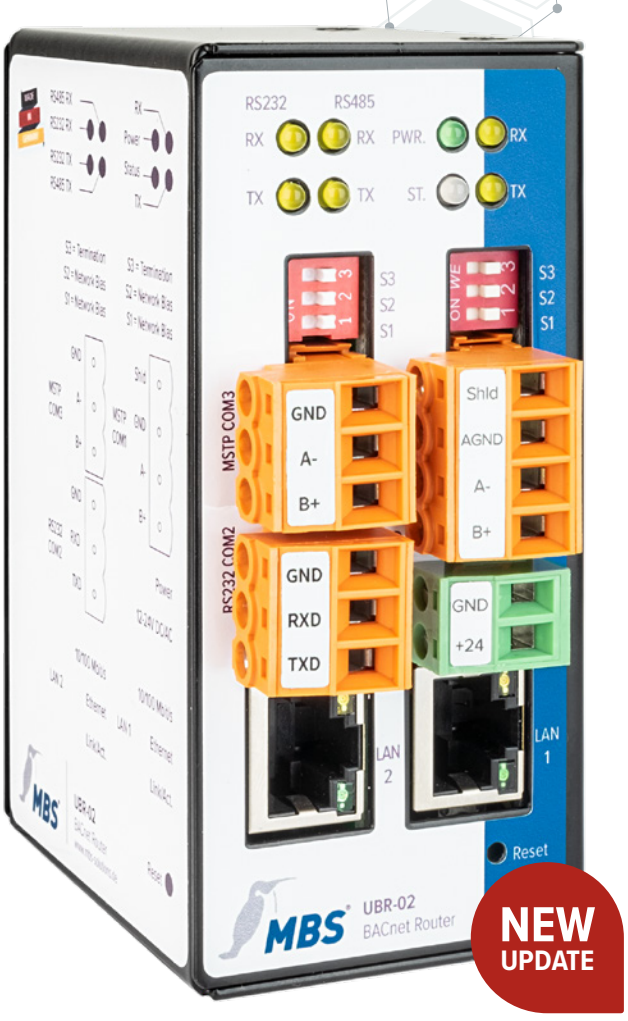
THE ROUTER SOLUTION FOR YOUR BUSINESS



UBR-02

Encrypted communication and authorised access

The UBR-02 model routes packages between the MS/TP media (RS485), Ethernet and IP, which can be linked to create a common network. The UBR-02 can now link two separate IP areas for the first time with two network connections. The new router moreover has two RS485 interfaces and can thus also be linked to two BACnet MS/TP bus systems simultaneously.

Version: 2023/06

Revision 22

BACnet/SC

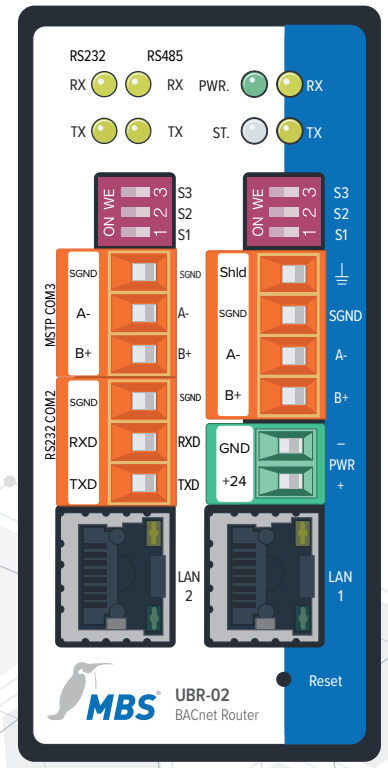
For more information: www.mbs-solutions.de

BACnet Network Security

Building automation in accordance with all the rules of security

The current trend of using company-wide IT structures in building automation brings with it new demands for the protection of transmission paths. That's why the BACnet (Building Automation and Control Networks) network protocol, the robust standard for data exchange between devices from different manufacturers, has been upgraded with safety architecture. MBS GmbH of Krefeld has now incorporated these mechanisms into a BACnet router. This way, the integrated home technology can be operated in isolation. At the same time, general BACnet communication via the company's network can be encrypted and data access can be authorised.

