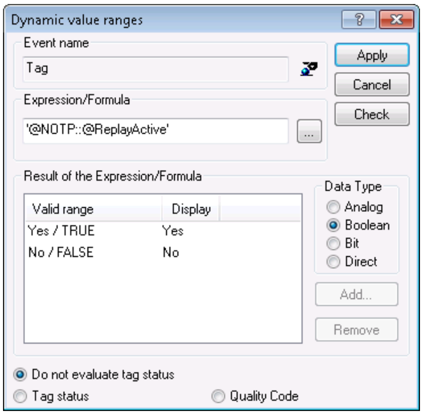
Data Type: ○ Analog ● Boolean ○ Bit ○ Direct

● Do not evaluate tag status
○ Tag status
○ Quality Code

Figure 10-42 Dynamic value ranges - Runtime Online Trend Control

Adapt the Replay Online Trend Control

1. Configure the Replay Online Trend Control and its buttons so that they are displayed in Replay mode.
   Select: "Object properties" → "Miscellaneous" → "Display"
   Show when @ReplayActive = TRUE
   Hide when @ReplayActive = FALSE



Dynamic value ranges

Event name: Tag

Expression/Formula: '@NOTP::@ReplayActive'

Result of the Expression/Formula

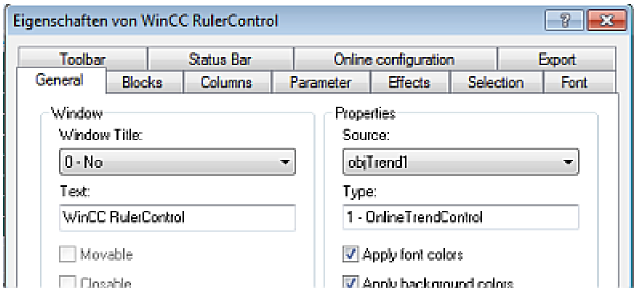
Valid range	Display
Yes / TRUE	Yes
No / FALSE	No

Data Type: ○ Analog ● Boolean ○ Bit ○ Direct

● Do not evaluate tag status
○ Tag status ○ Quality Code

Figure 10-43 Dynamic value ranges - Replay Online Trend Control

2. Make sure that the ruler control that is visible in Replay mode is connected to the correct trend control.



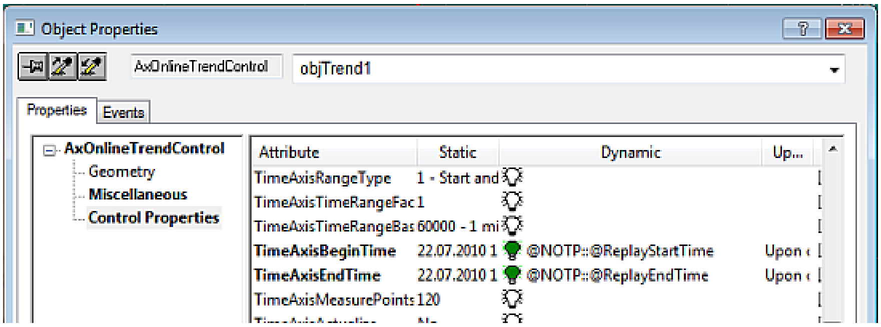
Eigenschaften von WinCC RulerControl

Window
Window Title: 0 - No
Text: WinCC RulerControl
□ Movable
□ Closable

Properties
Source: objTrend1
Type: 1 - OnlineTrendControl
☑ Apply font colors
☑ Apply background colors

Figure 10-44 Properties of WinCC RulerControl

3. To ensure that only those data that are important for Replay are displayed in the Replay Online Trend control, set the time range to "start to end time".
   Select: "Object properties" → "Control properties"
   TimeAxisBeginTime = @NOTP::@ReplayStartTime
   TimeAxisEndTime = @NOTP::@ReplayEndTime



Object Properties

AxOnlineTrendControl objTrend1

Attribute	Static	Dynamic	Up...
TimeAxisRangeType	1 - Start and		
TimeAxisTimeRangeFac	1		
TimeAxisTimeRangeBas	60000 - 1 mi		
TimeAxisBeginTime	22.07.2010 1	@NOTP::@ReplayStartTime	Upon (
TimeAxisEndTime	22.07.2010 1	@NOTP::@ReplayEndTime	Upon (
TimeAxisMeasurePoints	120		

Figure 10-45 Settings of time range for object properties (online trend control)

10.4.10 Adapt scripts for Replay

Adapting C scripts

Replay Runtime only detects the tags created in the declaration part and linked in the script trigger. No other tags are detected automatically.

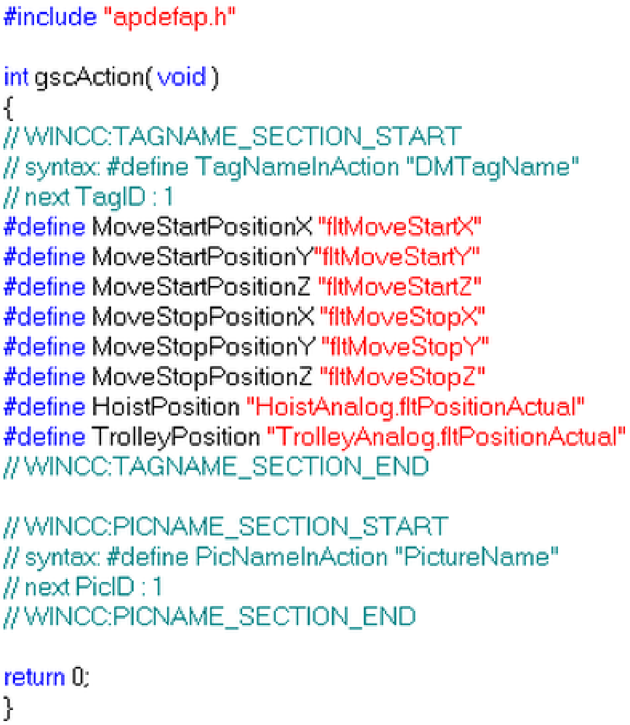
To ensure that Replay recognizes the tags linked into the C script, they must be created in the declaration part.

Note

If you have correctly created the declaration part of the script, use of the Cross Reference Assistant is not necessary.

Manual tag declaration

1. Declare all the tags used in the C script.



```
#include "apdefap.h"

int gscAction( void )
{
// WINCC:TAGNAME_SECTION_START
// syntax: #define TagNameInAction "DMTagName"
// next TagID : 1
#define MoveStartPositionX "fltMoveStartX"
#define MoveStartPositionY"fltMoveStartY"
#define MoveStartPositionZ "fltMoveStartZ"
#define MoveStopPositionX "fltMoveStopX"
#define MoveStopPositionY "fltMoveStopY"
#define MoveStopPositionZ "fltMoveStopZ"
#define HoistPosition "HoistAnalog.fltPositionActual"
#define TrolleyPosition "TrolleyAnalog.fltPositionActual"
// WINCC:TAGNAME_SECTION_END

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

return 0;
}
```

Figure 10-46 Correct tag declaration in the C script

Automatic tag declaration using the Cross Reference Assistant

To be able to use the Cross Reference Assistant, you have to have installed the SmartTools during the WinCC installation.

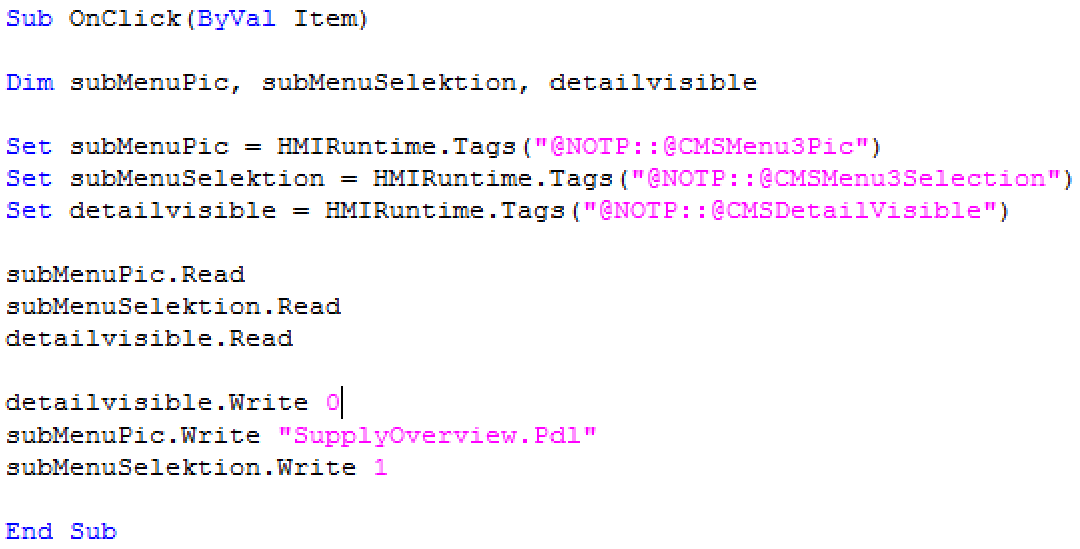
1. Open the WinCC project to be analyzed in the WinCC Explorer.
2. Start the Cross Reference Assistant by selecting "Start > All programs > Siemens Automation > SIMATIC > WinCC > Tools > Cross Reference Assistant"

The Cross Reference Assistant declares all the tags used in the script in the declaration part of a C script.

You will find details about Cross Reference in the WinCC online help for example under "Cross Reference".

Adapting VB Scripts

To ensure that Replay recognizes the tags linked in the VB script, you have to address the tags with the syntax "HMIRuntime.Tags("<Tagname>")". It is immaterial whether the tag is addressed via an object reference or not.



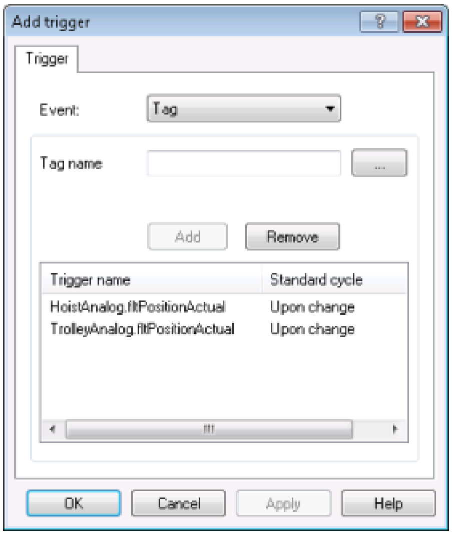
```
Sub OnClick(ByVal Item)

Dim subMenuPic, subMenuSelektion, detailvisible

Set subMenuPic = HMIRuntime.Tags("@NOTP::@CMSMenu3Pic")
Set subMenuSelektion = HMIRuntime.Tags("@NOTP::@CMSMenu3Selection")
Set detailvisible = HMIRuntime.Tags("@NOTP::@CMSDetailVisible")

subMenuPic.Read
subMenuSelektion.Read
detailvisible.Read

detailvisible.Write 0
subMenuPic.Write "SupplyOverview.Pdl"
subMenuSelektion.Write 1

End Sub
```

Figure 10-47 Correct tag declaration in the VB script

10.4.11 Triggering scripts

For C scripts and VB scripts, the following applies:

The Replay configuration editor automatically detects the triggers linked into the script and creates a Replay tag and an associated archive tag for the trigger tags during preparation of a picture.



Trigger name	Standard cycle
HoistAnalog.fltPositionActual	Upon change
TrolleyAnalog.fltPositionActual	Upon change

Figure 10-48 Changing a trigger

10.5 Application components in the WinCC project

10.5.1 Scripts for the Replay function

The following scripts are relevant for the Replay function.

The scripts are already included in the example application. Please contact the hotline if you have any questions.

- Script for switching to Replay mode
  NavigationVisible.bmo
- Script for hiding unnecessary navigation elements in Replay
  NavigationVisible.bmo
- Script for filling the picture selector tags
  ReplayLoadPics.bmo
- Script for message if Replay time is not valid
  NoReplayAvailable.bmo
- Script for calculating the Replay start time
  Date_Conversion_c.bmo
- Script for the reverse button
- Script for the forward button
- Script for the slider control
- Script for the alarm control
  GetSelectedMessage.bmo
- Subroutines for the alarm control
  SplitAlarms.bmo
- Script for the online table control
- Script for setting user rights in the application
  UserLogin.pas

10.5.2 Internal tags

Tags of the "ReplayControl" group

The internal tags of the ReplayControl group are created by the Replay configuration.

@ReplayControl structure tags

Note

- Tags that start with the string "In_" contain information about the CMS example application that are set by the user or by the application.
- Tags that start with the string "Out_" contain information set by the Replay Runtime about the Replay process that is running.
- The "Out_" tags must not be changed by the user and the application.

Tag name	Type	Description
		Tags for controlling Replay Runtime
In_TriggerStart	BIT	• Set this tag to 1 to start replay (and to start buffering) • Set this tag to 0 to stop replay (and to stop buffering) • If you set this tag to 0 while buffering, you will delete the buffer of the currently buffered picture. The previously buffered picture information is still retained.
In_TriggerPause	BIT	• Set this tag to 1 to pause replay • Set this tag to 0 to resume replay
In_ReplaySpeed	SIGNED SHORT	• Set this tag to 1 for normal Replay speed • Set this tag > 1 for fast forward • Set this tag < 1 for fast reverse
		Parameter to start Replay
In_StartYear In_StartMonth In_StartDay In_StartHour In_StartMinute In_StartSecond	WORD BYTE BYTE BYTE BYTE BYTE	The start time of the Replay interval must be set by the user before Replay is started.
In_Duration_min	DWORD	The time interval in minutes for which Replay data are to be replayed. The value must be > 0 and ≤ 60. The value is set before Replay is started.
		Status tags
Out_IsReplayOnline	BIT	If ReplayRuntime.exe is running this bit is 1.
Out_IsBuffering	BIT	If the pictures are being buffered, this bit is 1.
Out_IsReplaying	BIT	If replay is running or paused and buffering has been completed, this bit is 1.
Out_StatusMessage	TEXT16	This tag shows messages that come from Replay Runtime.
Out_BufferProgressValue	BYTE	Progress of the buffering as a percentage.
Out_WinCcWasUp	BIT	This tag is 1 if Replay is active and WinCC Runtime has run at the Replay time.
TlgReference	BYTE	This tag is archived cyclically to store the value of the "Out_WinCWasUp" tag. This value is not used by the application.
		Tags of the Replay time

Tag name	Type	Description
Out_CurrentYear Out_CurrentMonth Out_CurrentDay Out_CurrentHour Out_CurrentMinute Out_CurrentSecond Out_CurrentMillisecond	WORD BYTE BYTE BYTE BYTE BYTE WORD	During replay, these tags contain the current Replay time at which the tags are displayed in the pictures.
Out_Elapsed_ms	DWORD	This tag shows the current time in milliseconds. The current Replay time minus the start time is calculated here.
Tags that are used by the slider		
Out_Duration_ms	DWORD	The duration from the tag "In_Duration_min" that has been converted to milliseconds. This is used as the maximum value of the slider.
In_SliderPos_ms	DWORD	Slider position (is required to jump to a certain time)
InOut_SliderState	BYTE	This tags displays the status of the slider: • 0: normal – the value of the "Out_Elapsed_ms" tag is copied into the "In_SliderPos_ms" tag every 500 ms • 1: Slider is moved. • 2: Slider has been set. Using the slider status, Replay Runtime reads out the time at which Replay data will be replayed. This tag is set both by a VBS script and by the Replay Runtime. The jump from 0 to >1 and 1 to >2 is performed by the VBS. The jump from 2 to >0 by Replay Runtime
Out_DaylightSavingTime	BIT	1, if the corresponding tag was been acquired at Replay time during daylight saving time (for example, UTC + 2 and not UTC + 1 in Germany or Hungary).
Out_TimeOffset	FLOAT	This tag contains the time difference between UTC and the recording time so that the correct data can be read from the message archive at the end.

General tags

These tags are created by the Replay configuration but are not part of the @ReplayControl structure tag. These tags are all created in the "ReplayControl" group.

Tag name	Type	Description
Time tags		
@ReplayStartTime	TEXT16	Tag that is supplied with values by the CMS application using scripts, for example, to ensure correct functioning of the Online Table Control and Online Trend Control in Replay mode.
@ReplayEndTime	TEXT16	Tag that is supplied with values by the CMS application using scripts, for example, to ensure correct functioning of the Online Table Control and Online Trend Control in Replay mode.
Picture selector tags		
@ReplayedDynPic1... @ReplayedDynPic10 @ReplayedFixedPic1 ... @ReplayedFixedPic10	TEXT16	For example, if the "@ReplayedDynPic1" tag contains the value "Hoist.Pdl" and all other picture selector tags are empty, only those tags are buffered that are in the "Hoist.pdl" picture. If one of these tags changes and Replay is not active at the same time, replay of the Replay data will be set to pause.
Tags for the picture list of Replay		

Tag name	Type	Description
@ReplayPic1 ... @ReplayPic100	TEXT16	These tags contain the names of the pictures that have been selected for Replay in the Replay Configuration Editor. They are created on request. For example, if two pictures are selected for Replay ('Hoist.Pdl', 'Trolley.Pdl'), two tags will be created. The start value of the first tag is “Hoist.pdl”; the start value of the second tag is “Trolley.pdl”.
@ReplayNavigationPreparationProgress	Text16	This tag contains status information and is written to by the application while the navigation elements are being prepared for Replay.
@ReplayActive	BIT	This bit indicates whether Replay has been selected by the Replay button in the application.
Tag for defining the tag prefix		
@ReplayTagPrefix	TEXT8	The value of this tag is either "R_" or an empty string, depending on whether Replay is running or not.

Additional Replay tags

These tags are not automatically created by the Replay Configuration, but are already contained in the standard application. They can be found in the "ReplayControl" group and are absolutely essential to proper functioning of the Replay mode.

Tag name	Type	Description
@PictureLoaded	BIT	This tag indicates whether the picture has been correctly and completely loaded: • 1: Picture successfully loaded It is needed to ensure that Replay mode is correctly loaded
@ReplayActiveProjectWide	BIT	This tag displays the status of Replay mode: • 1: Active • 0: Inactive In contrast to the computer-local tag "@ReplayActive", this one is a project-wide tag.
@ReplayInUseBy	Text8	This tag contains the name of the user who activated Replay mode. The tag is empty if Replay mode is not active.
@ReplayInUseOnComputer	Text8	The tag contains the name of the computer from which Replay mode has been activated. The tag is empty if Replay mode is not active.
@ReplayWebNavIndicator	BIT	This tag indicates the location at which Replay mode has been activated: • 1: WebClient • 0: Local

Tags of the "Screens" group

Tag name	Type	Description
Tags for hiding the navigation buttons, primary navigation		
@ReplayButtonVisible1 ... @ReplayButtonVisible10	BIT	These tags are used for hiding the primary navigation buttons in Replay mode (menus 1 through 10).

Tag name	Type	Description
Tags for hiding the navigation buttons, secondary navigation		
@ReplayButtonVisible11... @ReplayButtonVisible110 @ReplayButtonVisible21... @ReplayButtonVisible210 @ReplayButtonVisible31... @ReplayButtonVisible310 @ReplayButtonVisible41... @ReplayButtonVisible410 @ReplayButtonVisible51... @ReplayButtonVisible510 @ReplayButtonVisible61... @ReplayButtonVisible610 @ReplayButtonVisible71... @ReplayButtonVisible710 @ReplayButtonVisible81... @ReplayButtonVisible810 @ReplayButtonVisible91... @ReplayButtonVisible910 @ReplayButtonVisible101... @ReplayButtonVisible1010	BIT	These tags are used for hiding the secondary navigation buttons in Replay mode (menus 1 through 10).

Tags of the "Settings" group

Tag name	Type	Description
@CMSSettingsReplayInstalled	BIT	This tag is described in the settings. If the checkmark is set for "Replay installed," this is 1.

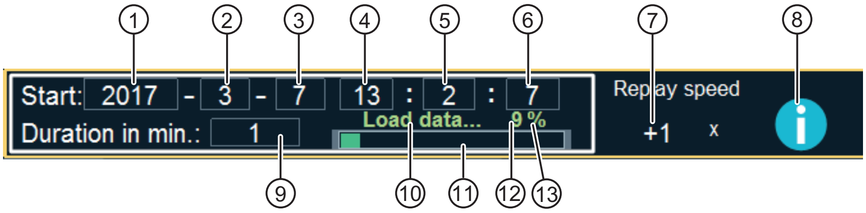
See also

Tags and configuration of the Replay operating bar (Page 360)

10.5.3 Tags and configuration of the Replay operating bar

If you want to create your own operating bar, you can use elements from the Replay operating bar of the CMS example application (ReplayBar_Head.pdl). This section explains how Replay operating and display elements used in the CMS example application are configured and to which tags they have been linked. With this knowledge, you can create your own Replay operating bar.

Replay operating bar, left part



Start: 2017 - 3 - 7 13 : 2 : 7
Duration in min.: 1
Load data... 9 %
Replay speed
+1 x

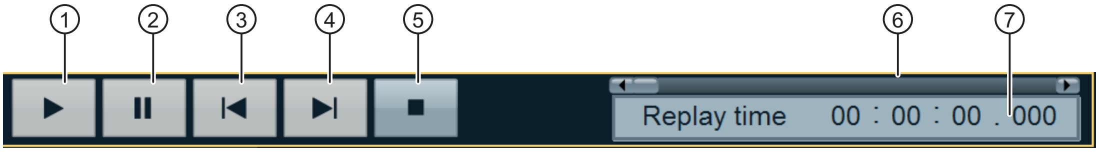
Number	Description	Properties / events
① *)	Input of the start year for replaying the Replay data	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.In_StartYear
② *)	Input of the start month for replaying the Replay data	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.In_StartMonth
③ *)	Input of the start day for replaying the Replay data	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.In_StartDay
④ *)	Input of the start hour for replaying the Replay data	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.In_StartHour
⑤ *)	Input of the start minute for replaying the Replay data	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.In_StartMinute
⑥*)	Input of the start second for replaying the Replay data	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.In_StartSecond
⑦	Input of the Replay speed	I/O field Properties > Miscellaneous > Operating enable: @NOTP::@ReplayControl.Out_IsReplayOnline Output value: @NOTP::@ReplayControl.In_ReplaySpeed
⑧	Display of the status of the Replay operating bar	Tooltip text: @NOTP::@ReplayControl.Out_StatusMessage
⑨	Input of the duration for replaying the Replay data	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.In_Duration_min
⑩	Display "Load data"	Static text, Properties > Miscellaneous > Display: No tag connection: @NOTP::@ReplayControl.Out_IsBuffering
⑪	Loading bar of the buffer	Properties > Miscellaneous > Process connection: @NOTP::@ReplayControl.Out_BufferProgressValue Properties > Miscellaneous > Display: No tag connection: @NOTP::@ReplayControl.Out_IsBuffering
⑫	Display of the buffer progress	I/O field, Properties > Output/Input > Output value: @NOTP::@ReplayControl.Out_BufferProgressValue Properties > Miscellaneous > Display: No tag connection: @NOTP::@ReplayControl.Out_IsBuffering
⑬	Display "%"	Static text, Properties > Miscellaneous > Display: No tag connection: @NOTP::@ReplayControl.Out_IsBuffering

*) Properties > Miscellaneous > Operating enable > Dynamic dialog:
@NOTP::@ReplayControl.Out_IsReplayOnline - @NOTP::@ReplayControl.Out_IsReplaying > 0

Note

When the dynamic dialog is saved, WinCC may output a warning that the tags used in the dynamic dialog have not been created. That is because the prefix "@NOTP::" is used in the dialog. If this is the case, click the "Ignore" button. The functionality is assured nevertheless.

Replay operating bar, right part



When configuring a new Replay operating bar, note that buttons 1 through 5 are locked in sequence from top to bottom.

- The start button can only be pressed once.
- Once the start button has been pressed and buffering starts, the stop button is released for operation.
- Once buffering has been completed, the pause button is released for operation.
- The forward and reverse buttons can only be operated in the "paused" state.

The following table provides an overview of the properties and events of the various buttons on the operating bar.

