MNS *i*S Motor Control Center
Interface Manual M*Link*
System Release V5.4/0

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Table of content

General

Target Group

This document describes communication and control interfaces used in MNS *iS*. The manual is primarily intended for those requiring information on accessing information and data provided from MNS *iS*. Furthermore the document provides information for integration of MNS *iS* as fieldbus component into PLC or higher level Process Control Systems to control system and application engineers.

It is assumed that the reader of this manual is familiar with basic terms of fieldbus and control communication (e.g. basic knowledge about PROFIBUS, Modbus etc.).

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:

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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.

Terminology

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

Abbreviation	Term	Description
	Aspect Object	ABB technology. An Aspect Object is a computer representation of a real object such as a pump, a valve, an order or a virtual object such as a service or an object type. An Aspect Object is described by its aspects and is organized in structures.
	Alarm	Alarm is defined as status transition from any state to abnormal state. Status transition to abnormal state can be data crossing over the pre-defined alarm limit.
	Bus Local	A Control Access term describing that the M*Control* accepts its commands from a device on the switchgear control network, e.g. the Web Interface, M*View*.
COTS	Commercial off the shelf	Commercial off the shelf product, term to describe products available on the market, ready to use
DCS	Distributed Control System	See also PCS
DTM	Device Type Manager	Software module used to manage devices via fieldbus (e.g. PROFIBUS) using frame application environment (e.g. PactWare, ABB Fieldbus Builder etc.)
Eth.	Ethernet	Ethernet is a local area network (LAN) technology. The Ethernet standard specifies the physical medium, access control rules and the message frames.
	Event	An event is a status transition from one state to another. It can be defined as alarm, if the state is defined as abnormal or as warning as a pre-alarm state.
FBP	FieldBusPlug	ABB technology for exchangeable fieldbus interface on intelligent field devices (e.g. transmitter, simple motor starter)
FD	Field Device	Term for devices connected to the fieldbus (e.g. motor control units or circuit breaker protection)
GSD file	Geräte Stamm Datei (German abbreviation)	A hardware description file for a PROFIBUS-DP or PROFIBUS-DP/V1 slave type

Abbreviation	Term	Description
GPS	Global Positioning System	System to detect local position, universal time and time zone, GPS technology provides accurate time to a system
	Hardware Local	A Control Access term describing that the M*Control* accepts its commands from the Hardwired inputs, when the respective Local control input is set to true.
HMI	Human Machine Interface	Generic expression
LVS	Low voltage switchgear	A factory built assembly built to conform with IEC 60439-1
MCC	Motor Control Centre	Common term for switchgear used for motor control and protection.
MNS		Modular Low Voltage Switchgear family from ABB
MNS *i*S		The integrated intelligent switchgear solution from ABB
	M*Start* M*Feed* M*Control* M*Link* M*View* M*Navigate*	MNS *i*S components integrated in the switchgear, see the MNS *i*S System Guide for technical details
	MODBUS	Fieldbus communication protocol
	MODBUS RTU	Fieldbus communication protocol
	Motor Starter	Consists of motor controller and electrical components to control and protect a motor, part of Motor Control Center
NLS	Native Language Support	Providing the ability to change the language of software tools in order to support native languages (English is basis, others are optional)
OPC		OLE for Process Control, an industrial standard for exchange of information between components and process control application
PCS	Process Control System	High level process control system
PLC	Programmable Local Controller	Low level control unit

Abbreviation	Term	Description
	PROFIBUS-DP	Fieldbus communication protocol with cyclic data transfer (V0).
	PROFIBUS-DP/V1	Fieldbus communication protocol, extension of PROFIBUS- DP allowing acyclic data transfer and multi master (V1).
	PROFIBUS-DP/V2	Fieldbus communication protocol, extension of PROFIBUS- DP allowing time stamp and communication between master and slave (V2).
RCU	Remote Control Unit	Local control unit with pushbutton and indicator to operate a device (e.g. motor) from field level.
RS232		Standard No. 232 for PC communication, established by EIA (Electronics Industries Association, USA)
RS485		Communication interface standard from EIA (Electronics Industries Association, USA), operating on voltages between 0V and +5V. RS-485 is more noise resistant than RS-232C, handles data transmission over longer distances, and can drive more receivers.
RTC	Real Time Clock	Integrated clock function in devices used to generate time and date information if a remote clock system is not present
	Software Local	A Control Access term describing that the M*Control* accepts its commands from the hardwired inputs as a result of either the PCS or M*View* passing the Control Access Authority to Soft-Local. Note: Does not require the hardwired local input to be set to true.
SNTP	Simple Network Time Protocol	a protocol used for time synchronization in Control Network through Ethernet
	Switchgear Bus Network	Term used to describe the internal switchgear communication network, between M*Link* and M*Control*.
TCP/IP	Transmission Control Protocol / Internet Protocol	TCP/IP is a high-level connection oriented , reliable, full duplex communication protocol developed for integration of the heterogenous systems.
	Trip	A consequence of an alarm activated or an external trip command from another device to stop the motor or trip the circuit breaker.

Abbreviation	Term	Description
UTC	Coordinated Universal Time	Coordinated Universal Time is the international time standard. It is the current term for what was commonly referred to as Greenwich Meridian Time (GMT). Zero (0) hours UTC is midnight in Greenwich England, which lies on the zero longitudinal meridian. Universal time is based on a 24 hour clock.
	Warning	A warning is defined as status transition from any state to pre-alarm state to inform in advance before an alarm level is reached.

Related Documentation

MNS *i*S

1TGC910137 M0201 MNS *i*S Interface Manual Web Interface, Release 5.4

1TGC910157 M0201 MNS *i*S Interface Manual Profibus, Release 5.4

1TGC910167 M0201 MNS *i*S Interface Manual Modbus, Release 5.4

1TGC910187 M0201 MNS *i*S M*Control* Interface Manual Profibus Direct, Release 5.4

1TGC910001 B0204 MNS *i*S System Guide

1TGC910609 M0201 MNS *i*S Quick Guide Installation and System Setup, Release 5.4

1TGC910069 M0201 M*Navigate* Help file V5.4

1TGC910018 M0202 MNS *i*S ATEX – Enhancements for Safety

Related System Version

The content of this document is related to MNS *i*S System Release 5.4/0.

The described functions are designed but may not be fully implemented in all details. Please refer to the current system guides and release notes regarding possible restrictions.

