BMS-CONTROLLER (7508212/00/100; 752-8303/8000-002)

For connection to the building management system

Revision 01 Status: 2022_06_01

1 Directories

1.1 Table of figures

2 Introduction

Thank you for purchasing the controller.

The MC-BMS controller transfers internal data (data points) to the gateway. The gateway provides access to the data points.

The availability as an integrated (MC-BMSM) or external (MC-BMS-EXT) variant enables a high degree of flexibility in the design of the appropriate connection to the existing building technology.

The ability to read out the main system and up to 32 subsystems with only one controller allows a cost-efficient and easy to realize implementation of almost any application

This documentation will help you to connect the controller quickly.

The technical data of the controller can be found in the chapter 15.

3 General Information

These instructions for use are aimed at the following target group: Qualified electricians and authorized specialists. It explains the safe and professional handling of the controllers MC-BMSM and MC-BMS-EXT (in the following referred to as controller). The general safety regulations and local accident prevention regulations applicable to the area of use as well as instructions and safety information must be observed. The instructions for use must be read before starting any work with the controller.

3.1 Designated use

The emergency lighting system is connected to the controller via an Ethernet interface and thus offers access to the data points that contain the following information:

- System status
- System fault memory
- Measured values (mains supply, battery parameters, and so forth)
- Test results (summarized and detailed)

The controller may only be used when it is in a technically perfect condition and with awareness of safety and dangers in accordance with the instructions for use. No changes, additions or modifications may be made to the controller without the approval of the manufacturer.

3.2 Reasonably foreseeable misuse

Infeed of a different supply voltage than the one provided.

3.3 Liability and Warranty

These instructions for use have been compiled in accordance with the applicable regulations.

In addition, all laws, standards and guidelines of the respective country in which the controller is operated must be observed. The manufacturer assumes no warranty or liability for damage or consequential damage caused by:

- improper use
- unauthorized or improper changes to the connections, settings, or programming of the controller
- failure to comply with regulations and rules of conduct for safe operation.

3.4 Disposal

NOTICE
Pollution from electronic components.
Electronic components must be disposed of in accordance with the legal regulations applicable in the respective country.

Packaging materials are not rubbish, but recyclable materials that have to be reused or recycled.

4 Safety

At the time of its development and manufacture, the controller was built in accordance with the applicable, recognized rules of technology and is considered to be operationally safe. The controller can pose a risk if it is used improperly or improperly by untrained personnel; the following must also be observed:

- Safety and hazard information in the operating instruction
- Appointed work and safety instructions of the operator

Faults that affect the function or safety of the controller must be reported to the responsible office immediately and eliminated.

4.1 Content of the operating instructions

Every person who is tasked with working on or with the controller must have read and understood the instructions for use before starting work. This also applies if the person has already worked with such a controller or a similar controller in the past or was trained by the manufacturer.

4.2 Changes and modifications to the controller

In order to avoid hazards and to ensure the optimal performance of the controller, it is forbidden to make changes or extensions that have not been approved by the manufacturer. Extensions, conversions or repairs that are not described in the instructions for use are reserved exclusively for trained specialist and service personal.

4.3 Responsibility of the operator

As described in point 4.1, these operating instructions must be freely accessible to all persons who work on or with the controller at all times in the immediate vicinity of the controller. The controller may only be operated in a technically perfect and operationally safe condition.

4.4 Requirements for the personnel

Work on and with the controller is reserved exclusively for trained electricians or authorized specialist personnel who must have received instruction on the dangers that may arise. Qualified personal are those who, based on their technical training, knowledge and experience, as well as knowledge of the relevant provisions, can assess the work assigned to them and recognize the dangers. If the personnel do not have the necessary knowledge, they must receive professional training. It must be ensured that tasks and activities have been defined and understood. These activities are only to be carried out under the supervision and control of qualified personnel.

5 Pictograms used in this operating instruction

Follow the instructions

Important Information

Danger to the Environment

6 Delivery options and scope of delivery

The controller for connection to the building management system is available in two versions.

6.1 Delivery options

6.1.1 MC-BMSM Controller

The MC-BMSM Controller is a variant of the controller that is integrated in the electronic cabinet of the emergency lighting system. Since the versions are adapted to local conditions and customer requirements, no representation can be placed here.

6.1.2 MC-BMS-EXT

MC-BMS-EXT is a variant of the controller that is housed in a external cabinet.

Figure 1: MC-BMS-EXT 750-821/00-100

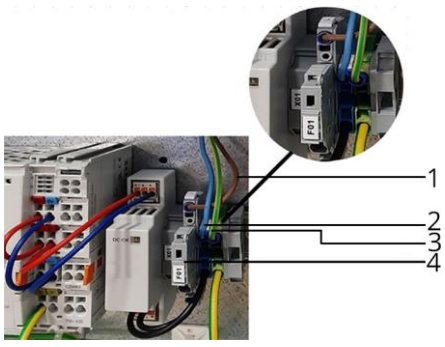
Figure 2: MC-BMS-EXT 752-8303/8000-002

6.1.3 Data of the control cabinet for MC-BMS-EXT

Length	400 mm (15,748 inch)
Width	210 mm (8,26772 inch)
Height	500 mm (19,685 inch)
Shipping weight	12,5 kg (27,55778 pound)
Volume	42 l (11,0952 gallon)

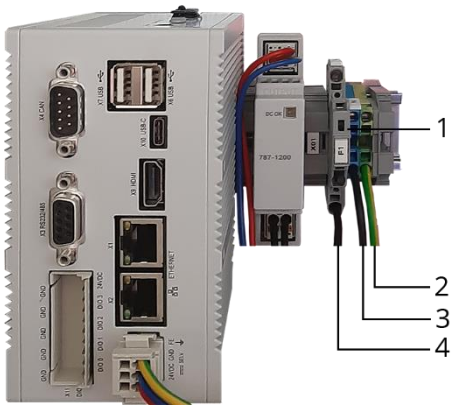
6.2 MC-BMS-EXT connection (controller)

6.2.1 Connection to the power supply



1 Phase
2 Neutral conductor
3 Protective conductor
4 Fuse F1 (2A slow-blow)

Figure 3: Connection-power-supply-MC-BMS-EXT 750-821/00-100



1 Fuse F1 (2A slow-blow)
2 Protective conductor
3 Neutral conductor
4 Phase

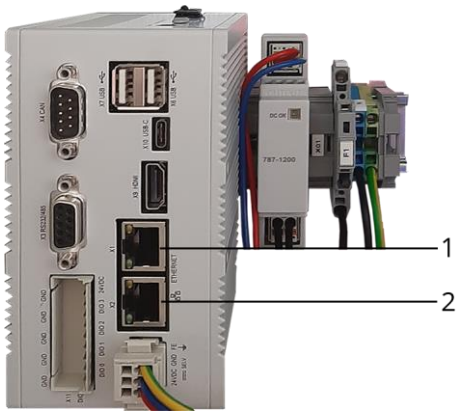
Figure 4: Connection power supply MC-BMS-EXT 72-8303/8000-002

Sockets X1 and X2 are switched in switch mode. BACnet is connected to socket X1, X2 is used to connect the system.