Number	Description	Properties / events
①	Play button for starting buffering and replaying Replay data.	**Properties:** Operating enable > Dynamic dialog: !'@NOTP::@ReplayControl.In_TriggerStart' || '@NOTP::@ReplayControl.Out_IsReplaying'&&'@NOTP::@ReplayControl.In_TriggerPause' Expression TRUE: Operating enable = 1 Expression FALSE: Operating enable = 0 **Events**: Mouse > Press left: VB script that sets the start trigger, resets the pause trigger, and also calculates the end time for replay. The required script is already implemented as an example in the supplied CMS example application.
②	Pause button for pausing replay of Replay data	**Properties:** Operating enable > Dynamic dialog: '@NOTP::@ReplayControl.Out_IsReplaying'&&!'@NOTP::@ReplayControl.In_TriggerPause' Expression TRUE: Operating enable = 1 Expression FALSE: Operating enable = 0 **Events**: Mouse > Press left: Direct connection: Source: Constant: 1; objective: Tag: @NOTP::@ReplayControl.In_TriggerPause

Number	Description	Properties / events
③	Reverse button, can be operated after the pause button has been pressed; jumps 500 milliseconds backward in time when pressed.	**Properties:** Operating enable > Dynamic dialog: '@NOTP::@ReplayControl.Out_IsReplaying'&&'@NOTP::@ReplayControl.In_TriggerPause' Expression TRUE: Operating enable = 1 Expression FALSE: Operating enable = 0 **Events**: Mouse > Release left: VB script with which the slider jumps back 500 ms in time and tag @NOTP::@ReplayControl.InOut_SliderState = 2 is set, so that CMS Replay writes the time value of the slider onto the current Replay time. The required script is already implemented as an example in the supplied CMS example application.
④	Forward button, can be operated after the pause button has been pressed; jumps 500 milliseconds forward in time when pressed.	**Properties:** Operating enable > Dynamic dialog: '@NOTP::@ReplayControl.Out_IsReplaying'&& '@NOTP::@ReplayControl.In_TriggerPause' Expression TRUE: Operating enable = 1 Expression FALSE: Operating enable = 0 **Events**: Mouse > Release left: VB script with which the slider jumps forward 500 ms in time and tag @NOTP::@ReplayControl.InOut_SliderState = 2 is set, so that the CMS Replay writes the time value of the slider onto the current Replay time. The required script is already implemented as an example in the supplied CMS example application.
⑤	Stop button for canceling buffering or stopping Replay	**Properties:** Operating enable > Dynamic dialog: '@NOTP::@ReplayControl.Out_IsReplaying' +'@NOTP::@ReplayControl.Out_IsBuffering' > 0 Expression TRUE: Operating enable = 1 Expression FALSE: Operating enable = 0 **Events**: Mouse > Press left: Direct connection: Source: Constant: 0; objective: Tag: @NOTP::@ReplayControl.In_TriggerStart

Number	Description	Properties / events
⑥	Slider of the Replay operating bar displays the current time. Sliding navigates to any Replay times between the Replay start time and end time.	**Properties:** Operating enable: @NOTP::@ReplayControl.Out_IsReplaying Maximum value: @NOTP::@ReplayControl.Out_Duration_ms Process connection: @NOTP::@ReplayControl.In_SliderPos_ms Minimum value: VB script that does not prescribe the minimum value but writes to the process connection of the slider every 500 ms so that the slider moves. The required script is already implemented as an example in the supplied CMS example application. **Events**: Mouse > Press left: Source: Constant: 1; objective: Tag: @NOTP::@ReplayControl.In-Out_SliderState Mouse > Release left: Source: Constant: 2; objective: Tag: @NOTP::@ReplayControl.In-Out_SliderState Property topics > Miscellaneous > Process connection > Change: Source: Property: this object: Process connection; objective: Tag: @NOTP::@ReplayControl.In_SliderPos_ms
⑦	Display of the current hour of Replay	Output, Properties > Output/Input > Output value: @NOTP::@ReplayControl.Out_CurrentHour
	Display of the current minute of Replay	Output, Properties > Output/Input > Output value: @NOTP::@ReplayControl.Out_CurrentMinute
	Display of the current second of Replay	Output, Properties > Output/Input > Output value: @NOTP::@ReplayControl.Out_CurrentSecond
	Display of the current millisecond of Replay	Output, Properties > Output/Input > Output value: @NOTP::@ReplayControl.Out_CurrentMilliSecond

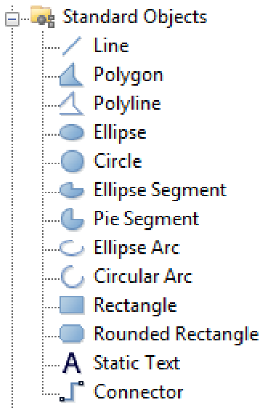
Note

For a complete overview of the tags of the interfaces of the Replay operating bar, see Chapter: "Internal tags (Page 356)".

10.5.4 Picture objects supported by Replay

WinCC makes a distinction between different types of picture objects.

Standard objects

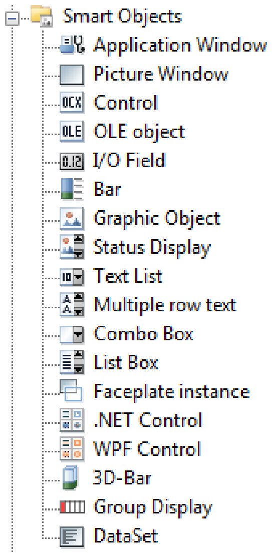


- Standard Objects
  - Line
  - Polygon
  - Polyline
  - Ellipse
  - Circle
  - Ellipse Segment
  - Pie Segment
  - Ellipse Arc
  - Circular Arc
  - Rectangle
  - Rounded Rectangle
  - Static Text
  - Connector

Figure 10-49 Standard objects

Standard objects can be replayed by Replay with restriction (events).
See: "Restrictions (Page 305)"

Smart objects



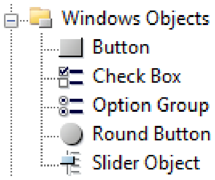
- Smart Objects
  - Application Window
  - Picture Window
  - Control
  - OLE object
  - I/O Field
  - Bar
  - Graphic Object
  - Status Display
  - Text List
  - Multiple row text
  - Combo Box
  - List Box
  - Faceplate instance
  - .NET Control
  - WPF Control
  - 3D-Bar
  - Group Display
  - DataSet

Figure 10-50 Smart objects

Not all smart objects can be replayed by Replay. "Moreover, the same restrictions (events) for the standard objects also apply to all smart objects.

Picture windows are only acquired by Replay if they have a static picture name.
See: "Restrictions (Page 305)"

Windows objects

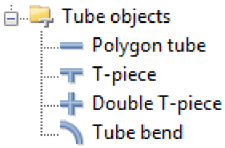


- Windows Objects
  - Button
  - Check Box
  - Option Group
  - Round Button
  - Slider Object

Figure 10-51 Windows objects

Windows objects can be replayed by Replay with restriction (events).
See: "Restrictions (Page 305)"

Tube objects

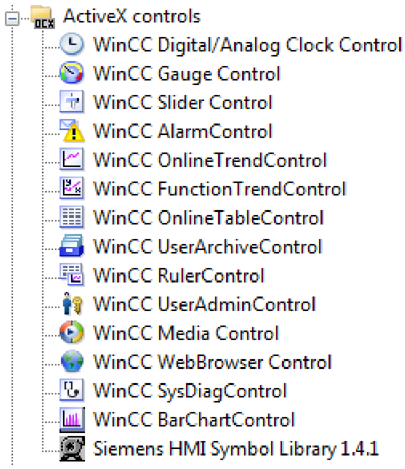


- Tube objects
  - Polygon tube
  - T-piece
  - Double T-piece
  - Tube bend

Figure 10-52 Tube objects

Tube objects can be replayed by Replay with restriction (events).
See: "Restrictions (Page 305)"

ActiveX controls



- ActiveX controls
  - WinCC Digital/Analog Clock Control
  - WinCC Gauge Control
  - WinCC Slider Control
  - WinCC AlarmControl
  - WinCC OnlineTrendControl
  - WinCC FunctionTrendControl
  - WinCC OnlineTableControl
  - WinCC UserArchiveControl
  - WinCC RulerControl
  - WinCC UserAdminControl
  - WinCC Media Control
  - WinCC WebBrowser Control
  - WinCC SysDiagControl
  - WinCC BarChartControl
  - Siemens HMI Symbol Library 1.4.1

Figure 10-53 ActiveX controls

Not all ActiveX controls can be replayed by Replay. For that reason, controls such as the table control and the alarm control have been adapted manually with scripts so that they work in Replay.

See also:
Restrictions (Page 305)
Insert an alarm control in a Replay picture (Page 342)
Insert the online table control in a Replay picture (Page 346)

Backup, backward compatibility, and migration 11

11.1 Backup

11.1.1 Creating a backup

You can create a backup of your CMS project.

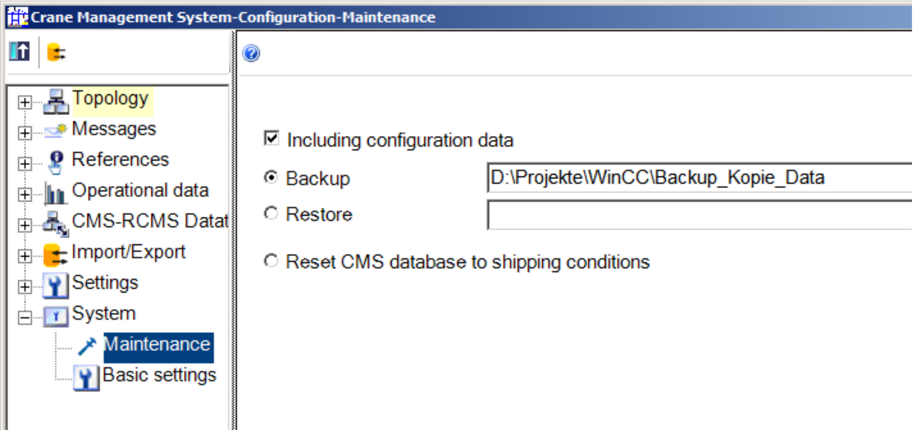
You must always create the backup in the corresponding WinCC version.

- SIMOCRANE CMS 4.1. SP1 up to 4.2: WinCC 7.0.
- SIMOCRANE CMS 4.3 (SP1): WinCC 7.2
- SIMOCRANE CMS 4.4 (SP2): WinCC 7.4

Note

For projects from SIMOCRANE CMS V4.1 SP1 to V4.2, indirect migration via SIMATIC WinCC 7.2 may be necessary. In this case, preparation has to be repeated after successful migration to SIMATIC WinCC V7.2.

1. Open the project to be migrated in the correct WinCC Version.
2. Open the CMS Editor.
3. Open screen form "System" → "Maintenance".
4. Activate "Including configuration data," enter the path under "Backup," and click "Start."



☑ Including configuration data

● Backup D:\Projekte\WinCC\Backup_Kopie_Data

○ Restore

○ Reset CMS database to shipping conditions

Figure 11-1 Preparing export of existing projects

After export has been successfully completed, "Backup ok" will be displayed at the bottom of the window.

The backup has been created

If you want to change to a higher version of SIMOCRANE CMS, you can now install the current versions of SIMATIC WinCC and SIMOCRANE CMS.
See also: Installation (Page 87).

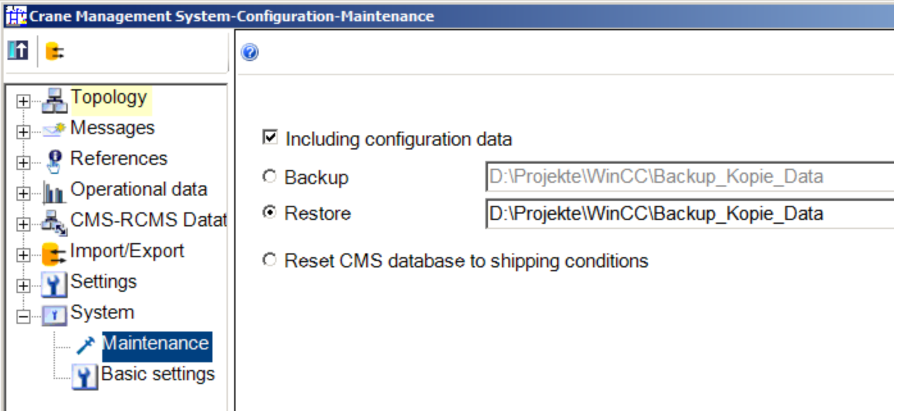
You can now re-import the backup:
See also: Importing the backup (Page 368)

11.1.2 Importing the backup

You can import a backup of your project.
See also: Creating a backup (Page 367)

1. Open the migrated project in the WinCC Explorer.
2. Open the CMS editor.
3. Go to "System" → "Maintenance"

4. Activate "Including configuration data," enter the path to the configuration file under "Restore", and click "Start."



☑ Including configuration data

○ Backup D:\Projekte\WinCC\Backup_Kopie_Data

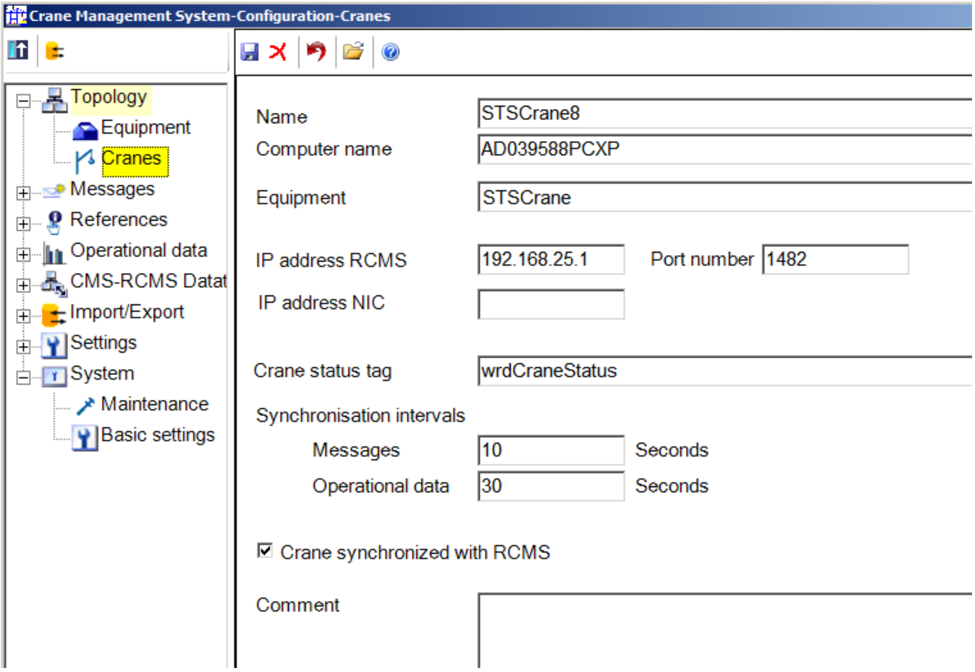
● Restore D:\Projekte\WinCC\Backup_Kopie_Data

○ Reset CMS database to shipping conditions

Figure 11-2 Selecting a database

After the restore has been successfully completed, "Restore ok" will be displayed at the bottom of the window.

5. Check that the configuration data have been correctly transferred.



Name STSCrane8

Computer name AD039588PCXP

Equipment STSCrane

IP address RCMS 192.168.25.1 Port number 1482

IP address NIC

Crane status tag wrdCraneStatus

Synchronisation intervals

Messages 10 Seconds

Operational data 30 Seconds

☑ Crane synchronized with RCMS

Comment

Figure 11-3 Have the configuration data been correctly transferred?

The backup has now been imported.

11.2 Backward compatibility

11.2.1 General information about backward compatibility

CMS 4.4 (SP3) and RCMS 4.4 (SP3) are backward compatible with the following CMS / RCMS components:

- CMS station 4.4 (SP3) with RCMS server 4.3 SP1
  CMS station 4.4 (SP3) behaves like CMS station 4.3 SP1.
  Data are exchanged between the CMS station and the RCMS server via XML files.
  See also: CMS 4.4 with RCMS server 4.3 SP1 (Page 371)
- CMS station 4.3 SP1 with the RCMS web application 4.4 (SP3)
  CMS station 4.3 SP1 transfers the data to Process Historian, which communicates with the RCMS web application.
  See also: CMS 4.3 with RCMS 4.4 web application (Page 390)

	RCMS			
CMS		4.2	4.3 SP1	4.4 (SP3)
	4.2	-	-	-
	4.3 SP1	-	Yes	Yes
	4.4 (SP3)	No	Yes	Yes

Compatibility matrix

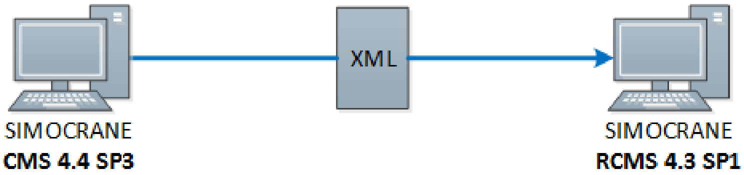


Figure 11-4 Backward compatibility: CMS 4.4 (SP3)

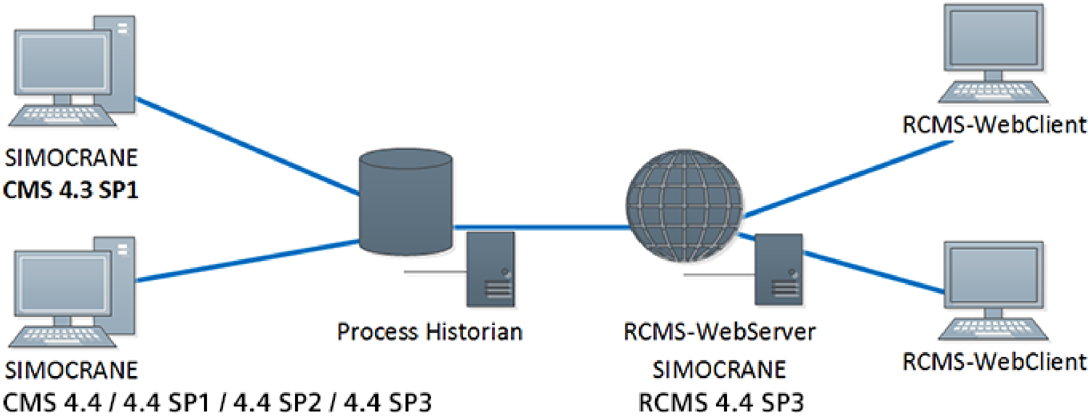


Figure 11-5 Backward compatibility: RCMS 4.4 (SP3)

11.2.2 CMS 4.4 with RCMS server 4.3 SP1

11.2.2.1 Instructions and restrictions (CMS with RCMS (WinCC))

When you operate CMS 4.4 with RCMS 4.3 SP1, you must observe the following instructions and restrictions.

For further details on data transfer, the topology, and the RCMS station, please see observe the documentation of your RCMS server.

Limited transfer of messages and operational data

The following aspects must be considered when configuring the topology of CMS and RCMS:

Messages

Configuration of 5 CMS is considered below by way of example.

The following performance data from the WinCC documentation must be considered in particular:

Continuous message load without loss (single user/server)	10 messages s^{-1}
Message burst (single user/server)	2000 messages per 10 s^{-1} every 5 min[1)]

[1)] If the interval before the next message burst is under five minutes, messages may be lost.

The consequence of this is that, for example, for a total of 5 CMS per RCMS, the following limits apply to each CMS:

- No more than 2 messages per second on average can be transmitted simultaneously from each CMS station to the RCMS server.
- However, the WinCC system also provides a data buffer that can intercept a burst of messages for a short time (see table above -> Message burst).

Operational data

The following performance data from the WinCC documentation must be considered in particular:

Archiving in database for server/single user ("Tag Logging Fast")	5000 s^{-1} [2)]
Archiving in database for server/single user ("Tag Logging Slow")	1000 s^{-1} [2) 3)]

[2)] The stated values apply to archiving without signing-off of data.

[3)] With "Tag Logging Slow," you must expect longer picture selection times for identical quantities than with "Tag Logging Fast."

This consequence of this is that, for a total of 5 CMS per RCMS, the following limits apply to each CMS:

- No more than 1000 values per second can be transmitted simultaneously from each CMS to the RCMS.

In the CMS example application, all process values are archived in the Tag Logging Fast. The following quantities are applied per CMS:

Process value archive	Number of tags	Acquisition cycle	Data rate CMS -> RCMS	
MoveData	13	On average 1 move per minute	13 min^{-1} ≈	0.22 s^{-1}
MMBFData	5	1 x per month	5 month^{-1} ≈	2 * 10^{-6} s^{-1}
CounterHourly	45	1 x per hour	45 hours^{-1} ≈	12.5 * 10^{-3} s^{-1}
TimerDaily	18	1 x per day	18 day^{-1} ≈	2.1 * 10^{-4} s^{-1}
			Total on the CMS ≈	0.24 s^{-1}
			Total on the RCMS ≈	5 * 0.24 s^{-1} ≈ 1.25 s^{-1}

It can be seen that only a fraction of the performance capacity is used by the CMS example application. This makes it possible to extend the tag logging of the individual CMS stations in the configuration.

Equivalent considerations apply to the topology with 25 CMS per RCMS.
A maximum topology of 25 CMS per RCMS is currently defined.

Note

The performance limits of SIMATIC WinCC 7.4 also apply to the link between PLC and CMS.

Time synchronization is required between CMS and RCMS

NOTICE

Time synchronization is absolutely essential!

Data stamped with a time in the future cannot be archived in the RCMS archive.
If the clock of the CMS station is ahead of the RCMS server clock, it is not possible to archive data on the RCMS.

For this reason, time synchronization between the hardware modules is crucial in SIMOCRANE CMS/RCMS systems.

See: Time synchronization (Page 156)

Limited length of the archive names and process tag names

On the RCMS, the archive name and process tag name are preceded by the crane name + "_" as a prefix.
Example "STSCrane1_MoveData"
Including this prefix, the archive name must not be longer than 32 characters and the process tag name not longer than 64 characters.

"String" data type prohibited in archive tags

NOTICE
Data loss due to use of "String" data type in archive tags
Use of the "String" data type in the definition of archive tags in tag logging archives is forbidden!
Only with WinCC 7.4.1 or higher may this data type be used in archive tags.
Older WinCC versions cannot use this data type in tag logging archives.
Errors will otherwise occur when data from XML files are entered in the tag logging archives of the RCMS server, resulting in rejection of the entire data set.

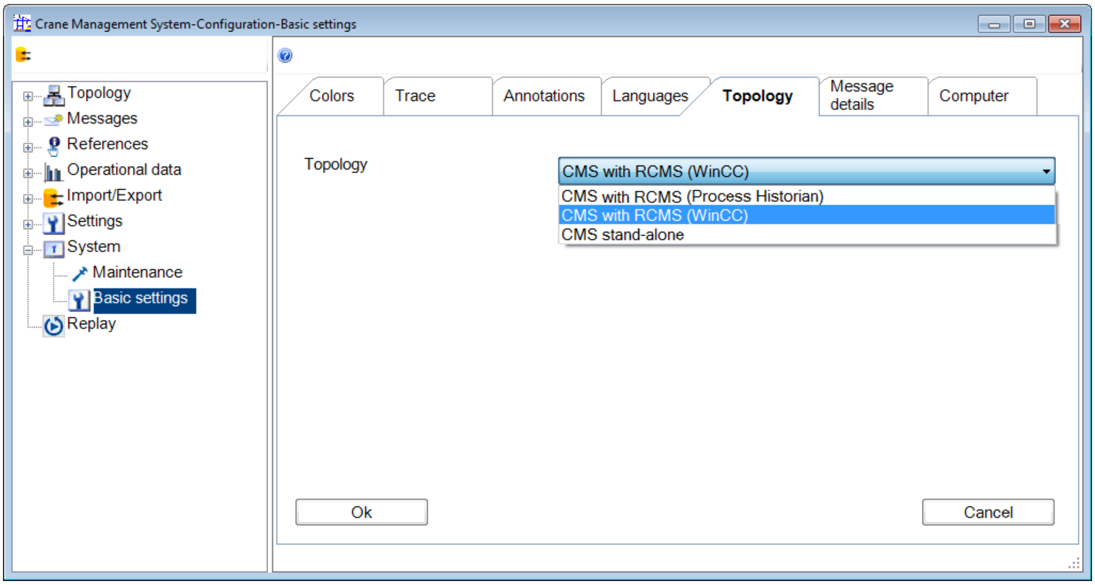
11.2.2.2 Setting the topology (CMS with RCMS (WinCC))

These instructions show you how to set up a CMS station, which is connected with a RCMS server 4.3 SP1.

For further information on the RCMS server, please also observe the documentation of your RCMS server.

Selecting the topology

1. Open the CMS Editor.
2. Open screen form "System" → "Basic settings" → "Topology".



Topology: CMS with RCMS (WinCC)

Figure 11-6 Changing the topology

3. Select the setting "CMS with RCMS (WinCC)"
4. Confirm with "OK".

Note

Close the CMS Editor

To apply the setting, close and re-open the CMS Editor.

Result

You have now defined a topology for a CMS station, which is connected to an RCMS server 4.3 SP1.