Document Revision History

Introduction

The system interface M*Link* is an industrial PC equipped with interface cards and ports required for communication internally to M*Control* and externally to process control systems.
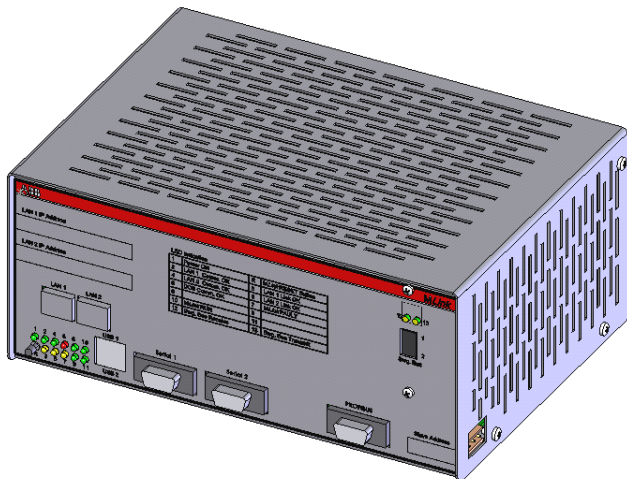

Figure 1 M*Link*

One M*Link* can communicate internally with up to 60 M*Control.* If more than 60 M*Control* are required, then additional M*Links* have to be used.
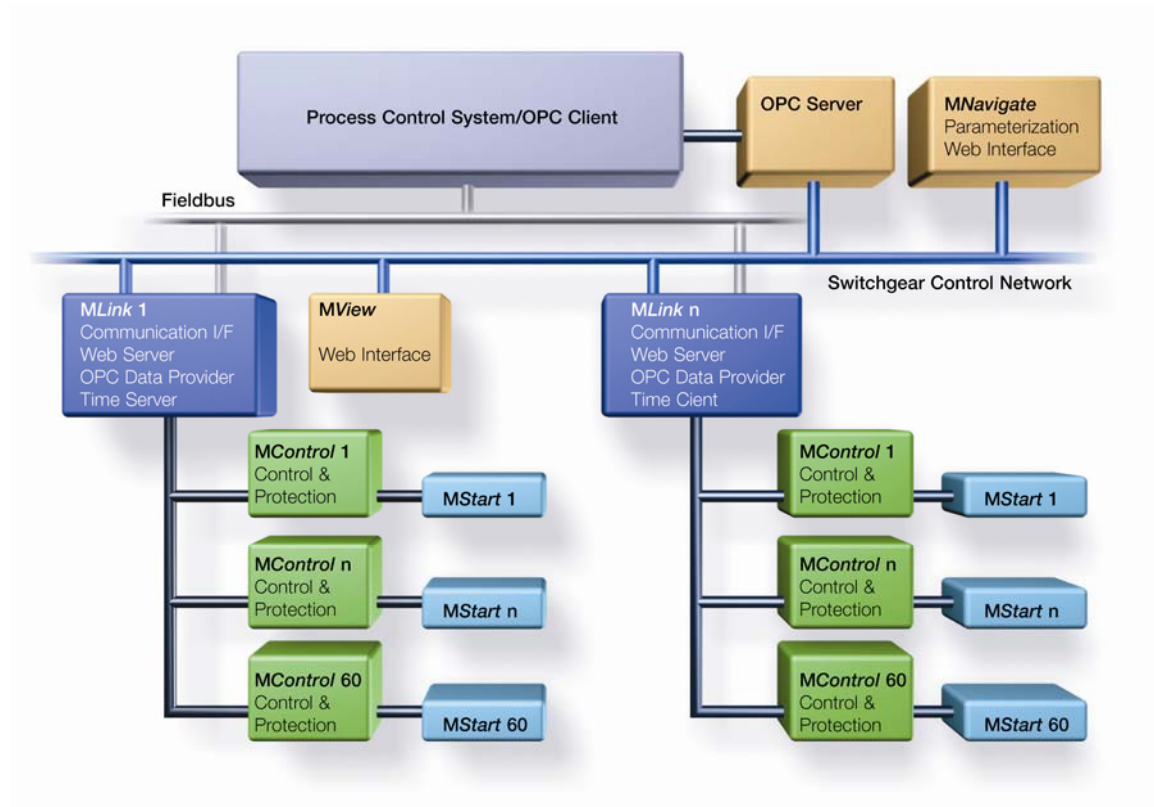

Figure 2 MNS *i*S System Configuration

Technical Data

The configuration of M*Link* depends on the selected communication protocol to the DCS. Following communication interface protocols are available:

- PROFIBUS DP (-V0) and PROFIBUS DP-V1
- MODBUS RTU / TCP

System functions such as M*Link* web interface (M*View*), OPC connectivity and time stamp are possible with all M*Link* specifications.

Identifier Numbers			
Protocol	**Modbus**		
Hardware Interface	RS 485 & TCP	RS 422 & TCP	RS232 & TCP
Standard	1TGE102009R4800	1TGE102009R4200	1TGE102009R2300
Dual Redundant	1TGE102019R4800	1TGE102019R4200	1TGE102019R2300
Protocol	**Profibus**		
Hardware Interface	DP & DPV1		
Standard	1TGE102009R1001		
Dual Redundant	1TGE102019R1001		

Electrical Data	
Power Supply	24V DC (19 – 33V DC)
Power Consumption	Typical 1000mA, Maximum 1700mA

Mechanical Data	
Weight	2.0 kg
Dimensions H x W x D	120 x 265 x 165 mm

Environmental Data	
Storage Temperature	-20°C to +70°C
Operating Temperature	0°C to +55°C
Degree of Protection	IP 20
MTBF (Mean Time Between Failures)	15 years @ 40°C

Table 1 Technical Data

Interfaces

Front view

Figure 3 Front view

LED 1	M*Link* Power On Indication
LED 2	Communication Ethernet LAN1
LED 3	Link LAN1 active
LED 4	Communication Ethernet LAN2
LED 5	Link LAN2 active
LED 6	DCS Communication active (PROFIBUS or Modbus)
LED 7	M*Link* Fault
LED 8	Application dependent (refer Table 6)
LED 9	Application dependent (refer Table 6)
LED 10	M*Link* Run indication (CF card application loaded and running)
LED 11	Application dependent (refer Table 6)
Button <R>	Reset button (Restart of M*Link*)
LAN 1	LAN1 Interface (Modbus TCP/ Profinet)
LAN 2	LAN2 Interface
USB 1	Not used
USB 2	Not used
Serial 1	Redundancy Interface (male plug)
Serial 2	Modbus RTU Interface (female plug)
PROFIBUS	PROFIBUS DP Slave Interface (female plug)
Swg Bus	Switchgear Bus Interface
LED 12	Switchgear Bus Rx Indication
LED 13	Switchgear Bus Tx Indication

