

MNS iS Motor Control Center  
MService based Condition Monitoring V7.3  
User Manual



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# 1 General

## 1.1 Target Group

MService is the embedded MNS iS Condition Monitoring device. Audiences of this manual are service technicians and switchgear operators on site.

The document describes how to get the device installed in a switchgear network, and how to operate it using the web based user interface.

The reader shall be familiar with the terms and concept of ABB MNS iS Low Voltage Switchgear.

## 1.2 Use of Warning, Caution, Information and Tip icon

This publication includes **Warning**, **Caution**, and **Information** icons where appropriate to point out safety related or other important information. It also includes **Tip** icons to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:



The electrical warning icon indicates the presence of a hazard that could result in *electrical shock*.



The warning icon indicates the presence of a hazard that could result in *personal injury*.



The caution icon indicates important information or warnings related to the concept discussed in the text. It might indicate the presence of a hazard that could result in *corruption of software or damage to equipment/property*.



The information icon alerts the reader to pertinent facts and conditions.



The tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although **Warning** notices are related to personal injury, and **Caution** notices are associated with equipment or property damage, it should be understood that the operation of damaged equipment could, under certain operational conditions, result in impaired process performance leading to personal injury or death. It is, therefore, imperative that you comply fully with all **Warning** and **Caution** notices.

### 1.3 Terminology

List of the terms, acronyms, abbreviations and definitions, the document uses.

Abbreviation	Term	Description
Eth.	Ethernet	Ethernet is a local area network (LAN) technology. The Ethernet standard specifies the physical medium, access control rules and the message frames.
HMI / WebHMI	Human Machine Interface	Hard- and Software which implements the user interface. A WebHMI is a SW providing the HMI in an Internet web browser
LVS	Low voltage switchgear	Low voltage switchgear assembly built in accordance with IEC 61439-1
MCC	Motor Control Centre	Common term for switchgear used for motor control and protection.
MNS		Modular Low Voltage Switchgear family from ABB
MNS iS		The integrated intelligent switchgear solution from ABB
	MStart MFeed MControl MConnect MSpeed MLink MView MNavigate	MNS iS components integrated in the switchgear, see the MNS iS System Guide for technical details
OPC		The industrial de-facto standard for exchange of information between components and process supervision and monitoring applications using TCP/IP based networks.
OPC ID	MNS iS OPC Network identifier	The OPC ID configured for MLink devices and for the OPC Server defines, which MLink devices are communicating to which OPC server. This defines a kind of logical sub-net within a certain IP network.
TCP/IP	Transmission Control Protocol / Internet Protocol	TCP/IP is a high-level connection oriented, reliable, full duplex communication protocol developed for networked integration of the heterogeneous computer systems.
NAMUR		NAMUR is an international user association of automation technology in process industries.

## 1.4 References

- [1] 1TGC910001B0204 MNS iS System Guide
- [2] 1TGC910231M0202 MNS iS OPC Server Interface Manual V7.3
- [3] 1TGC910221M0201 MNS iS Interface Manual Web Interface\_Rel\_7.0
- [4] NE107(2006-02-10)  
NAMUR Recommendation Self-Monitoring and Diagnosis of Field Devices



## 2 System Overview

### 2.1 Product Concept

The MService device implements an innovative approach to MNS iS condition monitoring: The supervision of the performance and health status of a MNS iS switchgear is made possible with a small-scale and easy-to-use embedded industrial PC.

The MService implements the whole condition monitoring concept from collecting field level real-time data to performing assessment algorithms. Based on that, it is possible to work out a prognosis of developing situations and prompting the operator for action. However, if the situation continues and results in a tripping or failure, the MService offers clear diagnosis for fast problem resolution.



Fig. 1: MService device

MService targets two main application scenarios:

- Customer's staff needs ongoing performance analysis and continuous support for maintenance planning for the MNS iS system, with MService installed as permanent part of the switchgear.
- ABB's service personnel uses the device to place it temporarily in a customer's switchgear to support customer decisions in keeping the switchgear in good condition by collecting data for a certain time and derive an assessment on the switchgear performance and health status.

To fit to these scenarios, the MService employs a small-scale, compact approach to enable fast commissioning and ease of use.

## 2.2 Supported Functions

MService Condition Monitoring covers the following main functions:

- Collection of operational data of the supervised modules
- Collection of all alarms and trips generated in the supervised modules
- Collection of maintenance warnings derived from additional assessment logic related to the supervised modules.
- Display of the MNS iS system structure highlighting modules signaling problems
- Display of historical data in trend displays
- Detailed information on the identification, location, and type of supervised modules
- Online supervision of temperature or power loss related problems within individual cubicles.

MService can supervise all modules in MNS iS, which are connected to the internal switchgear communication bus. This includes:

- Motor starter and feeder modules (all sizes), which are equipped with measuring and communication electronic device MControl
- Circuit breakers connected to the switchgear communication with the interface MConnect

Excluded from supervision in MService are all modules not connected to the internal switchgear communication such as MSpeed (Variable Speed drives in MNS iS) or conventional feeder.

In general, MService supports all types of modules which are also accessible in MView.

## 2.3 Hardware characteristics

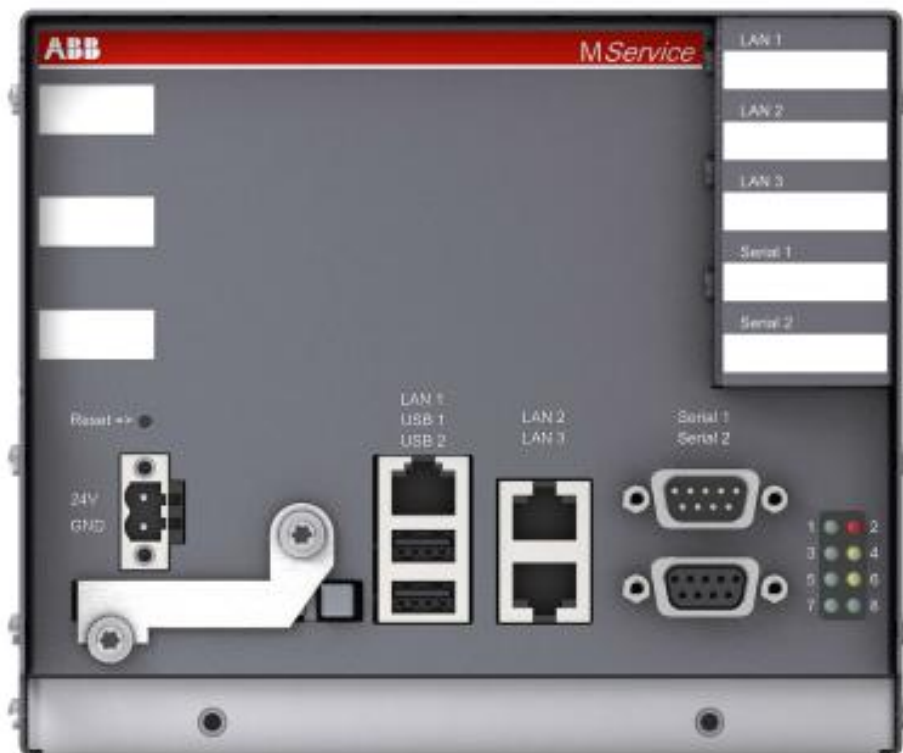


Fig. 2: MService interfaces

All interfaces of the MService devices are located in the front plate. The following interfaces are relevant for the operation of the device:

Power connector	24 DC connection
Reset button	If pressed < 5s, an operating system reboot is initiated. If pressed > 5s, an immediate hardware restart is executed.
CF-Card slot	The compact flash card is used to transfer configuration data to the device. For proper operation of the device a compact flash card must be inserted. To enforce this, the CF-Card slot is covered by a latch, which is locked by the power connector.
Network interfaces	
LAN1	1GB/s autosensing interface free to use for any network
LAN2	1GB/s autosensing interface free to use for any network. Primary interface to connect switchgear network and MNavigate.
LAN3	1GB/s autosensing interface with fixed IP-configuration used for point-to-point connection to a PC running MNavigate for initial

	<p>configuration download or maintenance access.</p> <p>The autosensing capability does not require using a cross-over cable to connect</p> <p>To avoid IP-Address conflicts, this interface must not be connected to a network switch.</p>
USB connectors	Used to attach an external hard drive for Backup/Restore of database.

The following interfaces are not used by regular operation:

Serial port 1 and 2	Not used
---------------------	----------

The LEDs on the front plate have the following indicator function:

LED 1 – 6	Not used / future option
LED 7	24V Power is connected and available
LED 8	Not used / future option


## 2.4 Technical Data

Electrical Data	
Power Supply	24V DC (19 – 31V DC)
Power Consumption	Typical 800mA, Maximum 1000mA
Mechanical Data	
Weight	2.5 kg
Dimensions H x W x D	140 x 160 x 165 mm
Environmental Data	
Storage Temperature	-20°C to +70°C
Operating Temperature	0°C to +55°C
Degree of Protection	IP 51
MTBF (Mean Time Between Failures)	46 years @ 40°C
System behavior	
Boot time of operating system	1 min
Start-up of SCADA and OPC packages	2min + SCADA Startup Delay (s) + (45s per connected MLink) + 5 min, if no MLink is available in network
Configuration time	30s per supervised MNS iS module/device

## 3 Installation and Commissioning

### 3.1 Commissioning Workflow Overview

The following workflow outlines the necessary steps to setup a MService device. Details for the individual items are found in the subsequent sections.

Step	Description
1	Mechanical installation and electrical connection. See section 0
2	Planning of network parameters within the switchgear network. See Sec. 3.3
3	Update the MService firmware with latest fixes available from the BU LPLS Support Database. See Sec. 3.5
4	Configuring network settings and other parameters in MNavigate. See section 3.4.1
5	Copy / Download initial configuration to MService See section 3.4.7
6	Connect MService to switchgear network
7	Power on   In order to have a correct start of the communication between the MService and the MLink devices it is essential to configure and connect first the switchgear LAN, and boot the device afterwards.
8	Complete the configuration using the 'Autoconfigurator Wizard' See section 4.3

### 3.2 MService mounting in MNS iS cubicle

The MService device is placed in the control compartment of a MNS iS switchboard. The device is mechanically held by means of a device support (single support 300mm for MService only, double support 400mm for MLink/MService combinations).

The electrical power (24V DC) is typically taken from the control voltage distribution bar in the same compartment.



Fig. 3: Example of MService placement in MNS iS switchboard



If the MService device is placed alongside of a MLink device, it is recommended to use the left position for the MService.

### 3.3 MService in MNS iS network

MService collects the operational data from the switchgear using the built-in MNS iS OPC Server. Therefore the device has to be connected to the MNS iS switchgear network. All MService and MLink devices have to be configured appropriately.

Different possibilities exist, how to set up the network, the most common are depicted in the following sections.



Do not connect several MService devices to the same network before the correct networks settings are downloaded and activated. A failure of the network communication may be result if ignoring this.

Since the design of computer networks is in most cases governed by company rules on site, ABB provides the required network equipment only on special request.

The network sketches in the following sections always assume, that all devices are connected to a network switch forming a local area network (LAN) depicted by the grey line.

### 3.3.1 Client PC requirements and configuration recommendations

The MService WebHMI uses standard web technologies limiting the software requirements on the client PC to a minimum. To use the web interface of the MService device a standard PC is needed with the following minimum characteristics:

Hardware	
CPU	Min. Intel Atom 1.6GHz
RAM	1 GB
Network interface	100 MBit / 1 GBit
Display	Recommended resolution: 1280x1024 pixel
Software	
Operating system	Windows XP / Windows 7 and corresponding server variants
Internet Browser	Microsoft Internet Explorer, Version 8, 9, 10 (see below remarks)
Java	Runtime environment, Version 6u24 or higher (see below remarks)

#### Microsoft Internet Explorer 9 & 10

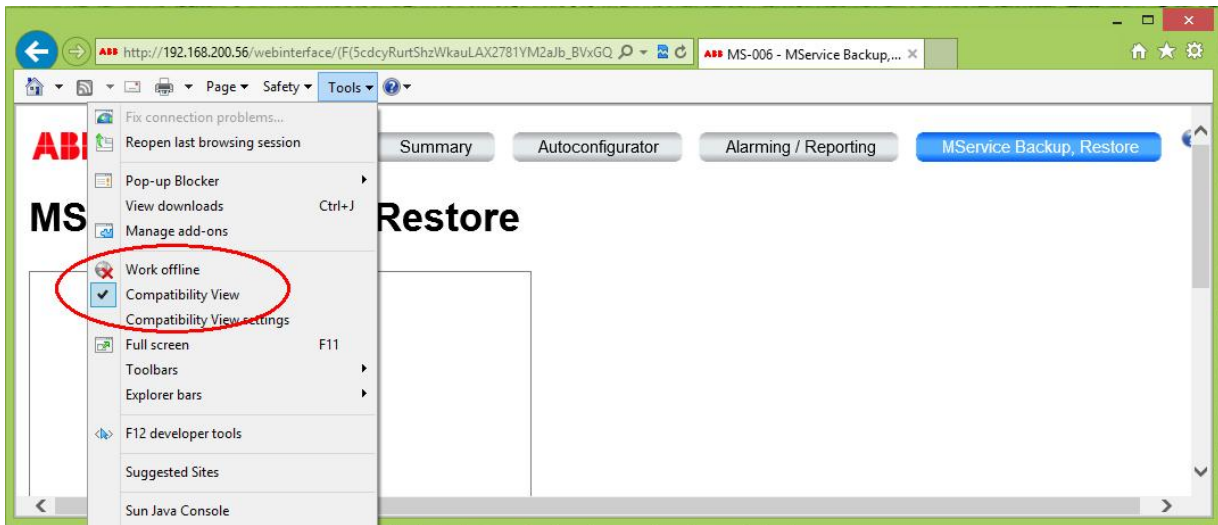
Using Internet Explorer Version 9 or 10 requires the following settings to be made:

- Show 'Command bar'



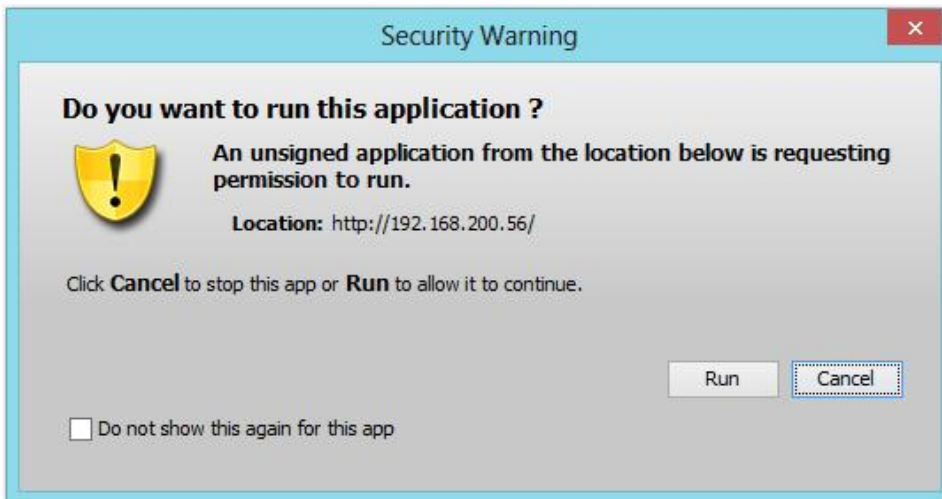


- From the 'Tools' menu, enable 'Compatibility View'



### Java Runtime Environment

The main display of the MService WebHMI is implemented as Java applet. Starting with Java 7, Oracle introduced a security check, asking the user to run the applet. Depending on the patch status of the Java runtime environment and the availability of updates, even a security risk is reported.



The user shall make sure to have latest Java runtime installed. If this is not possible, it is still considered a safe application, since user knows, that he is running the application from an MService (and not some unknown web site)

Therefore user can safely accept to run the MService applet.

Furthermore it is recommended to configure the Java Runtime environment in the following manner:

- Disable “Keep temporary files on my computer”

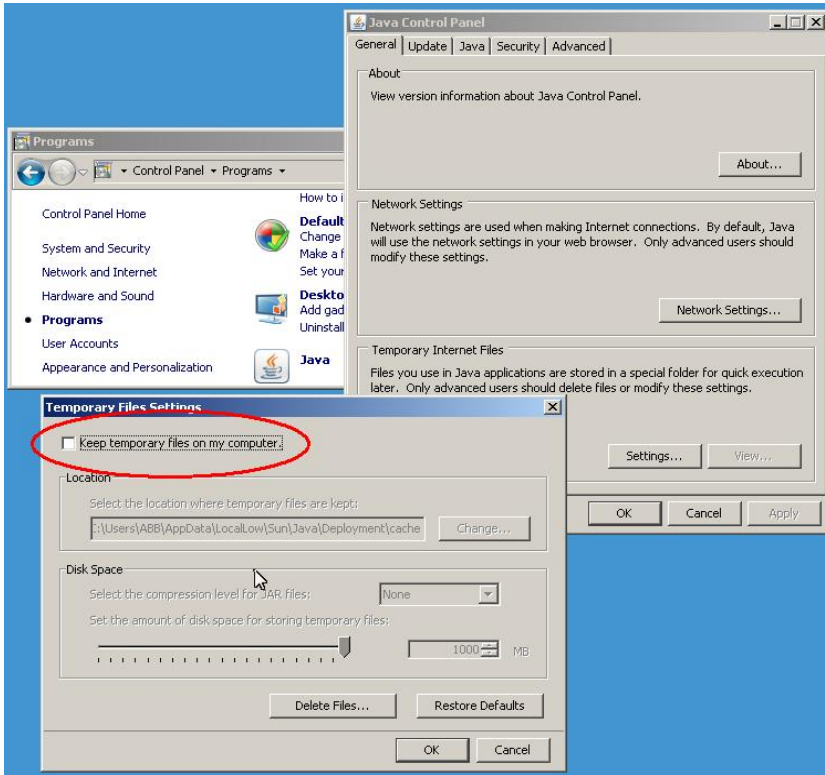


Fig. 4: Configuration of recommended Java settings

### 3.3.2 Switchgear network and client/plant network

The MService may be connected to both the Client (Plant) network and the Switchgear Network for MNS iS devices.

Connection to Client Network is via LAN1 and the Switchgear Network via LAN2.

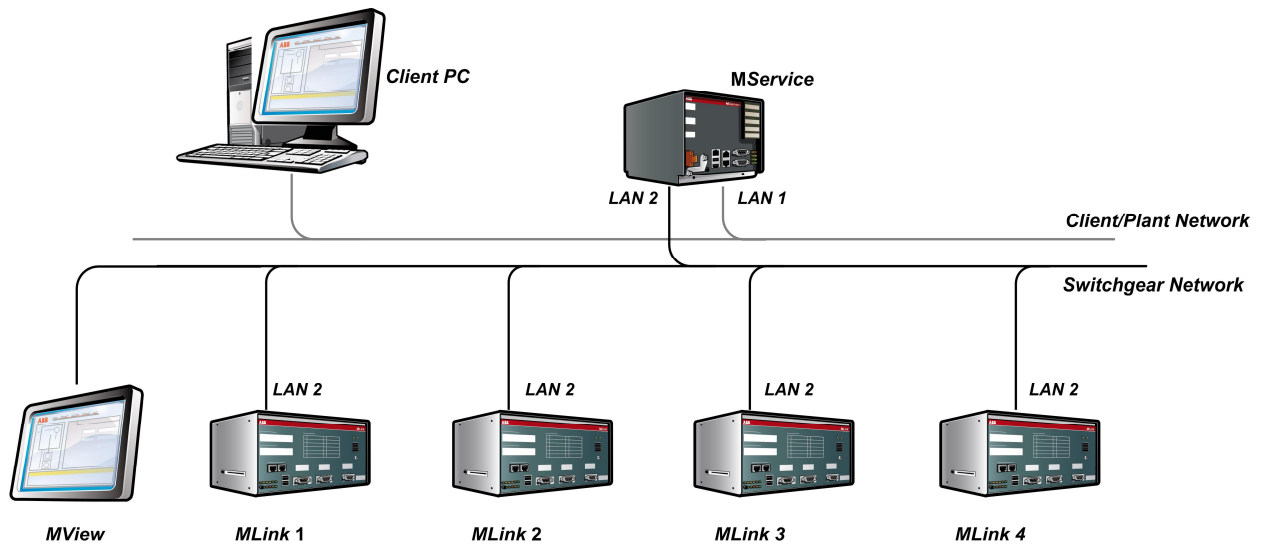


Fig. 5: MService network example LAN1 & LAN2

### 3.3.3 Switchgear network and client/plant network with commissioning laptop

The special purpose LAN connection LAN3 can be used to create a point-to-point connection. This is used in the commissioning phase to upload the initial base configuration to the device.

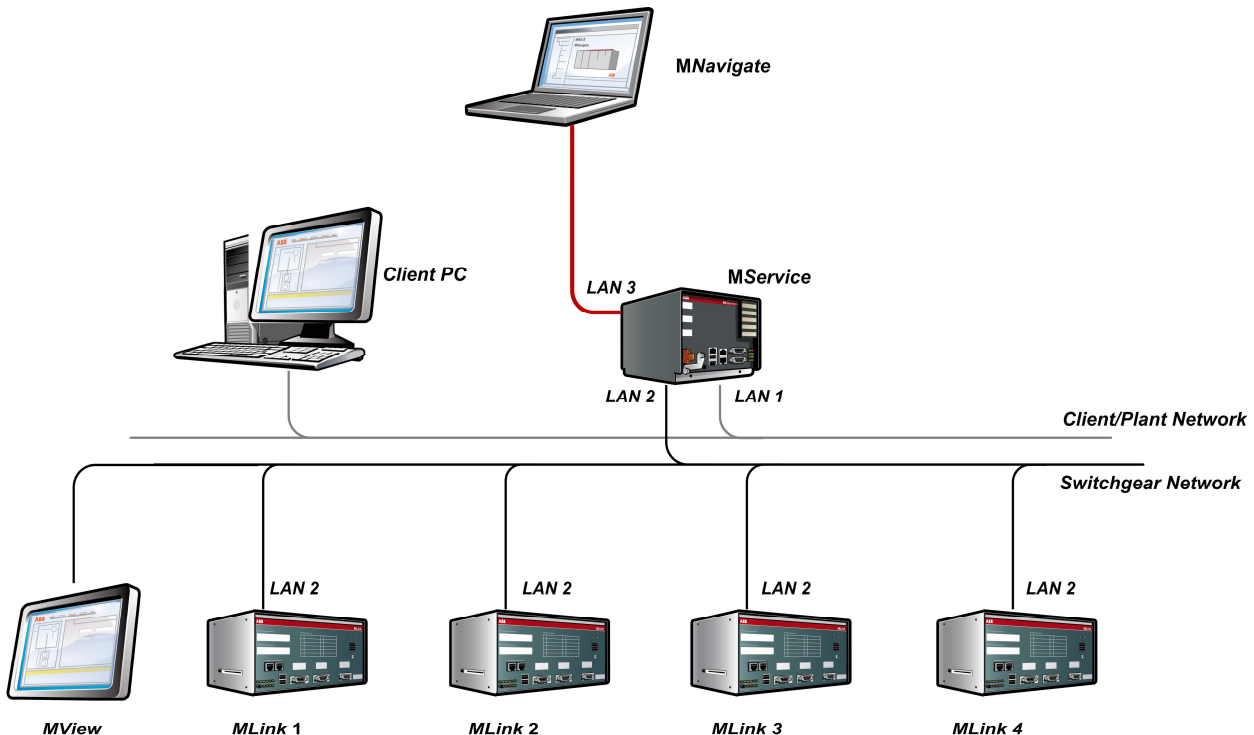


Fig. 6: MService LAN3 connection



LAN3 has a fixed network configuration, which is the same on all MService devices. It is set by factory and not configurable by any user. Therefore this port must not be connected to a network switch. Otherwise the function of the device is not possible and the whole network may fail to work.

### 3.3.4 Time synchronization via NTP

MService collects alarms and events from several sources such as MLink and MControl devices. The built-in logic uses real-time operational data to assess certain conditions and creates maintenance alarms on its own.

In order to have a coordinated message archive, where all messages are placed with their real time of occurrence it is crucial to synchronize all MLink and MService devices in the switchgear network.

All MLink and MService devices use the Network Time Protocol (NTP) to get the date & time from a single source, the time master.

There are several scenarios how to distribute the time in the switchgear network. Two of them use dedicated hardware or one of the MLink as described below. Other architectures are possible, such as using network bridges to synchronize several IT-networks in a plant.

Redundant time master are currently not supported in MNS iS and MService.

### 3.3.4.1 PC as time master

In a common scenario a standard PC or server located in the MNS iS switchgear network is configured as ntp server for all MNSiS devices.

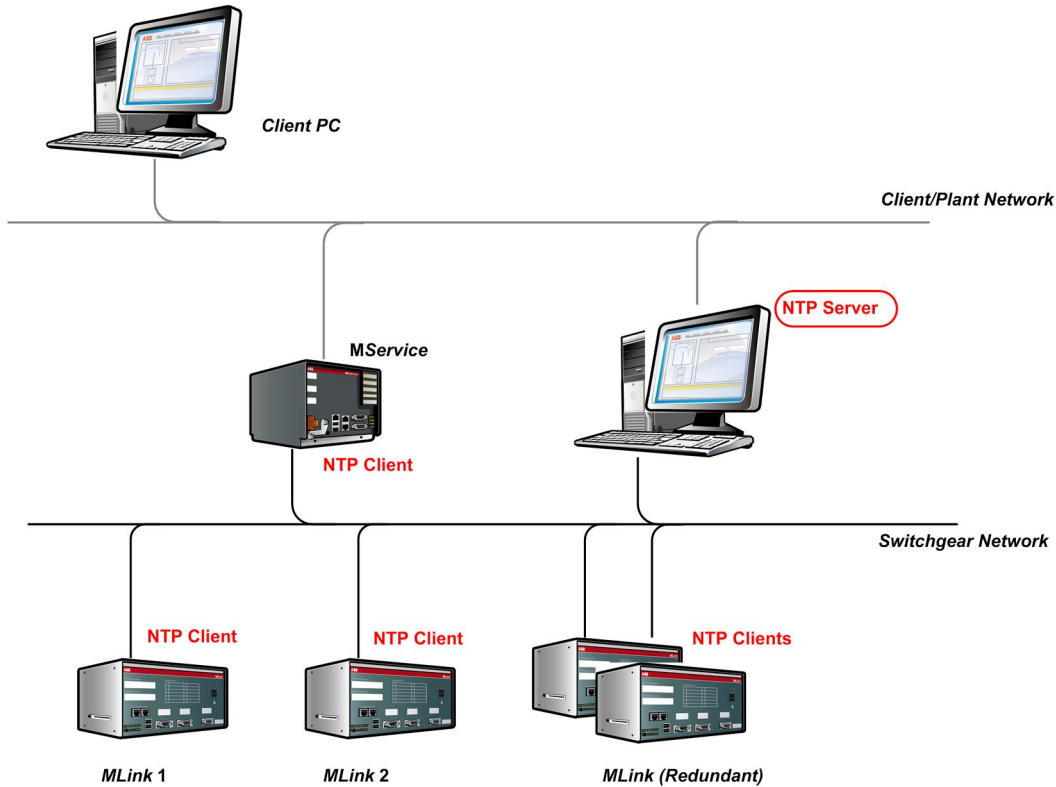


Fig. 7: Time synchronization with standard PC as NTP server

All MLink and MService devices have to be configured to use this clock master as NTP server. This is done using the MNavigate tool. For details how to achieve this see the MNavigate Help.

**3.3.4.2 Clock-master hardware**

There are dedicated products available just to provide the time to IT-Networks. They use the GPS and/or DCF77 or similar technologies to get a highly reliable reference time from public providers and distribute it to network clients.

All MLink and MService devices have to be configured to use this clock master as NTP server. This is done using the MNavigate tool. For details how to achieve this see the MNavigate Help.

This mechanism is the recommended one, since it provides highest reliability.

