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Re**m**ote **C**ontrol **U**nit -- **M**-Bus **i**ntegrated **D**ata **A**pplication **S**erver **S**ystem

+

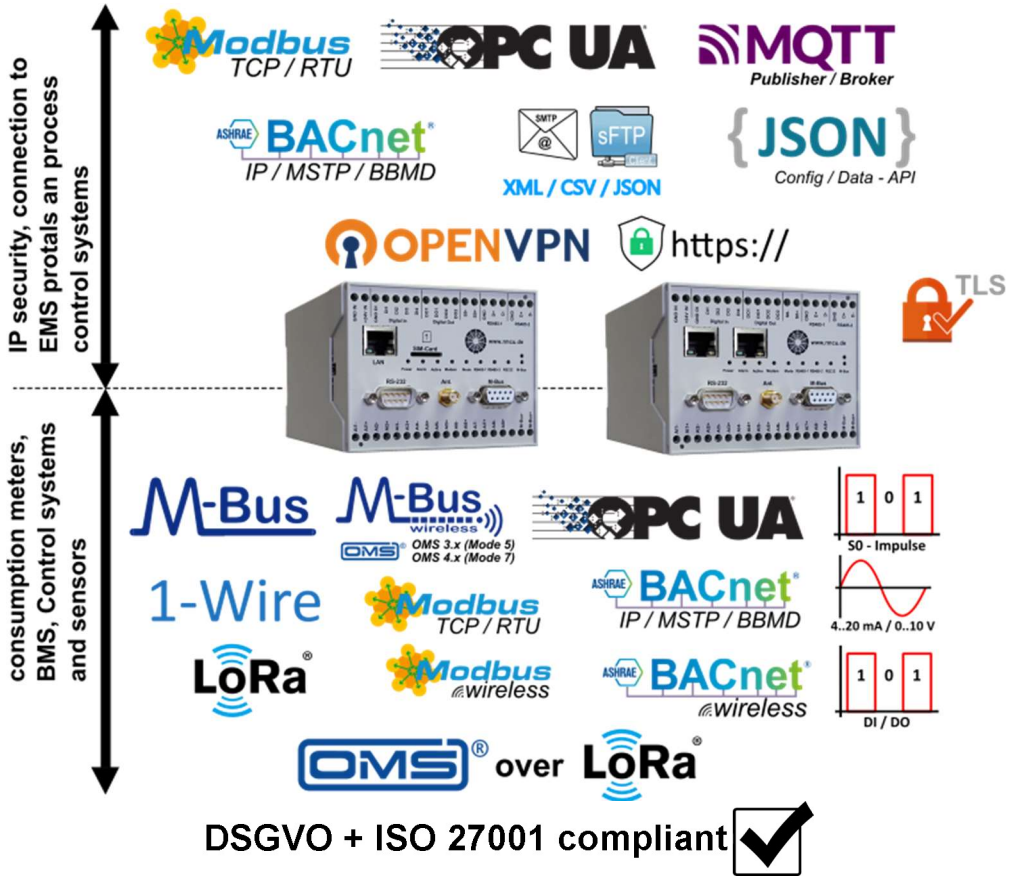
RmCU / MiDASS V4.0

Firmware 6.10.x, June 2025

RmCU V4.0 DIN Rail

RmCU V4.0 DIN Rail IT / IOT - 2x RJ45

MiDASS V4.0 Allround Indoor/Outdoor



DSGVO + ISO 27001 compliant ☑

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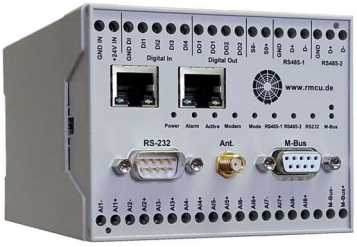
1 Device types

RmCU (DIN Rail)

1x Ethernet Interface



2x Ethernet-Interface for IT/OT separation

Standard features:

- 4 GB Data-Storage
- State LEDs
- CSV/XML/JSON-Interfaces
- FTP / SFTP, HTTP / HTTPS
- Ethernet 100 Mbit/s (RJ45)
- configurable Web-Interface
- Email dispatch (S/MIME)
- Display of measured values

Modules & additional Options:

max. 16 GB Storage	LTE/UMTS/GRPS mobile modem	second RJ45 – network-interface

4 possible slots

LoRa Gateway	M-Bus 20/65 – internal Level converter	M-Bus 120/250 – external Level converter	M-Bus wireless External Modul
1-Wire	Modbus RTU (RS-485)	BACnet MSTP (RS-485)	Modbus wireless (RS-485)
BACnet wireless (RS-485)	S0 - Impuls	DI / DO	4..20 mA / 0..10 V

Firmware-Extensions

Modbus TCP	BACnet IP	OPC UA	MQTT Publisher / Broker / Subscriber
JSON Config / Data - API	OPENVPN	Alarm-Management	IP-Routing

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Remote Control Unit -- M-Bus integrated Data Application Server System

MiDASS Indoor / Outdoor

Allround Indoor/Outdoor-housing

Outdoor (Alu-) housing

Standard features:

- 4 GB Daten-Storage
- State LEDs
- CSV/XML/JSON-Interface
- FTP / SFTP, HTTP / HTTPS
- Ethernet 100 Mbit/s (RJ45)
- configurable Web-Interface
- Email dispatch (S/MIME)
- Display of measured values

Modules & additional Options:

max. 16 GB Storage	LTE/UMTS/GRPS mobile modem

4 possible slots

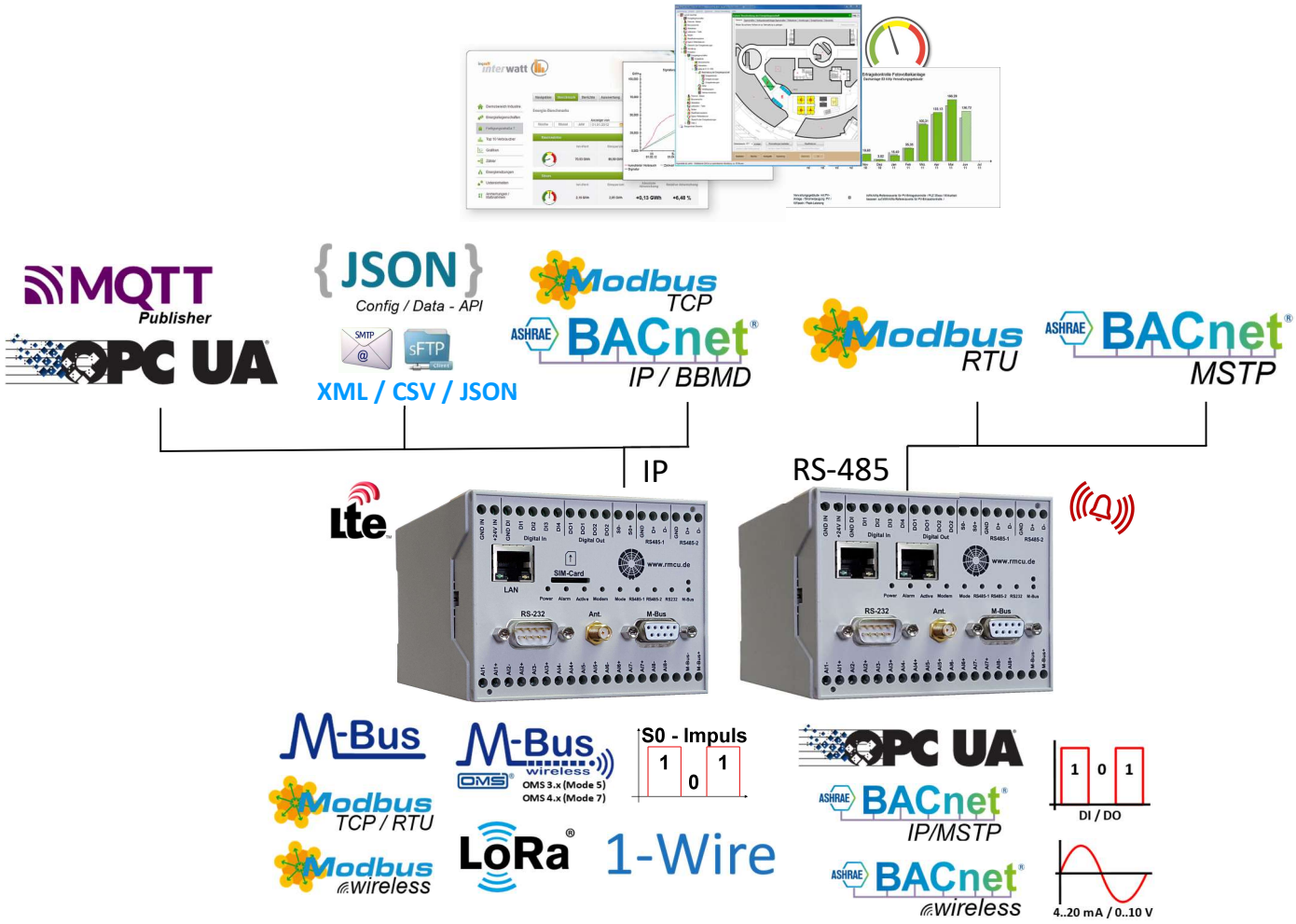
LoRa Gateway	M-Bus 20 – internal Level converter	M-Bus wireless External Modul	1-Wire
Modbus RTU (RS-485)	BACnet MSTP (RS-485)	Modbus wireless (RS-485)	BACnet wireless (RS-485)
S0 - Impuls	DI / DO		

