COMTRAXX® COM463BC

Gateway for data exchange
between the interfaces BCOM and external BMS

Software version V4.7.x

COM463BC_D00427_02_M_XXEN/09.2023

BENDER

Table of contents

1 General information

1.1 How to use the manual

ADVICE
This manual is intended for qualified personnel working in electrical engineering and electronics! Part of the device documentation in addition to this manual is the enclosed supplement "Safety instructions for Bender products".

ADVICE
Read the operating manual before mounting, connecting and commissioning the device. Keep the manual within easy reach for future reference.

1.2 Indication of important instructions and information

DANGER
Indicates a high risk of danger that will result in death or serious injury if not avoided.

WARNING
Indicates a medium risk of danger that can lead to death or serious injury if not avoided.

CAUTION
Indicates a low-level risk that can result in minor or moderate injury or damage to property if not avoided.

ADVICE
Indicates important facts that do not result in immediate injuries. They can lead to malfunctions if the device is handled incorrectly.

Information can help to optimise the use of the product.

1.3 Signs and symbols


Disposal


Protect from moisture


Protect from dust


Temperature range


Recycling

RoHS directives

1.4 Service and Support

Information and contact details about customer service, repair service or field service for Bender devices are available on the following website: Fast assistance | Bender GmbH & Co. KG.

1.5 Training courses and seminars

Regular face-to-face or online seminars for customers and other interested parties:

www.bender.de > know-how > seminars.

1.6 Delivery conditions

The conditions of sale and delivery set out by Bender GmbH & Co. KG apply. These can be obtained in printed or electronic format.

The following applies to software products:

ZVEI: Die Elektroindustrie

'Software clause in respect of the licensing of standard software as part of deliveries, modifications and changes to general delivery conditions for products and services in the electrical industry'

1.7 Inspection, transport and storage

Check the shipping and device packaging for transport damage and scope of delivery. In the event of complaints, the company must be notified immediately, see "www.bender.de > service & support.".

The following must be observed when storing the devices:

1.8 Warranty and liability

Warranty and liability claims for personal injury and property damage are excluded in the case of:

- Improper use of the device.
- Incorrect mounting, commissioning, operation and maintenance of the device.
- Failure to observe the instructions in this operating manual regarding transport, commissioning, operation and maintenance of the device.
- Unauthorised changes to the device made by parties other than the manufacturer.
- Non-observance of technical data.
- Repairs carried out incorrectly.
- The use of accessories or spare parts that are not provided, approved or recommended by the manufacturer.
- Catastrophes caused by external influences and force majeure.
- Mounting and installation with device combinations not approved or recommended by the manufacturer.

This operating manual and the enclosed safety instructions must be observed by all persons working with the device. Furthermore, the rules and regulations that apply for accident prevention at the place of use must be observed.

1.9 Disposal of Bender devices

Abide by the national regulations and laws governing the disposal of this device.

For more information on the disposal of Bender devices, refer to

www.bender.de > service & support.

1.10 Safety

If the device is used outside the Federal Republic of Germany, the applicable local standards and regulations must be complied with. In Europe, the European standard EN 50110 applies.

DANGER ***Risk of fatal injury due to electric shock!***

Touching live parts of the system carries the risk of:

- Risk of electrocution due to electric shock
- Damage to the electrical installation
- Destruction of the device

Before installing the device and before working on its connections, make sure that the installation has been de-energised. The rules for working on electrical systems must be observed.

Intended use

The COM463BC connects devices via the interfaces BCOM and external BMS. It is operated and configured using the web user interface integrated into the device.

Address setting and termination

For proper functioning of the COM463BC correct address assignment and termination is of utmost importance.

CAUTION ***Malfunction due to duplicated addresses***

Assigning addresses that are already used by existing devices in the bus systems concerned may cause serious malfunctions.

Make sure the COM463BC is correctly addressed and terminated.

2 Product description

This manual describes

- The gateway COMTRAXX® **COM463BC**.

