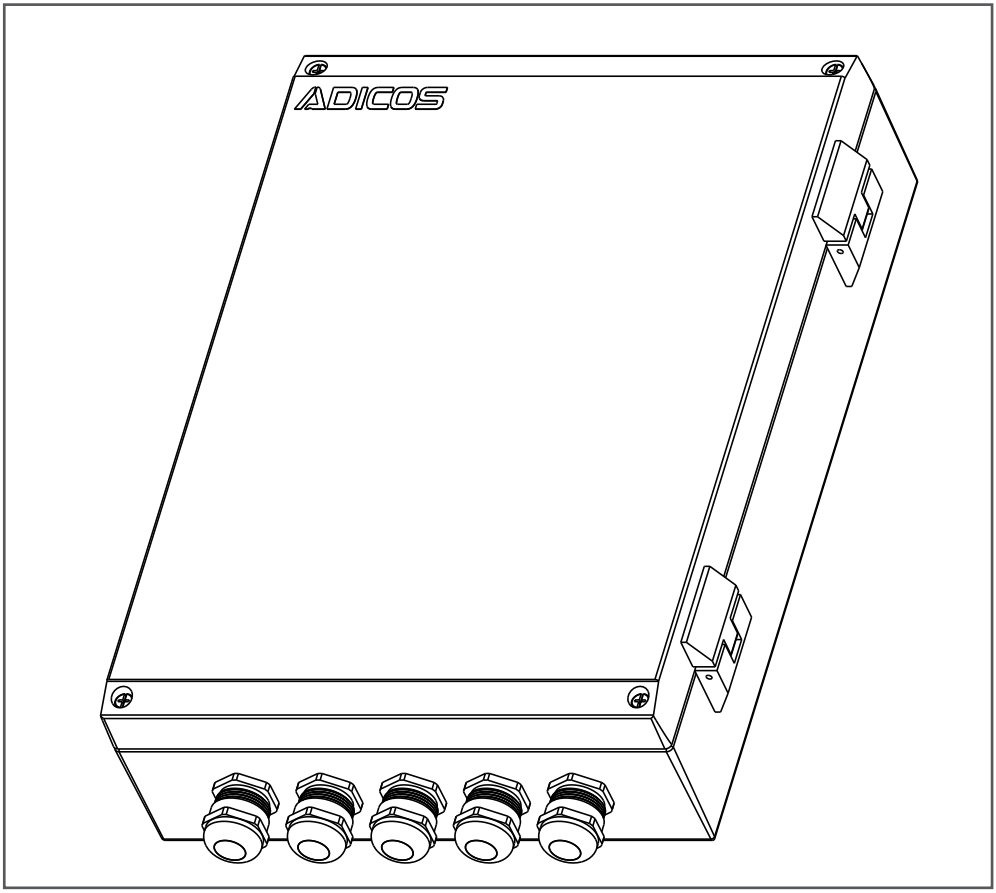

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Operating Manual

M-BUSMASTER XF

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ADICOS M-BUSMASTER XF Operating Manual
Article number: 420-2410-003
Index: EN21
Release date: 10.01.2023

– Translation –

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Abstract

The Advanced Discovery System (ADICOS®) is used for early detection of fires in industrial environments. It is comprised of various, separate detector units. By parameterizing and arranging the detectors appropriately, the system fulfills a predefined detection goal.

The ADICOS detectors are linked via the ADICOS M-Bus to the ADICOS M-BUSMASTER.

The M-BUSMASTER XF is the central interface for the ADICOS fire detectors. Compared to the M-BUSMASTER S, it has extended functionality (XF – Extended Function): It controls the communication with up to 255 ADICOS detectors and can also be used at long ranges. Access by a service PC is possible via a serial interface (RS232, with adapter USB) or via ethernet.

- Durable aluminum enclosure
- High resistance to moisture and dust
- Communication with up to 255 detectors
- Integrated overload detector
- Serial interface for operation of the detection system
- Optional Ethernet interface
- Little wiring required
- Central data compiling and visualization with PC software
- Repeater feature to expand range
- Port for 24V-UPS

Contents

1 About this Manual

1.1 Objective

This manual describes how to properly install, wire, start up and operate the ADICOS M-BUSMASTER XF. Once the device has been successfully started up, this document serves as a reference in the event of malfunctions.
It is intended to be used only by properly qualified personnel. (↦ Chap. 2, For your safety)

1.2 Explanation of Symbols

This manual follows a certain structure to make it easy to work with and understand. The following designations are used throughout.

Operational Objectives

Operational objectives specify the result to be achieved by following the subsequent instructions. Operational objectives are shown in **bold print**.

Instructions

Instructions are the steps to be taken in order to achieve the previously stated operational objective.
Instructions appear like this.