Table 2 Front View Connector, LED and Push Button function
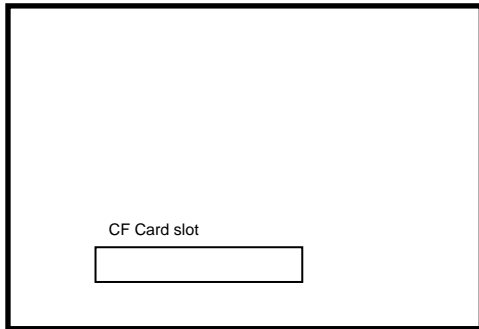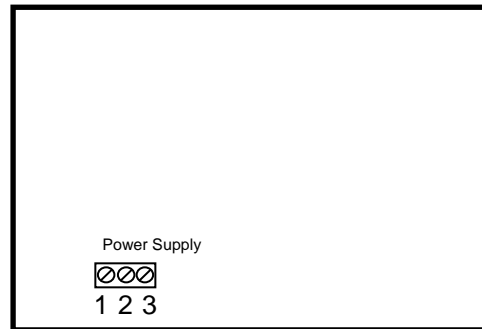
Side view Left / Right

Figure 4 Left Side View

Figure 5 Right Side View

1	Power Supply 0V
2	Not used
3	Power Supply +24VDC

Table 3 Power Supply Connector

Power Supply

The M*Link* requires 24V DC supply voltage. The connection is on the right side of the device with terminal plugs:

- Terminal 1 connects to 0V DC

- Terminal 3 connects to +24V DC

- Terminal 2 is not used

Software Modules

M*Link* contains different software modules depending on its initial configuration. The software modules are available on request.

Following software modules are available:

- Web Server
- OPC Server (DA & AE)
- Fieldbus
- Time Synchronization
- Redundant Operation

If a specific module is not available on the M*Link*, please contact your local ABB LVS Sales organization should this be required.

Web Server

A Web Server can be activated inside M*Link*. Through network connection web interface information can be displayed on M*View* or a PC using web browser software. For details about Web Interface see the document:

MNS *i*S Interface Manual Web Interface.

OPC Server

With MNS *i*S an OPC Server (DA & AE) is available. The software is typically installed on a server as part of the automation control system. The software installation program is delivered separately. If activated, the M*Link* functions as a data provider for the MNS *i*S OPC Server. For details about OPC Server see the document:

MNS *i*S Interface Manual OPC Server.

Fieldbus

M*Link* can include fieldbus communication to DCS. The type of fieldbus must be selected before ordering the M*Link* type. The fieldbus specific information (PROFIBUS, MODBUS etc.) can be found in the following documents:

MNS *i*S Interface Manual Profibus

MNS *i*S Interface Manual Modbus

Communication Interface Connection

Switchgear Network (internal)

The internal communication between M*Link* and M*Control* is via the switchgear bus. The wiring is located within the MNS *i*S cubicle. The bus cable is connected to the <Swg. Bus> terminal located on the front of the M*Link* at the upper right hand side. The internal communication does not require any configuration.

The shield of internal communication cable must be connected on both ends of the cable, and the bus terminated to suit the topology used. For more information on shielding, bus topologies and termination please refer to the MNS *i*S Quick Guide Installation and System Setup.

Switchgear Control Network

M*Link* can be connected to a standard 10/100 Base-T Ethernet network through LAN2 interface (Switchgear Control Network). Network components are standard (COTS – commercial of the shelf) components. No specific components are required connecting M*Link* to the network.

Examples of connections are shown in the following figures. Additional M*Link* and MNS *i*S tools (Engineering tool M*Navigate*, web interface, OPC Server, Time Server) are connected to this network (see Figure 2). The cable is CAT5, connector type is standard RJ45 type.

If the switchgear control network has any connection to other networks (e.g. plant management network etc.) measures have to be taken to protect the switchgear control network against unauthorized use (e.g. through Router and Firewall). This is a project specific configuration. Contact always the local network administrator and review the project specific requirements.

Connection examples of Switchgear Control Network

Option 1

If the M*Link* is directly connected to M*View* or a PC with web browser a cross-over network cable is used. On the M*Link*, the cable has to be connected to the right Ethernet connector (LAN2), on M*View* the cable has to be connected to the Ethernet connector. The cable type is CAT5 cable.
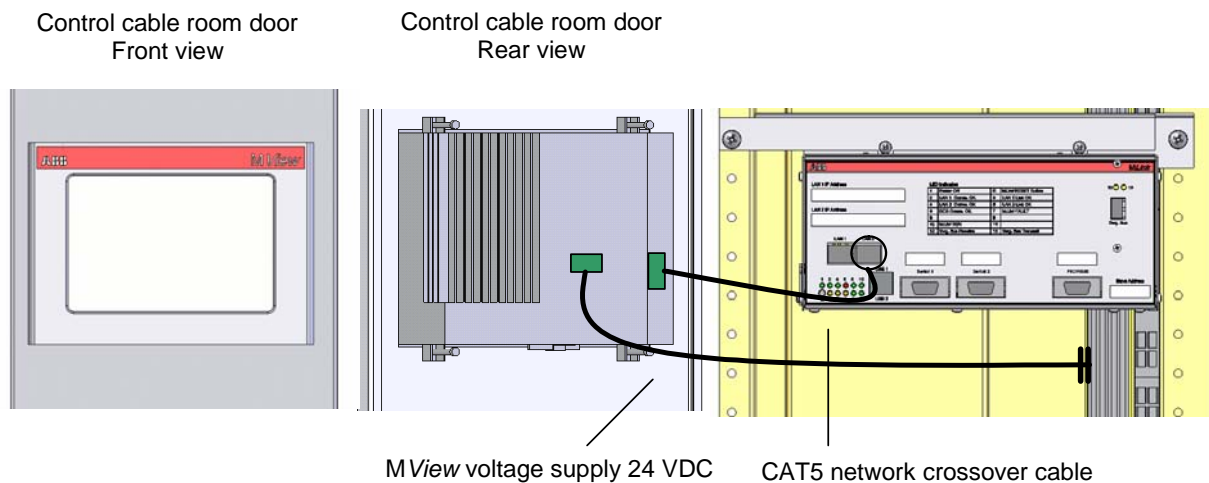

