bürkert
FLUID CONTROL SYSTEMS

Type ME43

Fieldbus gateway büS
to Industrial Ethernet, PROFIBUS DPV1, CC-Link

Operating Instructions

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

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Operating Instructions 1711/01_EUen_00810575 / Original DE

Fieldbus gateway type ME43

CONTENTS

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

1 THE OPERATING INSTRUCTIONS

The operating instructions describe the entire life cycle of the device. Keep these instructions ready to hand at the operation site.

Important safety information!

- ▸ Carefully read these instructions.
- ▸ Observe in particular the safety instructions, intended use and operating conditions.
- ▸ Persons, who work on the device, must read and understand these instructions.

1.1 Symbols

DANGER!

Warns of an immediate danger!

- ▸ Failure to observe the warning will result in fatal or serious injuries.

WARNING!

Warns of a potentially dangerous situation!

- ▸ Failure to observe the warning may result in serious injuries or death.

CAUTION!

Warns of a potential danger!

- ▸ Failure to observe the warning may result in a moderate or minor injury.

NOTE!

Warns of damage!

- ▸ Failure to observe the warning may result in damage to the device or other equipment.

Indicates important additional information, tips and recommendations.

Refers to information in these operating instructions or in other documentation.

▶ Designates an instruction which you must follow to prevent a hazard.

→ Designates a procedure which you must carry out.

Indicates a result.

MENUE Representation of software interface text.

1.2 Definition of the term “device”

In these instructions the term “device” denotes the following device types: ME43

- **Ex area:** stands for explosion-risk area
- Ex approval: stands for approval in the potentially explosive area

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

2 INTENDED USE

Inappropriate use of the device may be dangerous to people, nearby equipment and the environment.

The fieldbus gateway type ME43 is used as a field bus converter between büS and Industrial Ethernet, PROFIBUS DPV1, CC-Link.

- When using the device, observe the permitted data, operating conditions and application conditions. This information can be found in the contractual documents, the operating instructions and on the type label.
- In areas at risk of explosion, only use devices approved for use in those areas. These devices are labeled with a separate Ex type label. In use, note the information provided on the separate Ex type label and the additional explosion-related information or separate explosion-related operating instructions.

The device

- Do not use the device outside.
- Do not open the device.
- Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- Only operate the device when in perfect condition and always ensure proper storage, transportation, installation and operation.
- Use only as intended.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not consider any contingencies or incidents which occur during installation, operation and maintenance. The operator is responsible for observing the location-specific safety regulations, also with reference to the personnel.

General hazardous situations.

To prevent injury, ensure the following:

- Operate the device only in perfect condition and in accordance with the operating instructions.
- Do not make any changes to the device and do not subject it to mechanical stress.
- Secure device or system to prevent unintentional activation.
- Only trained technicians may perform installation and maintenance work.
- Install the device according to the regulations applicable in the country.
- After an interruption in the power supply, ensure that the process is restarted in a controlled manner.
- Observe the general rules of technology.

NOTE!

Electrostatic sensitive components and modules.

The device contains electronic components which react sensitively to electrostatic discharge (ESD). Contact with electrostatically charged persons or objects are hazardous to these components. In the worst case scenario, these components will be destroyed immediately or will fail after starting up.

- To minimize or eliminate the risk of damage resulting from sudden electrostatic discharges, ensure compliance with the requirements of EN 61340-5-1.
- Do not touch electronic components while the supply voltage is switched on!

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

4 GENERAL INFORMATION

4.1 Contact address

Germany

Bürkert Fluid Control Systems
Sales Center
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tel. + 49 (0) 7940 - 10-91 111
Fax + 49 (0) 7940 - 10-91 448
Email: info@burkert.com

International

You can find the contact addresses on the internet at:

www.burkert.com

4.2 Warranty

The warranty is only valid if the device is used as intended in accordance with the specified application conditions.

4.3 Information on the Internet

The operating instructions and data sheets for Bürkert products can be found on the Internet at:

www.burkert.com

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

5 PRODUCT DESCRIPTION

The fieldbus gateway type ME43 is used as a field bus converter between büS and Industrial Ethernet.

Application area:
Switch the process values between the devices of fieldbus 1 and fieldbus 2.

Device type	Fieldbus 1	Fieldbus 2
ME43	büS	PROFINET
ME43	büS	EtherNet/IP
ME43	büS	Modbus TCP
ME43	büS	PROFIBUS DPV1
ME43	büS	CC-LINK
ME43	büS	EtherCAT

Table 1: Type ME43 application area

The “Bürkert Communicator” software is required for the configuration of the Type ME43.
For description see chapter “10.3 Configuration of the fieldbus gateway ME43”, page 32.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

6 TECHNICAL DATA

6.1 Conformity

The device conforms to the EU Directives as per the EU Declaration of Conformity (if applicable).

6.2 Standards

The applied standards, which are used to demonstrate conformity with the EU Directives, are listed in the EU type examination certificate and/or the EU Declaration of Conformity (if applicable).

6.3 Operating conditions

WARNING!

Risk of injury due to malfunction if device used outdoors.

- Do not use the device outdoors and avoid heat sources which may cause the permitted temperature range to be exceeded.

Permitted ambient temperature range.	-20 °C to +60 °C
Operating altitude:	up to 2000 m above sea level

6.4 Mechanical data

Dimensions:	Refer to data sheet for Type ME43
Housing material:	Polycarbonate

6.5 Electrical data

Supply voltage:	24 V ⎓ ±10 % - residual ripple 10%
Power consumption	< 2 W
Degree of protection:	IP 20 according to EN 60529 / IEC 60529 (only if cables, plugs and sockets have been connected correctly) verified by Bürkert, not evaluated by UL
Protection class:	3 according DIN EN 61140 (VDE 0140)
Interfaces	1 spring-type terminal 5-pin for supply voltage and büS connection
PROFIBUS version:	1 plug-in connector D-Sub, 9-pin
CC-LINK version:	1 plug-in connector D-Sub, 9-pin
Industrial Ethernet version:	2 sockets for RJ45 plug-in connector
UL Devices:	Limited Energy Circuit (LEC) according to UL/ IEC 61010-1
	Limited Power Source (LPS) according to UL/ IEC 60950
	SELV/ PELV with UL Recognized Overcurrent Protection dimensioned according to UL/ IEC 61010-1 Table 18
	NEC Class 2 power source

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

6.6 Type label, device labeling

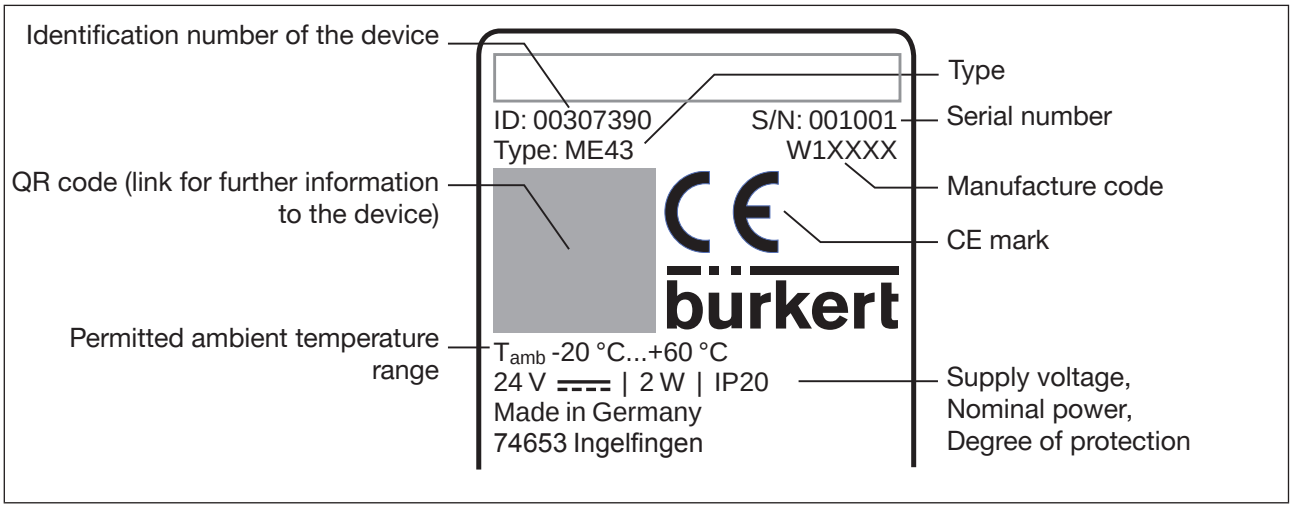


Figure 1: Description of type label and device labeling

6.7 Industrial Ethernet

PROFINET IO specifications

Topology recognition	LLDP, SNMP V1, MIB2, physical device
Minimum cycle time	10 ms
IRT	not supported
MRP (Media Redundancy)	MRP Client is supported
Additional supported features	DCP, VLAN priority tagging, Shared Device
Transmission speed	100 Mbit/s
Data transport layer	Ethernet II, IEEE 802.3
PROFINET IO specification	V2.3
(AR) Application Relations	The device can simultaneously process up to 2 IO-ARs, 1 Supervisor AR and 1 Supervisor DA AR.

EtherNet/IP specifications

Predefined standard objects	Identity Object (0x01)
	Message Router Object (0x02)
	Assembly Object (0x04)
	Connection Manager (0x06)
	DLR Object (0x47)
	QoS Object (0x48)
	TCP/IP Interface Object (0xF5)
	Ethernet Link Object (0xF6)
DHCP	supported

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

BOOTP	supported
Transmission speed	10 and 100 Mbit/s
Duplex transmission	Half Duplex, full Duplex, autonegotiation
MDI modes	MDI, MDI-X, Auto-MDIX
Data transport layer	Ethernet II, IEEE 802.3
Address Conflict Detection (ACD)	supported
DLR (ring topology)	supported
Integrated switch	supported
CIP Reset services	Identity Object Reset Service of Type 0 and 1

Modbus TCP specifications

Modbus Function Codes	1, 2, 3, 4, 6, 15, 16, 23
Mode	Message Mode: Server
Transmission speed	10 and 100 Mbit/s
Data transport layer	Ethernet II, IEEE 802.3

EtherCAT SPECIFICATIONS

Maximum number of cyclic input and output data	512 bytes in sum
Maximum number of cyclic input data	1024 bytes
Maximum number of cyclic output data	1024 bytes
Acyclic communication (CoE)	SDO, SDO master-slave SDO slave-slave (depending on master capability)
Type	Complex slave
FMMUs	8
Sync managers	4
Transmission speed	100 Mbit/s
Data transport layer	Ethernet II, IEEE 802.3

6.8 PROFIBUS DPV1 specifications

Acyclic communication	DP V1 Class 1 Read/Write DP V1 Class 1 Alarm DP V1 Class 2 Read/Write/Data Transport
Transmission speed	Fixed values from 9.6 kbit/s to 12 Mbit/s Autodetect mode is supported
Maximum size of the transmitted data	Input data: 244 bytes Output data: 244 bytes

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

6.9 CC-Link specifications

Features

Remote I/O Station	only I/O points
Remote Device Station	i/O points and Words
Configurable number of occupied stations	1...4
Configurable number of extension cycles	1, 2, 4, or 8
Supported protocols	CC-Link version 2.0
	CC-Link version 1.11

CC-Link version 2.0

Number of stations	up to 4 occupied stations
Maximum number of input data	368 bytes
Maximum number of output data	368 bytes
Input data	112 bytes (RY) and 256 bytes (RWw)
Output data	112 bytes (RX) and 256 bytes (RWr)
Extension cycles	1, 2, 4, 8
Transmission speed	156 kBit/s, 625 kBit/s, 2500 kBit/s, 5 MBit/s, 10 MBit/s

CC-Link version 1.11

Number of stations	up to 4 occupied stations
Maximum number of input data	48 bytes
Maximum number of output data	48 bytes
Input data	4 bytes (RY) and 8 bytes (RWw) per occupied station
Output data	4 bytes (RX) and 8 bytes (RWr) per occupied station
Transmission speed	156 kBit/s, 625 kBit/s, 2500 kBit/s, 5 MBit/s, 10 MBit/s

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

7 INSTALLATION

7.1 Safety instructions

WARNING!

Risk of injury from improper installation.

- Installation may be carried out by authorized technicians only and with the appropriate tools.
- Secure system against unintentional activation.
- Following installation, ensure a controlled restart.