2.1 Scope of delivery

Included within the scope of delivery

- A Gateway COM463BC
- A printed quick-start guide
- Safety instructions for Bender products
- The manuals 'COMTRAXX® COM463BC' and 'BCOM' are available as PDF files for download at https://www.bender.de/en/service-support/download-area/

2.2 Device features

- Gateway for data exchange between the interfaces BCOM and external BMS
- Ethernet (10/100 Mbit/s) for remote access via LAN, WAN or the Internet
- Gateway with web interface
- Data exchange between devices at the following interfaces:
  - External BMS bus (max. 99 x 150 devices)
  - BCOM (max. 255 devices)
- Remote display of present measured values and operation/alarm messages
- Ethernet interface with 10/100 Mbit/s for remote access via LAN, WAN or the Internet
- Assignment of individual texts for devices, channels (measuring points) and alarms
- Device failure monitoring
- E-mail notifications to various users in the event of alarms and system errors
- 100 virtual devices with 16 channels each can be created. These are used to transfer information from a BCOM system to an external BMS system.

2.3 Applications

- Information exchange between BCOM and external BMS systems
- Configuration of the information to be transferred from one system to the other
- Several BMS-external systems can be displayed together with BCOM systems in one overview
- Selective notification to different users in case of alarms
- Remote diagnosis, remote maintenance

2.4 Function

The COM463BC gateways are integrated into the existing EDP structure like PCs. After connecting to the network and compatible Bender products, all system devices can be accessed from any PC using a web browser. In this way, all important system information is directly available.

Verified web browsers: Microsoft Edge, Mozilla Firefox, Google Chrome.

2.5 Functional description

2.5.1 Interfaces

The COM463BC communicates via the following interfaces:

- External BMS (RS-485)
- BCOM (Ethernet)

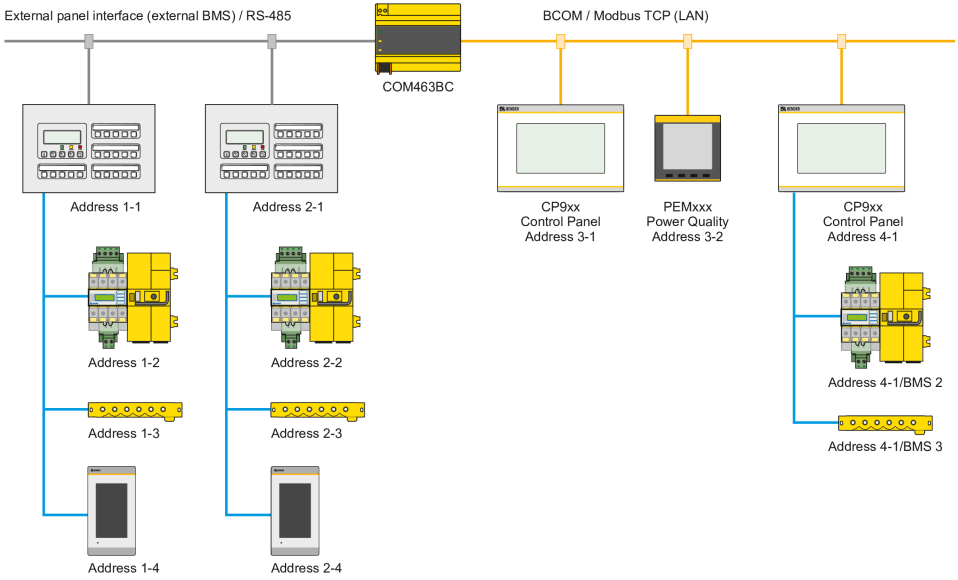


Image 2-1: Application example

2.5.2 BMS interface

External BMS bus (BMSe)

Individual Bender devices, such as MK800, TM800 or Bender panels can communicate via the external BMS bus (BMSe).
The COM463BC can communicate via the external BMS bus (BMSe).
The COM463BC cannot parameterise other bus devices on the external bus. The parameters of the COM463BC itself can, however, be set via the LAN connected.

Note that not all BMS masters can surrender their master function!

3 Mounting, connection and commissioning

The COM463BC is normally integrated into existing LAN structures, but can also be operated via a single PC on the Ethernet side.

CAUTION
If you are familiar with the configuration of computer networks, you can carry out the connection of the COM463BC yourself. **Otherwise please contact your EDP administrator!**

3.1 Preparation

1. Have all the questions concerning the installation been discussed with the technician responsible for the installation?
2. Is the BMS address to be set known?
   For more detailed information on the topic of BMS, in particular about the wiring of bus devices, please refer to the separate document "BMS bus". You can obtain this document at https://www.bender.de/en/service-support/download-area/
3. Does the computer network have a DHCP server?
   If the connected computer network contains a DHCP server, activate the 'DHCP' function. The IP address is automatically assigned and displayed.