Control cable room door
Front view

Control cable room door
Rear view

M*View* voltage supply 24 VDC   CAT5 network crossover cable

Figure 6 M*Link* direct connected to M*View*

Option 2

M*Link* connected to Switchgear Control Network providing facility to connect additional MNS *i*S
M*Link* and tools (e.g. OPC Server, PC with web browser for monitoring etc.). A network switch
has to be installed in the plant. M*Link* and M*View* are connected to the switch with standard
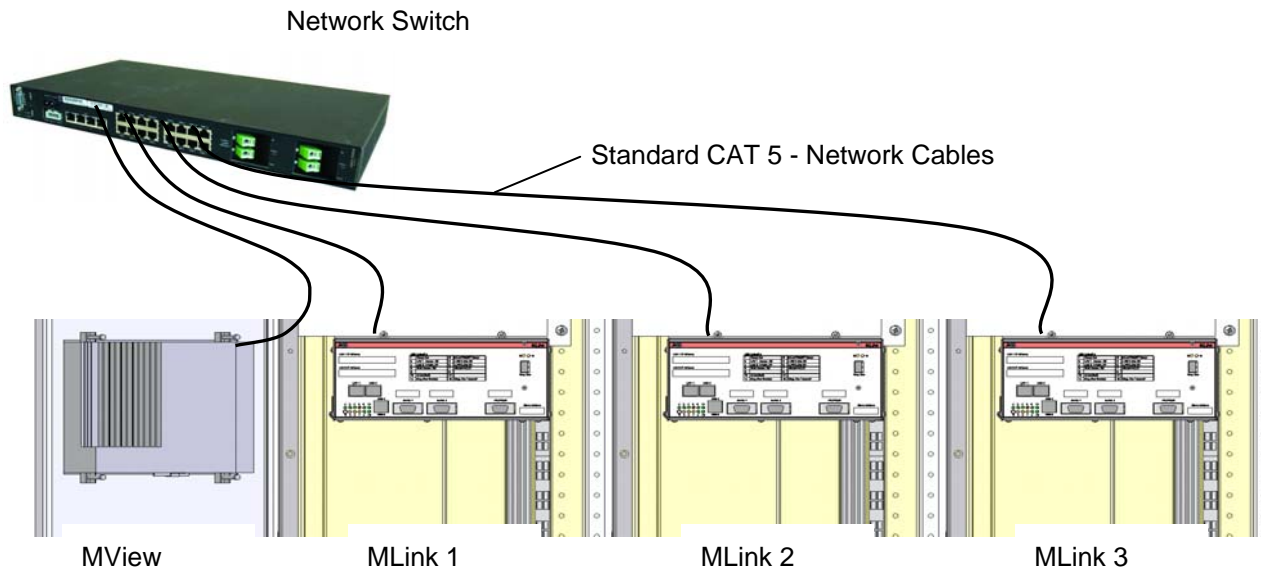CAT5 patch cable.

Figure 7 Network connection of M*Link* and M*View*

Option 2 allows using fewer number of M*View*. However, all M*Link* connected to the same
network can display their data on all M*View* connected to the same network.

It is recommended that a managed network switch is used to connect the M*Link* to the
PCS or PLC. The switch is not part of the MNS *i*S assembly but may be delivered
together with the switchboard depending on project scope definition.

Time Synchronization

In the M*Control* Alarms and Events can be provided with a time stamp. The time and date is received on M*Control* from M*Link* via the internal switchgear bus. In order to provide the correct time and date the Time Sync option must be activated in M*Link* and it may require a time server in the switchgear control network.

The protocol used for time synchronization is the standard network time protocol (NTP).

> ℹ️ Time Sync must be activated through the ABB Engineering Tool.

Option 1

A standard network component is installed which can provide the time signal as NTP Server. Such a NTP Server can be a computer or network server as well as Ethernet switches. As an option, this NTP Server can be equipped with a GPS Receiver to provide accurate time for the location.

> ℹ️ In case of Option 1, Time Server hardware is not part of MNS *i*S and has to be provided separately.

> ⚠️ If the Time Server is out of service, the M*Link* runs with the internal RTC (Real Time Clock) until a new time server signal is available. Redundant Time Servers are not supported.
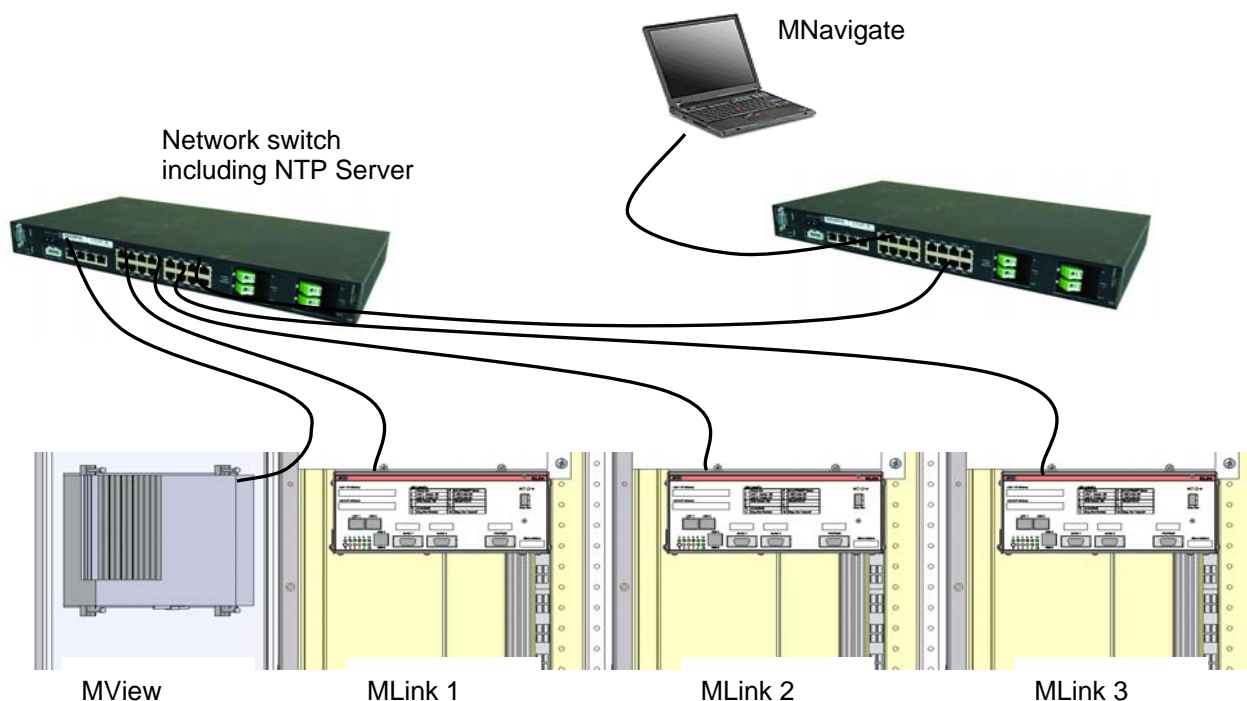