Firmware-Extensions

Modbus TCP	BACnet IP	OPC UA	MQTT Publisher / Broker / Subscriber
{ JSON } Config / Data - API	OPENVPN	Alarm-Management	IP-Routing

2 System connections

Connection to energy management portals (ISO 50001)



- Automated time-controlled recording of measured values
- Interfaces to the main ISO 50001 / Smart Meter portals via:
  - freely configurable XML-interface
  - freely configurable CSV- interface
- Automated data transfer via SMTP (e-mail) or SFTP/FTP
- Time synchronization via NTP
- Status flag for detecting problems with the sensor system
- Simple addition of new physical measured variables

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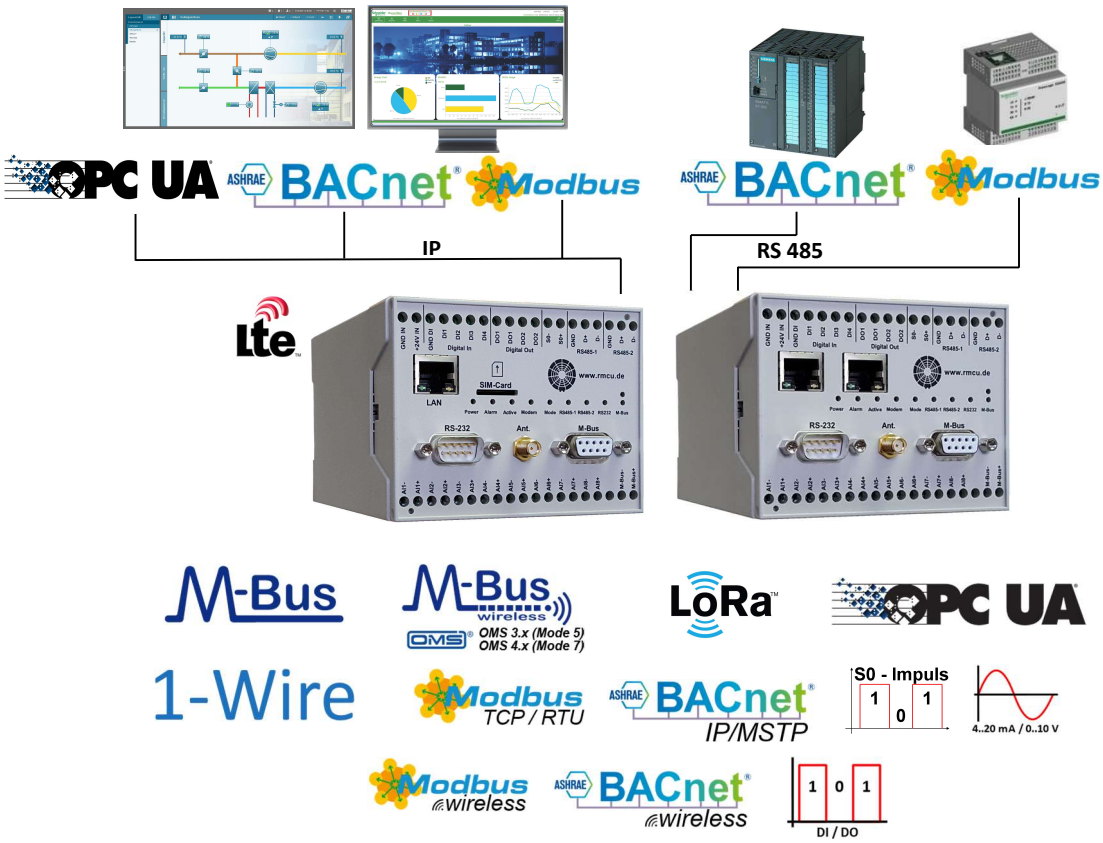
Connection to process control systems and building management systems via Modbus / BACnet / OPC UA



Modbus

- Simple connection via a Modbus TCP server with max. 16 parallel sessions
- Simple connection on site via a Modbus RTU server via RS-485 / RS-232
- Display of the connected sensors via a Modbus device address
- Free selection of the parameters to be displayed via the web interface
- Free assignment of Modbus register addresses
- Any sensors recorded on various protocols can be displayed with their own Modbus device addresses for the higher-level system

BACnet

- Simple connection via an integrated BACnet IP/MSTP server
- Free selection of the parameters to be displayed via the web interface

OPC UA

- Simple connection via an integrated OPC UA server
- Free selection of the parameters to be displayed via the web interface

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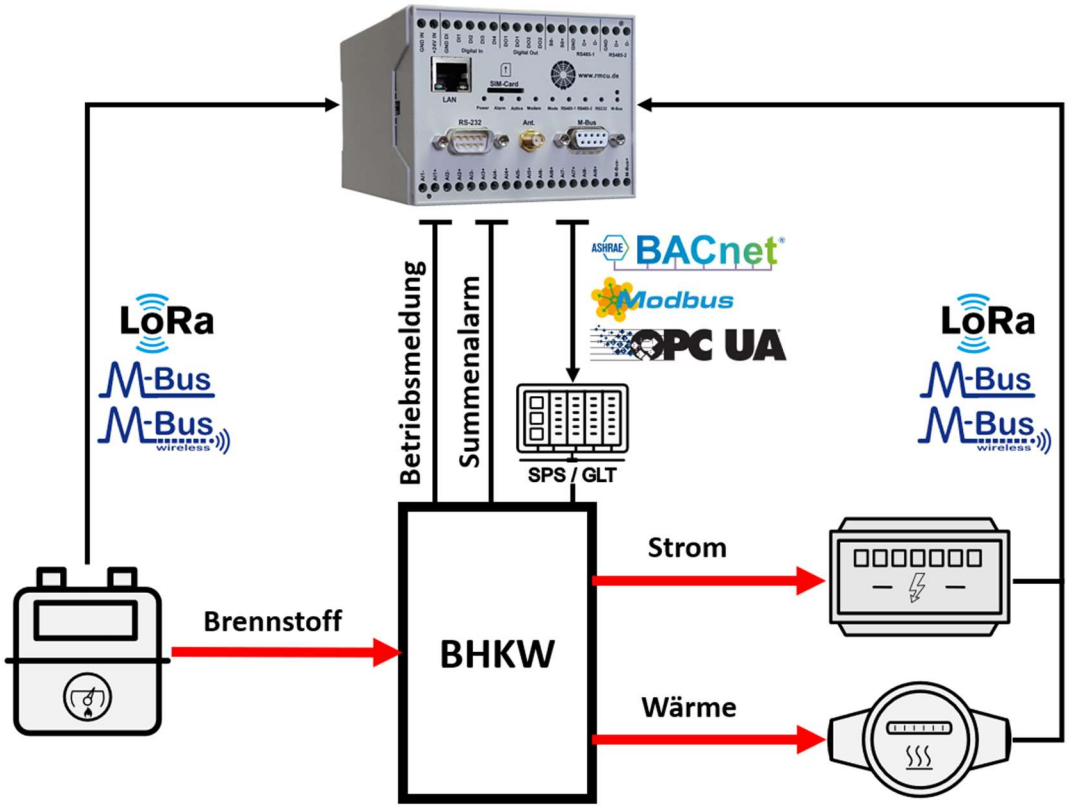
Connection of energy systems such as CHP units



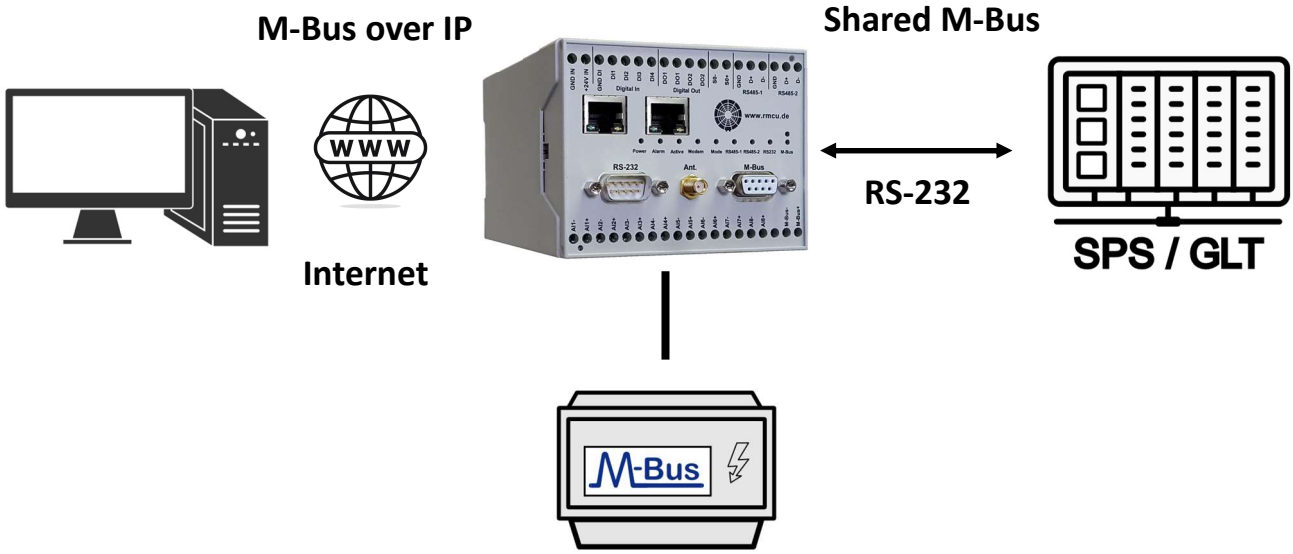
- Recording of all measured values for the creation of energy balances and calculation of efficiency levels
- Generation of alarm messages in the event of system failure
- Direct access to the CHP control system via Modbus, OPC UA or BACnet