7.2 Mounting on top hat rail

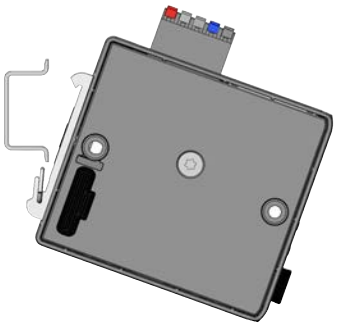
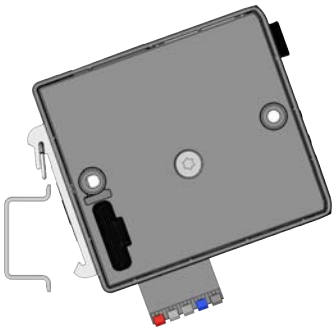
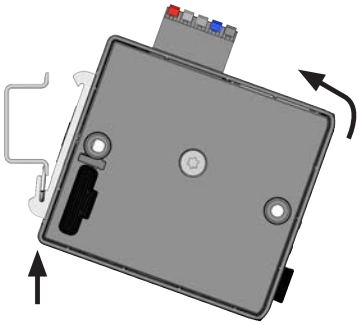
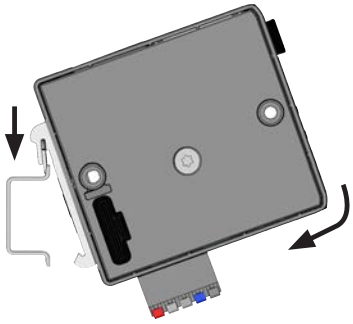
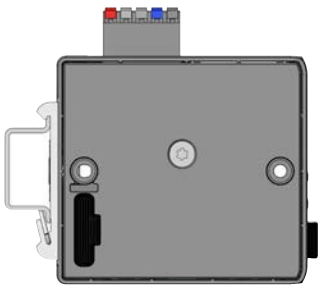
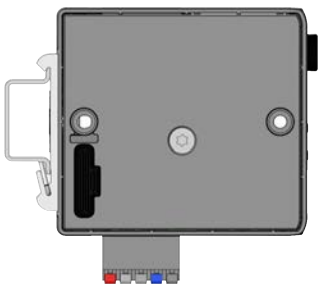
Electrical connection upwards	Electrical connection downwards
1.  → Tip device to the right and align with top hat rail.	1.  → Tip device to the left and align with top hat rail.
2.  → Mount device in the lower guide of the top hat rail.	2.  → Mount device in the upper guide of the top hat rail.
3.  → Push device upwards while also swiveling it to the left; lock it into the upper guide of the top hat rail.	3.  → Push device downwards while also swiveling it to the left; lock it into the lower guide of the top hat rail.

Figure 2: Mount device on top hat rail

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

7.3 Electrical connection

→ Connect 5-pin spring-type terminal in accordance with configuration.

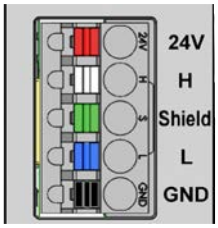
Configuration of 5-pin spring-type terminal		
Connector view	Color of terminal	Description
	Red	Supply voltage 24 V ⎓
	White	CAN H (büS connection)
	Green	Shielding
	Blue	CAN L (büS connection)
	Black	GND

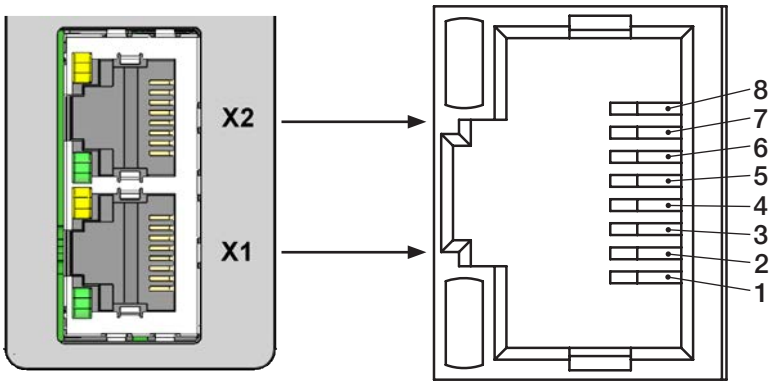
Table 2: Configuration of 5-pin spring-type terminal

7.4 Establishing connection to fieldbus

7.4.1 Industrial Ethernet

→ Insert the Ethernet cable into the sockets of the X1 and X2 interfaces.
The X1 and X2 interfaces for RJ45 plug-in connectors are equivalent.

Configuration of X1 and X2 interface



Pin	Plug configuration RJ45
1	TX+
2	TX–
3	RX+
4	Not used
5	Not used
6	RX–
7	Not used
8	Not used

Figure 3: Configuration of X1 and X2 interfaces; connection to fieldbus

NOTE!

To ensure electromagnetic compatibility (EMC)

- Only use shielded Ethernet cables.
- Connect the Ethernet cables of all devices to the top hat rail to ground the cable shielding.

→ Apply supply voltage.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

7.4.2 PROFIBUS version

Configuration of plug-in connector D-Sub, 9-pin

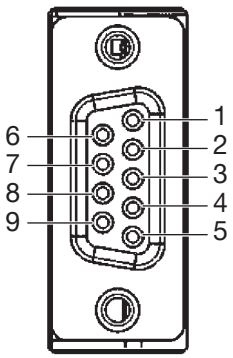
D-Sub, 9-pin	Pin	Signal	Function	Connection
	1	not used		
	2	not used		
	3	RxD/TxD-P	Data line minus (A conductor)	Mandatory
	4	CNTR-P	Repeater directional control	Optional
	5	DGND	Ground for data signals and VP	Mandatory
	6	VP	+5 V supply for bus terminating resistor	Optional
	7	not used		
	8	RxD/TxD-N	Data line plus (B conductor)	Mandatory
	9	not unsed		

Figure 4: PROFIBUS, Configuration of plug-in connector D-Sub, 9-pin

7.4.3 CC-Link version

Configuration of plug-in connector D-Sub, 9-pin

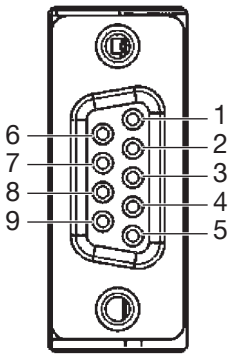
D-Sub, 9-pin	Pin	Signal	Function	Connection
	1	not used		
	2	not used		
	3	DA	Data line minus (A conductor)	Mandatory
	4	DG	Data ground	Mandatory
	5	not used		
	6	not used		
	7	not used		
	8	DB	Data line plus (B conductor)	Mandatory
	9	not used		

Figure 5: CC-Link, Configuration of plug-in connector D-Sub, 9-pin

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

8 START-UP

8.1 Safety instructions

WARNING!

Risk of injury from improper operation!

- Before start-up, it must be ensured that the operating personnel are aware of and fully understand the contents of the operating instructions.
- Note the safety instructions and intended use.
- Only trained and qualified personnel may start up the device or system.

8.2 Base settings

The following base settings can be made on the display of the device:

- Set IP address
  Fieldbus versions: set PROFIBUS address or CC-Link address
- Select protocol (not with PROFIBUS version and CC-Link address)

The “Bürkert Communicator” PC software and the büS stick, which is available as an accessory, are required for configuration, see chapter “14 Accessories”.

The “Bürkert Communicator” software and a general description of it are available on the Bürkert homepage.

8.2.1 Configuration and parameterization of the Type ME43

For configuration and parameterization see the chapter entitled “10 Setting up the büS network”.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

8.3 Web server

The configuration of the Ethernet device required for integration in the network can be implemented with a web server.

8.3.1 Connection to the web server

→ Setting IP address in the network card of the PC.

IP address: **192.168.0.xxx**

For xxx enter any numerical value except 100
(Ethernet device is delivered with 100 occupied by IP address).

→ Connect the PC to the Ethernet device with a network cable.

8.3.2 Access to the web server

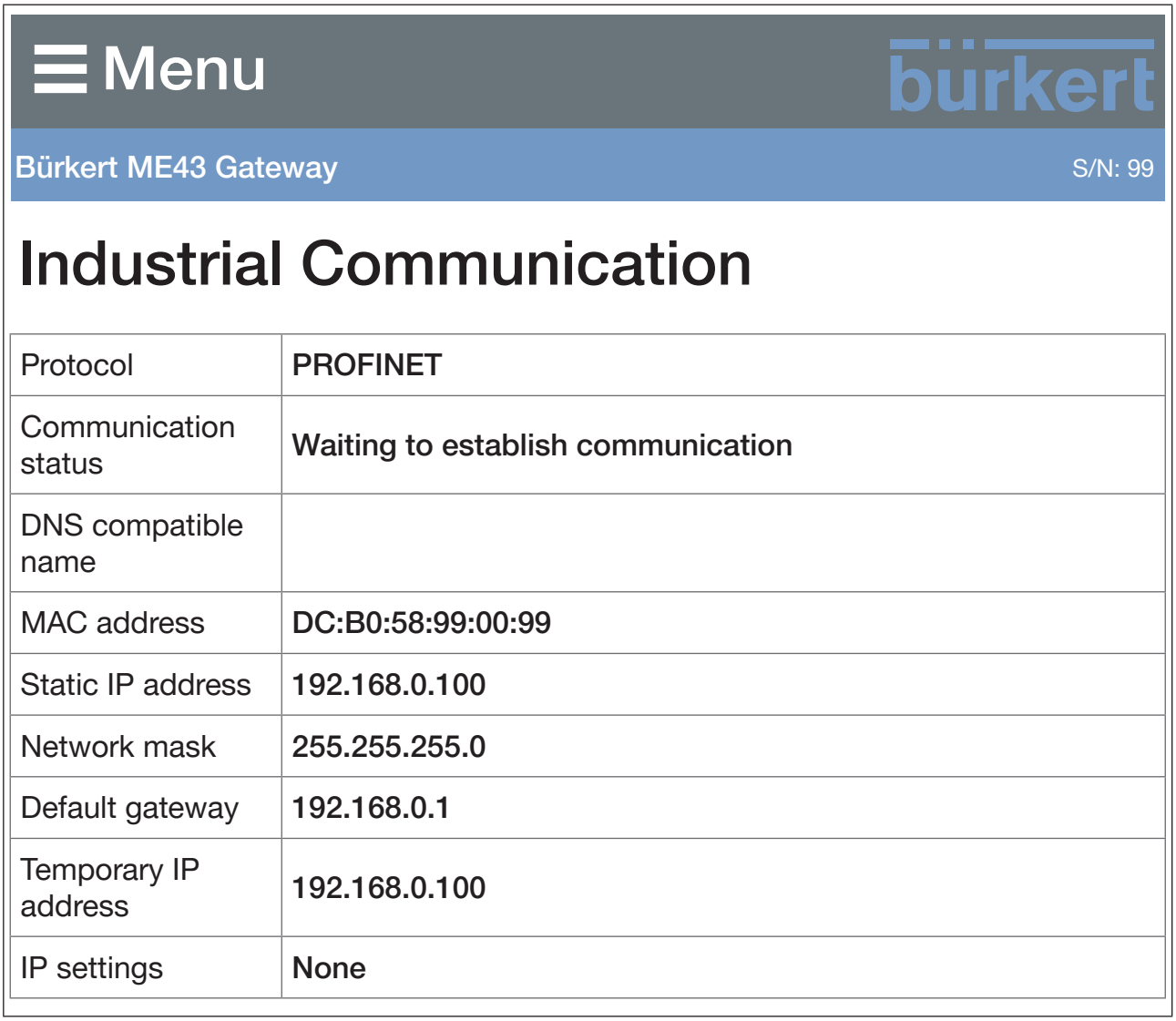


Figure 6: Access to the web server via the Default IP

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

With EtherNet/IP, it is also possible to set DHCP or BOOTP (NOT standard).
The IP address is acquired from a DHCP server.

→ Open an Internet browser.

→ Input Default IP **192.168.0.100**.
(For Ethernet/IP devices the IP address is assigned via a DHCP server. If no assignment occurs within 1 minute via DHCP, the device uses the Default IP 192.168.0.100.)

The software for configuration of the Ethernet device is now available on the PC.

Configuration of several devices:

All devices are delivered with the same IP address (192.168.0.100). To ensure that the device can be identified for the configuration, the network may contain only 1 device which has not yet been configured.

▸ Connect the devices (Ethernet device) in succession, individually to the network and configure.