► Indicates a single instruction

1 First of a series of instructions
2 Second of a series of instructions
3 etc.

Intermediate States

When it is possible to describe intermediate states or events resulting from the instruction steps (e.g. screens, internal function steps, etc.), they are shown like this:

▷ Intermediate state

Warnings

The following types of notes are used through this manual:

DANGER!
This combination of symbol and signal word indicates an immediately dangerous situation which could lead to death or severe injuries if it is not avoided.

WARNING!
This combination of symbol and signal word indicates a possibly dangerous situation which could lead to death or severe injuries if it is not avoided.

CAUTION!
This combination of symbol and signal word indicates a possibly dangerous situation which could lead to minor injuries if it is not avoided.

NOTICE!
This combination of symbol and signal word indicates a possibly dangerous situation which could lead to property damage if it is not avoided.

Tips and recommendations
This type of note provides information that is directly relevant for the further operation of the device.

1.3 Abbreviations

The following abbreviations are used through this manual:

Abbr.	Meaning
ADICOS	Advanced Discovery System
AAB	ADICOS junction box
M-BM	ADICOS M-BUSMASTER
NT	ADICOS NT V40-A3 - power supply for special fire detector

1.4 Storing this Manual

Store this manual near the fire detectors, in a place where it can easily be accessed when needed for reference.

2 Safety Instructions

When properly installed, started up, operated and serviced, the ADICOS M-BUSMASTER XF ensure operational safety at your facility. But it is imperative that the manual, including all safety notes, be read, understood and followed completely.

WARNING!
Personal injury and property damage!
Incorrect installation and operating errors can cause death, serious injury and damage to industrial equipment.
- **Read the entire manual and follow the instructions!**

2.1 Intended Use

The ADICOS M-BUSMASTER XF is designed in line with state-of-the-art technology and accepted safety regulations.
The device may be used only in compliance with the limits stated as technical operating specifications. These can be found in Chap. 10, »Technical Data«.

Intended use also includes following the instructions in this manual and complying with all relevant local regulations.

The ADICOS M-BUSMASTER XF may not be used for any other purpose. If the device is used in any other way, or if changes are made to the product, including in the course of installation and maintenance, the warranty claim is no longer valid.

2.2 Unintended Use

The ADICOS M-BUSMASTER XF may not be installed in potentially explosive areas.

2.3 Standards and Regulations

The safety and accident prevention regulations relevant to the specific application must be complied with when installing, starting up, servicing and inspecting the device.

The following standards and guidelines in their current version are particularly relevant:

Regulation	Description
VDE 0100	Erection of power installations with rated voltages below 1000 V
VDE 0800	Telecommunications – general concepts; requirements and tests for the safety of facilities and apparatus
VDE 0833	Alarm systems for fire
VDE 0845	Protection of telecommunication systems against lightning, electrostatic discharges and overvoltages from electric power installations – provisions against overvoltages
VdS 2095	Guidelines for automatic fire detection and fire alarm systems - planning and installation
DIN 14675	Fire detection and fire alarm systems – setup and operation

2.4 Personnel Qualification

Only properly trained and qualified persons may work on ADICOS equipment. Qualified persons are those who have received relevant professional training, have the required skills and experience and who are aware of applicable regulations, enabling them to work on electrical equipment and detect potential hazards.

WARNING!
Personal injury and property damage!
Incorrect installation and operating errors can cause death, serious injury and damage to industrial equipment.
- **Read the entire manual and follow the instructions!**

2.5 Modifications

WARNING!
Property damage or detector failure by any form of unauthorized modification!
Any form of unauthorized modification or extension can lead to a failure of the detector system. The warranty claim expires.

- **Never make unauthorized modifications on your own authority.**

2.6 Accessories and Spare Parts

WARNING!
Property damage due to short circuit or failure of the detector system
The use of parts other than the manufacturer's original spare parts and original accessories may result in property damage due to short circuits.

- **Only use original spare parts and original accessories!**
- **Original spare parts and accessories may only be installed by trained specialist personnel.**
- **Qualified personnel are persons as described in Chap. 2.3.**

3 Description of Product

The M-BUSMASTER XF, in conjunction with the ADICOS System Software, is a central unit of the Advanced Discovery System (ADICOS) designed specifically to meet the need for early fire detection in the industry. The M-BUSMASTER XF controls communication with up to 255 ADICOS detectors via the ADICOS M-Bus and serves as the interface between the ADICOS special fire detector and a service PC based standardly on RS-232. With an expansion module, it can also be based on Ethernet.

The states of all of the detectors in the system can be intelligently monitored with a service PC and the ADICOS System Software. All of the sensor data from the ADICOS fire detectors, such as concentration and temperature, is also continuously recorded and can be displayed as graphs. With the aid of the software, all of the detector parameters, e.g. sensitivity and alarm thresholds, can be configured separately for each detector.

The M-BUSMASTER XF power supply is AC 230 V. The device also has an input for an uninterruptible power supply with DC 24 V. When systems are spread out over a large area, the M-BUSMASTER XF can also be used as a repeater. Because it is so durable, the device is protected from dust and moisture penetration, and it can easily withstand harsh environments.