6.2.2 Network connection

1 Connection to building management system
2 Connection to emergency lighting system

Figure 5: Network connection MC-BMS-EXT 750821/00/100



1 Connection to building management system
2 Connection to emergency lighting system

Figure 6: Network connection MC-BMS-EXT 72-8303/8000-002

6.3 Scope of delivery

Included in the delivery are:

- 1x Controller MC-BMS 750-821/00-100

or

- 1xController MC-BMS-EXT 72-8303/8000-002

- 1x Bus-end clamp (only for MC-BMS 750-821/00-100

- 1x Application
- Modbus
- BACnet
- Application for monitoring several systems

- 1 x Power supply 24 V

7 BACnet-Controller connection diagram

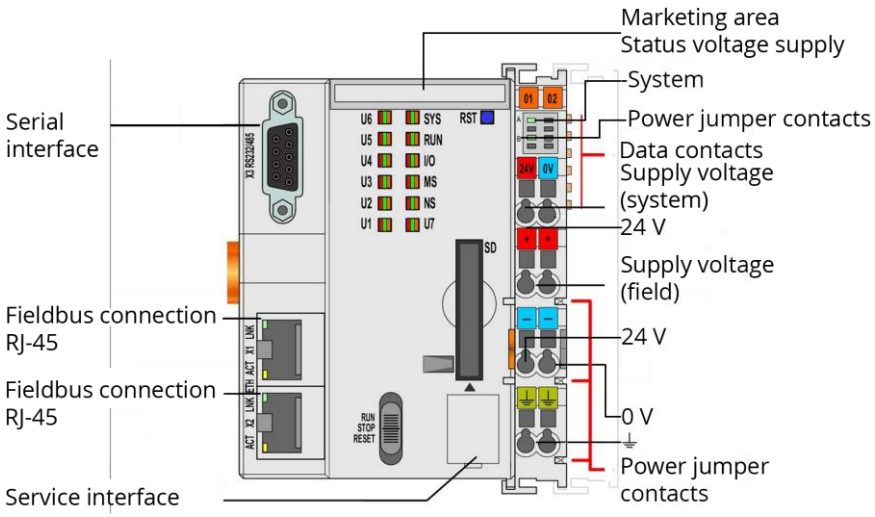


Figure 7: Connection diagram controller MC-BMS-EXT 750-821/00-100

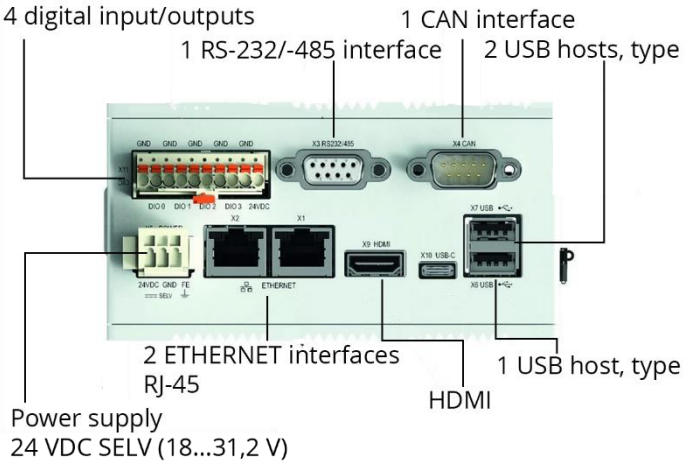


Figure 8: Connection diagramm controller MC-BMS 750-821/00-100

8 Technical Product description

8.1 Definition of terms

The MC-BMSM and MC-BMS-EXT controllers are an optional application in a network.
An emergency lighting system can consist of a main system and up to 32 sub systems. Each system (main system or sub system monitors up to 96 circuits, of which each circuit has up to 20 luminaries.
In cooperation with the gateway, the controller ensures that all information is read out from the connected emergency lighting system and made accessible to the outside via Modbus / IP-address or BACnet. It automatically detects which protocol is supported by the connected building management system.

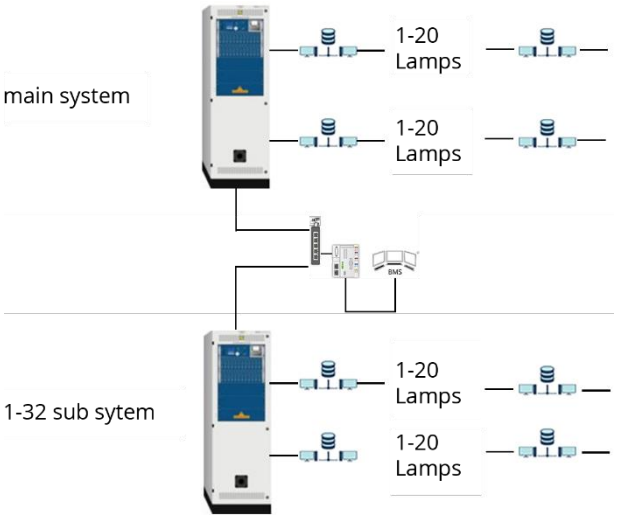


Figure 9: Networked system

8.2 Topology

The main system is connected to the sub system via Ethernet with a switch. The BACnet controller is coupled to the same network. A common sub net is initially assumed. A separation to two IP-addresses is possible in order to separate the internal network from the customer network.
If necessary, certain services can also be switched to the customer network via port forwarding.