8.3.3 Configuring Ethernet device

Logging into the system:

→ Input user name and password. User name: **admin**
Password: **admin**

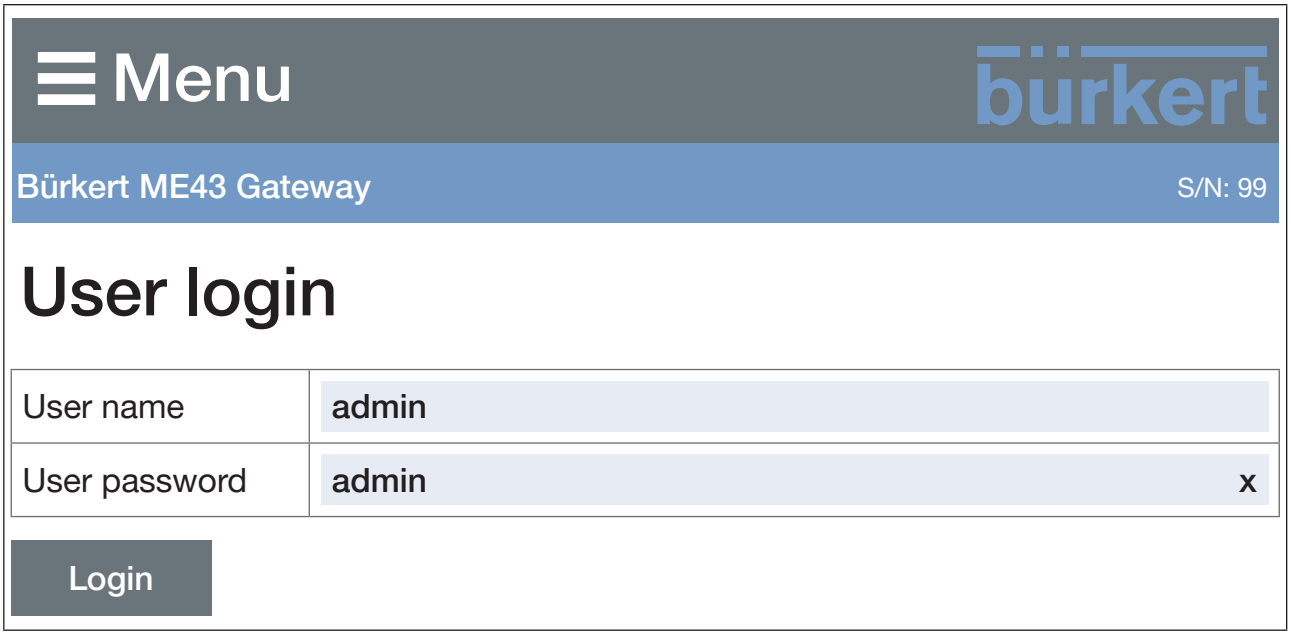


Figure 7: Logging into the system

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

Configuration:

→ Input device name and IP address for the Ethernet device.
The device name (DNS-compatible name) will be used later for project planning (e.g. in STEP 7).

→ Activate with **Commit changes**.

To accept the changed PROFINET parameters, the voltage must be reset in the Ethernet device.

→ Restart device with **Restart device**.

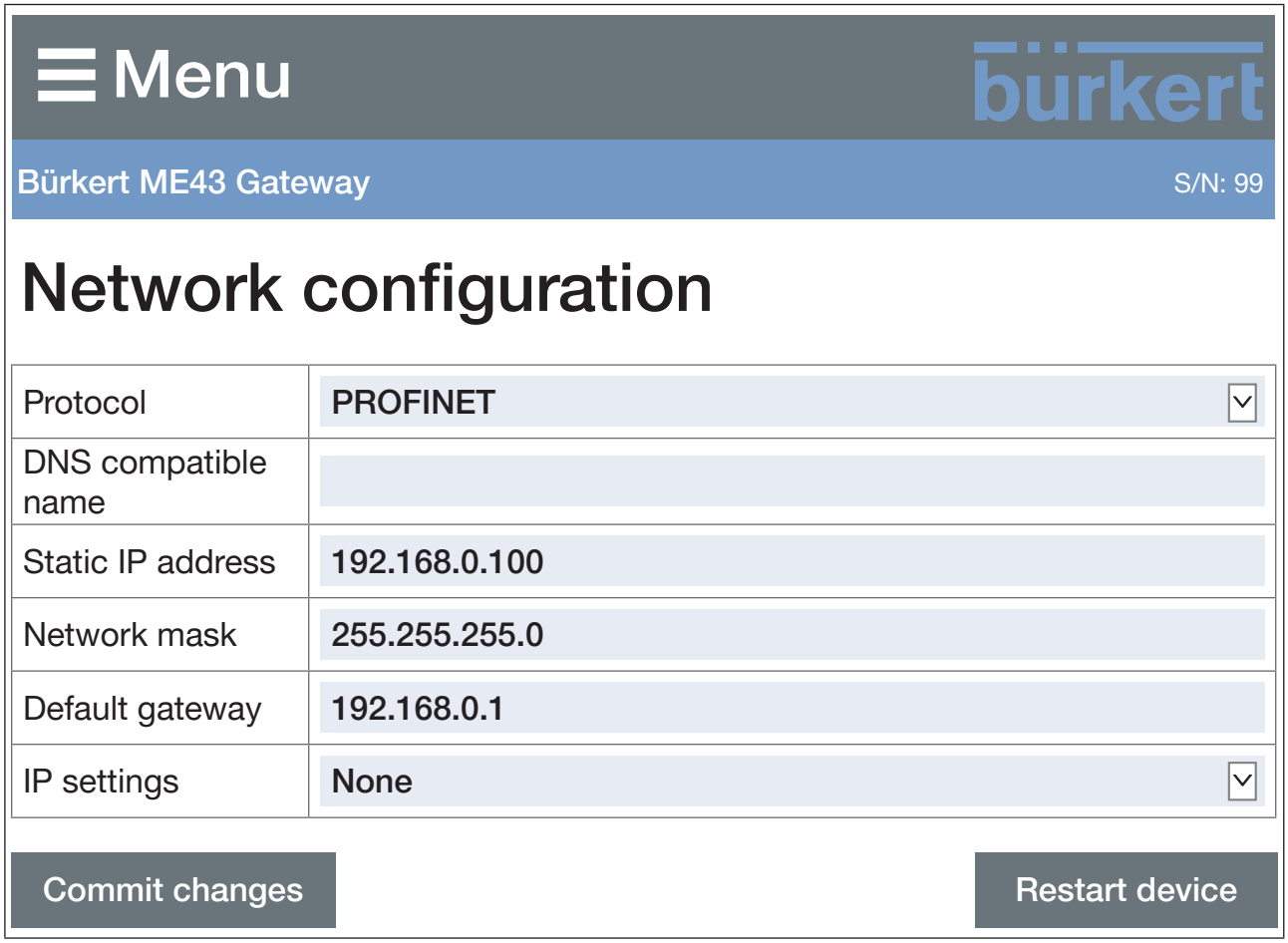


Figure 8: Configuring Ethernet device

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

8.4 Setting the PROFIBUS address

PROFIBUS address pre-configured at the factory: 126

The PROFIBUS address can be set on the display of the device or by using the Bürkert Communicator software on the PC.

To set the PROFIBUS address, you must switch to the “Parameters” detailed view.

Changing from View 1 to the detailed view:

When using Bürkert Communicator for configuration, select in the navigation area Industrial communication.

When using the display for configuration, press the menu key twice.

✓ You are in the detailed view Parameter.

It is only possible to set the PROFIBUS address if PROFIBUS DPV1 is set in the protocol. Devices with a PROFIBUS interface have the protocol pre-configured during production.

The protocol is set in the “Parameters” detailed view:
Protocol → Select protocol... → PROFIBUS DPV1

Setting the PROFIBUS address:

→ Select PROFIBUS-address.

→ Enter the address. Valid addresses: 0 to 126
If an address is set outside of the valid range, the device will display an error message.

✓ You have set the PROFIBUS address.

8.5 Setting the CC-Link address

CC-Link address pre-configured at the factory: 64

The CC-Link address can be set on the display of the device or by using the Bürkert Communicator software on the PC.

To set the CC-Link address, you must switch to the “Parameters” detailed view.

Changing from View 1 to the detailed view:

When using Bürkert Communicator for configuration, select in the navigation area Industrial communication.

When using the display for configuration, press the menu key twice.

✓ You are in the detailed view Parameter.

It is only possible to set the CC-Link address if CC-Link is set in the protocol. Devices with a CC-Link interface have the protocol pre-configured during production.

The protocol is set in the “Parameters” detailed view:
Protocol → Select protocol... → CC-Link

Setting the CC-Link address:

→ Select CC-Link-address.

→ Enter the address. Valid addresses: 0 to 64
If an address is set outside of the valid range, the device will display an error message.

✓ You have set the CC-Link address.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

9 OPERATION

9.1 Safety instructions for operation

WARNING!

Danger due to improper operation.

- The operating personnel must be aware of and have understood the contents of the operating instructions.
- Note the safety instructions and intended use.
- Only adequately trained personnel may operate the system or device.

9.2 Operating elements of Type ME43

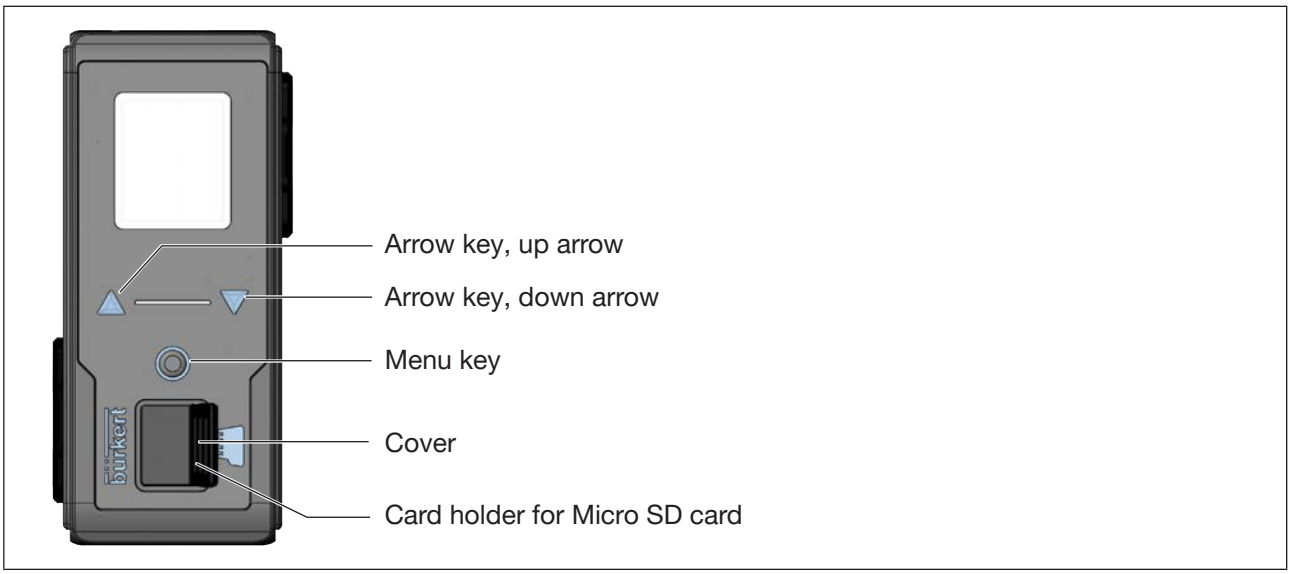


Figure 9: Overview of the operating elements

9.3 Operation of Type ME 43 using the display

Operation using the display is achieved by means of the two arrow keys and the round menu key.

Opening the main menu:

→ Press the menu key twice.
First the start screen appears, then the main menus with the detailed views Parameter, Diagnostics and Maintenance.

Returning from a menu:

→ Using the arrow keys, select Exit or Abort or Save and confirm using the menu key.

Effect of the selection:

Exit Returns to the next menu level up.

Abort Rejects any unsaved settings and returns to the next menu level up.

Save Saves any changed settings and returns to the next menu level up.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

9.3.1 Description of the keys

Element	Description
▽ Down arrow key	Page down through menu
	Decrease numerical values. Hold down arrow key to run through quickly.
△ Up arrow key	Page up through menu
	Increase numerical values. Hold down arrow key to run through quickly.
◉ Menu key	Open main menu
	Confirm selection
	Confirm input

Table 3: Description of the keys

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

9.4 Operation of Type ME 43 using the “Bürkert Communicator” software

The device can be configured on the PC using the “Bürkert Communicator” software.

The PC software “Bürkert Communicator” can be downloaded free of charge from the Bürkert website.
In addition to the software, the USB büS interface set, available as an accessory, is required.

This chapter only describes the fundamental handling of Bürkert Communicator. A detailed description of the operation and configuration of the PC software “Bürkert Communicator” can be found on the website www.burkert.com → Type 8920.