You now only have to define the equipment type and the crane.
See: Defining the equipment type (CMS with RCMS (WinCC)) (Page 374)
See: Defining the crane (CMS with RCMS (WinCC)) (Page 376)

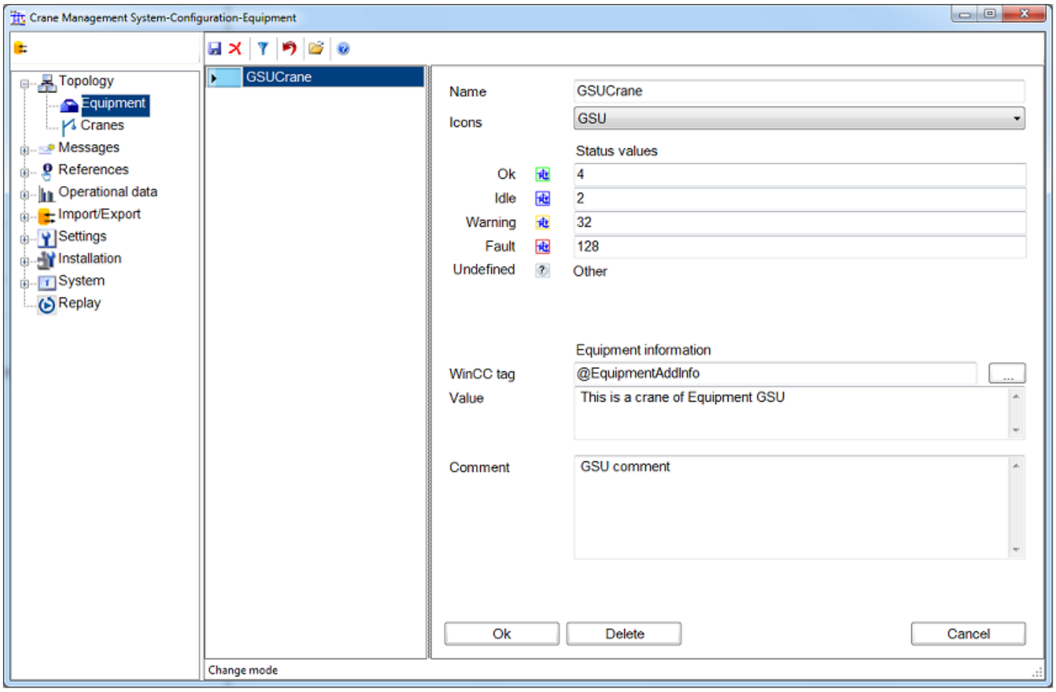
11.2.2.3 Defining the equipment type (CMS with RCMS (WinCC))

Each crane must be assigned to a certain equipment type. To do this, you must create an equipment type.

Note

This assignment must be identical on the CMS station and the RCMS server.
You will find further information in the documentation of your RCMS server.

1. Open screen form "Topology" → "Equipment".



GSUCrane

Name: GSUCrane

Icons: GSU

Status values

Ok	4
Idle	2
Warning	32
Fault	128
Undefined	Other

Equipment information

WinCC tag: @EquipmentAddInfo

Value: This is a crane of Equipment GSU

Comment: GSU comment

Figure 11-7 Defining the equipment type

2. Create a name for the equipment type.
   The name of the equipment type must only contain letters and numerals.
   The first character of the name must be a letter.

3. In the "Icons" field, select the icons for representing the cranes of this equipment type in the topology hierarchy.
   The icons can be adapted.
   See also: Settings: Icons (Page 203)

4. In the "Status values" field, define the relevant values of the crane status tag.
   The crane status tag is defined in screen form "Topology" → "Crane".
   You can enter individual digits or ranges, each separated from the next by a semicolon.
   Ranges include the start and stop value and are linked by a minus sign.
   Spaces are allowed and the length of the number range is limited to 255 characters.

5. Under equipment information, select the WinCC tag for outputting the comment typical of the equipment.

Note

This function can be used, for example, to display an accompanying equipment-specific comment in a WinCC screen on the RCMS server for each crane.

6. Confirm with "OK".

11.2.2.4 Defining the crane (CMS with RCMS (WinCC))

Note

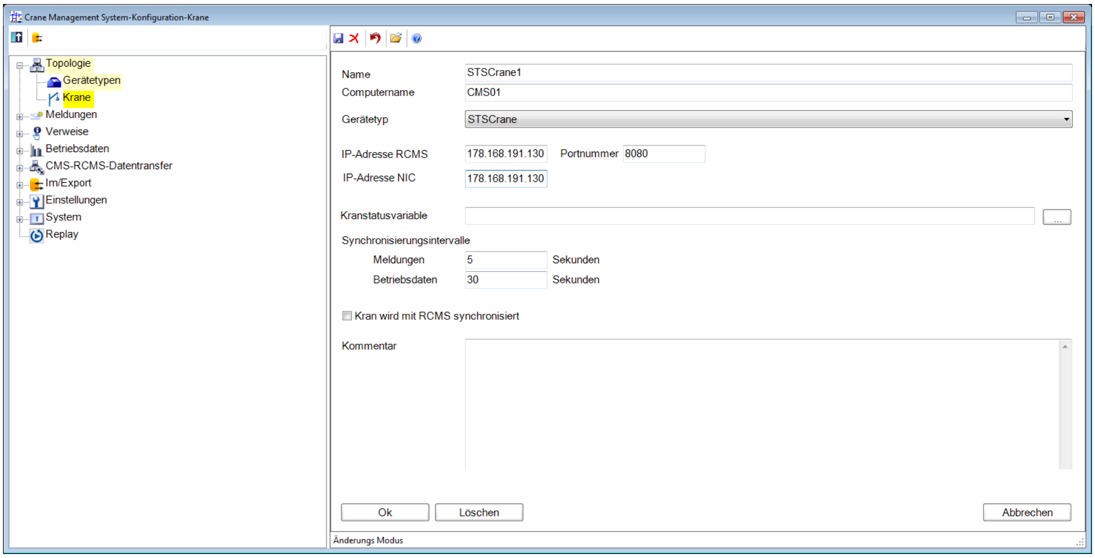
Each crane must have been created both on the CMS station and on the RCMS server.

The following settings for the crane must be identical on the CMS station and on the RCMS server:

- Name of the crane
- Equipment type of the crane
- Computer name of the CMS station
- Port number
- IP address NIC (if required)

You will find further information in the documentation of your RCMS server.

1. Open screen form "Topology" → "Cranes".



Name	STSCrane1
Computername	CMS01
Gerätetyp	STSCrane
IP-Adresse RCMS	178.168.191.130
Portnummer	8080
IP-Adresse NIC	178.168.191.130
Kranstatusvariable	
Synchronisierungsintervalle	
Meldungen	5 Sekunden
Betriebsdaten	30 Sekunden

☐ Kran wird mit RCMS synchronisiert

Kommentar

Figure 11-8 Entering cranes

2. Enter the name of the crane in the "Name" field.
   The name of the crane must only contain letters and numerals.
   The first character of the name must be a letter.

3. Enter the computer name for the CMS station in the "Computer name" field.

   Note

   The computer name must not be exactly "CMS"!
   Also follow the WinCC guidelines for the assignment of computer names.
   The computer name and crane name can be identical

4. Select an equipment type in the "Equipment" field.

5. Specify the IP address of the associated RCMS server in the "IP-Address RCMS" field.

6. In the field "Port number", enter the number of the port that is to be used for communication.

   Note

   Under Windows 2008, this communication port has to be activated manually.

   See also: Activation of the communication port (CMS with RCMS (WinCC)) (Page 379)

7. If your PC has several network cards, the IP address via which communication is established must be written in the "IP address NIC" field.
8. In the field "Crane status tag", select the WinCC process tag in which the controller sends the status of the crane.
9. Specify the RCMS update cycles for messages and operational data.
10. Select "Crane is synchronized with RCMS".
    If this option is not selected, neither configuration data nor runtime data will be transferred.
11. Confirm with "OK".
12. Restart the CMS Runtime to activate the changes to the communication parameters.

11.2.2.5 Setting data transfer (CMS with RCMS (WinCC))

These instructions show you how to set the data transfer to a RCMS 4.3 SP1.

To ensure that the acquired data are transferred to the RCMS server, in the following screen forms you must select which data will be transferred:

- CMS-RCMS data transfer: Transfer messages
- CMS-RCMS data transfer: Transfer operational data
- CMS-RCMS data transfer: Transfer Taglist

For further details on data transfer, please refer to the documentation of your RCMS server.

Sequence of steps

1. Open the CMS editor
2. In the screen form "CMS-RCMS data transfer" → "Transfer messages", select the "Runtime" check box for all messages to be transferred to the RCMS server.
   See also: CMS-RCMS data transfer: Transfer messages (Page 192)
3. In screen form "CMS-RCMS data transfer" → "Transfer operational data", select the "Runtime" check box for all operational data to be transferred to the RCMS server.
   See also: CMS-RCMS data transfer: Transfer operational data (Page 194)
4. In the screen form "CMS-RCMS data transfer" → "Transfer Taglist", enter the acquisition interval for all tags to be transferred to the RCMS server.
   Select the "Data transmission" check box to transfer the data to the RCMS server.
   See also: CMS-RCMS data transfer: Transfer Taglist (Page 195)

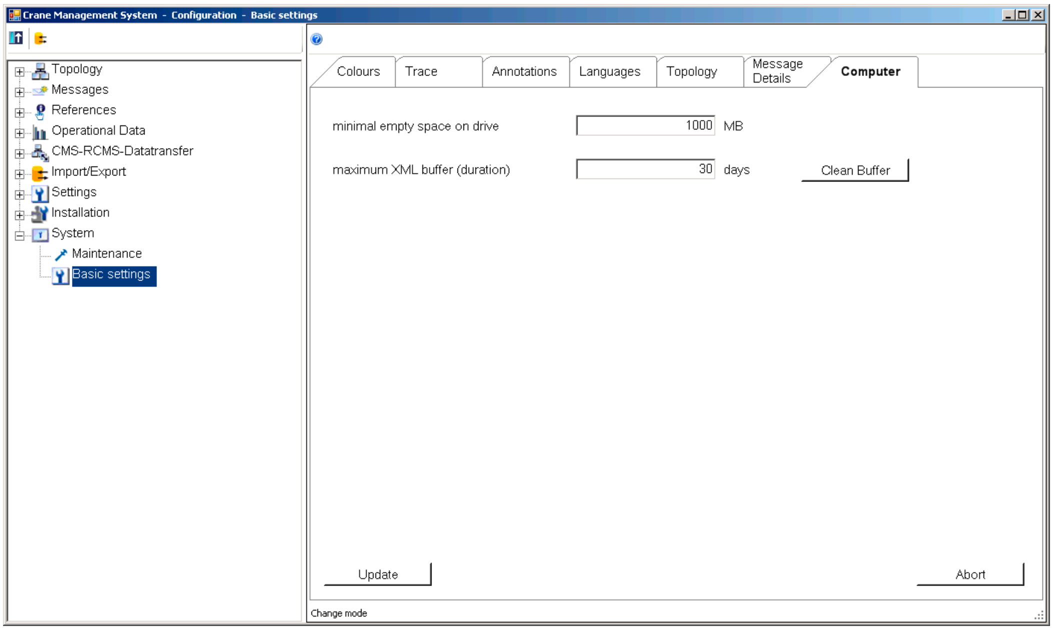
11.2.2.6 Buffer for XML files and setting its storage limit (CMS with RCMS (WinCC))

These instructions show you how to set the buffer for XML files for data transfer to an RCMS 4.3 SP1.

The buffer for the XML files can be limited in the CMS editor. CMS Runtime not only deletes the XML files in the transfer directories, but also deletes the files in the lower-level error directories, which are older than, for example, 30 days.

The CMS Runtime monitors the disk space as soon as you have activated CMS-RCMS data synchronization on the basis of XML files.
If the free disk space falls below this lower limit when an XML file is written (data transferred to the RCMS server), the function for writing XML files will be stopped.

1. Open the "Computer" tab under System → Basic settings.



minimal empty space on drive 1000 MB

maximum XML buffer (duration) 30 days

Figure 11-9 "Computer" tab

2. In the field "Maximum XML buffer", enter the number of days for which the XML files will be saved (e.g. 30 days).
   Using the button "Clear buffer", you can empty the entire buffer with a single click.

Note

Do not use any method other than the "Clear buffer" button to delete the XML files and transfer directories. By doing this, you ensure that the system can continue to generate XML files.

If you delete the transfer directories manually, you might also delete the directory required for current XML files. This directory is created only once per day or when the CMS is restarted.

3. Enter the reserved disk space in megabytes ("MB") in the "Minimum disk space" field.

11.2.2.7 Activation of the communication port (CMS with RCMS (WinCC))

These instructions show you how to set the communication port of a CMS station for communication with an RCMS 4.3 SP1.

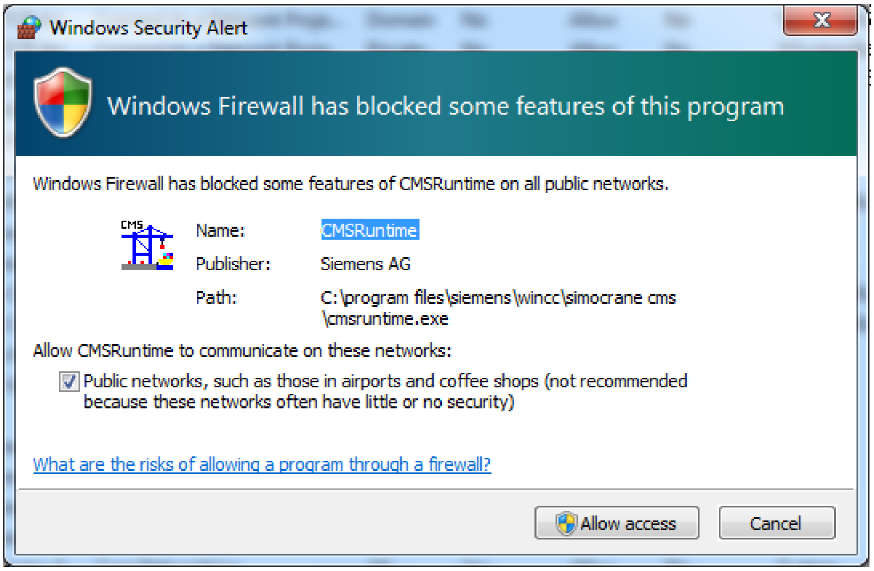
To ensure CMS/RCMS communication, certain settings must first be made in the Windows firewall.

These instructions show you what settings of the Windows Firewall have to be made on the CMS station.

For information on setting the Windows Firewall on the RCMS server, observe the documentation of your RCMS.

Under Windows 7 / Windows 10:

The first time you start CMSRuntime.exe, with the firewall activated, the following window will appear:



Windows Security Alert

Windows Firewall has blocked some features of this program

Windows Firewall has blocked some features of CMSRuntime on all public networks.

Name: CMSRuntime
Publisher: Siemens AG
Path: C:\program files\siemens\wincc\simocrane cms \cmsruntime.exe

Allow CMSRuntime to communicate on these networks:

☑ Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)

What are the risks of allowing a program through a firewall?

Figure 11-10 Windows firewall is blocking CMSRuntime

Click the "Allow access" button to add CMSRuntime.exe to the white list. After that, you can set the firewall ports.
See also: Setting of the firewall port (CMS with RCMS (WinCC)) (Page 380)

11.2.2.8 Setting of the firewall port (CMS with RCMS (WinCC))

These instructions explain which firewall ports have to be enabled on the CMS station to allow communication with a WinCC-based RCMS server.

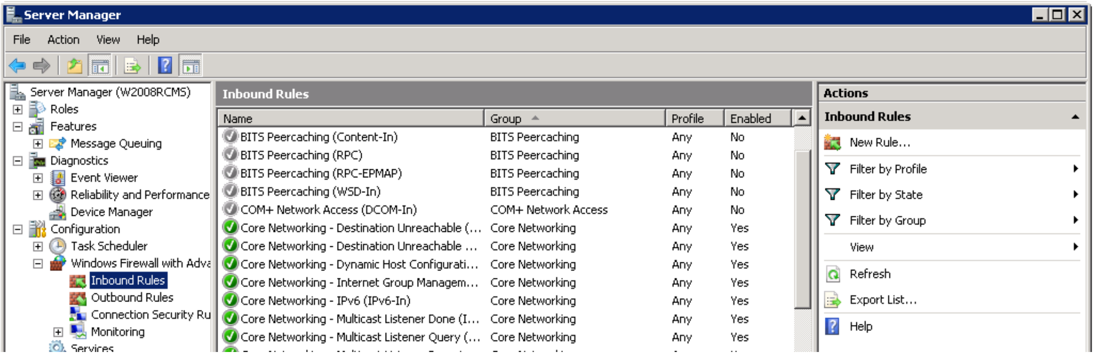
1. In the CMS Editor on screen form "Topology" → "Cranes", select the port that will be used for communication between the RCMS and CSS.
   Example:
   Port 1482 should be used for communication between CMS and RCMS.

Note

The same port must also be selected on the RCMS in screen form "Topology" → "Cranes"!

For further details on setting the Firewall ports on the RCMS server, observe the documentation of your RCMS server.

2. Open the advanced firewall settings.

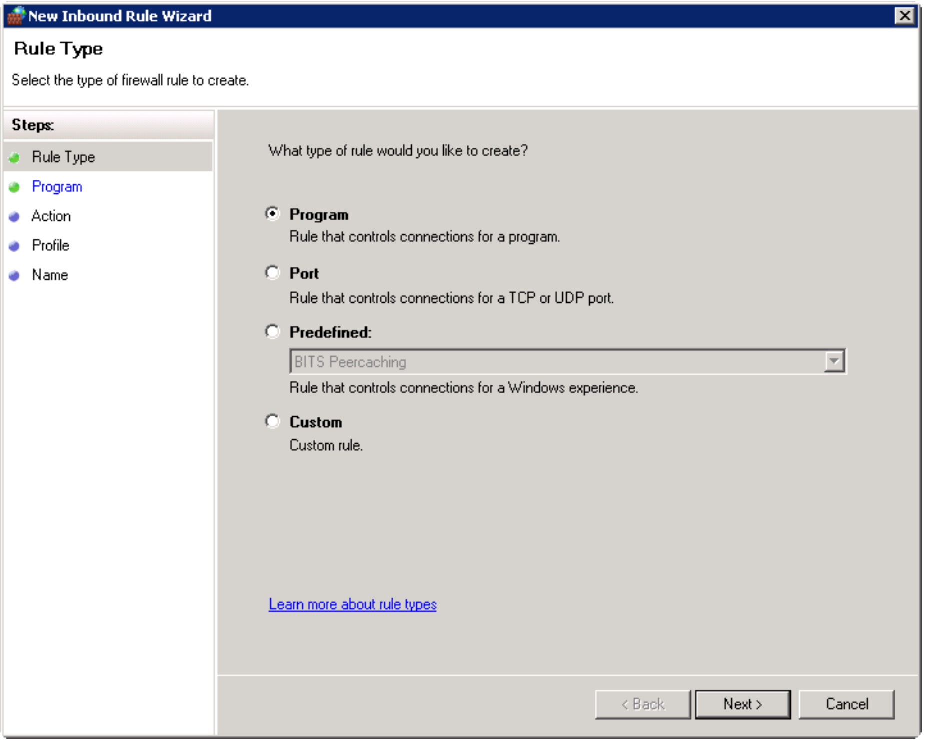


Inbound Rules

Name	Group	Profile	Enabled
BITS Peercaching (Content-In)	BITS Peercaching	Any	No
BITS Peercaching (RPC)	BITS Peercaching	Any	No
BITS Peercaching (RPC-EPMAP)	BITS Peercaching	Any	No
BITS Peercaching (WSD-In)	BITS Peercaching	Any	No
COM+ Network Access (DCOM-In)	COM+ Network Access	Any	No
Core Networking - Destination Unreachable (...	Core Networking	Any	Yes
Core Networking - Destination Unreachable ...	Core Networking	Any	Yes
Core Networking - Dynamic Host Configurati...	Core Networking	Any	Yes
Core Networking - Internet Group Managem...	Core Networking	Any	Yes
Core Networking - IPv6 (IPv6-In)	Core Networking	Any	Yes
Core Networking - Multicast Listener Done (I...	Core Networking	Any	Yes
Core Networking - Multicast Listener Query (...	Core Networking	Any	Yes

Figure 11-11 Windows firewall, inbound rules

3. Create a new rule under "Inbound Rules" as shown in the following figures.



Rule Type

Select the type of firewall rule to create.

What type of rule would you like to create?

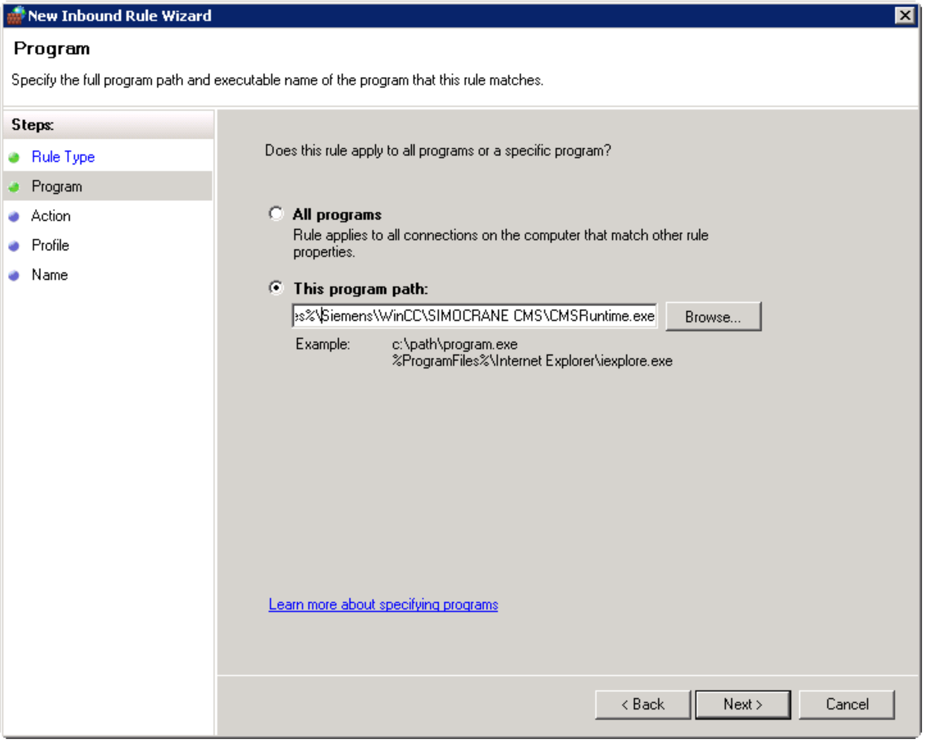
● **Program**
Rule that controls connections for a program.

○ **Port**
Rule that controls connections for a TCP or UDP port.

○ **Predefined:**
BITS Peercaching
Rule that controls connections for a Windows experience.

○ **Custom**
Custom rule.

Figure 11-12 Create rule, step 1



Program

Specify the full program path and executable name of the program that this rule matches.

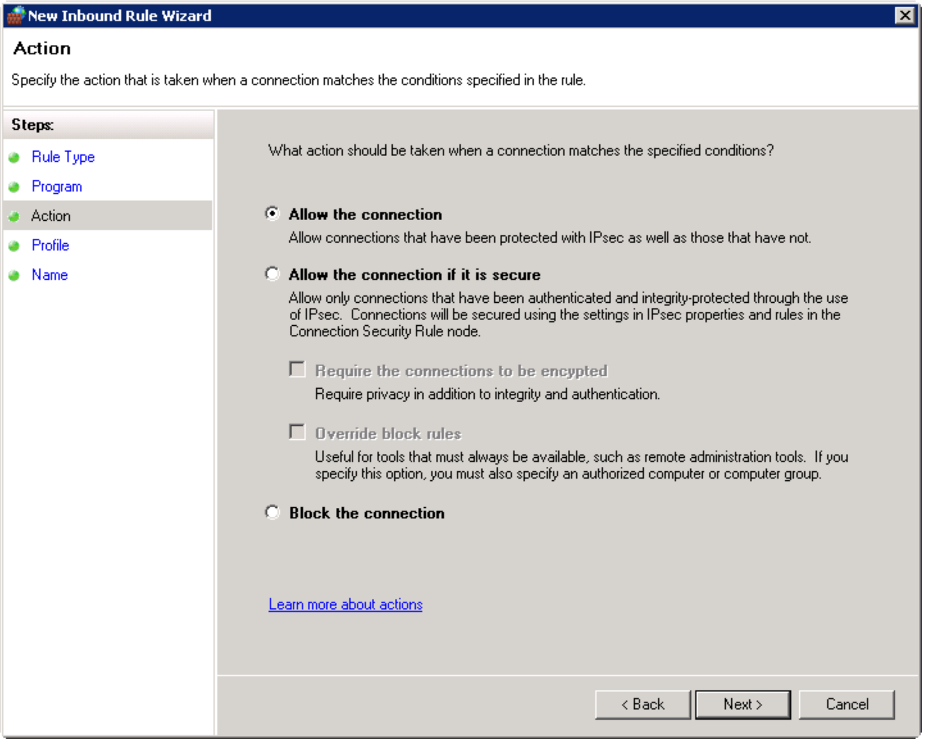
Does this rule apply to all programs or a specific program?

