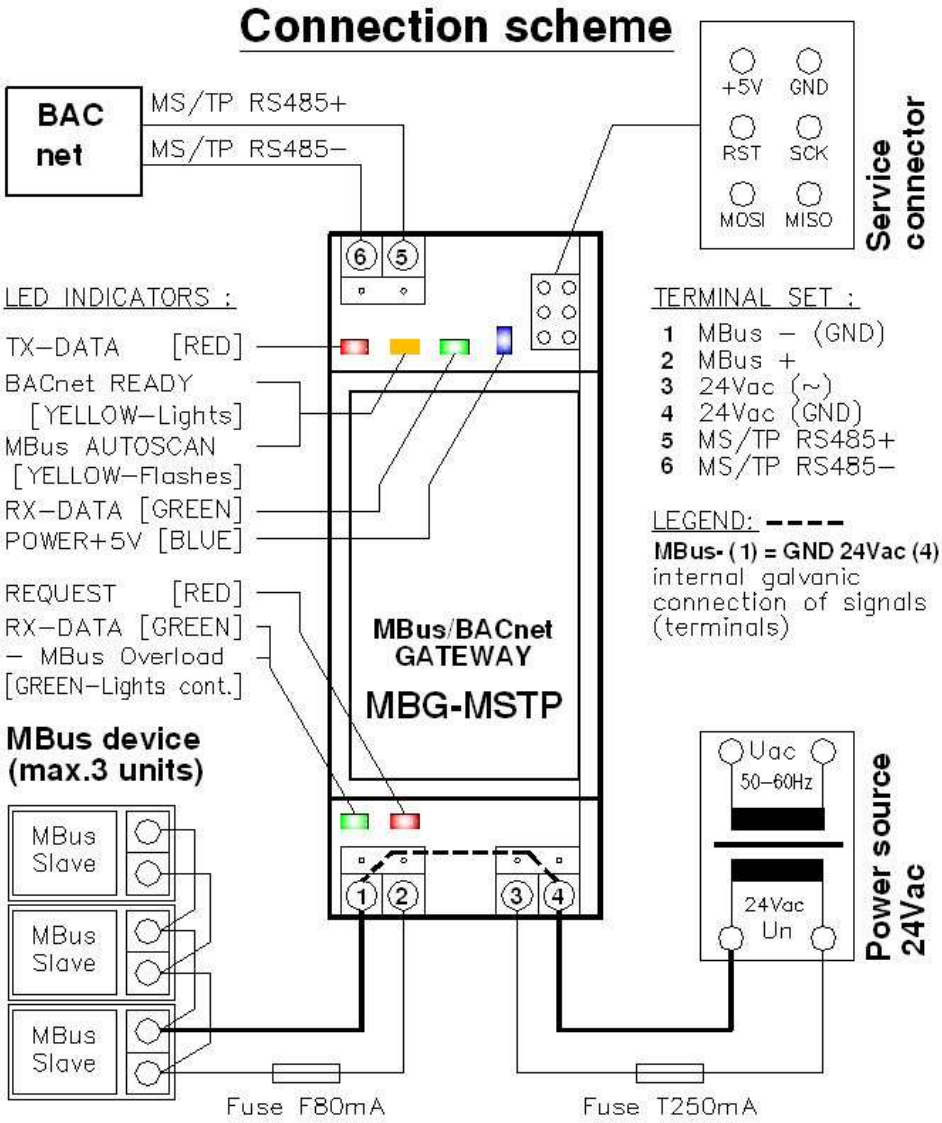
MBus / BACnet GATEWAY
Type: **MBG-MSTP**

H V A C

M A N U A L FOR INSTALLATION

Installation

Install MBG-MSTP Gateway in distribution panel on the DIN bar. Use recommended current fuses and connect all their conductors to removable screw connectors according to the connection scheme in the Picture.



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Activation of Gateway - Description

Having connected the device to supply voltage (24Vac) *BLUE* LED: POWER starts lighting continuously, which means the internal supply source +5V is operating correctly.

Shortly afterwards the *YELLOW* LED: READY starts lighting, providing the device has a valid BACnet sw- application (or after its upload) and the service connector is in the basic status. This LED indication means the device is ready to communicate over the BACnet link.

Simultaneously the MBus *RED* LED: REQUEST starts flashing, which means **it has been activated with automatic detection of the connected MBus devices - AUTOSCAN.** The course of this **process is indicated by the FLASHING *YELLOW* LED: READY**. During the first 20 seconds the *YELLOW* LED-READY lights, which means the power supply **preparation – initiation of the MBus Slave devices** is being in process.

If the MBus device is responding to transmitted signal, the MBus *GREEN* LED: RX-DATA- *Data reception* flashes once to signal reception of the MBus data packet. MBG-MSTP gateway records the detected MBus device in its internal memory and continues scanning of the MBus data link. Once the MBG-MSTP gateway has detected a maximum of three MBus devices, or checked addresses from 0 to 253, it stops scanning the link, decodes the raw data, generates the BACnet variables and starts communication with detected MBus devices.

The whole AUTOSCAN process of the MBus link might last up to 120 minutes and must be completed. Autoscan will re-start from the beginning, if autoscanning process has been interrupted by Reset of Gateway or disconnection from power supply voltage. Autoscan process will continue in running until at least 1 MBus device has been detected and saved into memory. The Autoscan process duration depends on the number of connected MBus devices, their communication speed and the value of their primary addresses.