9.4.1 Bürkert Communicator user interface

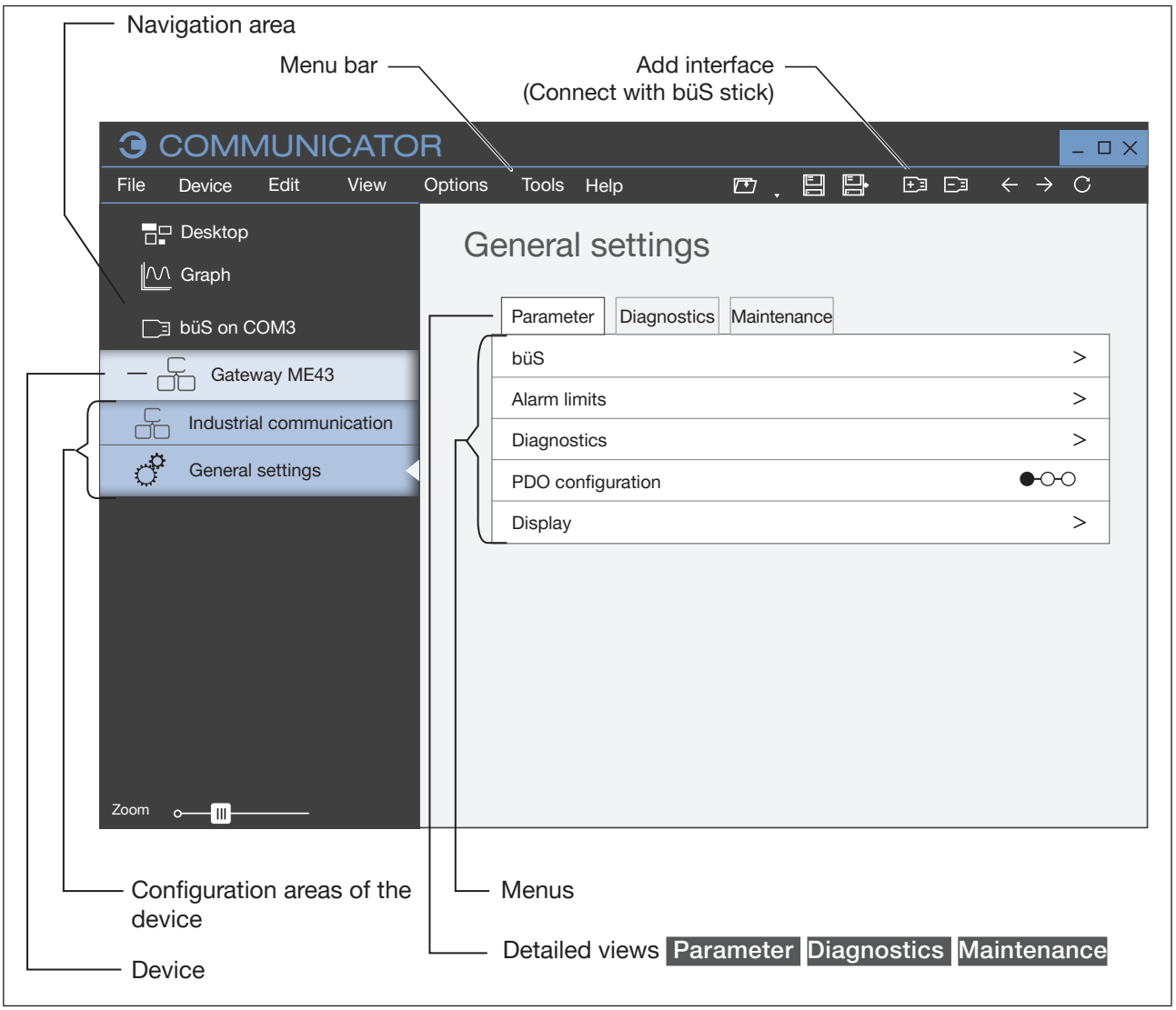


Figure 10: Bürkert Communicator user interface

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

9.4.2 Establishing a connection between the device and Bürkert Communicator

→ Install the Bürkert Communicator software on the PC.

→ Use the büS stick to establish the connection between the device and the PC.

→ Open Bürkert Communicator.

→ In the menu bar, click on the icon for Add interface.

→ Select büS stick or büS over network.

✓ You have established the connection between the device or the network and Bürkert Communicator. The device or devices in the network are displayed in the navigation area.

9.5 Importing and saving data using the Micro SD card

The Micro SD card can be used to save and transfer device-specific values and user settings to a different device.

The Micro SD card is not suitable for backups. If the Micro SD card of the device is re-inserted at a later date, the most recently saved data is not restored. The function of the Micro SD card is limited to exchanging data.

A Micro SD card which has just been inserted is checked for existing data during device restart. If applicable, this data is accepted or overwritten:

- The Micro SD card does not contain any data.
  The existing device-specific values and user settings are saved on the Micro SD card.
- The Micro SD card contains data which is compatible with the device.
  The Micro SD card data is imported by the device. The existing device-specific values and user settings are overwritten.
- The Micro SD card contains data which is not compatible with the device.
  The device overwrites the data on the Micro SD card with its own device-specific values and user settings.

NOTE!

Do not use conventional retail Micro SD cards for the device.
The inserted Micro SD card is a special industrial-grade version which is particularly durable and temperature-resistant.
Purchase the Micro SD card for the fieldbus gateway ME43 via your Bürkert sales branch only.

The Micro SD card is available as an accessory, see “14 Accessories”.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

Replacing the Micro SD card

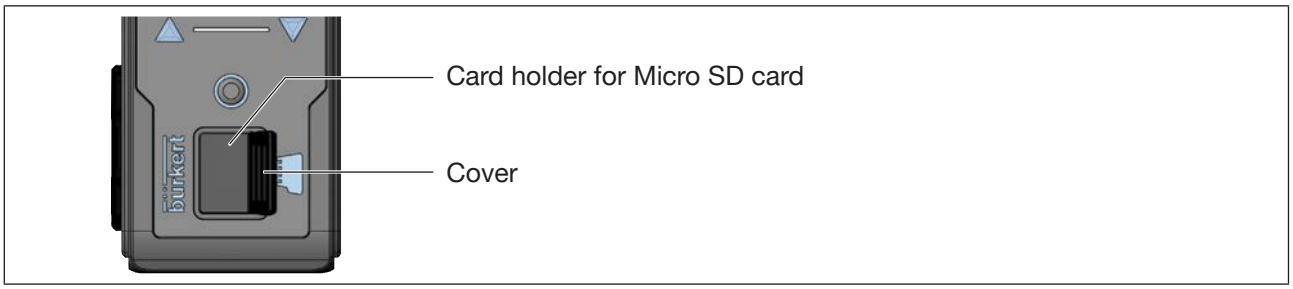


Figure 11: Replacing the Micro SD card; fieldbus gateway ME43

Removing the Micro SD card:

→ 1. Carefully pull the cover out of the recess.

→ 2. Rotate the cover upwards to the left.

→ 3. Press on the edge of the engaged Micro SD card to unlock it.

→ 4. Remove the Micro SD card.

Inserting the Micro SD card in replacement device:

⚠ Insert the memory card the right way around.

→ Insert the Micro SD card into the card holder.
Ensure that the Micro SD card clicks into place.

→ Close the card holder using the cover.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

9.6 Display elements of the Type ME43

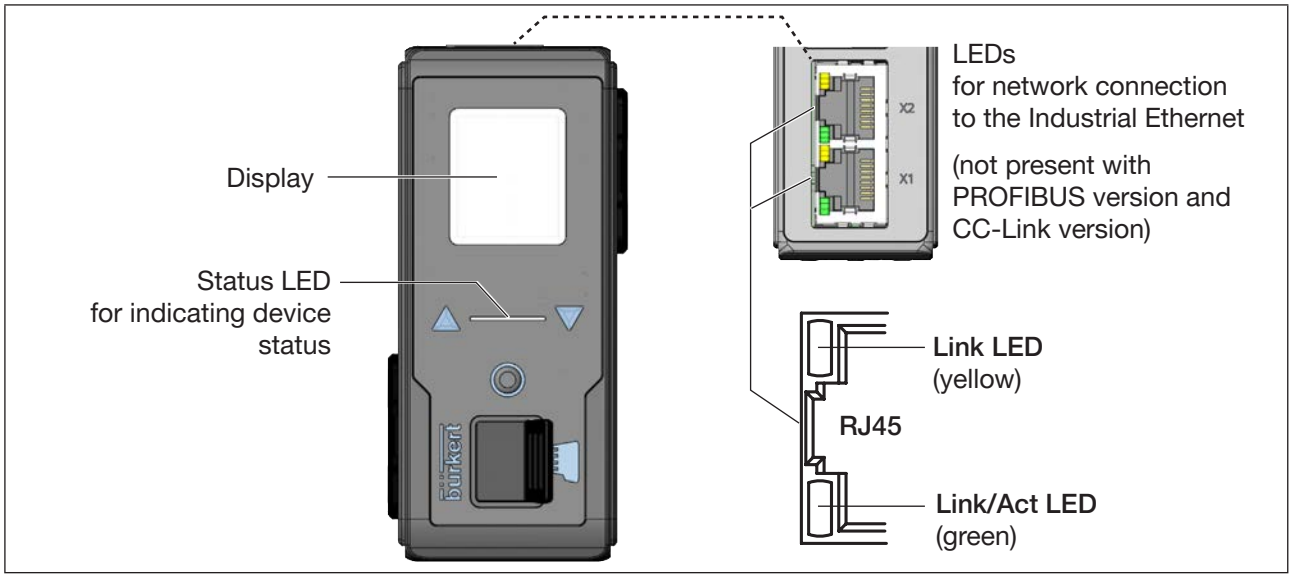


Figure 12: Overview of the display elements

9.7 LEDs for indicating the network connection to the Industrial Ethernet

The PROFIBUS version and CC-Link version has no status indicator for the network connection.

The network connection is established via a D-Sub, 9-pin plug-in connector.

Description:

LED status		Description and cause of error	Procedure
Link LED (yellow)	Active	Connection to the network established.	-
	Not active	No connection to the network available.	Check cables.
Link/Act LED (green)	Active	Rapid flashing: Connection to the higher-level protocol layer (PROFINET, EtherNet/IP or Modbus TCP) has been established. Data being transmitted. Slow flashing, around 20 seconds after restart. No connection established to protocol layer.	
	Not active	No connection to the network available.	Check cables.

Table 4: Description: LEDs for network connection

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

9.8 LED for indicating device status

The LED that indicates the device status changes color and status in accordance with NAMUR NE 107.

If several device statuses exist simultaneously, the device status with the highest priority is displayed. The priority is determined by the severity of the deviation from standard operation (red = failure = highest priority).

Displays in NAMUR mode:

Display in accordance with NE 107		Description	Meaning
Color code	Color		
5	red	Failure, error or malfunction	Malfunction. The functionality of the device is not guaranteed.
4	orange	Function check	The device is searching for a büS device, this status is terminated after a few seconds.
3	yellow	Out of specification	Ambient conditions or process conditions for the device are outside the specified area. Internal device diagnostics point to problems in the device or the process properties. Data sheet values cannot be complied with.
2	blue	Maintenance required	Based on a running diagnostic, the device has detected and corrected a deviation. Device functionality restricted. The device is in controlled operation, although a function is briefly restricted. → Service device.
1	green	Diagnostics active	Device is operating perfectly. Status changes are indicated in different colors. Messages are transmitted via a possibly connected fieldbus.
0	white	Diagnostics inactive	Device is switched on. Statuses are not displayed. Messages are not listed in the message list or transmitted via any connected fieldbus. Device is running within its specifications.

Table 5: Display of device status in NAMUR mode

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

10 SETTING UP THE büS NETWORK

10.1 Conversion Industrial Ethernet to büS

The function of the fieldbus gateway is to convert the process values between an Industrial-Ethernet PLC and büS devices. For this, the fieldbus gateway ME43 must be configured and parameterized.

10.2 Theoretical principles for the selection of büS devices and process values

Select the büS devices that are to communicate with the PLC via the fieldbus gateway ME43:

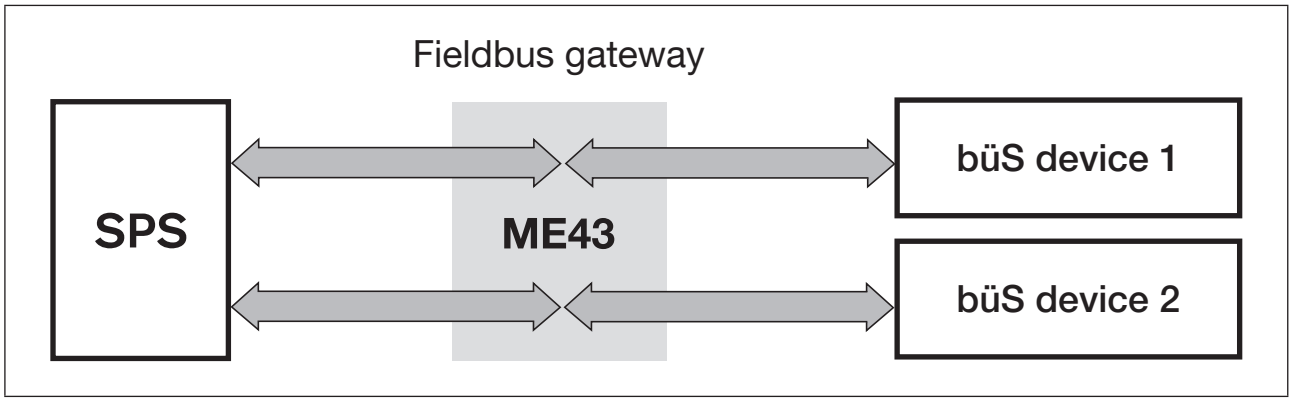


Figure 13: Configuration; selection of the büS devices that are to communicate with the PLC

Select which process values are to be converted from “Industrial Ethernet” to “büS”:

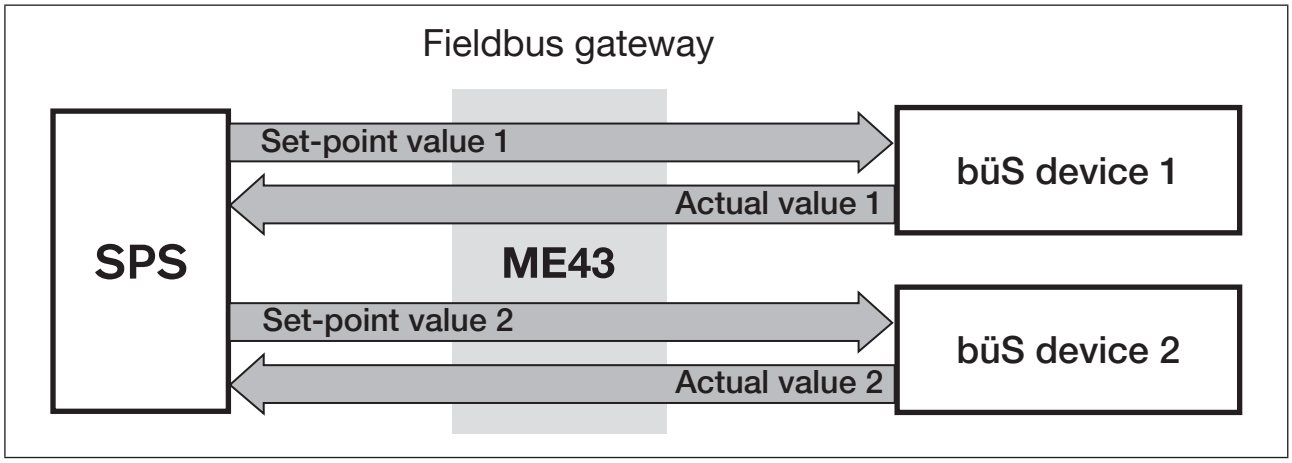


Figure 14: Configuration; selection of the process values that are to be converted from “Industrial Ethernet” to “büS”

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

Define the direction for transmission of the process values (from/to PLC, from/to büS device):

The direction is assigned from the perspective of the fieldbus gateway ME43 in the fieldbus büS.