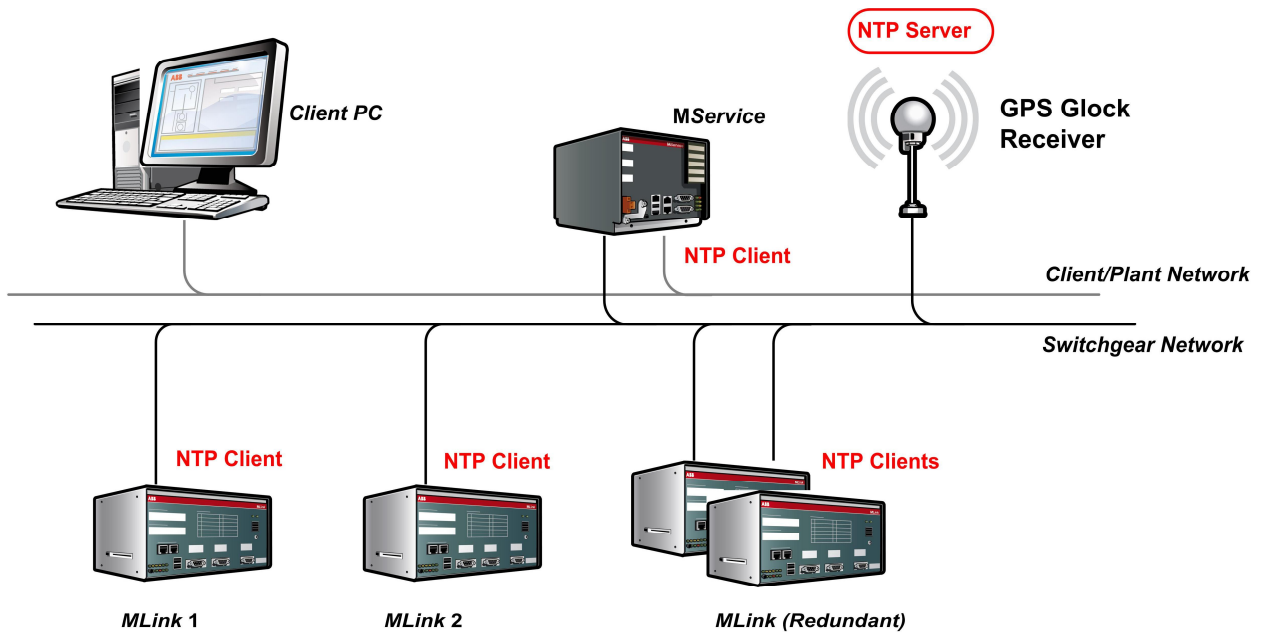


Fig. 8: Time synchronization with dedicated clock master as NTP server

### 3.3.4.3 MLink as time master

If there is no common time master available, the simplest case is to use one of the MLink as time master:

This MLink is configured to run from its own hardware clock, all other devices are configured to use this MLink as NTP server. This is done using the MNavigate tool. For details how to achieve this see the MNavigate Help.

This mechanism relies on the time of the time master MLink, which may need to be set each time after a reboot of this MLink device.

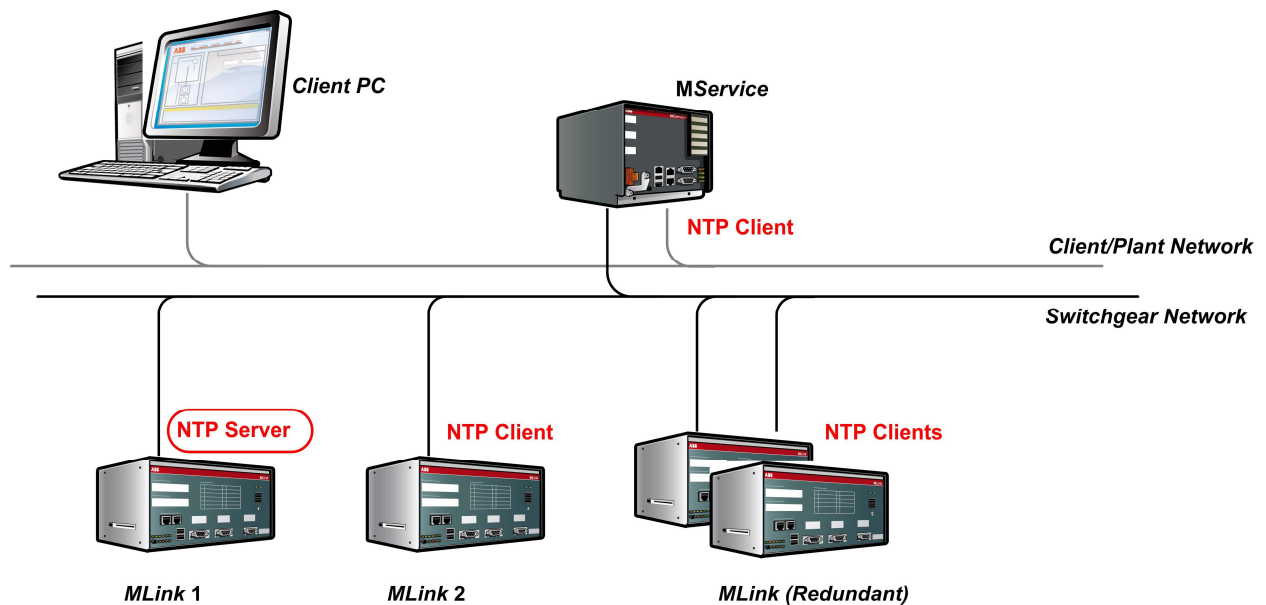


Fig. 9: Time synchronization with MLink as NTP server

## 3.4 MService commissioning

### 3.4.1 MService configuration via MNavigate

In MNavigate, one or multiple MService nodes appear if MService devices are found in the MNS iS configuration.

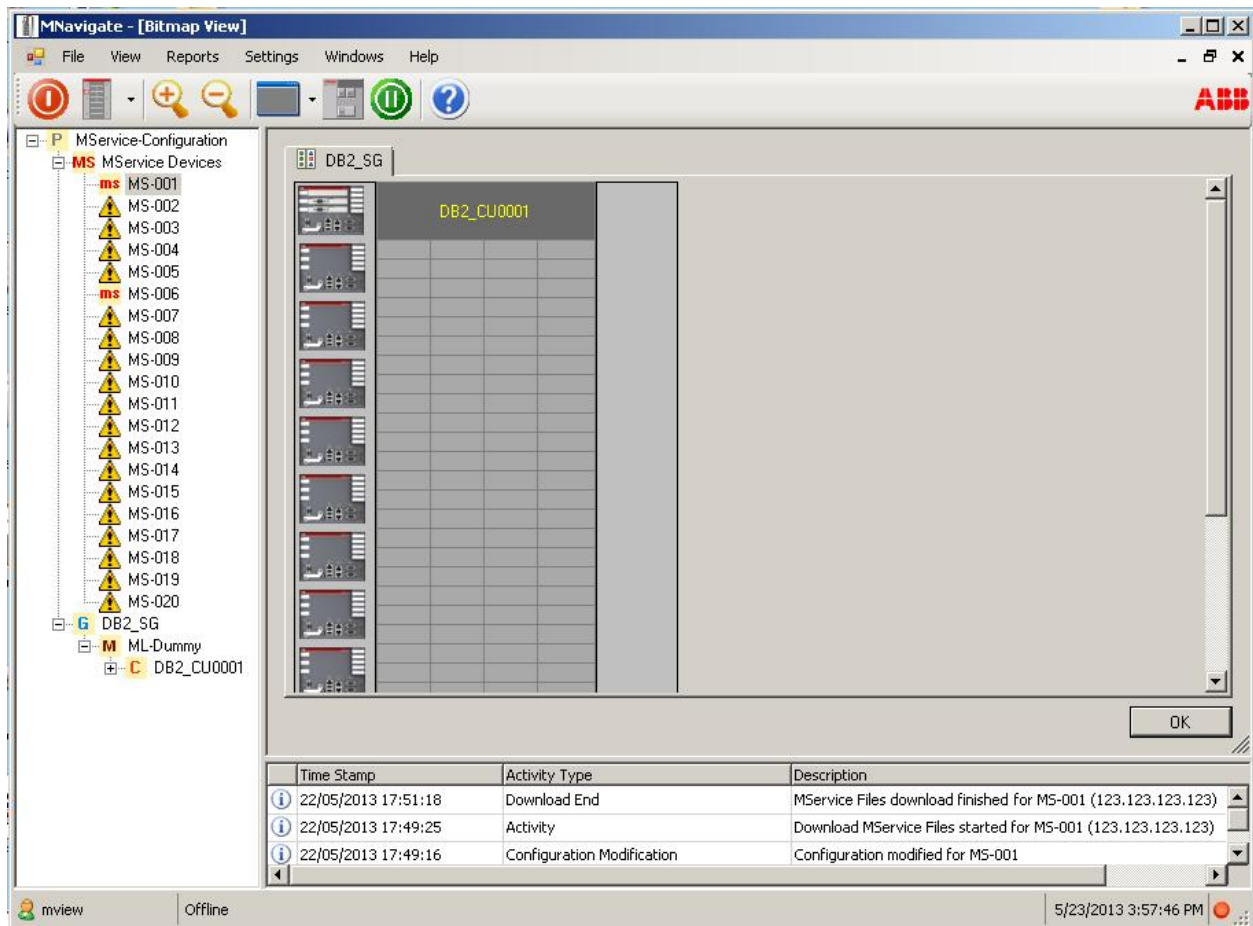


Fig. 10: Appearance of MService devices in MNavigate

The access to MService configuration dialogs is organized in the same manner as for all other MNS iS devices.

The following MService configuration settings need to be parameterized with the help of MNavigate.



### 3.4.2 MService Basic configuration

The basic settings define configuration of the network interfaces of the MService devices. While LAN1 and LAN2 can be freely used to connect the device to networks, LAN3 has a fixed configuration to allow for a point-to-point connection to the device for commissioning purposes.

The configuration of the time server and the time zone to be used is also part of this dialog.

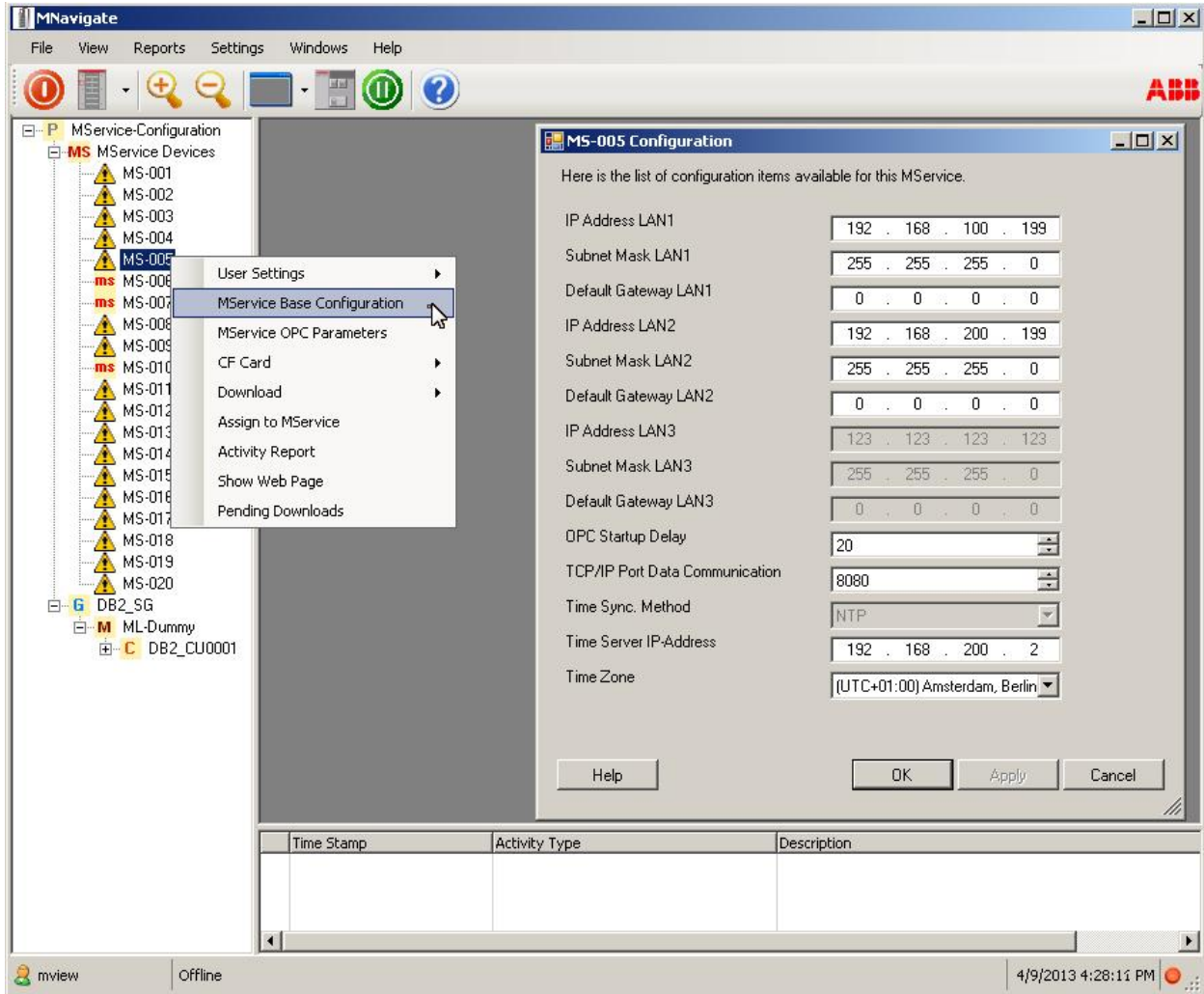


Fig. 11: MService configuration – Network settings

See next page for details on the available parameters

<b>MService basic configuration: available parameters</b>	
IP Address (LAN1,2)	IP-Address relevant for the corresponding LAN interface
Subnet Mask (LAN1,2)	Subnet mask relevant for the corresponding LAN interface
Default Gateway	Defines the gateway used enable network communication in other IP-networks. There shall be only one gateway set, either for LAN1 or for LAN2
OPC Startup Delay	Delays the start of the SCADA and OPC Components after the MService system start. This allows for fine tuning the MNS iS system start sequence to give the MLink devices time to power up and initialize their communication components.
TCP/IP Port Data Communication	For future use in complex network environments.
Time Sync Method	Fixed parameter: MService always uses ntp based synchronization
Time Server IP-Address	IP Address of the clock master or clock relay server.
Time Zone	Time zone used on MService. This influences the display of the timestamps of the messages.

### 3.4.3 OPC server parameters

The OPC server running in the MService needs to be configured to match the MNS iS OPC Server network set up.

Namely the OPC ID has to be set correctly to allow for correct communication to the MLink devices. See [2] for a detailed discussion of the OPC ID.

The OPC Refresh time can be used to fine tune the CPU load on the MService.

Detailed information on parameters, value ranges, default values etc. are available via the MNavigate Online Help.

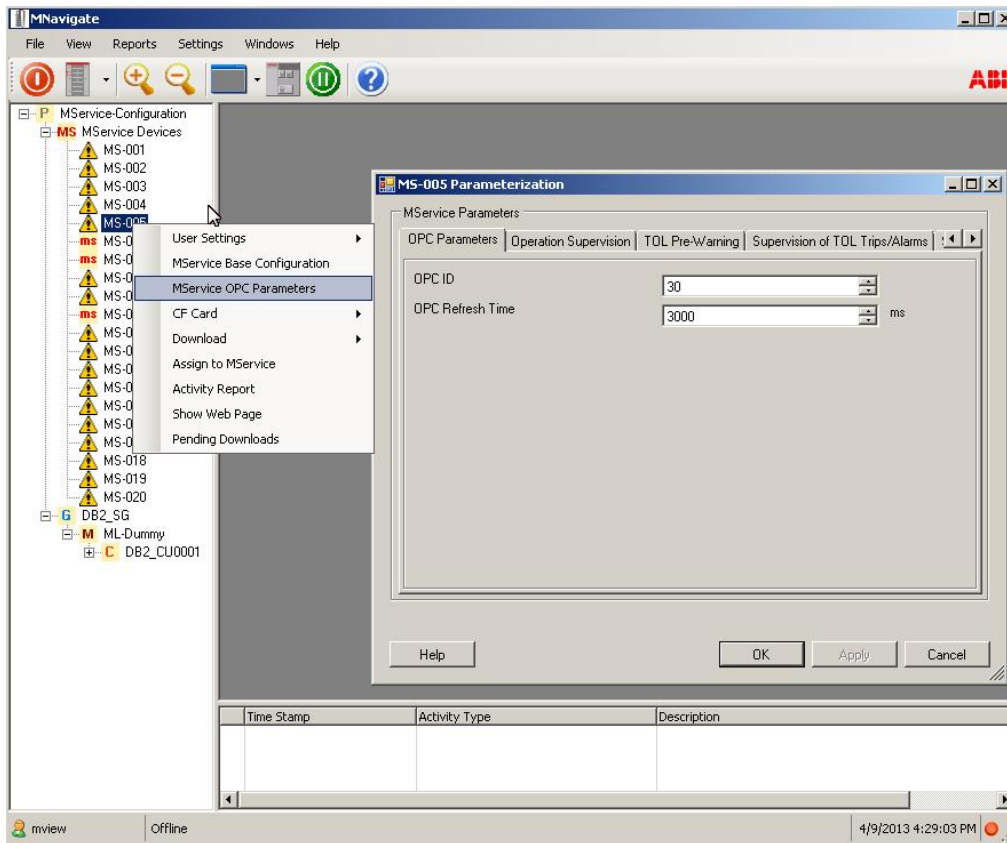


Fig. 12: MService configuration – OPC parameters

### 3.4.4 CAM (Condition Assessment Module) parameters

The MNS iS OPC server running on the MService includes a special module to run certain condition assessment logic. Various algorithms use the operational data from the MControl devices to derive maintenance alarms. These algorithms are parameterized as part of the OPC parameterization dialog.

Detailed information on parameters, value ranges, default values etc. are available via the MNavigate Online Help.

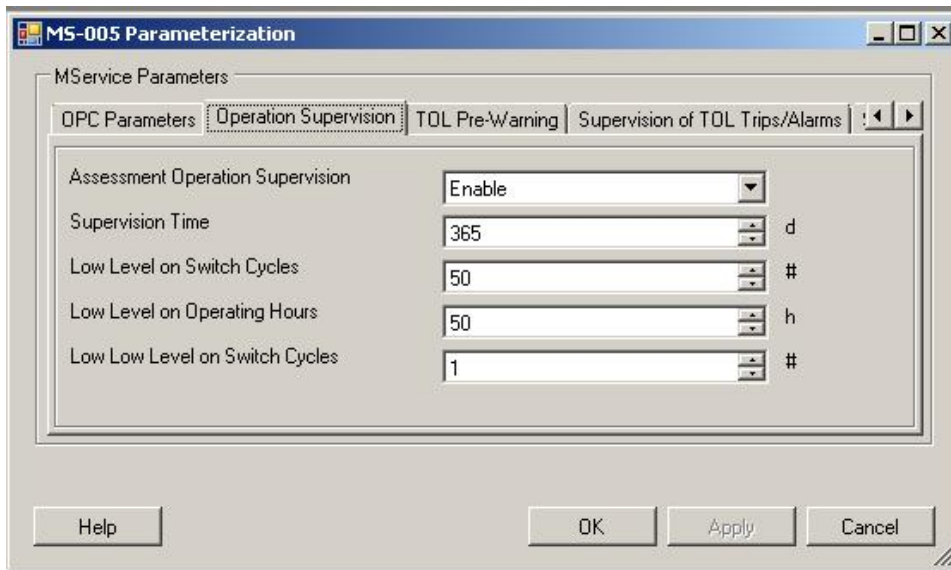



Fig. 13: MService configuration – Condition Assessment Module

### 3.4.5 User management and language settings

The access right to the MService device is governed by MNavigate user management. The language of the MService User Interface is also associated with the individual user definition.

Every user is associated with a role, which defines the access level to the different device classes in the switchgear. MService defines four access levels

No Access	User associated with this role do not have access to this MService
Read only	This access level allows simple observation
Read & Write	<p>In addition to 'Read' level, this access level allows acknowledgement of alarms, trips and condition messages.</p> <p> Acknowledging trips includes an automatic reset command ser to the corresponding MControl!</p> <p>Additionally adding of comments is possible.</p>
Administration	In addition to 'Read & Write' level, this access level allows changing system configuration.

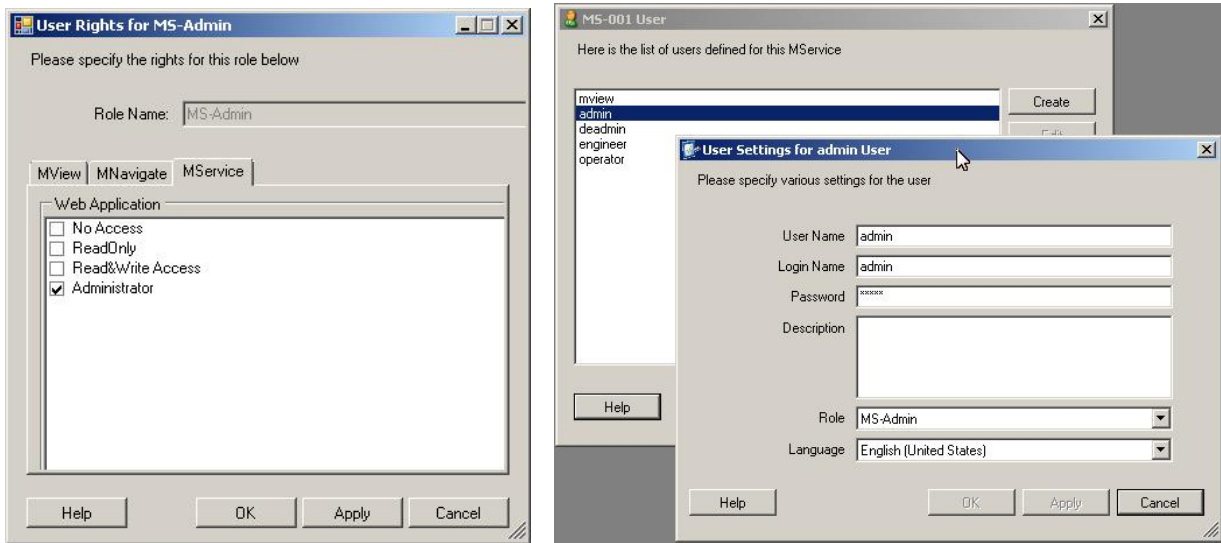


Fig. 14: MService configuration –Role definitions and creation of users

All user/role definition made for one device can be transferred to other devices in the same MNavigate project using the 'Assign to MLink/MService command.

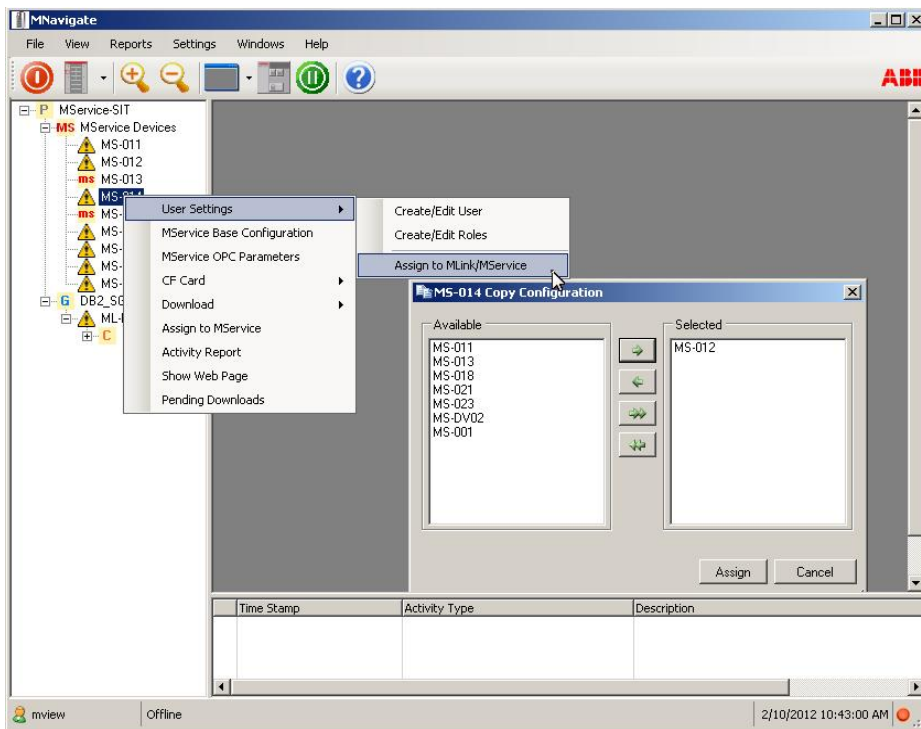


Fig. 15: MService configuration – Transfer user settings to other devices

### 3.4.6 Installation of a language pack for MService

Contact the local ABB service organization if a language other than English is required.

A new language pack can be installed using the context menu 'Import Language Package' from the 'MService Devices' object in MNavigate.

The language pack has to be copied or extracted from archive file to the following location:

C:\ABB MNS iS\

If this folder does not exist on the PC, it has to be created.



Do not use any special characters in the folder name!

As an example, the following picture shows the correct placement of the language pack 'MService NLS EN\_DE\_FR'.

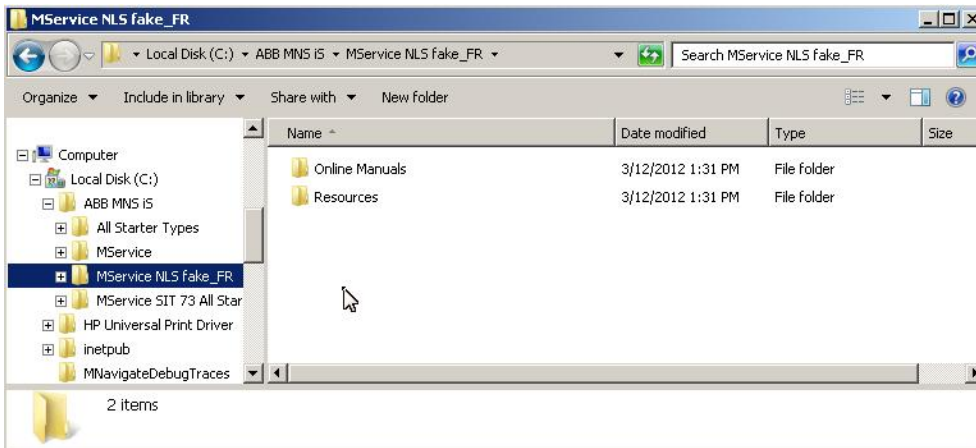


Fig. 16 Correct placement of the language pack 'MService NLS EN\_DE\_FR'

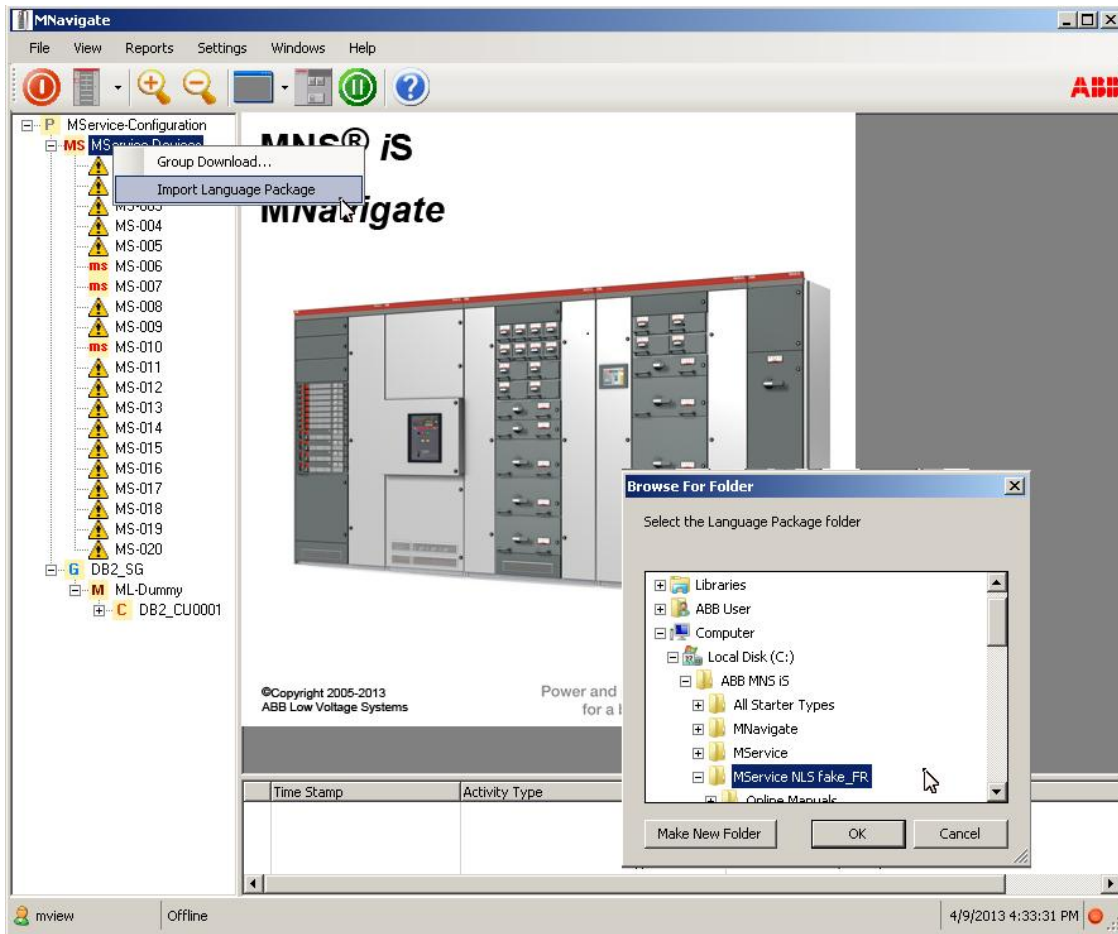


Fig. 17: Importing MService Language Pack

After successful load of a language pack, the 'edit user' dialog allows to select the language for the MService user interface.