3.1 Overview

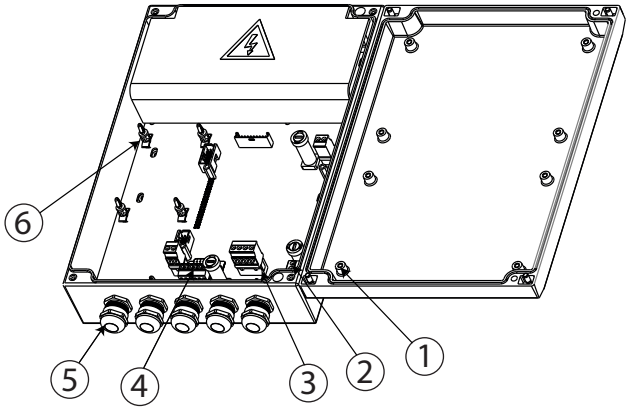


Fig. 1

No.	Description
①	Grounding
②	Supply voltage
③	Connecting terminal ADICOS M-Bus
④	Connecting terminal service PC (pre-configured cables)
⑤	Cable duct
⑥	Slot for Ethernet card (optional)

3.2 Scope of Delivery

Check that the delivery is complete and no items are damaged. The scope of delivery includes:

- M-BUSMASTER
- Optional: LAN card
- Instruction manual

3.3 Terminal Assignment and Connections

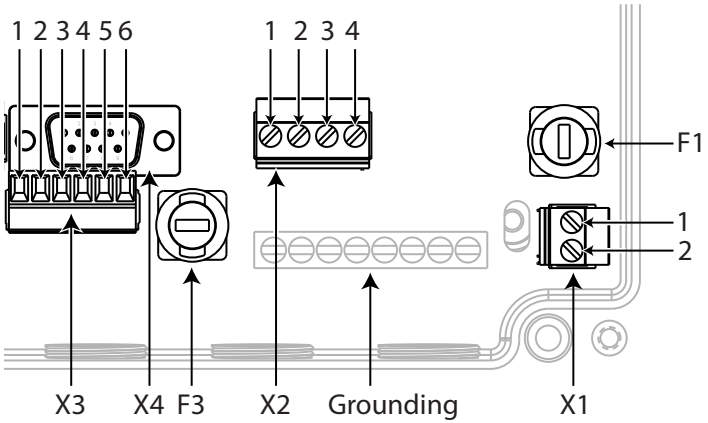


Fig. 2

3.3.1 Overview of Terminals

X1 – power supply

The standard power supply has a pre-configured power cable with a shock-proof plug.
Grid feed: AC 230 V, 90 ... 264 V
Power consumption: Max. 65 VA

X2 – optional 24 V power feed through UPS with battery buffing

Power feed: DC 24 ... 27 V; check proper polarity (Refer to circuit board label)
Current consumption: max. 4 A

X2 – M-Bus output on ADICOS M-BUSMASTER XF

Connection for two-wire bus system, for communication with the detectors.

Bus voltage: DC 40 V; protected against polarity reversal
Max. current: 1.5 A

X3, X4 – RS-232 PC connection

Plug connectors for serial cable or a SUB-D9 receptacle. All five connections (GND, TxD, RxD, DTR and RTS) have to be assigned. The device is supplied with a pre-configured interface cable.
Keep in mind that only one of the two connections may be used.

3.3.2 Terminal Assignment

Terminal no.	Designation	Signal
X1:1	Power supply AC 230 V	L1
X1:2	Power supply AC 230 V	N
X2:1	M-Bus output	M-Bus A
X2:2	M-Bus output	M-Bus B
X2:3	Power supply DC 24 V	GND DC 24 V
X2:4	Power supply DC 24 V	DC +24 V
X3:1	RS-232 PC connection	GND
X3:2	RS-232 PC connection	RxD
X3:3	RS-232 PC connection	TxD
X3:4	RS-232 PC connection	RTS
X3:5	RS-232 PC connection	DTR
X3:6	RS-232 PC connection	Not assigned
X4:1	RS-232 PC connection	Not assigned
X4:2	RS-232 PC connection	TxD
X4:3	RS-232 PC connection	RxD
X4:4	RS-232 PC connection	DTR
X4:5	RS-232 PC connection	GND
X4:6	RS-232 PC connection	Not assigned
X4:7	RS-232 PC connection	RTS
X4:8	RS-232 PC connection	Not assigned
X4:9	RS-232 PC connection	Not assigned
X5:1	M-Bus input “Slave”	M-Bus A
X5:2	M-Bus input “Slave”	M-Bus B

3.4 Internal LED Indicators

There are five LEDs indicating the operating mode on the main board.