What are you doing about security? This question has now arrived in the world of building automation too. When hackers attack the parliament building and the assailants gain administrator rights for the entire infrastructure, it is not just those responsible for IT who get goosebumps. Nowadays, facility managers are also required to protect their devices and communication paths from attacks from cyberspace – unlike the times when integrated home technology was in its infancy, when networks were physically enclosed and only accessible to authorised persons.



Using company IT without risk

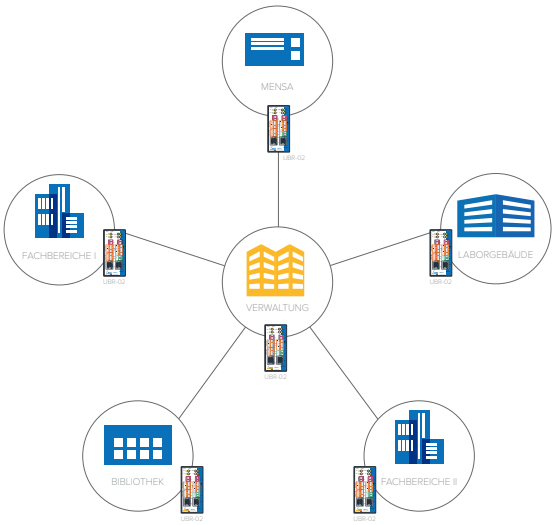
BACnet users also have to face up to this situation. The introduction of cross-manufacturer network protocols and the resultant standardised data exchange between devices from different manufacturers in the beginning largely made for indisputable benefits for building automation. After all, their success shows that there was little resistance to their use.

The trend then emerges in a second step which sees the use of IT structures for overall BACnet communication. This basically makes it possible to gain internet access to the infrastructure of the building automation. Yet the open BACnet protocol was not initially up to the task – there was no encryption and there were no user-related authentication mechanisms. In addition, client applications for BACnet were easily obtained and learned. Thus, if tied to the company network, the enclosed networks of building automation and security-sensitive systems would become potentially visible for every user and open to manipulation. This would open the flood gates to misuse.

Whether it be due to carelessness, ignorance or malicious intent: The consequences of such an incident can be very costly. And they are most certainly bad for the image. It's like the airport that has to be evacuated as soon as the ventilation system stops working. It is no coincidence then that the BACnet standard has recently been upgraded with the addition of network security architecture. The respective products which implement these mechanisms, are now making their way onto the market.

The following example of a fictitious clinic campus shows one possible application scenario:

In each building there is already an enclosed technology room with controllers and sensors which communicate with each other via BACnet. These networks have previously had no connection to the company-wide IT structure of the campus. However, the campus network is now to be used for data exchange with the central control technology which monitors and controls the field level from the administrative wing of the clinic. In order to be able to achieve this goal securely, a UBR-02 is added to each of the enclosed field level networks to connect controllers and sensors to the in-house IT. A further router which connects the control technology to the company-wide IT, completes the secured BACnet network. The campus network is now used as the transfer medium between the various BACnet units without anyone being able to intercept or manipulate the communication.



Example: Buildings on campus

Tunneled BACnet traffic

BACnet data exchange can be administrated securely via the company-wide network

The UBR-02 BACnet router from MBS GmbH of Krefeld, like its predecessor, the UBR-01, routes packages between MS/TP (RS485), Ethernet and IP media. This way, these media can be connected to form a common BACnet network. The UBR-02 now also has two network connections which can be used to connect two separate IP ranges. Use of the recently defined BACnet security mechanisms allows new router to tunnel overall BACnet traffic. If you connect multiple UBR-02 router to each other, communication between network segments can be encrypted and data access can be authorised. This results in a field level which is still isolated and invisible to users of the company network who do not have access rights. At the same time, general BACnet data exchange can be administrated securely via the company-wide network.

