MNS *i*S Motor Control Center
Interface Manual M*Link* HW 1TGE120021
System Release V7.0

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This document relates to the MNS *i*S System Release 7.0.

Table of content

General

Target Group

This document describes communication and control interfaces used in MNS *i*S. The manual is primarily intended for those requiring information on accessing information and data provided from MNS *i*S. Furthermore the document provides information for integration of MNS *i*S 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:

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.

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.
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
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.

Abbreviation	Term	Description
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
	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).

Abbreviation	Term	Description
	PROFIBUS-DP/V2	Fieldbus communication protocol, extension of PROFIBUS-DP allowing time stamp and communication between master and slave (V2).
	PROFINET	PROFINET is an open standard for Industrial Ethernet and standardized in IEC 61158 and IEC 61784.
PNIO	PROFINET IO	PROFINET for decentralized periphery and distributed automation
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

1TGC910211 M0201 MNS *i*S Interface Manual M*Link*, Release 7.0

1TGC910111 M0201 MNS *i*S M*Link* Upgrade Kit Manual

1TGC910221 M0201 MNS *i*S Interface Manual Web Interface, Release 7.0

1TGC910241 M0201 MNS *i*S Interface Manual Profibus, Release 7.0

1TGC910251 M0201 MNS *i*S Interface Manual Modbus, Release 7.0

1TGC910291 M0201 MNS *i*S Interface Manual PROFINET IO, Release 7.0

1TGC910281 M0201 MNS *i*S M*Control* Interface Manual Profibus Direct, Release 7.0

1TGC910261 M0201 MNS *i*S Interface Manual Redundancy, Release 7.0

1TGC910271 M0201 MNS *i*S M*Connect* Interface Manual, Release 7.0

1TGC910001 B0204 MNS *i*S System Guide

1TGC910201 M0201 MNS *i*S Quick Guide Installation and System Setup, Release 7.0

1TGC910090 M0201 M*Navigate* Help file V7.0

1TGC910018 M0208 MNS *i*S ATEX – Enhancements for Safety

Related System Version

The content of this document is related to MNS *i*S System Release 7.0.

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

Rev.	Chapter	Description of change	Date
M0201		Initial document for Release V7.0	July 2012
M0202	Data correction, page 14	Terminal connects in text corrected	July 2012
M0203	Data correction, page 22	NTP Server IP Setting corrected	July 2014

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.
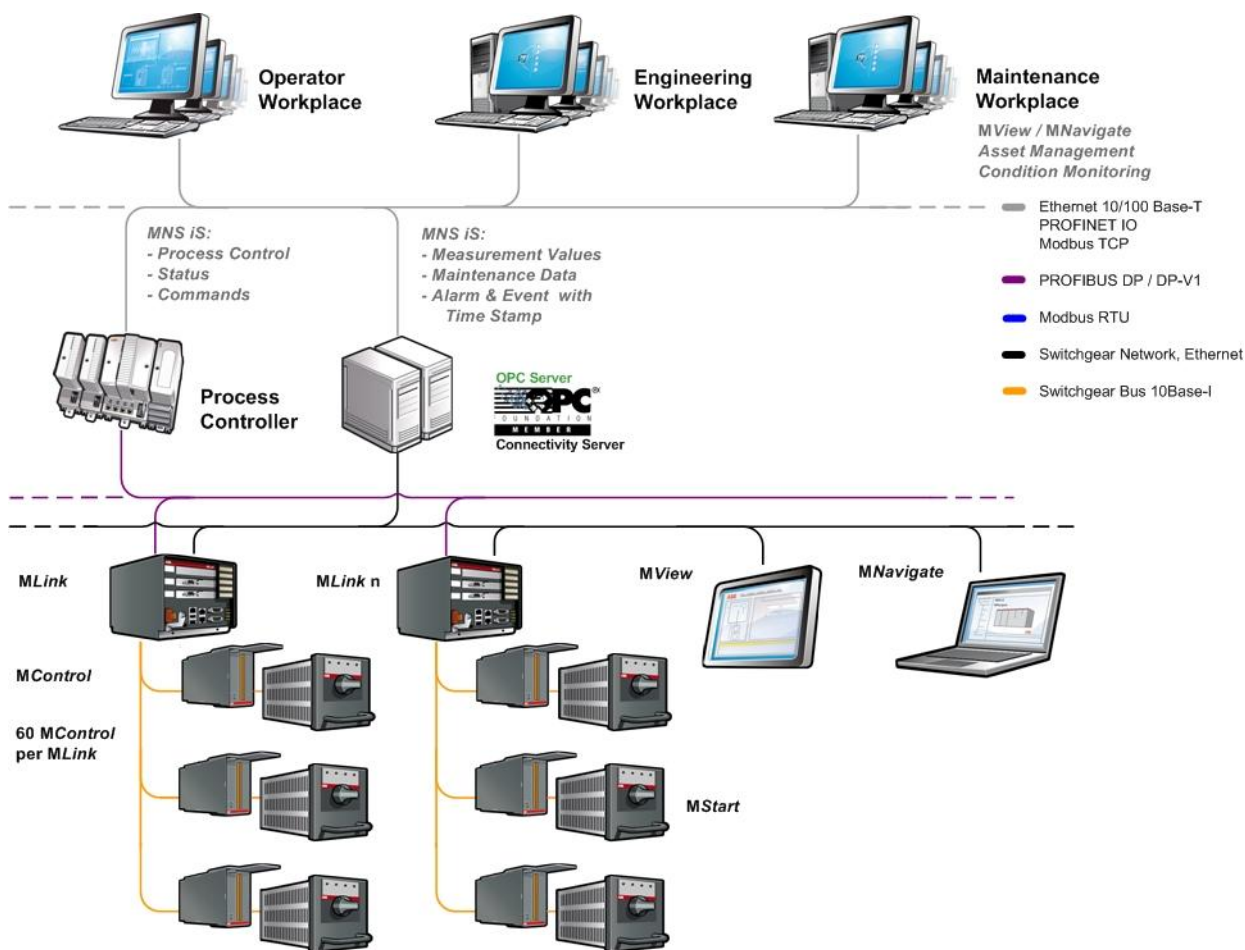