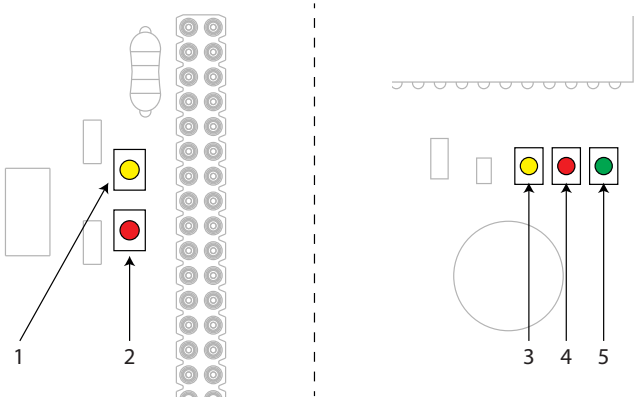


Fig. 3

	Designation	Color	Function
1	Query	Yellow	Data is being received from the RS-232 interface and forwarded to the M-Bus.
2	Reply	Red	Data is being received from the M-Bus and forwarded to the RS-232 interface.
3	Fuse	Yellow	Output fuse has triggered.
4	Overload	Red	Overload: The current consumption is greater than 1.5 A. To remedy this issue, remove consumers from the bus.
5	Normal	Green	Device is ready.

3.5 Jumper

3.5.1 Jumper Settings “Interface”

The interface through which the ADICOS M-BUSMASTER XF communicates can be configured with the jumpers A0 and A1.

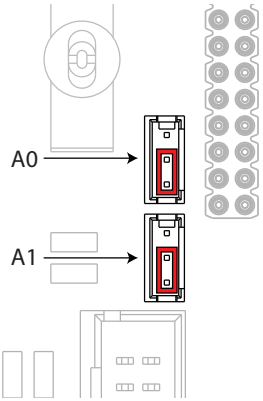


Fig. 4

The setting “Operation via RS-232 interface” corresponds to classic master operation. The data from the detector connected to the M-Bus is transferred for further processing via the RS-232 interface to a PC with ADICOS System Software.

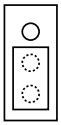
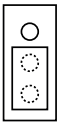
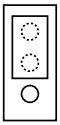
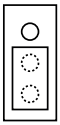
Operation via RS-232		Operation via optional module (Ethernet, etc.)	
A0	**A1**	**A0**	**A1**
			

Fig. 5

3.6 Fuses

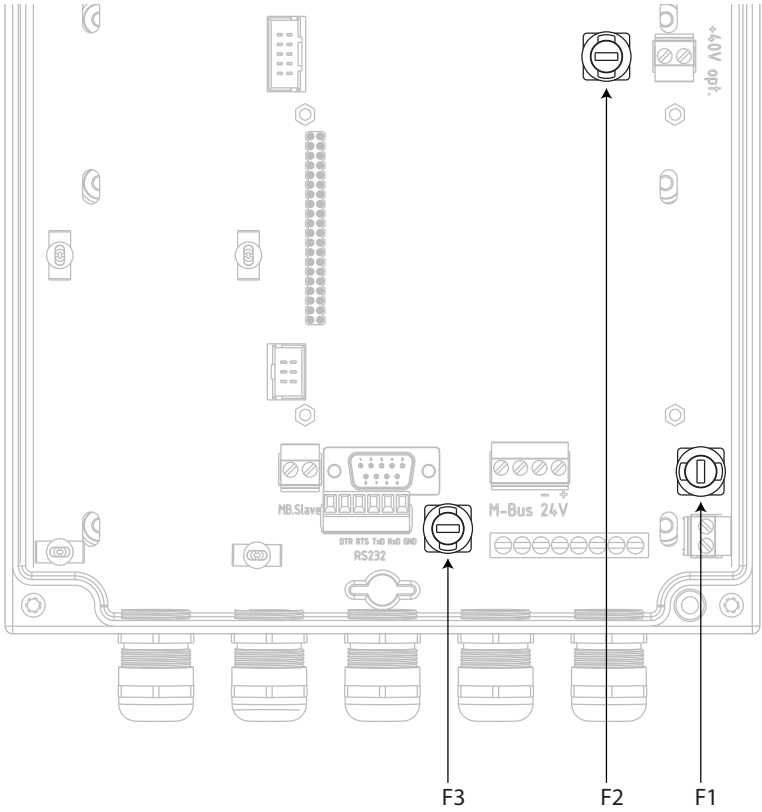


Fig. 6

F1	Mains fuse 230 V	1 A, slow-blow
F2	Mains fuse 24 V	4 A, slow-blow
F3	Output fuse M-Bus	2.5 A, slow-blow

4 Functioning

The ADICOS M-BUSMASTER XF serves as the interface between the computer and the detectors. The M-Busmaster facilitates communication between the master computer and the devices in the ADICOS series, and it serves as a level converter for the signals from the M-Bus to RS-232.

5 Installation

DANGER!
Malfunctioning and failure of the detector system
Incorrect installation of the ADICOS M-BUSMASTER XF can lead to faults and failures of the detector system.

