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THE TECHNICAL MAGAZINE BY SE-ELEKTRONIC

BACnet ENABLED
REMOTE MAINTENANCE
VIA MOBILE
COMMUNICATIONS:
**THE GSM ROUTER
BY
SE-ELEKTRONIC**



Remote maintenance for building automation that is independent from the IT infrastructure of the user of the building: The innovative GSM router for outdoor installation by SE-Elektronik allows direct access to the automation network via mobile communications.

Teleservice solutions in building automation are not only convenient, but economically viable: According to the VDMA (Verband deutscher Maschinen- und Anlagenbau e. V. – German Engineering Association) service costs can be reduced by up to 80 % with its use. Using remote maintenance, servicing can be planned in advance based on status data. Faults and expensive unscheduled repair work can be largely prevented. Additionally, a seasonal optimisation can significantly increase system efficiency and thus reduce energy costs in the long term.

HANDICAP IT INFRASTRUCTURE

The teleservice of technical devices and systems allows service technicians to set up a connection from anywhere in the world and makes the required service functions available. Predictions suggest that most control and regulation systems will be incorporated in telecontrol, teleservice and diagnosis concepts in future. However, the integration into the IT system of the user of the building that has so far often been necessary for this involves considerable technical and coordination efforts. Thus, an efficient remote maintenance is often delayed or completely inhibited.

NEW: TELESERVICE THAT IS INDEPENDENT FROM THE IT INFRASTRUCTURE OF THE USER OF THE BUILDING

For these reasons, SE-Elektronik has developed a new and astoundingly simple solution that is independent of the building IT. The innovative GSM router is simply fixed on the building facade. There it takes on the function of an outdoor sensor (temperature) and uses the existing outdoor sensor line as connection to the automation network.

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MOBILE COMMUNICATIONS FOR TELESERVICE: MORE EFFICIENCY, MORE FLEXIBILITY

So far, remote access via land lines was predominantly favoured in the case of teleservice solutions for building automation. Problems often occur when this is applied in practice. Either there is no IT infrastructure in place in the case of new or renovated buildings, or it is constantly changed as needed or redone due to changing technical requirements.

Even with an existing IT infrastructure the implementation of the building automation is often only possible to a limited extent. This is because the available IT administration often only has experience in office networks. The lacking understanding of industrial networks, insufficient acceptance of unknown devices and safety concerns often make it impossible to implement a remote access in a timely and practical manner.

MOBILE COMMUNICATIONS ACCESS VERY DIFFICULT TO IMPLEMENT SO FAR

All the mentioned reasons not only support teleservice applications, which are implemented independently of the IT belonging to the user of the building via mobile communications, for new or renovated buildings but rather for all buildings in general. This is because with remote access via mobile communications, the system engineer/operator is in control of everything.

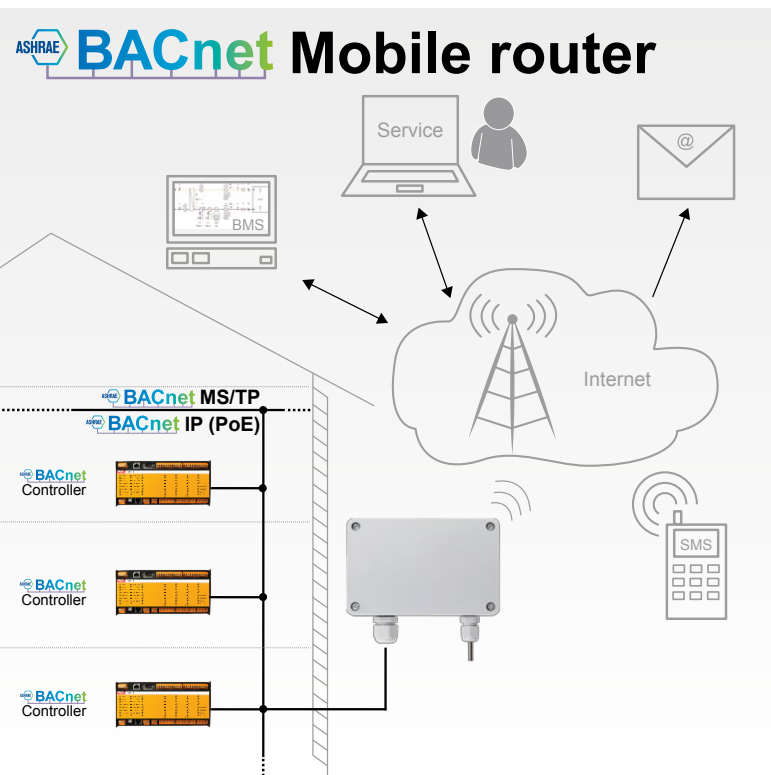


But there are also hurdles to overcome with mobile communications: The system technology is often installed in the basement. There are only poor or no mobile connections possible at all. Moving the aerial into a different part of the building or even outside is often not possible. On top of this the required cable length for the aerial cable is problematic: even in smaller buildings the signal damping is too high and the received signal too weak.