Fig. 18: Selection of user language

### 3.4.7 Activation of MService configuration

The actual configuration can be transferred to the MService device either by using direct copy the files on the CF-Card or with a download via LAN2 or LAN3 interface.



A download of configuration files via LAN1 is not possible.

#### 3.4.7.1 Copy configuration files to CF-Card

The configuration can be copied directly to the CF-Card of the MService device. The MService has to be powered off and the CF-Card has to be placed in a card reader device on the MNavigate PC.

The command opens a file dialog box to select the drive letter associated to the CF-Card and copies all configuration files on that place.

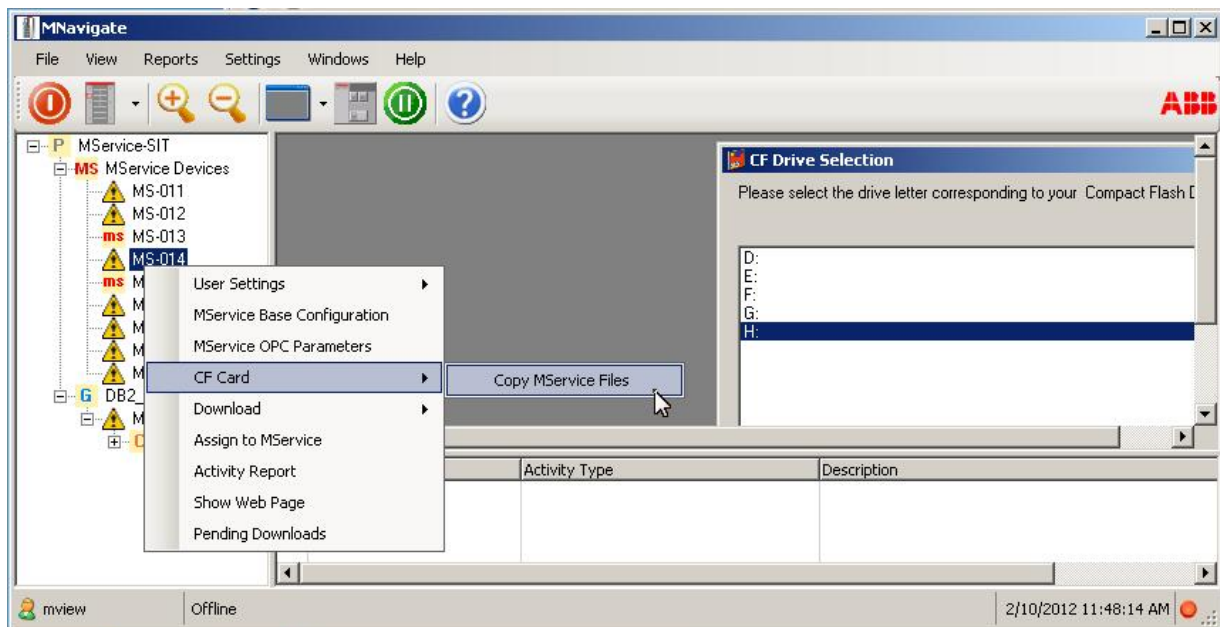


Fig. 19: Copy configuration on CF-Card

Place the CF-Card again in MService and power on.



Do not remove the CF-Card from the MService while the device is powered on.



Do not remove the CF-Card slot lock to gain better access to the CF-Card. The purpose of the lock is to prohibit the removal of the card during operation.



### 3.4.7.2 Configuration download via LAN3 'Service port'

The LAN3 port is used for point-to-point connections to the MService device. This is useful for situations, where no CF-Card reader is available and the device is not yet configured to communicate via the switchgear network.

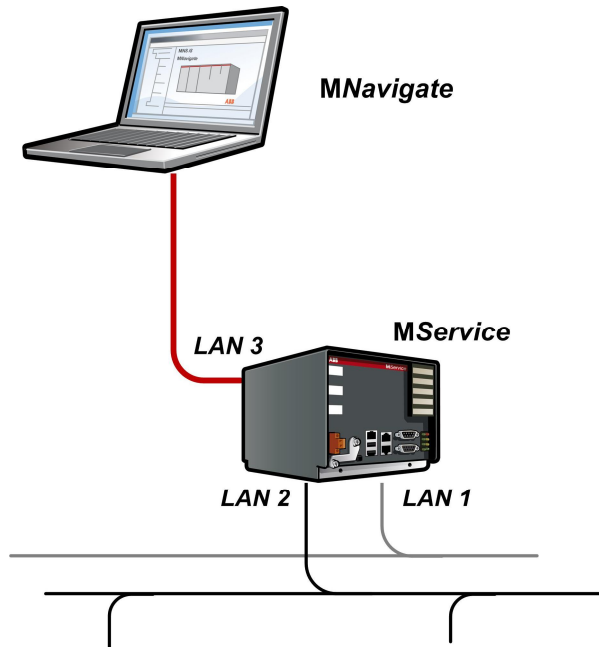


Fig. 20: Connect MNavigate PC to MService via LAN3 'Service Port'



After the initial download of a configuration and the subsequent connection to the switchgear network, a reboot is required to complete the activation of the new configuration.

The MNavigate PC has to be prepared by the following two steps:

- Connect a network interface of the PC directly to the LAN3 port of the MService. There is no need to use a cross-over cable as the Ethernet port will detect the cable type.
- Configure this network interface on the PC as shown in the picture.

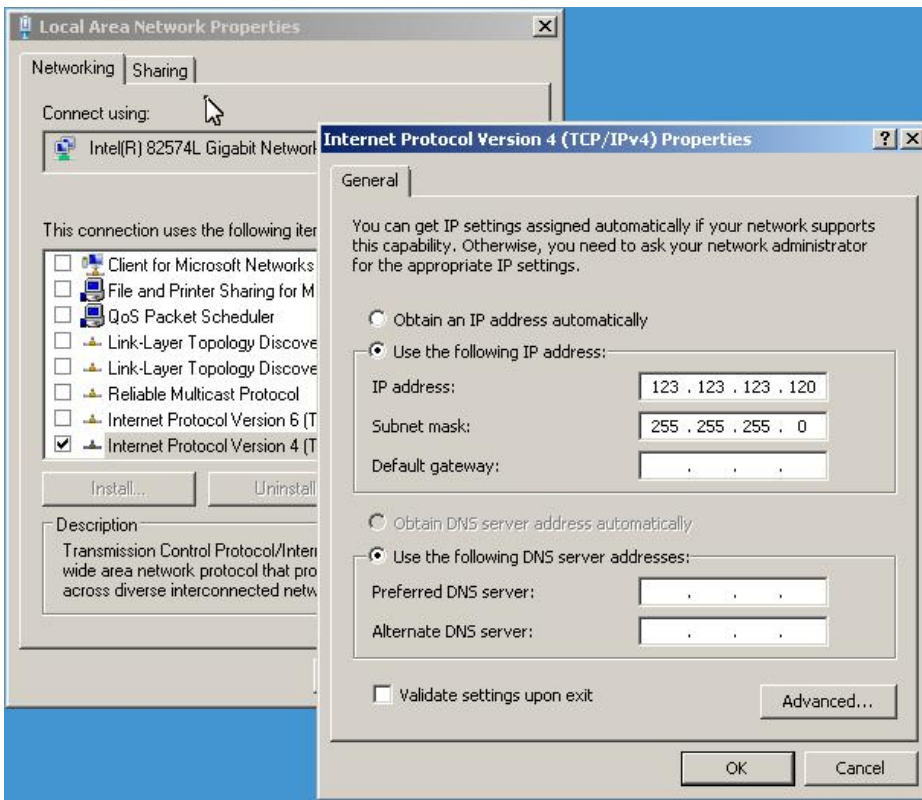


Fig. 21: Settings for network interface of MNavigate PC for access to MService via LAN3

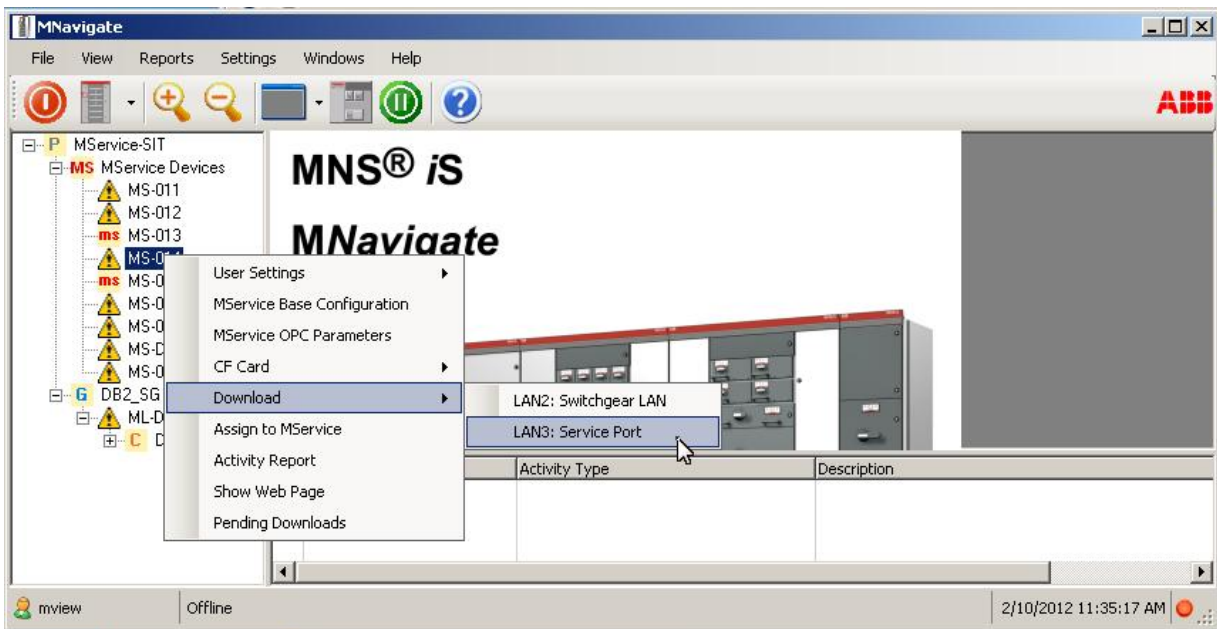


Fig. 22: Download configuration via LAN3 'Service Port'

### 3.4.7.3 Download via LAN2 'Switchgear LAN'

Once the initial MService configuration is done either with CF-Card or Service Port LAN3, the MService is accessible for further changes via the switchgear network connected to LAN2.

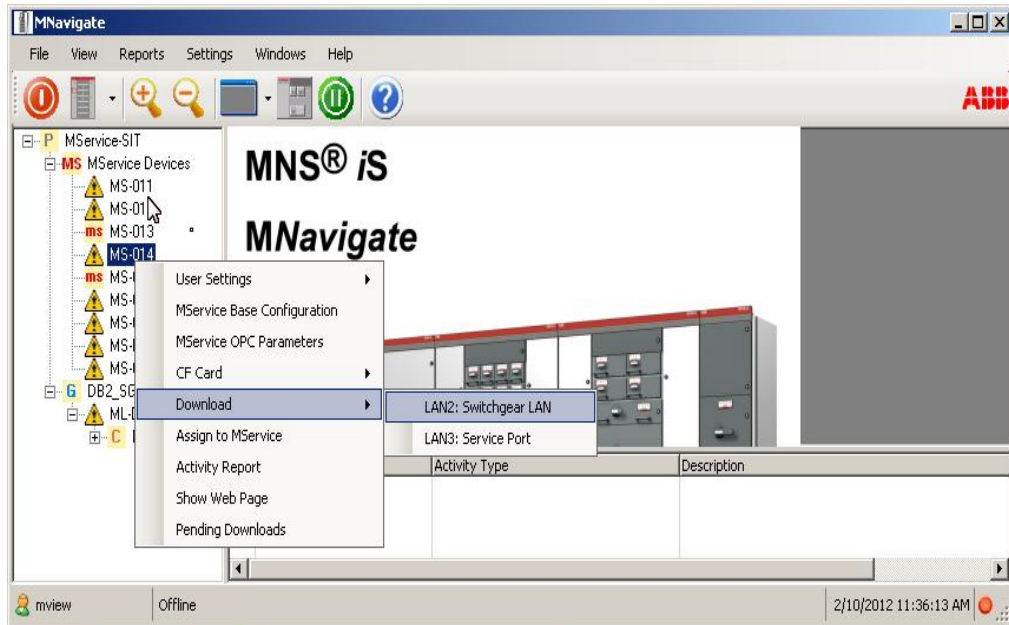


Fig. 23: Download configuration via LAN2 'Switchgear Network'

### 3.5 Update of System Firmware

To update the firmware of the MService device, the local ABB service organization may provide update packages.

An update package is an archive file in zip format, which is to be loaded to the MService. To ensure integrity of the package and prohibit installation of not released software, the zip file is encrypted. The user does not need to unzip the archive.

Updates are always installed via the CF-Card. The following procedure applies:

Step 1	The CF-Card has to be placed in a CF-Card reader on a PC.
Step 2	The zip file has to be copied on the CF-Card in the folder 'Firmware' as shown in the figure below. More than one update may be placed on the CF-Card

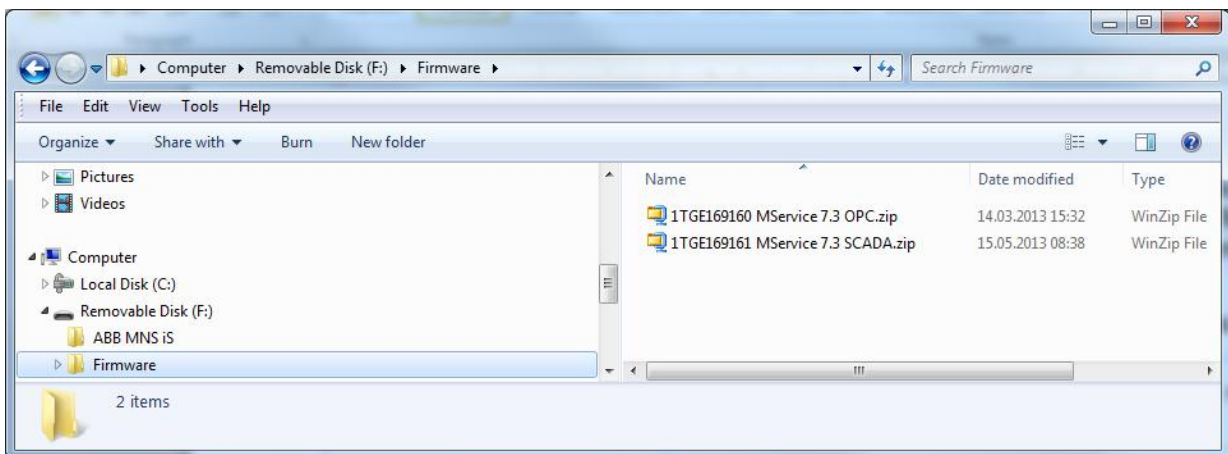


Fig. 24: Placement of firmware updates on the MService CF-Card

Step 3	After the next power-on the updates gets installed.
Step 4	A reboot happens after each update package.
Step 5	After successful installation the zip-File is removed automatically from the CF-Card. If the installation fails, the zip-File is moved to a new folder 'Firmware-unsuccesful' on the CF-Card

## 4 Getting started

### 4.1 Login

MService is controlled via a Web-Interface.



The site is optimized for a display with 1200x1024 pixels.

The underlying software technology does not allow zooming in and out.

To be able to view and control the MService, a login dialog has to be passed.

The Login screen provides form fields to enter your username and password and a login-button.



Fig. 25: MService login screen

Based on the given credentials, the system will perform a login operation. If this is successful, the User Interface will show up.

## 4.2 User Interface

The MService User Interface is shown in the language as previously assigned to the user. See chapter 4.4.1.4.



If no switchgear and device data are loaded yet, the main areas of the User Interface are still empty. Data are loaded using the Autoconfigurator, see instruction in section 4.3



Fig. 26: MService User Interface

The User Interface is divided into four sections as described in following chapter.

### 4.2.1 Menu bar

The Menu bar is the main navigation tool.



It delivers quick access to the most frequently needed information and operations.

Overview	The Overview page is always shown directly after the login. This page contains the menu bar, the cubicle view and the message list.
Message Archive	The Message Archive is opened in a new window and gives detailed access to all messages recorded in the system. See chapter 5.
Trend Display	The Trend Display allows graphical display of recorded data. See chapter 6.
Value Export	Measurement data can be exported to the client PC. See chapter 7
Configuration	The configuration page allows reviewing the settings of the device and modifying the condition monitoring setup. See chapter 8
Logout	Click on logout closes the connection to the MService and redirects the user back to the MService login screen.

The menu bar may get extended with a button 'reboot required'





This indicates are configuration change, which cannot be activated dynamically, such as changing the the timezone of the MService.

Please see sec. 9.5 for details how to boot the device from the WebHMI.

The 'reboot required' button disappears after next login to the WebHMI.

### 4.2.2 Message list

The Message list shows events colored according to their severity (latest events on top). The view changes dynamically always showing only the messages related to the actually chosen device view. For every entry, a timestamp, device name, description, a severity bar is shown.

Further on, links to the Knowledge Base (  ) as well as the Detailed View of the device (  ) are accessible. Messages can be acknowledged individually or group-wise. For details, see chapter 10.










































Acknowledgement	Timestamp	Plant	Text	Priority			
Not acknowledged	Feb 20, 2012 10:48:18.203 AM	ML-0000004214.3PMotor2	Thermal Overload Protection Tripped				
Not acknowledged	Feb 17, 2012 07:55:02.467 PM	ML-0000004214.3PMotor2	Thermal Overload Protection Alarm				
Not acknowledged	Feb 17, 2012 07:51:00.687 PM	ML-0000004214.3PMotor2	Stall Protection Alarm				
Not acknowledged	Feb 17, 2012 07:51:00.687 PM	ML-0000004214.3PMotor2	Stall Protection Alarm				
Not acknowledged	Feb 17, 2012 07:46:28.640 PM	ML-0000004214.3PMotor2	Undervoltage Protection Tripped				
Not acknowledged	Feb 17, 2012 07:32:32.177 PM	ML-0000004214.3PMotor2	Undervoltage Protection Alarm				
Not acknowledged	Feb 17, 2012 07:32:32.177 PM	ML-0000004214.3PMotor2	Undervoltage Protection Alarm				
Not acknowledged	Feb 17, 2012 07:46:28.640 PM	ML-0000004214.3PMotor2	Undervoltage Protection Tripped				
Not acknowledged	Feb 17, 2012 07:32:32.177 PM	ML-0000004214.3PMotor2	Undervoltage Protection Alarm				
Not acknowledged	Feb 17, 2012 07:46:28.640 PM	ML-0000004214.3PMotor2	Undervoltage Protection Tripped				
Not acknowledged	Feb 17, 2012 07:32:32.177 PM	ML-0000004214.3PMotor2	Undervoltage Protection Alarm				
Not acknowledged	Feb 17, 2012 07:32:32.177 PM	ML-0000004214.3PMotor2	Undervoltage Protection Alarm				
Not acknowledged	Feb 17, 2012 07:51:00.687 PM	ML-0000004214.3PMotor2	Stall Protection Alarm				
Group acknowledgement							

Fig. 27: Message list



**4.2.3 Cubicle view / Device view**

This area either shows the cubicle view or device views on MStart/MFeed, MLink or MService. For details see section 9.

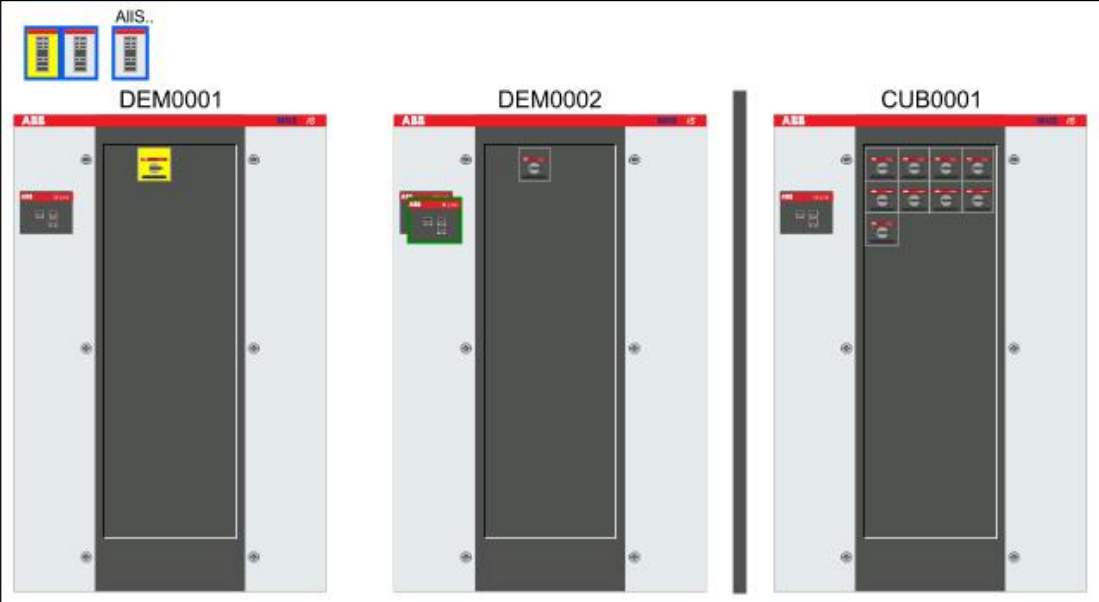


Fig. 28: Cubicle view

### 4.2.4 Tree view

As an additional navigation, the system tree view is always accessible from any part of the main window of the user interface by clicking the small triangle icon on the left side of the screen.

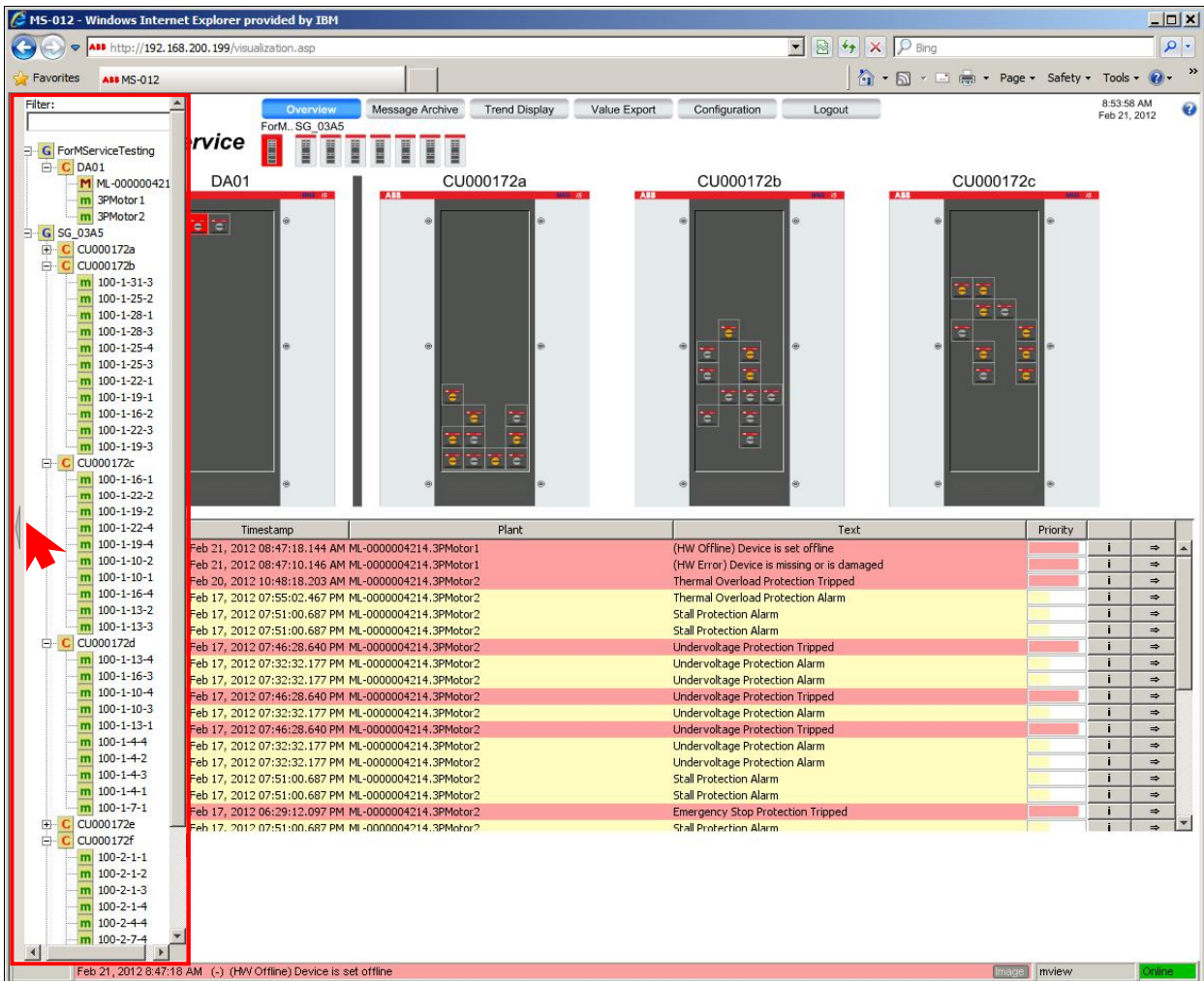


Fig. 29: Tree view (fade-in)

By clicking this triangle, the shortcut menu slides in from the left. Here the user can search all devices, presented in a hierarchical structure acc. to physical arrangement of the switchgear. From here, user can jump directly to the detail page of the selected device.

On top of the menu a search term can be entered in order to filter the list. Thus the menu is reduced and shows the matching devices only.

To hide the tree view, click on the small triangle on the left.

### 4.3 Autoconfigurator

If the MService is used for the first time and no device data are configured, the user configures the MService using the Autoconfigurator. Alternatively, the Autoconfigurator is also used to update the device data after a configuration change in MNS iS switchgear at site (e.g. adding of new devices etc.)