○ **All programs**
Rule applies to all connections on the computer that match other rule properties.

● **This program path:**
es%\Siemens\WinCC\SIMOCRANE CMS\CMSRuntime.exe

Example: c:\path\program.exe
%ProgramFiles%\Internet Explorer\iexplore.exe

Figure 11-13 Create rule, step 2



Action

Specify the action that is taken when a connection matches the conditions specified in the rule.

What action should be taken when a connection matches the specified conditions?

● **Allow the connection**
Allow connections that have been protected with IPsec as well as those that have not.

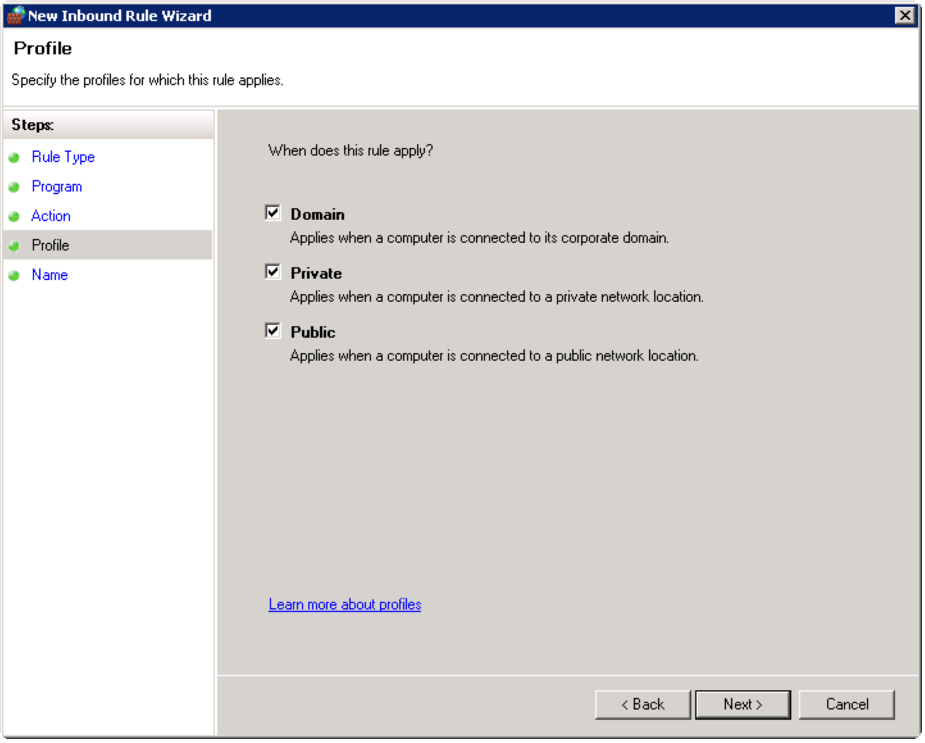
○ **Allow the connection if it is secure**
Allow only connections that have been authenticated and integrity-protected through the use of IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.

□ Require the connections to be encypted
Require privacy in addition to integrity and authentication.

□ Override block rules
Useful for tools that must always be available, such as remote administration tools. If you specify this option, you must also specify an authorized computer or computer group.

○ **Block the connection**

Figure 11-14 Create rule, step 3



Profile

Specify the profiles for which this rule applies.

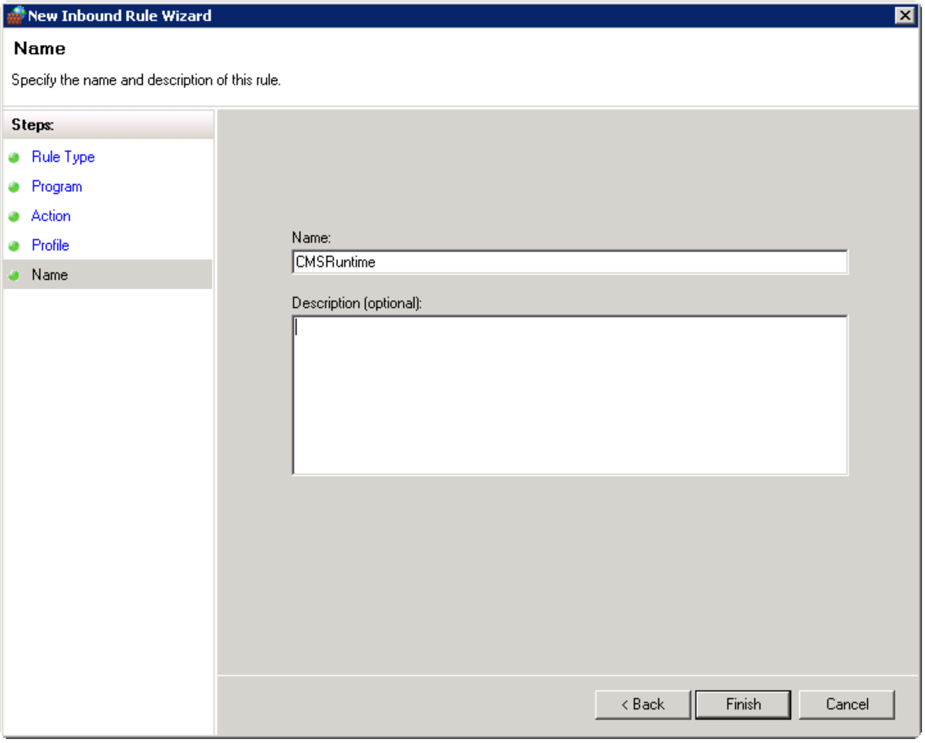
When does this rule apply?

☑ **Domain**
Applies when a computer is connected to its corporate domain.

☑ **Private**
Applies when a computer is connected to a private network location.

☑ **Public**
Applies when a computer is connected to a public network location.

Figure 11-15 Create rule, step 4



Name: CMSRuntime

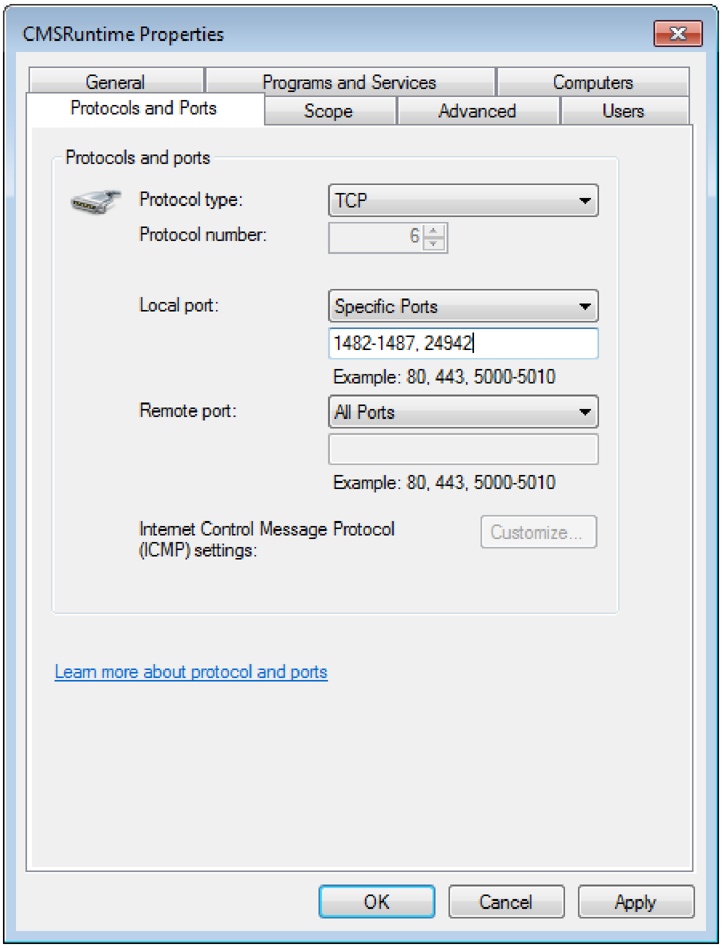
Description (optional):

Figure 11-16 Create rule, step 5

4. Adapt the settings to any hardware firewall there may be between the CMS and RCMS computer so that the ports set in "Protocols and Ports" are activated.
   Example:
   Release port "1482-1487" if you specified port 1482 in the CMS Editor in the screen form "Topology" → "Crane".

Note

In addition, port "24942" must **always** be released!



Protocols and ports

Protocol type: TCP

Protocol number: 6

Local port: Specific Ports

1482-1487, 24942

Example: 80, 443, 5000-5010

Remote port: All Ports

Example: 80, 443, 5000-5010

Internet Control Message Protocol (ICMP) settings:

Figure 11-17 CMS runtime properties

The firewall is now set up for communication between the RCMS server and CMS station.

11.2.2.9 Uploading / downloading configuration data (CMS with RCMS (WinCC))

General information on uploading / downloading configuration data (CMS with RCMS (WinCC))

Note

The upload and download function is only available for the topology "CMS with RCMS (WinCC)".

The upload and download function is used to exchange and maintain the consistency of the configuration data between the cranes of a particular equipment type and the equipment type. Configuration of the RCMS server is simplified by transferring this configuration data between the cranes (CMS stations) and the equipment type on the RCMS server.

The upload and the download belong together. The process is only completed after the download.

- Upload:
  The upload sends the configuration data of a crane (CMS station) to the associated equipment type on the RCMS server.
- Download:
  The download sends the configuration data of the equipment type from the RCMS server to the selected cranes (CMS stations). This operation completes the process.

These uploads and downloads are only performed between the cranes of one equipment type and the associated equipment type.

The configuration data for the equipment type are located on the RCMS server. The configuration data for the cranes of the equipment type are located on the associated CMS stations.

You can recognize any differences between the configuration data of the crane (CMS station) and the equipment type on the RCMS server by the color marking in the CMS Editor.

Note

The upload or download overwrites the corresponding configuration data on the target computer.
If additional configuration data are located on the target computer (for example, additional messages), they are retained on the target computer.
WinCC tags that are used in messages and Tag Logging archives are not created by the download.

The crane status tag is not set on downloading!
The crane status tag must be manually set for each CMS station in the screen form "Topology" → "Cranes".

For further information on uploading and downloading, please also observe the documentation of your RCMS server.

What are configuration data?

Configuration data is configured data in the WinCC and CMS Editors. This configuration data is initially part of the WinCC project of the CMS stations. The configuration data of the equipment type are located on the RCMS server.

Configuration data are:

- Topology data
- WinCC messages (including message classes, message types, message blocks and group messages)
- Maintenance instructions, which are assigned to one message
- References, which are assigned to an equipment type, a crane, or a message
- WinCC Tag Logging archives that are defined for the acquisition of move data

- WinCC Tag Logging archives that are defined for the acquisition of counter differences
- WinCC Tag Logging archives that are defined for the acquisition of MMBF data

What configuration data are transferred?

This section shows what configuration data are transmitted during uploading or downloading. In the table, you will find detailed information on how the data on the RCMS server and the CMS station are handled.

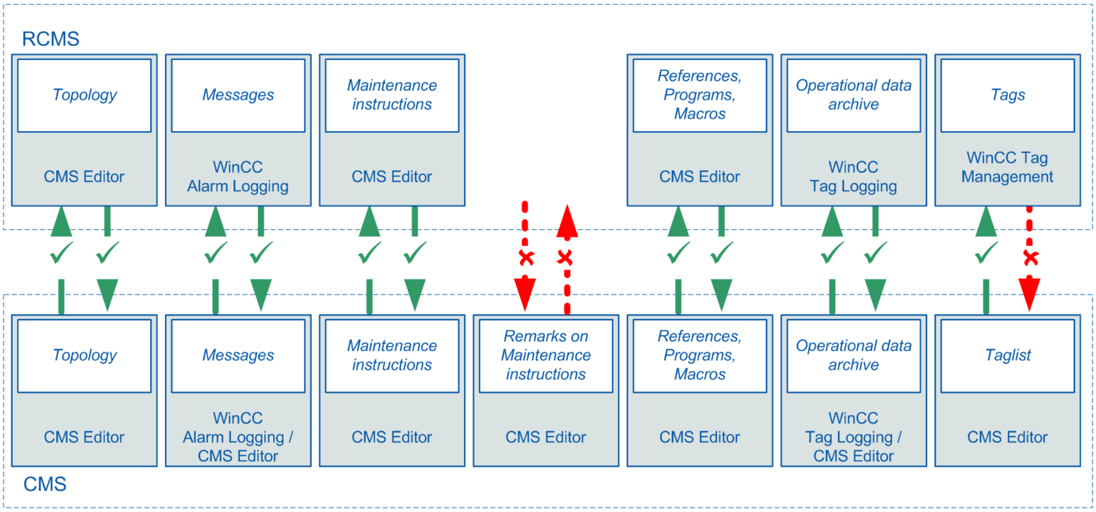


Figure 11-18 Transferring configuration data

Type	Upload (CMS → RCMS)	Download (RCMS → CMS)
Topology	On the RCMS, the topology data are overwritten.	On the CMS station, the topology data are overwritten. **Note:** Any WinCC tags that are used must exist, otherwise the download is canceled with an error.
Messages (incl. message classes, messages types, message blocks)	On the RCMS, existing messages are overwritten and new messages are generated for each equipment type in the WinCC Alarm Logging. This adds an offset to the WinCC message numbers. This offset is defined in the CMS Editor for each existing equipment type. Message classes, message types, message blocks and group messages that are not yet available are automatically created.	On the CMS station, existing messages are overwritten and new messages are generated in the WinCC Alarm Logging. In this case, the offset of the WinCC message numbers at the RCMS is subtracted. Message classes, message types, message blocks and group messages that are not yet available are automatically created. **Note:** Any WinCC tags that are used must exist, otherwise the download is canceled with an error.
Maintenance instructions	Existing maintenance instructions are overwritten on the RCMS and are then created again.	Existing maintenance instructions are overwritten on the CMS station and then created again.
Remarks on maintenance instructions	No synchronization	No synchronization
References (programs and macros)	Existing references are overwritten on the RCMS and are created again.	Existing references are overwritten on the CMS station and then created again.

Type	Upload (CMS → RCMS)	Download (RCMS → CMS)
Operating data archives (move data, counter differences, MMBF data)	On the RCMS, the operational data archives are overwritten and new archives are created in the WinCC Tag Logging. The crane name followed by "_" is placed as a prefix in front of the archive name of the CMS station. The process tags used are created in the tag group "Crane name" (e.g. "STSCrane1"). If this group does not yet exist, it is created.	On the CMS station, the operational data archives are overwritten and new archives are created in the WinCC Tag Logging. The crane name prefix followed by "_" is removed. **Note:** Any WinCC tags that are used must exist, otherwise the download is canceled with an error.
Tags (tags, structure tags, and structure types)	A structure type is created on the RCMS with the tags defined in the tag list of the CMS station. A structure type is created for each equipment type. The name of the structure is the equipment type with the prefix "@CMS" (e.g. @CMSSTSCrane). In addition, a WinCC structure tag is generated with the crane name as the tag prefix from this type (e.g. "STSCrane1.tag1", …). The tag is created in the tag group "Crane name" (e.g."STSCrane1"). If this group does not yet exist, it is created.	**Note:** WinCC tags that are used must exist, otherwise the download is canceled with an error.

Uploading / downloading configuration data (CMS with RCMS (WinCC))

Note

The upload and download function is only available for the topology "CMS with RCMS (WinCC)".

When you set up a new RCMS project, it does not initially contain any configuration data for the crane. To simplify configuration at the RCMS server, particularly for large quantities, we recommend the following procedure.

For further information on uploading and downloading, please also observe the documentation of your RCMS server.

Sequence of steps

1. Create the topology on the CMS stations.
   See Setting the topology (CMS with RCMS (WinCC)) (Page 373)
2. Configure one CMS station per equipment type.

   Note

   If you created additional tags during configuration, create these additionally required tags on all CMS stations of the same equipment type.

3. Select all configuration data on the CMS station that is to be transferred to the RCMS server.
   See: Operating data: Move data (Page 186)
   See: Operating data: Counters (Page 189)
   See: Operating data: MMBF (Page 191)
4. Perform an upload for this CMS station to transfer the configuration data to the RCMS server.
   See: CMS-RCMS data transfer: Upload (CMS station) (Page 197)
5. If necessary, adapt the configuration data to the equipment type on the RCMS server.

   Note

   If you created additional tags during configuration, create these additionally required tags on all CMS stations of the same equipment type.

6. Perform a download for all CMS stations of one equipment type.
   For further information on downloading, please also observe the documentation of your RCMS server.

   Note

   The crane status tag is not set on downloading!
   The crane status tag must be manually set for each CMS station in screen form "Topology" → "Cranes"!

Result

All CMS stations of one equipment type are now consistent.

11.2.2.10 Renaming cranes retrospectively (CMS with RCMS (WinCC))

Note

Loss of archive data

If you subsequently change the crane name, then you create a new entry for this crane on the RCMS server. This new entry has no link to the archive data that has been acquired up till then. From now on all archive data is written to a new archive!

Only change the crane name in exceptional situations!

Follow the sequence of steps given below if you wish to rename a crane retrospectively in a CMS / RCMS scenario:

1. On the CMS station:
   Open the "Topology" → "Cranes" dialog and change the name of the crane.
2. On the RCMS station:
   Open the "Topology" → "Cranes" dialog and change the name of the crane.
3. On the CMS station:
   Open the "CMS-RCMS data transfer" → "Upload" dialog and perform an upload.

You have now successfully renamed the crane.

11.2.2.11 System messages (CMS with RCMS (WinCC))

CMS Runtime displays general execution and error information in the CMS system messages. These system messages use reserved message classes that are created in the WinCC Alarm Logging. The messages of these classes only use the status "came in".

Message class 15 "CMSTimeZone"

This message class contains the following message type:

- CMSTimeZoneWarning: Message type 225

Message class 16 "CMS"

This message class contains the following message types:

- CMS_Fault: Message type 241
- CMS_Warning: Message type 242
- CMS_Info: Message type 243

The system messages have an offset of 50000 in the WinCC Alarm Logging.

Table 11-1 CMS system messages

Message number	Message type	Message text (user text block 5)
Messages at the CMS station and at the RCMS server		
50000	CMS_Info	*Crane name*: Configuration data upload has been started.
50001	CMS_Fault	*Crane name*: Configuration data upload completed with errors.
50002	CMS_Info	*Crane name*: Configuration data upload successfully completed.
Additional messages at the CMS station		
50200	CMS_Info	*n* XML files were deleted from the transfer directories.
50201	CMS_Info	*n* XML files were deleted from the error directories.
50210	CMS_Info	Connection to the RCMS server established.
50211	CMS_Info	Connection to the RCMS server disconnected.
50212	CMS_Info	Connection to WinCC Runtime established.
50213	CMS_Info	Connection to WinCC Runtime aborted.
50220	CMS_Info	*Crane name*: Configuration data download started.
50221	CMS_Fault	*Crane name*: Configuration data download completed with errors.
50222	CMS_Info	*Crane name*: Configuration data download successfully completed.
Time zone warnings		
50400	CMSTimeZoneWarning:	MMBF: PLC time stamp invalid, replaced by current PC time.
50401	CMSTimeZoneWarning:	MoveData: PLC time stamp invalid, replaced by current PC time.
Additional messages at the RCMS server		
50510	CMS_Info	*Crane name*: Connection established.

Message number	Message type	Message text (user text block 5)
50511	CMS_Info	*Crane name*: Connection aborted.
50512	CMS_Info	Connection to WinCC Runtime established.
50513	CMS_Info	Connection to WinCC Runtime aborted.

11.2.3 CMS 4.3 with RCMS 4.4 web application

You can connect a CMS 4.3 to the Process Historian. In this way, a RCMS 4.4 web application can read the data from the Process Historian.

For this purpose, you need to consider the following:

- You must set the topology of the CMS 4.3 to "CMS without RCMS Server"
  See the documentation of your CMS 4.3
- You must configure the CMS 4.3 like a CMS 4.4 in topology "CMS with RCMS (Process Historian)".
  See also: Configuring a CMS station (Page 99)
- You must connect the CMS 4.3 to Process Historian
  See also: Connecting CMS station to Process Historian (Page 110)

11.3 Migration of existing projects

11.3.1 General information about migrating projects

In order to be able to use a project that runs under an older WinCC version (WinCC 7.0.x or higher), you must migrate this.

Note

Backup required!

A number of tables need to be deleted for the purposes of migration.

The contents of these tables have to be restored again from the backup file.

See also: Creating a backup (Page 367)

Note

The Replay function has been added to CMS V4.2.

If you want to use the Replay function for projects from CMS V.4.1 SP1, you must configure these accordingly.

See also: The Replay function (Page 303)

Note

Current projects are only released for use with the current version of SIMOCRANE CMS.

It is not permissible that they are migrated to previous versions of SIMOCRANE CMS and operated.

11.3.2 Preparing for migration

1. Create a backup copy of the project.

Note

Backup copy of the project recommended!

If migration cannot be performed successfully, it is necessary to have a copy of the original project.

- Store the backup copy in a safe place.
- Make sure that the backup copy cannot be changed before you continue.

2. Make a backup copy of the project.
See: Creating a backup (Page 367)

Note

Backup required!

A number of tables need to be deleted for the purposes of migration.

The contents of these tables have to be restored again from the backup file.

3. Make sure that the following conditions are fulfilled:

   – CMS Runtime has been stopped

   – WinCC Runtime has been stopped

   – The WinCC project is closed.

   – The WinCC Explorer is closed

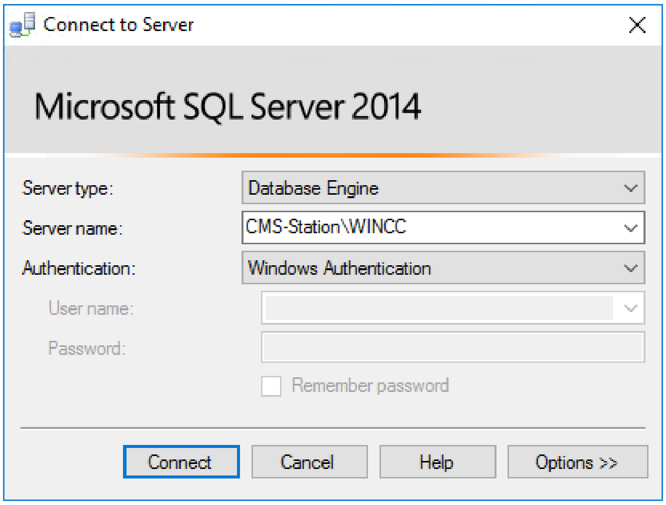
4. Open the "SQL Server 2014 Management Studio" as an administrator.

Note

You can find the SQL Server 2014 Management Studio by clicking on Start and searching for "SQL Server 2014 Management Studio".

In order to launch this program as an administrator, click on the option "Run as administrator" in the shortcut menu for the executable file.
If a prompt appears asking whether you will allow the program to make changes to your computer, confirm with OK.

The "Connect to Server" dialog box appears.



Server type: Database Engine
Server name: CMS-Station\WINCC
Authentication: Windows Authentication
User name:
Password:
□ Remember password

Figure 11-19 Migration, step 1

5. Select the setting "Windows Authentication" and click on "Connect".
6. Right click on "Databases" and then select "Attach...".