Figure 8 Example, showing 3rd party Network Switch and 3rd party NTP Server in a switchgear control network, standard CAT5 network cables are utilized

Option 2

One M*Link* in the network is configured to run with its internal real time clock (RTC). In this case the date and time for this M*Link* must be set through the web interface (see doc. MNS *i*S Interface Manual Web Interface). This M*Link* acts as a time server (NTP Server) in the switchgear control network. Other M*Links* can request the time information from this M*Link* to synchronize their internal clock.
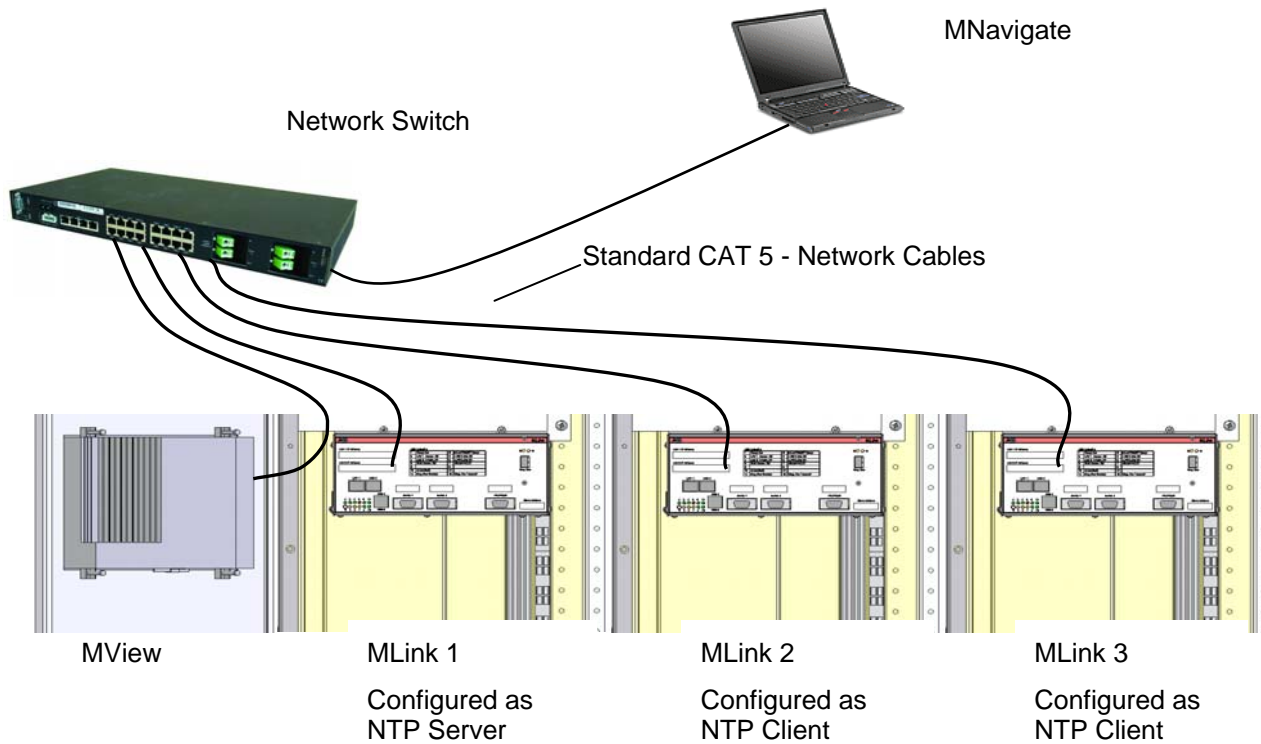

Figure 9 Example, using M*Link* as NTP Server

Getting Started

Initial Values

M*Link* requires parameter settings as initial values for network operation. The parameters are required depending on M*Link* configuration. Additionally parameter for Web Server, OPC Server and Fieldbus are also required (see respective Interface Manuals).

The parameters have to be loaded onto the Compact Flash (CF) card before power up using M*Navigate* tool. After successful communication between M*Navigate* and M*Link* (either direct or via network) the parameters can then be changed from M*Navigate* through the network.

⚠️ Any change of communication related parameter for Ethernet network (e.g. IP address) requires a restart of M*Link*. Fieldbus communication related parameter (e.g. comm. speed, or slave address) can be change during runtime of M*Link*.

Parameter	Default Value	Range	Remarks
IP Address LAN2 **(LAN2)**	192.168.200.100		Settings according to network administrator
Subnet Mask LAN2	255.255.255.0		Settings according to network administrator
Broadcast Address LAN2	192.168.200.255		Calculated automatically
Default Gateway LAN2	0.0.0.0		Settings according to network administrator
IP Address LAN1 **(LAN1)**	192.168.100.100		Settings according to network administrator
Subnet Mask LAN1	255.255.255.0		Settings according to network administrator
Broadcast Address LAN1	192.168.100.255		Calculated automatically
Default Gateway LAN1	0.0.0.0		Settings according to network administrator
Time Synchronization	none	none, RTC, NTP	only accessible if available
Time Server Address	0.0.0.0		Settings according to network administrator