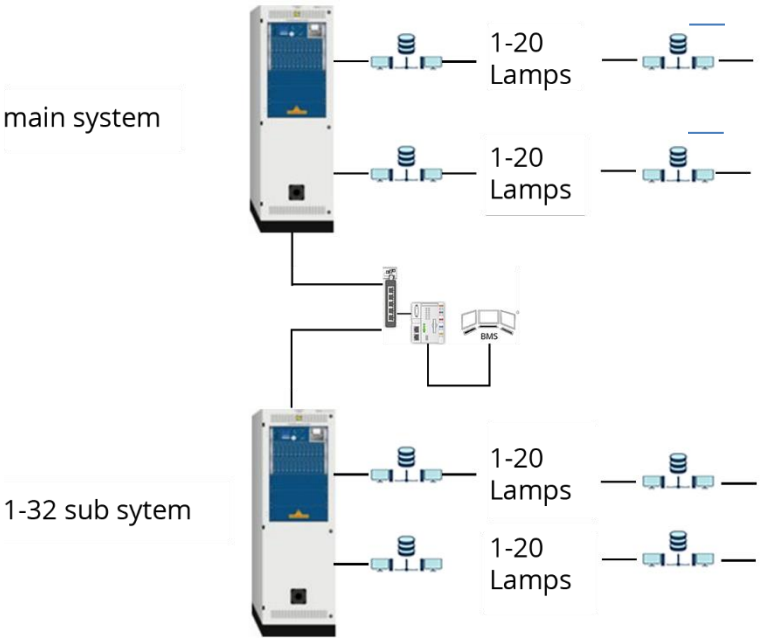


Figure 10: Networked systems connected to MC-BMS-EXT via an external switch

8.3 Description of the applications

8.3.1 BACnet Application

BACnet (Building Automation and Control Networks) is a network protocol for building automation. It is standardized by ASHRAE, ANSI and as ISO 16484-5.
Gateways exist for interoperable and cross-system communication, which couple communication participants on the BACnet side with other systems and protocols (e.g. DALI, KNX or LON).

The aim of BACnet is to enable open, interoperable building automation in functional buildings. BACnet is the description of a method for exchanging data between heating, ventilation and air conditioning (HVAC) systems.

The term system includes devices at the field level - i.e. sensors and drives - as well as the automation (DDC devices, controllers) and management levels (building management systems).
In addition to HVAC technology, third-party trades such as lighting control and safety technology can also be taken into account. The ASHRAE SSPC (Standing Standard Protocol Committee) only recently presented an appendix (addendum c) to the BACnet protocol to the specialist public, which describes data objects from the field of hazard detection technology.

8.3.2 Modbus Application

The Modbus protocol is a communication protocol based on a server / client or client / server architecture. It is a way of establishing server-client communication among intelligent devices. In addition, it makes it possible to have a multi-brand network as an independent protocol, with devices from different providers communicating in the same network.
In order to be able to address the Modbus, the serial communication parameters must first be known or defined. These include baud rate, parity and stop bits. Furthermore, the client address (s) to be addressed by the server are added.

8.3.3 Application for networking of several CBS systems

The application for networking CBS systems is an application based on a server / client or client / server architecture. The controller first queries the server and then all connected clients in order to make the status of the clients available to the building management system.

9 Setting a customer-specific IP-address

The controller is delivered from the factory with a preset IP-address. The following describes how, if necessary, this IP-address can be changed.
The prerequisite for changing the IP-address of the IP-gateway for BACnet controllers is that the associated computer is connected to the controller via a network cable.

9.1 Preparing

Open Windows on your computer.

Open the settings menu. For that push the gear icon at the start menu. Setting menu opens.

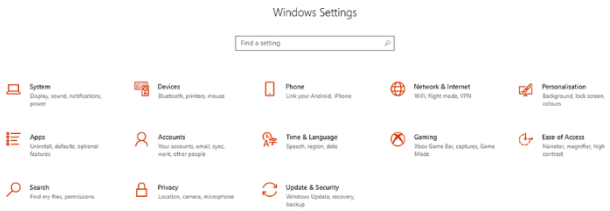
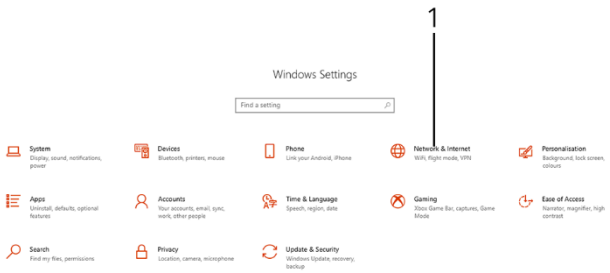


Figure 11: "settings " menu

Open the “Network settings and Internet” sub menu. For that push the Button “Network and Internet” at the settings menu.



1 Button Network and Internet

Figure 12: Menu „network settings and internet“

The Network controller sub menu opens.

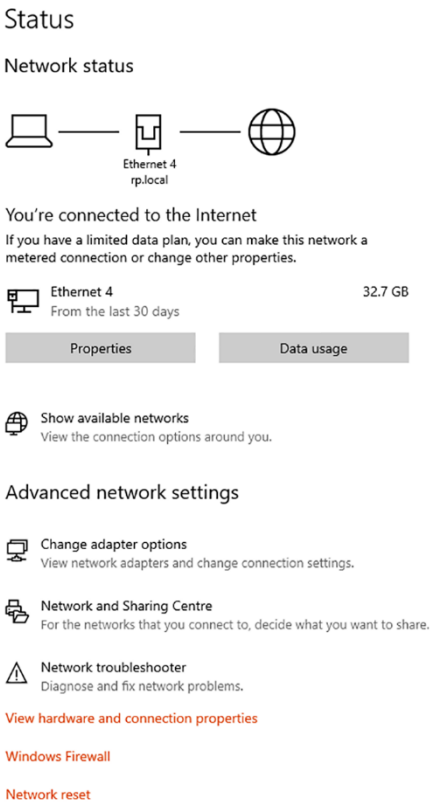
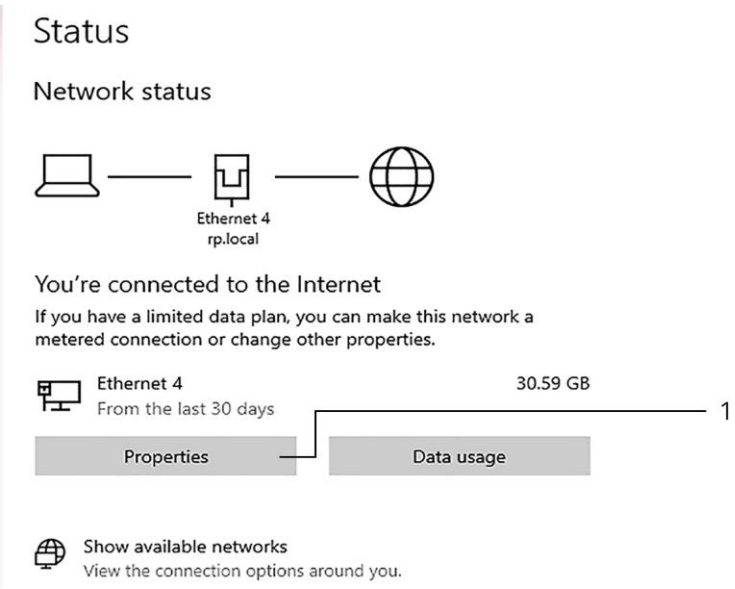