- **Installation work may only be performed by specialist personnel! (–› Chap. 2.3, Personnel qualification)**
- **De-energize the detector löschen: entire detector system for any installation work!**

5.1 Requirements of Mounting Location

The ADICOS M-BUSMASTER XF is not approved for use in potentially explosive areas and may never be used in such areas.

5.1.2 Protective Measures

To ensure smooth operation of the ADICOS M-BUSMASTER XF, always consider the following factors when choosing a place to attach the device.

Temperature

Even under the most unfavorable conditions, the ambient temperature at the mounting location must remain within the temperature range specified for the ADICOS M-BUSMASTER XF (Refer to Chap. »11 . Technical Data«).

Moisture

When choosing a place to install the ADICOS M-BUSMASTER XF, take into consideration that it may not be exposed to moisture. Keep in mind that water could be used for cleaning purposes near the mounting location.

Vibration

The electronics contained in the ADICOS M-BUSMASTER XF can be damaged when subjected to vibration. If there are any sources of strong vibration near where the device is installed, it has to be positioned such that it is immune to the vibration.

Electromagnetic Radiation

The electronics contained in the ADICOS M-BUSMASTER XF can be damaged when subjected to electromagnetic radiation. So do not place the device near high voltage equipment. And always use shielded cable.

5.2 Wiring

WARNING!
Malfunctioning and failures of the detector system
Incorrect wiring of the ADICOS M-BUSMASTER XF can cause malfunctioning, leading to failure of the detector system.

- **Only specialist personnel may wire the equipment (–› chap. '2.3. Personnel Qualification)**
- **Before beginning any wiring work, deenergize the detection system**
- **Use ADICOS junction cables only for connecting detectors as well as ADICOS junction boxes!**

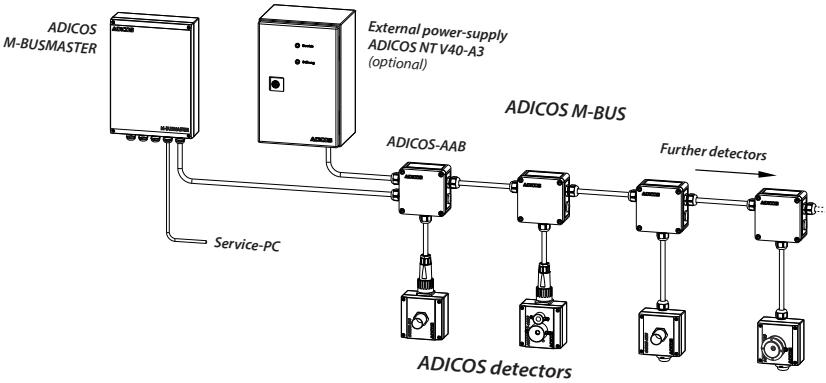


Fig. 7

In addition to the basic wiring configuration shown here, refer to the wiring examples in the manuals for the individual detectors.
When wiring the devices, be aware of the number of detectors and the maximum cable lengths. The maximum line length is a factor of the number of detectors as well as the cable capacity (Refer to Chap. 11, »Technical Data«).

5.3 Mounting

DANGER!
Property damage due to electrical voltage!
ADICOS systems work with electrical current, which can cause equipment damage and fire if not installed properly.

- **De-energize the detector system before mounting the device!**
- **Mounting may be performed only by properly trained personnel.**

CAUTION!
Risk of injuries!
The ADICOS M-BUSMASTER XF is heavy. Incorrect mounting or the use of unsuitable wall mounts can result in injury.

- **Mounting in a suitable location may be performed only by properly trained personnel.**

1 Select a suitable mounting location.
2 Secure the ADICOS M-BUSMASTER XF with suitable fittings. Consider the wall structure and the thickness of the enclosure when choosing fittings (Chap. 11.1, »Dimensions«).
3 Connect the components to one another (Refer to Chap. 5.2, »Wiring Specifications«).
4 Connect the ADICOS M-BUSMASTER XF to the power supply.

5.3.3 Optional LAN Connection with Ethernet Card

The ADICOS M-BUSMASTER XF can be ordered with an Ethernet card if needed. The additional board is in the slot and the internal connecting cables are attached before the device leaves the factory. The LAN cable still has to be connected.

1 Pass the LAN cable through the cable duct. Do not crimp the cable until it has been drawn through the cable duct.
2 Connect the crimped LAN cable to the LAN connection on the Ethernet card.

6 Commissioning

► Supply voltage to the device to start up the ADICOS M-BUSMASTER XF.

Once all of the connections have been made as required, the entire wiring configuration can be checked as follows:

6.1 Measuring Resistance

As long as no detector or repeater is connected to the bus wiring, the resistance of the entire bus wiring can be checked with the aid of a resistance meter at the installation location of the ADICOS M-BUSMASTER XF. The measured resistance is ∞.
The single branch lines wired parallel to one another can now be individually short-circuited at the respective end, one after the other. This has to appear on the resistance meter at the end of the bus trunk line. This ensures that there are no interruptions or short circuiting in the bus line.