Figure 2 MNS *i*S System Configuration

Hardware Types and 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

- PROFINET IO

The PROFINET interface is supported for use with the ABB 800xA System only

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

For communication to MControl a dedicated interface plug (switchgear bus connector) has to be used dependent on system configuration (redundant, non redundant system).

Protocol	**Modbus**			**Profinet IO**	**Profibus**
Hardware Interface	RS 485 & Ethernet TCP IEEE 802.3	RS 422 & Ethernet TCP IEEE 802.3	RS232 & Ethernet TCP IEEE 802.3	Ethernet TCP IEEE 802.3	DP & DPV1
MLink ID	1TGE120021R0010				1TGE120021R0110
Swg. bus connector **non-redundant** (with termination)	1TGE120016R0104				
Swg. bus connector **dual redundant** (w/o termination)	1TGE120016R0103				

Table 1 Hardware Selection

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	

Table 2 Technical Data

Interfaces

Front view
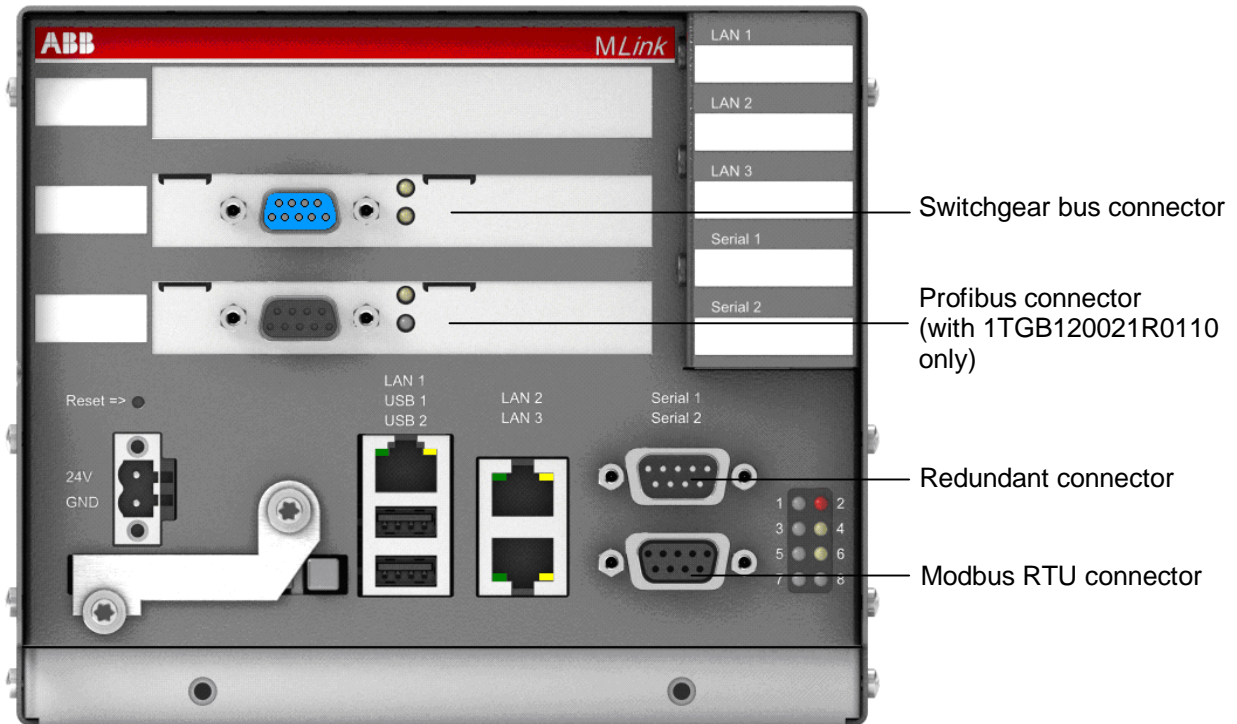
Fig. 1 M*Link* front view

Swg Bus	
Switchgear Bus Interface (female blue plug)	
Swg Bus – upper LED, yellow	Switchgear Bus Rx Indication
Swg Bus – lower LED, yellow	Switchgear Bus Tx Indication
Profibus	
PROFIBUS DP Slave Interface (female black plug)	
Profibus – upper LED, yellow	Profibus Communication running
Profibus – lower LED, green	Profibus READY for communication
Power Supply	
Button Reset	Reset button (Restart of M*Link*)
24V	Power Supply +24VDC
GND	Power Supply 0V
CF card	
CF card	CF card is protected against unintentional removal after closing the flap and connecting the power supply (details see page 24)

LAN	
LAN 1	LAN1 Interface (Modbus TCP/ Profinet)
LAN 1 – LED left, green	Link LAN1 active
LAN 1 – LED right, yellow	Communication Ethernet LAN1
LAN 2	LAN2 Interface
LAN 2 – LED left, green	Link LAN2 active
LAN 2 – LED right, yellow	Communication Ethernet LAN2