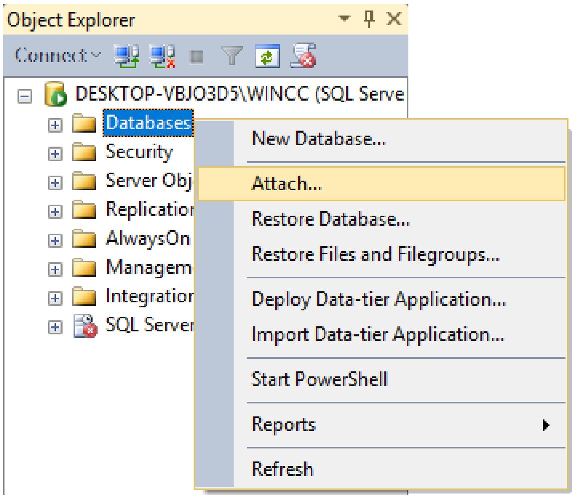


Figure 11-20 Connecting a database

7. Click on "Add…".

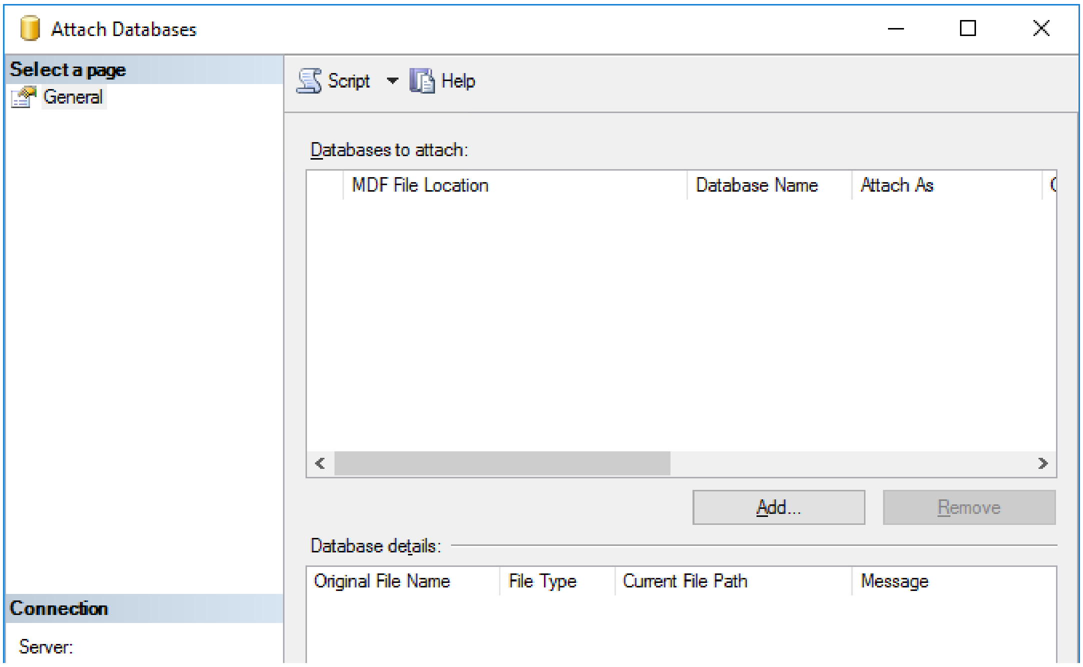
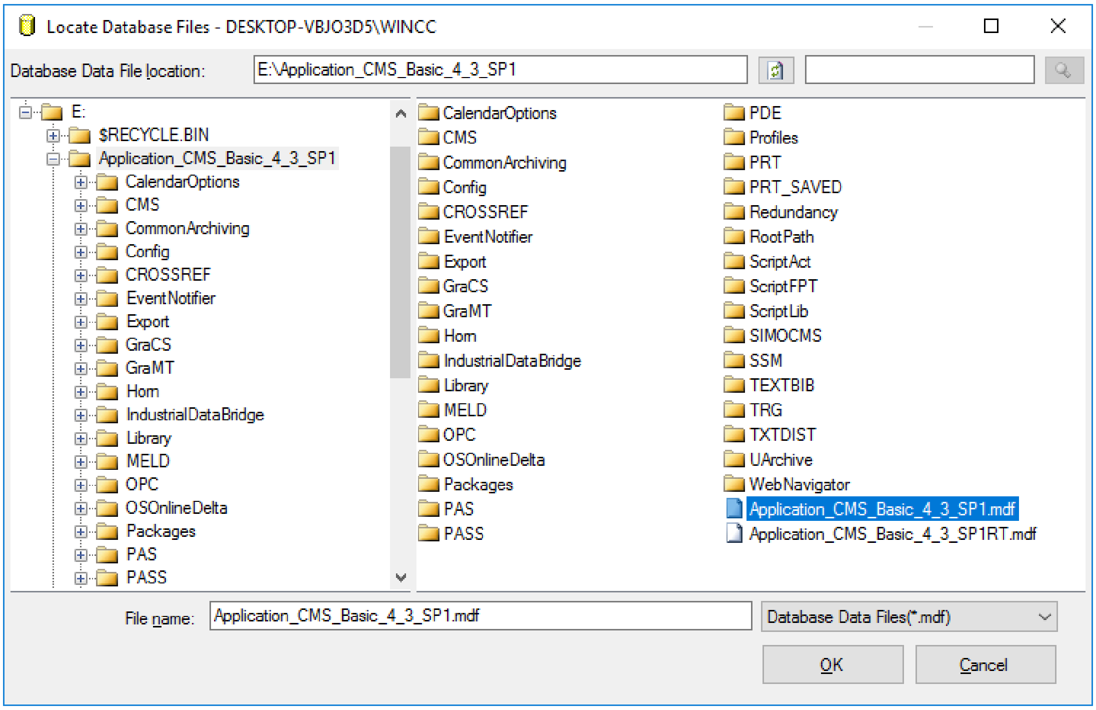


Figure 11-21 Adding a database

8. Navigate to the WinCC project folder of the project to be migrated.

9. In the project folder, select the database (mdf file) with a name does NOT end in "RT," and confirm with "OK."



Database Data File location: E:\Application_CMS_Basic_4_3_SP1

File name: Application_CMS_Basic_4_3_SP1.mdf

Database Data Files(*.mdf)

Figure 11-22 Selecting the database without the ending "...RT"

The name of the added database is displayed in the "Attach As" column.

10. Confirm with "OK".

11. Click on "View" → "Object Explorer Details".

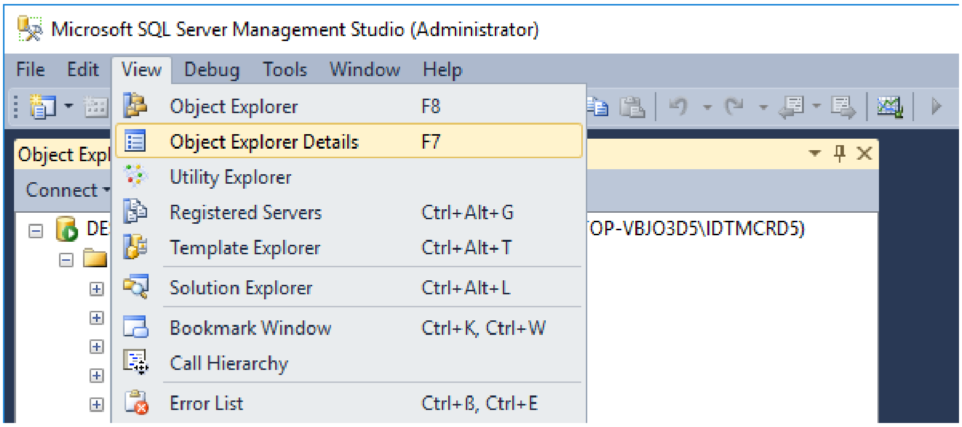
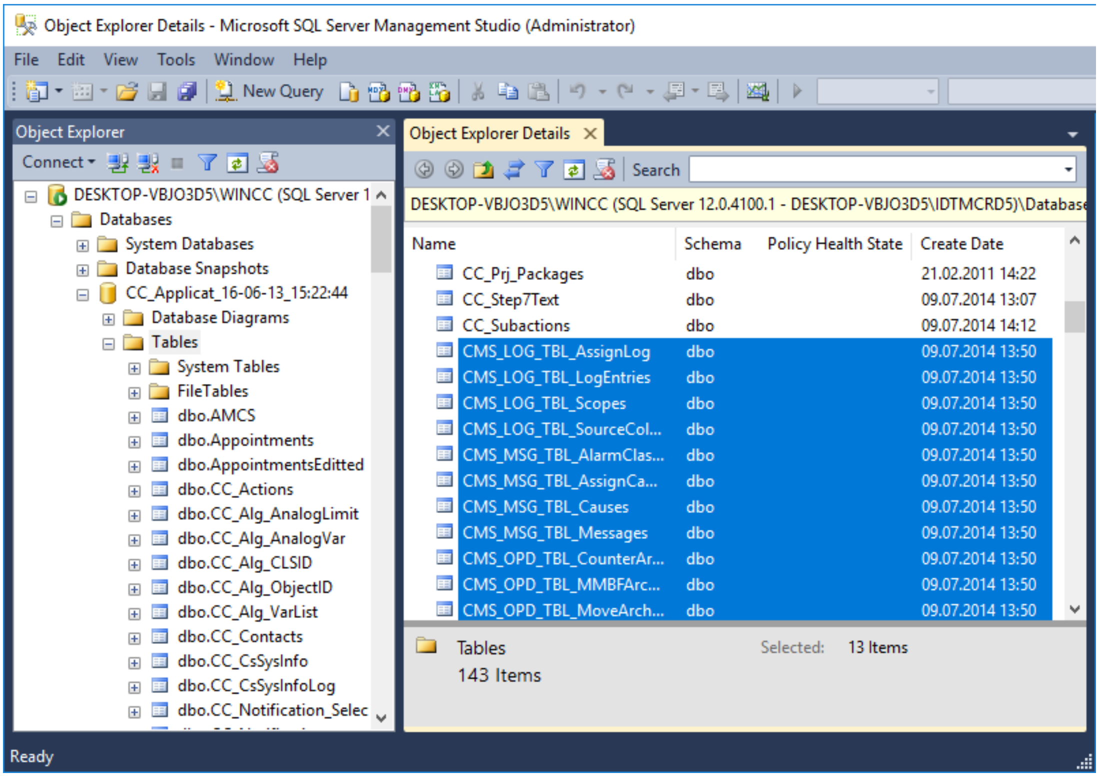

Microsoft SQL Server Management Studio (Administrator)
File Edit View Debug Tools Window Help
Object Explorer F8
Object Explorer Details F7
Utility Explorer
Registered Servers Ctrl+Alt+G
Template Explorer Ctrl+Alt+T
Solution Explorer Ctrl+Alt+L
Bookmark Window Ctrl+K, Ctrl+W
Call Hierarchy
Error List Ctrl+B, Ctrl+E
Object Expl
Connect
DE
OP-VBJO3D5\IDTMCRD5)

Figure 11-23 Setting the detailed view in the Object Explorer.

12. Expand the database (with the + symbol) and click on "Tables."
All the tables in the database appear in the right hand section of the window.



DESKTOP-VBJO3D5\WINCC (SQL Server 12.0.4100.1 - DESKTOP-VBJO3D5\IDTMCRD5)\Database

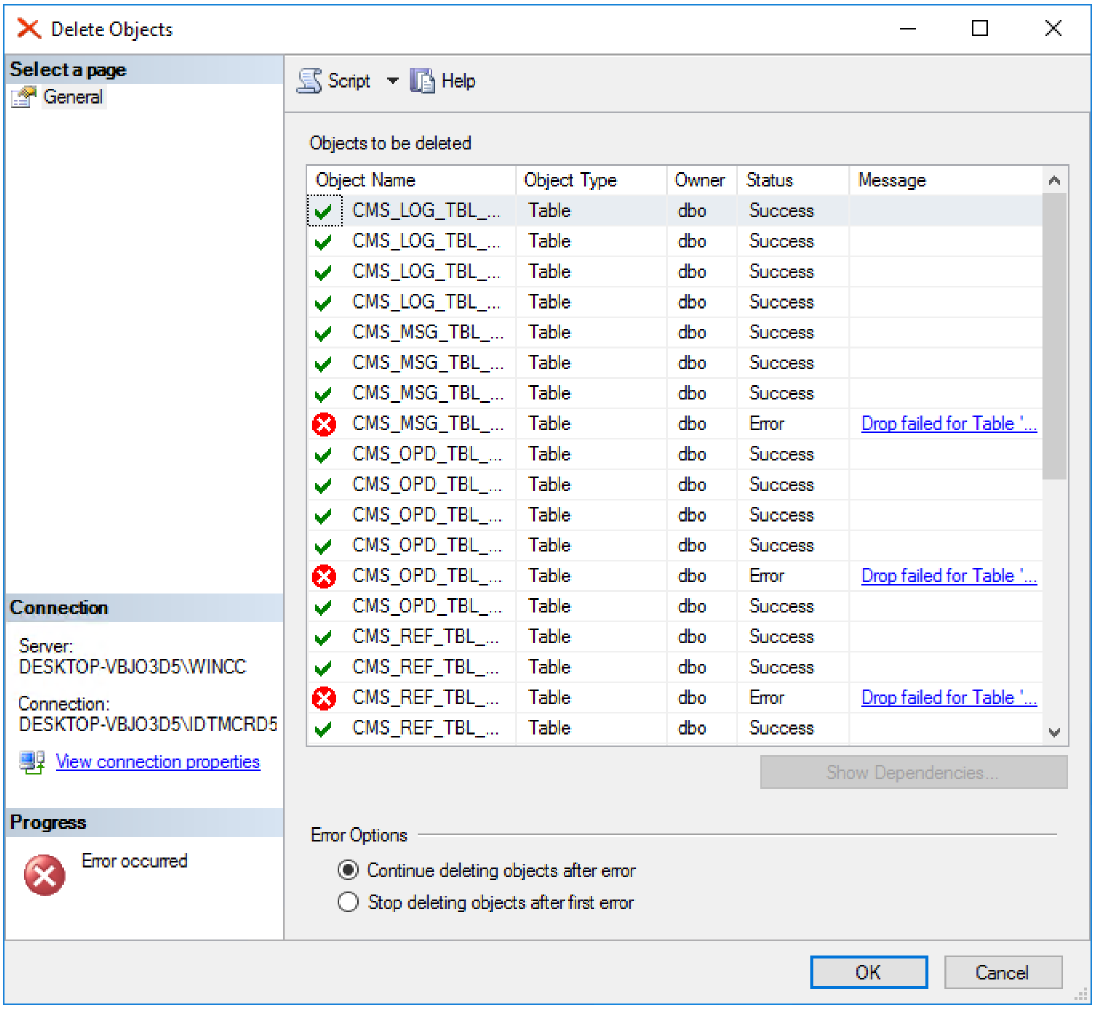
Name	Schema	Policy Health State	Create Date
CC_Prj_Packages	dbo		21.02.2011 14:22
CC_Step7Text	dbo		09.07.2014 13:07
CC_Subactions	dbo		09.07.2014 14:12
CMS_LOG_TBL_AssignLog	dbo		09.07.2014 13:50
CMS_LOG_TBL_LogEntries	dbo		09.07.2014 13:50
CMS_LOG_TBL_Scopes	dbo		09.07.2014 13:50
CMS_LOG_TBL_SourceCol...	dbo		09.07.2014 13:50
CMS_MSG_TBL_AlarmClas...	dbo		09.07.2014 13:50
CMS_MSG_TBL_AssignCa...	dbo		09.07.2014 13:50
CMS_MSG_TBL_Causes	dbo		09.07.2014 13:50
CMS_MSG_TBL_Messages	dbo		09.07.2014 13:50
CMS_OPD_TBL_CounterAr...	dbo		09.07.2014 13:50
CMS_OPD_TBL_MMBFArc...	dbo		09.07.2014 13:50
CMS_OPD_TBL_MoveArch...	dbo		09.07.2014 13:50

Tables
143 Items
Selected: 13 Items

Figure 11-24 Selecting tables in the database

13. Select all tables with a name starting "CMS."

14. Press the Delete key and confirm the delete operation by clicking on "OK".
    The selected tables are deleted. Some tables may remain undeleted because of dependencies between the tables.



Objects to be deleted

	Object Name	Object Type	Owner	Status	Message
✓	CMS_LOG_TBL_...	Table	dbo	Success	
✓	CMS_LOG_TBL_...	Table	dbo	Success	
✓	CMS_LOG_TBL_...	Table	dbo	Success	
✓	CMS_LOG_TBL_...	Table	dbo	Success	
✓	CMS_MSG_TBL_...	Table	dbo	Success	
✓	CMS_MSG_TBL_...	Table	dbo	Success	
✓	CMS_MSG_TBL_...	Table	dbo	Success	
✖	CMS_MSG_TBL_...	Table	dbo	Error	Drop failed for Table '...
✓	CMS_OPD_TBL_...	Table	dbo	Success	
✓	CMS_OPD_TBL_...	Table	dbo	Success	
✓	CMS_OPD_TBL_...	Table	dbo	Success	
✓	CMS_OPD_TBL_...	Table	dbo	Success	
✖	CMS_OPD_TBL_...	Table	dbo	Error	Drop failed for Table '...
✓	CMS_OPD_TBL_...	Table	dbo	Success	
✓	CMS_REF_TBL_...	Table	dbo	Success	
✓	CMS_REF_TBL_...	Table	dbo	Success	
✖	CMS_REF_TBL_...	Table	dbo	Error	Drop failed for Table '...
✓	CMS_REF_TBL_...	Table	dbo	Success	

Connection

Server:
DESKTOP-VBJO3D5\WINCC

Connection:
DESKTOP-VBJO3D5\IDTMCRD5

View connection properties

Progress

Error occurred

Error Options

● Continue deleting objects after error

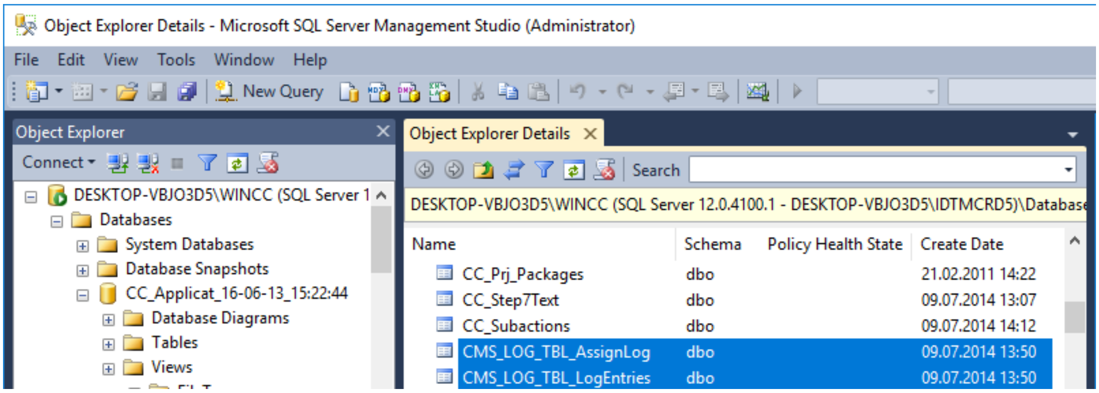
○ Stop deleting objects after first error

Figure 11-25 Deleting the tables

15. Click on "OK" again to delete the remaining entries.
    Now, no tables should be listed that have a name starting "CMS."

16. Ignore the message indicating the errors have been found.

17. Click on "Views".
    All the views in the database appear in the right hand portion of the window.


Object Explorer Details - Microsoft SQL Server Management Studio (Administrator)
File Edit View Tools Window Help
New Query
Object Explorer
Connect
DESKTOP-VBJO3D5\WINCC (SQL Server 1
Databases
System Databases
Database Snapshots
CC_Applicat_16-06-13_15:22:44
Database Diagrams
Tables
Views
Object Explorer Details
Search

DESKTOP-VBJO3D5\WINCC (SQL Server 12.0.4100.1 - DESKTOP-VBJO3D5\IDTMCRD5)\Databas

Name	Schema	Policy Health State	Create Date
CC_Prj_Packages	dbo		21.02.2011 14:22
CC_Step7Text	dbo		09.07.2014 13:07
CC_Subactions	dbo		09.07.2014 14:12
CMS_LOG_TBL_AssignLog	dbo		09.07.2014 13:50
CMS_LOG_TBL_LogEntries	dbo		09.07.2014 13:50

Figure 11-26 Migration, step 6.5

18. Select all views with a name starting "CMS."

19. Press the Del key.
    The selected views are deleted.

20. Right click on the database and select "Tasks" → "Detach" in order to detach the link to the database.

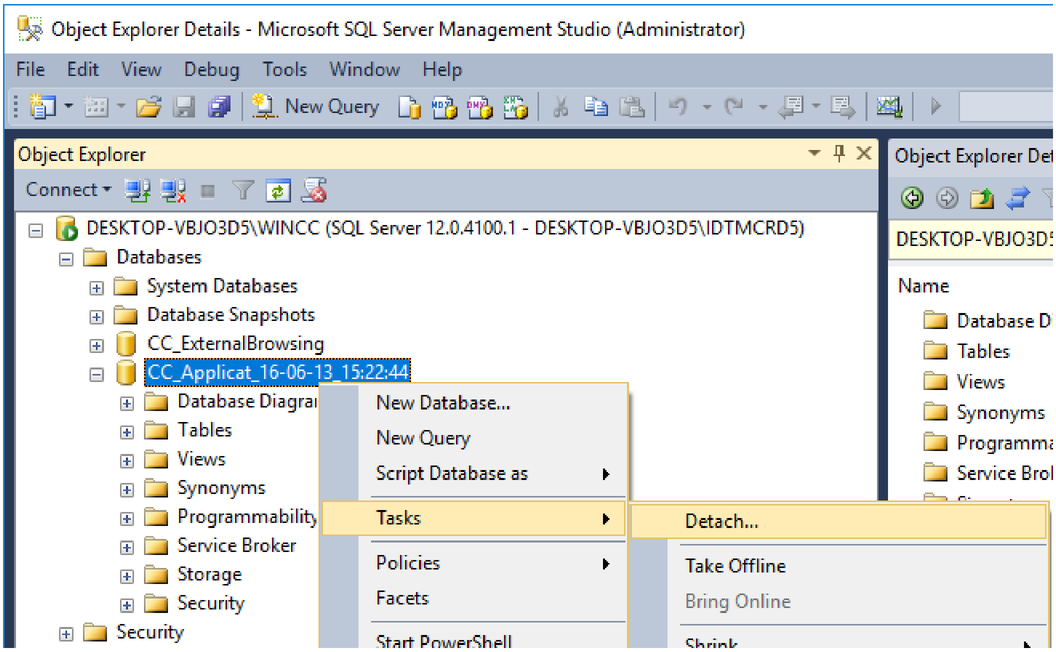


Figure 11-27 Detaching from the database.

Note

The connection must be detached!

If you do not disconnect from the database, the WinCC Project Migrator will cancel migration with an error message.

21. Close the "SQL Server Management Studio".
22. Using the "WinCC Project Migrator", you can now migrate the old CMS project.
    See: Migrating the project (Page 398)

11.3.3 Migrating the project

Preliminary remark

When migrating using the WinCC Project Migrator, there is no difference between single-user projects, multi-user projects, and clients with a dedicated project.

The projects are migrated to UNICODE. Tables that do not originate from WinCC are not migrated.

The time required depends on the size of the project to be migrated and the performance of the computer used. The time required for migration of the Runtime data varies according to the number of messages and tags. It can take several hours.

Note

Note that WinCC 7.4 SP1 Update 11 and CMS 4.4 SP3 must be installed before you can perform the following steps.

Procedure

Make sure that the following conditions are fulfilled:

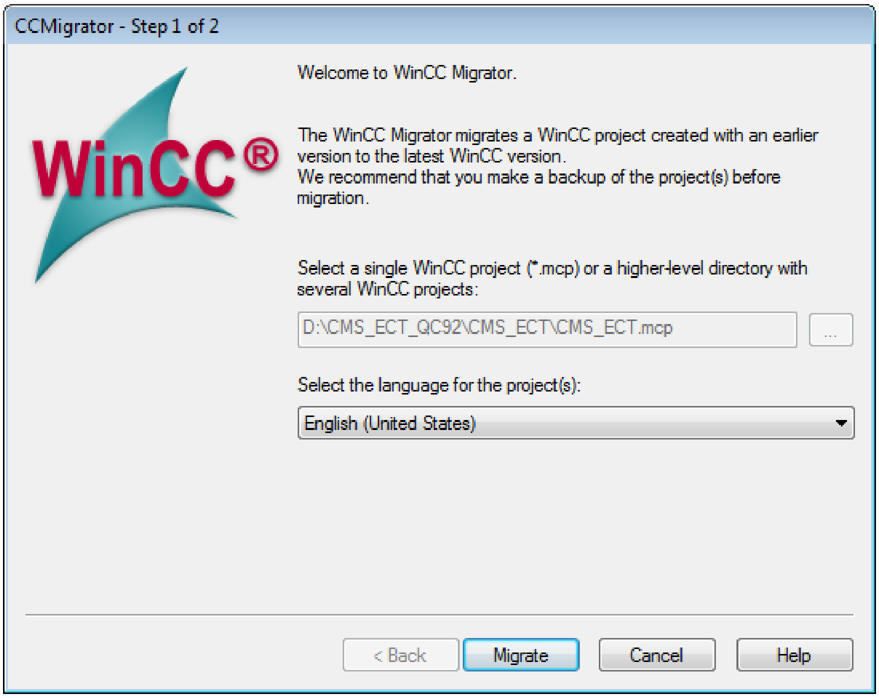
- WinCC 7.4 SP1 Update 11 and CMS 4.4 SP3 are installed.