The Autoconfigurator reads the switchgear structure and device data based on the OPC network configuration. With this, devices are added or excluded from the condition monitoring.

#### 4.3.1 Adding and removing modules to be monitored by MService

To start, select 'Configuration' in the menu bar.

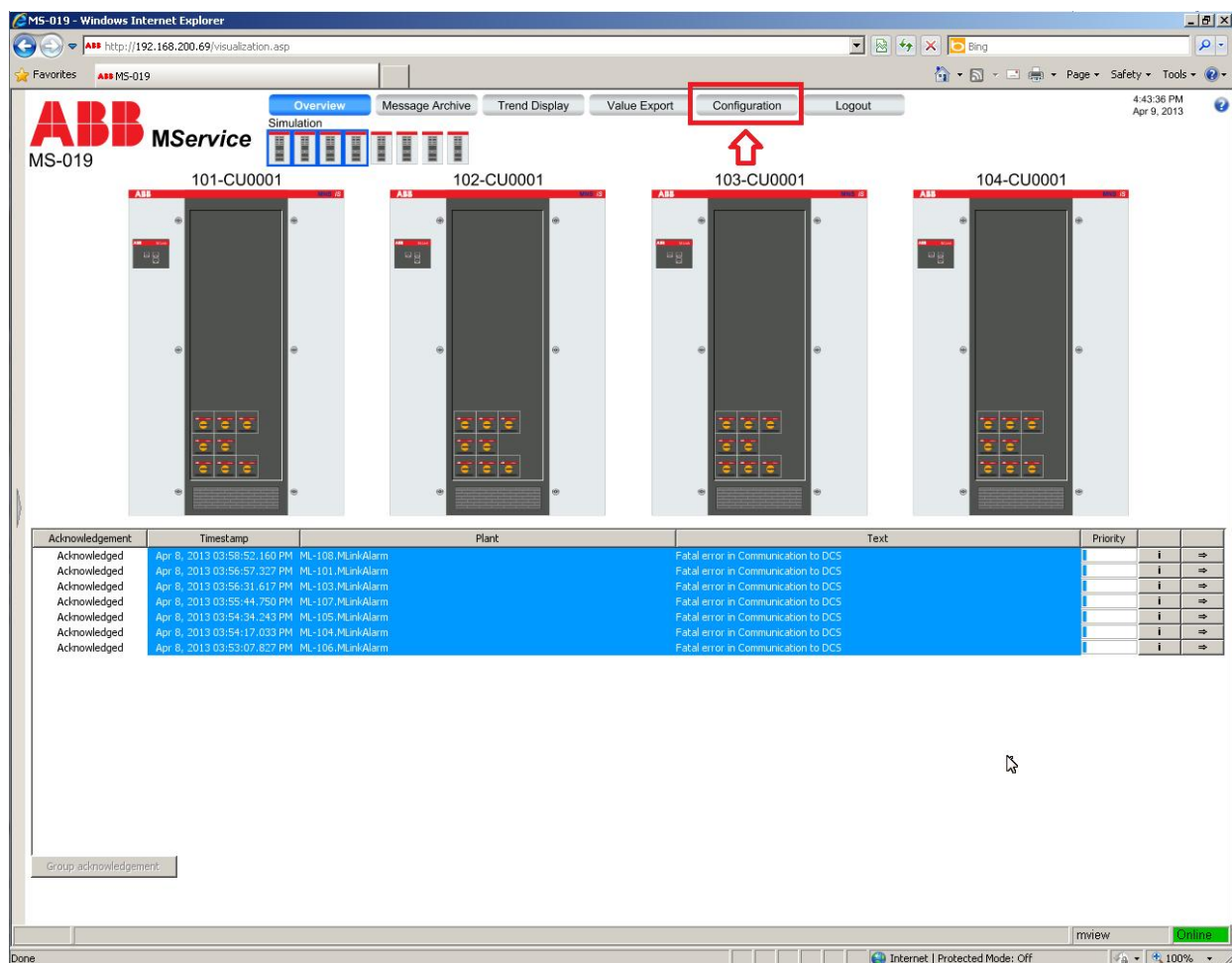


Fig. 30: Starting the Configuration

A new browser window is opened. Select 'Autoconfigurator' to start the configuration wizard.



A 4-step wizard creates needed objects, database entries, visualization pages based on the information stored in MNS iS configuration files:

**Step 1: Scan of the system for new and removed modules**

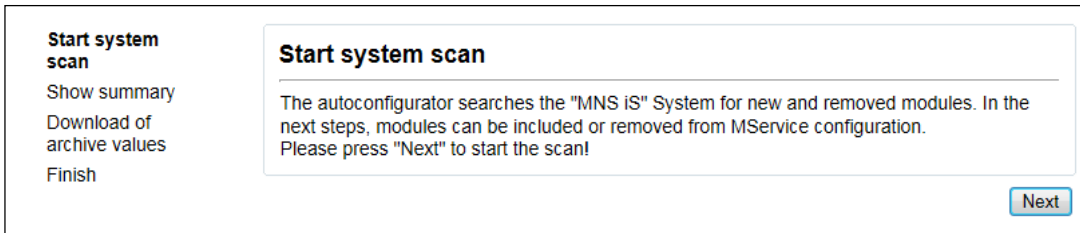


Fig. 31: Autoconfigurator – System scan

Click Next to start the process.

**Step 2: Summary of this scan.**

In the first (left) column new modules which are not yet integrated into the system are shown and can be selected for insertion. In the second (middle) column modules are shown which are configured and integrated in the system but no longer responding, allowing the user to delete these devices e.g. after modification in the MNS iS switchgear. The third column (right) makes it possible to re-synchronize the MService configuration with the MNS iS system.

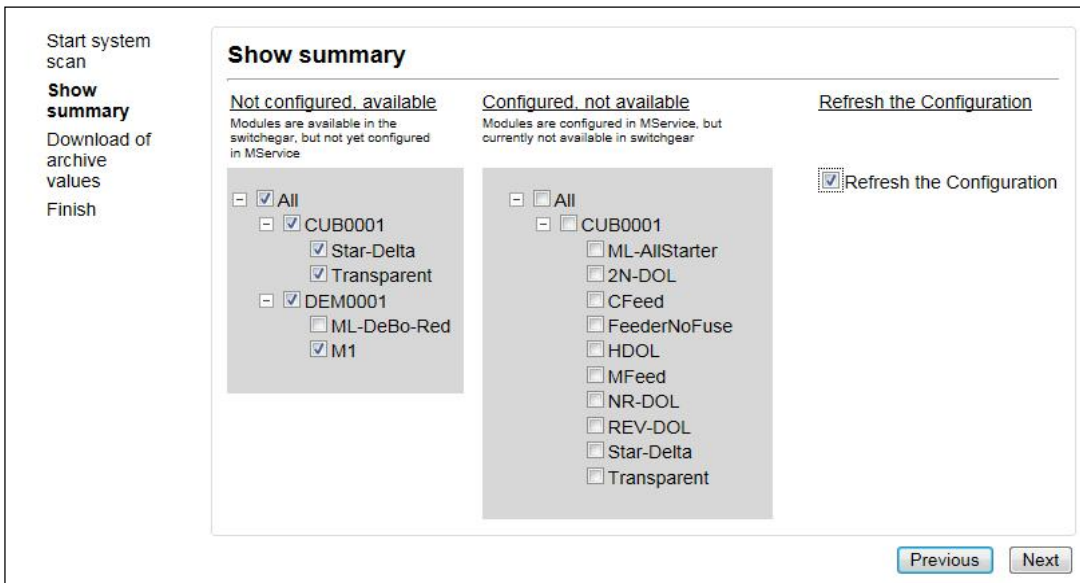


Fig. 32: Autoconfigurator – Show summary

Click Next to continue.

**Step 3 (only for deletion): Download of archive values.**

This page shows up only in case modules are selected for deletion.

Here user can download the history values as CSV-file analog to the [value export](#) in the main menu bar in order to archive measurement data from these devices.

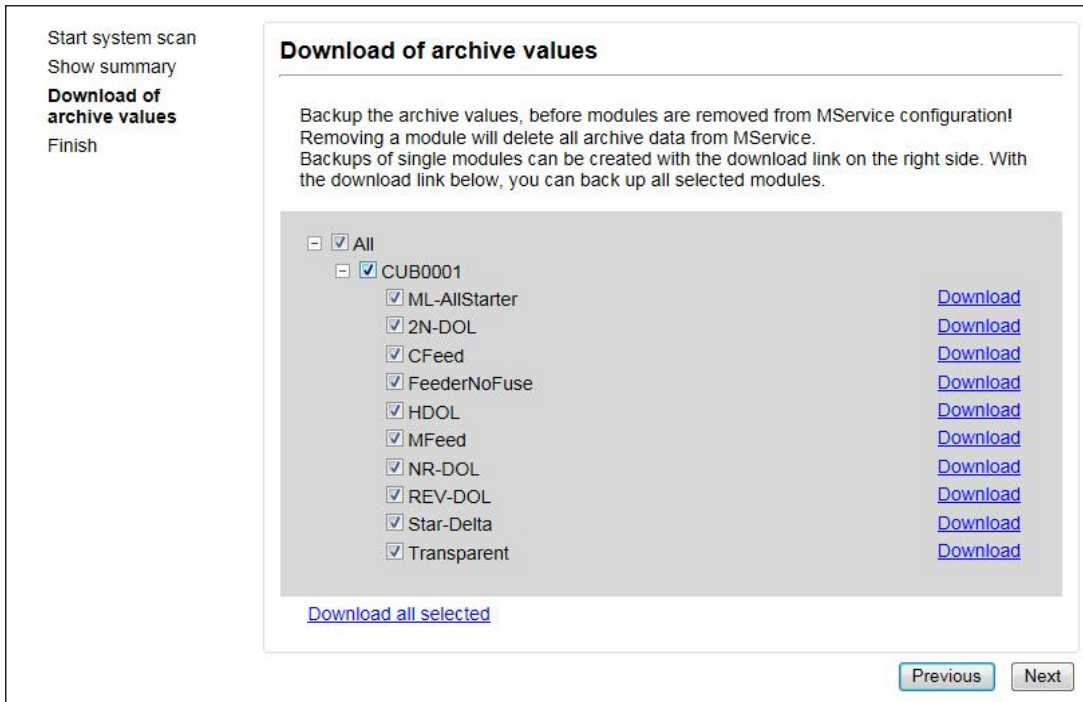


Fig. 33: Autoconfigurator – Download of archive values

Click Next when ready.

**Step 4: Confirmation**

Before the Autoconfigurator starts loading/modifying the configuration, step 4 asks to confirm this action. If modules/devices have been selected for deletion, all the history values for this device are deleted.



Fig. 34: Autoconfigurator – Finish

Click Finish to start the Autoconfiguration.

After clicking finish, the wizard starts the automatic configuration and gives feedback on the progress.

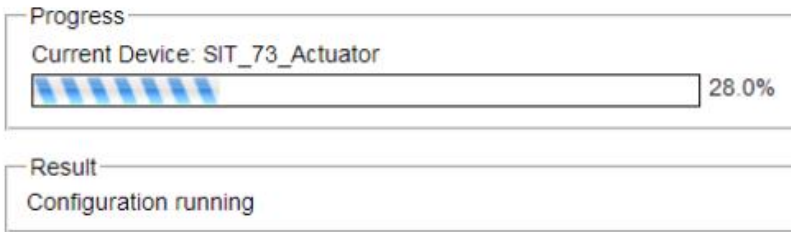
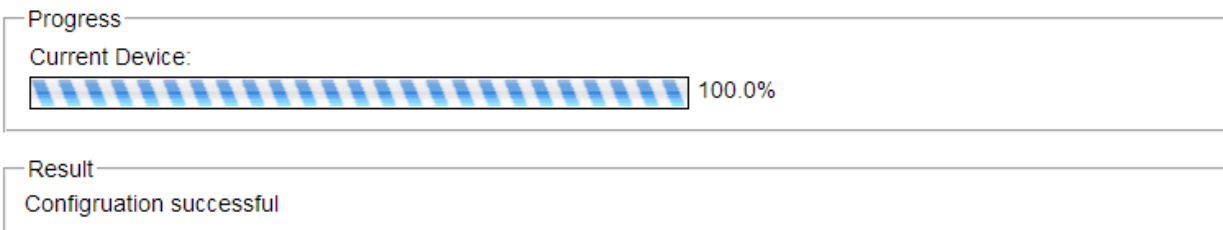


Fig. 35: Autoconfigurator – Configuration progress

New or modified switchgear data are now being made available and user can start using MService functionality.



Please log on to this MService again to reload the new configuration. It may be required to restart the browser. [Next](#)

Fig. 36: Autoconfigurator – Configuration done

Click Next to return to the configuration overview page.

### Step 5: Reload WebHMI

After Autoconfiguration it is required to reload the WebHMI in order to see the changed configuration. Depending on the settings of the client PC, it might be necessary to close down all windows of the internet browser.



Modules not selected during the configuration are excluded from MService supervision. Such modules are greyed out in the visualisation and in the tree view. If a complete MLink and its MControl devices are excluded, the related cubicles are not shown at all.

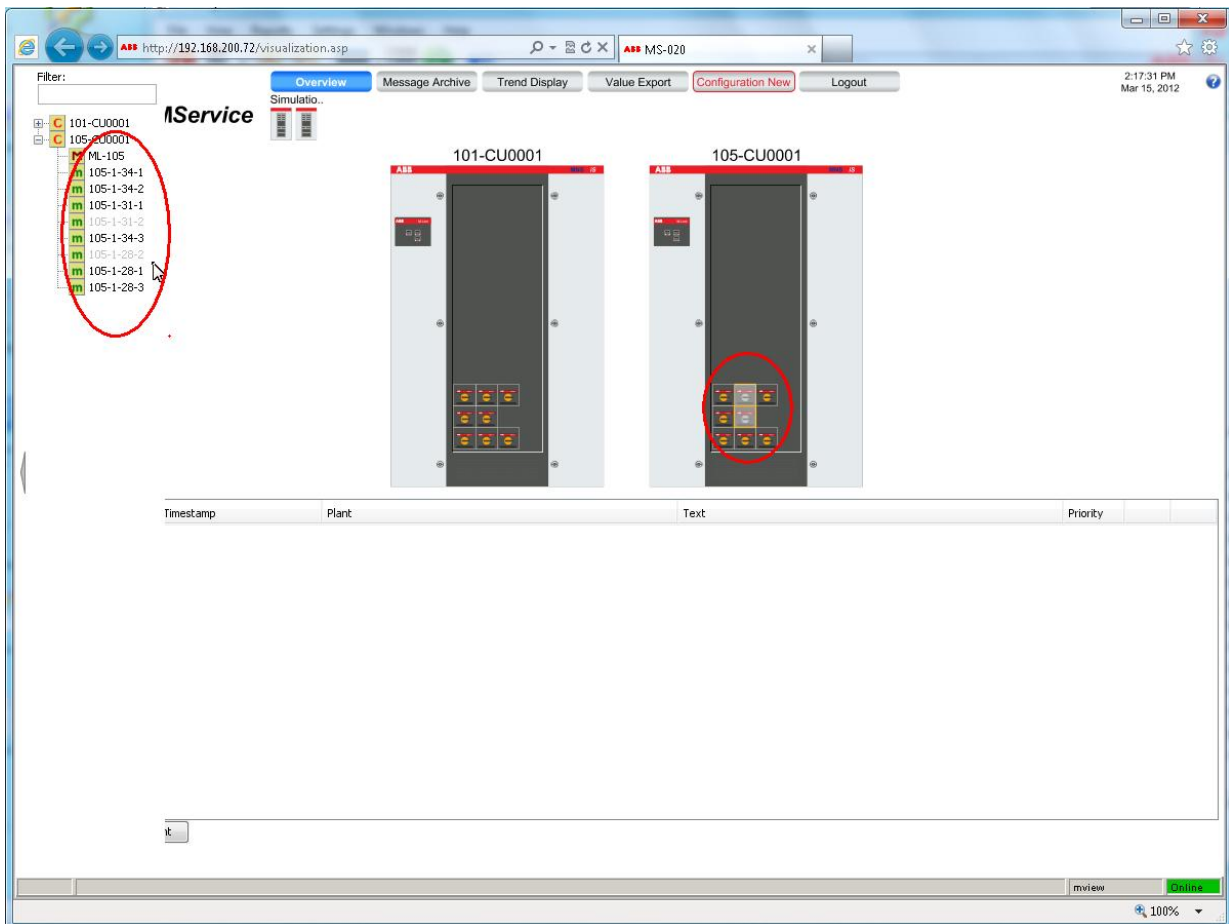


Fig. 37: Excluded modules are displayed in light grey. No detail display is available for them

## 5 Message Archive

The Message archive is opened in a new window.



All digital messages (alarms, operating messages, warnings and so on) are shown in the message archive with time stamp and exact message text. Extensive filter and search criteria allow getting a fast and precise overview. On every message individual notes can be entered and saved (e.g. for the next employee on duty).

Filtered occurrences can be exported as csv-files so they can be opened and revised in Microsoft Excel™. Alternatively the message lists can be printed directly.

### 5.1 Configuration area

In the configuration area (upper part of the window) it is specified, which messages shall be displayed in the listing area. Several filtering options are available.

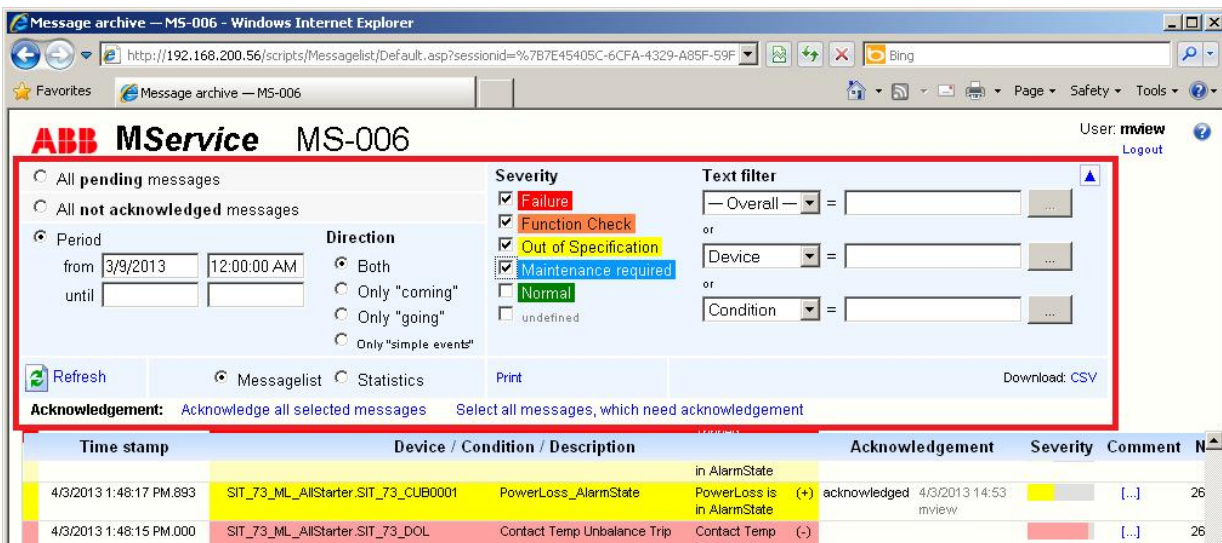




Fig. 38: Configuration area



<b>Generic functions</b>		
	Help	Opens the online help.
	Collapse / expand filter	The filter area will be collapsed respectively expanded.
	Refresh	The display is updated with the settings made in the configuration area.
	Print	The current list (with optional filter applied) is printed.
	Download CSV	The list is downloaded as csv file, which should be saved first and then opened e.g. in Microsoft Excel™.
<b>Filter Settings</b>		
	All pending messages	All currently active messages are displayed.
	All not acknowledged messages	All not yet acknowledged messages are displayed. The amount between brackets displays how many not acknowledged messages exist in the system currently.
	Period	All messages which appeared in a specified selected period are displayed. Selection of period for frequency analysis of messages.
	Direction	Selection which messages are to be displayed produced by a coming or by a going message or by both signals.
	Priority	Selection which message types are to be displayed. A multiple selection is possible. The designations are shown in that color, which is also used for the messages in the listing area below.
	Text filter	Here a text filter can be entered. Up to three text passages can be used to search the device/ condition/ description fields. Filter texts are combined with OR. The following placeholders are possible:  ?      for a single character

		* for any characters
<b>Display Options for Listing area</b>		
	Message list	All messages are displayed as a list sorted by date and time in descending order.
	Statistics	<p>User can choose this option only if <i>Period</i> is marked. Thereby the actual list of messages is analyzed on</p> <ul style="list-style-type: none"> <li>• the frequency of occurrence (counter)</li> <li>• the period</li> <li>• the average period</li> <li>• the percentage period</li> </ul> <p>The entries of the list can be sorted by clicking on the headings:</p> <ul style="list-style-type: none"> <li>• Message text</li> <li>• Counter</li> <li>• Period</li> </ul> <p>Clicking once more the sorting is reversed.</p>
<b>Group Acknowledgement</b>		
	Select all messages, which need acknowledgement	All messages which need acknowledgement are selected in the data sheet.
	Acknowledge all selected messages	All marked messages are acknowledged.

## 5.2 Listing area

In the Listing Area (lower part of the window) the messages are listed according to the filter criteria defined in the configuration area. The color is equivalent to the color of the message type.

The message list is automatically updated every 60 s and/or with every change of the filter settings. Manual update is possible utilizing the “Refresh” button.

If more than 500 messages according to the selected filter criteria have come up, the display is separated into several pages. At the bottom of the message list, user finds links to switch between the several pages.

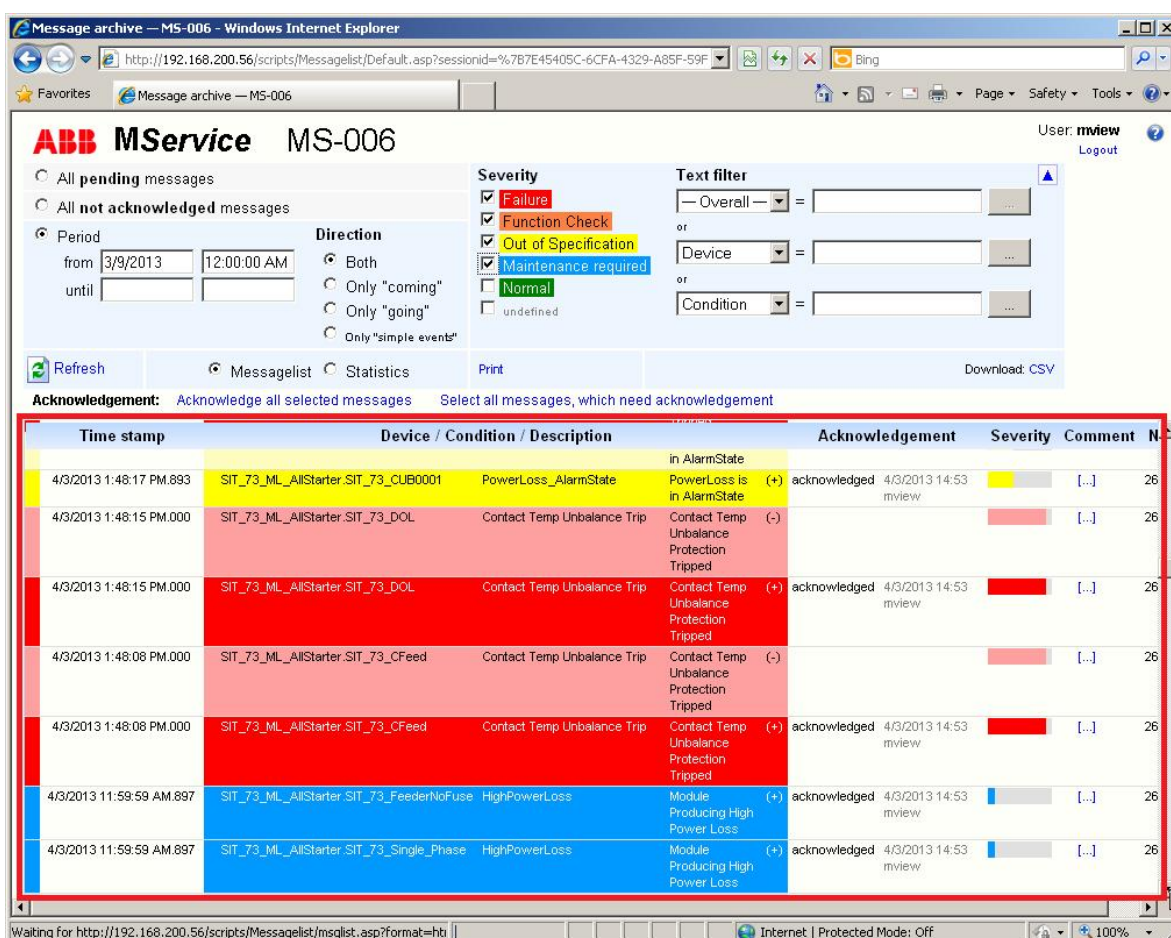



Fig. 39: Listing area

<b>Explanation of list headings</b>	
Timestamp	This is the point of time, the message appears.
Device/Condition/ Description	<p>The message text gives information on the device the message refers to.</p> <p>Background color Color corresponds to the message severity acc. to NAMUR recommendation. For the definition see section 9.1</p> <p>Color shade The active message has a dark color shade and the inactive a bright shade.</p> <p>Blinking Not acknowledged messages are blinking.</p>
Acknowledgement	<p>In this column, messages are marked as acknowledged/ not acknowledged.</p> <p>User can set check boxes and thereby acknowledge groups of messages by clicking on <i>Acknowledge all selected messages</i>.</p>
Severity	The length of the bar equates to the severity of the message.
Comment	<p>By clicking the squared brackets at <i>Comment</i> a window is opened, allowing the user to add a free notation on each particular incident.</p> <p>This comment applies to this particular event only.</p> <p> This is different from the notations (e.g. instructions) in the <i>Knowledge base</i> which refer generally to messages</p>
No.	<p>Consecutive number of the message.</p> <p>All messages receive a unique counter number in the sequence of arriving in the system. This number can also be used to sort the message list in an exported csv file in case no time stamp is available in MNS iS</p>

**Quick Filter**

A “quick filter” mechanism allows for immediate selecting events limited to certain criteria: Device, Condition, Description, or Direction (coming/going).

The “quick filter” is applied using the mouse hovering over a message line and clicking on the appearing ‘lock’ symbol.

Time stamp	Device / Condition / Description			
4/3/2013 1:48:18 PM.000	SIT_73_ML_AllStarter.SIT_73_REV-DOL02	Contact Temp Unbalance Trip	Contact Temp Unbalance Protection Tripped	(-)
4/3/2013 1:48:18 PM.000	SIT_73_ML_AllStarter.SIT_73_REV-DOL02	Contact Temp Unbalance Trip	Contact Temp Unbalance Protection Tripped	(+)
4/3/2013 1:48:17 PM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(-)
4/3/2013 1:48:17 PM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(+)
4/3/2013 1:48:15 PM.000	SIT_73_ML_AllStarter.SIT_73_DOL	Contact Temp Unbalance Trip	Contact Temp Unbalance Protection Tripped	(-)

Fig. 40: Application of a “Quick Filter”

The result is shown as follows:

Time stamp	Device / Condition / Description			
4/3/2013 1:48:17 PM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(-)
4/3/2013 1:48:17 PM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(+)
4/3/2013 11:59:59 AM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_WarningState	PowerLoss is in WarningState	(-)
4/3/2013 11:59:59 AM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_WarningState	PowerLoss is in WarningState	(+)
4/3/2013 10:28:29 AM.930	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(-)
4/3/2013 10:28:29 AM.930	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(+)
4/3/2013 10:17:44 AM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_CriticleState	PowerLoss is in CriticleState	(-)
4/3/2013 10:17:44 AM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_CriticleState	PowerLoss is in CriticleState	(+)
4/3/2013 10:16:11 AM.897	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(-)
4/3/2013 10:16:11 AM.897	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	PowerLoss is in AlarmState	(+)

Fig. 41: “Quick filter” applied on Device Name

Multiple ‘quick filters’ can be applied at one time.