Example:
- The set-point values of a büS device are the output values of the fieldbus gateway ME43.
- The actual values of a büS device are the input values of the fieldbus gateway ME43.

Process output values of the PLC are received by the fieldbus gateway ME43 as process input values via Industrial Ethernet. These process input values are converted and provided as process output values via büS.

Conversely, process output values of the büS device are received as büS input values. These process input values are converted and output as process output values via Industrial Ethernet.

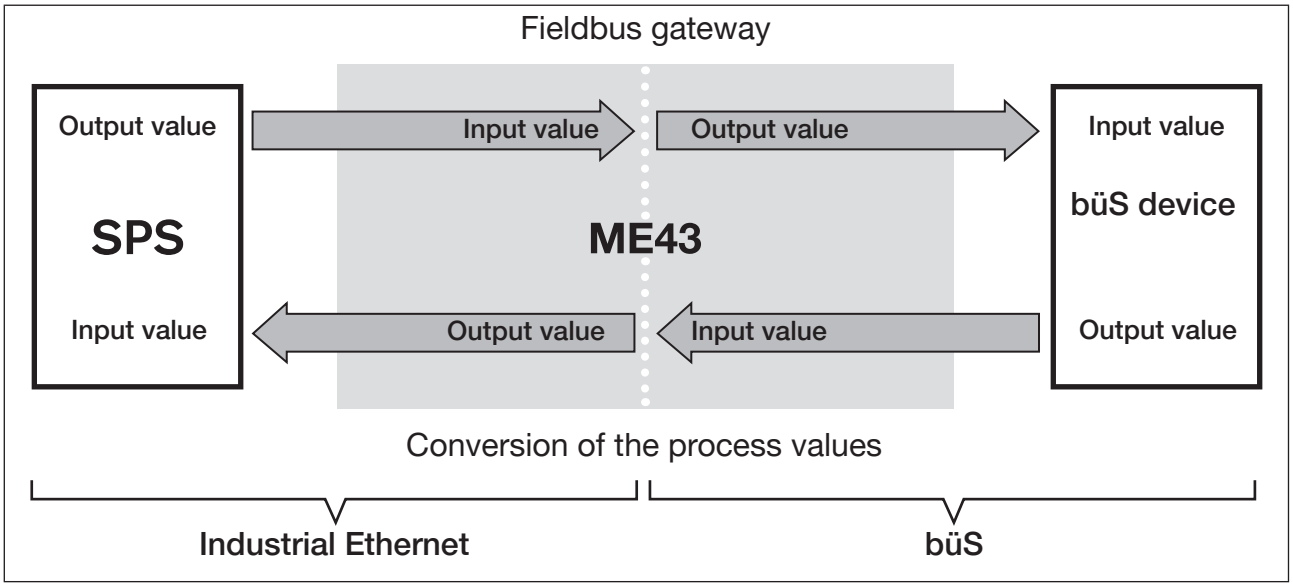


Figure 15: Configuration; principle of direction allocation for process values

Based on the type of conversion, büS devices can be addressed directly using their process values and the direction of conversion.

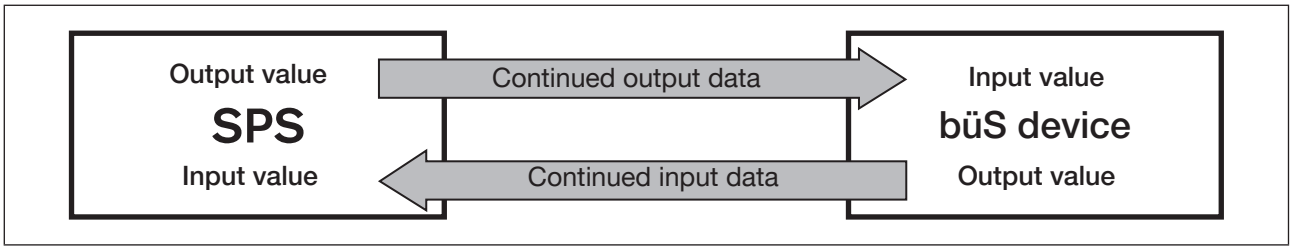


Figure 16: Configuration; type of conversion for process values from the PLC to the büS device

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

10.3 Configuration of the fieldbus gateway ME43

The “Bürkert Communicator” PC software and the büS stick, which is available as an accessory, are required for configuration, see chapter “14 Accessories”.

The “Bürkert Communicator” software and a general description of it are available on the Bürkert homepage.

The following steps must be performed to configure the fieldbus gateway ME43:

1. **Prepare the configuration.**
2. **Configure the fieldbus gateway ME43.**
   Select the büS devices and process values that are to communicate with the PLC via the fieldbus gateway ME43.
   Fieldbus-specific address mapping of the objects.
3. **büS network configuration.**

10.3.1 Preparing the configuration

→ **Establish the connection with the Bürkert Communicator PC software.**
See chapter “9.4.2 Establishing a connection between the device and Bürkert Communicator”

Procedure in Bürkert Communicator:

→ Select Gateway ME43 in the navigation area.
To open the configuration areas, click on +.

→ Select Industrial communication.

→ Select Protocol

→ Select Select protocol.

→ Select fieldbus protocol.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

10.3.2 Configuration of fieldbus gateway ME43

→ Select **Create a gateway configuration**.

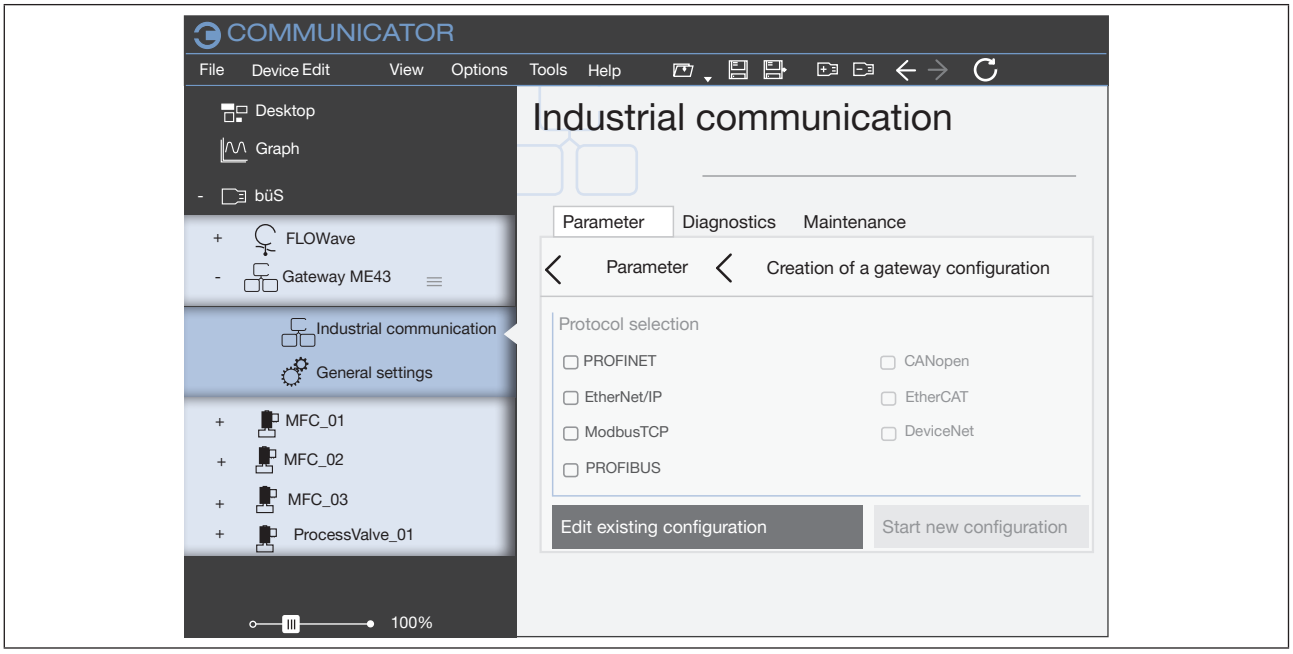


Figure 17: Select configuration, protocol

→ Select target protocol in the window **Protocol Selection**. It is possible to select several protocols.

When selecting several, the configuration files will be created for the selected protocols based on the following IO-value configuration.

→ Select **Edit existing configuration** or **Start new configuration**.

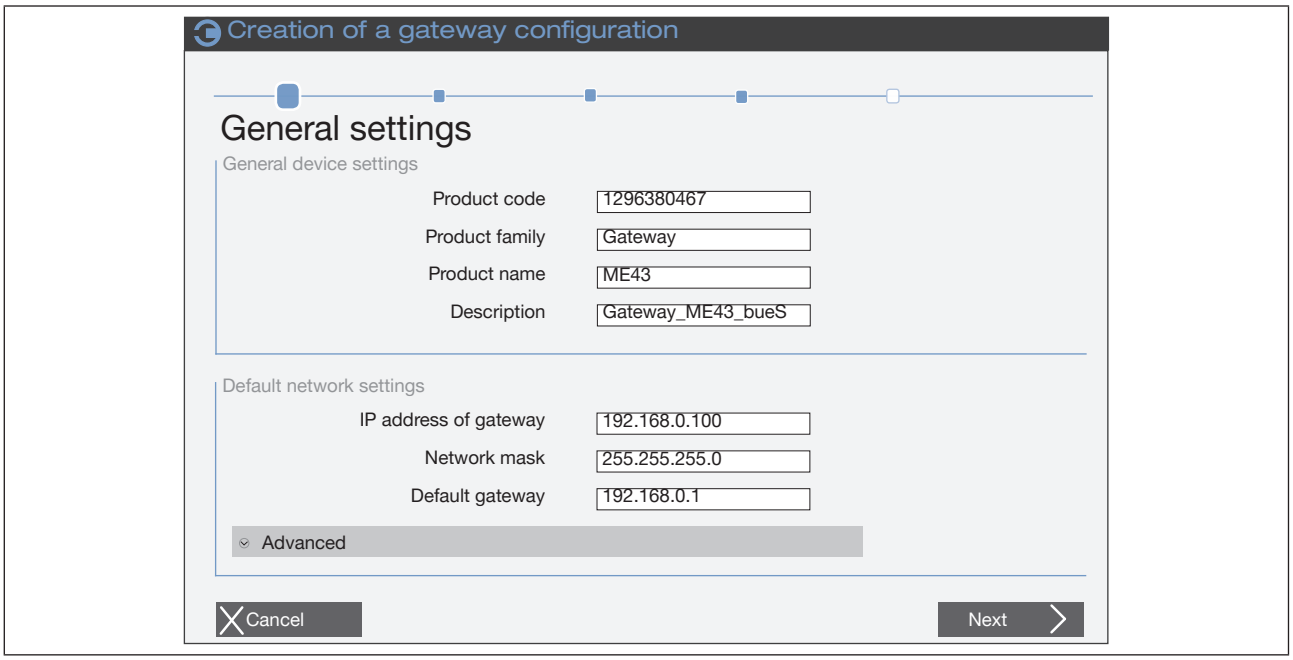


Figure 18: Configuration, general settings

→ Modify general settings for device description file of target system (PLC) (if necessary).

→ Select **Next**.

→ To display the process values, click on the **+** before **Input values** and **Output values**.