1. Open WinCC "Project Migrator".

Note

You can find the WinCC "Project Migrator" by clicking Start and searching for "Project Migrator".

The start window of the Project Migrator "CCMigrator - Step 1 of 2" opens.



CCMigrator - Step 1 of 2

Welcome to WinCC Migrator.

The WinCC Migrator migrates a WinCC project created with an earlier version to the latest WinCC version.
We recommend that you make a backup of the project(s) before migration.

Select a single WinCC project (*.mcp) or a higher-level directory with several WinCC projects:

D:\CMS_ECT_QC92\CMS_ECT\CMS_ECT.mcp

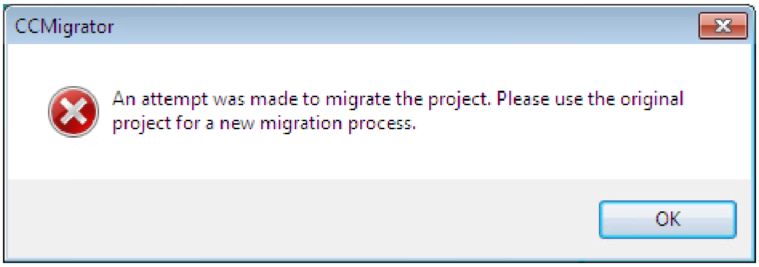
Select the language for the project(s):

English (United States)

Figure 11-28 CCMigrator - step 1 of 2

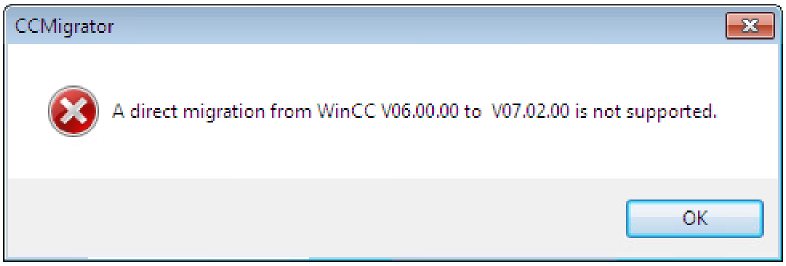
2. Select the project directory in which the WinCC project is located by clicking the "..." button. If you want to migrate more than one project in one step, select the path with the directories containing the WinCC projects.
3. Set the language of the computer on which the project or projects were created. The default setting is the language version defined in the language options of the operating system for non-Unicode programs or in the system locale.

4. Click the "Migrate" button.
   The window "CCMigrator - Step 2 of 2" opens. The Project Migrator shows the steps of the migration. Wait until the migration has been successfully completed. Migration of a project can take several hours.
   – If the following error message is displayed, an error has occurred during preparation of the migration.
     You must perform the entire migration again with the backup copy of the project.
     See: Preparing for migration (Page 392)



An attempt was made to migrate the project. Please use the original project for a new migration process.

   – If the following error message is displayed, this could mean that the connection between the Microsoft SQL Server and the database was not detached.
     Detach the Microsoft SQL Server from the database and start migration again.
     See: Preparing for migration (Page 392)



A direct migration from WinCC V06.00.00 to V07.02.00 is not supported.

5. When the migration is completed successfully, the Project Migrator displays the message: "WinCC project successfully migrated."
6. Click the "Finish" button.
7. Restart CMS Runtime.
   This will ensure that the deleted tables are restored in the database.
8. Import the backup.
   See: Importing the backup (Page 368)
9. Set a suitable topology for the CMS station.
   See also: Setting the topology (Page 106)
   See also: Setting the topology (CMS with RCMS (WinCC)) (Page 373)

Administering hardware and software 12

12.1 General

This chapter describes PC configuration within the entire CMS topology. This includes the computers of the CMS level and the computers of the RCMS level. Two aspects are highlighted during configuration:

- Autostart of the computer and all applications
- Security settings

The PC forms the basis of the SCADA system. Most users should only have access to the operator control and monitoring functions of the CMS application.

12.2 PC configuration of the CMS station

Software installation

- Before installing the software packages, define the definitive name of the computer for the local CMS station.

Note

Please note that the computer name cannot be precisely called "CMS".

You should also observe the WinCC guidelines for the assignment of computer names. If the computer name should be the same as the crane name, then it may contain letters and numbers only. The first character of the computer name must be a letter.

- Assign the computer's IP address according to your network configuration.
- Install the software packages required on the PC. Note the installation instructions for the respective software.

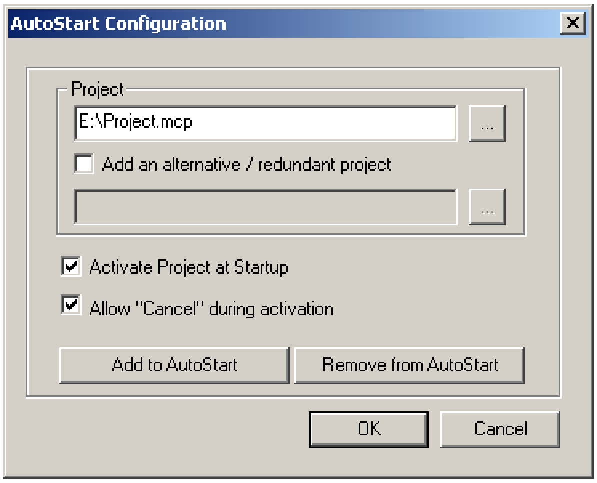
Table 12-1 Software packages on the local CMS station

Prerequisite	Software component
General	SIMATIC WinCC
	SIMOCRANE CMS for CMS
For Web Navigator access	WinCC / WebNavigator Server

Automatic start

- Autostart of PC as soon as there is a supply voltage: You can define how the PC behaves in its BIOS.
  - Set the boot behavior such that the PC starts up automatically as soon as there is a supply voltage.
- Automatic Windows user log-on
  - Set up automatic user log-on as described in Chapter Automatic user logon in Windows (Page 407).

- Automatic activation of the WinCC project: Launch the CMS example application using the WinCC "AutoStart Configuration" application.
  - From the Windows start menu, start "AutoStart Configuration".
  - Enter the path to the WinCC project in the "Project" field.
  - Set check mark for "Activate Project at Startup".
  - Remove check mark from "Allow "Cancel" during activation".
  - Enter the WinCC AutoStart Configuration application in the Windows autostart ("Add to AutoStart") button.



AutoStart Configuration

Project: E:\Project.mcp

☐ Add an alternative / redundant project

☑ Activate Project at Startup

☑ Allow "Cancel" during activation

Figure 12-1 WinCC AutoStart Configuration

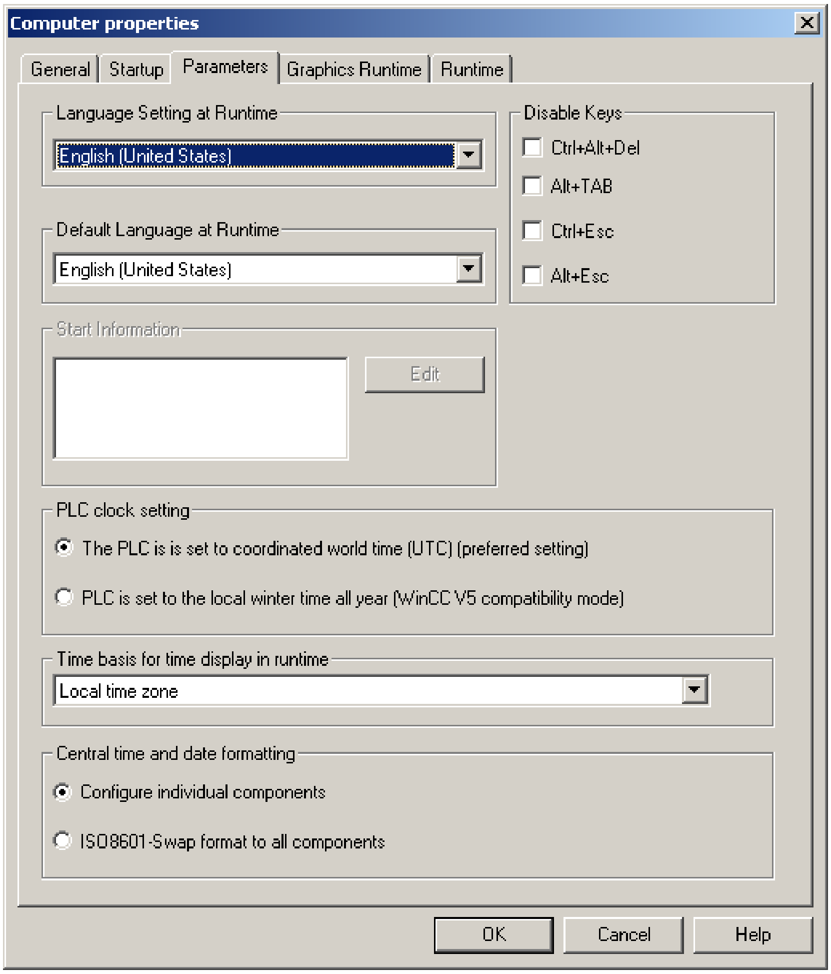
- Automatic activation of the WinCC options: You can enter the WinCC optional packages and add-ons (e.g. SIMOCRANE CMS) in the WinCC startup list.
  - Use "Computer properties" and "Startup" tab to open the startup list.
  - "Add…" opens the "Applications to add" window.
  - Enter the path and startup parameters of the application you want here.

Security settings

You can make most of the security settings in WinCC-Explorer under "Computer settings".

- Open the "Computer properties" in WinCC Explorer by selecting "Computer" → "Properties".
- Open the "Parameters" tab.

- Under "Disable Keys" you can deactivate a series of shortcuts which the user can use to access Window components from the CMS user interface. Do this by removing the check mark from the selection boxes.



Computer properties

Language Setting at Runtime: English (United States)

Default Language at Runtime: English (United States)

Start Information

Disable Keys

□ Ctrl+Alt+Del

□ Alt+TAB

□ Ctrl+Esc

□ Alt+Esc

PLC clock setting

● The PLC is is set to coordinated world time (UTC) (preferred setting)

○ PLC is set to the local winter time all year (WinCC V5 compatibility mode)

Time basis for time display in runtime: Local time zone

Central time and date formatting

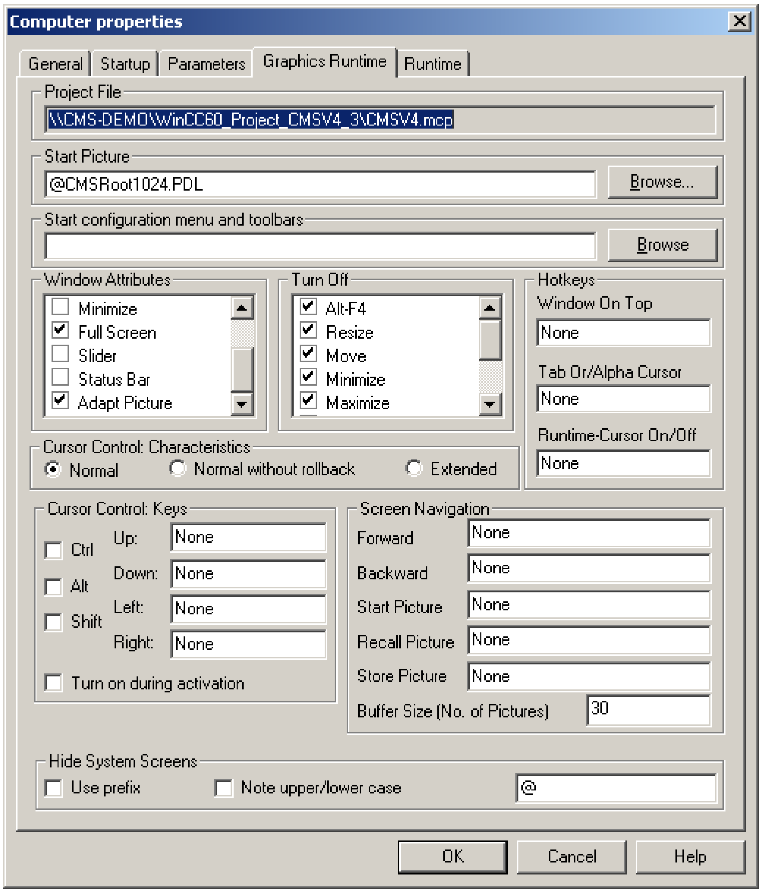
● Configure individual components

○ ISO8601-Swap format to all components

Figure 12-2 WinCC computer properties, "Parameters" tab

- Open the "Graphics Runtime" tab.

- You can set attributes for the graphics window in the "Window Attributes" field. Select the "Full Screen" attribute. The WinCC graphics runtime environment is then shown in full screen. The Windows user interface cannot be seen.
- You can deactivate various functions in the "Turn Off" field. Select the "Alt-F4" function to prevent the user interface being closed using the Alt-F4 shortcut.



Project File: \\CMS-DEMO\WinCC60_Project_CMSV4_3\CMSV4.mcp

Start Picture: @CMSRoot1024.PDL

Start configuration menu and toolbars:

Window Attributes
- □ Minimize
- ☑ Full Screen
- □ Slider
- □ Status Bar
- ☑ Adapt Picture

Turn Off
- ☑ Alt-F4
- ☑ Resize
- ☑ Move
- ☑ Minimize
- ☑ Maximize

Hotkeys
- Window On Top: None
- Tab Or/Alpha Cursor: None
- Runtime-Cursor On/Off: None

Cursor Control: Characteristics
● Normal ○ Normal without rollback ○ Extended

Cursor Control: Keys
- □ Ctrl
- □ Alt
- □ Shift
- Up: None
- Down: None
- Left: None
- Right: None
- □ Turn on during activation

Screen Navigation
- Forward: None
- Backward: None
- Start Picture: None
- Recall Picture: None
- Store Picture: None
- Buffer Size (No. of Pictures): 30

Hide System Screens
□ Use prefix □ Note upper/lower case @

Figure 12-3 WinCC computer properties, "Graphics Runtime" tab

12.3 PC configuration of the web client station

Software installation

1. Before installing the software packages, define the definitive name of the PC for the web client station.
2. Assign the PC's IP address according to your network configuration.
3. Install the software packages required on the PC. Note the installation instructions for the individual components. These software components are:

Table 12-2 Software packages on the web client station

Prerequisite	Software component
General	WinCC/Web Navigator Client
	SIMOCRANE CMS for the web client

12.4 User administration

12.4.1 Information for Windows users

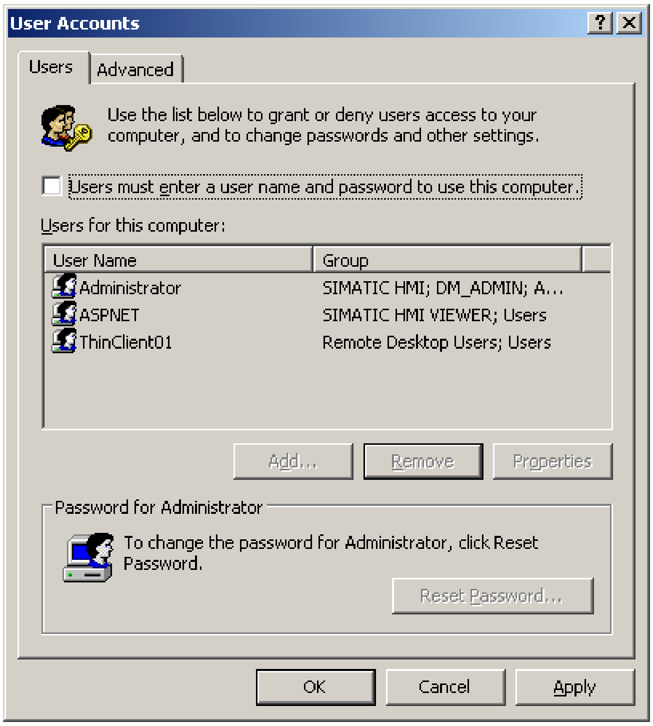
You must set up one main user and password on all PCs.

- Create a user with the same username and password on all the CMS stations.
- The user must have administrator rights.
- Refer to the WinCC documentation to check all other user rights required.

12.4.2 Automatic user logon in Windows

You can set up automatic logon for a Windows user upon the system starting in the user accounts:

1. Select "Start" → "Run" → "control userpasswords2" to access the "User accounts".



Use the list below to grant or deny users access to your computer, and to change passwords and other settings.

☐ Users must enter a user name and password to use this computer.

Users for this computer:

User Name	Group
Administrator	SIMATIC HMI; DM_ADMIN; A...
ASPNET	SIMATIC HMI VIEWER; Users
ThinClient01	Remote Desktop Users; Users

Password for Administrator

To change the password for Administrator, click Reset Password.

Figure 12-4 Windows user accounts

2. Remove the check mark from "User must enter a user name and password to use this computer".
3. When you click on "OK", the dialog appears for entering the user who is to be automatically logged on when the computer starts.
4. Enter the user's name and password for logging on.

Service and maintenance

13

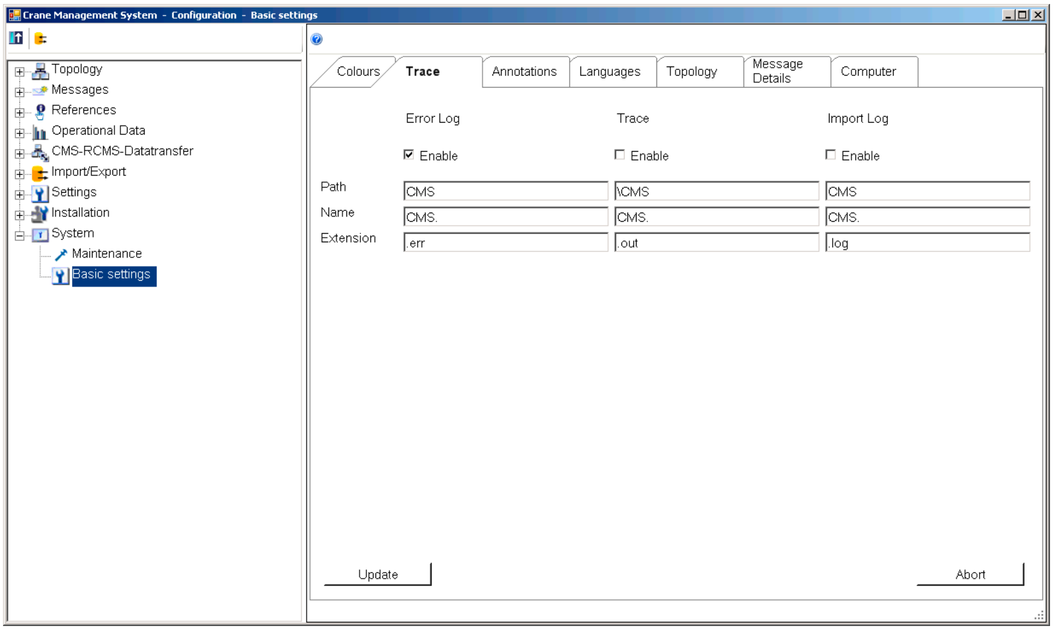
13.1 Checking the data volume

13.1.1 Log files

The CMS Runtime produces log files on the local crane station to output error messages, operating processes and import processes. The error log (*.err) only contains an entry if an error has occurred. The trace (*.out) very quickly absorbs a huge volume of data because the CMS Runtime writes a lot of output to the file for diagnostics purposes. A new file is created in the specified directory for each month. The default setting for the directory creates the log files in the "CMS" sub-folder in the WinCC project directory.

You can block or re-enable the output to the log files in the CMS editor. We would strongly recommend blocking the outputs to the trace log file during operation and only using this diagnostic function for commissioning. If you don't do this, huge volumes of data will collect because old files are not automatically deleted.

You can also prohibit the output of error logs to the error file.



	Error Log	Trace	Import Log
	☑ Enable	☐ Enable	☐ Enable
Path	CMS	\CMS	CMS
Name	CMS.	CMS.	CMS.
Extension	.err	.out	.log

Figure 13-1 Enabling/blocking log files in the CMS editor

1. Open the CMS editor in WinCC Explorer.
2. Navigate to "System" → "Basic settings" → "Trace".
3. Remove the check mark from the "Enable" box for "Trace" and also for the "Error Log" and "Import Log" if necessary.

13.2 Data archiving and backup

13.2.1 Backup of WinCC messages

Messages archived in WinCC can be swapped out of the archive database (WinCC Alarm Logging) as a backup. You can configure the swap-out in the archive manager of WinCC Alarm Logging.

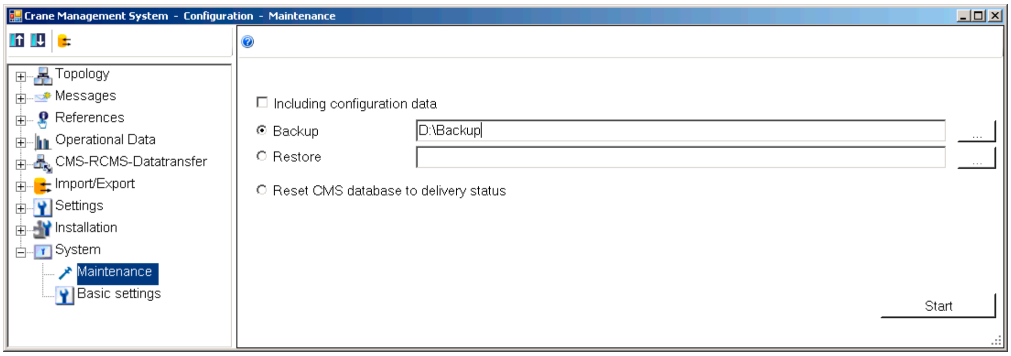
13.2.2 Backup of WinCC process values

Process values in WinCC can be swapped out of the archive database (WinCC Tag Logging) as a backup. You can configure the swap-out in the archive manager of WinCC Tag Logging.

13.2.3 Backup of user data in the CMS editor

You can save all your user data in the CMS editor as a backup.

You will find the backup function under "Settings" → "Maintenance". Here you can back up data, restore backed up data and reset the CMS database contents to the CMS delivery condition.



□ Including configuration data

● Backup D:\Backup

○ Restore

○ Reset CMS database to delivery status

Figure 13-2 Backup of user data in the CMS editor

Appendix A

A.1 Design guidelines

A.1.1 Introduction

The design guidelines form the basis of the CMS example applications in the interests of creating a standard and easily recognizable look and feel. The guidelines relating to the external look of the user interface should apply to all crane applications both on the crane itself and as the central terminal application.

The user interface should always ensure user-friendly operation. The needs of different end users (crane drivers, maintenance technicians, terminal operators) should be satisfied in particular. The design guideline aims to provide simple rules and concepts to also simplify configuration.

A.1.2 Screen design and layout

The layout of the CMS example applications deviates from the standard WinCC screen design. The concept is based on the idea of always giving the viewer a familiar framework which helps him or her find their way around the CMS user interface.

Symbolic displays rather than realistic graphics:

One design aspect is the use of simple but meaningful symbols to display screen objects. Using just a few graphic details produces an independent look.

Reduction in volume of information on display

The less information is displayed, the faster it can be taken in by the observer. The user interface screens shouldn't be used to pack as much information as possible onto the screen area provided. On the contrary, that information which the crane driver or service technician needs to reliably perform his work is displayed. Detailed information can also be called up if necessary.

Touch operation

The CMS is designed for touch operations, i.e. a mouse isn't used, the user simply touches the on-screen keypad. In terms of size, the control buttons are large enough that they can be operated by people wearing gloves. Simple settings can usually be undertaken using just one button.

A.1.3 Navigation

All screen navigation in the user interface is controlled using internal tags and picture windows. The user interface is split by hierarchy into four levels. All picture windows are in the @CMSRootxyz.pdl start screen. A picture tag is assigned to each picture window, which dynamizes its screen content. The tag content is controlled using the navigation bars for the first and second screen levels and using elements in the screen content for the third and fourth levels.

The fourth level simply contains the selection dialogs for the user.