   If the computer network does not include a DHCP server, the IP address, network mask (SN) and standard gateway must be specified by the EDP administrator. The IP address has been permanently assigned to the device. Therefore, deactivate the 'DHCP' function on the gateway.
4. Ask for the IP address of the NTP server; it is required for the automatic time setting.
5. Are suitable PC hardware and software available for commissioning?
   - System requirements (minimum): 1.6 GHz processor/512 MB RAM
   - Verified web browsers: Microsoft Edge, Mozilla Firefox, Google Chrome

For initial connection, the basic configuration of the COM463BC is to be undertaken outside the installation, depending on the specific situation.

3.2 Installation and connection

Only skilled persons are permitted to carry out the work necessary to install, put into service and run a device or system.

DANGER ***Risk of fatal injury due to electric shock!***
Touching live parts of the system carries the risk of:

- Risk of electrocution due to electric shock
- Damage to the electrical installation
- Destruction of the device

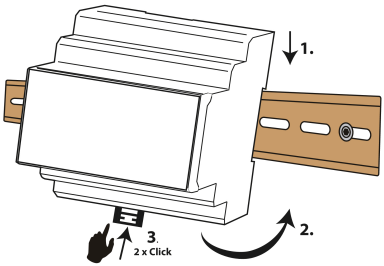
Before installing and connecting the device, make sure that the installation has been de-energised. The rules for working on electrical systems must be observed.

DANGER ***Mortal danger and risk of irreparable damage due to moisture!***
Install device such that it is protected against moisture.

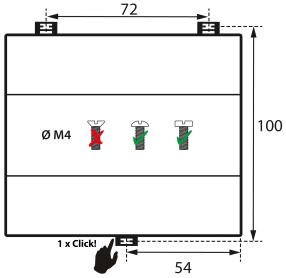
CAUTION
Pay attention to installation location
Operation of the device is only permitted in operating locations with **restricted access***! This can be installation in a switch cabinet, for example.*

3.2.1 Mounting the device

The device is suitable for the following types of installation:
- Snap-on mounting on a DIN rail according to IEC 60715 or
- Screw mounting using 3 x M4

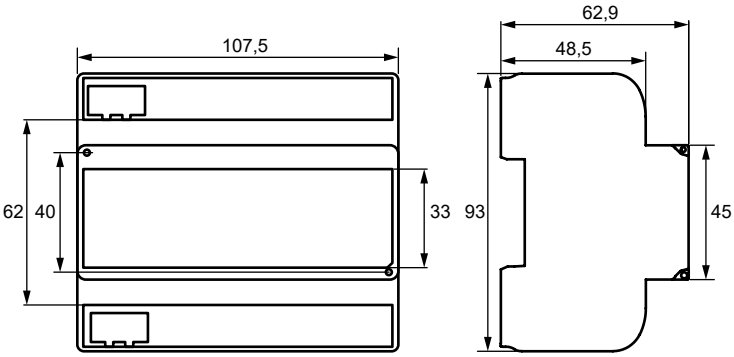


Snap-on mounting on a DIN rail according to IEC 60715

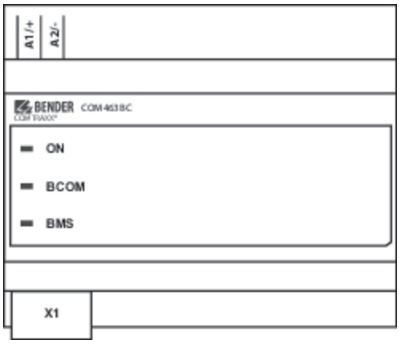


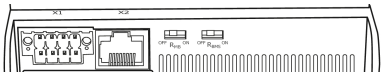
Screw mounting using 3 x M4

Dimension diagram (mm)