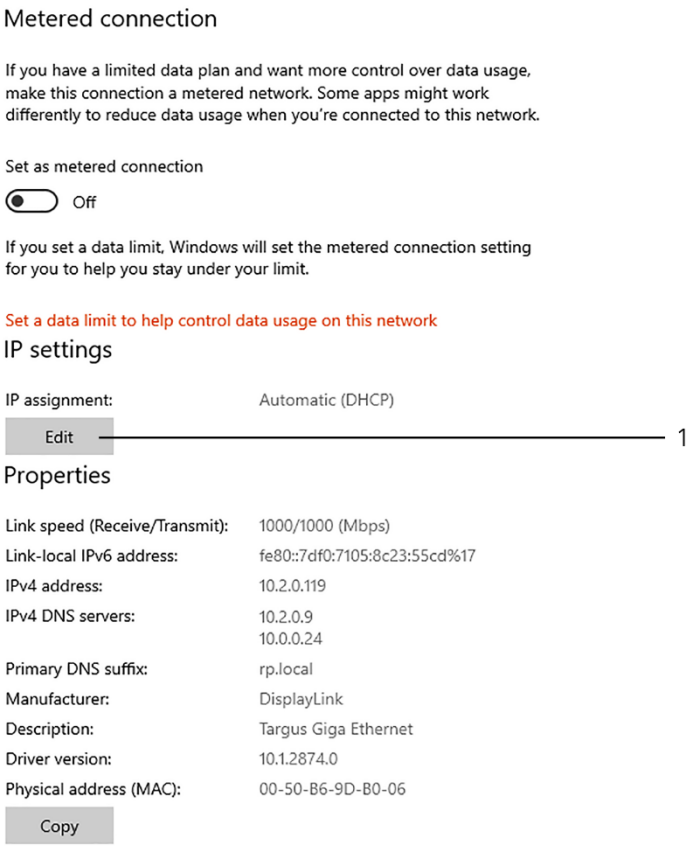
Figure 13: „Network controller sub menu“

Select the “Properties” submenu by pushing the “Properties” button.



1 Button Properties

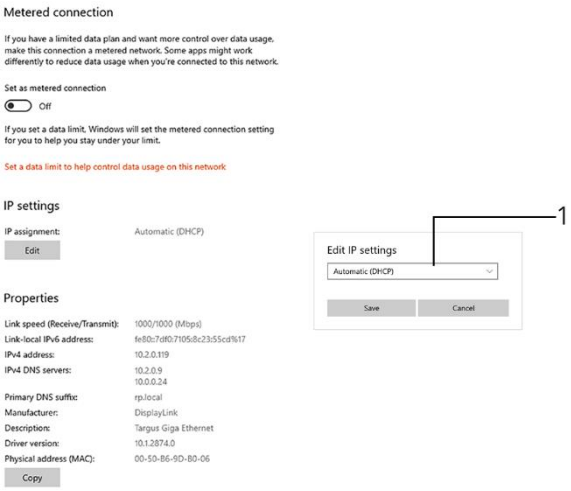
Figure 14: Select „Properties“ sub menu



1 Button „Edit“

Figure 15: "Edit" Button

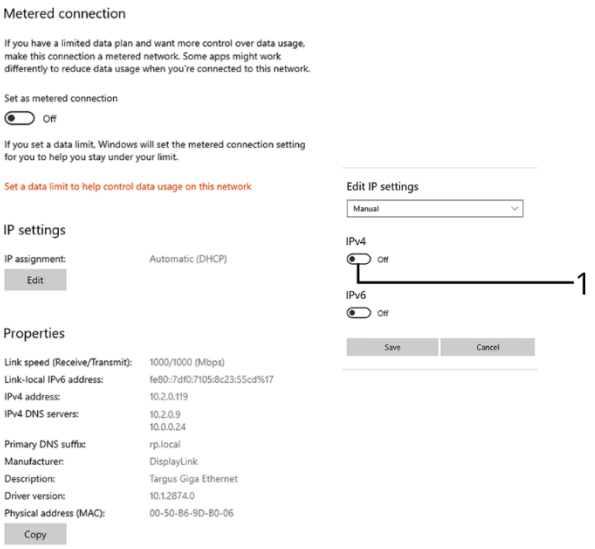
The "Edit IP-settings" window opens.
Open the "Edit IP-settings” menu and change to “Manual”.



1 Button Edit IP-settings

Figure 16: Automatic (DHCP) change to manual

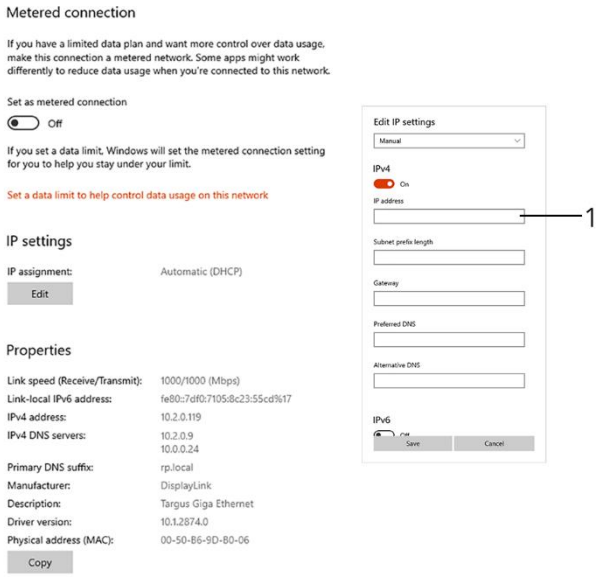
Change the “IPv4 switch” to on.



1 IPv4 switch

Figure 17: "Metered connection" menu with switch "PPv4"

The IP-address can be changed in the menu that opens. After that the new IP-address must be saved.

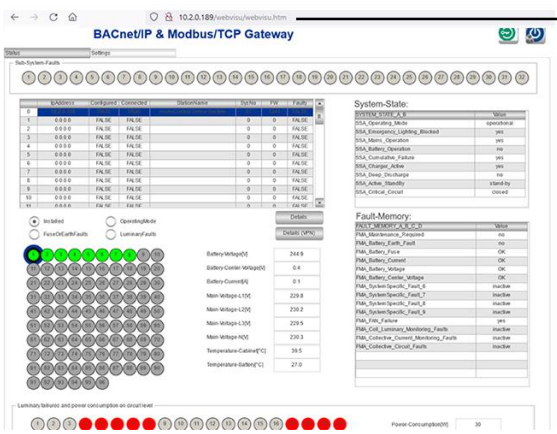


1 Put in IP-address

Figure 18: Put in IP-address

9.2 Change of the IP-address of the IP-gateway for BACnet controller

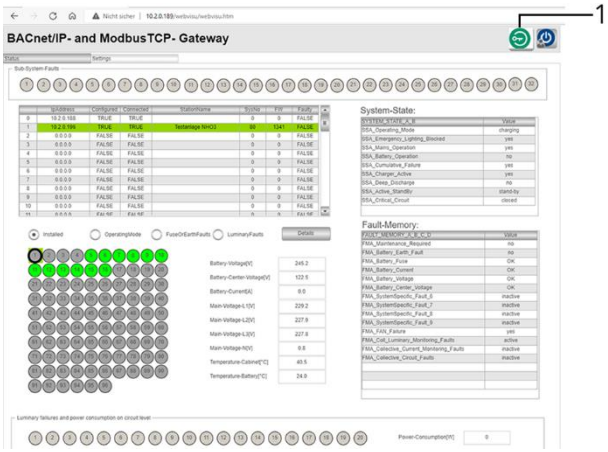
Enter number “192.168.5.100” in the command line