Time stamp	Device / Condition / Description			
4/3/2013 1:48:17 PM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	Supervision of temperature problems in cubicle is in AlarmState	(-)
4/3/2013 1:48:17 PM.893	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	Supervision of temperature problems in cubicle is in AlarmState	(+)
4/3/2013 10:28:29 AM.930	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	Supervision of temperature problems in cubicle is in AlarmState	(-)
4/3/2013 10:28:29 AM.930	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	Supervision of temperature problems in cubicle is in AlarmState	(+)
4/3/2013 10:16:11 AM.897	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	Supervision of temperature problems in cubicle is in AlarmState	(-)
4/3/2013 10:16:11 AM.897	SIT_73_ML_AllStarter.SIT_73_CUB0001	PowerLoss_AlarmState	Supervision of temperature problems in cubicle is in AlarmState	(+)

Fig. 42: Multiple “Quick filters” applied on Device Name and Condition

## Statistics

With the aid of the statistics option in the Configuration Area, the frequency of occurrence of messages during a certain time period can be evaluated. Total duration and average duration of single messages are calculated, the percentage duration is displayed graphically as a bar graph. The list can be sorted according to different criteria.

Messageid	Msgtext	Severity	Counter	Duration	Average duration	Percentaged duration
MS-006	Database size limit (9.5GB)		1	200.84 h	200.84 h	26.43 %
ML-DeBoRed.Breaker	HW Status		1	0.00 h	0.00 h	0.00 %
ML-DeBoRed.MLinkAlarm	HW Status		3	0.00 h	0.00 h	0.00 %
ML-DeBoRed.Mod010102	HW Status		2	760.02 h	380.01 h	100.00 %
ML-DeBoRed.MLinkAlarm	App_Fatal_Param		2	760.02 h	380.01 h	100.00 %
SIT_73_ML_AllStarter.SIT_73_Actuator	Contact Temp Unbalance Trip		2	0.00 h	0.00 h	0.00 %
SIT_73_ML_AllStarter.SIT_73_CFeed	Contact Temp Unbalance Trip		2	0.00 h	0.00 h	0.00 %
SIT_73_ML_AllStarter.SIT_73_DOL	Contact Temp Unbalance Trip		2	0.00 h	0.00 h	0.00 %
SIT_73_ML_AllStarter.SIT_73_REV-DOL01	Contact Temp Unbalance Trip		2	0.00 h	0.00 h	0.00 %
SIT_73_ML_AllStarter.SIT_73_REV-DOL02	Contact Temp Unbalance Trip		2	0.00 h	0.00 h	0.00 %
SIT_73_ML_AllStarter.SIT_73_SoftStarter	Contact Temp Unbalance Trip		1	0.00 h	0.00 h	0.00 %
ML-DeBoRed.Mod010102	Earth Leakage Alarm		1	0.00 h	0.00 h	0.00 %

Fig. 43: Frequency analysis

## 6 Trend Display

The trend display opens in a new window after clicking the button in the menu bar.



Depending on the settings of the browser, the new window may be opened and pushed behind all other windows. Use the Windows task bar to bring it to the front.

### 6.1 Display options

There are extensive curve representation possibilities. The user can select any process items and represent them in graphs. This applies for analogue as well as for digital values at the same time.

Further on, graphs combinations can be saved with an individual name. At any time, these combinations can be re-called via a selection box listing the saved graphs combinations.

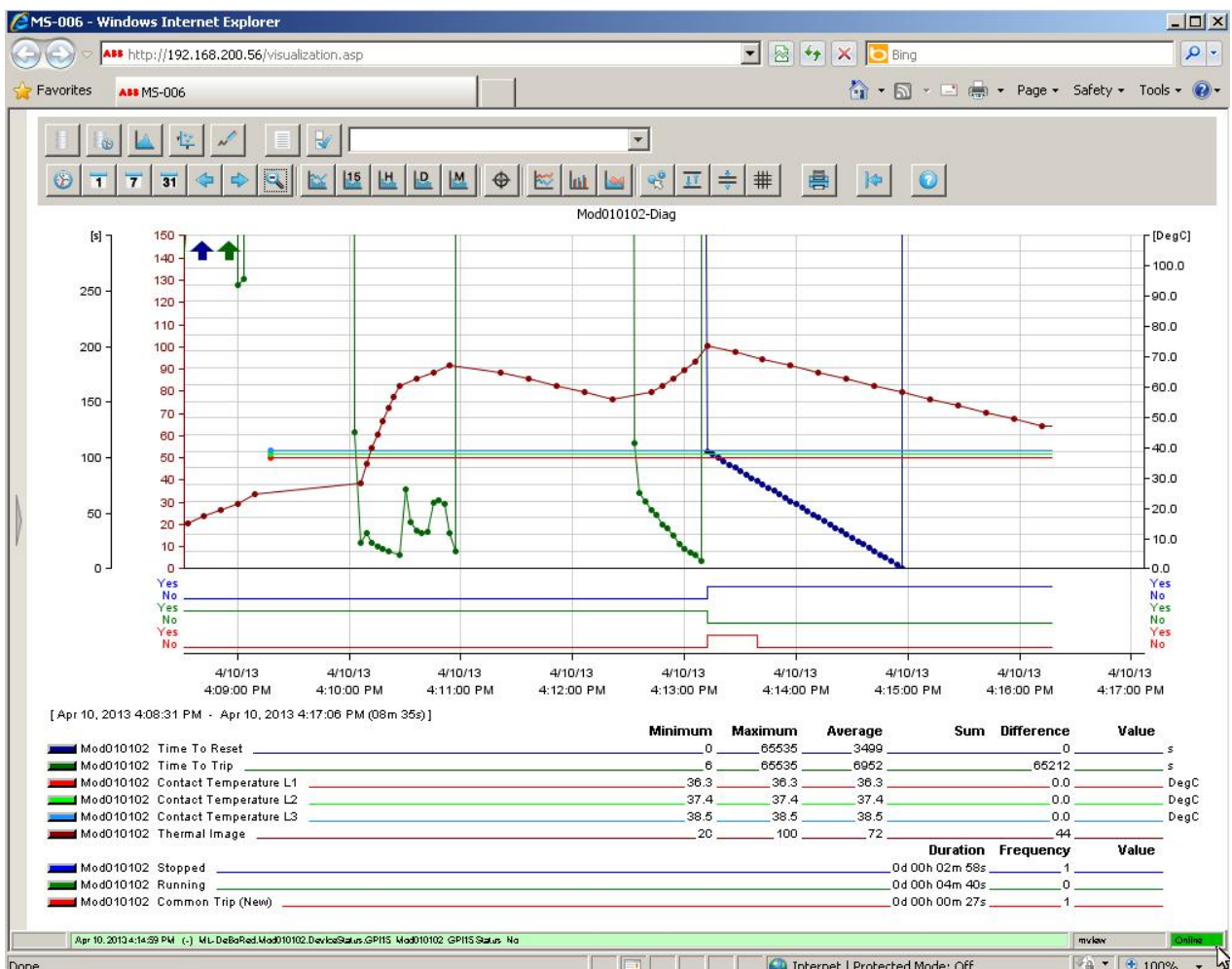


Fig. 44: Trend display with legend

Trend display options available:

Selection of process values



Selection of single process values from system structure or selection of user-defined value (graphs) combinations

Display mode



Selection between display modes e.g. time series, frequency analysis or live data recorder

Legend



Fade in of process item names related to defined graphs. Legend can be extended by user-defined titles.

Time intervals



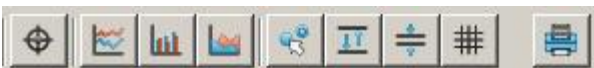
Time axis is configured, either via explicit setting of the time range or via pre-defined range settings. Options for navigation and zooming are given.

Data aggregation level



Access to the various pre-defined levels of data aggregation, e.g. fifteen minutes average

Diagram options




Options like crosshair, line graph, bar graph.

Optional fade in of extreme values, limits, single data points.

Print the current view.



## 6.2 Selection of Process Items and Layout Configuration

Clicking on the  button, the process item selection window opens. Individual process items of devices chosen from the system tree can be added to a specific combination.

Each graph has a default characteristic (color, scale) which can be modified.

The chosen graphs combination can be directly shown in the trend diagram or saved under a particular name.

Further on, the layout of the diagram (background, grid, Y-axis definitions) is defined for the particular graphs combination.

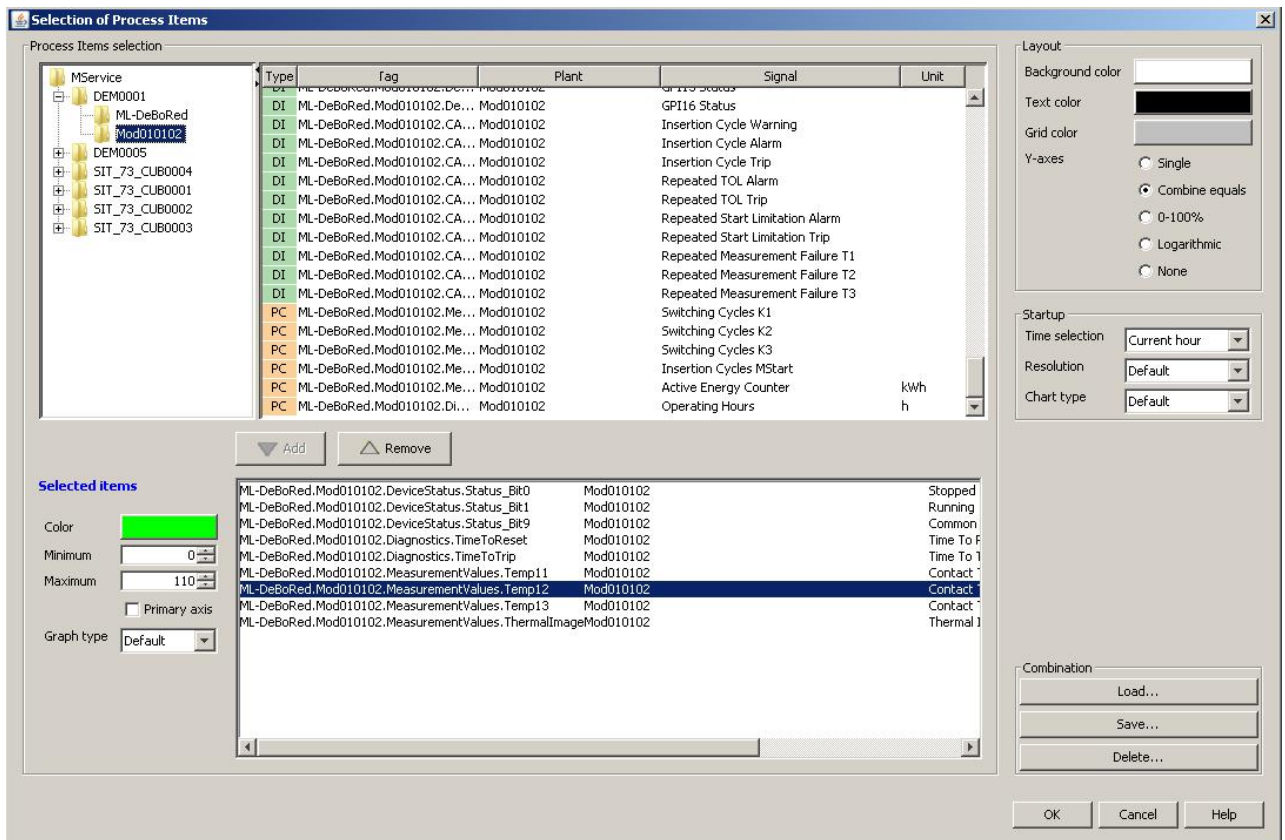


Fig. 45: Selection of process items

<b>Process Items selection</b>	
Selection of process item to be displayed in a graph.	
Add	Adds the selected process item to the combination in the lower window.
Remove	Deletes the marked process item from the combination in the lower window.
<b>Selected items</b>	
The properties of the selected process items can be changed here.	
Color	Specifies the color to be used for the graph of the selected process item. A standard color selection dialog is used.
Minimum	Defines the lowest value of process item to be shown in the graph.
Maximum	For items of type "AI" (i.e. analog measurements), this value defines the highest value of process item to be shown in the graph. For items of type "PC" (e.g. switching cycles counter), this value defines the maximum in the 1h aggregate display. In other aggregation levels the y-axis is adjusted automatically based on this value.
Primary Axis	The item marked as 'primary axis' determines the horizontal grid lines of the trend.
Graph Type	Type of Graph (Line, Bar, Area) for this individual item.
<b>Layout</b>	
Layout options for the actual graphs combination.	
Background color	Background color of the graphs combination.
Text color	Text color of the legend of the graphs combination.
Grid color	Color of the grid lines

Y-axes	Single	For each displayed graph a separate Y-axis is shown.
	Combine equals	Y-axes with the same scale are displayed only once (default).
	0-100%	On the right and left side one Y-axis with a scale from 0 to 100% is shown (for all graphs of the combination).
	Logarithmic	Y-axis is represented with a logarithmic scaling (for all graphs of the combination).
	None	No Y-axis is shown.
<p><b>Startup</b></p> <p>Startup options for the actual graphs combination.</p>		
Time selection	Initial range of time-axis (current hour, day, month, year) 'Default' is 'current day'	
Resolution	Initial data aggregation (raw values, aggregated values 15min, 1h, 1d, 1m) 'Default' is 'Raw values'	
Chart Type	Initial type of graph (Line, bar, or area diagram) 'Default' is 'Line diagram'	
<p><b>Combinations</b></p> <p>A combination of different process items and presentation options is saved under one graphs combination name and can be recalled at any time.</p>		
Load	Opens a dialog listing all available graphs combinations. Desired graph combination can be selected and opened with <i>OK</i> .	
Save	Saves a graphs combination under a specified name.  Option "Public": The graphs combination can be opened and seen by all users accessing this MService.	
Delete	Deletes an available graphs combination. Graphs combination to be deleted is selected in the list and deleted with <i>OK</i> .	

### 6.3 Graphs characteristics

After the definition of the process values for the graphs combination, the trend is shown with default characteristic: archive values of current day, shown in a line diagram.

If analog values in the chosen time period are out of the parameterized scale, an arrow will be drawn in up or down direction in the color of the variable.

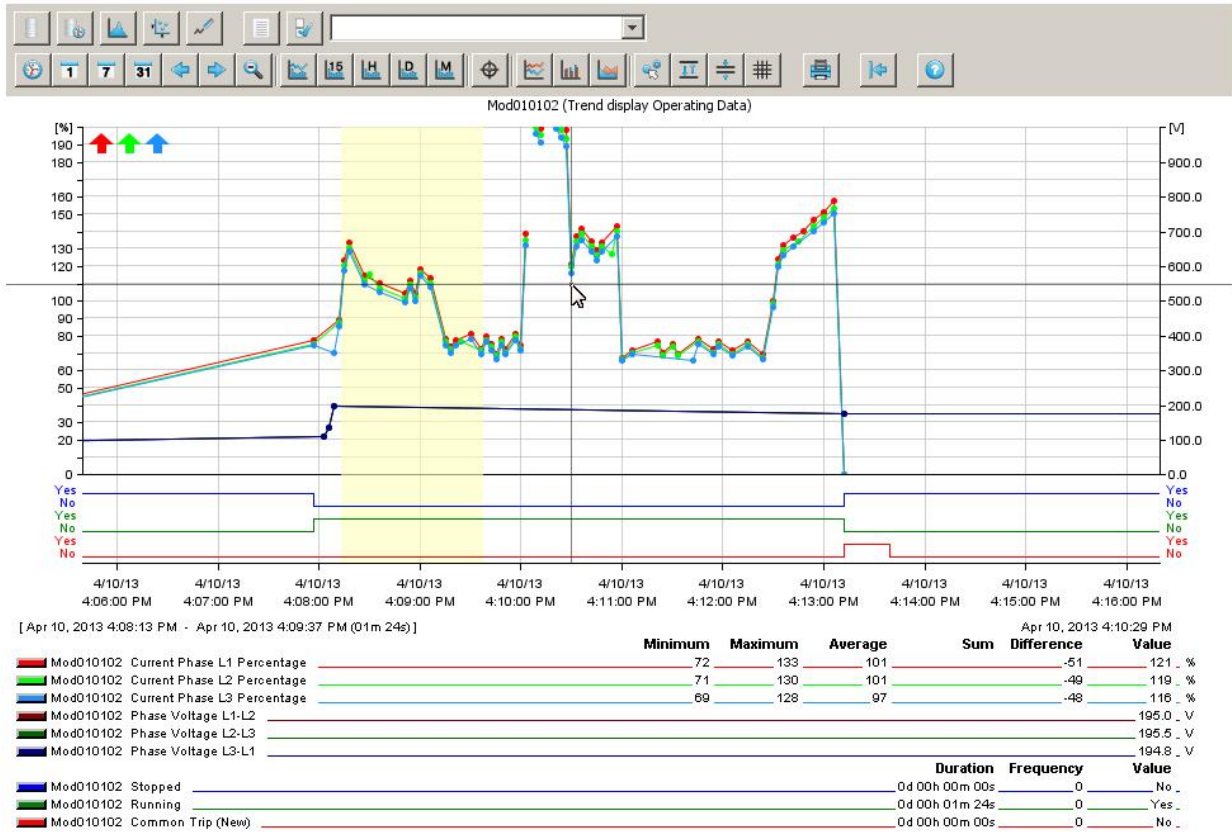



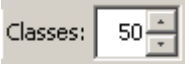

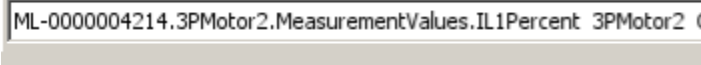






Fig. 46: Trend display example


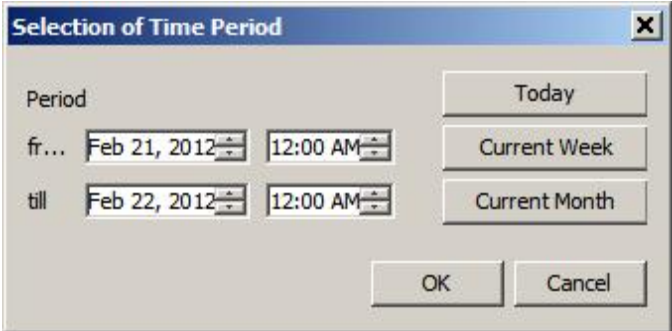
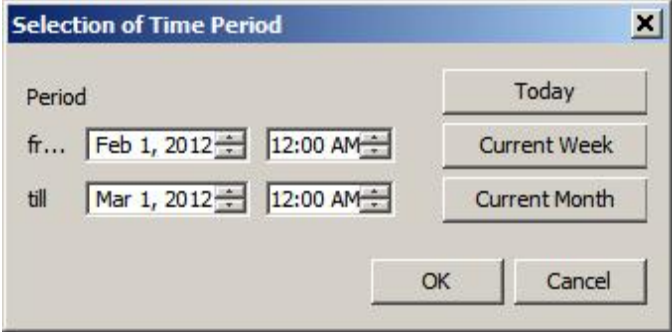
### 6.3.1 Graph controls







Graphs characteristics can be modified using the following options:

Display mode Depending on the selection of the display mode, the remaining toolbar varies.		
	Archive Values	In order to calculate the graphs, archived values from the MService database are used.  The graph is updated with the latest values depending on the selected data aggregation level.
	Archive Values with Time Comparison	See archive values.  2 graphs to be compared are shown with a time offset which can be defined. See time selection.
	Frequency Analysis	The frequency of occurrence of analog measured values is displayed with a bar graph.  With selection of this option, the classes buttons become visible:    With the number of classes the measuring range of the selected process item is partitioned along the x-axis. The higher the number of classes, the finer the resolution of the frequency analysis.
	XY-Presentation	With the XY-Presentation a measured value is shown in dependence of another value, e.g. the power input of a pump as a function of the differential pressure of this pump.  With selection of this option, the list box for the selection of the X-axis becomes visible:  
	Pen recorder	The live values of the selected process items are written directly in a line graph.
	Legend on/off	Legend is shown or hidden, see sec. 6.3.2

	Selection of Process Items	See Selection of process items, sec. 6.2
	Graphs Combinations	Via this dropdown field, a graphs combination can be selected and shown.
	Exit	Exit from full screen trend view to previous Power Module view.

**Time Intervals**

	Time Selection	<p>Definition of the time period, the graphs are shown for.</p>  <p>Date and hour can be entered freely or selected directly by clicking the buttons. (Today, current week, current month).</p> <p>If the mode <i>archive values with time comparison</i> is active, the following dialog box comes up. Time offset for the comparison of 2 graphs is defined. The offset curve is dotted.</p> 
---	----------------	--

	Today	Current day is indicated as time period.
	Current Week	Current week is indicated as time period.
	Current Month	Current month is indicated as time period.
	Scroll Back	With <i>Scroll back</i> the current time period is moved back half of the current selected time period.
	Scroll Forward	With <i>Scroll forward</i> the current time period is moved forward half of the current selected time period.
	Zoom out	The current time period is zoomed out into the next larger one.
	Zoom in	A certain time period is marked with the left mouse button hold. Thus the marked time period will be displayed in a larger scale.

### Aggregation












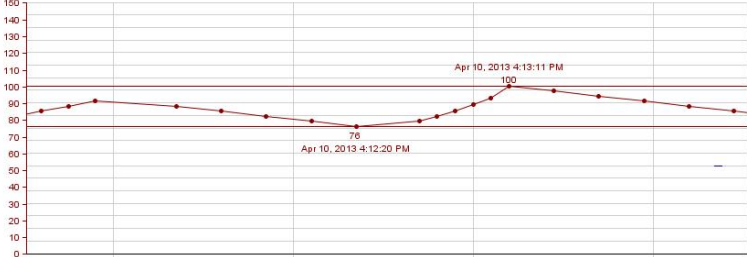




	Raw values	Archived raw values are displayed.
	15 min aggregation	Archived 15-minutes-values are displayed.
	1 hour aggregation	Archived hours-values are displayed.
	1 day aggregation	Archived days-values are displayed.
	1 month aggregation	Archived months-values are displayed.


Diagram options		
	Crosshair	<p>Activation of crosshair enables the user to read out coordinates of a specific point in the diagram.</p> <p>Depending on the position of the crosshair, the corresponding data are displayed in the legend.</p> <p>Statistics</p> <p>A certain time period can be marked with the crosshair (left click into the diagram, drag mouse along the x-axis). Thus the legend is extended by statistical data for this time period, see sec. 6.3.3</p> <p>Crosshair "freezing"</p> <p>This function is only available in the archive- and time comparison modes. With right mouse click into the diagram, it is possible to "freeze" the mouse pointer (e.g. for a print-out). After "freezing", the crosshair can be moved with pressed mouse button.</p>
	Line chart	Values are shown in a line chart.
	Bar chart	Values are shown in a bar chart.
	Area chart	Values are shown in an area diagram.
	Measured Value marker on/off	<p>There are 2 different marker types for measured values:</p> <ul style="list-style-type: none"> <li>● A dot signals: Measured value is within range.</li> <li>✘ A cross signals: Measured value is out of range. In the legend the value is indicated in red.</li> </ul> <p>In case of an OPC failure, no value is displayed.</p>



	<p>Min/Max-Display on/off</p>	<p>The extreme values (minimum and maximum) of each indicated graph in the diagram are marked with a horizontal line. The extreme values are identified with date and time.</p> 
	<p>Limits on/off</p>	<p>Option not used</p>
	<p>Grid Lines on/off</p>	<p>Background grid lines are shown or hidden.</p>
	<p>Print</p>	<p>Opens a print dialog to print out the current view.</p> <p> Microsoft XPS printer may not be supported on Windows 7 client PCs.</p>

### 6.3.2 Legend

The legend lists the process items shown in the trend display graphs. Using the crosshair option, the legend is extended by statistical data.

Legend is switched on or off by clicking on the button .







[ Feb 21, 2012 9:27:44 AM - Feb 21, 2012 9:28:50 AM (0d 06h 31m 05s) ]		Feb 21, 2012 9:27:59 AM				
	Minimum	Maximum	Average	Sum	Difference	Value
 3PMotor2 Current Phase L1 Percentage	0	515	109		515	5 %
 3PMotor2 Current Phase L2 Percentage	0	512	108		512	5 %
 100-1-10-1 Current Phase L2 Percentage	47	51	49		-4	48 %
 100-1-10-3 Current Phase L1 Percentage					0	0 %
 100-1-10-3 Current Phase L2 Percentage					0	0 %
 100-1-16-4 Current Phase L1 Percentage	47	52	50		4	50 %

Fig. 47: Trend display legend

It is possible to show or hide graphs temporarily by clicking on their corresponding colored bars in the legend.

	3PMotor2 Current Phase L1 Percentage	
	3PMotor2 Current Phase L2 Percentage	
	100-1-10-1 Current Phase L2 Percentage	
	100-1-10-3 Current Phase L1 Percentage	
	100-1-10-3 Current Phase L2 Percentage	
	100-1-16-4 Current Phase L1 Percentage	

Fig. 48: Trend display – show/hide graphs

### 6.3.3 Statistics

With activated crosshair a *statistics* options can be used.

A certain time period is marked with the crosshair (left click into the diagram, drag mouse along the x-axis). The selected range is colored in yellow. The legend is extended by statistical data for this time period.

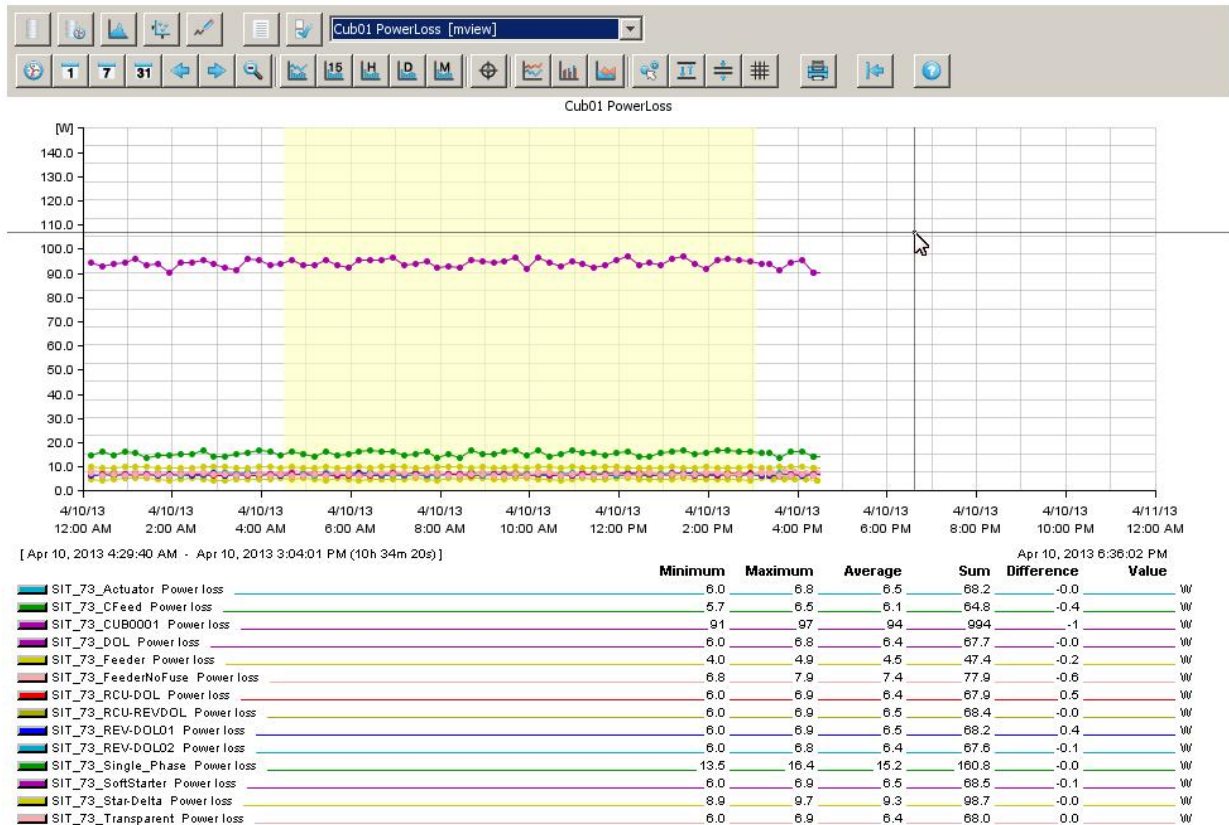


Fig. 49: Selection of range for statistics

With a further left mouse-click the selected range is fixed. A left mouse-click at the left or right border next to the y-axis removes the selection.

