TROX® TECHNIK

The art of handling air

Modbus®

EM-BAC-MOD-01

BACNET AND MODBUS INTERFACE FOR EASYLAB CONTROLLERS AND ADAPTER MODULES

Expansion module for EASYLAB fume cupboard controllers, room controllers, extract air controllers, supply air controllers, and adapter modules, for the integration of rooms or individual volume flow controllers with the central BMS

- Switching between BACnet MS/TP and Modbus RTU
- BACnet Standardised Device Profile (Annex L)
- Modbus interface with individual data registers
- Native BACnet interface by integrating the expansion module with EASYLAB components
- Easy retrofitting
- Double-stack terminal blocks for the EIA-485 bus
- Equipment address and data transfer parameters can be defined

Interface to central BMS

- When used on a controller with active room management function (RMF) the module provides also data points for the entire room, e.g. for total volume flows or consolidated alarms
- When used on a single controller: data points for volume flow rate, alarm, damper blade position, or others
- Centralised operating mode default setting, e.g. night-time operation

Application

Application

- Expansion module Type EM-BAC-MOD-01 for the EASYLAB system

- BACnet-MS/TP or Modbus RTU interface to the central BMS
- Data points for individual controllers or for the room
- Room interface: Default setting of room operating modes within the EASYLAB system, increase or reduction of the air change rate, readout of the actual room operating values or evaluated damper blade positions, consolidated alarms
- Controller interface: Operating mode default setting for a single fume cupboard controller, readout of individual operating values such as volume flow rates for single controllers, or individual alarms
- Can be used with fume cupboard, supply air, extract air or differential pressure controller EASYLAB TCU3 and with adapter module TAM
- For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operation theatres, intensive care units, and offices with very demanding control requirements
- Factory mounted or for retrofitting into the EASYLAB base component casing

Special characteristics

- Ready for installation, can be easily connected to the main PCB
- Interface for EIA-485 networks BACnet MS/TP and Modbus RTU
- BACnet Protocol Revision 12.0
- Only standard BACnet objects or Modbus registers are used for communication
- Data interface for an EASYLAB controller or for an EASYLAB room with different functional profiles
- Hardware switch to enter network addresses and communication parameters (no communication software required)

Description　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　▯

Parts and characteristics

- Microprocessor with setup programme stored in nonvolatile memory
- EIA-485 communication interface
- Slide switch to switch between BACnet and Modbus communication protocols
- Two address switches, X and Y, to set equipment addresses 1-99
- 8-way DIP switches to adjust the communication parameter
- Double-stack terminal blocks for the EIA-485 network (simple wiring)
- Two indicator lights indicate communication and errors, respectively
- Connection to update the firmware
- EIA-485 terminal resistor that can be activated