1 Command line

Figure 19: Enter number "192.168.5.100" in the commando line

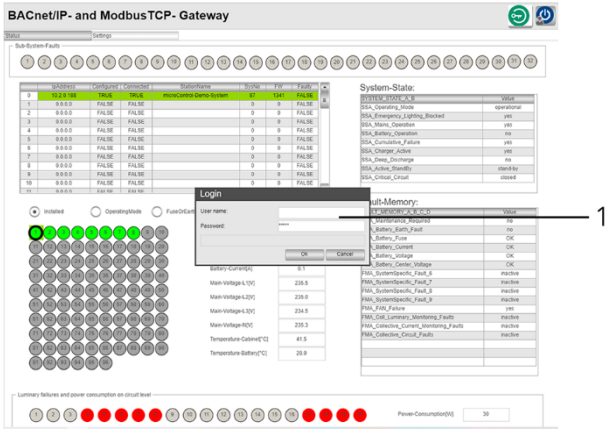
In the mask that opens, use the mouse to push the key symbol (right).



1 Button with key Symbol

Figure 20: Push "key" symbol

Login window opens.



1 Login Window

Figure 21: Login window

Enter via the keyboard field that opens:

User: operator
Password: ser

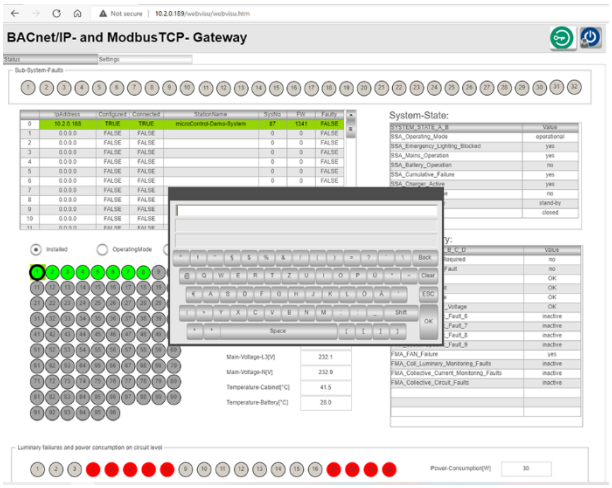
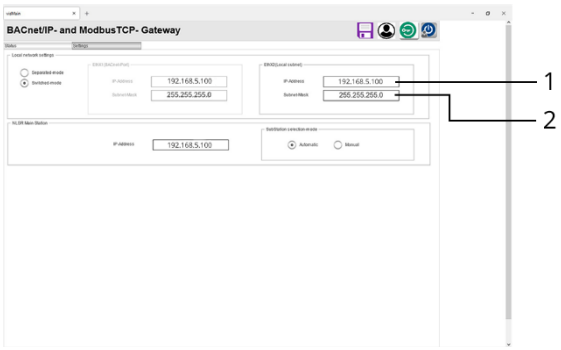


Figure 22: Virtual keyboard

The IP-address can be changed at this point.



1 standard IP-address
2 subnet IP-address

Figure 23: Local Network Settings menu

10 Function description

At first the controller reads the XML file from the main system. In addition to the data of the circuits / luminaires, this also includes the number of connected sub systems and their IPaddresses.

Then the XML files are read from the sub systems.

The registers of the Modbus interface to be created are stored in the XML files.
In addition, the information is also made available as BACnet objects
This is done in objects that are as structured as possible (BACnet Rev 1.14).
The XML files are then queried cyclically and the value in each case hand over as a process value.

The status of the lights are bit-coded and transmitted in a double word.
An update rate of approx. 1 minute is sufficient. If the system cannot be reached for more than 5 minutes, the values are marked accordingly (invalid).
Only the user interface HTTPS, Modbus and BACnet are open.

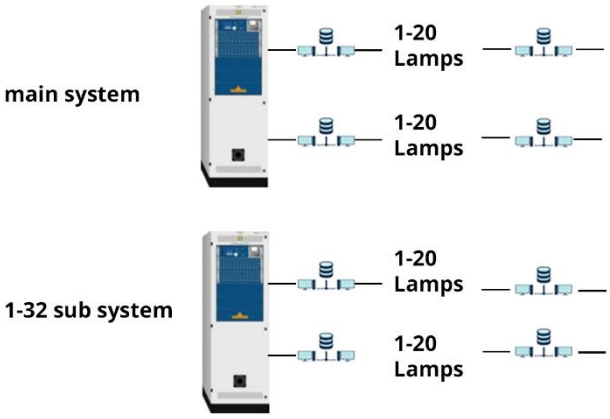


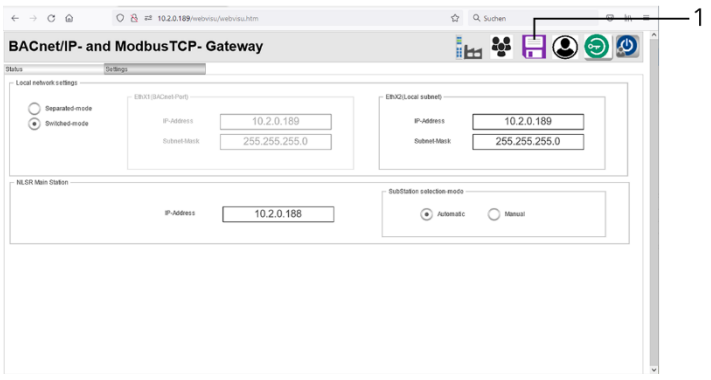
Figure 24: Systems networked via an external switch in connection with MC-BMS-EXT

11 Workflow on the construction site

The IP-addresses must match each other so that communication can take place. The IP-address of the controller can be freely set. By pushing the reset button for about 7 seconds, the controller has the standard IP-address 192.168.1.17
The following workflow must be adhered to:
Set the final IP-address via Web-Based Enterprise Management (WBEM).