LAN 3	Not used
LAN 3 – LEDs	Not used
USB 1, 2	Not used
Serial 1	Redundancy Interface (male plug)
Serial 2	Modbus RTU Interface (female plug)
LED indications	
LED 1	M*Link* Run indication (CF card application loaded and running)
LED 2	M*Link* Fault
LED 3	Application dependent (see section LED indication, page 27)
LED 4	Application dependent (see section LED indication, page 27)
LED 5	Application dependent (see section LED indication, page 27)
LED 6	DCS Communication active (PROFIBUS or Modbus)
LED 7	M*Link* Power On Indication
LED 8	Application dependent (see section LED indication, page 27) In redundant configurations: M*Link* primary

Table 3 Front View Connectors, LED and Push Buttons

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 +24V DC
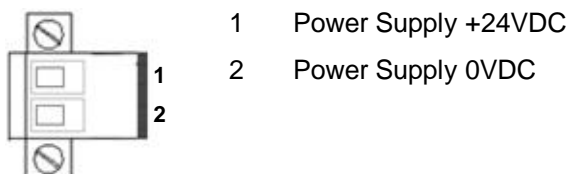- Terminal 2 connects to 0V DC

1   Power Supply +24VDC

2   Power Supply 0VDC

Fig. 2   Power Supply Connector

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

MNS *i*S Interface Manual Profinet IO

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 blue Sub-D 9 terminal located on the front of the M*Link* at the upper part of the device. 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.

If managed switches or routers are used in the Ethernet network it has to be taken care that sent ARP messages are passed through.

Background: After reboot, MLink 1TGE120021 will send a Gratuitous ARP (Address Resolution Protocol) message to force all connected Ethernet devices to update the internal ARP table. This special ARP message is used to map the network layer address (MAC address) to a dedicated link layer address (IP address). This ARP table refresh is required to be able to establish an Ethernet communication.

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.
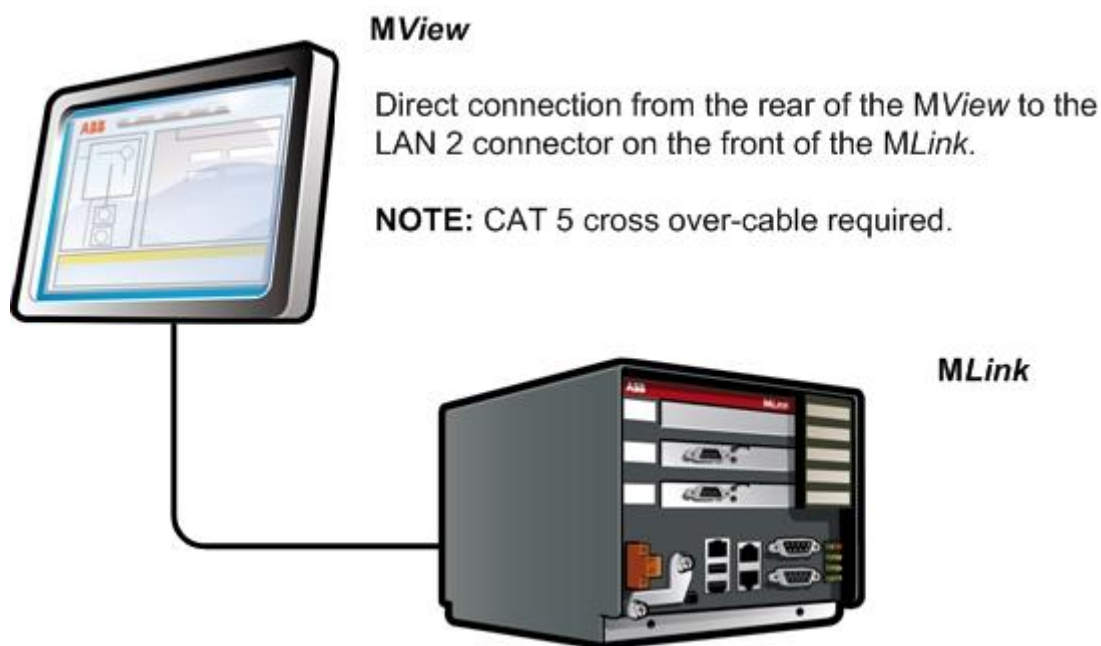