3 Features / additional Options / Modules

M-Bus	DIN EN 13757-3	M-Bus Master	Member of OMS
M-Bus wireless	DIN EN 13757-4	M-Bus Master (S1,T1,C1 OMS 3+4)	Member of OMS
LoRa	ISM 868 MHz	LoRa Concentrator	
OPC UA	IEC 62541	OPC UA Server / Client	
Modbus	IEC 61158	TCP/RTU Client TCP/RTU Master	
Modbus wireless	IEC 61158	RTU Client RTU Master	
BACnet	ISO 16484-4	IP/MSTP Client IP/MSTP Master	
BACnet wireless	ISO 16484-4	MSTP Client MSTP Master	
MQTT	ISO 20922	MQTT Client (Publisher)	
{JSON}	RFC 8259 ECMA-404	Data (Push & Pull) Config API	
S0 - Impuls 1 0 1	DIN EN 62053-31	Interner µ-Controller	
1-Wire	Maxim Spec.	1-Wire Master	
4..20 mA / 0..10 V		Analog Input 4-20 mA / 0-10 V	
1 0 1 DI / DO		Digital Input	

3.1 M-Bus

Wired M-Bus



M-Bus:

- internal M-Bus level converter for 20/65 M-Bus loads
- external M-Bus level converter for up to 250 M-Bus loads
- Shared M-Bus
  - The connected M-Bus consumption meters can be addressed **simultaneously** by a BMS or another data logger. RmCU replaces the M-Bus level converter of the BMS
- M-Bus over IP
  - Remote configuration of any M-Bus slaves with manufacturer-specific tools
- Logging of the M-Bus protocols
- automatic M-Bus evaluation in accordance with DIN EN 13757-3
- generation and management of device-specific M-Bus drivers on an XML basis
- Scan via primary and secondary addresses
- Automatic and manual assignment of primary addresses
- Direct M-Bus access on site

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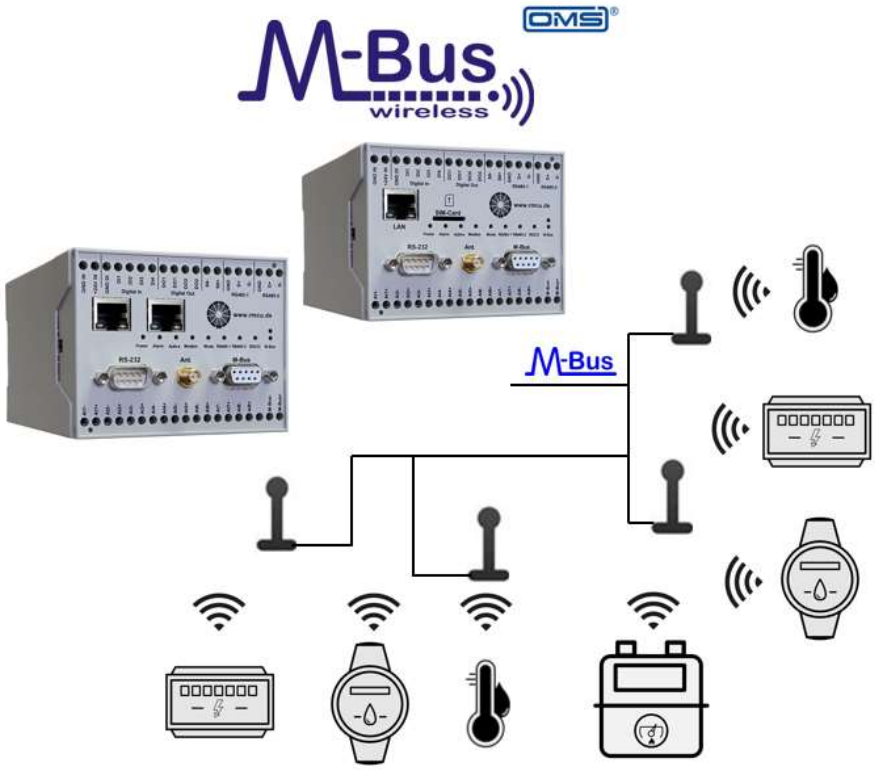
Wireless M-Bus (433 / 868 MHz)



Wireless M-Bus:

- internal wireless M-Bus receiver
- up to 4 external wM-Bus receivers (connected via M-Bus)
- automatic M-Bus evaluation in accordance with DIN EN 13757-4
- Support of the unidirectional modes S1, T1 + C1
- AES encryption OMS 3.x (Mode 5) and OMS 4.x (Mode 7)
- Generation and management of device-specific M-Bus drivers on an XML basis
- Logging of the wM-Bus protocols

3.2 LoRaWAN (EU868 / US915)

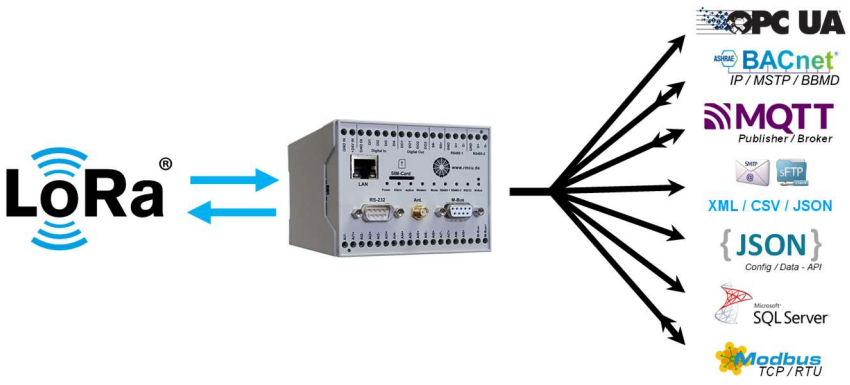
LoRa Basestation Features:

- LoRaWAN Receiver (EU868 MHz, 8 Channels / US-915 MHz)
- LoRaWAN Network Server
- LoRaWAN Application Server
- Support of LoRaWAN Sensoren Class A and Class C

Activation Modes:

- ABP (Activation By Personalization) Mode (DevAddr / NwkSKey / AppSKey)
- OTAA (Over-The-Air Activation) Mode (DevEUI / AppKey)

Decryption of the uplink messages of the end nodes, parsing of the payload
(Sensor-specific parser adaptation necessary)

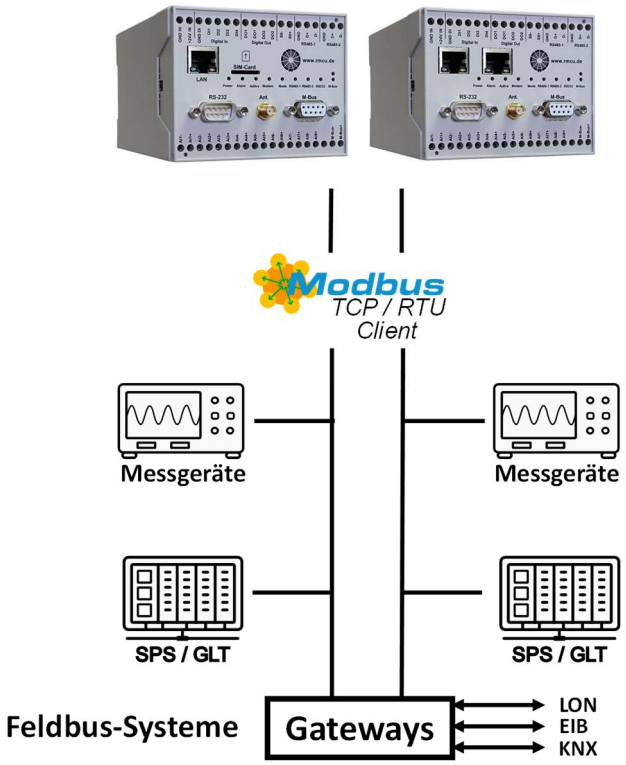


(You can find a more detailed description in our LoRa data sheet)

3.3 Modbus

Modbus TCP/RTU Client (Master)

The Modbus TCP/RTU client integrated in RmCU/MiDASS can be used to read data from any Modbus TCP/RTU controllers and consumption meters.