3.2.2 Connecting the device





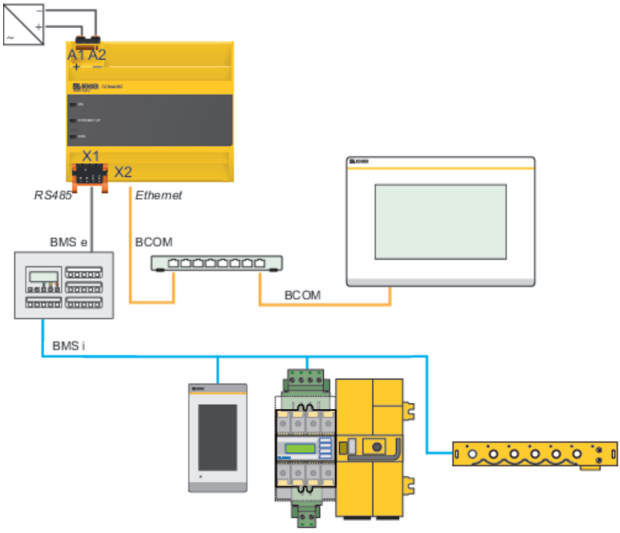
Element	Explanation
A1/+; A2/-	Power supply
Plug **X1**	BMS bus (Bender measuring device interface): Terminals **A**BMS and **B**BMS
Plug **X2**	Ethernet connection (RJ45) for the connection to the PC network as well as to BCOM
$\mathbf{R}_{BMS}$	BMS bus terminating resistor switch

Make the connection as follows:

1. Remove terminal covers of the device.
2. BMS bus connection
   Connect the terminals **A**BMS and **B**BMS to the BMS bus (A to A, B to B). If the COM463BC is at the end of the BMS bus, you must switch the terminating switch $\mathbf{R}_{BMS}$ on the device to "ON‘.
3. Ethernet connection (BCOM)
   Connect Ethernet cable (RJ45) to the COM463BC and connect to the network. It is recommended to use at least on Ethernet cable of category 5 (Cat. 5).
4. Connect power supply
   Connect terminals A1/+ and A2/- to a power supply. The power supply must be protected using a 6 A fuse.
5. Position the terminal covers and click it into place.

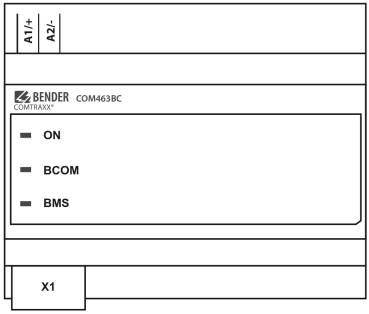
3.2.3 Wiring diagram

Wiring diagram COM463BC (example)



3.3 Display and control elements

COM463BC



LED	Function
ON	'ON' LED: Flashes during the start process. The LED lights continuously as soon as the device is ready for operation.
BCOM BMS	LEDs indicate activity on the various interfaces.

3.4 Commissioning the device

1. Switch on the supply voltage: When the device is supplied with power, all LEDs light up briefly. During the start process the 'ON' LED flashes. After a successful start, the 'ON' LED then illuminates continuously. The device is now ready for operation.
2. Start web user interface:
   – Open an internet browser.
   – Type the following IP address to open the web interface of the COM46…:
   ▶ If your PC is in a 192.168.0.0 IT subnet, you can reach the COM46… via the factory-set IP address 192.168.0.254.
   ▶ If your PC is in a different subnet, you must disconnect the PC from your network. Connect the COM46… directly to your PC. Open the web user interface using the **second pre-defined IP address**: 169.254.0.1. For this purpose, DHCP must be enabled on the PC.

   In the web user interface, the IP address of the COM46… can be set as required.
3. Configure: As a minimum, configure all address data for the COM46…. Always configure the BCOM interface (system name, subsystem, device address).

   Risk of duplicate addresses if BCOM system name is not changed.

   The factory setting for the system name on all Bender BCOM devices is "SYSTEM". If several systems are established in the same network, there is a risk that addresses will be assigned more than once. ***Therefore, always give each system a new BCOM system name during commissioning****.*
4. Integrate devices into the system:

– BCOM devices are detected automatically

5. Check connection
   Connect the COM46… to the network again. Start the web user interface. All other settings (individual texts, e-mail notifications, …) can now be made.

3.5 Factory settings for addresses

The COM463BC is supplied with the following factory settings:

Parameter	Factory setting
IP address	192.168.0.254
Connection can always be made using the pre-defined IP address (e.g. for commissioning)	169.254.0.1
Net mask	255.255.0.0
Standard gateway	192.168.0.1
DNS	194.25.2.129
DHCP	off
t_{off} (Timeout for DHCP address assignment)	30 s
BMS address	1
BMS protocol	BMS e
BCOM system name	SYSTEM
Subsystem address	1
BCOM device address	0 (= off)

The settings can be changed using the web user interface.

4 Web user interface

The web user interface of the device enables access via LAN, WLAN or the Internet. It provides a uniform display of all connected Bender devices.