THE SOLUTION: GSM ROUTER WITH INTEGRATED OUTDOOR SENSOR FUNCTION

Whilst developing a practical mobile solution the SE-Elektronik engineers benefited from an important factor which has been overlooked so far: For building automation an outdoor sensor is almost always required for the control of heating and air conditioning. This sensor is installed in the shadows of the building's north side and connected to the automation in the technology centre via a cable.

Thus the solution for the cable problem was as simple as it was convincing: We have combined the GSM router with an outdoor sensor installed inside the housing and designed it as complete BACnet station. For the communication with the automation network the cable for the outdoor sensor is used. In the other direction the GSM router can within seconds issue network messages to the control station or nearest service technician as text message or email.



AN OVERVIEW OF THE GSM ROUTER

The GSM router is a complete BACnet device with BACnet profile B-BC with version 1.15. It is parametrised and configured by means of a standard web browser and it communicates optionally by means of Ethernet (PoE) or RS485. Ethernet allows a maximum cable length of 100 m, RS485 allows 1,200 m. All components (GSM modem with aerial, router, outdoor sensor and power supply) are contained in the housing.

THE MOST SIMPLE PARAMETRISATION AND COMMUNICATION

The messages generated by any station in the BACnet network are sent as a text message or an e-mail into the mobile communications network via defined message categories. The messages are distributed to up to 8 recipient groups, selected according to date and priority. Thus, the new GSM router allows for more transparency and operational reliability at any time of day and night.



DESIGN

- Plastic housing for outdoor use (-20 °C to +60 °C)
- Dimensions 129 x 82 x 55 mm
- Protection class IP65

SPECIAL FUNCTIONS

- Integrated external temperature sensor
- Geographical sun level calculation for shading and lighting

MOBILE COMMUNICATIONS

- Integrated mobile communications aerial
- The integrated modem supports the following mobile communication standards:
 - GSM (CSD) for direct dial-up (PPP)
 - Frequencies: Quad band GSM (850/900/1800/1900 MHz)
 - GPRS/EDGE/LTE

CONNECTIONS

- 24V AC/DC voltage supply or Power over Ethernet (PoE)
- RS485 twisted pair
- Ethernet
- USB (RNDiS) Ethernet over USB

CONFIGURATION AND PARAMETRISATION

- Connection: via one of the communication ports or the integrated USB port
- Configuration and parametrisation: using common web browsers.

ALARMING

The messages and alarms generated in the BACnet network are sent as a text message or an e-mail via multiple message categories (BACnet Notification Class). For this, forms can be expanded with a logo, text information or value states of BACnet objects.

NETWORK

Integrated TCP(UDP)/IP Stack with the essential network applications:

- HTTP (HyperText Transfer Protocol)
- FTP (File Transfer Protocol)
- SNTP (Simple Network Time Protocol)
- VPN (Virtual Private Network)
- SMTP (Simple Mail Transfer Protocol)
- DHCP (Dynamic Host Configuration Protocol)

You can order the mobile router using the following article number:

G 02 93 10, Type: ROUTER-GSM



TEAM PLAYER: OPEN FOR BACnet AND OTHER COMMUNICATION STANDARDS



Whilst developing the GSM router, SE-Elektronik ensured ideal compatibility with common automation solutions. The device is designed as complete BACnet device with BACnet profile B-BC, but can also be integrated in networks which use other communication standards such as Modbus.

ESSENTIAL PERFORMANCE FEATURES

- All objects changeable at runtime
- Dynamic creation and deletion of objects (e.g. Scheduler, calendar, Trend, EventLog, Notification class, command, ...)
- Supports Alarming with text message and email dispatch
- Automated time synchronisation
- Backup and restore
- BACnet Routing (MS/TP, IP, PTP)
- Integrated web-based BACnet browser for visualising and changing BACnet objects

FOLLOWING OBJECTS ARE AVAILABLE TO ALL AUTOMATION STATIONS IN THE BACnet NETWORK BY DEFAULT:

- Outside temperature (for HVAC)
- Sunrise, sunset (for automatic lighting control)
- Sun level (for automatic shading) Optionally the router can retrieve information from the internet such as local weather forecast and time signal for automated time synchronisation

EXPANSION OF EXISTING SYSTEMS

Customers who use other communication standards such as A-Bus, B-Bus or E-Bus can implement the GSM router with their individual mobile communications solution. Following functions are additionally available:

- Upload and download of DDC programs
- Diagnosis (direct contact)
- Connection to service portal
- Sending of text and email messages

THE GSM ROUTER BY SE-ELEKTRONIK. FOR MORE FLEXIBILITY AND EFFICIENCY WITH CONTROL AND MAINTENANCE OF YOUR BUILDING AUTOMATION.

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