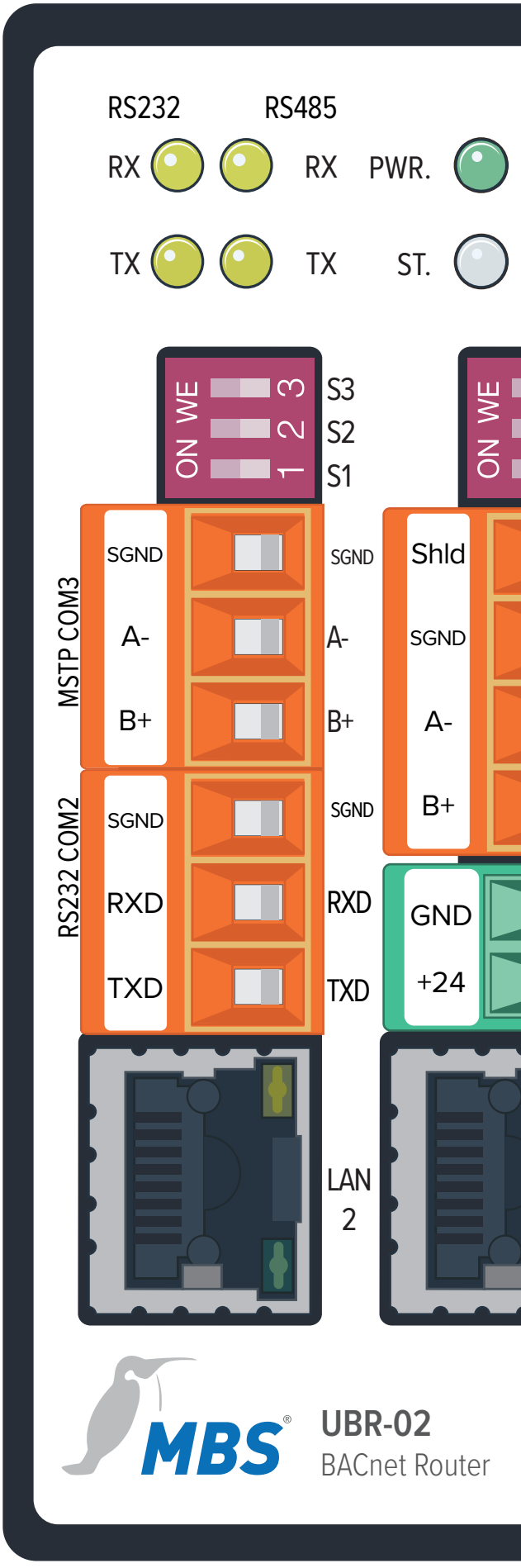
Cost-effective solution, optimum protection

The benefits: Local BACnet traffic still runs with existing commerciall available devices on which no modifications have to be made at all. A UBR-02 is simply added to the inventory for each building – a cost-effective solution. At the same time, general BACnet traffic can be processed cost-effectively via the existing company network. Separation of the communication paths also guarantees protection from interception and access security.

Moreover, this solution also outdoes approaches which manage communication via VPN (Virtual Private Network) or VLAN (Virtual Local Area Network) as practice has shown that the required interaction of computer systems and home technology is difficult to maintain. The UBR-02 on the other hand can be used by the BACnet users themselves and even administrated with their own means

Protecting the building automation infrastructure

For financial reasons, a growing number of building operators wish to access their company networks for the overall BACnet data exchange. This is not without its risks, as this essentially enables unauthorised parties access to the building automation infrastructure. To date, however, encryption and user-specific authentication were not foreseen in the BACnet protocol. Following enhancement of the standard for data exchange between different manufacturers' devices with the according security mechanisms, MBS reacted by complementing the tried-and-tested BACnet router UBR-01 with security functions based on the protocol requirements.