4.1 Functions of the web user interface

- Bus overview of the associated devices
- Indicating alarms and measured values
- Display by interface or subsystem
- Device failure monitoring
- Saving settings as 'backup' and restoring values again
- Documenting settings and measured values
- Assigning individual texts for devices, measuring points (channels) and alarms
- E-mail notifications to different user groups according to a time-controlled schedule in the event of alarms and system errors. The sender's e-mail address can be entered.
- Display of virtual devices. A virtual 'measuring point' is obtained by logically or numerically evaluating measured values of 'real' devices connected to the gateway.

4.2 Software products used

Select **Tools > Information > Copyrigh** to display the used software products.

4.3 Browser configuration

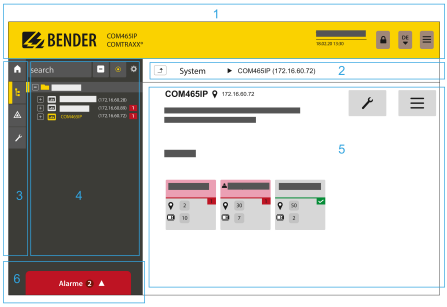
As browser, the latest version of Google Chrome, Microsoft Edge and Mozilla Firefox are recommended. To use the functions of the web user interface, JavaScript has to be activated. The pop-up blocker should be deactivated for the IP address of the COMTRAXX® device.

For Windows© Internet Explorer, the compatibility view has to be disabled.

*Select **Extras > Configuration of compatibility view. Deactivate** the button **Display Intranet sites in compatibility view**.*

4.4 Home page COMTRAXX® user interface

1. Open an Internet browser.
2. Enter the IP address of the gateway in the address line (example: http://172.16.60.72).

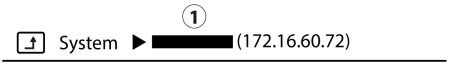


1 Headline
2 Path display
3 Navigation
4 Subnavigation
5 Content area
6 Alarm overview

4.4.1 Headline

1 Clicking the logo: Return to home page
2 Used device: Device type
3 Used device: **System name** > **Subsystem** > **Device address**
Date and time of the device
4 The symbol indicates that the web user interface is protected by a password. Click the symbol and then click **Login** to enter the user name and password.
5 Language selection
6 Open/close navigation (button only available in small browser window)

4.4.2 Path display (breadcrumb navigation)



1= Device

The path display shows at any time on which device and in which bus you are currently located in the content window.

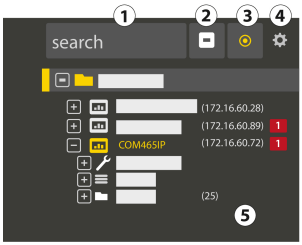
4.4.3 Navigation

	Menu	Description
	Start	Display of information about the device and the software. Please have this information to hand if you need to contact us for assistance by telephone.
	System overview	The system overview shows all devices in the system either by subsystem or by interface. Pending alarms and operating messages are displayed and the respective devices can also be configured.
	Alarms	Display of all pending alarms and data of the devices sending an alarm
	Tools	Functions that affect the entire system

The navigation symbols are permanently visible on the left side. Even if a random submenu of the web user interface is open, you can navigate to one of the four areas by clicking the respective symbol.

4.4.4 Subnavigation

The system overview is displayed in the subnavigation.



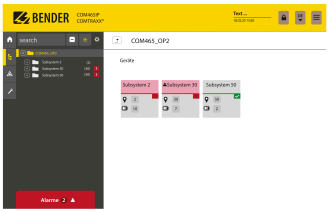
Legend

1. Full text search in the system for device names or menu entries. Matches are highlighted in yellow.
2. Close unfolded tree in the subnavigation
3. Fold out automatically: When enabled (= yellow), the displayed contents of the content area are shown in the subnavigation with automatically unfolding device tree in addition to the path display. Path display and content area are always synchronous. When disabled (= white), the subnavigation is not adapted to the path display or the current content area.
4. - Select **display** by subsystems or by interfaces. The interface display is only available for COMTRAXX® V4.xx and higher.
   - Configure the **line height** of the entries.
5. The number in brackets (here: 25) indicates the set bus address.