Figure 3 M*Link* directly connected to M*View*

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.
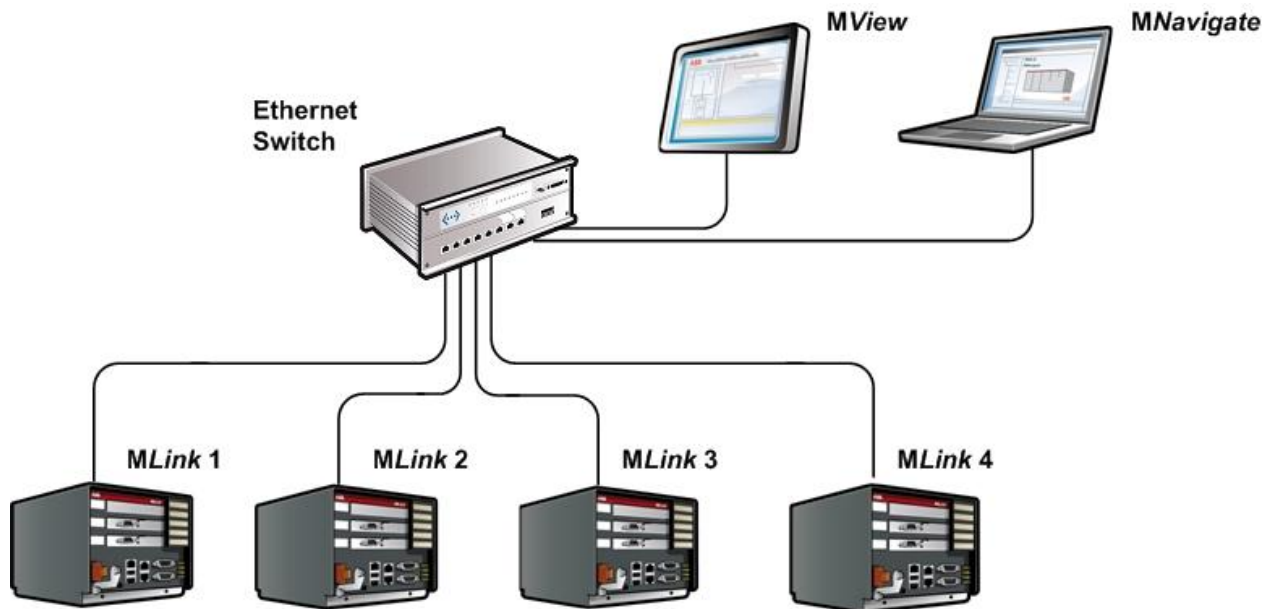
Figure 4 Network connection of M*Link* ,M*View* and M*Navigate*