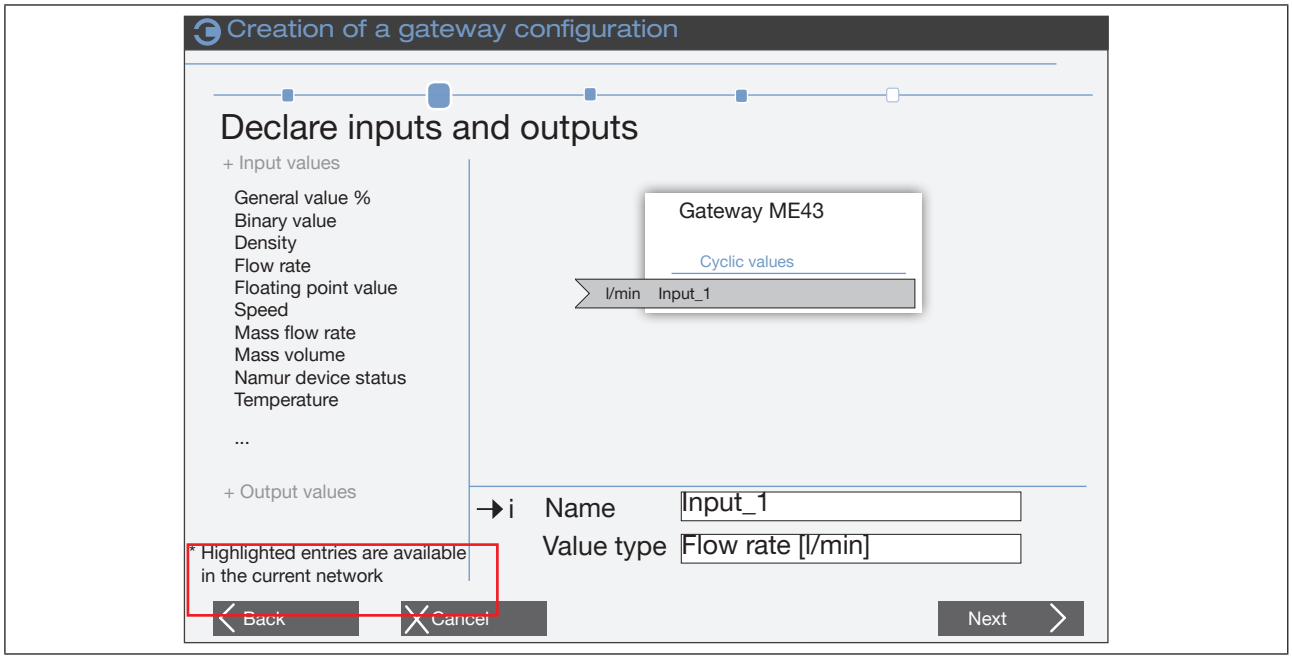


Figure 19: Declaring inputs and outputs

The process values available in the büS network are highlighted.

→ Drag-and-drop or double click to add process values to the fieldbus gateway.
Adding multiple values from the same unit at the same time:
→ Click on the unit with the right mouse button and then on the window **Add multiple**.

→ Change the name. These names appear above the device description file in the target controller.

→ Add all of the required values.
Contextualized definition of values
Input values: Values received from the büS device and read by the PLC (büS device → fieldbus gateway → PLC)
Output values: Values written by the PLC to the büS devices/fieldbus gateway.

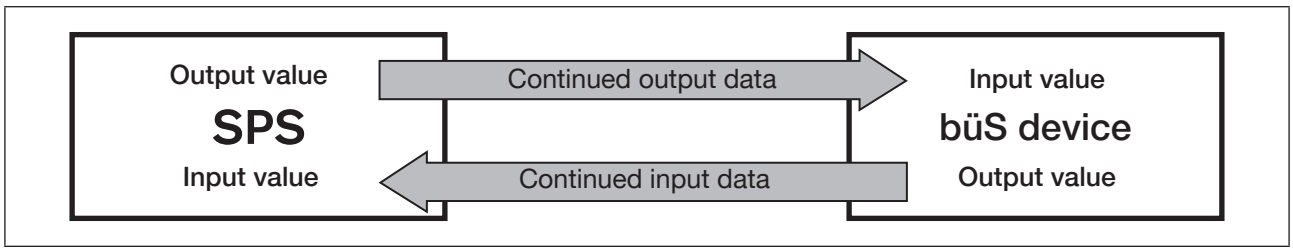


Figure 20: Configuration; type of conversion for process values from the PLC to the büS device

✔ You have selected the büS devices and process values.

→ Using **Next** you can open the menu for the fieldbus-specific address mapping.

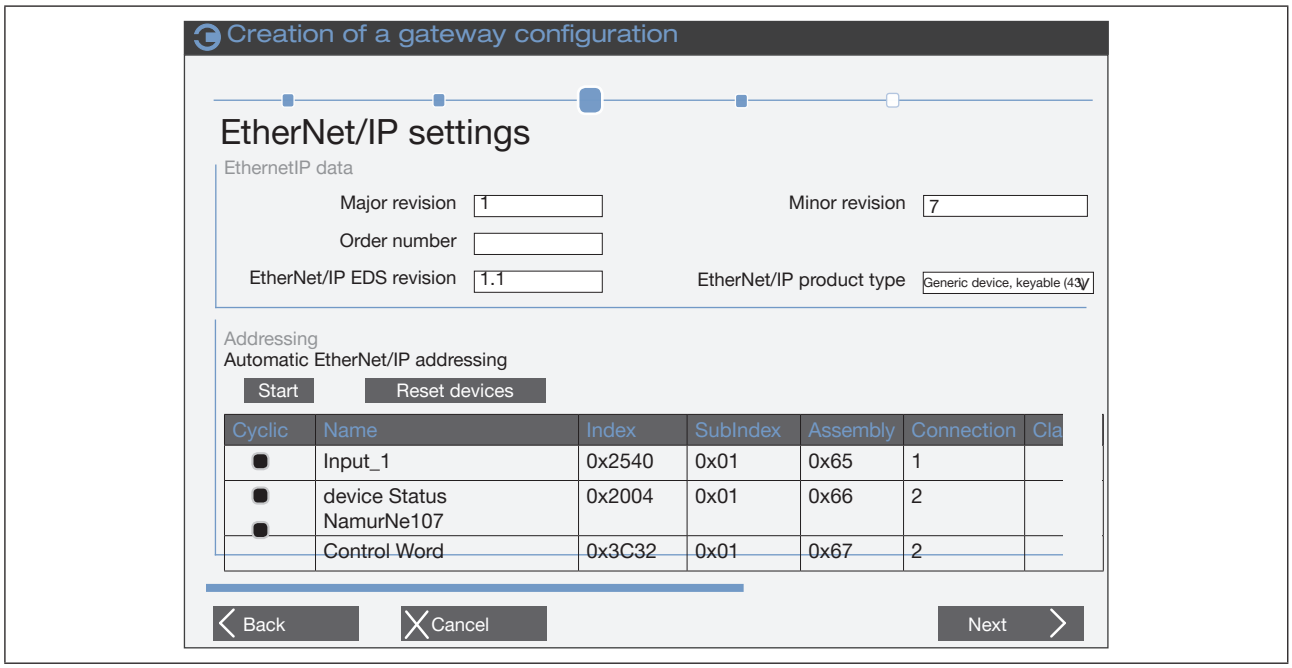


Figure 21: Configuration, fieldbus-specific address mapping

→ Check editable fields and complete if necessary.

→ **Start** means that object addressing is performed automatically, can be modified manually.

→ Select **Next**.

If multiple protocols are selected (see “Figure 17: Select configuration, protocol”) the corresponding protocol-specific configuration pages then appear.

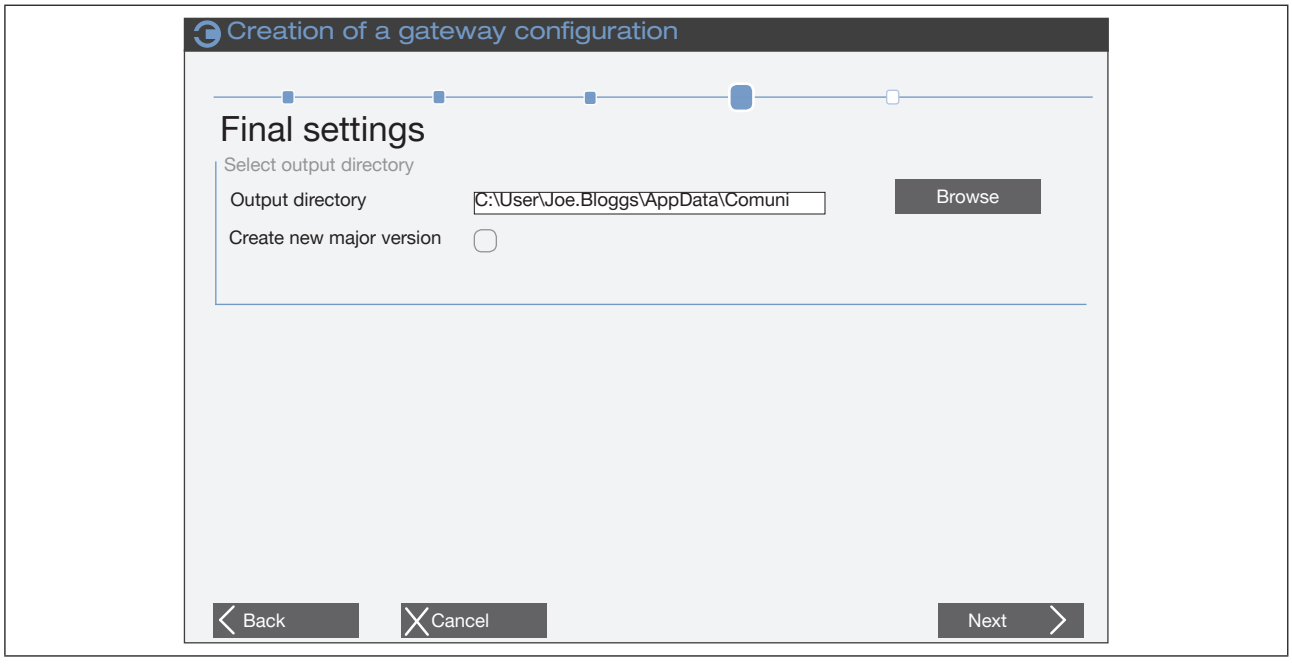


Figure 22: Selection of output list

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

→ Saving of the configuration and download to the device.
This download is performed in the background.
The existing device description file is also provided in the sub-folder “PCL” under the specified path.

→ Select **Finish**.

→ Select **OK**, the window is closed and an automatic device restart is performed.

✔ The configuration of the device is completed. The connection between the PLC and fieldbus gateway is established.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

10.4 Configuration of the büS network

→ **Establish the connection with the Bürkert Communicator PC software.**
See chapter "9.4.2 Establishing a connection between the device and Bürkert Communicator"

Procedure in Bürkert Communicator:

→ Select - büS in the navigation area.

→ Select detailed view **büS-Map**.

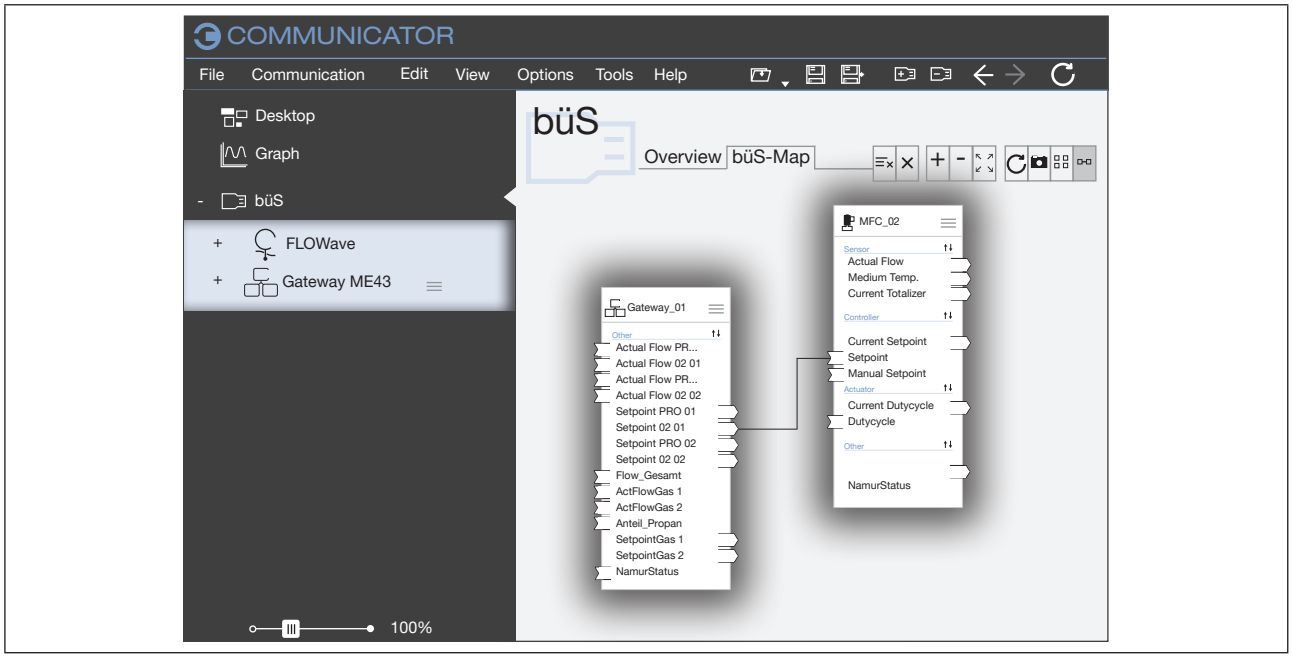


Figure 23: büS-Map

→ Using drag and drop, parameterize the inputs and outputs.
(Dashed line connections represent as yet inactive connections between devices.
Compatible connection points are highlighted in blue.)