- Baud rate: 1200, 2400, 4800, 9600 (Default), 19200, 38400, 57600 and 115200
- Data bits: 5, 6, 7 or 8 (Default)
- Parity: none [n] (Default), even [e] or odd [o]
- Stoppbit: 0, 1 (Default) or 2
- Connection of up to 31 Modbus RTU devices
- Connection of up to 250 Modbus TCP devices
  - ➢ parallel queries from up to 8 Modbus servers (slaves)
- Generation and management of device-specific Modbus drivers on an XML basis
- Support of multi-register queries
- Direct access to Modbus TCP devices
- Modbus register data type test for plausibility checks

Modbus TCP/RTU Server (Slave)

All recorded measurement data can be made available to other devices via Modbus TCP/RTU server (slave).

- Provision of up to 65535 mode input and holding registers
- Parallel polling of up to 16 Modbus TCP clients
- Support of set coils and set holding register functions (commands) for switching the device's relays or LoRaWAN actuators or setpoint specifications for LoRaWAN thermostats
- Each recorded measuring point can be made available to higher-level systems under its own Modbus device address. The individual measured values can be assigned to individual register addresses (freely adjustable)
- Recorded measured values can be displayed with different data types (float, int, uint, double, string)

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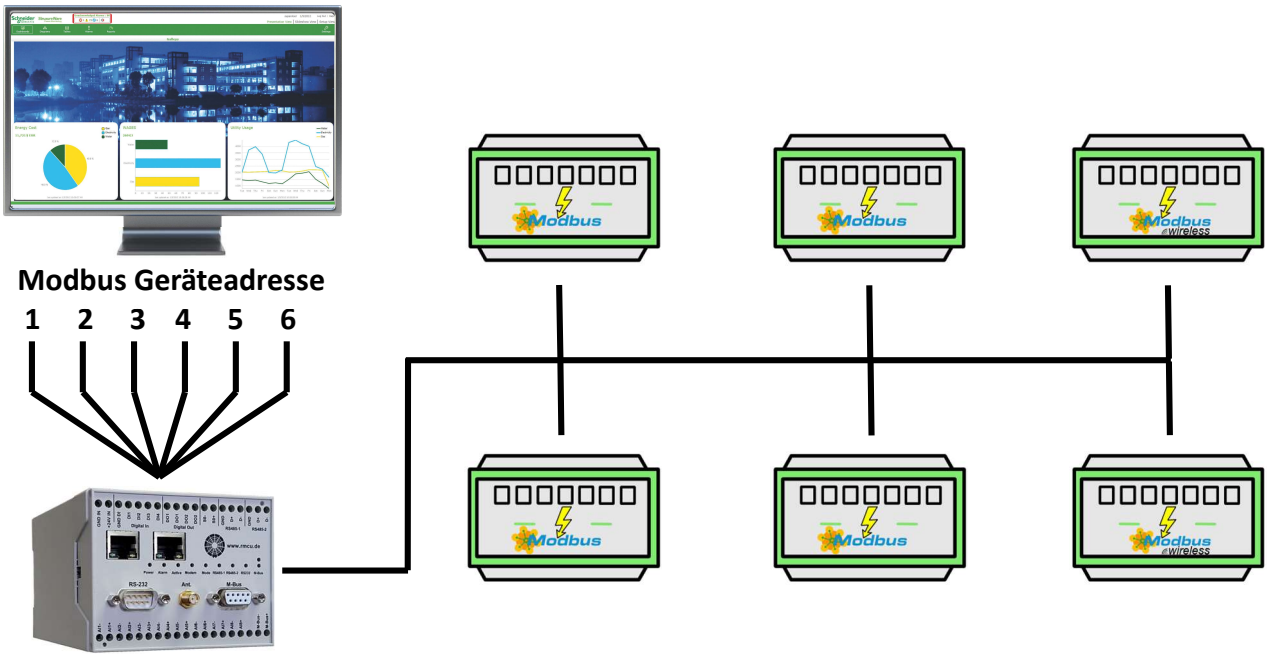
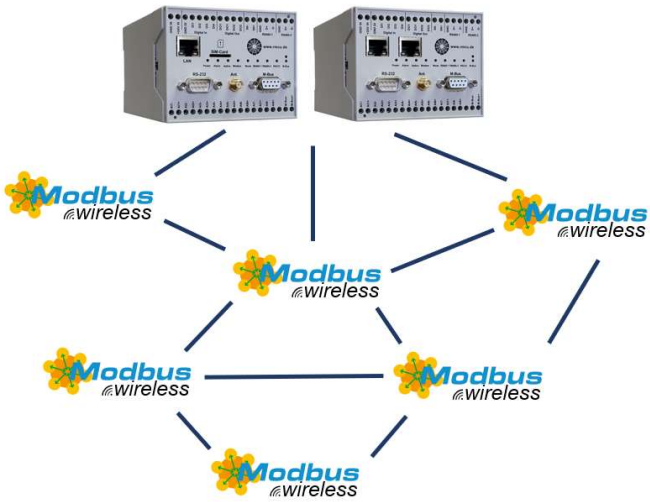
Modbus RTU/TCP - Transparent access



- Transparent access via Modbus TCP/RTU to all connected Modbus RTU and Modbus TCP devices
- Automatic conversion of Modbus “TCP” → “RTU” and “RTU” → “TCP”

Wireless Modbus

wModbus extends the Modbus protocol with a mesh network for wireless communication. This extension allows the exchange of control and monitoring data between different devices and systems without physical cabling. This simplifies the installation and expansion of automation systems.

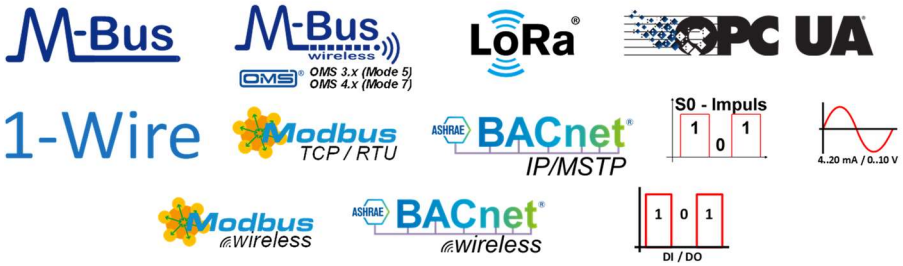


- Connection of up to 100 wModbus servers
- Robust against interference
- Quick and easy commissioning
- Mesh network infrastructure
- Wide range of applications

3.4 BACnet

BACnet IP/MSTP Server (Slave)

All measured values recorded by RmCU/MiDASS can be forwarded to control systems or portal applications with a BACnet interface via the optional BACnet IP/MSTP server integrated in RmCU/MiDASS.

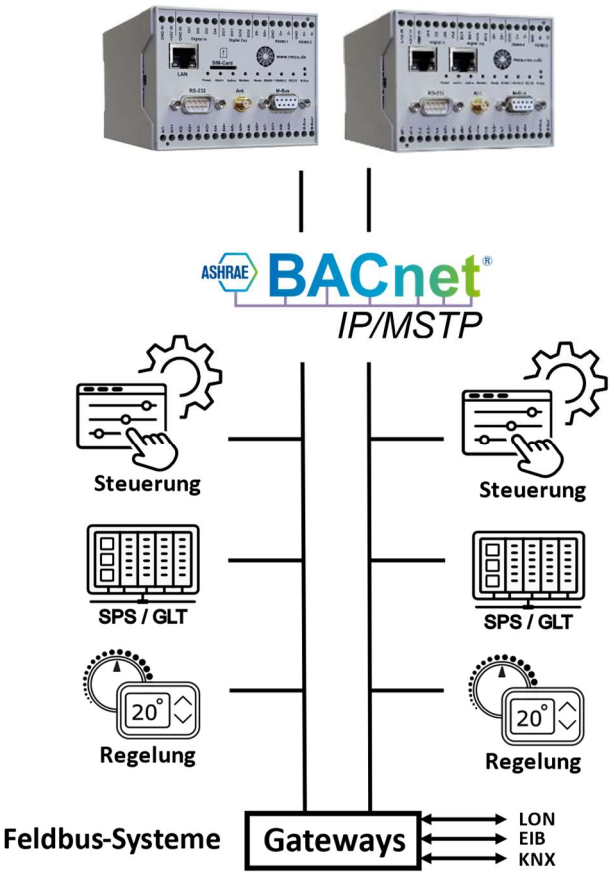


- Support of binary output and analog output objects (commands) for switching the device's own relays or LoRaWAN actuators or setpoint specifications for LoRaWAN thermostats
- Support of the following BACnet features:
  - **Analog Input Object:** Display of current measured values
  - **Binary Input Object:** Display of digital inputs
  - **Trend Log Object:** Storage of historical measured values with time stamps
  - **Notification Class Object:** Notifications from…
    - **Trend Log:** Buffer_Ready messages
    - **Alarming:** Alarm Raise- und Clear- messages
  - **Change of Value (COV):** subscription of change of value
  - **Binary Output Object:** Switching the RmCU integrated relays
  - **BACnet Broadcast Management Device:** BACnet BBMD is used to transmit broadcast messages to other BACnet networks (can also be used via mobile radio)

- **WhoIs Scan:** Check which BACnet controllers are in the network (BACnet IP and MSTP)
- **PICS Scan:** Query and display of BACnet features and configuration of an IP/MSTP BACnet controller
- **Analog Output Objects (z.B. LoRa Thermostate):** Transmission of setpoint specifications for e.g. LoRaWAN thermostats

BACnet IP/MSTP Client / Master

The BACnet IP/MSTP client integrated in RmCU/MiDASS can be used to read data from any BACnet IP/MSTP controllers.