This change will only take effect after the device has been restarted.

On the start page of the WebVisu, project-specific data can now be entered, which can also be used when assigning names for BACnet objects.
After entering the IP-address of the main system, the readout of the main system must be started by pressing the SAFE button.



1 SAFE button

Figure 25: Press the "SAFE" button

The following screen appears:

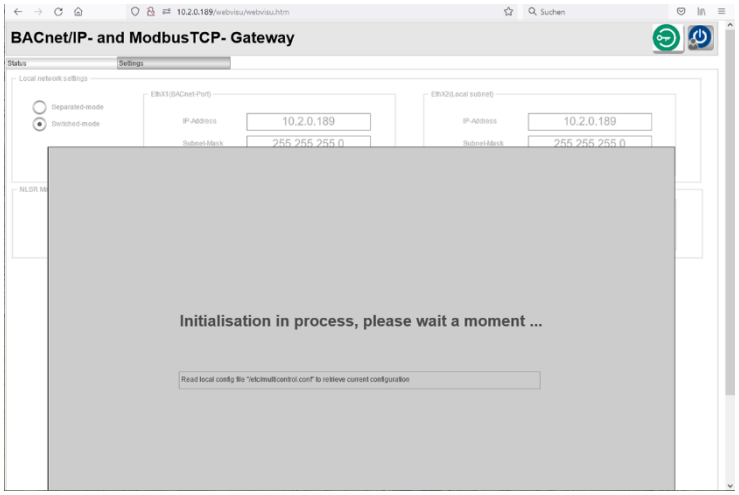


Figure 26: Screen initialisation in progress

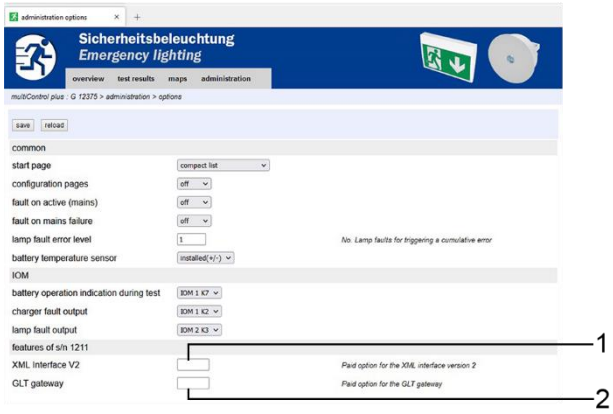
Setting the IP-address is completed.

12 Bringing into service of the controller

In order to be able to put the controller into operation, at first it must be released with an activation key. When purchasing an integrated controller (MC-BMSM), the activation key has already been pre-installed by the producer. In this case, no intervention by the customer is required. When purchasing an externally mounted controller (MC-BMS-EXT), first the customer must receive an activation key from the manufacturer.

In order to receive the activation key from the manufacturer, please have the serial number of the emergency lighting system ready (to find on the name plate of the system)!

As soon as the key is available, it must either be entered directly by the support of the producer or by the customer in a mask of the web interface.



1 XML Interface V2

2 Mask for entering the GLT gateway activation

Figure 27: Web Interface mask

13 Further functions and options for later additions

Further options for later additions are available:

- TLS encryption between the main system or the sub system and the controller
- Copy protection of the application (protection against reading out the application)
- Hardware with or without the logo
- Language changing (standard: English)
- Port forwarding or container (FTPS)
- Other IP-security functions
- MQTT interface

14 Data Points (system)

BACnet Object name	Object type (Units)	Modbus Register (hex)	Bit	Description
-	-	3000 - 30FC	-	**Reserved**
				GLT Gateway State
GatewayFault	BINARY_VALUE	30FD	0	Gateway fault (0=ok, 1=fault)
GatewayInitialized	BINARY_VALUE	30FD	1	Control unit has initialized the gateway (=1) or not (=0)
-	-	30FD	2 – 15	Reserved
GatewayUpdate-Counter	ANALOG_VALUE	30FD		**GLT Gateway Update Counter** Is increased with every data update by 1.
GatewayID	ANALOG_VALUE	30FE		**GLT Gateway ID** (Fixed value: 0x4757)
GatewayRevision	ANALOG_VALUE	30FF	-	**GLT Gateway Revision** (0..65535)
				System State
OperationMode	BINARY_VALUE	3100	0	Operation mode (0=Charging, 1=Operational)
CBSblocked	BINARY_VALUE	3100	1	Emergency lighting blocked (0=no, 1=yes)
MainsOperationActive	BINARY_VALUE	3100	2	Main operation (0=no , 1=yes)
BatteryOperation Active	BINARY_VALUE	3100	3	Battery operation (0=no, 1=yes)
CummulativeFault	BINARY_VALUE	3100	4	Cumulative fault (0=ok, 1=active)
ChargerFault	BINARY_VALUE	3100	5	Charger (0=inactive, 1=active)
DeepDischargeFault	BINARY_VALUE	3100	6	Deep discharge (0=ok, 1=active)
ActiveOnMains	BINARY_VALUE	3100	7	Active on mains (0=ok, 1=active)
CriticalCircuitActive	BINARY_VALUE	3100	8	Critical Circuit (0=closed, 1=open)
-	-	3100	9 – 15	Reserved
				System State
-	-	3101	0 – 15	Reserved
				Fault memory A (Fault: 0=inactive, 1=active)
MaintenanceRequired	BINARY_VALUE	3102	0	Maintenance required (0=no, 1=yes)
BatteryEarthFault	BINARY_VALUE	3102	1	Battery earth fault (0=no, 1=yes)
BatteryFuseFault	BINARY_VALUE	3102	2	Battery fuse fault (0=no, 1=yes)
BatteryCurrentFault	BINARY_VALUE	3102	3	Battery current fault (0=ok, 1=invalid range)
BatteryVoltageFault	BINARY_VALUE	3102	4	Battery voltage fault (0=ok, 1=invalid range)
BatterySymmetry-Fault	BINARY_VALUE	3102	5	Battery symmetry fault (0=ok, 1=invalid range)
DCM_fault	BINARY_VALUE	3102	6	DCM fault
LDM_fault	BINARY_VALUE	3102	7	LDM fault
IOM_fault	BINARY_VALUE	3102	8	IOM fault
SAM_fault	BINARY_VALUE	3102	9	SAM fault
Fan_fault	BINARY_VALUE	3102	10	Fan fault
Luminary_fault	BINARY_VALUE	3102	11	Lamp fault (cumulative fault from lamp monitoring)
CircuitCurrent_fault	BINARY_VALUE	3102	12	Current fault (Cumulative fault from current monitoring)
Circuit_fault	BINARY_VALUE	3102	13	Circuit fault (Cumulative fault: earth, fuse)