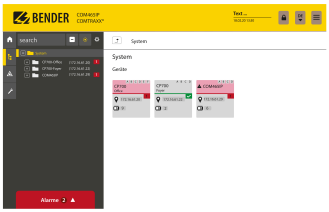
The display by subsystem or interface is possible independently of the configured Modbus image V1 or V2.

4.4.5 Content area

Display of the system, alarms and entries for the tools .



Content area of the system display by **subsystem**



Content area of the system display by **interface**

4.4.6 Overview of pending alarms

***Clicking the alarm overview**: List of pending alarms*

***Clicking on the list**: Details about the alarms in the content area*

5 Virtual devices

The concept of virtual devices involves combining existing measurements with other measurements in such a way that additional values, operating or alarm states can be displayed. Combine up to 26 measurements with numerical and logical operators to create a new 'virtual' measuring point. Each of these measuring points uses one channel. A virtual device consists of a maximum of 16 channels. Virtual devices are treated like real devices and are fully integrated into the Bender system: All calculated values

– can be stored in a data logger,
– are available via Modbus,
– can be displayed in a visualisation.

5.1 Application possibilities

Warnings

Alarms and warnings can be configured for Modbus devices. Through virtual devices, user-defined warning limits can be set for devices that do not offer this option (e.g. PEMs). Each generated warning appears in the warning history and can be used to send an e-mail notification.

Device failure monitoring

In large buildings with many devices installed in a production hall, department or floor, virtual devices simplify simultaneous monitoring for device failure. It allows narrowing down the location of the failure and enables fast intervention.

Converting to BMS bus (mirroring)

Operating states of the virtual devices can be transmitted via BMS bus even if the real devices have no BMS interface. For this purpose, the virtual devices are 'mirrored' to the BMS bus. The states of the measuring points (channels 1…12) are transmitted during the channel query of the BMS master.

*Only **operating states** are transmitted via the BMS bus (No alarm, Prewarning, Alarm). Specific measured values cannot be transmitted.*

5.2 Managing virtual devices

Path: Tools > Device management > Virtual devices

5.2.1 Virtual devices: Overview list/Main page

Address

Device addresses: 1…255

Alarm

Current operating state of the virtual device (prewarnings are displayed as alarms)

No Alarm Alarm

Device name

Virtual devices are always named "VD700…".

Mirrored

When enabled, the operating states of channels 1…12 of the virtual device are transmitted via BMS bus.

5.2.2 Editing a virtual device

Device address, device name and BMS mirroring can be edited.

5.2.3 Editing channels

In the channel overview, the 16 possible channels are displayed with the following information:

- Current operating state (no alarm Prewarning Alarm)
- Individual text for prewarning or alarm
- General and individual channel description
- Current measured value
- Defined formula

In the overview, channels can be created or edited via. Channels can be deleted via .

Refer to the 'Legend and examples' tab for assistance.

5.2.4 Deleting a device

A virtual device can be deleted via the bin.

5.2.5 Adding a virtual device

Use the button in the footer to add virtual devices.

The number of virtual devices that can be created depends on the COMTRAXX® device used or its active function modules.

Device address

Select a free bus address from the drop-down menu.

Virtual devices are treated like real devices. Therefore, addresses must not be assigned twice!

Device name

Assign a name to the virtual device.

Virtual devices are always named "VD700…". In addition, an individual name can be assigned.

Mirroring to BMS

If operating states are to be transmitted via BMS, this can bet set here.

Virtual devices are treated like real devices. Therefore, addresses must not be assigned twice!

6 Troubleshooting

6.1 Malfunctions

If the device causes malfunctions in the connected networks, please refer to this manual.

6.1.1 What should be checked?

6.1.2 Frequently asked questions

How do I access the device if the address data are unknown?

1. Connect the device directly to a Windows PC using a patch cable
2. Activate the DHCP function on the PC.
3. Wait around one minute.
4. Access is now possible using the following pre-defined IP address: 169.254.0.1.
5. Now set the new address data.

Document the new settings as a PDF file. Use the backup function to save all settings of the device (see Chapter: "Device features", Page 9).

Frequently asked questions on the Internet

FAQs on many Bender devices can be found at:

Fast assistance | Bender GmbH & Co. KG

6.2 Device operation, maintenance, cleaning

Maintenance

The device does not contain any parts that require maintenance.

Cleaning

The device may only be cleaned using a clean, dry, soft, antistatic cloth.