6.2 Measuring Voltage

After the bus wiring has been checked and proven to be correct, the voltage supply to the ADICOS M-BUSMASTER XF can be switched on. The green LED (normal) should light up to indicate that the device is ready for operation.
There should be voltage of approx. 40 V at the output terminals of the ADICOS M-BUSMASTER XF. Once the ADICOS M-BUSMASTER XF has been switched on, there has to be voltage between DC 38 and 40 V at every detector connected and at the input terminals MB-IN of the M-Bus repeater. The voltage can be measured with a multimeter.
When using ADICOS detectors, measure the voltage at terminals on the connector assemblies or the respective contacts on the connection cables.

6.3 Integrating M-BUSMASTER XF into a Network

First connect a service PC to the ADICOS central unit and install the System Software on the service PC.

6.3.1 Integrating M-BUSMASTER XF via Serial Interface RS-232

Prerequisite
The customer has to have installed a service PC with ADICOS System Software.

The serial RS-232 interface is standard on the ADICOS M-BUSMASTER XF. Connect the ADICOS M-BUSMASTER XF to the COM port on the service PC and start the System Software.

1 First set the interface parameters in the software as needed. Select the COM port used and a baud rate of 4800 baud.

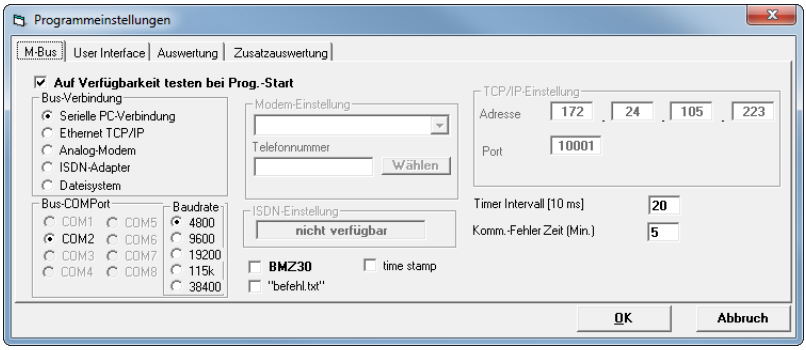


Fig. 8

2 Add one or more ADICOS detectors to the query, e.g. using the autoscan feature.

▷ While the service PC is communicating with the detectors connected in the field, the red LED (reply) as well as the yellow LED (query) should be flashing.

6.3.2 Integrating M-BUSMASTER XF via Optional LAN Connection

The ADICOS M-BUSMASTER XF can be equipped with an Ethernet connection upon request. The network card is based on a module XPort supplied by Lantronix. The MAC address of the network card can be found on the label on the XPort

.

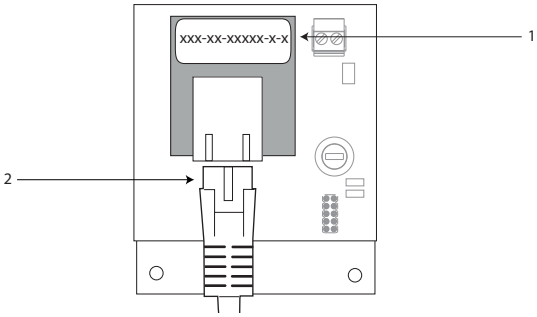


Fig. 9

1	MAC address
2	Ethernet cable

The Ethernet module automatically obtains its IP address from the DHCP server of the network. Using the "Lantronix DeviceInstaller" (https://www.lantronix.com/products/deviceinstaller/), a software tool provided by the manufacturer of the XPort, the IP address of the respective MAC address ADICOS M-BUSMASTER XF can be found or adapted as required.

Finding Connected Devices

1 Check that all components are connected properly and supplied with voltage.

2 Start the Lantronix DeviceInstaller on a computer in the same network.

▷ The software automatically lists all Ethernet modules within the network as “XPort Direct” or “XPort Direct+.”

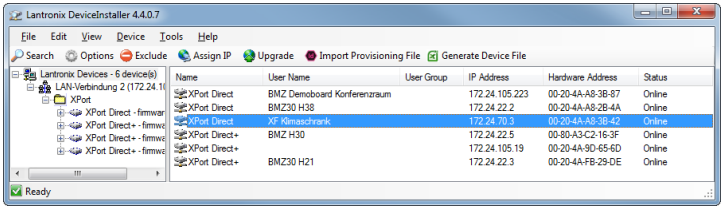


Fig. 10

Changing IP Address

1 Select the device to be changed from the list.

2 Then click “Assign IP.”

▷ The wizard used to adapt the IP address opens.