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 supplied 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.
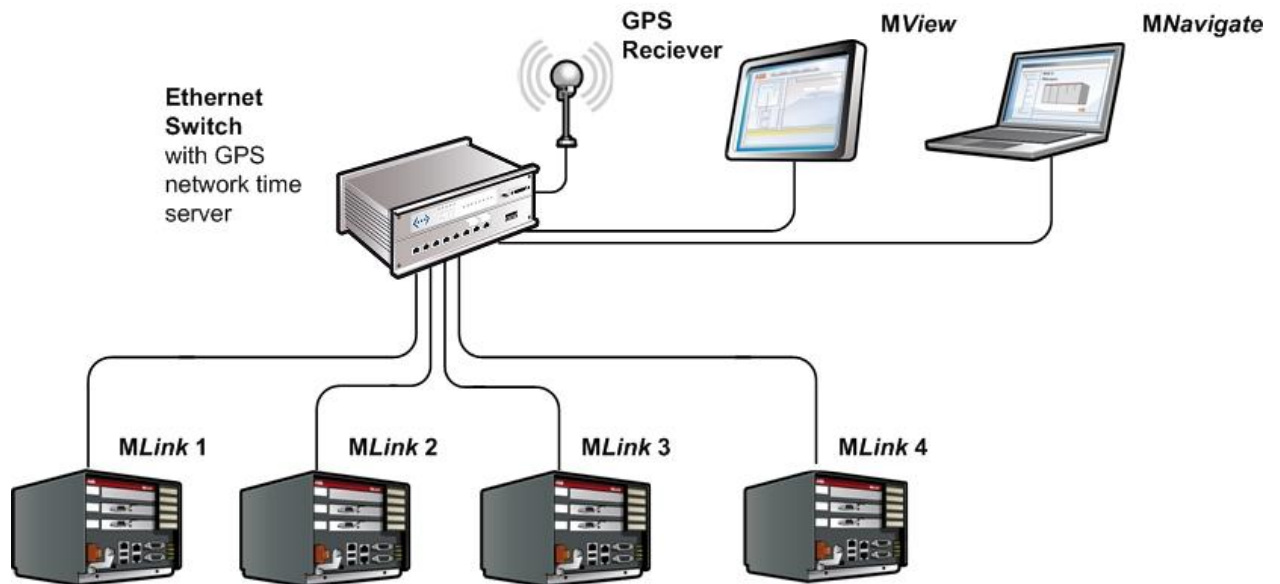

Figure 5 Example, showing 3rd party Network Switch and 3rd party NTP Server in a switchgear control network, standard CAT5 network cables are utilized

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.

> ⚠️ MLink buffers system time (RTC) for 3 hours. Afterwards it is set to 2009-01-01.
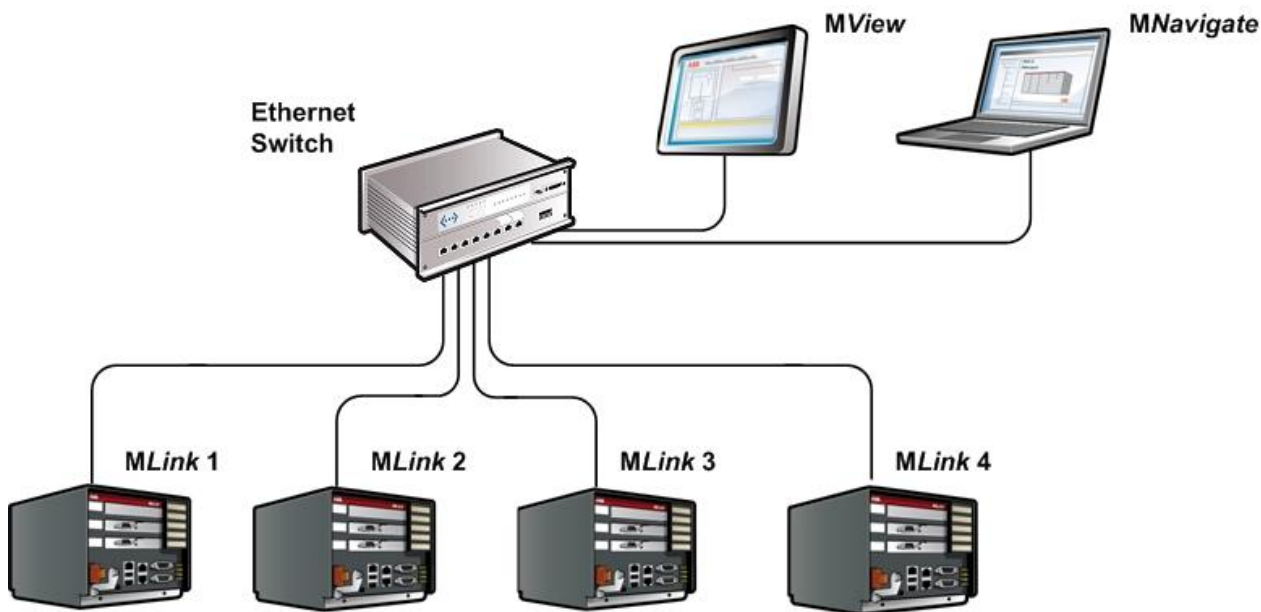
Figure 6 Example, using M*Link* as NTP Server

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 Parameters

Settings

All configuration settings and parameterisation for the MLink are configured with the M*Navigate* software tool.

Figure 7 IP Address settings   **Figure 8 Time Sync settings**

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

LAN1 and LAN2 port with the same subnet IP Range is NOT supported (e.g. 192.168.**200**.100/24 and 192.168.**200**.101/24).

NTP Server and MLink (LAN2) have to be part of the same Ethernet subnet or a network router has to be used.