7 Technical data

7.1 Tabular data

( )* = Factory setting

Insulation coordination in acc. with IEC 60664-1/IEC 60664-3

Rated voltage	AC 250 V
Rated impulse withstand voltage/overvoltage category	4 kV / III
Pollution degree	3
Protective separation (reinforced insulation) between	(A1/+, A2/-) - [(ABMS, BBMS), (X2)]

Supply voltage

Supply voltage U_s	AC/DC 24…240 V
Frequency range U_s	50…60 Hz
Power consumption	≤ 6.5 VA / ≤ 4 W

Indications

LEDs	
ON	operation indicator
BCOM	data traffic BCOM
BMS	data trafficBMS
Ethernet (terminal X2)	lights during network connection flashes during data transfer

Memory

Individual texts	unlimited number of texts each with 100 characters
E-mail configurations and device failure monitoring	max. 250 entries

Interfaces

Ethernet	
Connection	RJ45
Cable length	< 100 m
Data rate	10/100 MBit/s, autodetect
HTTP mode	HTTP/HTTPS (HTTP)*
DHCP	on/off (on)*
t_{off} (DHCP)	5…60 s (30 s)*

Ethernet	
IP address	
nnn.nnn.nnn.nnn	(192.168.0.254)*
can always be reached via	169.254.0.1
Netmask	nnn.nnn.nnn.nnn (255.255.0.0)*
Protocols	TCP/IP, DHCP, SMTP, NTP

BMS-Bus (external)	
Interface/protocol	RS-485/BMS external
Operating mode	master/slave (master)*
Baud rate BMS external	(19.2 / 38.4 / 57.6) kBit/s
Cable length	≤ 1200 m
Cable	shielded, one end of shield connected to PE
Cable recommended	CAT6/CAT7 min. AWG23
Cable alternatively	twisted pair, J-Y (St) Y min. 2x0.8
Connection	X1 (ABMS, BBMS)
Connection type	see connection 'Push-wire terminal X1'
Terminating resistor	120 Ω (0.25 W), can be switched on internally
Device address	2…99 (2)*

BCOM	
Interface/protocol	Ethernet/BCOM
BCOM system name	(SYSTEM)*
BCOM subsystem address	1…255 (1)*
BCOM device address	0…255 (0)*

Environment / EMC

EMC	EN 61326-1

Ambient temperatures	
Operating temperature	–25…+55 °C
Transport	–40…+85 °C
Long-term storage	–25…+70 °C

Classification of climatic conditions acc. to IEC 60721	
Stationary use (IEC 60721-3-3)	3K22
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K22

Mechanical conditions acc. to IEC 60721	
Stationary use (IEC 60721-3-3)	3M11
Transport (IEC 60721-3-2)	2M4
Long-term storage (IEC 60721-3-1)	1M12

Connection

Connection type	pluggable push-wire terminals

Push-wire terminals

Conductor sizes	AWG 24-12
Stripping length	10 mm
rigid/flexible	0.2…2.5 mm²
flexible with ferrule with/without plastic sleeve	0.25…2.5 mm²
Multiple conductor, flexible with TWIN ferrule with plastic sleeve	0.5…1.5 mm²

Push-wire terminal X1

Conductor sizes	AWG 24-16
Stripping length	10 mm
rigid/flexible	0,2…1.5 mm²
flexible with ferrule without plastic sleeve	0.25…1.5 mm²
flexible with ferrule with plastic sleeve	0.25…0.75 mm²

Other

Operating mode	continuous operation
Mounting position	front-orientated, air must pass through cooling slots vertically
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Snap-on mounting on a DIN rail	IEC 60715

Screw mounting	3 x M4
Type of enclosure	J460
Enclosure material	polycarbonate
Flammability class	UL94V-0
Dimensions (W x H x D)	107.5 x 93 x 62.9 mm
Software	D0472
Weight	≤ 240 g

( )* = Factory setting

7.2 Standards, approvals and certifications

7.3 Ordering information

Device

Type	Application	Supply voltage/ frequency range U_S	Power consumption	Art. No.
COM463BC-230V	Gateway for the connection of systems with BCOM and external BMS	AC/DC 24…240 V 50…60 Hz	≤ 6.5 VA / ≤ 4 W	B95061051

7.4 Document revision history

Date	Document version	Valid from software version	State/Changes
08.2020	00	4.0.x	First edition
12.2020	01	4.1.x	*Added* Chapter 'Virtual devices' Logo UKCA
09.2023	02	4.7.x	*Editorial revision* Layout overall document

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