- connection of up to 31 BACnet MSTP devices
- connection of up to 250 BACnet IP devices
- generation and management of device-specific BACnet drivers based on XML
- Feedback channel via analogue input object LoRa (thermostats) for actuators and relays
- Notificaten Classes
- Writable description fields
- BACnet device scan to locate BACnet devices
  - (WhoIs query)
- Detailed scan to determine the BACnet device properties
  - (PICS query)

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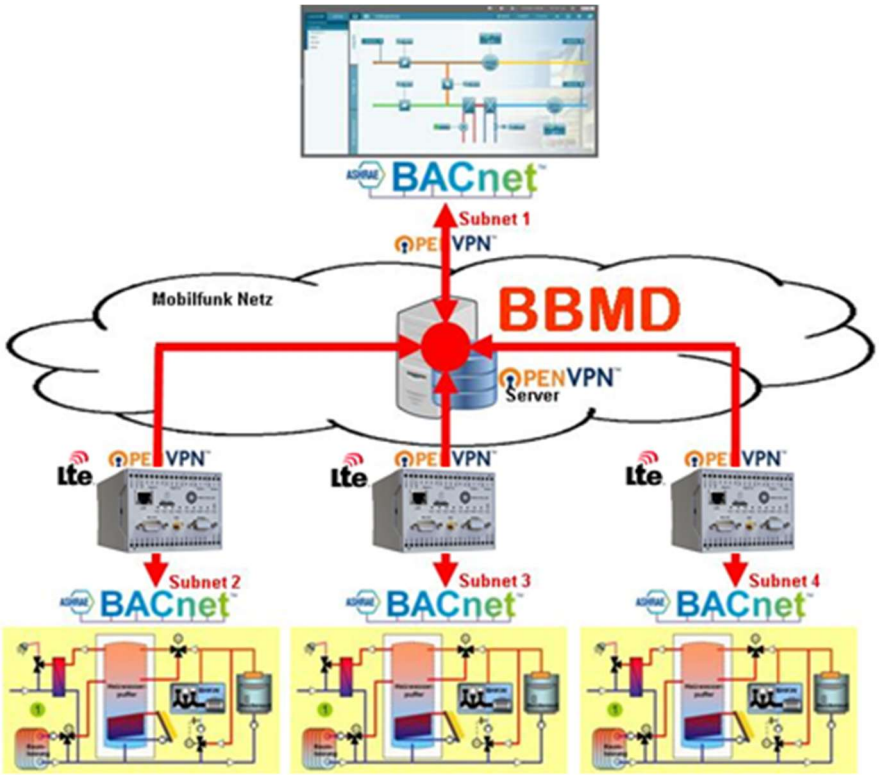
BACnet broadcast management device (BBMD)

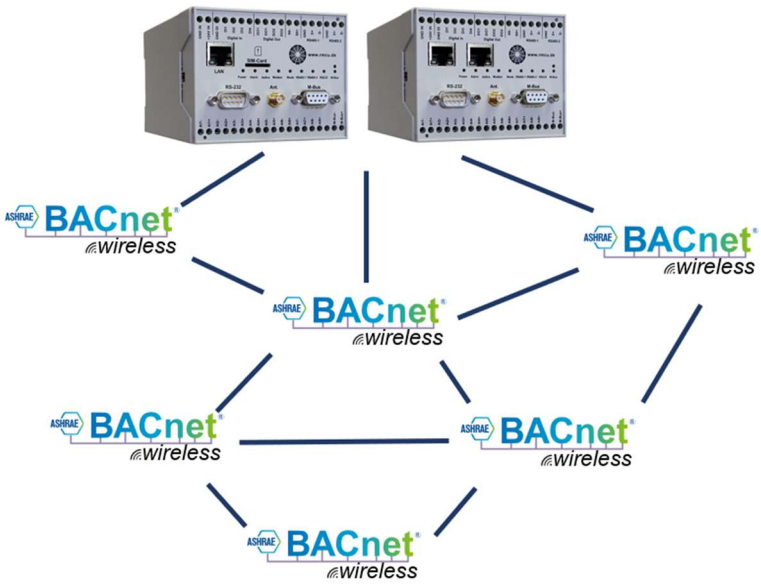
BBMD is used when BACnet controllers are distributed over several logical or physical IP networks and are to be operated in a Point To MultiPoint or MultiPoint To MultiPoint environment.
The BBMD optionally integrated in RmCU/MiDASS is used to send the broadcast messages occurring in BACnet systems from the local subnet to other subnets or to receive broadcast messages from other subnets and forward them to the own subnet.
When sending messages, up to 10 other BBMDs can be served using the point-to-multipoint method.
The use of OpenVPN is particularly important in WAN environments in order to fulfil the requirements of ISO 27001 and the EU Data Protection Regulation.

Example: Use of BBMD in an IP network secured via OpenVPN to connect decentralised BACnet systems to a control centre with a BACnet interface via mobile radio. The OpenVPN server is also operated as a router here.



Wireless BACnet

Wireless BACnet extends the BACnet protocol for wireless communication. This extension allows the exchange of control and monitoring data between different devices and systems without physical cabling. This facilitates the installation and expansion of automation systems.

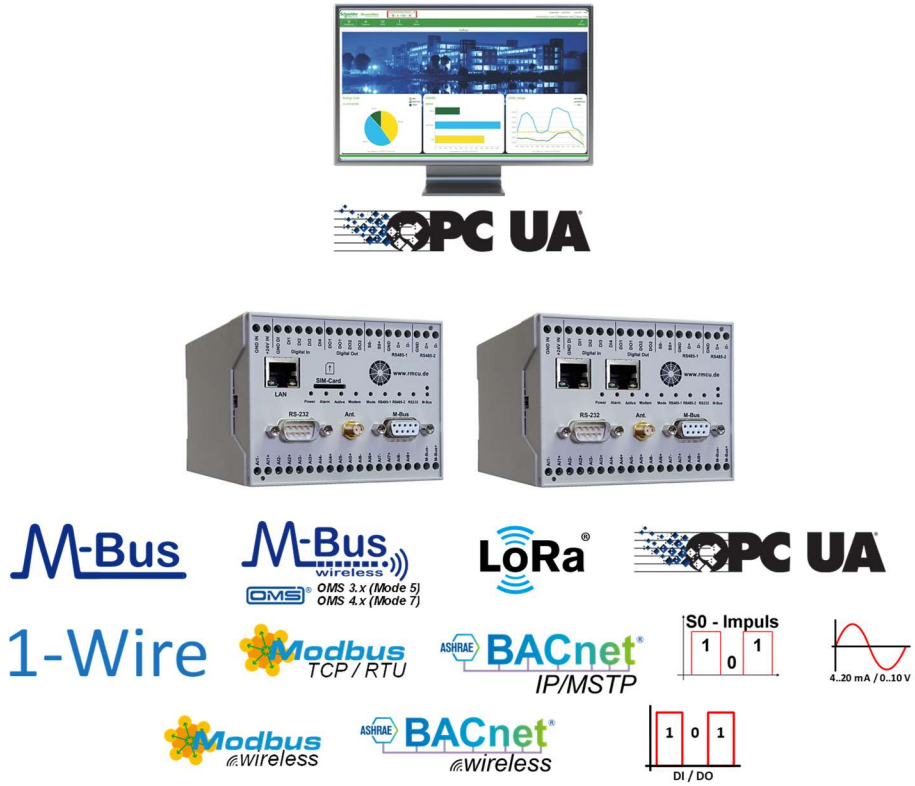


- One wBACnet gateway with up to 100 wBACnet nodes
- Robust against faults
- Quick and easy commissioning
- Mesh network as infrastructure
- Wide range of applications

3.5 OPC UA

OPC UA Server

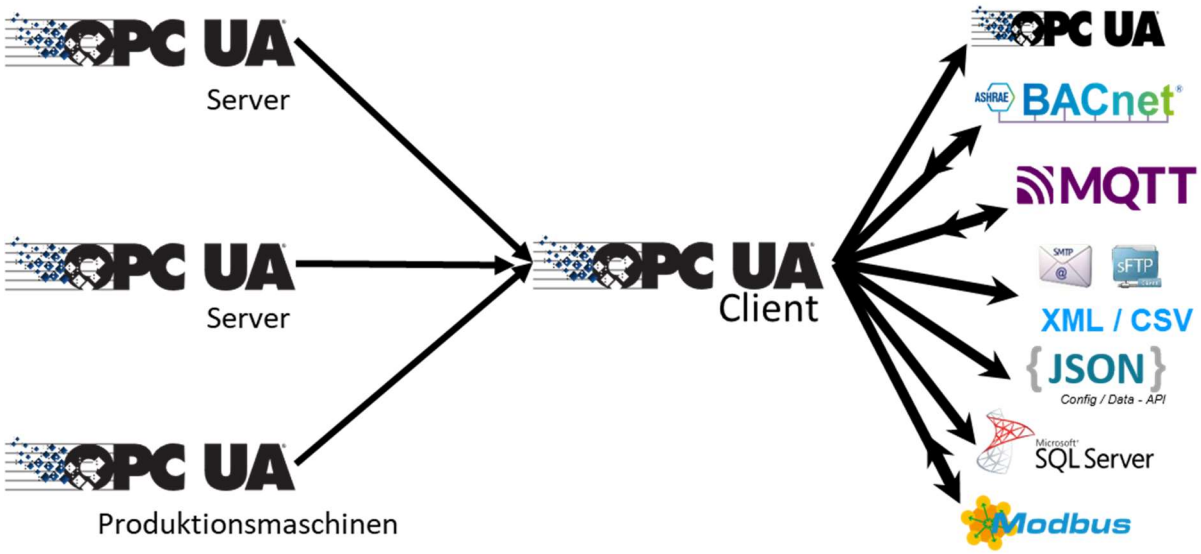
An OPC UA server is optionally integrated in RmCU/MiDASS.
Recorded measured values from any sensors can be mapped to an internal OPC UA server and can then be transferred to a higher-level system in real time via an OPC UA client.