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 is 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 it is not possible to communicate to the MLink, please refer to the trouble shooting section in this document and / the M*Link* section in the M*Navigate* Help file

MLink Installation

The M*Link* is installed in control cable compartment of the MNS *i*S cubicle. It is mounted on a special support fixed by screws.
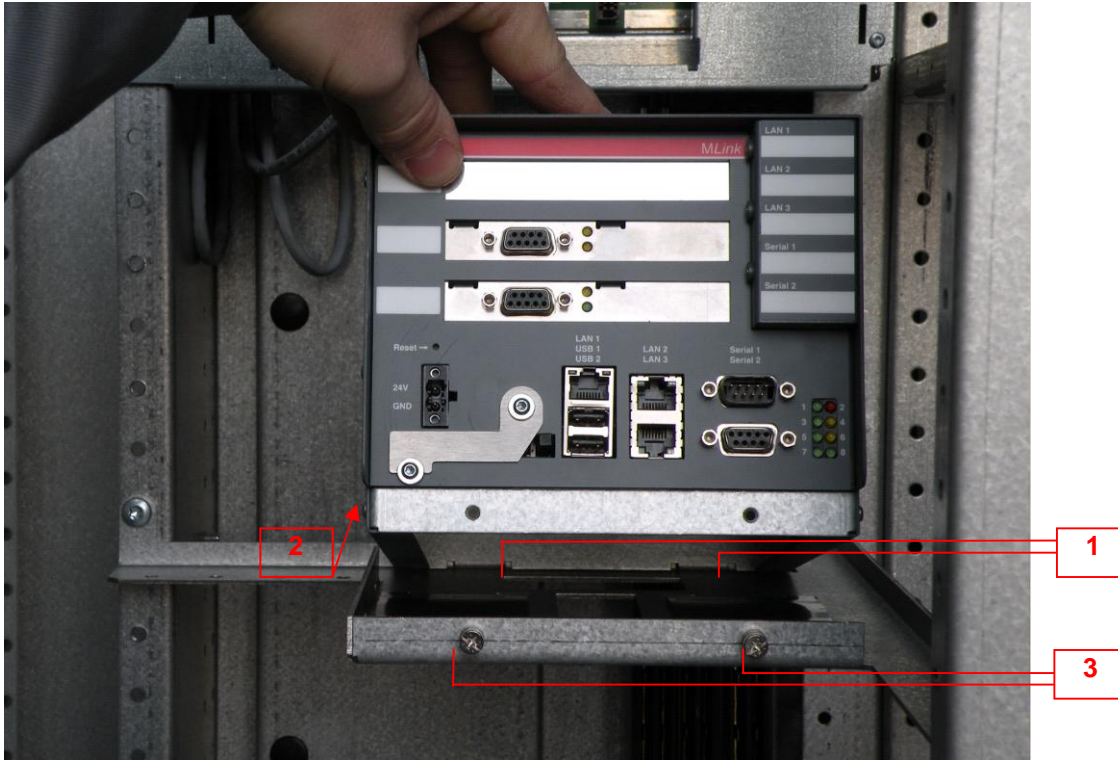

Figure 9 Mounting of M*Link* inside of MNS *i*S cubicle

In order to install (or re-install) the M*Link*, the following procedure applies:

1. Ensure the two metal tabs (1) on the lower back side of M*Link* case locate in the rear slots of the M*Link* support. (The M*Link* should be located approximately 20° from horizontal).

2. Now tilt the device down and slide it back into the MLink support (2) until the support holds the MLink in position.

3. Secure M*Link* with the 2 screws at the front of the support (3)

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

CF card installation

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.

On the MLink front side there is the slot to insert the Compact Flash Memory card (CF card). The CF card slot is behind a movable metal cover.

CF card shall be inserted with the correct side up as the card is mechanically coded and should not be forced.

To insert the CF card correctly, please refer [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.

The following example shows the ABB standard CF card.

Figure 10 CF card insertion

Figure 11 CF card insertion - detail

Start-up of MLink and application download

Power-On procedure

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.

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 7 & LED 1 (Run) should be on as a minimum. For more information please refer to Table 2.