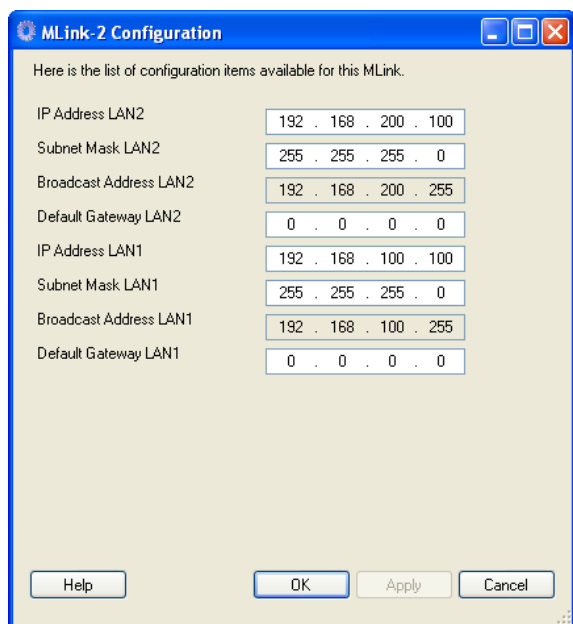**Table 4 M*Link* Default Parameter**

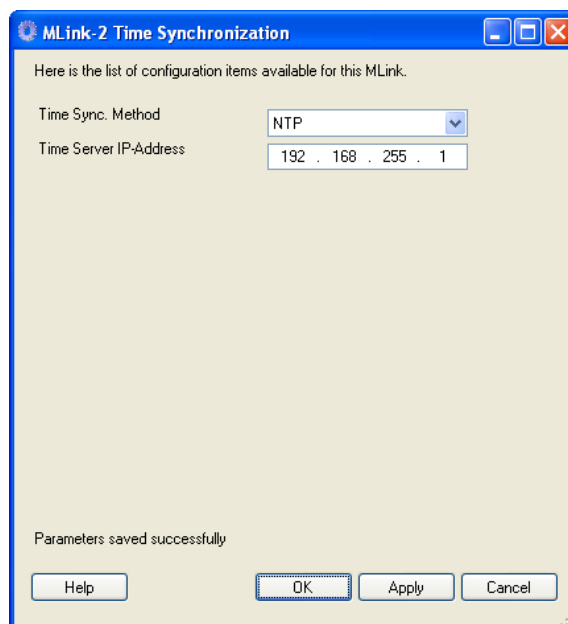**Figure 10 IP Address settings**   **Figure 11 Time Sync settings**

M*Link* does not support DHCP service to get automatic network address. If the default IP Address and Subnet Mask has to be locally adjusted, the parameter above has to be modified and loaded into M*Link*. Any change in the address requires the MLink to be restarted before the change is activated.

Do not configure LAN1 and LAN2 port with the same subnet IP Range. For example 192.168.**200**.100 and 192.168.**200**.101 is **not** supported.

Definition of IP Addresses

An *IP Address* is a required setting in order to allow data communication in an Ethernet network. If the devices are integrated in a plant network, the local network administrator has to be consulted to find correct settings.

The *Subnet Mask* defines the size of the network. In typical applications the subnet mask is as per default settings. However, the local network administrator has to be consulted, if other IP addresses than the default settings apply.

The *Broadcast Address* is required for the M*Link* to send data to other MNS *i*S devices. Since the M*Link* does not know which IP address is used by the other devices, data are sent as broadcast messages. The broadcast address is calculated automatically by M*Navigate*.

The *Default Gateway* is an address for a network gateway, if the switchgear control network is connected to a plant network. The gateway is not part of the MNS *i*S scope. If a gateway is used, the local network administrator is to be consulted for correct settings.

If wrong settings of IP Address have been downloaded to the M*Link* and the communication to the M*Link* cannot be established over the network anymore, the network data must be corrected offline directly with the CF card of the M*Link*. For details please refer the M*Navigate* help file.

Procedure to resolve incorrect address settings:

Remove the CF card from M*Link*, insert the card into a card reader connected to M*Navigate* and write the data again to the CF card. Re-insert the card into M*Link* (refer [Figure 13 CF card insertion]) and power up the M*Link*, the M*Link* will then reboot and run with the new configuration settings.

> ⚠️   **Do not remove the CF card from M*Link* when the device is powered up!**

Installation check

The M*Link* is installed in the left compartment (control cable compartment) of one MNS *i*S cubicle. The module is mounted on a special rail mechanically fixed by screws.
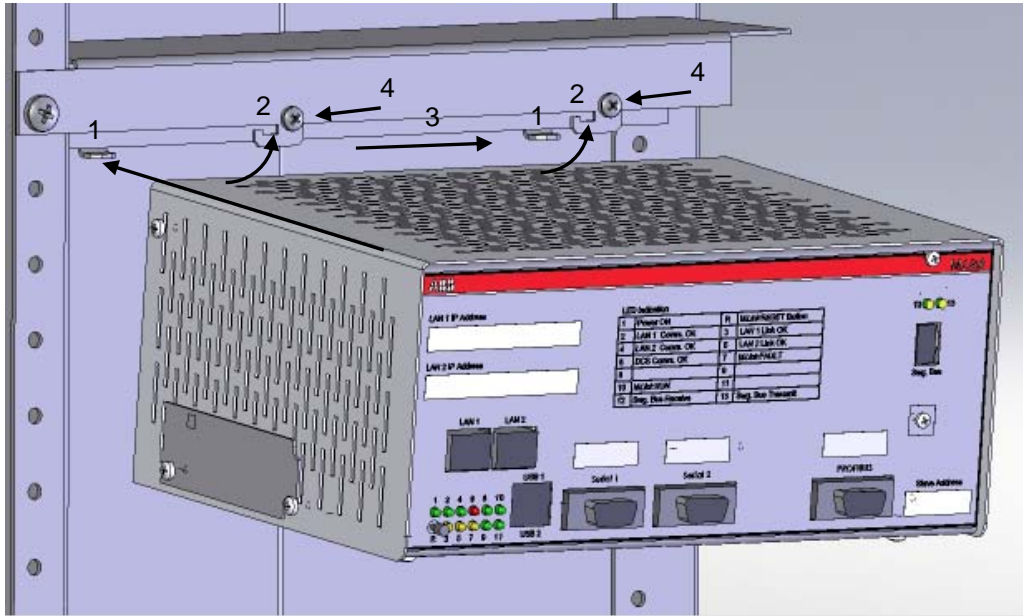

Figure 12 Mounting of M*Link* inside of MNS *i*S cubicle

On the left side is the slot to insert the Compact Flash Memory card (CF card). To insert the CF card correct please refer [Figure 13 CF card insertion]. The CF card is required to start and run the M*Link*. The procedure to create the CF card configuration is described in the software tool documentation M*Navigate* help file.

In order re-insert M*Link*, following procedure applies:

1. Ensure the two metal tabs (1) on the mounting bar position locate in the rear slots of the M*Link* case. (The M*Link* should be located approximately 30° from horizontal).

2. Now tilt the M*Link* up so the two support hooks (2) locate through the top of the M*Link* case.

3. Slide the M*Link* to the right (3) until the support hook holds the MLink in postion.

4. Secure M*Link* with two screws (4)

To remove the M*Link* the sequence above should be reversed.

Before Power On, complete a visual check of power cable connection and overall wiring of the switchboard.

The M*Link* requires parameter settings to function correctly. Parameter settings are completed with M*Navigate*. If M*Link* is configured with a single M*View* in a stand alone configuration then, the default settings can be applied. Otherwise the settings must be configured before start-up.

> Any change of configuration settings on the M*Link* requires restart of the M*Link*. During M*Link* restart all communication on the switchgear bus network is stopped, this is automatically established in the boot up process.

Start-up of MLink and application download

Power-On procedure

Insert CF card.

> Ensure that the correct card for the particular project is used. Insert the CF card with the correct side up, the card is mechanically coded and should not be forced.