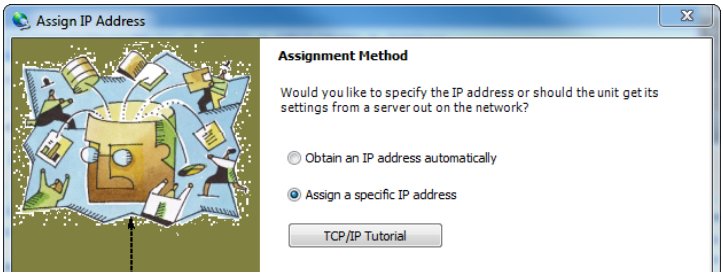


Fig. 11

3 Select “Assign a specific IP address“ and click “Next.”

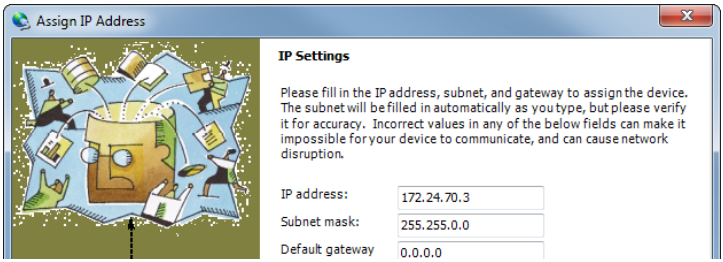


Fig. 12

4 Enter the desired IP address and the subnet mask, then click “Next.”

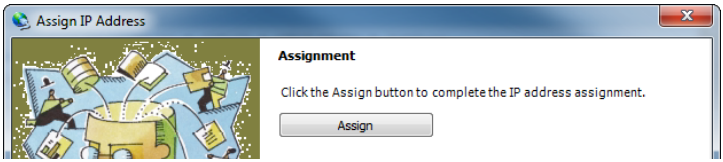


Fig. 13

5 Click “Assign.”

▷ The new IP address is programmed.

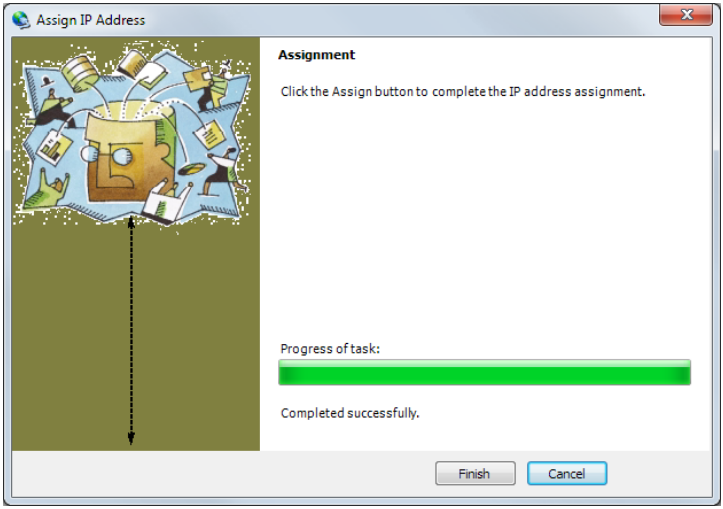
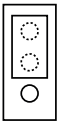
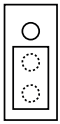


Fig. 14

6 Click “Finish” and close the Device Installer.

Setting up M-Bus-Master in ADICOS System Software

Prerequisite

Operation via auxiliary module (Ethernet, etc.)	
A0	**A1**
	

Verify that the jumper “A0” is plugged into the upper position (Refer to Chap. “3.5.1 Jumper Settings “Interface””).

1 Adjust the interface parameters in the software as follows:

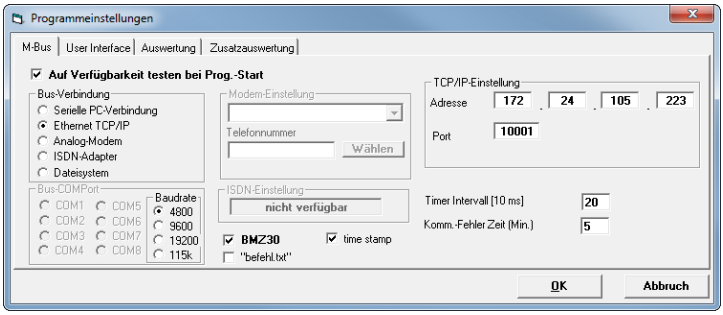


Fig. 15

Bus connection: Ethernet TCP/IP
TCP/IP setting: the preset or programmed IP address
Port: 10001

2 Click “OK” to confirm the settings.

3 Add ADICOS detectors to the query, e.g. using the autoscan feature.

▷ While the service PC is communicating with the connected detectors, the red LED (reply) as well as the yellow LED (query) should be flashing.

6.4 Checking Bus Communication

Once all of the devices have been started up and the central (host) computer and ADICOS M-BUSMASTER XF have been switched on, the ADICOS System Software can be opened. The software enables each separate device to be integrated and checked using the central computer. While the service PC is communicating with the connected detectors, the red LED (reply) as well as the yellow LED (query) should be flashing.