BACnet Object name	Object type (Units)	Modbus Register (hex)	Bit	Description
-	-	3102	14 – 15	Reserved
-	-	-	-	**Fault memory B**
	BINARY_VALUE	3103	0 – 15	Reserved
-	-	-	-	**Fault memory C**
	BINARY_VALUE	3104	0 – 15	Reserved
-	-	-	-	**Fault memory D**
	BINARY_VALUE	3105	0 – 15	Reserved
-	-	-	-	**Sub system fault** (1 to 16)
Sub system_01_fault	BINARY_VALUE	3106	0	Sub system 1 (0=ok, 1=fault)
-	-	-	-	-
Sub system_16_fault	BINARY_VALUE	3106	15	Sub system 16 (0=ok, 1=fault)
-	-	-	-	**Subsystem fault** (17 to 32)
Sub system_17_fault	BINARY_VALUE	3107	0	Sub system 17 (0=ok, 1=fault)
-	-	-	-	-
Sub system_32_fault	BINARY_VALUE	3107	15	Sub system 32 (0=ok, 1=fault)
BatteryVoltage	ANALOG_VALUE (VOLTS)	3108	0 – 15	**Battery voltage** (Resolution 0,1V)
BatterySymmetry Voltage	ANALOG_VALUE (VOLTS)	3109	0 – 15	**Battery symmetry** (Resolution 0,1V)
BatteryCurrent	ANALOG_VALUE (AMPERES)	310A	0 – 15	**Battery current** (Resolution 0,1V)
MainsVoltageL1	ANALOG_VALUE (VOLTS)	310B	0. – 15	**Mains voltage L1** (Resolution 0,1V)
MainsVoltageL2	ANALOG_VALUE (VOLTS)	310C	0 – 15	**Mains voltage L2** (Resolution 0,1V)
MainsVoltageL3	ANALOG_VALUE (VOLTS)	310D	0 – 15	**Mains voltage L3** (Resolution 0,1V)
MainsVoltageN	ANALOG_VALUE (VOLTS)	310E	0 – 15	**Mains voltage N** (Resolution 0,1V)
CabinetTemperature	ANALOG_VALUE (DEGREES_CELCIUS)	3110	0 – 15	**Temperature cabinet** (Resolution 0,1°C)
BatteryTemperature	ANALOG_VALUE (DEGREES_CELCIUS)	3111	0 – 15	**Temperature battery** (Resolution 0,1°C)
-	-	-	-	**Number of circuits**
FirstCircuit	ANALOG_VALUE	3200	0 – 7	First circuit (1..96)
LastCircuit	ANALOG_VALUE	3200	8 – 15	Last circuit (1..96)
Circuit_01_to_16_ installed	ANALOG_VALUE (1)	3201	0 – 15	**Circuit 1 to 16 installed** Circuit 1 (Bit 0: 0=not installed, 1=installed)
Circuit_17_to_32_ installed	-	3202	0 - 15	**Circuit 17 to 32 installed** Circuit 17 (Bit 0: 0=not installed, 1=installed)
Circuit_33_to_64 installed Circuit_65_to_96 installed	ANALOG_VALUE (1)	3203 –3206		**Circuit 33 to 96 installed**
Circuit_01_to_32_mode Circuit_33_to_64_mode Circuit_65_to_96_mode	ANALOG_VALUE (1)	3209 –320E		**Circuit 1 to 96 operation mode** (0=maintained, 1=non-maintained)

Circuit_01_to_32_fault Circuit_33_to_64_fault Circuit_65_to_96_fault	ANALOG_VALUE (1)	3211 – 3216		Circuit 1 to 96 fault (0=ok, 1=fault: Fuse or earth fault)
Circuit_01_to_32 fuse fault Circuit_33_to_64 fuse_fault Circuit_65_to_96 fuse_fault	ANALOG_VALUE (1)	3219 – 321E		**Circuit 1 to 96: Fuse** (0=ok, 1=fuse fault) Each circuit is assigned bit value: Bit 3219.0: Circuit 1 Bit 3219.1: Circuit 2 ...
Cicuit_01_to_32 earth_fault Ciruit_33_to_64 earth_fault Ciruit_65_to_96 earth_fault	ANALOG_VALUE (1)	3221 – 3226		**Circuit 1 to 96: Earth fault** (0=ok, 1=earth fault)
Circuit_01_to_32 curent_fault Circuit_33_to_64 current fault Circuit_65_to_96 current_fault	ANALOG_VALUE (1)	3229 – 322E		**Circuit 1 to 96: Current monitoring** (on circuit level)
Circuit_01_power	ANALOG_VALUE (WATTS)	3231		**Circuit 1: Power** (Power during last test; Resolution 1W)
-	-	-		**-**
Circuit_96_power	ANALOG_VALUE (WATTS)	3290		**Circuit 96: Power** (Power during last test; Resolution 1W)
Circuit_01_to_32 luminary_fault Circuit_33_to_64 luminary_fault Circuit_65_to_96 luminary_fault	ANALOG_VALUE (1)	3352 – 3356		**Circuit 1-96 Lamp faults** (Summarized lamp fault on circuit level)
Circuit_01_lumi-nary_fault_01_to_20	ANALOG_VALUE (1)	3359 – 335A		**Circuit 1: Lamp faults** (on lamp level 1-20) (Bit 3359.0: Lamp 1, Bit 3359.1: Lamp 2, ... Bit 335A.3: Lamp 20)
-	-	-		-
Circuit_96_lumi-nary_fault_01_to_20	ANALOG_VALUE (1)	3417 – 3418		**Circuit 96: Lamp faults** (on lamp level 1-20) (Bit 3417.0: Lamp 1, Bit 3417.1: Lamp 2, ...Bit 3418.3: Lamp 20)
not available	-	34BD	-	**System name** (43 chars) (22 registers) Low- and High-byte contain an ASCII-char.
SystemNumber	ANALOG_VALUE	34E8	-	**System number** (32 Bit)
SystemFirmware Version	ANALOG_VALUE	34EA	-	**NLSR firmware version** (16 Bit)
System IP address	ANALOG_VALUE	34EC 34ED	-	**System IP-address** (32 Bit)

Table 1: Date points (system) 2

15 Technical Data

15.1 Application descriptions

15.1.1 Environmental conditions

The controller may only be operated under the following conditions:

- environment temperature: 0°C bis 55 °C,
- humidity : until 85% (not condensing).
- without temperature derating: 0 bis 2000 m; with temperature-derating: 2000 to 5000 m (0,5 K/100 m);
  max: 5000 m