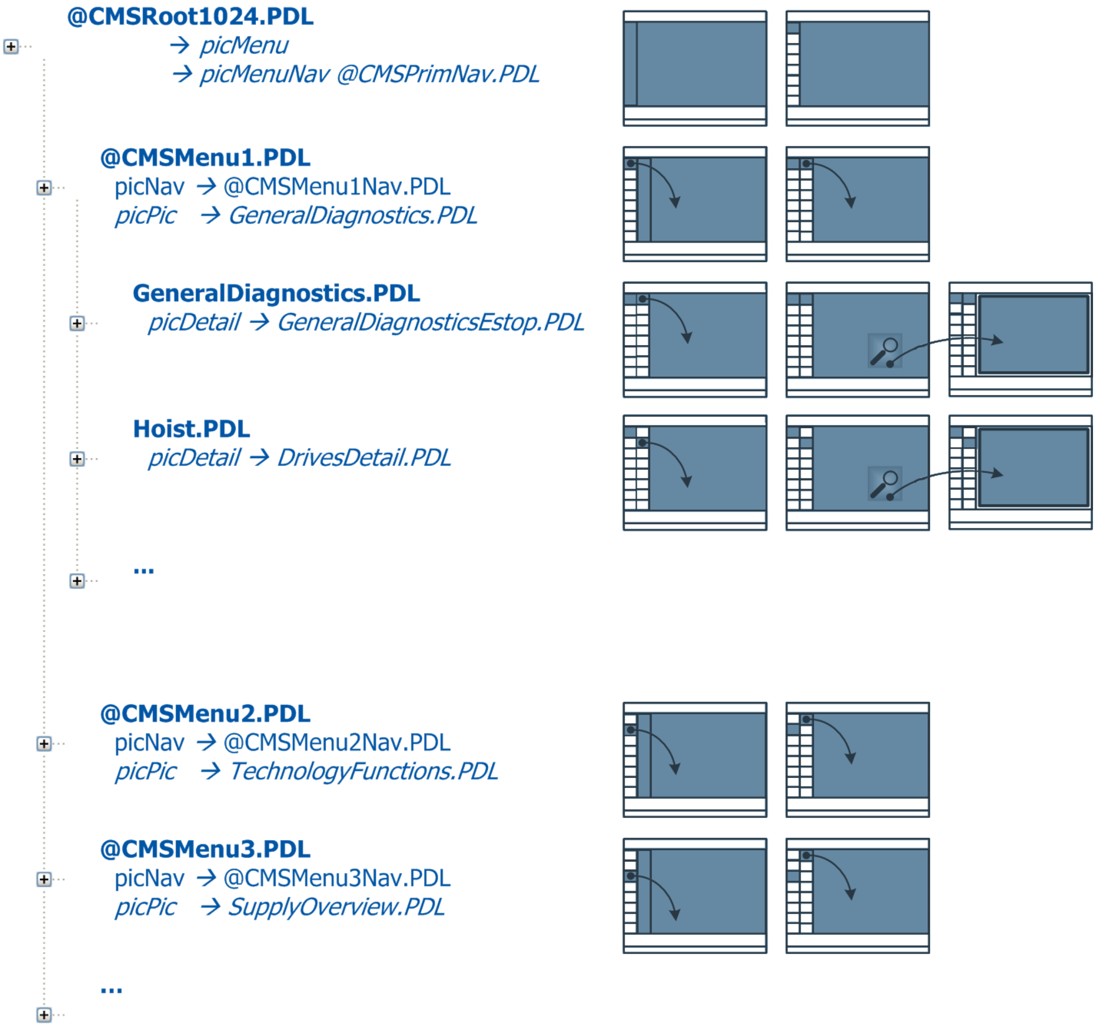

@CMSRoot1024.PDL
→ picMenu
→ picMenuNav @CMSPrimNav.PDL
@CMSMenu1.PDL
picNav → @CMSMenu1Nav.PDL
picPic → GeneralDiagnostics.PDL
GeneralDiagnostics.PDL
picDetail → GeneralDiagnosticsEstop.PDL
Hoist.PDL
picDetail → DrivesDetail.PDL
...
@CMSMenu2.PDL
picNav → @CMSMenu2Nav.PDL
picPic → TechnologyFunctions.PDL
@CMSMenu3.PDL
picNav → @CMSMenu3Nav.PDL
picPic → SupplyOverview.PDL
...

Figure A-1 Navigation

A.1.4 Color scheme

The color palette for the user interfaces has been reduced to a limited number of colors, based on the workbench design.

The static elements or normal operating modes are shown in a few colors from one family of colors (gray). Their job is to show the position of the components and not to stand out from the background.

Process values within the normal range and normal component operating modes are indicated by a few colors of another family of colors (blue) which clearly do stand out from the static background.

These unobtrusive gray and blue shades put the least strain on the human eye.

Using unobtrusive colors for static elements and normal operating modes means that the observer can quickly see fault states which stand out due to the use of high-contrast color shades when the components are not the focus of his or her field of vision.

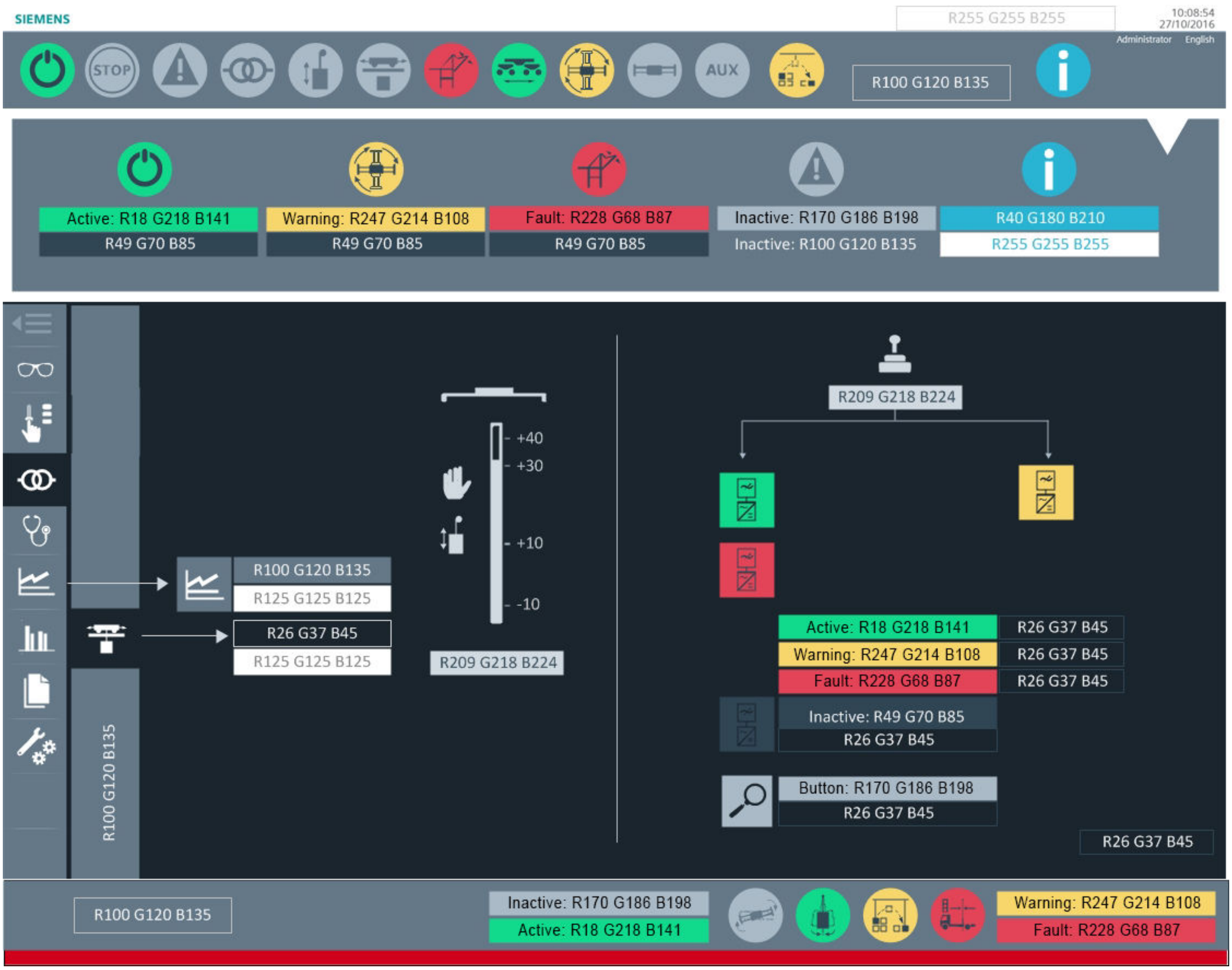


Figure A-2 CMS color palette

A.1.5 Naming conventions

Naming conventions for all parts of the project make it easier for the configuration to be traced. When using WinCC and its extensive functionality as a SCADA system, it is a good idea to observe the guidelines for naming throughout the project.

The naming conventions include:

- Tag names in the tag management (external and internal tags)
- Screen names for WinCC graphics
- Procedure names for project functions and actions
- Tag names within procedures
- Names for objects in WinCC graphics

The following applies: The more meaningful the element designations, the easier it is to navigate in a project. All designations are in English. Note that it is very hard to read extremely long names. We would therefore recommend using clear abbreviations for long names which are used frequently (e.g. "Res" for reset). But if using an abbreviation be sure to consistently use this abbreviation for the same expression.

The names are structured so that individual words are split by using a combination of upper and lower case (e.g. blnMoveTrigger).

Naming convention for tags

Tags in the tag management for the automation system or within procedures are designated such that both their type and wherever possible the components they are assigned to are clearly recognizable. Both parts are preceded by a meaningful designation.

Type + component + designation → e.g.: blnMoveTrigger

In scripts all WinCC tags used are defined at the start (#define). The prefix for the tags in the definition section is "tag".

Table A-1 Naming conventions for tags

Type	Type abbreviation as prefix	Example
Bool(ean)	bln	blnMoveTrigger
Byte	byt	bytHoistStateMotor
Short	srt	srtHoistCurrent
Word	wrd	wrdHoistStateDrive
Integer	int	intHoistCurrent
Double Word	dwd	dwdCounterReset
Long	lng	lngHoistDistance
Character	chr	chrPictureName
Tag	tag	tagPictureName

Naming convention for internal system tags

The internal CMS system tags are used for screen navigation, selecting objects or for general settings. They have the @CMS prefix. This prefix suggests that a system tag labeled in this way should be neither deleted nor changed. If they are deleted or changed, malfunctions may arise within the screens.

@CMS + designation → e.g.: @CMSMainPic

Naming convention for WinCC graphics

Just the same as the designation of internal tags, all CMS navigation screens in an example application start with the system prefix @CMS, e.g. @CMSMenu1.PDL.

Naming conventions for objects in WinCC graphics

Regardless of the HMI product used, as well as observing the conventions for naming tags and scripts, attention should also be paid to conventions for naming screen objects. Through the introduction of graphic standard objects (such as square-wave, line etc.), most HMI products support an object-focused development process.

The function of an object can therefore be recognized in the way all objects are depicted in the screen. Incorrectly inserted objects, which bear the standard name, can also be delimited.

The table below shows naming conventions for objects in WinCC screens.

Table A-2 Naming conventions for screen objects

Type	Type abbreviation as prefix	Example
Button	btn	btnCloseWindow
Control	ctrl	ctrlTrend
Graphic Object	gco	gcoCrane
Line	lin	linBorder
Picture Window	pic	picMainWindow
Rectangle	rcl	rclBorder
Status Display	std	stdMotor1
Text	txt	txtCounterName

Naming conventions for procedures ("Scripting")

The body of all tag / procedure names should be meaningful and reflect the tag function as well as possible. Procedure names should also start with a verb which contains the functionality realized, such as "InitNameArray" or "CloseDialog".

A.1.6 Code conventions

Code conventions are suggestions which aim to help you write VBS or C code for procedures and actions.

All the procedures (project functions) and global actions created should start with a brief comments header (see below), which briefly summarizes their functionality. Detailed descriptions should be moved to the code itself so that minor changes to code do not have to be constantly made in the header.

Function parameters in particular should be described in the header if their function is not clear from the name or if the procedure only permits certain values or value ranges. The same applies to return values and WinCC tags which are changed by the procedure.

Another key component of the comment header is the tracking of changes, with a product brief of the modifications made and an entry for the date and author for possible queries.

```
/////////////////////////////////////////////////////////////////
// Author:
//
// Version:
//
// Date:
//
// Function:
//
// Parameters:
//
// Return values:
//
///////////////////////////////////////////////////////////////

///////////////////////////////////////////////////////////////
//
// Change Log:
//
//    -DATE-         -AUTHOR-         -DESCRIPTION-
//
///////////////////////////////////////////////////////////////
```

A.1.7 Conventions for the screen structure

Screen levels

When producing the screen structure in the WinCC Graphics Designer, we would recommend using the WinCC principle of levels. The principle improves clarity during configuration.

Levels 1-7 were given preference in application projects. The conventions shown in the table have been used in these. In exceptional cases (due to the nesting of objects), there have been deviations from the convention:

Description	Level
Static background elements, screen frame	1-2
Static texts	2-3
Dynamic screen elements which cannot be operated	4
Screen elements which can be operated	5
Controls	6
Screen window	7
Faceplates and types	8

Description	Level
Superimposed elements	12
Invisible elements	15

Font sizes

To ensure a standard look, it is essential to keep the font sizes uniform. The following font sizes have been used in CMS example applications for a screen resolution of 1024 x 1280:

Designation	Size	Bold	Underlined	Use
Standard text	14	+	-	Standard I/O fields, standard texts
Standard title	14	+	+	Title for linked groups of I/O fields
Window title 1	16	+	-	Window title of detail and dialog windows
Text 1	18	+	-	Highlighting of important information / process values (I/O fields, texts)

A.2 XML import formats

A.2.1 General information

All import and export formats are structured as follows:

Basic structure of the import and export formats:

```
<?xml version="1.0" standalone="yes"?>
   <TableName-ExportDate>
      <TableName>
         <AttributeName>attribute_value</AttributeName>
         ...
      </TableName>
      <CMS_SYS_TBL_Version>
         <MajorNumber>1</MajorNumber>
         <MinorNumber>0</MinorNumber>
         <Revision>4</Revision>
      </CMS_SYS_TBL_Version>
   </TableName-ExportDate>
```

The tag names are case-sensitive, i.e. they differentiate between upper-case and lower-case letters. All mandatory fields must be filled in, optional fields can be left empty or excluded completely.

The coding format of the export date in the root tag of the export file is as follows:
`yyyy-mm-dd_HH-MM-SS`
(`yyyy`: four-digit year; `mm`: Month; `dd`: Day; `HH`: Hours; `MM`: Minutes; `SS`: seconds)

The database version used to create the XML file is output in each XML file. These details must not be deleted or changed. If necessary, this version information can also be used for the purpose of importing XML files that are compatible with all versions once changes have been made to the database pattern.

Note

The database version is not listed in all of the following examples.

A.2.2 Terminals

Table name: CMS_TOP_TBL_Terminals

Table A-3 Terminals

XML tag	Meaning	Format	Mandatory field
TerminalName	Name of the terminal	Text	yes
IconName	Name of the icon assigned to the terminal	Text	yes
Comment	Optional comment	Text	no

Example:

```
<CMS_TOP_TBL_Terminals-2007-12-30_14-45-45>
  <CMS_TOP_TBL_Terminals>
    <TerminalName>Terminal 1</TerminalName>
    <IconName>Terminal</IconName>
  </CMS_TOP_TBL_Terminals>
</CMS_TOP_TBL_Terminals-2007-12-30_14-45-45>
```

A.2.3 Equipment types

Table name: CMS_TOP_TBL_Equipments

Table A-4 Equipment types

XML tag	Meaning	Format	Mandatory field
EquipmentName	Name of the equipment type	Text	yes
IconName	Name of the icons assigned to the equipment type	Text	yes
Description	Equipment-specific comment to be displayed in a WinCC screen	Text	no
WinCCTag	Name of a WinCC tag for displaying an equipment-specific comment	Text	no
BandConditionFault	Range of numbers for "Fault" status	Text	no
BandConditionOk	Range of numbers for "OK" status	Text	no
BandConditionStandby	Range of numbers for "Idle" status	Text	no
BandConditionWarning	Range of numbers for "Warning" status	Text	no
OffsetMessageNumber	Offset for WinCC message numbers in the WinCC Alarm Logging	Numeric	yes
Comment	Optional comment	Text	no

Example:

```
CMS_TOP_TBL_Equipments-2010-09-07_14-27-35>
  <CMS_TOP_TBL_Equipments>
    <EquipmentName>STSCrane</EquipmentName>
    <IconName>Crane</IconName>
    <Description>80 tons</Description>
    <WinCCTag>Eq_Desc</WinCCTag>
    <BandConditionFault>128</BandConditionFault>
    <BandConditionOk>1</BandConditionOk>
    <BandConditionStandby>2-32</BandConditionStandby>
    <BandConditionWarning>64</BandConditionWarning>
    <OffsetMessageNumber>1000</OffsetMessageNumber>
  </CMS_TOP_TBL_Equipments>
</CMS_TOP_TBL_Equipments-2010-09-07_14-27-35>
```

A.2.4 Cranes

Table name: CMS_TOP_TBL_Nodes

Table A-5 Cranes

XML tag	Meaning	Format	Mandatory field
TerminalName	Identifier of terminal to which the crane is assigned	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
NodeName	Name of the crane	Text	yes
ComputerName	Name of the computer on which the CMS is running	Text	yes
IPAddress	IP address of the relevant link partner	Text	yes
PortNumber	Number of the port used for communication with the RCMS	Numeric	yes
IPAddressNIC	IP address of the network card, via which the CMS station is connected with the RCMS server. This setting must only be made for the topology "CMS with RCMS (WinCC)".	Text	no
isNodeViaTCPIP	Crane is linked to RCMS via TCP/IP	true/false	yes
isServer	Identifier indicating whether this involves an RCMS server	true/false	yes
TagNodeState	Name of a WinCC tag that can be used to read the crane status for controlling the display of the crane in the CMS NodeTree control.	Text	no (for CMS station)
SyncIntervalMessages	Interval in seconds where messages are transferred to the RCMS	Numeric	yes (for CMS station)
SyncIntervalOperationalData	Interval in seconds where operating data (such as move data, MMBF data, etc.) is transferred to the RCMS	Numeric	yes (for CMS station)
Comment	Optional comment	Text	no

Example

```
<CMS_TOP_TBL_Nodes>
     <TerminalName>Terminal1</TerminalName>
     <EquipmentName>RCMS</EquipmentName>
     <NodeName>RCMSServer</NodeName>
     <ComputerName>RCMS01</ComputerName>
     <IPAddress>192.168.11.1</IPAddress>
     <PortNumber>1482</PortNumber>
     <isNodeViaTCPIP>false</isNodeViaTCPIP>
     <isServer>true</isServer>
     <isDataTransformNeeded>false</isDataTransformNeeded>
     <Comment>RCMS Server PC</Comment>
</CMS_TOP_TBL_Nodes>
<CMS_TOP_TBL_Nodes>
     <TerminalName>Terminal1</TerminalName>
     <EquipmentName>STSCrane</EquipmentName>
     <NodeName>STSCrane1</NodeName>
     <ComputerName>CMS01</ComputerName>
     <IPAddress>192.168.11.10</IPAddress>
     <PortNumber>1482</PortNumber>
     <isNodeViaTCPIP>true</isNodeViaTCPIP>
     <isServer>false</isServer>
     <TagNodeState>Kran1.wrdCraneStatus</TagNodeState>
     <isDataTransformNeeded>false</isDataTransformNeeded>
     <SyncIntervalMessages>10</SyncIntervalMessages>
     <SyncIntervalOperationalData>10</SyncIntervalOperationalData>
     <Comment>CMS-Station of STSCrane1</Comment>
</CMS_TOP_TBL_Nodes>
```

A.2.5 Maintenance instructions

Table name: CMS_MSG_TBL_Causes

Table A-6 Maintenance instructions

XML tag	Meaning	Format	Mandatory field
Description	Maintenance instruction text	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
PossibleCause	Description of the possible cause of the fault	Text	no
PossibleRemedy	Description of a possible repair measure	Text	no
Comment	Comment on the maintenance instruction, is also displayed in CMSFaults.	Text	no

Example:

```
<CMS_MSG_TBL_Causes-2010-09-07_14-09-12>
```

Example:

```
  <CMS_MSG_TBL_Causes>
    <Description> Crane 4711 elevator jerks</Description>
    <PossibleCause> Cause2</PossibleCause>
    <PossibleRemedy> Remedy2</PossibleRemedy>
    <Comment> Comment2</Comment>
    <EquipmentName>STSCrane</EquipmentName>
  </CMS_MSG_TBL_Causes>
</CMS_MSG_TBL_Causes-2010-09-07_14-09-12>
```

A.2.6 Comments on maintenance instructions

Table name: CMS_LOG_TBL_LogEntries

Table A-7 Logbook

XML Tag	Meaning	Format	Mandatory field
Author	Name of the author	Text	yes
DateTimeEntered	Date entered	Date	yes
Scope	Indicates whether the comment is assigned to a message or a maintenance instruction text (only "Message" can be specified).	Text	yes
Entry	Comment text or logbook entry text	Text	no

Example:

```
<CMS_LOG_TBL_LogEntries-2007-12-30_14-45-45>
  <CMS_LOG_TBL_LogEntries>
    <Author>Adam</Author>
    <DateTimeEntered>2000-12-30T17:56:12+01:00</DateTimeEntered>
    <Entry>Entry</Entry>
    <Scope>Message</Scope>
  </CMS_LOG_TBL_LogEntries>
</CMS_TOP_TBL_LogEntries-2007-12-30_14-45-45>
```

A.2.7 Assignment of comments to maintenance instructions

Table name: CMS_MSG_TBL_AssignLog

Table A-8 Assignment of comments to maintenance instructions

XML Tag	Meaning	Format	Mandatory field
Author	Name of the author	Text	yes
DateTimeEntered	Date entered	Date	yes

XML Tag	Meaning	Format	Mandatory field
ColumnName	Column where an entry was made (*PossibleCause*, *PossibleRemedy, Comment*)	Text	yes
SourceType	Type of assignment (*Message*, *Cause*)	Text	yes
SourceName	Name of the element that is assigned to the the comment (WinCC message number, name of the maintenance instruction)	Text	yes

Example:

```
<CMS_LOG_TBL_AssignLog-2011-01-31_10-15-31>
  <CMS_LOG_TBL_AssignLog>
    <DateTimeEntered>2000-12-30T17:56:12+01:00</DateTimeEntered>
    <Author>Adam</Author>
    <ColumnName>Comment</ColumnName>
    <SourceType>Message</SourceType>
    <SourceName>1</SourceName>
  </CMS_LOG_TBL_AssignLog>
</CMS_LOG_TBL_AssignLog-2011-01-31_10-15-31>
```

A.2.8 Assignment of maintenance instructions

Table name: CMS_MSG_TBL_AssignCause

Table A-9 Assignment of maintenance instructions

XML tag	Meaning	Format	Mandatory field
Description	Name of the maintenance instruction that is assigned	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
MessageNumber	Message number from WinCC	Numeric	yes

Multiple items of information must be linked when maintenance instructions are assigned. Firstly, the maintenance instruction must be uniquely identifiable. This is achieved by specifying the maintenance instruction identifier. Secondly, the object to which the maintenance instruction is assigned must be exactly specified.

Example:

```
<CMS_MSG_TBL_AssignCause-2010-09-07_13-50-08>
  <CMS_MSG_TBL_AssignCause>
    <Description>Crane 4711 Limit switch tripped</Description>
    <EquipmentName>STSCrane</EquipmentName>
    <MessageNumber>1</MessageNumber>
  </CMS_MSG_TBL_AssignCause>
```

Example:

```
</CMS_MSG_TBL_AssignCause-2010-09-07_13-50-08>
```

In the example, the maintenance instruction with identifier "Crane 4711 Limit switch tripped" is assigned to the WinCC message with number 1 from "STSCrane" equipment type.

A.2.9 References

Table name: CMS_REF_TBL_References

Table A-10 References

XML tag	Meaning	Format	Mandatory field
ReferenceName	Reference identifier	Text	yes
ReferenceTypeName	Type of reference	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
ReferencePath	Path for accessing the reference	Text	no
MacroList	List of macros used, separated by tabs	Text	no
Comment	Optional comment	Text	no
ProgramName	Program with which the reference should be opened	Text	yes

Example:

```
<CMS_REF_TBL_References-2010-09-07_13-43-02>
  <CMS_REF_TBL_References>
    <ReferenceName> crane 4711 Motor Operating Instructions</ReferenceName>
    <ReferenceTypeName>Manuals</ReferenceTypeName>
    <ReferencePath>/A "page=%Page% %adobeFilename%</ReferencePath>
    <MacroList>%adobeFilename%        %Page%    </MacroList>
    <Comment> Notice! Big changes to XALM12</Comment>
    <ProgramName>Acrobat Reader</ProgramName>
    <EquipmentName>STSCrane</EquipmentName>
  </CMS_REF_TBL_References>
</CMS_REF_TBL_References-2010-09-07_13-43-02>
```

A.2.10 Assignment of references

Table name: CMS_MSG_TBL_AssignReference

Table A-11 Assignment of references

XML tag	Meaning	Format	Mandatory field
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
Reference	Identifier of the assigned reference	Text	yes
Type	Object type to which the reference is assigned (*Equipment*, *Node*, *Message*)	Selection	yes
Source	Name of the object to which the reference is assigned (name of crane or name of equipment type or message number)	Text	yes
ParameterList	List of macros and macro values used, separated by tabs Format: macro name <tab> macro value <tab>, etc.	Text	no

Multiple items of information must be linked when references are assigned. Firstly, the reference must be uniquely identifiable. This is achieved by specifying the reference identifier. Secondly, the object to which the reference must be assigned must be exactly specified.