If the mouse points directly to the border of the selection, the mouse-pointer changes into a double arrow. Thus the selected range can be modified.

With double-click on the double arrow, a dialog box opens to specify the exact time.



Fig. 50: Selection of range for statistics graphically (left) and directly (right)

The legend shows the following information on statistics:

Value	Indication of the value for the position of the crosshair.
Difference	If the mouse pointer is placed between 2 measurement points, the value difference is shown.
Sum	All values within the selected area are summed up. Sum is only calculated for counters like switch cycles, insertion cycles etc.
Average	Average of values within the selected area is displayed.
Maximum	Highest value within the selected area is displayed.
Minimum	Smallest value within the selected area is displayed.
The following values are only displayed in case a digital signal is available in the graphs:	
Duration	Display of time how long a digital signal has been in signal state 1 (high) within the selected area.
Count	Display of amount of starting attempts (rising edge) of the digital signal within the selected area.

## 7 Value Export

Measurement values can be exported in the widespread CSV format.



### 7.1 Export of data from MService

User selects the desired modules/devices and the time span and then clicks on 'Create Archive File'.



#### Archive Value Export

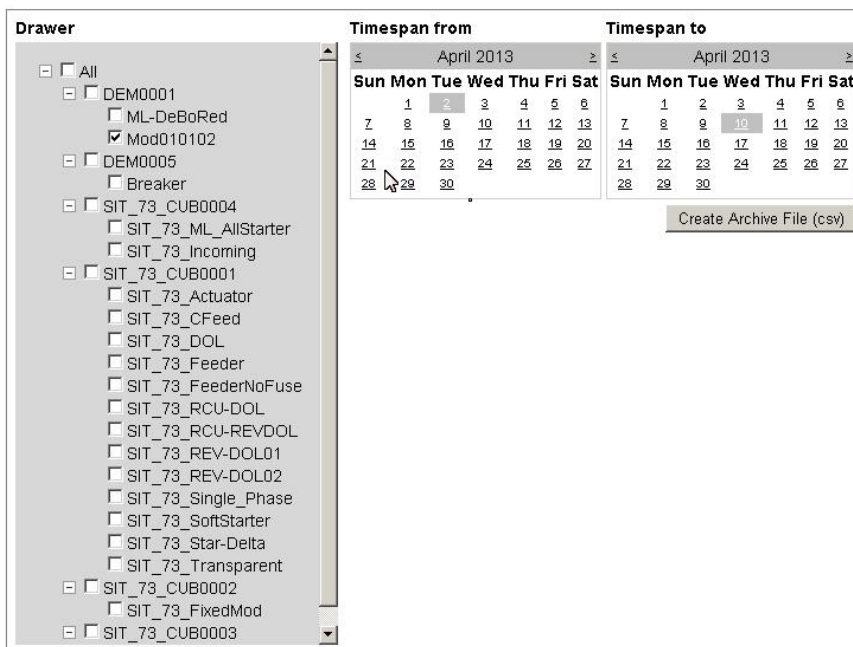


Fig. 51: Archive value export – Module and time span setting

A progress bar indicates the ongoing process to create the csv.

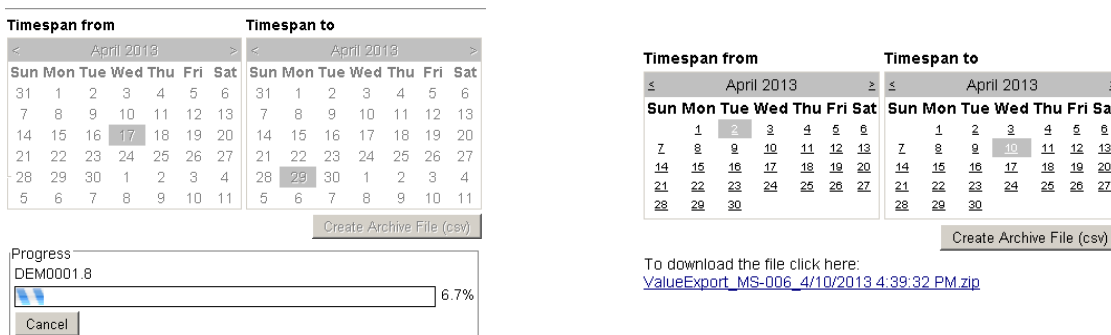


Fig. 52: Archive value export – feedback during creation of zip file (left side) and download link for zip file (right side)

The created compressed archive (zip) contains one embedded zip with multiple csv files per selected device:

- Archive values: List of analog values
- Message archive: List of status messages and alarms  
(Message archive is only available, if there are messages in the selected time span)

The file structure presents every data record in a separate line with timestamp, message text, acknowledgement status, priority, comment and number separated by semicolons.

Export files containing more than 65.000 lines are separated to different files.

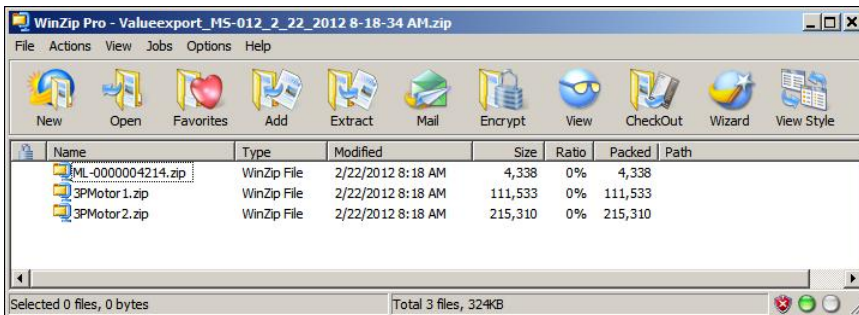


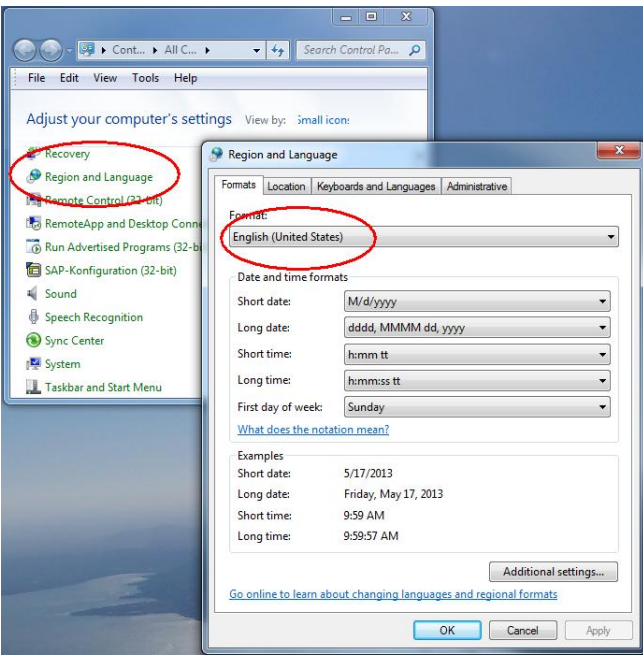
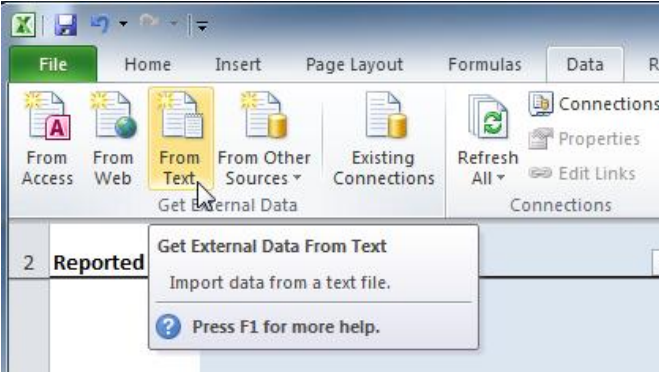
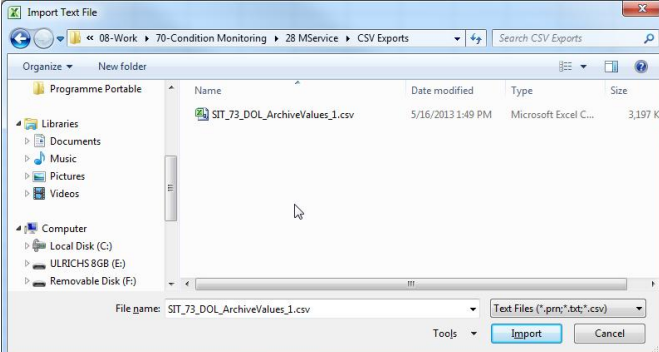
Fig. 53: Archive value export – file export

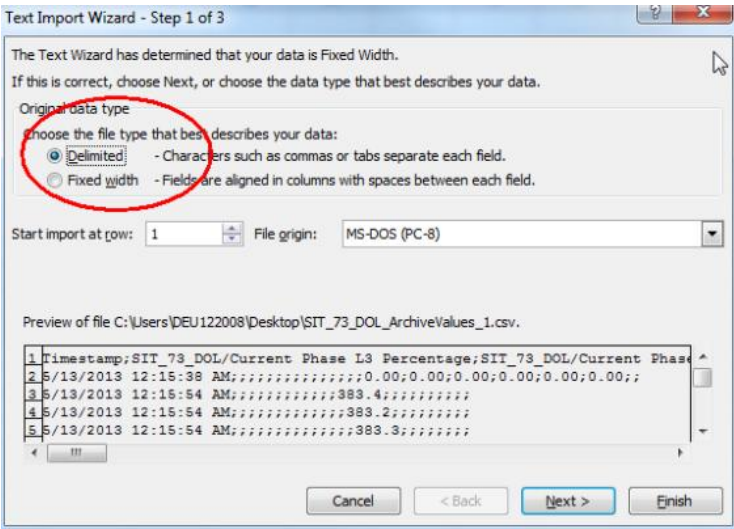
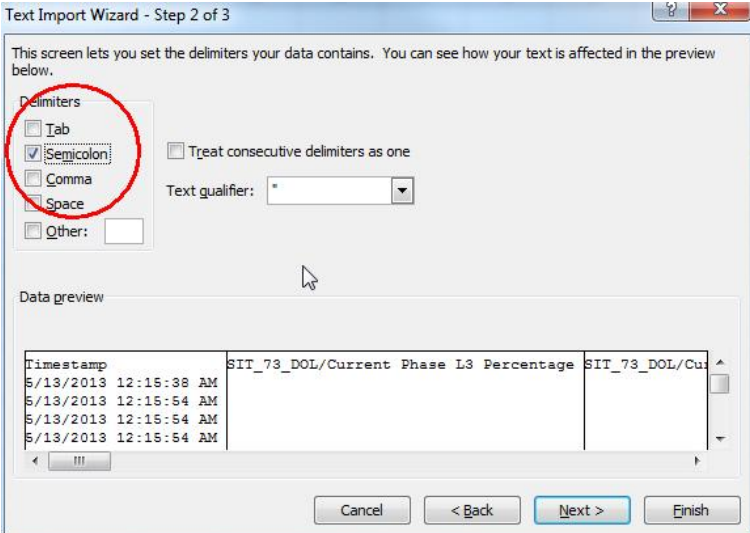
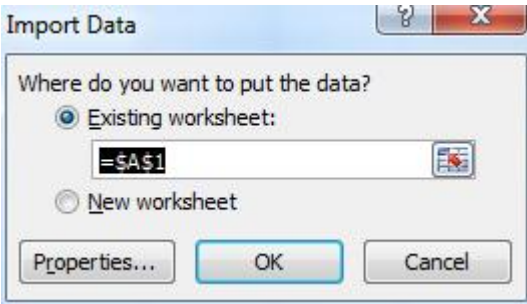
## 7.2 Import of the data into Microsoft Excel



The formatting of the csv data depends on the regional settings of the current user exporting the data. E.g. if the user's language is 'English', the date format is Month/Day/Year and the decimal separator is '.'

If the data is to be imported into Microsoft Excel, the user's regional settings of Windows temporarily have to be adjusted to match the regional settings of the exporting MService user.

<p>1</p>	<p>Open "Control Panel → Region and Language", to prepare the csv import matching the export settings.  (Example shown for US-English)</p>	
<p>2</p>	<p>In Excel, open a workbook and use the 'Data' menu to import the csv file.  (Example shown for Excel 2010)</p>	
<p>3</p>	<p>Locate and Select the csv file.</p>	

<p>4</p>	<p>Text import wizard : Set Data type to 'Delimited'.</p>	 <p>Text Import Wizard - Step 1 of 3</p> <p>The Text Wizard has determined that your data is Fixed Width. If this is correct, choose Next, or choose the data type that best describes your data.</p> <p>Original data type</p> <p>Choose the file type that best describes your data:</p> <ul style="list-style-type: none"> <li><input checked="" type="radio"/> Delimited - Characters such as commas or tabs separate each field.</li> <li><input type="radio"/> Fixed width - Fields are aligned in columns with spaces between each field.</li> </ul> <p>Start import at row: 1 File origin: MS-DOS (PC-8)</p> <p>Preview of file C:\Users\DEU122008\Desktop\SIT_73_DOL_ArchiveValues_1.csv.</p> <pre> 1 Timestamp;SIT_73_DOL/Current Phase L3 Percentage;SIT_73_DOL/Current Phase 2 5/13/2013 12:15:38 AM;0.00;0.00;0.00;0.00;0.00;0.00; 3 5/13/2013 12:15:54 AM;383.4; 4 5/13/2013 12:15:54 AM;383.2; 5 5/13/2013 12:15:54 AM;383.3; </pre>
<p>5</p>	<p>Text import wizard : Set delimiter to 'semicolon' only.</p>	 <p>Text Import Wizard - Step 2 of 3</p> <p>This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below.</p> <p>Delimiters</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Tab</li> <li><input checked="" type="checkbox"/> Semicolon</li> <li><input type="checkbox"/> Comma</li> <li><input type="checkbox"/> Space</li> <li><input type="checkbox"/> Other: <input type="text"/></li> </ul> <p><input type="checkbox"/> Treat consecutive delimiters as one</p> <p>Text qualifier: *</p> <p>Data preview</p> <pre> Timestamp      SIT_73_DOL/Current Phase L3 Percentage  SIT_73_DOL/Cu 5/13/2013 12:15:38 AM  0.00;0.00;0.00;0.00;0.00;0.00; 5/13/2013 12:15:54 AM  383.4; 5/13/2013 12:15:54 AM  383.2; 5/13/2013 12:15:54 AM  383.3; </pre>
<p>6</p>	<p>Text import wizard : Select where the data should be placed within the Excel document.</p>	 <p>Import Data</p> <p>Where do you want to put the data?</p> <ul style="list-style-type: none"> <li><input checked="" type="radio"/> Existing worksheet: <input type="text" value="\$A\$1"/></li> <li><input type="radio"/> New worksheet</li> </ul> <p>Buttons: Properties..., OK, Cancel</p>
<p>7</p>	<p>Reset the regional settings to the previous state</p>	





## 8 Configuration



The configuration function provides the ability to check the device's settings and modify the condition monitoring setup via four sub-pages: Summary page with network settings, the Autoconfigurator, Alarming and Reporting tool and the MService Backup/Restore tool.

### 8.1 Summary

In the Summary page, the user finds the applied IP network settings of the system. It allows for checking version numbers, network configuration, OPC server settings and local time settings.

To change these settings use MNavigate as described in sec. 4.4.

User has also the possibility to set the MService system time according to the time of the web client. This is useful should the configured NTP server temporarily not be available.



Changing the MService time into the past may result in loss of data and need of recalculation of the aggregated values.

No further validation check is done. If the time is changed here, it is assumed that the client PC has the correct time set.

**ABB MService** MS-006 Summary Autoconfigurator Alarming / Reporting MService Backup, Recovery ?

### System Overview

Version numbers	
OPC-Server:	7.3.0003
MService-Firmware:	7.3.0001
Network configuration	
MService LAN 1 IP-Address:	192.168.100.56
MService LAN 1 Gateway:	0.0.0.0
MService LAN 1 Subnetmask:	255.255.255.0
MService LAN 2 IP-address:	192.168.200.56
MService LAN 2 Gateway:	0.0.0.0
MService LAN 2 Subnetmask:	255.255.255.0
MService LAN 3 IP-address:	123.123.123.123
MService LAN 3 Gateway:	0.0.0.0
MService LAN 3 Subnetmask:	255.255.255.0
OPC-ID:	30
OPC-Language:	en
Timeserver (NTP):	192.168.200.2
<input type="button" value="Set MService time from web client"/>	
Locale settings	
Timezone:	(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna

Fig. 55: MService system overview

## 8.2 Autoconfigurator

Autoconfiguration is described in section 4.3

## 8.3 Alarming and Reporting

MService is able to send alarm and report notifications via E-Mail. The settings are done in the Alarming and Reporting configuration form:

**ABB MService** MS-006 Summary Autoconfigurator Alarming / Reporting MService Backup, Recovery ?

### Alarming and Reporting

Settings for Message Severity Classes

<b>Normal</b>	E-Mail	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Maintenance required</b>	E-Mail	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Out of Specification</b>	E-Mail	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Function Check</b>	E-Mail	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Failure</b>	E-Mail	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fault Reports

Sendinterval:

E-Mail Address:

E-Mail-Settings

SMTP-Server:

Sendname:

Sendaddress:

SMS-Settings

Device is not available / Future option

Fig. 56: Alarming and reporting

### Messages

For each of the five message classes user can define up to three destination E-mail addresses to be notified in case of an event.

### Fault reports

A 'fault report' is an email containing all messages in the configured send-interval with severity 'Maintenance required soon' (100) and higher.

For fault reports, up to three destination E-mail addresses and sending intervals can be defined.

### E-Mail settings

To enable this functionality, E-Mail server settings have to be made so that the server is able to send the notification E-Mail. SMTP-server IP address, a sender name and a sender mail address are to be provided. See figure above for examples.

In case the e-mail settings are not correct and MService is not able to deliver the mail to the mail server, a system message is issued, indicating a problem with the 'FCEmail' component.

5/16/2013 9:39:27 AM.467	FCEmail.EmailApplication.1	FCEmail.EmailApplication.1 Error	(-)
5/16/2013 9:34:27 AM.850	FCEmail.EmailApplication.1	FCEmail.EmailApplication.1 Error	(+)

The message has a severity of 750 ("Function Check").  
It is automatically cleared by the system within few seconds



In order to use the E-Mail option, MService device must be connected to a plant or enterprise network. Additional security requirements apply according to the customer network regulations and it may not be possible to use this option in some networks.

Check with the customer network and IT administrator for options.

## 8.4 Backup / Restore

Safety backups of the MService database and configuration can be done on an external USB hard-disk. This is an option to prevent complete data loss. In case the database gets corrupted or MService hardware was replaced, the data can be restored from backup.

### 8.4.1 Backup

The USB hard-disk has to be connected to one of the USB connectors on the MService device front. The 'Backup/Recovery' page allows defining a location where the backup shall be placed on the hard-disk.

The progress of the backup creation is shown after pressing 'Backup now'.

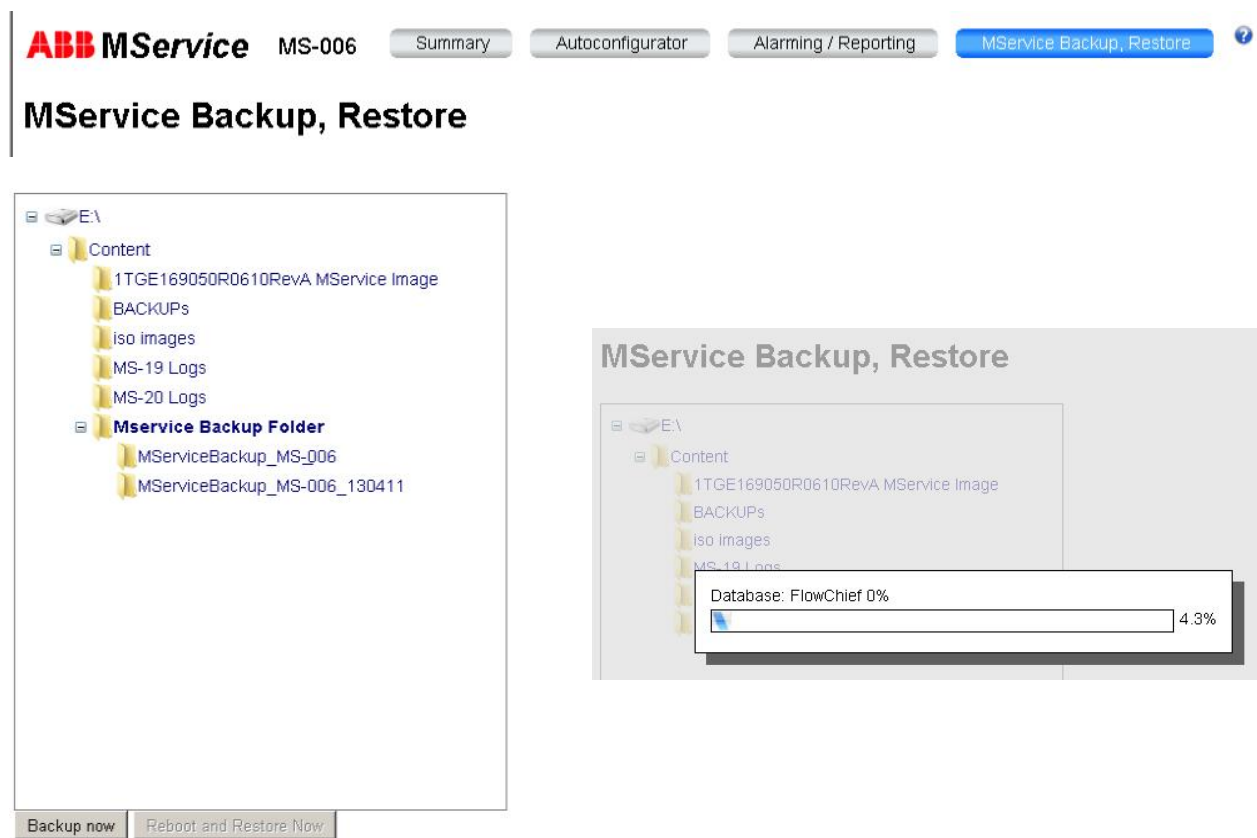


Fig. 57: Backup: defining the target location (left side) and feedback on progress (right side)

### 8.4.2 Restore

In the window select a folder with a valid backup file. The 'Reboot and Restore Now' button is enabled once a valid file is found by MService.

To restore a database and the configuration recovery click on 'Reboot and Restore Now'.

#### MService Backup, Restore



Fig. 58: Restore: Selecting the location of the backup

Pressing 'Reboot and restore now' triggers a confirmation dialog, before an immediate reboot of the MService followed by an automated replacement of the current database with the backup database is executed.



Ensure that the power supply to the MService device is not cut off during the process. Do not power off or remove USB hard-disk until it is possible to log-in to the MService.

## 9 Data view area

The data view occupies the middle part of the MService display. It contains either an overview on the MNS iS system or detailed pages for the various devices or the cubicles.

### 9.1 Cubicle overview

In the cubicle view a detailed display of up to 4 MNS iS cubicle is presented.

A thumbnail list of all cubicles configured in the MService is shown above. Clicking on the thumbnails allows for switching to the desired cubicle in the main view.

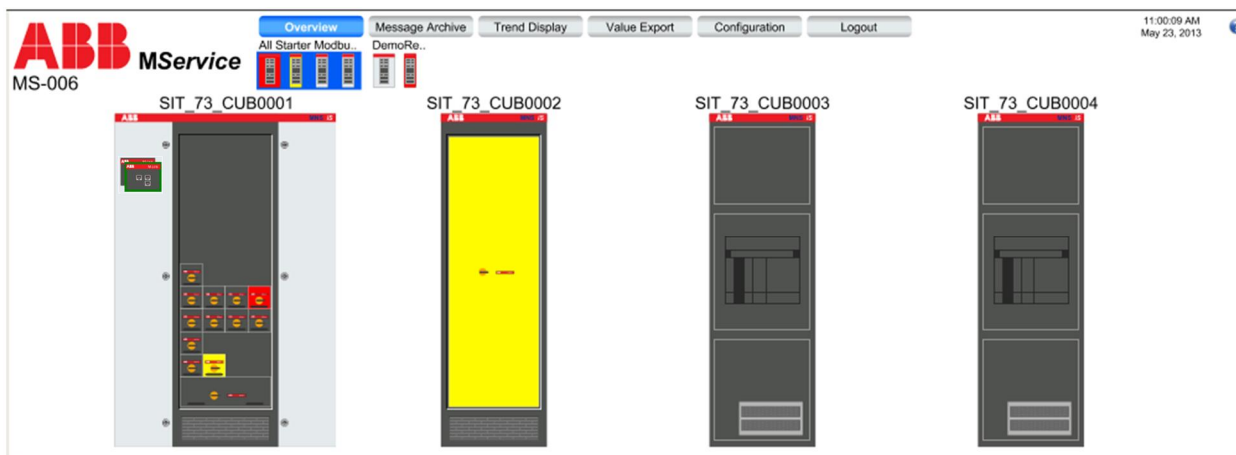


Fig. 59: Cubicle view

Cubicles of the same switchgear are grouped. The groups are separated by a gray line between the cubicle pictures respective a bigger spacing between the thumbnails.

Every MStart /MFeed or Circuit Breaker module is displayed in its configured location within the equipment compartment of the cubicle.

The MLink is always shown in the first of its associated cubicles; this is for technical reason and may not be the actual location of the MLink. If this cubicle is a slim cubicle without control compartment, the MLink is not shown. It is only accessible through the tree menu or the link on 'info tab' of a related device

Devices which are included in the MService configuration are shown in dark grey and are colored according to the operational status.

Devices which are shown as part of a cubicle but are not configured for supervision are indicated in light grey color.

Devices can be clicked to jump to the detailed view.

Devices in status 'running' or 'closed' are shown with a small orange circle. Devices with an active alarm or trip are shown in yellow (alarm) or red (trip).

### 9.1.1 Color coding

The cubicle thumbnails are colored if one of their modules has an active alarm/trip state. The color coding is according to the NAMUR recommendation [4].

Following table describes the color and meaning.






Severity	Sub-Condition	Description
1 - 99	Normal 	Motor is available. Status is <b>‘normal’</b> . Asset functionality is fully available. No maintenance is required.
100 -399	Maintenance required 	Motor is available. Status is <b>‘maintenance required (soon)’</b> . Asset functionality fully available but maintenance required soon to avoid functional restrictions, e.g. caused by a nearly exhausted wear reserve or operating conditions.
400 -749	Out of Specification 	Motor is still available. Status is <b>‘out of specification’</b> . Asset functionality available but decreased due to operating conditions outside the specified limits.
750 – 899	Function Check 	Motor has been stopped. Operation is not possible. Status is <b>‘function check’</b> . Asset functionality might be temporarily restricted, due to on-going work on the asset, e.g. as local operation, maintenance (main-switch off), simulation or a function check (test-position).
900 – 1000	Failure 	Motor has been stopped. Status is <b>‘failure’</b> . Asset Functionality lost due to malfunction of its peripherals or due to operating conditions.

Fig. 60: Colors in cubicle view



The colors are predefined and cannot be changed by the user.



## 9.2 Cubicle Online Power-loss Supervision

As an advanced option in MService, the Online Power-loss Supervision function assesses the total power-loss together with the number of temperature related problems of individual modules within each cubicle. Three different alarms with increasing severity are generated alongside an indication which of the modules is rated as highest contributor to the total power loss.