TECHNICAL DATA SHEET
UBR-02

OEM
Based on our modularity, we develop and manufacture cost-effective and time-efficient solutions for you which are highly innovative and guarantee a secure investment. Take advantage of the expertise we have accumulated over more than 30 years and our experience of customer projects in various industries.

PWR - Power
Operating voltage:
V+: +12 to +24V DC or 12 to 24V AC
V-: GND or 12 to 24V AC

LAN
J45: 10/100 MBit Ethernet
Link: Displays a LAN connection
10/10: Displays the connection speed

LED
Power: Lights up as soon as the device is connected to a suitable operating voltage
RX: Blinks when the unit is receiving data
Status: Multicolor status LED
TX: Blinks when the unit is transmitting data

COM1
RS485
B+: Non-inverted input
A-: Inverting input
SGND: Ground connection
Shld: Shield

COM2
RS232
TXD: Sending line
RXD: Receiving line
SGND: Ground connection

COM3
RS485
B+: Non-inverted input
A-: Inverting input
SGND: Ground connection

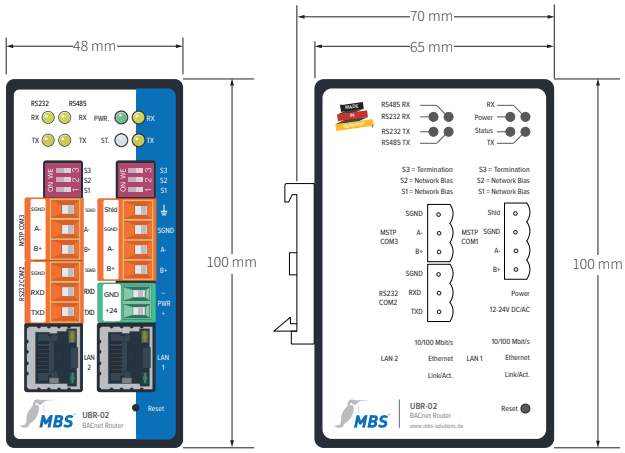
Dip switch (COM1 and COM3)
Bias: voltage for RS485
Bias: voltage for RS485
120 Ohm: Termination resistance

BACnet routing options
BACnet-SC
BACnet / IP
BACnet / Ethernet (ISO 8802-3)
BACnet / MS/TP (RS485)
BBMD (BACnet Broadcast Management Device)
FD (Foreign Device)

Features
BACnet Secure Connect (BACnet/SC)
BACnet Revision 22
Encrypted communication (SLL)
authorized access
2 x LAN, 2x RS485 and 1x RS232,
Slave-Proxy Mode
Auto-Slave-Detection
ARM9 processor
integrated Web server for configuration and analysis
No Moving parts such as fans or similar
after a power failure of the UBR-01 Router restarts automatically
Supporting international language packages
DHCP-Server (Dynamic Host Configuration Protocol)
Integrated and switchable network and bias resistors

NEW UPDATE

The UBR-02 supports the current BACnet Revision 22 and can therefore be used to build the innovative Secure Connect (BACnet/SC) security structure. It routes between the MS/TP media (RS485), Ethernet and IP, which can be linked to create a common BACnet network. The UBR-02 can also link two separate IP areas with two network connections.



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Need help with commissioning?

Contact us!

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Specifications
Power consumption: 2.1 watts
Weight: 300 grams
Dimensions: height: 100 mm, width: 48 mm, depth: 70 mm (incl. DIN top-hat rail adapter)
Ambient temperature: 0...45°C, 32...113°F
Ambient humidity: 20...80 per cent relative humidity, non-condensing
Protection class: IP20
Assembly: DIN top-hat rail TS35 in accordance with EN 60715

Article numbers
UBR-01: Art.-Nr. 2-0012

Imprint: **Managing Director:** Gerhard Memmen-Krüger, Nils-Gunnar Fritz
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Responsible for contents according to § 6 MDStV: Gerhard Memmen-Krüger, Nils-Gunnar Fritz

*This product is CE certified
*Specifications subject to change

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CE UKCA UKNI RoHS compliant