Confirm operation

Once correct operation has been established it is then possible to proceed with system configuration and application download.
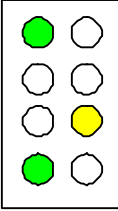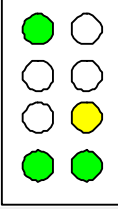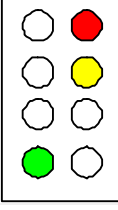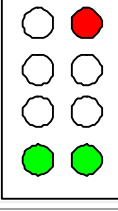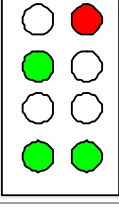
Redundancy support in MNS iS
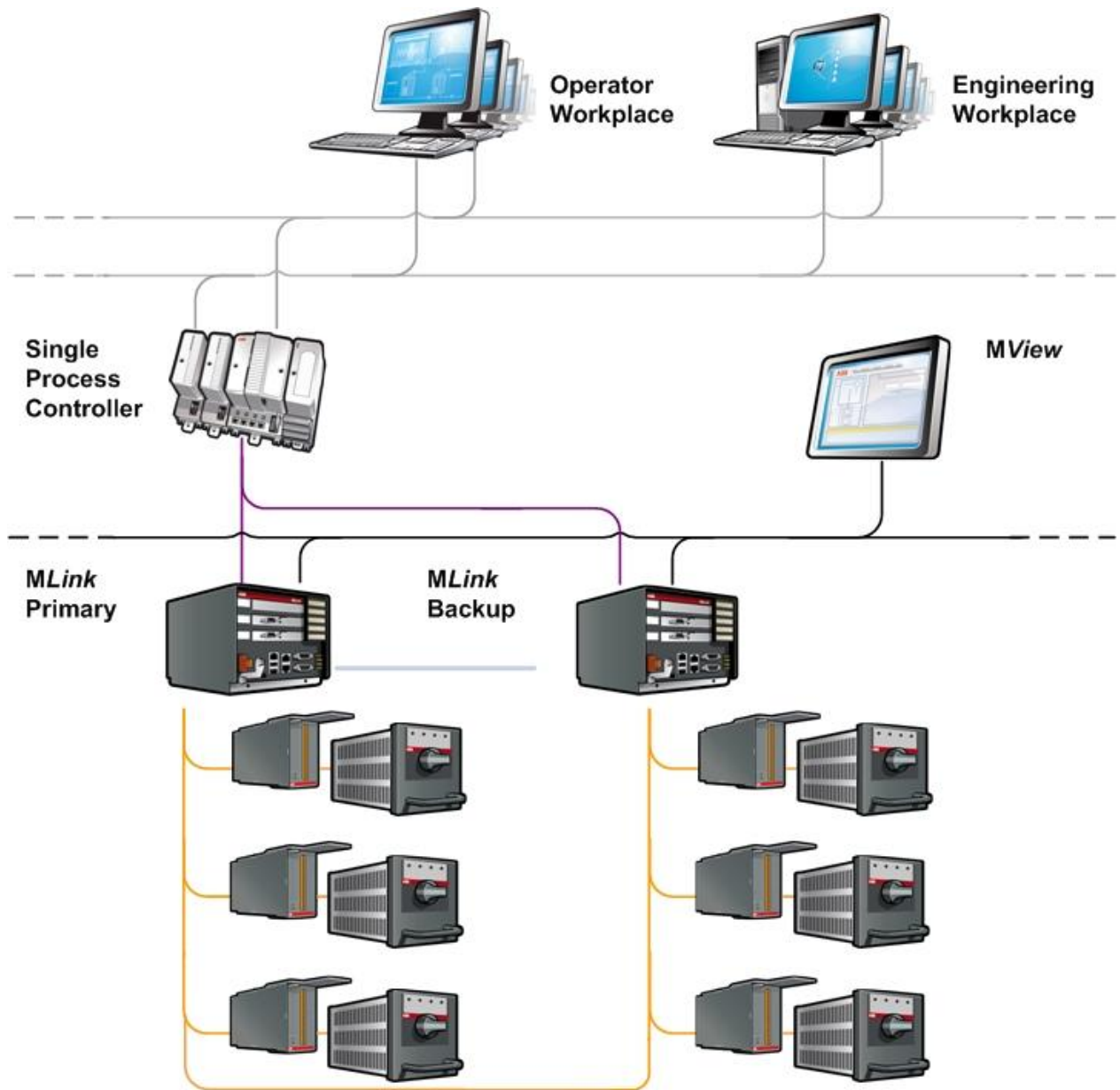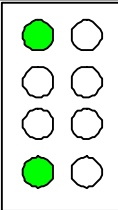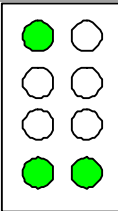
Figure 12 System architecture redundant system