> Example shows ABB standard CF card.


Figure 13 CF card insertion

Power On the control voltage supply.

> The M*Link* boots automatically. At this time the M*Link* performs internal software checks and verifies that the data available on the CF card is suitable.

> At the end of boot sequence the LED 1 and LED 10 (Run) should be on as a minimum for more information please refer to Table 2).

Confirm operation

If the Web Server option is activated, via M*View* or a PC with web browser software should be used to verify the function of the M*Link*. Once correct operation has been established it is then possible to proceed with system configuration and application download.

Redundancy support in MNSiS
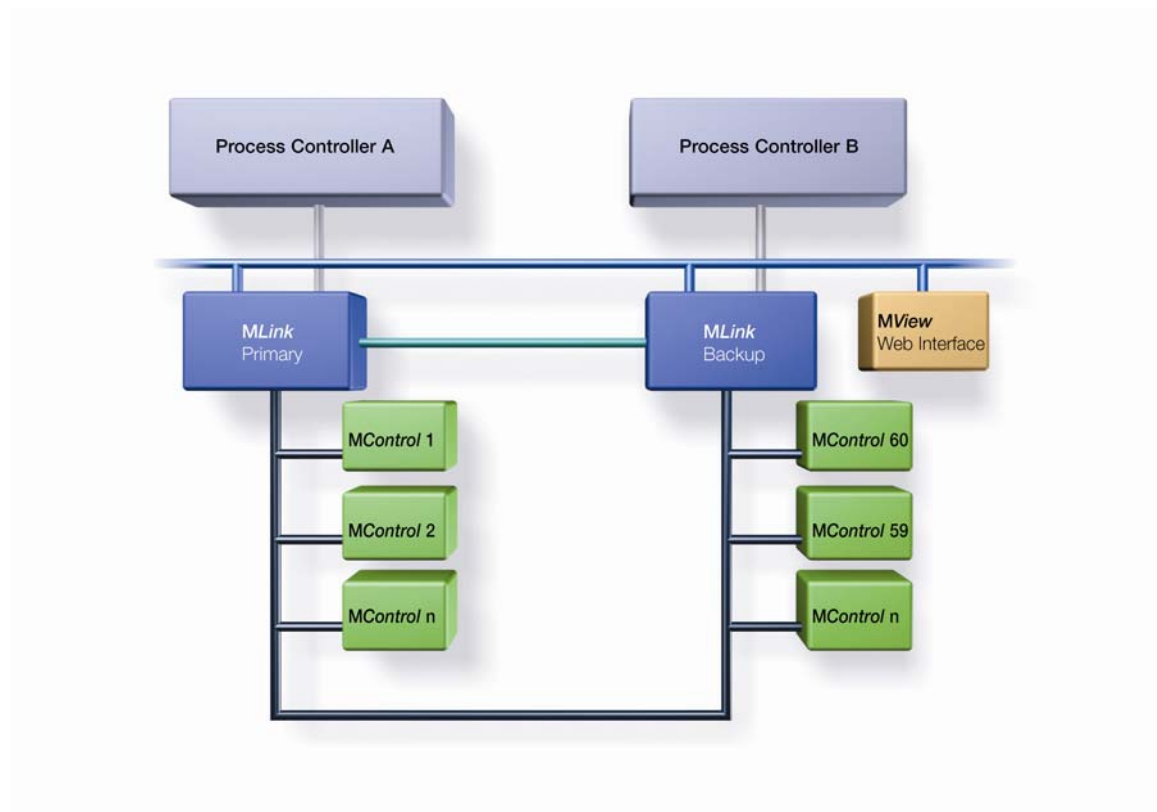
Figure 14 System architecture redundant systems

A redundant system requires two M*Links* connected to the same switchgear bus. In this configuration the M*Links* are synchronized using a redundant link cable.

For more information concerning redundant operation please refer to the MNS *i*S Interface Manual Redundancy.

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Troubleshooting and Maintenance