If macros are used in the assignment, these macros are stored in the "ParameterList" tag along with the value to be substituted. The individual values are stored one after the other using the format <macro name> <tab> macro value <tab>, etc.

References can be assigned to the following types of object:

- An equipment type (type: Equipment)
- A message (type: Message)
- A crane (type: Node)

The type of assignment is defined by the "Type" tag. In addition to the type of assignment, the name of the object to which the reference is assigned is also required. This name is passed in the "Source" tag which contains either the name of the equipment type or of the crane.

Example:

```
<CMS_REF_TBL_AssignReference-2010-09-07_13-40-12>
  <CMS_REF_TBL_AssignReference>
    <EquipmentName>STSCrane</EquipmentName>
    <Reference>Crane 4711 Wind Meter Operating Instructions</Reference>
    <Type>Message</Type>
    <Source>1</Source>
    <ParameterList>=%Page% 4 %adobeFilename% wind.pdf</ParameterList>
  </CMS_REF_TBL_AssignReference>
</CMS_REF_TBL_AssignReference-2010-09-07_13-40-12>
```

In the example, the reference with identifier "Crane 4711 Wind Meter Operating Instructions" is assigned to the message with message number 1 for the "STSCrane" equipment type.

A.2.11 Cargo handling data

Table name: CMS_OPD_TBL_MoveArchives

Table A-12 Cargo handling data

XML tag	Meaning	Format	Mandatory field
ArchiveName	Name of the WinCC Tag Logging archive in which the data are entered.	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
TagStartMoveTrigger	Name of a WinCC tag, which contains the trigger event at the instant that the cargo handling operation starts.	Text	no
TagStartTimestampYear	Name of a WinCC tag, which contains the year of the start time.	Text	no
TagStartTimestampMonth	Name of a WinCC tag, which contains the month of the start time.	Text	no
TagStartTimestampDay	Name of a WinCC tag, which contains the day of the start time.	Text	no
TagStartTimestampHour	Name of a WinCC tag, which contains the hour of the start time.	Text	no
TagStartTimestampMinute	Name of a WinCC tag, which contains the minute of the start time.	Text	no
TagStartTimestampSecond	Name of a WinCC tag, which contains the second of the start time.	Text	no
TagStopMoveTrigger	Name of a WinCC tag, which contains the trigger event at the instant that the cargo handling operation stops.	Text	yes
TagStopTimestampYear	Name of a WinCC tag, which contains the year of the stop time.	Text	no
TagStopTimestampMonth	Name of a WinCC tag, which contains the month of the stop time.	Text	no
TagStopTimestampDay	Name of a WinCC tag, which contains the day of the stop time.	Text	no
TagStopTimestampHour	Name of a WinCC tag, which contains the hour of the stop time.	Text	no
TagStopTimestampMinute	Name of a WinCC tag, which contains the minute of the stop time.	Text	no
TagStopTimestampSecond	Name of a WinCC tag, which contains the second of the stop time.	Text	no
TagDurationMove	Name of a WinCC tag, which contains the duration of the cargo handling operation.	Text	no
TimestampFromStartEvent	Identifier as to whether the start time is also the archiving time. In the other case, the stop time is the archiving time.	true/false	no
isDisabled	Identifier as to whether processing is disabled	true/false	no
Comment	Optional comment	Text	no

For cargo handing data, you must always specify an archive name, the name of the equipment type as well as the selection as to which time stamp should be entered into the archive. Using the WinCC tags for the start and stop times, you control which acquisition mode should be selected.

You can either specify only the start and stop triggers, or you can specify the start and stop triggers as well as tags for the start and/or the stop time stamp from the control.

As a third possibility, you can just specify the stop trigger as well as the tags for the start time stamp and the stop time stamp.

As soon as you specify one of the time stamp components (year, month, …), then you must also specify all of the other components in the time stamp.

Example:

```
<CMS_OPD_TBL_MoveArchives-2010-09-07_10-47-15>
  <CMS_OPD_TBL_MoveArchives>
    <ArchiveName>Process Value Archive</ArchiveName>
    <TagStartMoveTrigger>MoveStart</TagStartMoveTrigger>
    <TagStartTimestampYear>MoveStartYear</TagStartTimestampYear>
    <TagStartTimestampMonth> MoveStartMonth</TagStartTimestampMonth>
    <TagStartTimestampDay> MoveStartDay</TagStartTimestampDay>
    <TagStartTimestampHour> MoveStartHour</TagStartTimestampHour>
    <TagStartTimestampMinute> MoveStartMinute</TagStartTimestampMinute>
    <TagStartTimestampSecond> MoveStartSecond</TagStartTimestampSecond>
    <TagStopMoveTrigger> MoveStop</TagStopMoveTrigger>
    <TagStopTimestampYear> MoveStopYear</TagStopTimestampYear>
    <TagStopTimestampMonth> MoveStopMonth</TagStopTimestampMonth>
    <TagStopTimestampDay> MoveStopDay</TagStopTimestampDay>
    <TagStopTimestampHour> MoveStopHour</TagStopTimestampHour>
    <TagStopTimestampMinute> MoveStopMinute</TagStopTimestampMinute>
    <TagStopTimestampSecond> MoveStopSecond</TagStopTimestampSecond>
    <TagDurationMove>MoveDuration</TagDurationMove>
    <TimestampFromStartEvent>true</TimestampFromStartEvent>
    <EquipmentName>STSCrane</EquipmentName>
  </CMS_OPD_TBL_MoveArchives>
</CMS_OPD_TBL_MoveArchives-2010-09-07_10-47-15>
```

In the example, the buffered cargo handling data acquisition is imported with start and stop trigger for the "STSCrane" equipment type.

A.2.12 Counters

Table name: CMS_TOP_TBL_Nodes

Table A-13 Counters

XML tag	Meaning	Format	Mandatory field
ArchiveName	Name of the WinCC Tag Logging archive in which the data are entered	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
AcquisitionCycle	Selection of the acquisition cycle for calculating the difference.	Numeric	yes
FirstStartDay	Parameters for the acquisition cycle; acquisition day.	Numeric	no
FirstStartHour	Parameters for the acquisition cycle; acquisition hour.	Numeric	no
FirstStartMinute	Parameters for the acquisition cycle; acquisition minute.	Numeric	no
isDisabled	Identifier as to whether processing is disabled.	true/false	no
Comment	Optional comment	Text	no

For the counters, you must always specify an archive name, the name of the equipment type as well as the acquisition cycle.

The acquisition cycle is coded as a numeric value. You can specify the following acquisition cycles:

- 2: Hourly
- 3: Daily
- 4: Weekly
- 5: Monthly

Depending on the acquisition cycle you select, the following parameters apply as mandatory fields:

- Hourly: FirstStartMinute (0-59)
- Daily: FirstStartMinute (0-59); FirstStartHour (0-23)
- Weekly: FirstStartMinute (0-59); FirstStartHour (0-23); FirstStartDay (1-7)
- Monthly: FirstStartMinute (0-59); FirstStartHour (0-23); FirstStartDay (1-31)

Example:

```
<CMS_OPD_TBL_CounterArchives-2010-09-07_11-00-55>
  <CMS_OPD_TBL_CounterArchives>
    <ArchiveName> CounterHourly </ArchiveName>
    <AcquisitionCycle>2</AcquisitionCycle>
    <FirstStartMinute>0</FirstStartMinute>
    <EquipmentName>TEST</EquipmentName>
  </CMS_OPD_TBL_CounterArchives>
  <CMS_OPD_TBL_CounterArchives>
    <ArchiveName>CounterMonthly</ArchiveName>
    <AcquisitionCycle>5</AcquisitionCycle>
    <FirstStartDay>1</FirstStartDay>
```

Example:

```
    <FirstStartHour>0</FirstStartHour>
    <FirstStartMinute>0</FirstStartMinute>
    <EquipmentName>STSCrane</EquipmentName>
  </CMS_OPD_TBL_CounterArchives>
</CMS_OPD_TBL_CounterArchives-2010-09-07_11-00-55>
```

In this example, two archives are imported for calculating the counter difference for the "STSCrane" equipment type. The first archive records the data hourly to minute 0, the second archive records the data monthly to the first day of the month at 00:00:00.

A.2.13 MMBF

Table name: CMS_OPD_TBL_MMBFArchives

Table A-14 MMBF

XML tag	Meaning	Format	Mandatory field
ArchiveName	Name of the WinCC Tag Logging archive in which the data are entered.	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
TagMMBFTrigger	Selection of the acquisition cycle for calculating the difference	Text	yes
TagTimestampYear	Name of a WinCC tag, which contains the year of the time stamp	Text	no
TagTimestampMonth	Name of a WinCC tag, which contains the month of the time stamp	Text	no
TagTimestampDay	Name of a WinCC tag, which contains the day of the time stamp	Text	no
TagTimestampHour	Name of a WinCC tag, which contains the hour of the time stamp.	Text	no
TagTimestampMinute	Name of a WinCC tag, which contains the minute of the time stamp.	Text	no
TagTimestampSecond	Name of a WinCC tag, which contains the second of the time stamp.	Text	no
isDisabled	Identifier as to whether processing is disabled.	true/false	no
Comment	Optional comment	Text	no

For the MMBF data, you must always specify an archive name, the name of the equipment type as well as the trigger.

As soon as you specify one of the time stamp components (year, month, …), then you must also specify all of the other components in the time stamp.

Example:

```
<CMS_OPD_TBL_MMBFArchives-2010-09-07_11-39-49>
  <CMS_OPD_TBL_MMBFArchives>
    <ArchiveName>Process Value Archive</ArchiveName>
    <TagMMBFTrigger>MmbfTrigger</TagMMBFTrigger>
```

Example:

```
     <TagTimestampYear> MmbfYear</TagTimestampYear>
     <TagTimestampMonth>MmbfMonth</TagTimestampMonth>
     <TagTimestampDay>MmbfDay</TagTimestampDay>
     <TagTimestampHour>MmbfHour</TagTimestampHour>
     <TagTimestampMinute>MmbfMinute</TagTimestampMinute>
     <TagTimestampSecond>MmbfSecond</TagTimestampSecond>
     <EquipmentName>STSCrane</EquipmentName>
  </CMS_OPD_TBL_MMBFArchives>
</CMS_OPD_TBL_MMBFArchives-2010-09-07_11-39-49>
```

In the example, an MMBF data archive is imported for the "STSCrane" equipment type. WinCC tags are defined to acquire the time stamp.

A.2.14 Tag list

Table name: CMS_OPD_TBL_Taglists

Table A-15 Tag list

XML tag	Meaning	Format	Mandatory field
TagName	Name of the WinCC tag to be transferred	Text	yes
isSystemTag	True: Identifier for CMS system variable	true/false	no
AcquisitionCycle	Selection of the acquisition cycle for the tag	Numeric	yes
FirstStartHour	Parameters for the acquisition cycle; acquisition hour	Numeric	no
FirstStartMinute	Parameters for the acquisition cycle; acquisition minute	Numeric	no
VariableTypeID	ID for WinCC tag type (see table below)	Numeric	yes
VariableTypeLength	Length of the WinCC tag	Numeric	yes
isSyncRTDisabled	True: Selection Runtime data transfer	true/false	No
isSyncCSDisabled	True: Selection, configuration data transfer	true/false	no
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes

For the tag list, for each tag that you wish to transfer you must specify a tag name, the name of the equipment type as well as the acquisition cycle.

The acquisition cycle is coded as a numeric value. You can specify the following acquisition cycles:

- 0: Every minute
- 1: Every second
- 2: Every hour
- 3: Daily
- 7: Upon change

Depending on the acquisition cycle you select, the following parameters apply as mandatory fields:

- Every hour: FirstStartMinute (0-59)
- Daily: FirstStartMinute (0-59); FirstStartHour (0-23)

For each tag, the tag type is coded in the form of an ID:

Example:

```
<CMS_OPD_TBL_TaglistTags-2011-01-17_10-52-27>
  <CMS_OPD_TBL_TaglistTags>
    <TagName>StartAus</TagName>
    <isSystemTag>false</isSystemTag>
    <AcquisitionCycle>3</AcquisitionCycle>
    <FirstStartHour>12</FirstStartHour>
    <FirstStartMinute>0</FirstStartMinute>
    <VariableTypeID>11</VariableTypeID>
    <VariableTypeLength>0</VariableTypeLength>
    <isSyncRTDisabled>false</isSyncRTDisabled>
    <isSyncCSDisabled>false</isSyncCSDisabled>
    <EquipmentName>STSCrane</EquipmentName>
  </CMS_OPD_TBL_TaglistTags>
</CMS_OPD_TBL_TaglistTags-2011-01-17_10-52-27>
```

In the example, a tag is imported for the "STSCrane" equipment type. The tag is acquired daily.

A.2.15 Icons

Table name: CMS_TOP_TBL_Icons

Table A-16 Icons

XML tag	Meaning	Format	Mandatory field
IconName	Name of the icon	Text	yes
IconOk	Icon for displaying the "OK" status; 16 x 16 pixels	Base64String	no
IconLargeOk	Icon for displaying the "OK" status 32 x 32 pixels	Base64String	no
IconOffline	Icon for displaying the "Offline" status; 16 x 16 pixels	Base64String	no
IconLargeOffline	Icon for displaying the "Offline" status; 32 x 32 pixels	Base64String	no
IconFault	Icon for displaying the "Fault" status; 16 x 16 pixels	Base64String	no
IconLargeFault	Icon for displaying the "Fault" status; 32 x 32 pixels	Base64String	no

XML tag	Meaning	Format	Mandatory field
IconWarning	Icon for displaying the "Warning" status; 16 x 16 pixels	Base64String	no
IconLargeWarning	Icon for displaying the "Warning" status; 32 x 32 pixels	Base64String	no
IconStandby	Icon for displaying the "Idle" status; 16 x 16 pixels	Base64String	no
IconLargeStandby	Icon for displaying the "Idle" status; 32 x 32 pixels	Base64String	no
IconCMSRuntimeDown	Icon for displaying that the CMS Runtime has not been started; 16 x 16 pixels	Base64String	no
IconLargeCMSRuntime-Down	Icon for displaying that the CMS Runtime has not been started; 32 x 32 pixels	Base64String	no
IconWinCCRuntime-Down	Icon for displaying that the WinCC Runtime has not been started; 16 x 16 pixels	Base64String	no
IconLargeWinCCRuntimeDown	Icon for displaying that the WinCC Runtime has not been started; 32 x 32 pixels	Base64String	no
IconPLCNotConnected	Icon for displaying that there is no connection to the control; 16 x 16 pixels	Base64String	no
IconLargePLCNotConnected	Icon for displaying that there is no connection to the control; 32 x 32 pixels	Base64String	no
IconUndefined	Icon for displaying an undefined status; 16 x 16 pixels	Base64String	no
IconLargeUndefined	Icon for displaying an undefined status; 32 x 32 pixels	Base64String	no
Comment	Optional comment	Text	no

Note

Base64 defines a method for coding 8-bit binary data (e.g. executable programs, zip files or screens) in a string comprising only a few codepage-neutral ASCII characters. External tools are available for displaying and/or generating base64-coded information. Services for the online coding or decoding of base64-coded information are also available on the Internet.

Example:

```
<CMS_TOP_TBL_Icons-2007-12-30_14-45-45>
  <CMS_TOP_TBL_Icons>
     <IconName>Crane</IconName>
     <IconOk>Qk32AAAAAAAAAHYAAAAoAAAAEAA  ...  AAAAAAAA==</IconOk>
     <IconOffline>Qk32AAAAAAAAAHYAAAAoAAAAEAA ...  AAAAAAAAAA==</IconOffline>
     <IconFault>Qk32AAAAAAAAAHYAAAAoAAAAEA   ...   BAAAAAAAAAAAAA==</IconFault>
     <IconWarning>Qk32AAAAAAAAAHYAAAAoAAA   ...   AAAAAAAAAA==</IconWarning>
     <Comment />
  </CMS_TOP_TBL_Icons>
</CMS_TOP_TBL_Icons-2007-12-30_14-45-45>
```

A.2.16 Macros

Table name: CMS_REF_TBL_Macros

Table A-17 Macros

XML tag	Meaning	Format	Mandatory field
MacroName	Macro name	Text	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
MacroText	Macro value for global macros	Text	no
isValueSuppliedBySystem	Identifier, macro value determined by the system	true/false	yes
isPredefined	Identifier, predefined macro	true/false	yes
Comment	Optional comment	Text	no

When manually adapting macros, no changes must be made to macros which have the value "true" in one or both of the "isPredefined" or "isValueSuppliedBySystem" identifiers. For all user-defined macros, the value for both these fields must always be "false".

Example:

```
<CMS_REF_TBL_Macros-2009-05-13_09-56-21>
  <CMS_REF_TBL_Macros>
    <MacroName>%ApplicationPath%</MacroName>
    <isValueSuppliedBySystem>true</isValueSuppliedBySystem>
    <isPredefined>true</isPredefined>
    <EquipmentName>STSCrane</EquipmentName>
  </CMS_REF_TBL_Macros>
</CMS_REF_TBL_Macros-2009-05-13_09-56-21>
```

A.2.17 Programs

Table name: CMS_REF_TBL_Programs

Table A-18 Programs

XML tag	Meaning	Format	Mandatory field
ProgramName	Name of the program as it is displayed in the selection fields	Text	yes
CommandString	Command to be executed	Text	no
MacroList	List of macros used, separated by tabs	Text	no
Comment	Optional comment	Text	no

Example:

```
<CMS_REF_TBL_Programs-2007-12-30_14-45-45>
```

Example:

```
  <CMS_REF_TBL_Programs>
    <ProgramName>Acrobat Reader</ProgamName>
    <CommandString>%ProgramFiles%\Adobe\Reader 8.0\Reader\AcroRd32.exe</CommandString>
    <MacroList>%ProgramFiles%</MacroList>
  </CMS_REF_TBL_Programs>
</CMS_REF_TBL_Programs-2007-12-30_14-45-45>
```

A.2.18 Reference types

Table name: CMS_ REF_TBL_ReferenceTypes

Table A-19 Reference types

XML tag	Meaning	Format	Mandatory field
ReferenceTypeName	Name of the reference type	Text	yes
TabOrder	Sort identifier	Numeric	yes
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
Comment	Optional comment	Text	no

Example:

```
<CMS_REF_TBL_ReferenceTypes-2008-01-29_11-19-51>
  <CMS_REF_TBL_ReferenceTypes>
    <ReferenceTypeName>Manuals</ReferenceTypeName>
    <TabOrder>20</TabOrder>
    <EquipmentName>STSCrane</EquipmentName>
    <Comment />
  </CMS_REF_TBL_ReferenceTypes>
</CMS_REF_TBL_ReferenceTypes-2008-01-29_11-19-51>
```

A.2.19 Languages

A.2.19.1 Transfer

The transfer export function is used, for example, to transport language-specific texts to other installations. This export file contains the content of several tables in the order given below:

- Table containing all dialog components or messages (CMS_SYS_TBL_UserTextComponents)
- Table with the language-specific content of the dialog components or messages (CMS_SYS_TBL_UserTexts)

Table A-20 Languages

XML tag	Meaning	Format	Mandatory field
CountryRegion	Unique language identifier	Text	yes
ShortSign	Language code	Text	yes
LCID	Windows local ID data	Numeric	yes
TabOrder	Sorting criterion in the table of implemented languages or sequence of tabs in the acquisition screens	Numeric	yes
DefaultLanguage	Identifier for default language	True/False	yes

Table A-21 Dialog components and messages

XML tag	Meaning	Format	Mandatory field
ComponentName	Message details ("MessageDetailRows") and reference types ("ReferenceTypes")	Text	yes
UserText	Text code for message details and reference types	Text	yes
Comment	Optional comment	Text	no

Table A-22 Language-specific content of dialog components or messages

XML tag	Meaning	Format	Mandatory field
ComponentName	Name of the dialog, data type or message group	Text	yes
UserName	Name of the dialog component, language code value or message identifier	Text	yes
CountryRegion	Unique language identifier	Text	yes
Text	Language-specific text	Text	yes

Example:

```
<UserTextsTransfer>
  <CMS_SYS_TBL_ImplementedLanguages>
    <CountryRegion>German - default</CountryRegion>
    <ShortSign>de</ShortSign>
    <LCID>1031</LCID>
    <TabOrder>1</TabOrder>
    <DefaultLanguage>1</DefaultLanguage>
  </CMS_SYS_TBL_ImplementedLanguages>
  <CMS_SYS_TBL_UserTextComponents>
    <ComponentName>MessageDetailRows</ComponentName>
    <UserTextName>DBEquipment</UserTextName>
  </CMS_SYS_TBL_UserTextComponents>
  <CMS_SYS_TBL_UserTextComponents>
    <ComponentName>MessageDetailRows</ComponentName>
    <UserTextName>DBNode</UserTextName>
    <Comment />
  </CMS_SYS_TBL_UserTextComponents>
  <CMS_SYS_TBL_UserTexts>
    <ComponentName>MessageDetailRows</ComponentName>
    <UserTextName>DBNode</UserTextName>
    <CountryRegion>English - United States</CountryRegion>
    <Text>Crane name</Text>
  </CMS_SYS_TBL_UserTexts>
</UserTextsTransfer>
```

A.2.19.2 Translation

The export file for translation of language-specific texts contains only the parameters required for performing a translation. While the transfer export file always contains the language-specific information for all implemented languages, the translation export file contains only the language-specific texts of one language.

Table A-23 Languages

XML tag	Meaning	Format	Mandatory field
EquipmentName	Identifier of the equipment type to which the crane is assigned	Text	yes
ComponentName	Name of the data type	Text	yes
UserTextName	Internal data key	Text	yes
Text	Language-specific text	Text	yes
Comment	Optional comment	Text	no

Example:

```
<LanguagesTranslation>
  <CMS_SYS_TBL_UserTexts_English-UnitedStates>
    <EquipmentName>STSCrane</EquipmentName>
    <ComponentName>MessageDetailRows</ComponentName>
    <UserTextName>DBNode</UserTextName>
    <Comment />
    <Text>Crane name</Text>
  </CMS_SYS_TBL_UserTexts_English-UnitedStates>
</LanguagesTranslation>
```

A.2.20 FMDB import

The XML import format is a bought-in component and is therefore completely different to the scheme described above. The following data are supplied for the FMDB import:

Table A-24 FMDB import

XML tag	Meaning	Format	Mandatory field
IFNo	WinCC fault number	Text	yes
InstructionText	Maintenance instruction (probable cause of fault)	Text	no
TestText	Maintenance instruction (probable fault remedy)	Text	no
CD_Page	Content for macro: Absolute page in the circuit diagram	Numeric	no
PLC_Block	Content for macro: Block in the Step 7 project	Numeric	no
PLC_NW	Content for macro: Network in the above mentioned block of the Step 7 project	Numeric	no
…	Content for macro: …	…	…

For an FMDB import, maintenance instructions are imported as well as the assignment of references with defined wildcards for any number of existing message numbers. A reference is assigned if it contains an FMDB XML tag.

You can also add any XML tags, the content of which you define existing wildcards (macros) when assigning a reference to the specified message number. You must have first defined the macro in the dialog used to define macros in the CMS Editor. Observe the following notation: `%FMDB_TagName%`

Example:

```
<XML-Export>
  <IFNo>1</IFNo>
  <MessageText>ET200 fault Low voltage distribution-1</MessageText>
  <InstructionText>fgngfn</InstructionText>
  <TestText>fdbgfngn</TestText>
  <CD_Page>11</CD_Page>
```

Example:

```
  <PLC_Block>FC1001</PLC_Block>
  <PLC_NW>1</PLC_NW>
</XML-Export>
<XML-Export>
  <IFNo>2</IFNo>
  <MessageText>ET200 fault Low voltage distribution-2</MessageText>
  <InstructionText>fgngfn</InstructionText>
  <TestText>fdbgfngn</TestText>
  <CD_Page>12</CD_Page>
  <PLC_Block>FC1001</PLC_Block>
  <PLC_NW>2</PLC_NW>
</XML-Export>
```

In the example above, the maintenance instructions as well as the content for three wildcards are imported for the reference assignment for two WinCC messages.