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

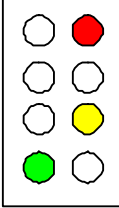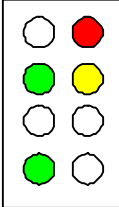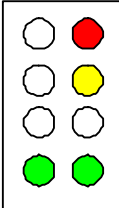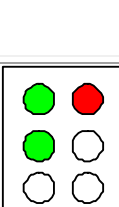| LED indication	Description	Additional information / Actions
1 ● ○ 2 3 ○ ○ 4 5 ○ ○ 6 7 ● ○ 8	M*Link* is running Ok.	
1 ● ○ 2 3 ○ ○ 4 5 ○ ○ 6 7 ● ● 8	M*Link* is running Ok.	LED 8 M*Link* is Primary in Dual Redundant configuration.
1 ● ○ 2 3 ○ ○ 4 5 ○ ◐ 6 7 ● ○ 8	M*Link* is running Ok.	LED 6 DCS communication active
1 ● ○ 2 3 ○ ○ 4 5 ○ ◐ 6 7 ● ● 8	M*Link* is running Ok.	LED 6 DCS communication active LED 8 M*Link* is Primary in Dual Redundant configuration.
1 ○ ● 2 3 ○ ◐ 4 5 ○ ○ 6 7 ● ○ 8	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.
1 ○ ● 2 3 ○ ○ 4 5 ○ ○ 6 7 ● ● 8	Error in M*Link* XML Configuration file	Possible cause could be an interrupted or disturbed communication between M*Navigate* and M*Link* while downloading. Please use M*Navigate* to download the M*Link* configuration again.
1 ○ ● 2 3 ● ○ 4 5 ○ ○ 6 7 ● ● 8	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.
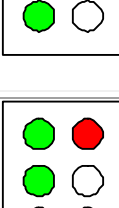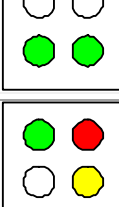
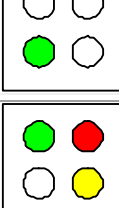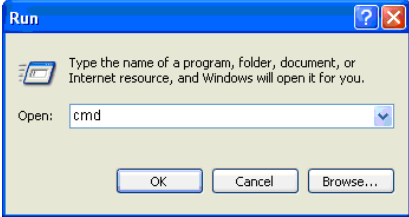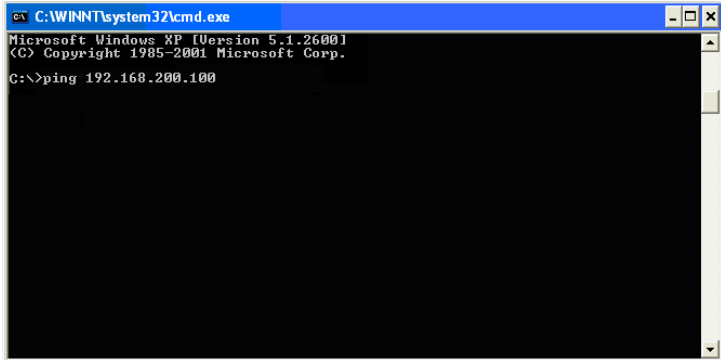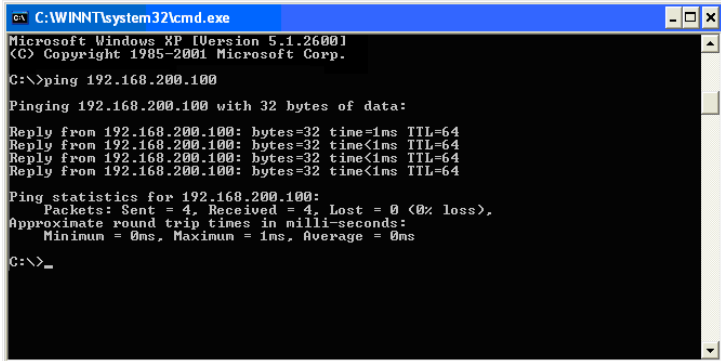| LED	Error	Description
1 ○ ● 2 3 ○ ○ 4 5 ○ ◐(yellow) 6 7 ●(green) ○ 8	Internal M*Link* error	M*Link* is not able to create internal database. Please reboot the M*Link*. If that doesn't resolve the problem use M*Navigate* to download the M*Link* configuration again.
1 ○ ● 2 3 ●(green) ◐(yellow) 4 5 ○ ○ 6 7 ●(green) ○ 8	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.
1 ○ ● 2 3 ○ ◐(yellow) 4 5 ○ ○ 6 7 ●(green) ●(green) 8	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).
1 ●(green) ● 2 3 ●(green) ○ 4 5 ○ ○ 6 7 ●(green) ○ 8	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).
1 ●(green) ● 2 3 ●(green) ○ 4 5 ○ ○ 6 7 ●(green) ●(green) 8	General DCS fault (only available if configured)	See above LED 8 M*Link* is Primary in Dual Redundant configuration.
1 ●(green) ● 2 3 ○ ◐(yellow) 4 5 ○ ○ 6 7 ●(green) ○ 8	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.
1 ●(green) ● 2 3 ○ ◐(yellow) 4 5 ○ ◐(yellow) 6 7 ●(green) ○ 8	General redundancy fault (only available if configured)	See above LED 6 DCS communication active

Table 5 LED error indication

Troubleshooting

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 • Enter the ping command with the correct IP address of M_Link_: ping xxx.yyy.zzz.aaa • If no reply is received, check the cable connection of the PC or M_View_ and M_Link._ 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 Swg. Bus LED 1 & LED 2 on M*Control*).
	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

Table 6 Troubleshooting

Contact us

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