7 Operation

During operation, the ADICOS M-BUSMASTER XF serves as the level converter from the M-Bus system to a standard interface.

8 Maintenance

8.1 Cleaning

DANGER!
Risk of electric shock
Risk of electric shock if not cleaned correctly!
ADICOS equipment works with electric current. Failure to clean the equipment properly can lead to electric shock.

- **Deenergize the entire detector system before cleaning the device!**

The ADICOS M-BUSMASTER XF enclosure can be cleaned with a soft, damp cloth and dish-washing liquid. Scouring agents, acids and bases may not be used; do not apply water pressure to clean. Use caution to prevent water from penetrating the device. If is not cleaned properly, the ADICOS M-BUSMASTER XF will not function as intended and can cause electric shock.

8.2 Replacing ADICOS M-BUSMASTER XF

WARNING!
Impaired functioning
Defective components can impair proper functioning. The equipment no longer works as intended.

- **If it is defective in any way, immediately replace the ADICOS M-BUSMASTER XF.**

8.2.1 Maintenance

The ADICOS M-BUSMASTER XF does not contain any wearing parts or consumables. So no maintenance is required in this regard.

9 Failure

What to do, if ...	Description	Remedy
... the “Overload” light is illuminated	The M-Bus output is overloaded	– Remove the consumer
... no detector is communicating	– Line interrupted – Power supply to detector(s) is disrupted – No connection to the service PC – Defect in M-BUS-MASTER	– Check M-Bus voltage – Check bus lines for breakage/disruptions – Measure voltage at M-Bus output (set-point: DC 38 ... 40 V) – Check connection to service PC – Replace the M-Busmaster
... single detectors are not communicating	– Line interrupted – Power supply to detector(s) is disrupted	– Measure the voltage in the terminal block connector – Check that voltage is being supplied and there is M-Bus voltage

10 Disposal

Return the device to the manufacturer when it reaches the end of its serviceable life. The manufacturer will ensure that the components are disposed of properly, in an environmentally friendly manner.

11 Technical Data

Mains voltage input:	AC 230 V ± 10%
Mains input fuse:	1 A, slow-blow
Input 24 V / UPS:	DC 20 ... 27 V
Input fuse 24 V / UPS:	4 A, slow-blow
Max. power consumption:	65 VA
Output voltage M-Bus:	DC 38 ... 40 V
Output fuse M-Bus:	2.5 A, slow-blow
Power output M-Bus:	60 W (internal output current limited to 1.5 A)
Baud rate M-Bus:	4800 baud
Maximum line length M-Bus:	≈ 2 km @ 4800 baud
Maximum line length RS-232:	2.5 m
Max. number of detectors with which the device can communicate:	255
Temperature range:	-10 ... +60 °C
Relative humidity:	≤ 95 % relative humidity (non-condensing)
Enclosure:	Coated die-cast aluminum (corrosion-resistant)
Dimensions (H x W x D):	72,5 x 208 x 303 mm
Weight:	3.3 kg
Degree of protection:	IP 65

11.1 Dimensions

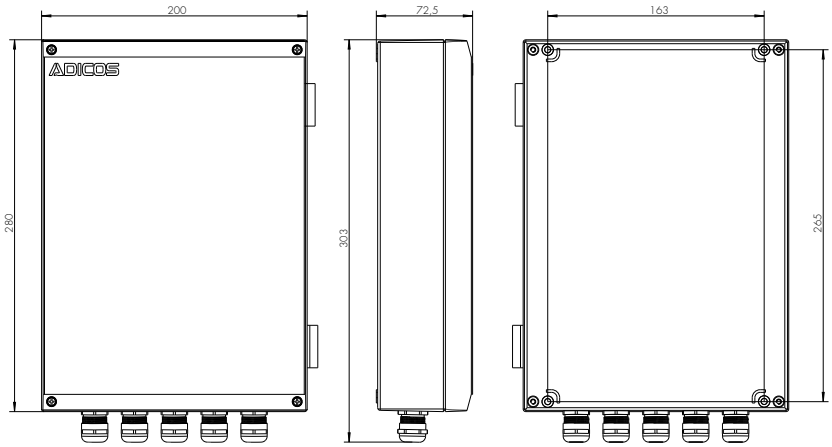
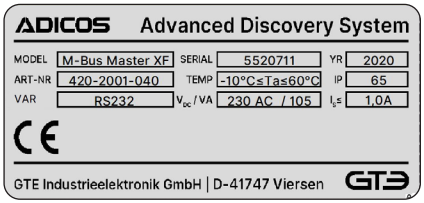


Fig. 8

11.2 ID Plate



Model:	Device model	SERIAL:	Serial number (variable)	YR:	Year of production (variable)
ART-Nr:	Article number (variable)	TEMP:	Ambient temperature	IP:	Degree of protection
VAR:	Interface	V_{DC}/VA:	Voltage range / maximum power consumption	I_s:	Input fuse
	CE marking:				