<b>Cubicle Online Power-loss supervision</b>		
Severity	Alarm	Description
300	Power-loss is in warning state	The total 1h-average of the cubicle power-loss is above the configured limit
400	Power-loss is in alarm state	The total 1h-average of the cubicle power-loss is above the configured limit and some modules report temperature related problems (less than 5)
500	Power-loss is in critical state	The total 1h-average of the cubicle power-loss is above the configured limit and modules report temperature related problems (more than 5)
<b>Module Online Power-loss supervision</b>		
Severity	Alarm	Description
100	Module producing high power-loss	In case of a cubicle power-loss alarm, the three modules contributing most to the total power-loss are evaluated and marked with this warning

Cubicle Online Power loss supervision is only available,

- if the MNS iS system data files were recreated and exported by MNS Engineer 7.3.or newer
- Parameterization of the assessment requires at least MNavigate 7.3
- At minimum a 'Download Device List' to the MLink devices is required
- A 'Download configuration' to MService is required



A dedicated cubicle detail page provides an overview on the current status of the power-loss supervision. The cubicle detail page is accessible through the overview page by clicking in the cubicle area not hitting a device. Alternatively, open the left side tree menu (see 4.2.4) and select the cubicle there.

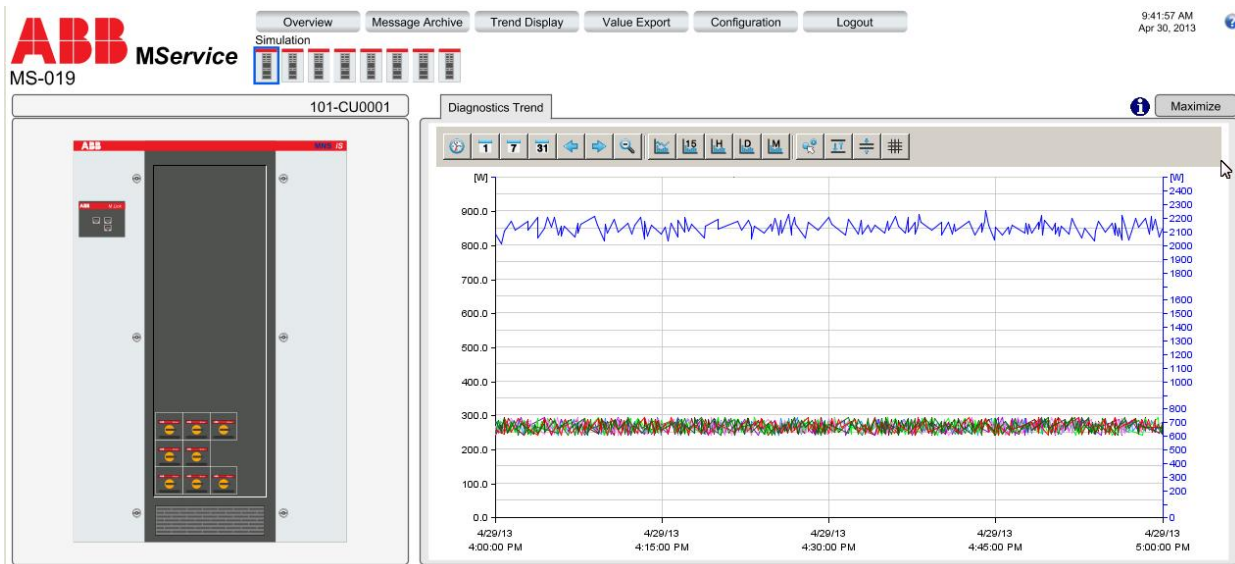


Fig. 61: Cubicle detail page with online power-loss information


The page shows the selected cubicle on the left side and a trend display on the right side. The trend shows the total cubicle power-loss.

If the total number of modules in the cubicle (supervised and not supervised) is less than 10, their individual power-loss values are shown. In case of more than or equal 10, only the power-loss summary is shown.



The configuration of this page cannot be changed by the user.

### 9.3 Power Module view

The detailed view of an MStart/MFeed or Circuit Breaker is opened by clicking the device in the Cubicle view. Another option to open the detailed view is via the “detail view”-button (  ) in the Message list (see 5.2.2) or via the left side tree menu (see 4.2.4).

On the left side a simplified MStart/MFeed or Circuit Breaker schematic is shown whereas on the right side detailed information and control options are available in a tab-separated area. The lower part of the window shows the alarm and event list, filtered for the selected module.

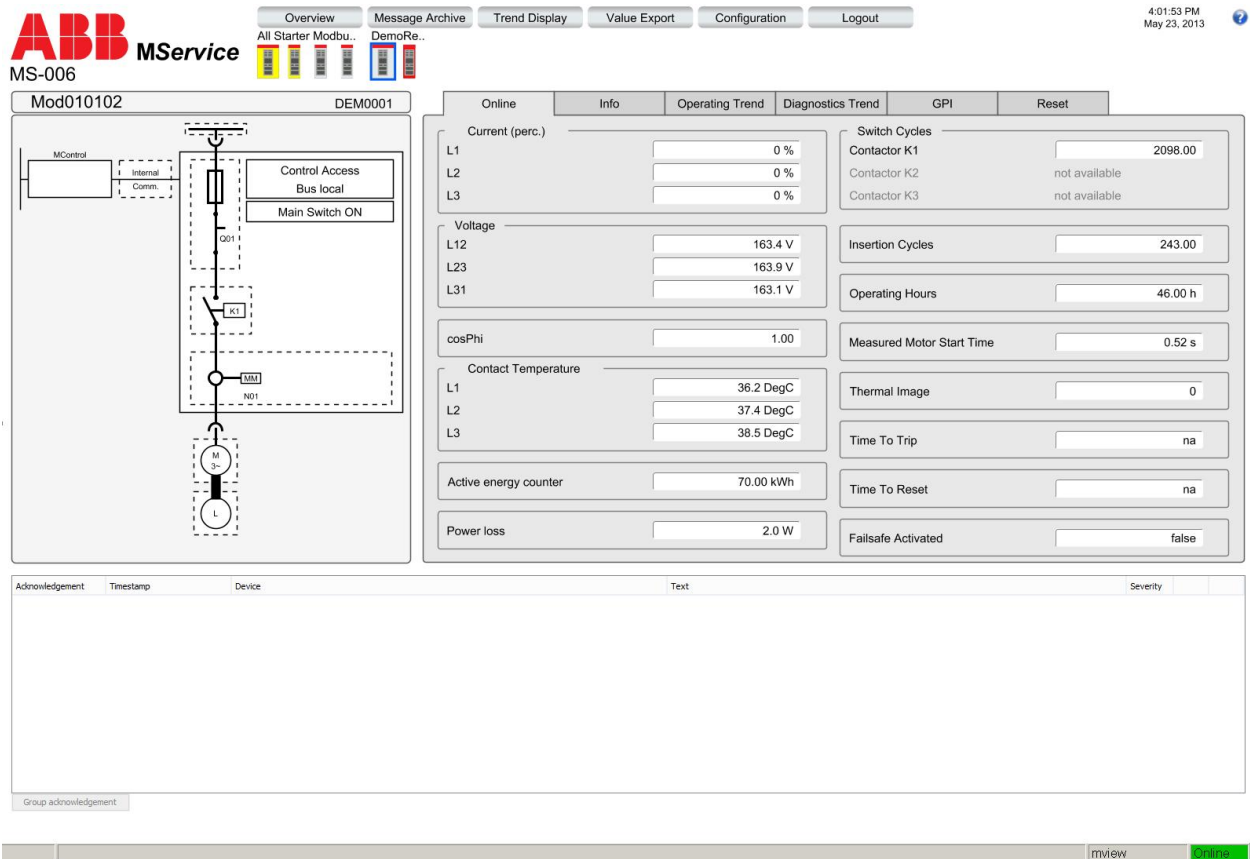


Fig. 62: Power Module view example: MStart

### 9.3.1 Power Module schematic

The Power Module view on the left side shows a simplified schematic of the device’s electrical structure with the device and cubicle name on top.

Individual parts of a module, which are with a fault or require maintenance action, are colored according to the color of the associated message’s priority (see also 10.1.1).

Additional status information is provided and indicated when active.

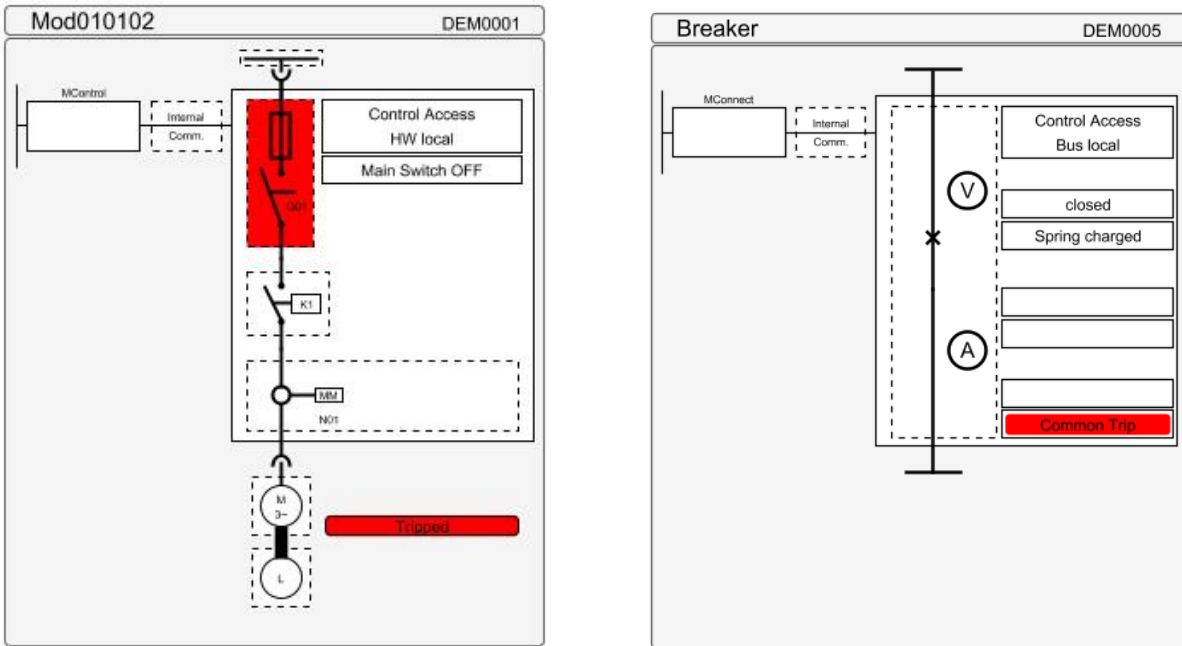


Fig. 63: Power Module schematic example: MStart and Circuit Breaker

### 9.3.2 Tab “Online”

This area shows the live values available for the device. This is useful for directly monitoring actual electrical and maintenance values.

MStart / MFeed connected through MControl

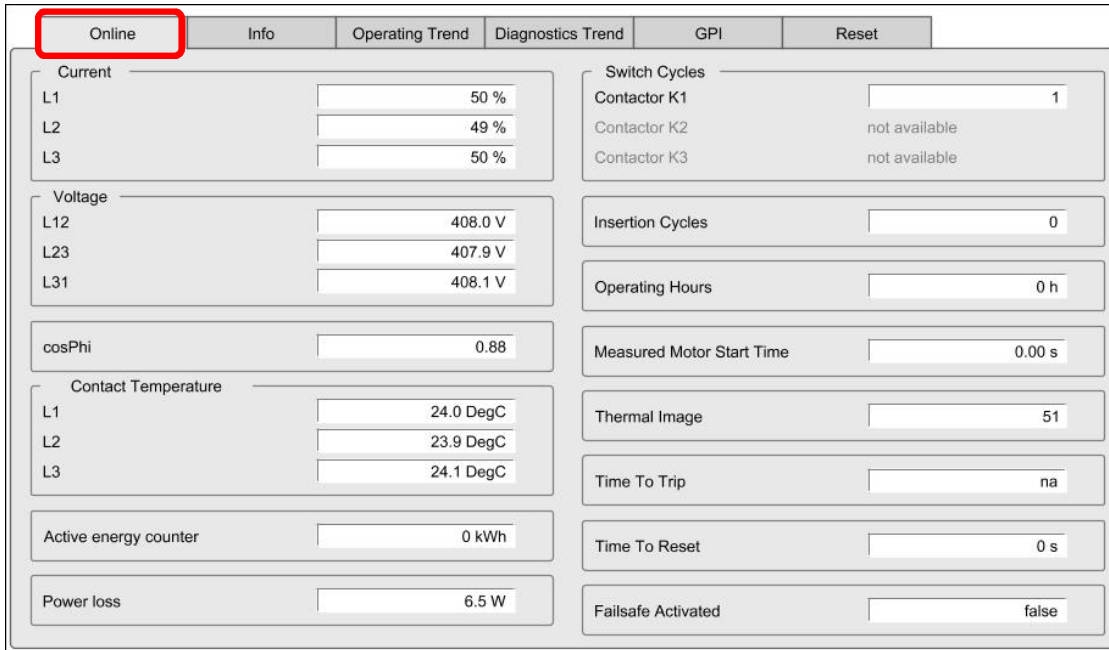


Fig. 64: Power Module view - Online values for MStart

The following values are available (depending on motor, load or module type)

MStart / MFeed	
Current	Current for up to 3 phases in percent of rated current
Voltage	Phase to phase Voltage for up to 3 phases
cosPhi	Power factor
Contact Temperature	Temperature of the outgoing contacts for up to 3 phases
Active energy counter	Current value of energy counter calculated by MControl
Power loss	Module’s current power loss

Switch Cycles	Count of switching operations for up to 3 contactors
Insertion cycles	Count of Power Module insertions
Operating Hours	Count of operational time of load in hours
Measured Motor Start Time	Start-up time of the motor
Thermal Image	Motor temperature profile showing the thermal load level
Time to Trip	Expected time to trip due to thermal overload
Time to Reset	Expected time to wait until TOL trip reset is possible
Failsafe Activated	Device is in Failsafe status (serial communication failure)

Circuit Breaker connected through MConnect

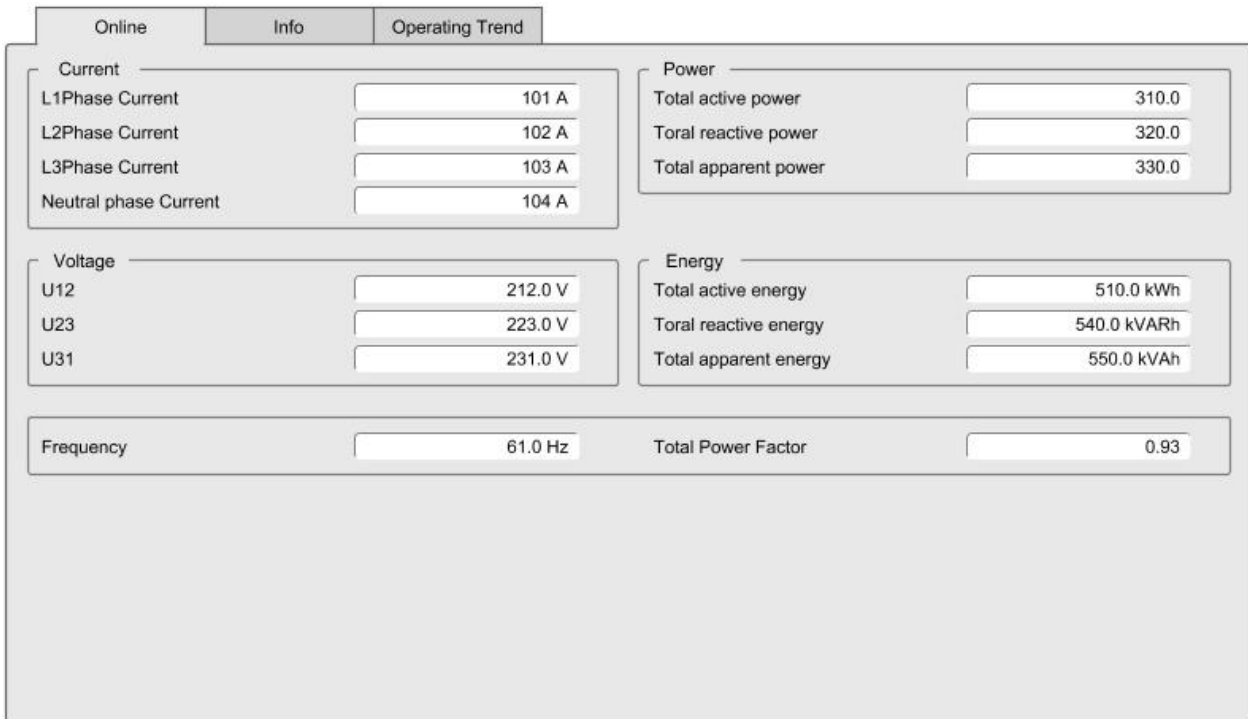


Fig. 65: Power Module view - Online values for Circuit Breaker

Circuit Breaker	
Current	Absolute current for 3 phases and neutral current
Voltage	Line to line voltages
Power	Total active, reactive, and apparent power
Energy	Total active, reactive and apparent energy
Frequency	Measured Frequency
Total Power factor	Power factor (Cos Phi)

### 9.3.3 Tab “Info”

Here, detailed hardware information of the device can be found. This is useful to identify a device, the connected plant component (e.g. motor or load) and the device main parameters (e.g. serial number)

#### MStart / MFeed connected through MControl

Online	Info	Operating Trend	Diagnostics Trend	GPI	Reset
<b>Labels</b> Device Name 1 SIT_73_FixedMod Device Name 2 SIT_73_FixedMod Device Name 3 BA01		<b>Power Module Info</b> Identnumber 1TFL732011U1481 Size 72E Serial Number 20301-091500015 Nominal Current 540A			
<b>Location</b> Switchgear All Starter Modbus TCP Cubicle SIT_73_CUB0002 Level 1 Position 1		<b>Drawer Functions</b> Power Module Type NR-DOL Application Type NrDolRcu			
<b>MLink</b> Device Name <a href="#">SIT_73_ML_AllStarter</a>		<b>MControl / MConnect</b> Identnumber 1TGE120010R1000			
<b>MView</b> <a href="#">Open MView web page</a>					

Fig. 66: Power Module view – Device Information for MStart / MControl

The following information is available:

Labels	
Device Name 1, 2, 3	Device Identifier for MStart / MFeed as in MNavigate
Location	
Switchgear	Switchgear name where the device is located
Cubicle	Cubicle name where the device is located
Level	The row where the device is installed in the cubicle
Position	The column where the device is installed in the cubicle



<b>MLink</b>	
Device Name	Name of the MLink to which the device is connected to through the internal serial communication.  Clicking on the link opens the detail page for that MLink
<b>MView</b>	
Open MView web page	Clicking on this link opens a new web browser with the MView web page of the related device. The attempt is based on the current MService user.  This function is limited to networks, where the MService client is connected to the same subnet as the MLink.
<b>Power Module Info (MStart / MFeed)</b>	
Identnumber	ABB Identification number of the Power Module
Size	Mechanical size of MStart / MFeed (6E4, 6E2, .. 72E)
Nominal Current	Maximum current of the Power Module
Serial Number	Serial number identifying the Power Module
<b>Power Module Functions</b>	
Power Module Type	Starter/Feeder type
Application type	Configured software application
<b>MControl / MConnect</b>	
Identnumber	ABB Identification number of the MControl device as originally engineered.

**Circuit Breaker connected through MConnect**

Online
Info
Operating Trend

**Labels**

Device Name 1	SIT_73_Outgoing
Device Name 2	SIT_73_Outgoing
Device Name 3	AA01

**Location**

Switchgear	All Starter Modbus TCP
Cubicle	SIT_73_CUB0003
Level	1
Position	1

**MLink**

Device Name	<a href="#">SIT_73_ML_AllStarter</a>
-------------	--------------------------------------

**MView**

[Open MView web page](#)

**Breaker**

Type	1SDA056518R0001
Breaker Type	Outgoing Breaker
Serial Number	Serial Number not valid
Nominal Current	3200A
Number of poles	3
Reference Standard	IEC

**MControl / MConnect**

Device Type	1TGE120071R1600
-------------	-----------------

Fig. 67: Power Module view – Device Information for a Circuit Breaker / MConnect

The following information is available:

<b>Labels</b>	
Device Name 1, 2, 3	Device Identifier of the Circuit Breaker as in MNavigate
<b>Location</b>	
Switchgear	Switchgear name where the device is located
Cubicle	Cubicle name where the device is located
Level	The row where the device is installed in the cubicle (1 to 36)
Position	The column where the device is installed in the cubicle (1 to 4)

<b>MLink</b>	
Device Name	Name of the MLink to which the device is connected to through the internal serial communication.  Clicking on the link opens the detail page for that MLink.
<b>MView</b>	
Open MView web page	Clicking on this link opens a new web browser with the MView web page of the related device. The attempt is based on the current MService user.  This function is limited to networks, where the MService client is connected to the same subnet as the MLink
<b>Breaker Info</b>	
Identnumber	ABB Identification number of the circuit breaker.
Breaker Type	Incoming / Outgoing / Bus-Tie circuit breaker
Serial Number	Serial number of the circuit breaker
Nominal Current	Nominal current of the breaker as engineered
Number of Poles	3 / 4 pole application as engineered
Reference standard	Relevant standard the device conforms to (IEC)
<b>MControl / MConnect</b>	
Identnumber	ABB Identification number of the MConnect device as originally engineered.

### 9.3.4 Tab “Operating Trend”

The Operating Trend is available for MStart / MFeed and Circuit Breaker.

This is a graph view plotting operational data (e.g. current and voltage) for the selected device into a diagram. Function and usage is similar to the Trend Display (see 6), but the graphs combination is predefined for Operating Trend.

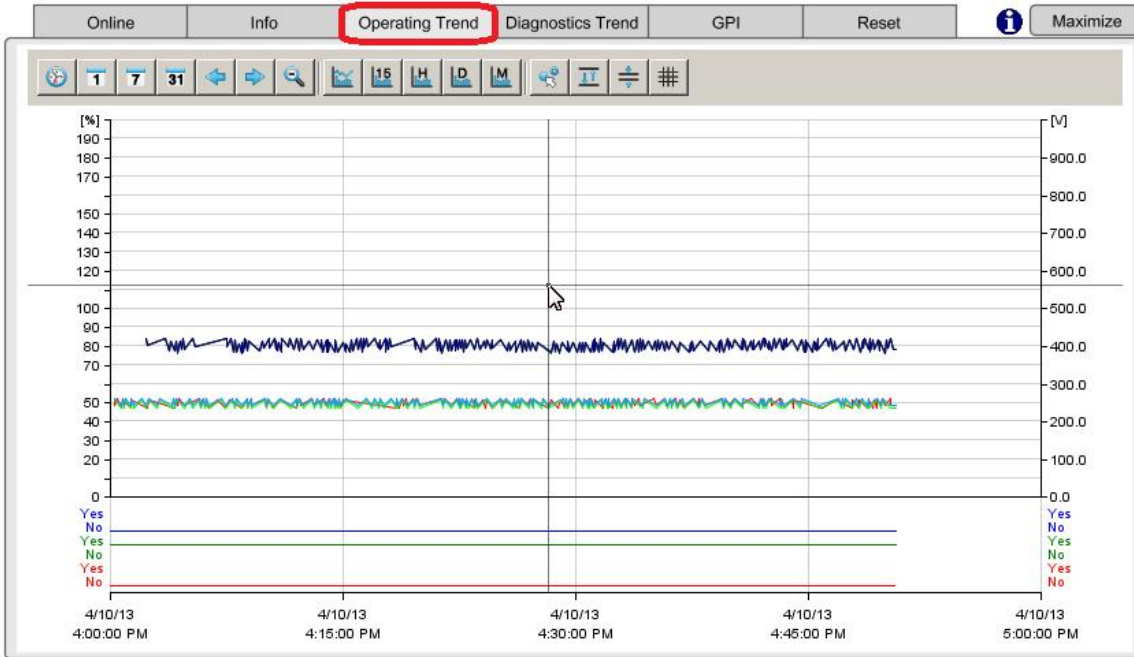


Fig. 68: Power Module view – Operating Trend


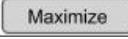
With a click on the “info” icon , a detailed legend pops up in a new window. Here user finds the color and description for every curve in the graph.



Fig. 69: Power Module view – Operating Trend Legend

Clicking on the “Maximize” button  , the trend display opens in full size mode with all capabilities of the trend display (see also description of trend display in chapter 6.).

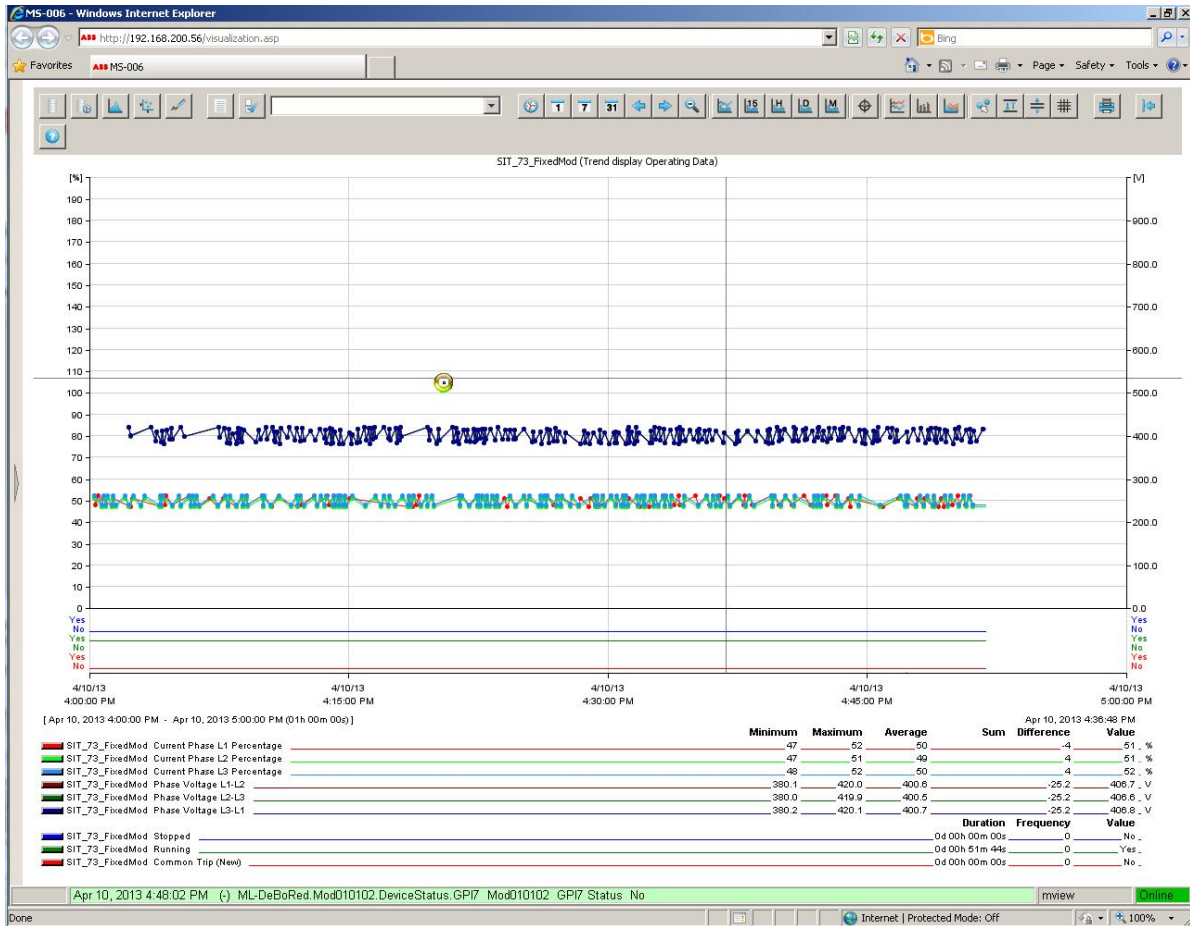



Fig. 70: Maximized trend display

Using the “Exit” button  user returns to the Power Module detail page.