15.2 Controller

Communication	Modbus (TCP, UDP) ETHERNET Modbus RTU RS-232-Interface RS-485-Interface EtherNet/IPTM-Adapter (Client), Libary for e!RUNTIME EtherCAT-Server, requires an additional license MQTT
ETHERNET-Logs	HCP DNS NTP FTP FTPS SNMP HTTP HTTPS SSH
Visualisation	Web-Visu
operating system	Real-time Linux (with RT preemption patch)
CPU	Cortex A8; 1 GHz
visualization language	English

15.3 Connection Data	
connection technology communication / fieldbus	Modbus TCP/UDP: 2 x RJ-45; Modbus RTU: 1 x Rifle D-Sub 9; RS-232 Interface 1 x BRifle D-Sub 9; RS-485-Interface 1 x Rifle D-Sub 9
connection technology: system supply	2 x CAGE CLAMP®
connection Technology field supply	6 x CAGE CLAMP®
connection type 1	System / field supply
15.3.1 Geometric Data Controller	
width	78,6 mm / 3.094 inch (7508212/00/100) 65,0 mm / 2.559 inch (752-8303/8000-002)
depth	71,9 mm / 2.831 inch (7508212/00/100) 123,0 mm / 4.843 inch (752-8303/8000-002)
depth (from top edge) mounting rail	64,7 mm / 2.547 inch (7508212/00/100) 115,0 mm / 4.528 inch (7508212/00/100)
15.3.2 Mechanical Data Controller	
weight	214,8 g (7508212/00/100) 600,0 g (7508212/00/100)
color	light grey
housing material	Polycarbonat, Polyamid 6.6 (7508212/00/100) Aluminium power coated
15.3.3 Power adapter 24 VInput 15.3.4 Input	
phases	1
nominal input voltage $U_{e\ Nenn}$	1 x AC 100 … 240 V
input voltage range	AC 90 … 264 V
input voltage derating	-2 %/V (< AC 100 V)
nominal line frequency range	47 … 63 Hz

15.3.5 Output	
nominal output voltage $U_{a\ Nenn}$	DC 24 V (SELV)
rated output current $I_{a\ Nenn}$	0,5 A
output power rating	12 W
control deviation	≤ 1 %
control deviation, dynamic load change 10 … 90 %	≤ 1 %
15.3.6 Fuse	
internal fuse	T 1 A / AC 250 V
Fuse that must be connected upstream	An external DC fuse is required for DC input voltage.
15.3.7 Security and Protection	
isolation voltage (Pri.-Sek.)	DC 4,242 kV
protection class	II
type of protection	IP20 (according to EN 60529)
backfeed resistance	≤ DC 31 V
overvoltage category	II
15.3.8 Connection data	
connection type 1	Input
connection technology	Push-in CAGE CLAMP®
solid conductor	0,2 … 2,5 mm² / 24 … 12 AWG
Fine-stranded conductor	0,2 … 2,5 mm² / 24 … 12 AWG
15.3.9 Geometric data	
width	18 mm / 0.7 inch
hight	90 mm / 3.543 inch
depth	55 mm / 2.165 inch
15.3.10 End module 15.3.11 Geometric Data	
width	12 mm / 0.472 inch
hight	100 mm / 3.937 inch
depth	69,8 mm / 2.748 inch

16 Glossary

Term	Definition
ANSI	American National Standard Institute
ASHARE	ASHRAE Standard is a room air standard for thermal environmental conditions with human use.
BACnet	BACnet Building Automation and Control Networks is a data transmission protocol for building automation and building control.
baud rate	The baud rate is the specification of how often a signal changes its state in a communication channel. The unit is given in baud or bd. The baud rate is sometimes referred to as the symbol rate.
bit coded	Coded in binary
datenframe	In an Ethernet network, devices share data packets with each other, which are also called Ethernet packets. Their content is i.a. the Ethernet frame (also often referred to as a data frame in German), which in turn is divided into several data records.
double-word	A data word or just a word is a certain amount of data that a computer can process in one step in the arithmetic-logic unit of the processor. Twice a word - in the respective context - is called a double word (English double word, DWord for short) or long word.
ethernet	Ethernet is a technique that specifies software (protocols, etc.) and hardware (cables, distributors, network cards, etc.) for wired data networks. It enables the exchange of data in the form of data frames between the devices (computers, printers and like).
fieldbus	A field bus is a bus system that contains field devices such as measuring probes (sensors) and actuators (actuators) in a plant for the purpose of communication with an automation device connects.
FTPS	FTP over SSL or FTP over TLS, or FTPS for short, is a method for encrypting the File Transfer Protocol (FTP).
gateway	In computer science, gateway refers to a component (hardware and / or software) that establishes a connection between two systems.
HTTPS	Hypertext Transfer Protocol Secure (HTTPS, English for "secure hypertext transfer protocol") is a communication protocol in the World Wide Web with which data can be transmitted securely against eavesdropping. It represents a transport encryption.
IP-address	IP-address is the abbreviation for Internet Protocol. Every computer, server, device, mobile phone, etc. that is connected to the Internet is assigned a globally unique IP-address.
Modbus	Modbus is a communication protocol that enables data to be exchanged between a server and multiple clients.

Modbus/IP-address	IP-address of the associated Modbus interface
MQTT	Message Queuing Telemetry Transport (MQTT) is an open network protocol for machine-to-machine communication (M2M) that enables the transmission of telemetry data in the form of messages between devices, despite high delays or limited networks. [1] Corresponding devices range from sensors and actuators, cell phones, embedded systems in vehicles or laptops to fully developed computers.
parity	Evenness of the number of bits set in a binary word.
process value	Controlled variable, actual value in the control loop.
serial interface	The serial interface is a colloquial term for an interface for data transmission between two devices, in which individual bits are transmitted one after the other (serial data transmission)
stopbit	The stop bit is a discrete-character synchronization element that indicates the end of an asynchronous character. Like the start bit, the stop bit can be a single discrete bit or a bit combination of several bits.
sub net	A sub net is a sub net of a network in the Internet Protocol (IP-address). It combines several consecutive IP-addresses by means of a sub net mask at binary boundaries under a common front part, the prefix.
switch	Switch refers to a coupling element in computer networks that connects network segments with one another. Within a segment, it ensures that the data packets, so-called “frames”, arrive at their destination.
TLS encryption	TLS stands for "Transport Layer Security" and is a protocol for encrypting data transmissions on the Internet. It is better known under its predecessor name SSL (Secure Sockets Layer).
Web-based-enterprise-management	Web-Based Enterprise Management (WBEM) is a collective term for a set of standard functions for the administration and remote maintenance of computer systems in managed environments.
XML-File	An .xml file extension is an Extensible Markup Language (XML) file. These are actually just plain text files that use custom tags to describe the structure and other functions of the document.