OPC UA Features	
Designation	**Product description**
Historical data	History values - depth and frequency can be set per measured value
Engineering units	MPID – Designation of the measuring point
Range	Lower & upper limit On/Off
Display-/Browse name	Additional designation
Database backup	Possibility to save a backup of the database
Clear database	Possibility to empty the database

OPC UA Client

An OPC UA client is optionally integrated in RmCU/MiDASS.
The OPC UA client integrated in RmCU/MiDASS can be used to read data in parallel from any OPC UA server.

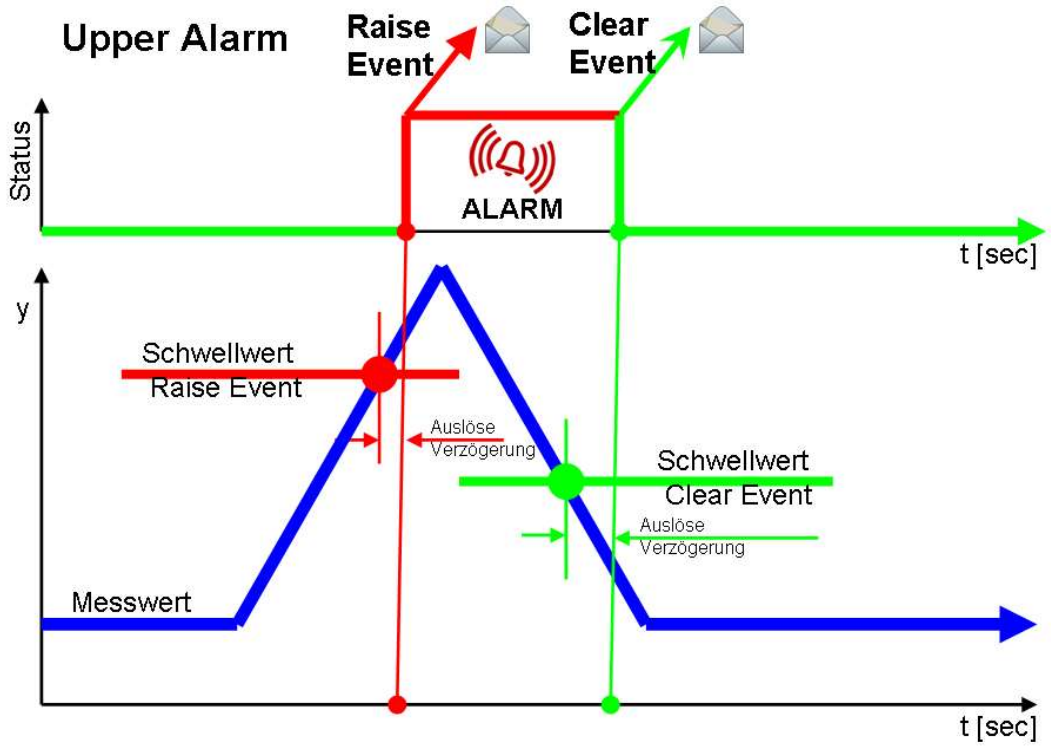


3.6 CSV/XML/JSON special interface for portals

Special CSV/XML/JSON formats are already available for connection to the following portals:

1. Robotron with special XML format
2. Dezem with Simple BU
3. Schneider Electric with special XML format & CSV format
4. CUBIC with special JSON-format
5. Buderus with Logamatic
6. MST with ProMoS JSON-Format

3.7 Alarm management



With the optional alarm management system, all measured values recorded by RmCU/MiDASS can be alarmed if limit values are exceeded. The failure of connected devices and sensors is also signalled. The emails are suitable for service personnel, but can also be used via an XML interface for connection to ISO 50001 portals with an integrated alarm management system or to external, commercially available trouble ticket systems.
The alarm system complies with the guidelines and standards commonly used in industry and mobile communications, such as those defined in ETSI X733.
An upper and lower alarm can be defined for each measured value, each consisting of an alarm raise and an alarm clear event.
To avoid false alarms, a hysteresis and a time delay are defined (see above)

The following parameters can be assigned to each alarm:

- Priority (Warning, Minor, Major, Critical)
- Alarm identifier (establishes the connection between a raise and clear event)
- Alarm class (for statistical evaluation or the storage of work instructions)
- Freely defined text for the raise and clear event

3.8 IP- connection

General features

- Connection via LAN / WAN / DSL router or integrated mobile modem
- 2 local IP addresses for integration into company networks

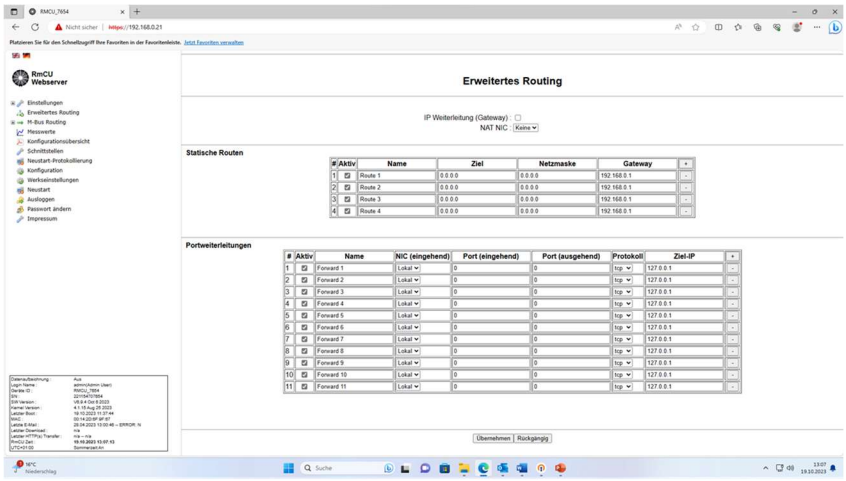
- Second network interface for separating IT & OT networks, an additional local IP address is available

- DHCP client
- DNS
- DHCP server for connecting controllers with DHCP client

- Mobile radio
  - ➢ Permanent monitoring of the carrier
  - ➢ Support of SIMs with variable and fixed IP addresses
  - ➢ SIMs without a return channel can also be used with restrictions
  - ➢ (When connecting via OpenVPN, SIM cards without a return channel can also be used without restrictions)
  - ➢ Easy integration into existing VPNs or CDAs

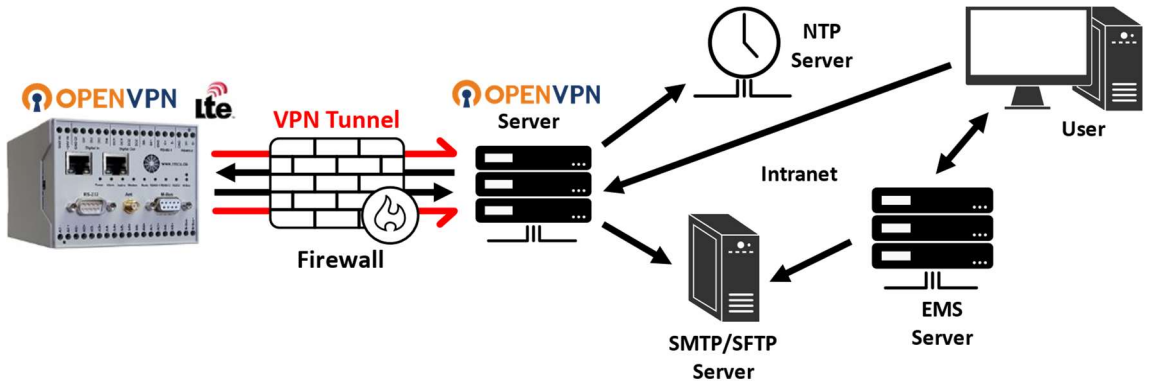
IP router

The IP router is available as an option.



- Use as a gateway for other IP-capable devices such as BMSs or local RmCUs.
- Integrated firewall
- Flexible port forwarding (TCP/UDP)

Connection via integrated OpenVPN client (optional)



Protected connection to an OpenVPN server with the following features:

- - End to end encryption
- - RmCU/MiDASS is invisible on the Internet and protected against cyber attacks
- - RmCU/MiDASS can be used as a VPN gateway for other IP-capable components, e.g. current meters or BMSs with Modbus TCP interface.
- When operating in customer networks, the web interface can be accessed from outside without having to change the customer's firewall settings.