### 9.3.5 Tab “Diagnostics Trend”

The Diagnostic Trend is only available for MStart / MFeed.

This is a graph view plotting diagnostic data (e.g. contact temperature, thermal image, time to trip, time to reset) for the device. The content is predefined for Diagnostic Trend.

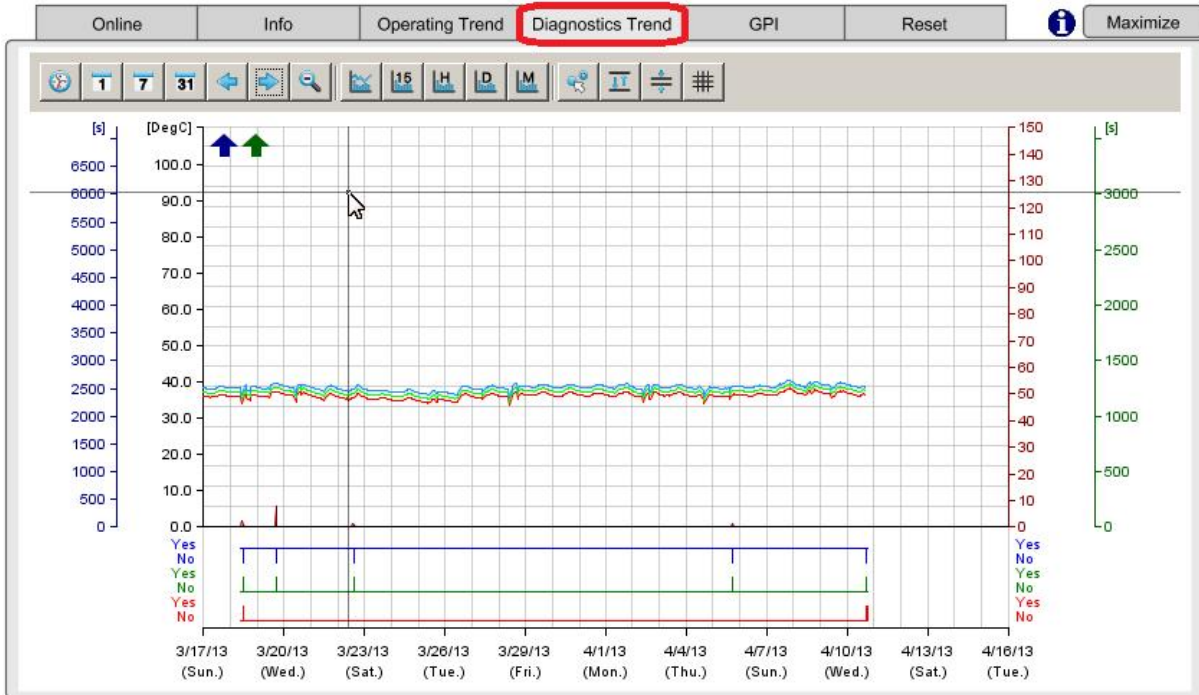



Fig. 71: Power Module view – Diagnose Trend

The legend, opening when clicking on the “info” icon , has the same functionality as in Operating Trend. (see 0)

### 9.3.6 Tab “GPI” - General Purpose Input

The tab is only available for MStart / MFeed.

Each MStart / MFeed has up to 16 digital input channels (General Purpose Input – GPI) which are individual customizable according to the application need.

If a GPI is active (high), the associated diagnostic lamp in this view is blue.

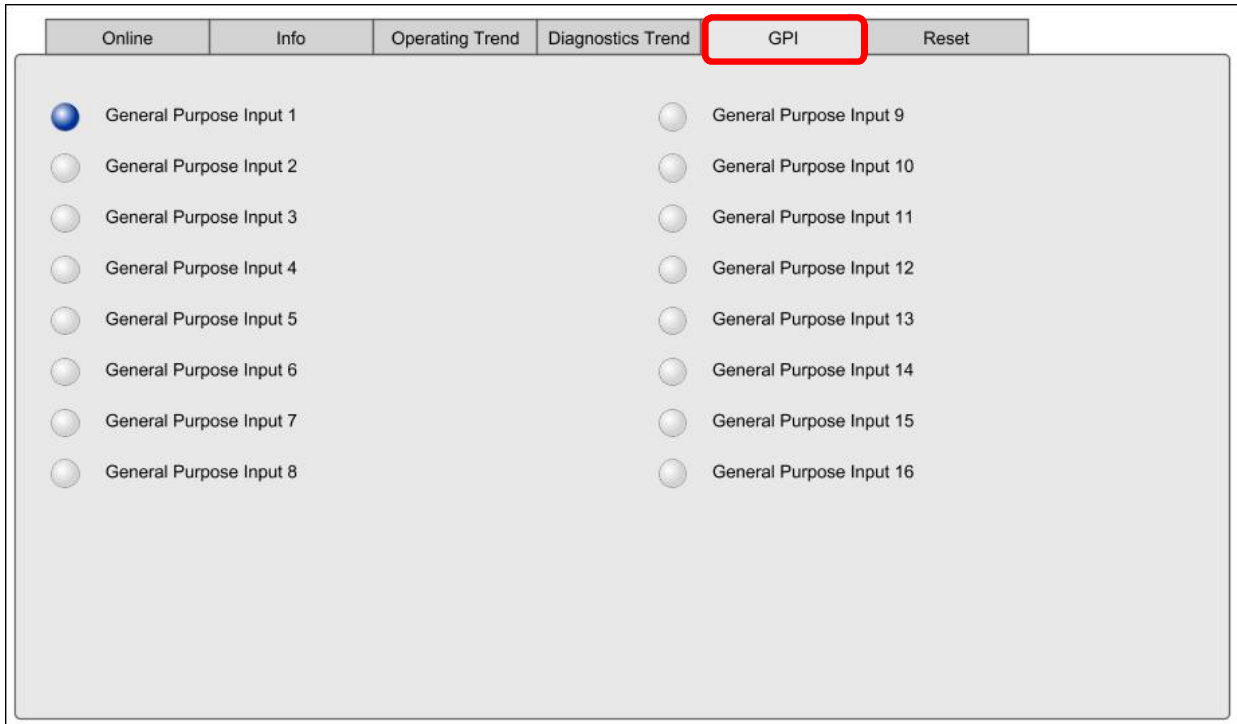


Fig. 72: Power Module view – General Purpose Inputs (GPI)



User specific texts for the GPI as configured in MNavigate and shown in MView are not transferred to MService.

### 9.3.7 Tab “Reset”

The tab is only available for MStart / MFeed.

Several condition assessment algorithms are running within the OPC server and parameterized via MNavigate. See sec. 3.4.4

A few of them are related to some maintenance action, which cannot be monitored automatically from data coming from the devices. Therefore these assessment algorithms have to be reset manually using this tab.

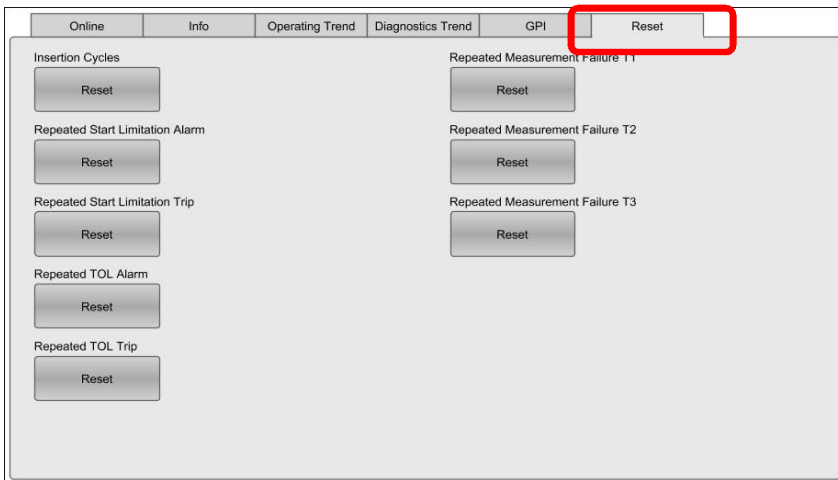




Fig. 73: Power Module view – Reset function

Reset options:

<p>Assessment: Insertion Cycles</p>	<p>The MStart / MFeed supervises the numbers of its insertion cycles and an alarm is shown on MView. MService has implemented an additional supervision, which raises an alarm each 100 cycles. The severity is increased in two steps from ‘Maintenance required’ until ‘Failure’.</p> <p> It is recommended to disable the MStart/MFeed alarm in MNavigate if the function is used in MService</p>
<p>Assessment: Repeated Alarms / Trips</p>	<p>A frequency of occurrence of alarm / trips is supervised for ‘Start Limitation’ and ‘TOL protection’ by MControl resp. ‘DCS communication error’ in MLink. A special condition is raised, if such an event happens more as specified.</p> <p>The limit and period of assessment is to be specified in MNavigate.</p> <p> The ‘TOL’ Trip and Alarm are assessed individually based on the same parameters. The same applies for ‘Start Limitation’</p>



## 9.4 MLink view

By selecting one particular MLink in the cubicle view or alternatively in the left side tree menu, all its details are presented.

### 9.4.1 MLink configuration data

On the left side the user can see the MLink configuration data.

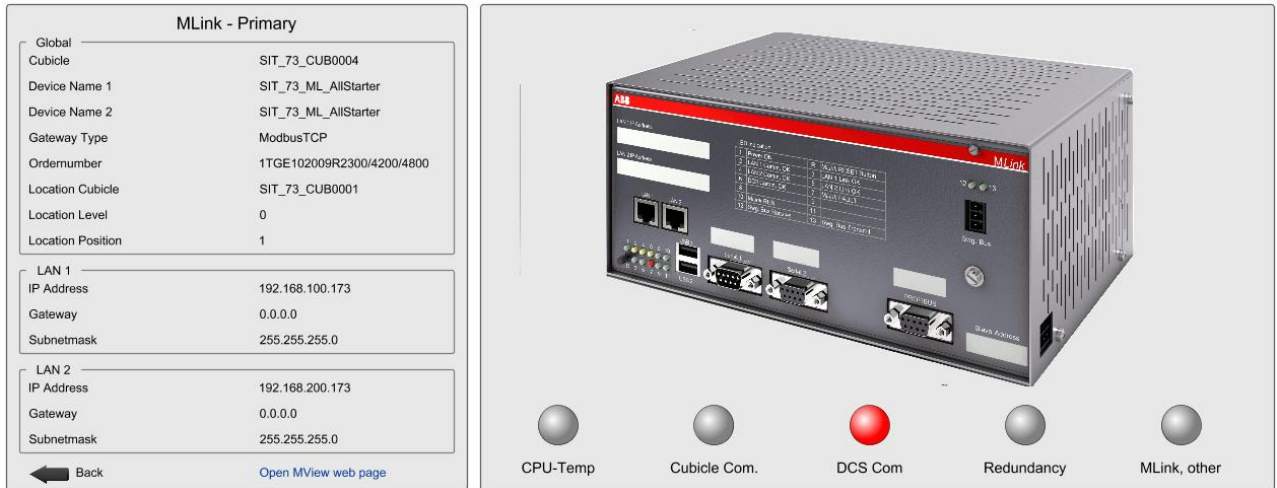


Fig. 74: MLink configuration data

Global configuration parameters	
Global	
Cubicle	Name of the cubicle
Device Name 1, 2	Names of the MLink
Gateway Type	Fieldbus protocol
Identnumber	ABB identification number of the MLink device
Location Cubicle	Cubicle location identifier
Location Level	Row in this cubicle (1 to 36)
Location Position	Column in this cubicle (1, 3)

LAN 1, 2		Configuration of primary and secondary LAN interface	
IP address		Network IP address	
Gateway		Gateway IP address	
Subnetmask		Network subnet mask	
Open MView web page		<p>Clicking on this link opens a new web browser with the MView web page of the related device. The attempt is based on the current MService user.</p> <p>This function is limited to networks, where the MService client is connected to the same subnet as the MLink</p>	











**9.4.2 MLink critical state signals**

On the right side a schematic view of the device is shown with warning lamps signaling the critical states listed hereunder. If the OPC connection is lost (Com state alarm), a red frame around the MLink appears.



Fig. 75: MLink critical state signals

Critical state signals are with colors as defined in 10.1.1:

CPU-Temp		No valid temperature value
		Temperature is increased.
		Temperature is critical.
Cubicle Com.		Combines all failures leading to communication loss between MLink and all MControl is lost (e.g. internal switchgear bus failure).
DCS Com		Combines all failures leading to communication loss between MLink and DCS (e.g. fieldbus failure).
Redundancy		All states leading to availability of redundant device. Communication via the active device still running.
		Parameter "Startup as Primary" sent to both devices by mistake. Internal switchgear bus communication is disturbed.
MLink, other		MLink supervision not running or internal error occurred or the connection to MNavigate is interrupted.
		Connection to MNavigate is interrupted.
		Critical failure in the MLink configuration or the supply voltage is below alarm level.

### 9.4.3 Redundant MLink configuration

In a redundant MLink configuration both the primary and backup MLink are shown in the same view.

The active MLink device (currently communicating top a DCS master) has a green border.

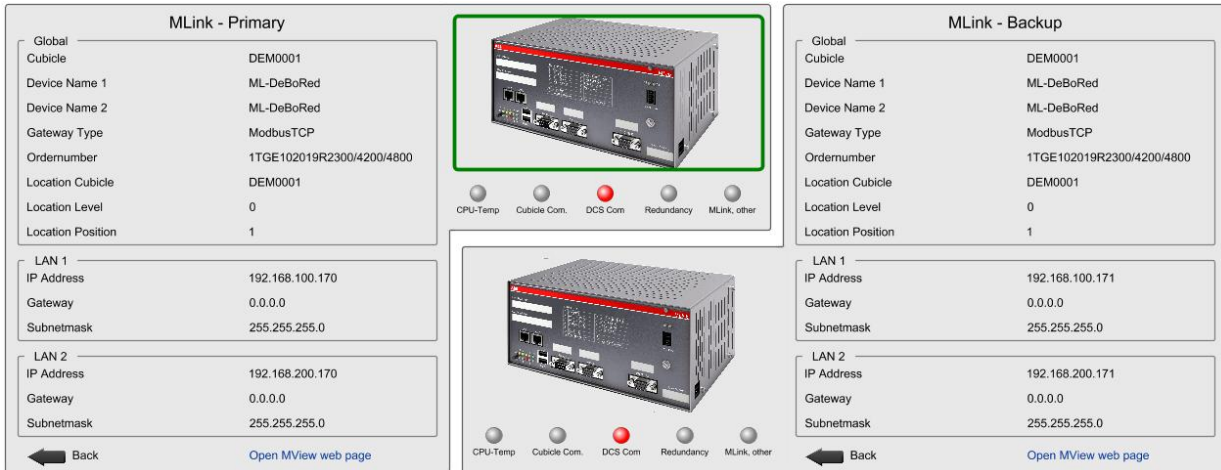


Fig. 76: Redundant MLink configuration

### 9.5 MService view

By clicking on the ABB logo in the top-left corner, the MService detailed view opens.

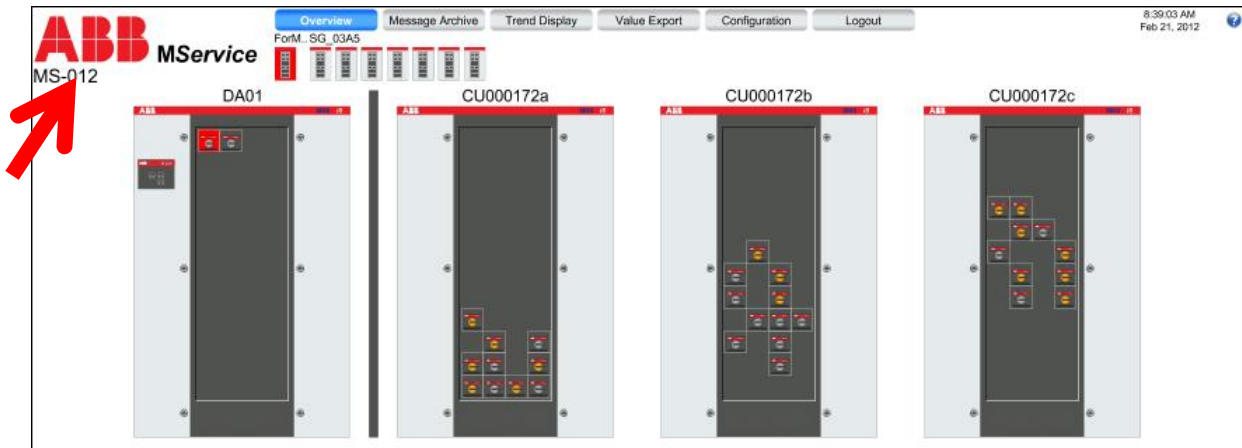


Fig. 77 Opening MService view

Version numbers	
OPC-Server	7.3.0003
MService-Firmware	7.3.0001
Network configuration	
LAN 1 IP Address	192.168.100.56
LAN 1 IP-Gateway	0.0.0.0
LAN 1 Subnetmask	255.255.255.0
LAN 2 IP Address	192.168.200.56
LAN 2 IP-Gateway	0.0.0.0
LAN 2 Subnetmask	255.255.255.0
LAN 3 IP Address	123.123.123.123
LAN 3 IP-Gateway	0.0.0.0
LAN 3 Subnetmask	255.255.255.0
OPC-ID	30
OPC-Language	en
Timeserver (NTP)	192.168.200.2
Locale settings	
Timezone	(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna

Runtime information

Last boot time	4/3/2013 5:19:09 PM
CPU Load	10 %
Free HDD space	53299 MB
Usage of History DB	16 %
Oldest entry in History DB	3/15/2013 1:10:35 PM

Fig. 78: MService view

The page shows the configuration parameters of the MService device. Furthermore some operational data such as last boot time, current CPU load and the usage of the internal hard drive and the active database are shown.

At the bottom of the MService picture user finds a button which allows to reboot the device.



The reboot of the MService device using this button is possible only after the device has been configured once.

## 10 Message list details


The Message list shows alarms and events colored according to their severity (for color coding see 10.1.1). The latest event is on top of the list. The view changes dynamically showing only the messages related to the actually chosen device. For every entry, a timestamp, device name, description, a severity bar is shown. Further on, links to the knowledge base as well as the detailed view of the device are accessible.

Messages can be acknowledged individually or group-wise.

Acknowledgement	Timestamp	Plant	Text	Priority			
Not acknowledged	Feb 24, 2012 06:27:33.547 PM	ML-0000004214.3PMotor2	Motor is stopped. Repeated thermal overload trip of motor.		i	=>	▲
Not acknowledged	Feb 24, 2012 06:09:43.557 PM	ML-0000004214.3PMotor2	Motor will be stopped soon due to a trip.		i	=>	
Not acknowledged	Feb 23, 2012 11:04:16.457 AM	ML-0000004214.3PMotor2	Thermal Overload Protection Tripped		i	=>	
Not acknowledged	Feb 23, 2012 11:04:16.457 AM	ML-0000004214.3PMotor2	Stall Protection Alarm		i	=>	
Not acknowledged	Feb 23, 2012 10:56:02.537 AM	ML-0000004214.3PMotor2	Thermal Overload Protection Tripped		i	=>	
Not acknowledged	Feb 23, 2012 11:04:16.457 AM	ML-0000004214.3PMotor2	Stall Protection Alarm		i	=>	
Not acknowledged	Feb 23, 2012 10:28:25.390 AM	ML-0000004214.3PMotor2	Thermal Overload Protection Tripped		i	=>	
Not acknowledged	Feb 23, 2012 11:04:16.457 AM	ML-0000004214.3PMotor2	Stall Protection Alarm		i	=>	
Not acknowledged	Feb 23, 2012 10:25:39.357 AM	ML-0000004214.3PMotor2	Thermal Overload Protection Tripped		i	=>	
Not acknowledged	Feb 23, 2012 11:04:16.457 AM	ML-0000004214.3PMotor2	Stall Protection Alarm		i	=>	
Not acknowledged	Feb 23, 2012 10:22:54.500 AM	ML-0000004214.3PMotor2	Thermal Overload Protection Tripped		i	=>	▼
Group acknowledgement							

Fig. 79: Message list

### Link to Knowledge Base

The “information”-button () opens the Knowledge Base database in MService. The Knowledge Base provides detailed information on each message. It includes detailed on the type of incident, the description, possible cause and suggested actions.

Every Knowledge Base entry can be extended by the user by adding plant specific information and/or advice for co-workers.



User needs read/write access to add or edit comments in the Knowledge Base.



Comments can only be entered as plain text.

Do not try to add formatting marks such as <bold> or similar.  
Use the following rules to enter certain special characters

< &lt;

> &gt;

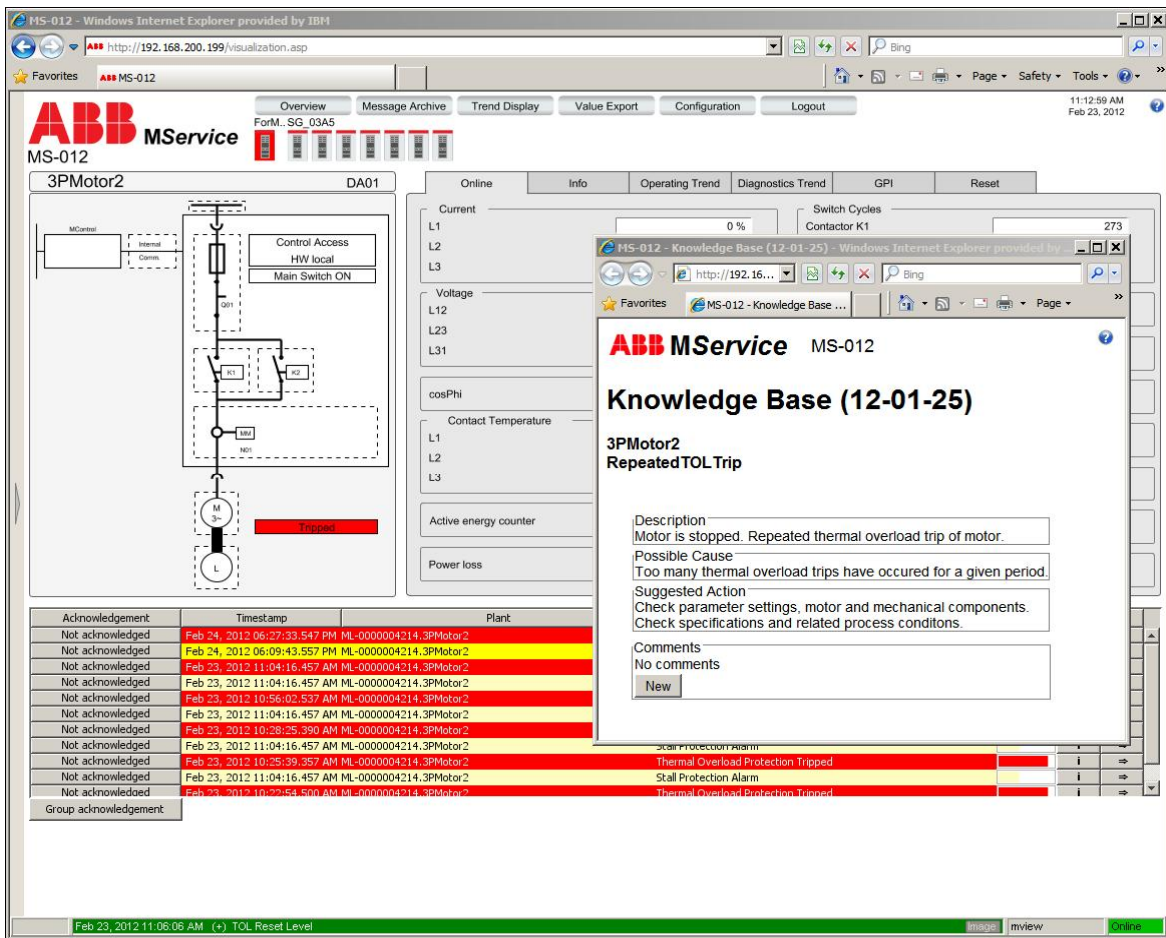



Fig. 80: Knowledge Base

**Link to Module Detail View**

With the “arrow”-button , user can jump to the related Power Module view of MStart / MFeed or Circuit Breaker. Additional diagnostics is possible there.

For details, see section 9.3.

**Acknowledgement**

By clicking on the button  next to a message it can be acknowledged.

Acknowledging a message means a user has recognized its occurrence. If the message condition is cleared, the message will disappear from the list. In addition, acknowledgement of trip messages triggers a reset command sent to the corresponding MControl / MConnect. To be able to acknowledge, the current user needs to have at minimum ‘Write’ access to the MService.



Acknowledging trips includes an automatic reset command sent to the corresponding MControl!

Consider limiting Write access to MService if this is to be prevented.

## 11 Trouble Shooting

Following chapter contains some hints and recommendation when facing trouble during commissioning or operation of MService.

### Warranty seal



The MService device housing must never be opened. A warranty seal is applied on the housing.

Warranty is void if seal is broken!

### Internet Explorer does not show changed system configuration

When the Autoconfiguration wizard completed successfully, the user session has to be restarted. Depending on the settings of the web browser it might be necessary to close the browser and all its windows in order to clean up current session and restart the Java engine cleanly.

### Boot of MService device without connected network

If the MService is booted but not connected to any switchgear network, the communication components close down after a while. All configured devices are shown as 'not connected'.

If the switchgear network is connected later on, the MService device is still not able to re-establish the communication to the MLink devices.

In this case a reboot of the MService is required with connected switchgear network.

### Configured MLink does not show live values after reboot of MService

If the MService was booted, but a single MLink was not available at that time, the communication could not be established.

When the MLink is later on connected to the switchgear network, the MService is still not able to re-establish the communication.

In this case a reboot of the MService is required with connected switchgear network

The left screenshot shows the MService configuration page for two devices, 101-CU0001 and 105-CU0001. Below the device icons is a table of acknowledgment messages:

Acknowledgment	Timestamp	Plant	Text	Priority
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High

The right screenshot shows the MService monitoring page for device 101-CU0001. It displays various electrical parameters and a table of acknowledgment messages:

Acknowledgment	Timestamp	Plant	Text	Priority
Acknowledged	May 15, 2012 02:25:51 PM	101	101-CU0001 Device is missing or is damaged	High



### Communication loss to MLink

If the communication between MService and MLink gets lost, the related cubicles are shown with a red border. In the module detail view, all data items are shown with an orange border.

### NTP server temporarily not available

The internal clock of the MService is not battery buffered. Therefore, after ca. 3h power off, the time is reset to the device's default value.

If the configured network time service is not available after system boot, the system time is set to a recovery time stamp value, which is stored regularly on the hard disk. This mechanism ensures, that the MService system time and all database entries always use a continuous proceeding time. No overlap of 'time fragments' will happen.

Once the NTP server is available again, the system time is synchronized automatically. If the MService time is ahead of the ntp server time, MService time will be set backwards as long as the step is less than 1 week.

### Timeout during csv export

Exporting large data packs may require long time for the MService to read all data out of history database and prepare it for download to the client PC.

The time-out of this operation is set to 1hour.

If the download does not happen within this period, an error of the web server is shown. Use the web browser's 'back' button to return to the previous page and select the range to be exported new.

To avoid this it is recommended to divide the data to be downloaded manually in smaller packs via selection of smaller date range or fewer devices.

### Failure in sending E-mail

In case the e-mail settings are not correct or there is no network connection to a mail server and MService is not able to deliver the mail to the mail server, a system message is issued, indicating a problem with the 'FCEmail' component.

5/16/2013 9:39:27 AM.467	FCEmail.EmailApplication.1	FCEmail.EmailApplication.1 Error	(-)	
5/16/2013 9:34:27 AM.850	FCEmail.EmailApplication.1	FCEmail.EmailApplication.1 Error	(+)	

The message has a severity of 750 ("Function Check") and is automatically cleared by the system within a few seconds.

Review and correct the settings as described in sec. 8.3

If the problem persists, ask the IT administrator of the mail server to check its configuration as well.

## Contact us

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