OPERATING STAGES and LED INDICATION after ACTIVATION of Gateway / connection to supply:

1) After the first START / RESET / no connection of MBus devices has been detected

BACnet side:

(RED-flashes) TX-DATA: The LED flashes in the rhythm of data packet **transmission** (providing BACnet line is connected)

(YELLOW –lights continuously) READY: **BACnet is Ready** to communicate

(YELLOW –lights): **MBus Autoscan** - During the first 20 seconds: The power supply initiation of the MBus Slave devices is being in process.
The LED lights continuously: AUTOSCAN has been completed

(YELLOW-flashes**): MBus Autoscan** - AUTOSCAN of MBus link is running – detection of connected MBus devices (LED flashes with half frequency of the MBus LED: *RED* -Request)
- completion after detection of 3 MBus devices or less than 3 devices within 120 minutes, approximately
- AUTOSCAN will run until at least 1 MBus device has been detected and saved into memory

(GREEN -flashes) RX-DATA : LED flashes in the rhythm of data packet **reception** (providing BACnet line is connected)

(BLUE-lights continuously) POWER +5V: **Power supply is in operation**, internal power supply source +5V is operating correctly

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MBus side:

(GREEN -flashes) RX-DATA : LED flashes in the rhythm of data packet **reception** from the MBus Slave device
(GREEN –lights continuously) RX-DATA : **MBus link is overloaded**, communication has been interrupted
(RED-flashes) REQUEST: LED flashes in the rhythm of **transmission of request** for data packet from the MBus device

2) AUTOSCAN has been completed / detected MBus devices were saved into internal memory

BACnet side:

(RED-flashes) TX-DATA: The LED flashes in the rhythm of data packet **transmission** (providing BACnet is connected)
(YELLOW –lights continuously) READY: **BACnet is Ready** to communicate
(YELLOW –lights continuously): **MBus Autoscan** - has been **completed** (addresses of detected MBus devices have been saved into internal memory)
(GREEN -flashes) RX-DATA : LED flashes in the rhythm of data packet **reception** (providing BACnet is connected)
(BLUE -lights continuously) Power +5V: **Power supply is in operation**, internal power supply source +5V is operating correctly

MBus side:

(GREEN -flashes) RX-DATA : LED flashes in the rhythm of data packet **reception** from the MBus Slave device
(GREEN –lights continuously) RX-DATA : **MBus link is overloaded**, communication has been interrupted
(RED-flashes) REQUEST : LED flashes in the rhythm of **transmission of request** for data packet from the MBus device

Important notes:

- Each MBus device (maximum 3 devices) connected to MBG-MSTP gateway must be assigned a unique primary address.
- If the **MBus LED** RX-Data: ***GREEN* – lights continuously**, it means that **MBus link is overloaded** and MBus communication has been interrupted. Please eliminate overload on the MBus link and check the link front-end current fuse.

Integration into the visualisation SW-environment or a Master-device

MBG-MSTP gateway is optionally settable (via configuration of SW tool) either as a BACnet MSTP Slave (default setting) or a BACnet MSTP Master device (it requires an additional order).

Slave Mode - BACnet MSTP Slave :

- In this mode it is necessary to activate communication with Slave devices either in visualisation SW or Master device in order to ensure functional communication. To activate this communication, set the MBG-MSTP gateway's MSTP and BACnet ID addresses in the SW environment or in the Master device.

  Response of MBG-MSTP gateway to signal from the BACnet Master device is indicated by flashing of the BACnet LED -*RED* : TX-Data.

Master Mode - BACnet MSTP Master :

- The Gateway is a self–identifiable MSTP device according to the MSTP token-ring rules.

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Default setting of the MBG-MSTP gateway:

- BACnet MSTP mode: **Slave**
- MSTP address: **202**
- BACnet ID: **202**
- Max APDU size: **480**
- Segmentation: **No segmentation**
- Vendor ID: **202**

RESETTING of MBG-MSTP Gateway

Important !

To reset Gateway is necessary in the following cases:

- Replacement or addition of a new MBus device on the MBus link after completion of AUTOSCAN.
  This RESET must always be executed after completion of MBus device replacement to start automatic detection - AUTOSCANNING of MBus link and saving the detected devices into internal memory.
- Defaulting of MBG-MSTP Gateway

To RESET MBG-MSTP Gateway please follow the below steps:

1. **Turn OFF supply voltage,**
2. **Disconnect the BACnet link,**
3. **Short-circuit SCK and GND pins on the service connector,**
4. **Turn ON supply voltage,**
5. **Approximately after 1 second, disconnect SCK and GND pins,**
6. **Connect the BACnet link.**

Please always keep the above order ! Otherwise you can damage the device !

MBG-MSTP Gateway automatically activates default settings, deletes the detected MBus devices from its memory, deletes definitions of the BACnet variables and starts automatic scanning the MBus link –**AUTOSCAN,** this is optically indicated by **flashing** of the ***YELLOW*** **LED**: Ready.

Autoscan process of MBus link will be completed within 120 min, the maximum, with MBus devices connected to the link. The duration time depends on the number of connected MBus devices, communication speed and the value of their primary addresses. Autoscan will be running as long as at least 1 MBus device has been detected. Autoscan will be completed after detection of the third MBus device on the link and its saving into memory.

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Decoding of the MBus data and creation of the BACnet variables

In its basic configuration the MBG-MSTP gateway decodes the current, maximum and minimum values from the MBus protocol. Names for the BACnet variables are generated according to the standard definition of the MBus protocol. If there is a request for decoding of the tariff and stored values it is necessary to change configuration of the MBG-MSTP gateway.

MBG-MSTP gateway is according to the standardized MBus protocol universal and ready to detect as many MBus devices as it is possible.
If connected a non-standard MBus device it is also possible, upon a request, to adjust setting of the decoder and MBus scanner for such a MBus device which is not detected by MBG-MSTP gateway automatically.

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