→ Select **Apply changes**.

All configured devices are restarted.

✓ You have configured the büS network.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

10.5 Download gateway configuration file for device configuration

If, for instance, a configuration file exists from a previous project, the device can be directly configured with it.

→ **Establish the connection with the Bürkert Communicator PC software.**
See chapter "9.4.2 Establishing a connection between the device and Bürkert Communicator"

Procedure in Bürkert Communicator:

→ Select Gateway ME43 in the navigation area.
To open the configuration areas, click on +.

→ Select Industrial communication.

→ Select Downloading a gateway configuration file.

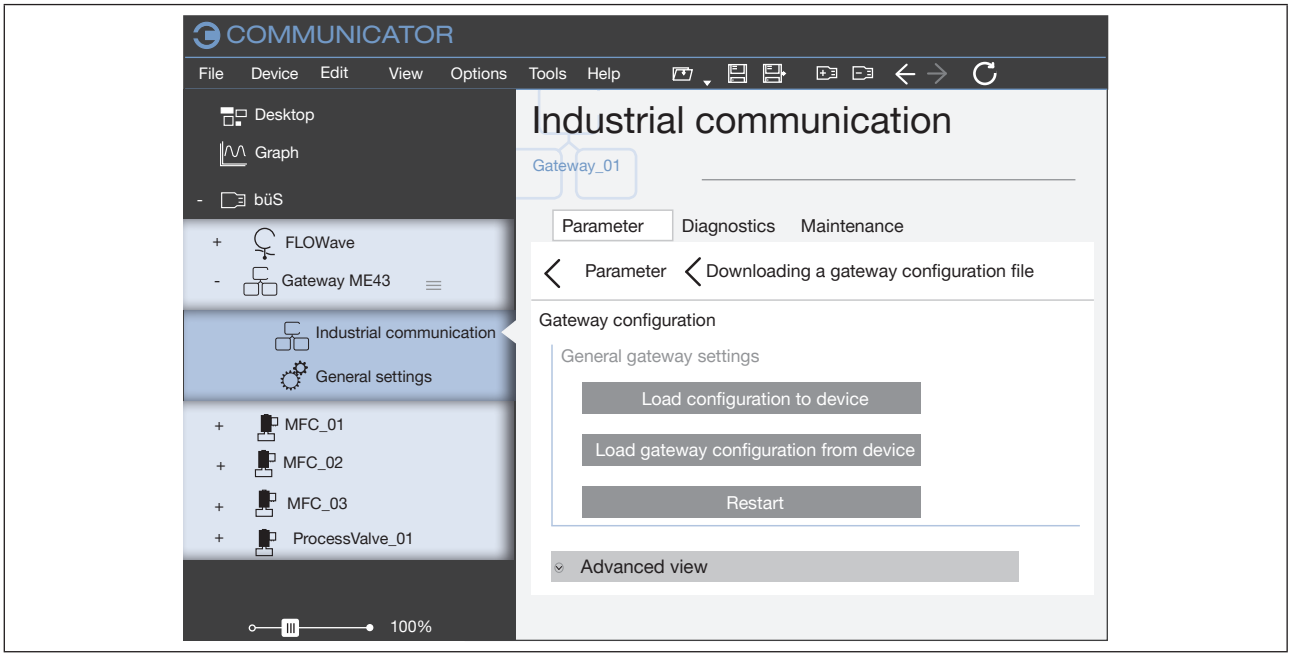


Figure 24: Downloading a gateway configuration file

→ Select Load configuration to the device.

→ Specify the name and location of the file.

→ Use Restart to perform a device restart.

✓ You have configured the device with the gateway configuration file.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

11 OTHER SETTING OPTIONS

11.1 Settings on the display of the fieldbus gateway ME43

Settings adjusted on the display can also be adjusted using the PC software “Bürkert Communicator”.

Overview:

Detailed view on display	Setting		Bürkert Communicator	
			Configuration area	Detailed view → Menu
Parameter	Set IP address. Field bus versions: set PROFIBUS address or CC-Link address. For a description see chapter “Start-Up”.		Industrial communication	Maintenance
	Select protocol. For a description see chapter “Setting up the büS network”.			
Parameter	Setting display	brightness	General settings	Parameter → Display
		contrast		
		installation position		
Maintenance	Restart device		General settings	Maintenance → Reset device
	Ident. number		General settings	Maintenance → Device information
	Serial number			
	Software version			
	Hardware version			
	büS version			
	ICom version		Industrial communication	Maintenance → Version numbers

Table 6: Setting options on the display of the fieldbus gateway ME43

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

11.2 Settings using the PC software “Bürkert Communicator”

The device can be configured on the PC using the “Bürkert Communicator” software.

The PC software “Bürkert Communicator” can be downloaded free of charge from the Bürkert website.
In addition to the software, the USB büS interface set, available as an accessory, is required.

11.2.1 Overview of device-specific setting options that can be adjusted using Bürkert Communicator

The list of setting options shown below only includes the device-specific options for the fieldbus gateway ME43 and does not include the description of the PC software Bürkert Communicator.

A detailed description of the operation and configuration of the PC software “Bürkert Communicator” can be found on the website www.burkert.com → Type 8920.

Bürkert Communicator configuration area	Detailed view	Setting	
Industrial communication	Maintenance	Version numbers	Stack Name
			Stack Version
			Stack Build
			Stack Revision
			Stack Date
			ICom Version

Table 7: Setting options in Bürkert Communicator, Industrial Communication configuration area – maintenance detailed view

Bürkert Communicator configuration area	Detailed view	Setting	
Industrial communication	Diagnostics	Protocol	Only display, no setting
		Connections to PLC	Setting the PLC connection
		Communications status	Only display, no setting
		Advanced Last status code	

Table 8: Setting options in Bürkert Communicator, Industrial Communication configuration area – diagnostics detailed view

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

Bürkert Communicator configuration area	Detailed view	Setting	
Industrielle Kommunikation	Parameter	Select Protocol For a description see chapter “Setting up the büS network”.	
		Set PROFIBUS address[1)]	
		Set CC-Link address[2)]	
		Set DNS compatible name[3)]	
		MAC address is displayed [4)]	
		Set Static IP address[4)] For a description see chapter “Start-Up”.	
		Set Network mask[4)]	
		Set Default gateway[4)]	
		Specify Temporary IP address[4)]	
		Downloading a gateway configuration file For a description see chapter “Setting up the büS network”.	
		Create a gateway configuration For a description see chapter “Setting up the büS network”.	
		Unit conversion	
		Advanced settings	Set baud rate Change baud rate[5)]
			IP settings for EtherNet/IP[6)]
			Set Internal cycle time
			Set Communication Timeout[7)]
			Control Mode
			Control Word
			Edit hide objects
			Reset hide objects
			Protocol firmware update
			Reset device • Restart • Hardware reset of industrial communication • Restore XML data

Table 9: Setting options in Bürkert Communicator, Industrial Communication configuration area – parameters detailed view

1) Only for PROFIBUS DPV1

2) Only for CC-Link

3) Only for PROFINET

4) Not present for DeviceNet, CANopen, PROFIBUS DPV1

5) Only for EtherNet/IP

6) Only for Modbus TCP

7) Only for PROFIBUS DPV1 and CC-Link

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

Bürkert Communicator configuration area	Detailed view	Setting
General settings	Parameter	büS Configuration of the büS interface • Displayed name Assign for display and Bürkert Communicator • Location Specify location displayed for the device • Description Enter description text for tooltips • Advanced Advanced settings Unique device name For partner allocation Specify Baud rate. büS address Specify CANopen address. Bus mode büS interface mode Deallocation delay Time from loss of a partner to deletion of its configuration
		Alarm limits Set limits from which the device outputs a warning or error • Supply voltage • Device temperature
		Diagnostics Activate/deactivate diagnostics
		PDO Configuration Configure process data objects • PDO 1 • PDO 2 • PDO 3 • Reset to default values
		Display • Set the display Brightness • Set the display Contrast • Set the display Mounting position • Language Set language for display • Set Screen saver

Table 10: Setting options in Bürkert Communicator, General Settings configuration area – parameters detailed view

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

Bürkert Communicator configuration area	Detailed view	Setting
General settings	Diagnostics	**Device status** The following values are displayed: • **Operating duration** • **Device temperature** • **Supply voltage** • **Min./Max. values** for **Max. temperature** Maximum measured device temperature **Min. temperature** Minimum measured device temperature **Max. supply voltage** Maximum measured supply voltage present on device **Min. supply voltage** Minimum measured supply voltage present on device • **Device boot counter** • **Transferable memory status** (Memory not available) • **Current system time**
		büS-Status • **Receive errors** Number of current reception errors is displayed • **receive errors max.** The most severe reception error that was produced relative to the device status is displayed. The indicator can be reset to 0. • **Transmit errors** Number of current send errors is displayed • **Transmit errors max.** The most severe send error that was produced relative to the device status is displayed. The indicator can be reset to 0. • Set **CANopen status** Pre-operational or operational
		Logbook The logbook lists all warnings and error messages, specifying the type, time and signature. The messages listed in the logbook can be updated, saved and deleted.

Table 11: Setting options in Bürkert Communicator, General Settings configuration area – diagnostics detailed view

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

Bürkert Communicator configuration area	Detailed view	Setting
General settings	Maintenance	**Device information** The following information for the device is displayed: • **Displayed name** Is only displayed if a name has been input in the menu of the same name in the parameters detailed view. • **Ident. number** of the device • **Serial number** of the device • **Software ident. number** • **Software version** • **büS version** • **Hardware version** • **Product type number** • **Manufacture date** • **eds version** • **f(x) version** • **Device driver** **Driver version** **Firmware group** **DLL version** **Origin**
		Reset device **Restart** **Reset to factory settings**

Table 12: Setting options in Bürkert Communicator, General Settings configuration area – maintenance detailed view

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

12 MAINTENANCE

12.1 Safety instructions for maintenance

WARNING!

Risk of injury from improper maintenance work.

- Maintenance may be carried out only by trained technicians and with the appropriate tools.
- Secure system against unintentional activation.
- Following maintenance, ensure a controlled restart.

12.2 Replacement of the fieldbus gateway ME43

Procedure:

1. Switch off supply voltage.
2. Remove 5-pin spring-type terminal.

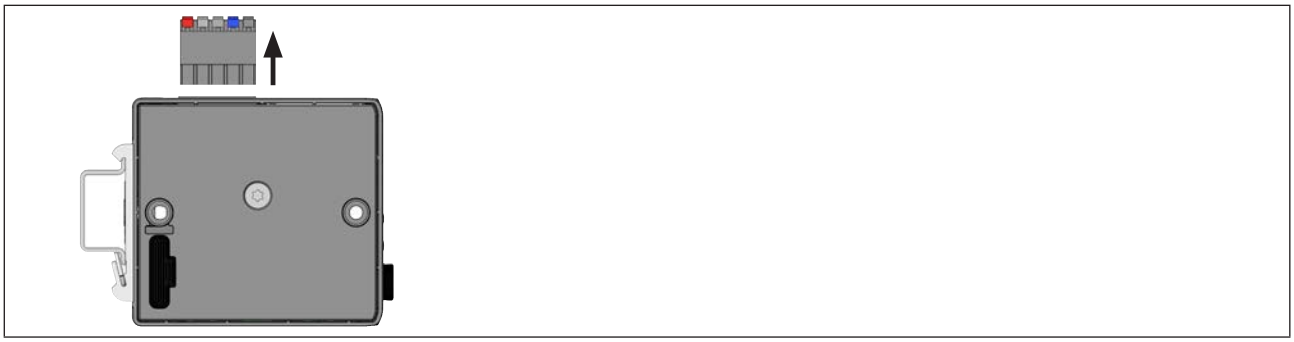


Figure 25: Remove 5-pin spring-type terminal

3. Remove Ethernet cable from the X2 and X2 interfaces.
   For the PROFIBUS version and CC-Link version: Remove plug-in connector D-Sub, 9-pin.
4. Remove the device from the top hat rail.