Advantages for operation via mobile phone connections (LTE/5G):

- It is not necessary to use a VPN or CDA from the mobile network operator or VPN solutions from third-party providers that realise a VPN via the SIM card.
- The web interface can also be accessed from outside when using SIM cards without a return channel.
- Even when using SIMs with variable IP addresses, the fixed IP address assigned by the OpenVPN server can be used externally.

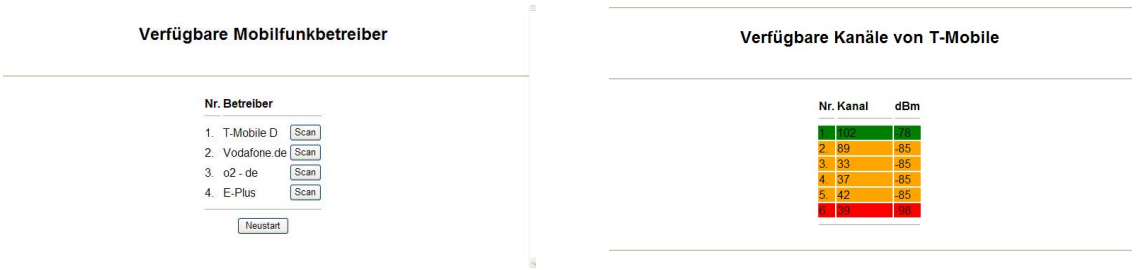
The RmCU/MiDASS can also be accessed and configured on the smartphone/tablet via OpenVPN access on the smartphone/tablet

The OpenVPN client is optional.

3.9 Remote maintenance

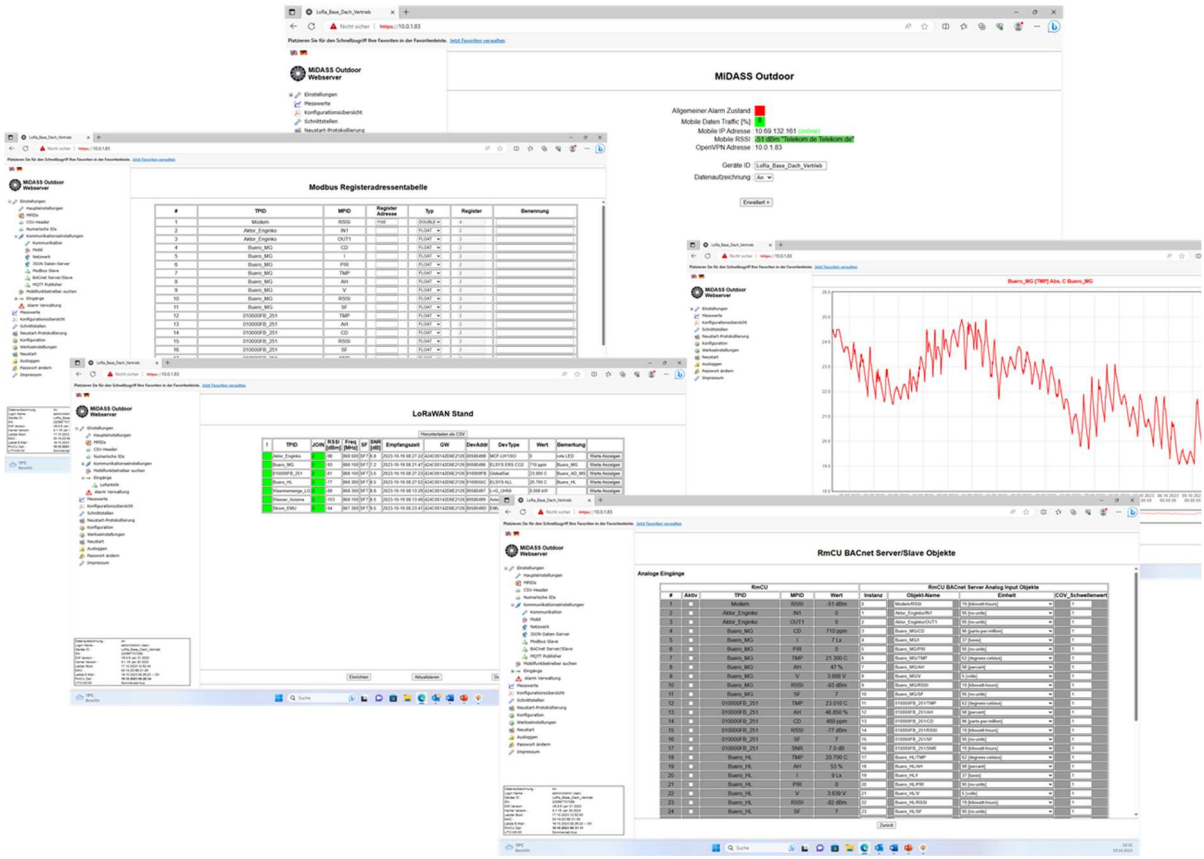
- Remote access and remote configuration of all fieldbus protocols via the web interface.
- Creation and testing of LoRa, M-Bus, wM-Bus, BACnet and Modbus driver files.
- M-Bus over IP
- Copying LoRa, M-Bus, wM-Bus, BACnet IP/MSTP and Modbus RTU/TCP driver files
- Backup or restore the RmCU/MiDASS configuration via files.
- Remote firmware update
- Certificate management

3.10 LTE/UMTS/EDGE/GSM availability check



- Scan to display the mobile network operators available at the location
- Display of the strongest carrier

3.11 HTTPS web interface



- HTTPS: SSL/TLS encrypted web interface
  optionally with mutual authentication

- Simple configuration through logical menu control
- Multilingual German / English, other languages can be added
- Graphical display of current measured values including history

4 DSGVO / ISO 27001

4.1 IP Standards

Standard	Description
TLS	All encrypted connections support the TLSv1.2 and TLSv1.3 encyrption standards (Support of older standards possible)
OpenVPN Client	VPN via encrypted TLS connection, incl. firewall
Firewall	Atomatically generated firewall upon configuration
HTTPS (TLS)	Encrypted Webinterface
SMTP (SSL/TLS)	Data transfer via E-Mail
S/MIME	E-Mail encryption see: Interim model of the Federal Network Agency of 20.12.16
FTP / SFTP(TLS)	Data transfer via FTP / SFTP(TLS)
NTP	Time synchronisation
SSH (TLS)	Access to the file system for data backup, up- and downloads etc.
DHCP Client	IP address assignment via a DHCP server
DHCP Server	Assignment of IP addresses to connected devices
DNS	Conversion of domain names to IP addresses
PeerDNS	Assignment of the DNS server by the mobile operator
SHA-256	Encryption of user authentication data
AES256-cbc	Backup / Restore RmCU system configuration
drive encryption:	A: certificates | A: certificates LUKS AES256 in xts-plain64 mode

4.2 Loggings

Standard	Description
User Logging	Logging of successful and unsuccessful login attempts, as well as the logouts of the web interface and SSH access
MAC Logging	Logging of RJ 45 devices locally connected to RmCU in mobile radio operation
OpenVPN Logging	Logging of the OpenVPN Client (since system start)
Log of Reboots	Logging of regulated and unregulated RmCU starts
Application Log	Logging of the RmCU firmware application
Email Logging	Logging of E-Mail dispatch

4.3 Access rights

User Level	Description
admin	Firmware update, system restore, access to the passwords of subordinate users
cert_admin	Installing and replacing the certificates
tech_admin	Device configuration incl. connection of sensors, upload and download of device drivers and configurations
user	Read only

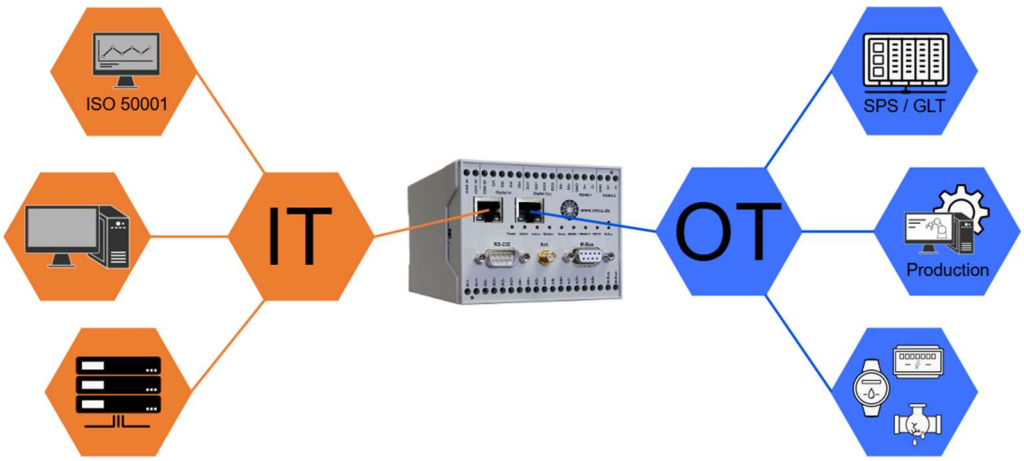
Authorization	User-Level			
	admin	cert_admin	tech_admin	user
Certificate upload to RmCU directly via HTTPS	-	+	-	-
Driver upload	+	-	+	-
Driver download	+	-	+	-
Change configuration	+	-	+	-
View configuration	+	-	+	+
Config: Backup/Restore	+	-	+	-
Change own password	+	+	+	-
Change others password	+	-	-	-
Mobile scan	+	-	+	-
BACnet scan	+	-	+	-
Modbus data type test	+	-	+	-
Factory access	+	-	-	-
Reboot	+	+	+	-
Apply All Changes	+	-	+	-
Set Relais via https	+	-	+	-
view OpenVPN Log	+	+	+	-
view MAC Logging	-	+	-	-