LED indication

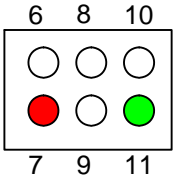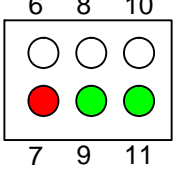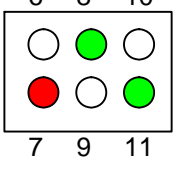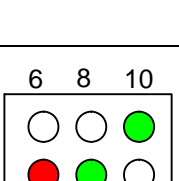| LED indication	Description	Additional information / Actions
6 8 10 / 7 9 11 (LED 10 green)	M*Link* is running Ok.	
6 8 10 / 7 9 11 (LED 8, 10 green)	M*Link* is running Ok.	LED 8 M*Link* is Primary in Dual Redundant configuration.
6 8 10 / 7 9 11 (LED 6 yellow, LED 10 green)	M*Link* is running Ok.	LED 6 DCS communication active
6 8 10 / 7 9 11 (LED 6 yellow, LED 8, 10 green)	M*Link* is running Ok.	LED 6 DCS communication active LED 8 M*Link* is Primary in Dual Redundant configuration.
6 8 10 / 7 9 11 (LED 7 red, LED 9 green)	M*Link* missing application files	Possible cause could be a interrupted or disturbed communication between M*Navigate* and M*Link* while downloading. Please use M*Navigate* to download the M*Link* configuration again.
6 8 10 / 7 9 11 (LED 8 green, LED 7 red)	Error in M*Link* XML Configuration file	Possible cause could be a interrupted or disturbed communication between M*Navigate* and M*Link* while downloading. Please use M*Navigate* to download the M*Link* configuration again.
6 8 10 / 7 9 11 (LED 8 green, LED 7 red, LED 9 green)	Error in M*Link* XML Parameter file	Possible cause could be a interrupted or disturbed communication between M*Navigate* and M*Link* while downloading. Please use M*Navigate* to download the M*Link* parameter again.
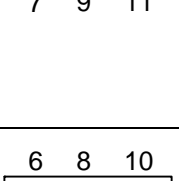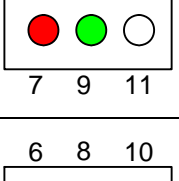
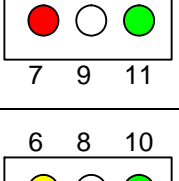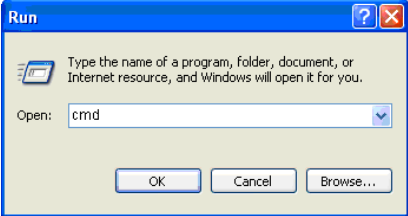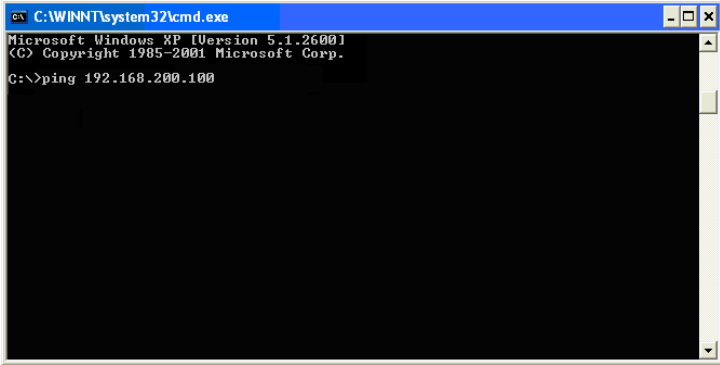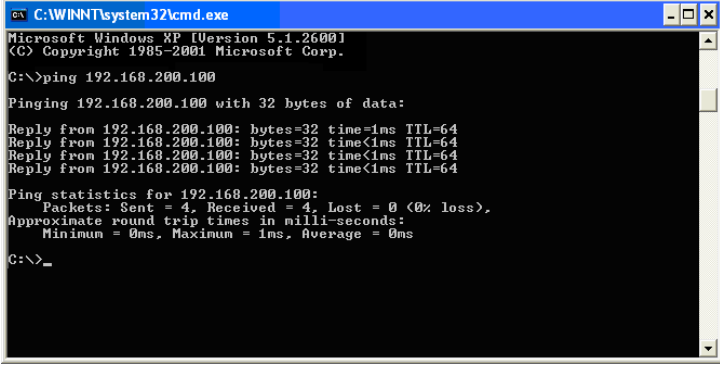| LED	Description	Action
6 8 10 / 7 9 11 — row1: ○ ○ ○, row2: ● ○ ●(green)	Internal M*Link* error	M*Link* is not able to create internal database. Please reboot the M*Link*. If that doesn't resolve the problem use M*Navigate* to download the M*Link* configuration again.
6 8 10 / 7 9 11 — row1: ○ ○ ○, row2: ●(red) ●(green) ●(green)	Xml file missing	During startup M*Link* is checking if all required xml files are available. In case of a missing file that error is indicated. Please use M*Navigate* to download the M*Link* configuration again.
6 8 10 / 7 9 11 — row1: ○ ●(green) ○, row2: ●(red) ○ ●(green)	Network configuration error	M*Link* is not able to configure the IP settings as mentioned in configuration file e.g. due to wrong setting of Default Gateway parameter for that Ethernet Interface. Please use M*Navigate* to check the settings and download the M*Link* configuration again. If a download is not possible please use a flash card reader (ref. to MNavigate Help or MNavigate Manual).
6 8 10 / 7 9 11 — row1: ○ ○ ●(green), row2: ●(red) ●(green) ○	General DCS fault (only available if configured)	Please check if M*Link* hardware (the identity number) matches to the project specification (e.g. Profibus M*Link* <-> Profibus project). Furthermore the DataMapping should be checked. Please use M*Navigate* to download the M*Link* configuration or download Mapping file again (ref. to MNavigate Help or MNavigate Manual).
6 8 10 / 7 9 11 — row1: ○ ●(green) ●(green), row2: ●(red) ●(green) ○	General DCS fault (only available if configured)	See above LED 8 M*Link* is Primary in Dual Redundant configuration.
6 8 10 / 7 9 11 — row1: ○ ○ ●(green), row2: ●(red) ○ ●(green)	General redundancy fault (only available if configured)	Please use M*Navigate* to check the redundancy status (Redundancy Report) . If a mismatch was found please download the regarding file. For details please refer to MNavigate Help or MNavigate Manual.
6 8 10 / 7 9 11 — row1: ●(yellow) ○ ●(green), row2: ●(red) ○ ●(green)	General redundancy fault (only available if configured)	See above LED 6 DCS communication active

Table 6 LED error indication

Problem	Solution
No access to M*Link* with the web interface or M*Navigate*	Check if the correct IP address in the address bar of the web browser has been entered.
	Check if the M*Link* is powered on and no fault indication is on the LED indication of M*Link.*
	Check if the Web Server option is activated. This option is customer project specific and can only be enabled using MNS Engineering Tools. If available it can be used to check communication to the M*Link.*

	Check if the network configuration is correct; use a ping command to verify that the M*Link* is reachable. Open a command window on the PC:
	• Start / Run, then type in "cmd" and click Enter
	
	Run
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
	Open: cmd
	[OK] [Cancel] [Browse...]
	
	• Enter the ping command with the correct IP address of M*Link*: ping xxx.yyyy.zzz.aaa
	
	C:\WINNT\system32\cmd.exe
	Microsoft Windows XP [Version 5.1.2600]
	(C) Copyright 1985-2001 Microsoft Corp.
	
	C:\>ping 192.168.200.100
	
	• If no reply is received, check the cable connection of the PC or M*View* and M*Link*.
	
	C:\WINNT\system32\cmd.exe
	Microsoft Windows XP [Version 5.1.2600]
	(C) Copyright 1985-2001 Microsoft Corp.
	
	C:\>ping 192.168.200.100
	
	Pinging 192.168.200.100 with 32 bytes of data:
	
	Reply from 192.168.200.100: bytes=32 time=1ms TTL=64
	Reply from 192.168.200.100: bytes=32 time<1ms TTL=64
	Reply from 192.168.200.100: bytes=32 time<1ms TTL=64
	Reply from 192.168.200.100: bytes=32 time<1ms TTL=64
	
	Ping statistics for 192.168.200.100:
	    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
	Approximate round trip times in milli-seconds:
	    Minimum = 0ms, Maximum = 1ms, Average = 0ms
	
	C:\>_
	
	If a reply is received the connection is ok.

Problem	Solution
	If the M*Link* is still not reachable;
	Remove the CF card from M*Link*, insert the CF card into a card reader connected to M*Navigate* and write the M*Link* data again to the CF card.
	Ensure that correct address settings are entered for M*Link*.
	Re-insert the card to M*Link* and start M*Link* and check communication.
No access to M*Control* (download)	Check that the internal switchgear bus is running (fast flashing LED 12 and 13).
	Check that the M*Control* are configured properly in M*Navigate.*
	Check the communication state of M*Control*, if the M*Control* is offline, all LED on M*Start* are flashing.
	Use M*Navigate* to set M*Control* to online state (check M*Navigate* Manual for details)
M*Navigate* Error Codes	See M*Navigate* help file

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