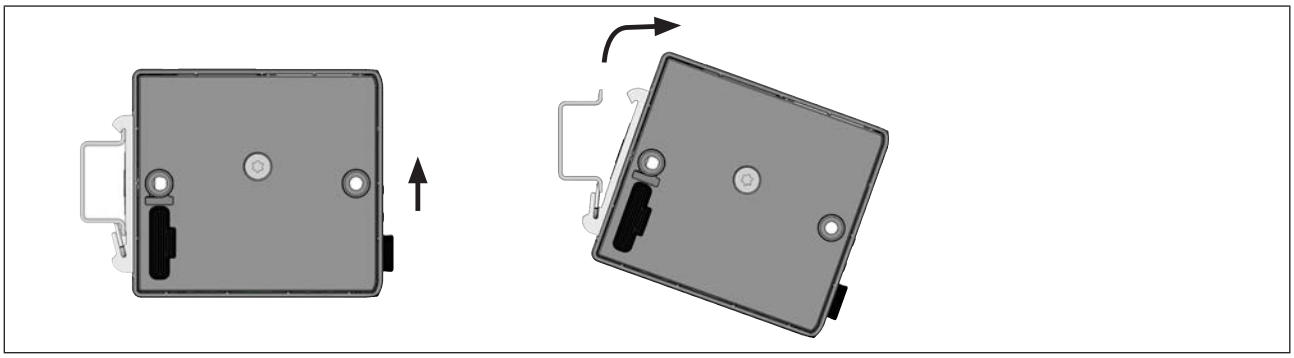


Figure 26: Remove the device from the top hat rail

→ Push the device upwards and detach it from the upper guide of the top hat rail.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

5. **Remove the Micro SD card**

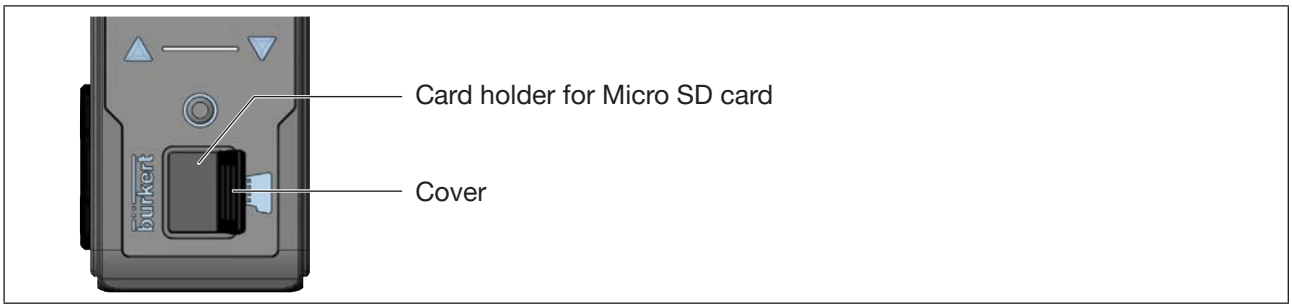


Figure 27: Replacing the Micro SD card; fieldbus gateway ME43

→ Carefully pull the cover out of the recess.

→ Rotate the cover upwards to the left.

→ Press on the edge of the engaged Micro SD card to unlock it.

→ Remove the Micro SD card.

6. Insert Micro SD card in replacement device:

⚠ Insert the memory card the right way around.

→ Insert the Micro SD card into the card holder. Ensure that the Micro SD card clicks into place.

→ Close the card holder using the cover.

7. Attach the replacement device to the top hat rail

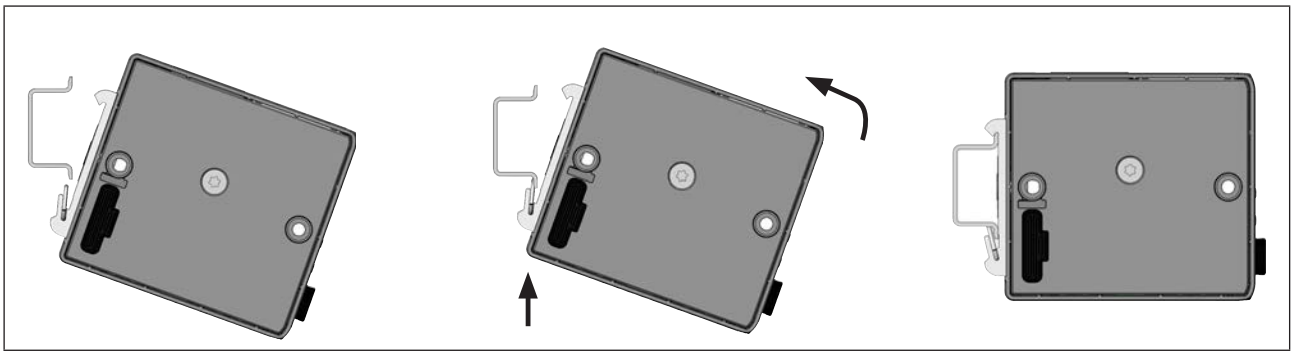


Figure 28: Attach the device to the top hat rail

→ Tip device to the right and align with top hat rail.

→ Mount device in the lower guide of the top hat rail.

→ Push device upwards while also swiveling it to the left; lock it into the upper guide of the top hat rail.

8. Connect the replacement device electrically

→ Attach the 5-pin spring-type terminal to the device.

→ Insert the Ethernet cables in the sockets X1 and X2 (for plug-in connector RJ45).
For the PROFIBUS version and CC-Link version: Insert plug-in connector D-Sub, 9-pin.

→ Apply supply voltage.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

13 TROUBLESHOOTING

Problem	Possible cause	Procedure
The NAMUR-LED goes out periodically.	The power supply collapses periodically – the device performs a reset each time.	Use power supply with adequate power.
	The voltage drop in the connection cable is too great.	Increase cable cross-section. Reduce cable length.
No process values are transferred between Industrial Ethernet and büS.	No cable connection.	Check Ethernet and büS cable connection.
	Reading and writing of the values has not been allowed by the PLC in the control object of the device.	Allow reading and writing of the values in the control object of the device.
	The process values have been configured incorrectly.	Check configuration of the process values.
	The process values have been allocated incorrectly.	Check allocation of the process values to the büS devices.
The process values cannot be allocated to the büS devices.	The process values have not been configured.	Check configuration of the process values.
	The import of the configuration must be completed by restarting the device.	Restart the device after configuration.
	The process values have been allocated to different classes.	Check allocation to ensure that büS devices are working with process values of the same class.
	Observe input and output direction as allocation.	Verify that direction of input and output is correct.
An incorrect value is transmitted or value is zero.	The process values have not been allocated or have been allocated to the wrong devices.	Check allocation of the process values.
Replacement device fails to take over values from Micro SD card from the defective device.	The device ID numbers of the replacement device and the defective device differ.	Values can only be transmitted between devices having the same Ident number.
	The Micro SD card is defective. The device was unable to write any values on the Micro SD card.	Replace the Micro SD card (refer to chapter “14 Accessories”) and try again to transmit the parameters of the defective device to the Micro SD card (see chapter “9.5 Importing and saving data using the Micro SD card”).
Replacement device fails to take over all values from Micro SD card from the defective device.	The EDS device description between the replacement device and the defective device differs.	Only the existing values of the defective device can be transferred to the replacement device. New values of the replacement device must be parameterized using the “Bürkert Communicator” software.

Table 13: Troubleshooting

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

13.1 Status indicators and action to be taken

Status LED indicators based on NAMUR NE 107	Description	Procedure
No color	No power is supplied to the device.	Connect device to power supply.
Flashing rapidly (applies to all colors)	The device was selected using the “Bürkert Communicator” software.	De-select the device using the “Bürkert Communicator” software.
Red	Device defective.	Device requires maintenance – Contact the manufacturer.
	Communication with other büS devices not possible.	Integrate device into a network with other büS devices.
	Bus error (e. g. short circuit).	Check wiring.
	The device is not connected to the PLC.	Check wiring. Check device description for connecting the device to the PLC.
	Device cannot find the allocated büS device.	Check whether the büS device is allocated to the device.
Orange	Search for büS devices active. Status is terminated after a few seconds.	If the device status persists for more than 4 minutes, perform a restart of the network.
Yellow	Device temperature out of specification, destruction of the device is a possibility.	Operate the device inside the specification.
	Internal device diagnostics point to problems in the device or the process properties.	Take action based on logbook messages.
Blue	Maintenance required	Service device.

Table 14: Action to be taken based on device status indicators

LED status		Description and cause of error	Procedure
Link LED (yellow)	Not active	No connection to the network established	Check cables.
Link/Act LED (green)	Not active	No connection to the network available.	Check cables.

Table 15: LEDs for network connection and action to be taken

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

14 ACCESSORIES

CAUTION!

Risk of injury and/or damage due to the use of incorrect parts!

Incorrect accessories and unsuitable spare parts may cause injuries and damage the device and its environment.

▸ Use original accessories and original spare parts from Bürkert only.

Accessories	Order number
büS Stick set (including power supply unit) and “Bürkert Communicator” software	00772426
Micro SD card	on request

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

15 DISASSEMBLY

WARNING!

Risk of injury from improper disassembly.

▸ Disassembly may be carried out by authorized technicians only.

1. Switch off supply voltage

2. Remove 5-pin spring-type terminal.

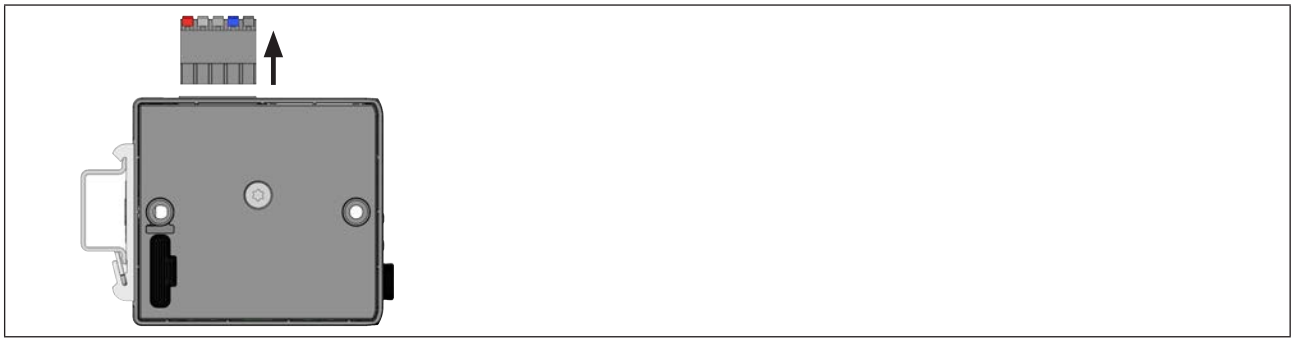


Figure 29: Remove 5-pin spring-type terminal

3. Remove Ethernet cable from the X2 and X2 interfaces.
   For the PROFIBUS version and CC-Link version: Remove plug-in connector D-Sub, 9-pin.

4. Remove the device from the top hat rail

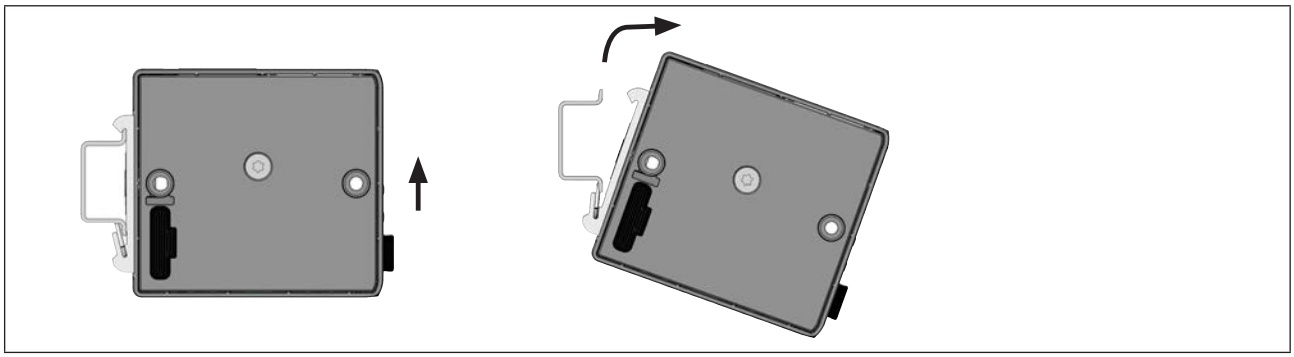


Figure 30: Remove the device from the top hat rail

→ Push the device upwards and detach it from the upper guide of the top hat rail

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

16 PACKAGING, TRANSPORT

NOTE!

Damage in transit due to inadequately protected devices.

- Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- Observe permitted storage temperature.

17 STORAGE

NOTE!

Incorrect storage may damage the device.

- Store the device in a dry and dust-free location.
- Storage temperature: -30 °C to +80 °C.

18 DISPOSAL

NOTE!

Damage to the environment caused by device components contaminated with media.

- Dispose of the device and packaging in an environmentally friendly manner.
- Observe applicable disposal and environmental regulations.

Observe national regulations on the disposal of waste.

MAN 1000328026 EN Version: A Status: RL (released | freigegeben) printed: 23.11.2017

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