4.4 Other technical standards

Standard	Description
GSM / GPRS / EDGE / LTE / 5G	Mobile radio standards for connecting IP-based devices according to ETSI standard
XML	Format for transmitting measured values
CSV	Format for transmitting measured values
JSON	Format zur Übertragung von Messwerten / Format der Data-/Config-API-Schnittstelle
MQTT	For the transmission of measured values
ETSI X733	Alarm management system (measured values + sensor failure)
Modbus TCP/RTU	For the transmission of measured values
BACnet IP/MSTP	For the transmission of measured values
OPC UA Server	To provide the measured values
Two network interfaces (RJ45)	For the separation of IT & OT networks

4.5 RmCU V4.0 IT/OT

In the RmCU with the second network interface, a distinction is made between the information technology (IT) network and the operational technology (OT) network. Due to the physical separation, with an internal firewall, there is no cross-network communication between the IT and OT networks.

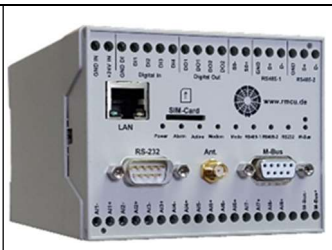


- Data transmission and access to the web interface for configuring the system takes place in the IT network.

- Data is exchanged between the data logger and the meters and machines in the OT network.

5 Hardware

5.1 Housing

	 **RmCU V4.0 DIN Rail**	 **MiDASS Allround Indoor/Outdoor**	 **MiDASS Outdoor**
General	• Prozessor Cortex A-5, 400 MHz • 128 MB Flash, 4 GB Data-Storage (optional up to 16 GB possible) • 128 MB RAM • Hardware-Watchdog • Real Time Clock – RTC (Gold-Cap buffered)		
Housing	DIN Rail Housing 100x75x110 mm	Wall-mounted housing 255x275x92 mm	Wall-mounted housing 300x220x50 mm
Protection class	IP20	IP66	IP65 bis IP67
Temperature-Range	0 bis +60 °C	-20 ... +60 °C	-30 ... +70 °C
Pole Mounting possible	No	Yes	Yes
Additional Casing available	Yes	No	No
Power supply	24 V DC	230V AC / 12 V DC	230V AC / 12 V DC
Power consumption	typ.: 5 Watt max.: 10 Watt	typ.: 5 Watt max.: 10 Watt	typ.: 5 Watt max.: 10 Watt
External Ports	• 1x Antenna cabel LoRa (SMA-socket) • 1x Antenna cabel LTE (SMA-socket) • 1x 9-pin D-SUB-connector • 1x 9-pin D-SUB-Socket • Choice of: ➢ 2x RJ45 ➢ 1x RJ45 and LTE Modem • Additional Ports over screw terminals	• 1x Antenna cabel-LoRa (N-connector) • 1x Antenna cabel-LTE (N-connector) • 1x Ethernet-Interface RJ45 • 1x screw fitting M16	• 1x Antenna cabel-LoRa (N-connector) • 1x Antenna cabel-LTE (N-connector) • 1x Ethernet-Interface RJ45 • 1x screw fitting M16

5.2 Hardware interfaces

	 **RmCU V4.0 DIN Rail**	 **MiDASS Allround Indoor/Outdoor**	 **MiDASS Outdoor**
Ethernet-Interface	• IEE 802.3	• IEE 802.3	
LED's	• Power • Alarm • Active – Data logging • LTE Modem • Mode – OpenVPN State • LED-Interfaces: ➢ State RS485-1 ➢ State RS485-2 ➢ State RS232 ➢ State M-Bus	• Power • Alarm • Active – Data logging • LTE Modem Power • LTE Modem State • Mode – OpenVPN State • Rx / Tx Interface Port 1 • Rx / Tx Interface Port 2 • Rx / Tx Interface Port 3 • Rx / Tx Interface Port 4	
Taster	• Reset	• Reset	
S0 - Pulse Input	**1-Channel:** • according to DIN EN 62053-31 • galvanically isolated • measuring current: 10 mA • maximum voltage: 12,5 V	**Plug-in module (2-Channel):** • according to DIN EN62053-31 • galvanically isolated • measuring current: 10 mA • maximum voltage: 12,5 V	
LoRaWAN (868 / 915 MHz)	**Incl. Network- and Application-Server** • LoRaWAN OTAA/ABP Mode • 8 simultaneous Channel • Support of EU-868 andUS-915	**Incl. Network- and Application-Server** • LoRaWAN OTAA/ABP Mode • 8 simultaneous Channel • Support of EU-868 and US-915	
Wireless M-Bus (433 / 868 MHz)	**External DIN-Rail module:** • according to DIN EN 13757-4 • S1–, T1– & C1–Mode • BSI-compliant OMS3 and OMS4 Encryption (Mode 5/7)	**Plug-in module:** • according to DIN EN 13757-4 • S1-, T1 & C1– Mode • BSI-compliant OMS3 and OMS4 Encryption (Mode 5/7)	
Wired M-Bus (internal / external)	**Screw terminals:** • according to DIN EN 13757 • 20/65 M-Bus Loads (internal) • up to 250 M-Bus Loads (external)	**Plug-in module / Connection via Screw terminals:** • according to DIN EN 13757 • galvanically isolated • 20 M-Bus Loads (internal)	
RS-232 Interface	**2x Serial Interface:** • 1x 9-pin D-SUB-Connector • 1x 9-pin D-SUB-Socket ➢ 2-Wire: RX, TX • Baud rate: up to 115200 Baud	**Plug-in module:** • 9-pol D-Sub-Connector ➢ 4-Wire: RXD, TXD, RTS, CTS • Baud rate: up to 115200 Baud	

2x RS-485 Interface	**Screw terminals:** • Baud rate: up to115200 Baud • Parity: even, uneven or none • Stoppbit: 0, 1 or 2 • Cabel length: max. 500 m • 2-Wire line	**Plug-in module / Connection via Screw terminals:** • galvanically isolated to the MiDASS • Termination via jumper possible: ➢ Jumper closed: 220 Ohm ➢ Jumper open: none Abschlusswiderstand • Baud rate: up to 115200 Baud • Parity: even, uneven or none • Stoppbit: 0, 1 or 2 • 2-Wire line
Digital Inputs	**4x digital Input** • Voltage level: ➢ Signal Low-Level: 0...1 VDC ➢ Signal High-Level: 2...24 VDC • Input currents: ➢ at 2 V: ~0,2 mA ➢ at 12 V: ~2,3 mA ➢ at 25 V: ~4,9 mA • galvanically isolated to the RmCU • Cabel length per Channel: max. 10 m	**4x digital Input** **Plug-in module / Connection via Screw terminals:** • on request
DO / Relay	**2x Relay-Outputs**, designed for • Imax = 3 A • Umax = 277 VAC • Pmax = 750 VA	**2x Relay-Outputs** **Plug-in module / Connection via Screw terminals:** • on request
8x Analog Inputs (other divisions on request))	**4x PT 1000** (2-Wire) **2x Analoge Inputs 0(4)...20 mA** **2x Analoge Input 0...10 V**	**PT 1000** (2-Wire), **Analoge Inputs 0(4)...20 mA, Analoge Input 0...10 V** **Plug-in module / Connection via Screw terminals:** • on request
	8x PT 1000 (2-Wire) • 2-Wire connection • Measuring current: 0,4096 mA • Resolution: ~0,12 °C • Measurement accuracy: ± 2 °C • Cable length per Channel: max. 10 m	**PT 1000** (2-Wire) **Plug-in module / Connection via Screw terminals:** • on request
	4x Analoge Inputs 0(4)...20 mA • Internal Load: 100 Ohm • Resolution: ~0,0055 mA • Measurement accuracy: < ± 0,5 % • Cable length per Channel: max. 100 m	**Analoge Inputs 0(4)...20 mA** **Plug-in module / Connection via Screw terminals:** • on request
	4x Analoge Input 0...10 V • Internal Load: 100 kOhm • Resolution: ~2,6 mV • Measurement accuracy: < ± 0,25 % Cable length per Channel: max. 10 m	**Analoge Input 0...10 V** **Plug-in module / Connection via Screw terminals:** • on request

Integrated mobile modem	• without mobile modem	• without mobile modem
	• LTE / UMTS / GSM / GPRS / EDGE	• LTE / UMTS / GSM / GPRS / EDGE
	• 5G / LTE / UMTS / GSM / GPRS / EDGE	• 5G / LTE / UMTS / GSM / GPRS / EDGE