Construction features

- PCB dimensions and fixing points correspond to the EASYLAB main PCB and the casing
- Fixing with screws
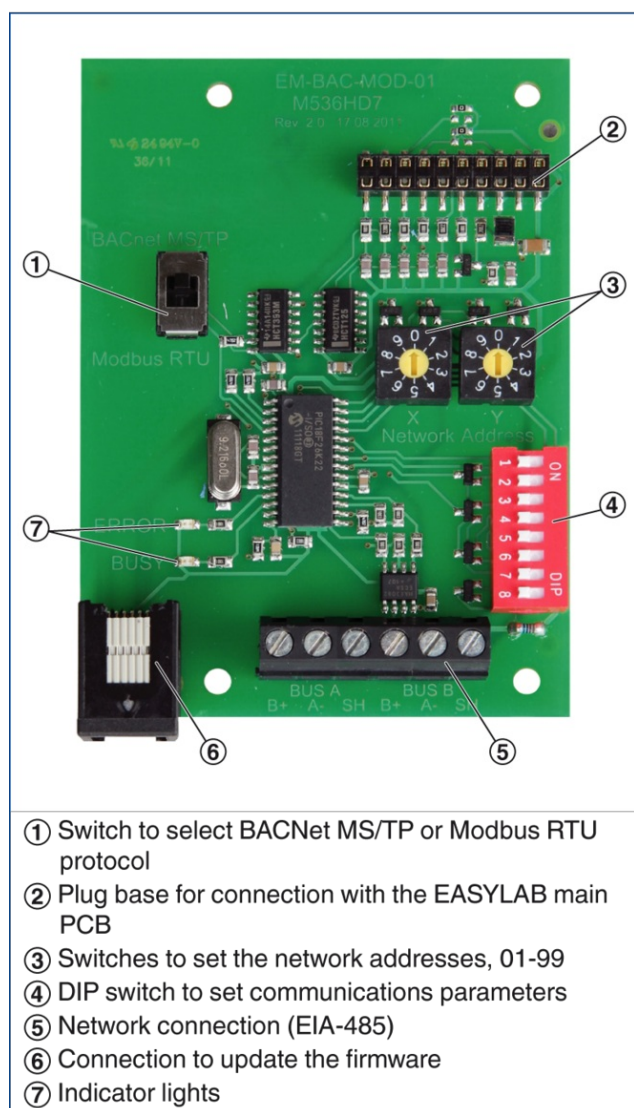- Pin header to connect the module to the main PCB of the TCU3 or TAM

INFORMACIÓN TÉCNICA

Functional description

The expansion module EM-BAC-MOD-01 is used to integrate EASYLAB controllers Type TCU3 or EASYLAB adapter modules Type TAM into a BACnet (MS/TP) network and in this way connect them to the central BMS.

The BACnet or Modbus interface supports the EASYLAB room operating mode concept. It is possible to set operating mode defaults in order to control different volume flow rates for daytime and night-time operation; it is also possible to increase or reduce the air change rate (volume flow rate setpoint change), e.g. to influence the room temperature.

Using the BACnet or Modbus interface, an individual alarm management system can be set up by consolidating configurable EASYLAB alarms. The interface also enables the transfer of actual operating values such as volume flow rates and damper blade position for a controller or for all controllers in a room.

EM-BAC-MOD-01

① Switch to select BACNet MS/TP or Modbus RTU protocol
② Plug base for connection with the EASYLAB main PCB
③ Switches to set the network addresses, 01-99
④ DIP switch to set communications parameters
⑤ Network connection (EIA-485)
⑥ Connection to update the firmware
⑦ Indicator lights

Supply voltage	5 V DC from controller or adapter module
Communications interface	EIA-485 standard
Protocol	BACnet MS/TP standard rev. 12 or Modbus RTU
Data transmission speeds	BACnet: 9600, 19200, 38400, 76800 baud, Modbus: 9600, 19200, 38400, 57600 baud
Parity checks for data transmission security	None, odd, even
Configurable network addresses	01 … 9901 … 99
Operating temperature	0 – 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2004/108/EG
Dimensions (B × H × T)	78 × 65 ×100 mm

Expansion module to supplement an EASYLAB base component (controller TCU3 or adapter module TAM) with a BACnet or Modbus interface to link rooms or individual volume flow controllers to the central BMS.

The expansion module includes an interface for EIA-485 networks that can be used for BACnet MS/TP or Modbus RTU (switching), a switch to enter communication parameters, a connection to update the firmware, and indicator lights.

Special characteristics

- Ready for installation, can be easily connected to the main PCB
- Interface for EIA-485 networks BACnet MS/TP and Modbus RTU
- BACnet Protocol Revision 12.0
- Only standard BACnet objects or Modbus registers are used for communication
- Data interface for an EASYLAB controller or for an EASYLAB room with different functional profiles
- Hardware switch to enter network addresses and communication parameters (no communication software required)

Technical data

- Communication interface: EIA-485 standard
- Protokoll: BACnet MS/TP standard rev. 12 or Modbus RTU
- Data transmission speeds: BACnet: 9600, 19200, 38400, 76800 baud, Modbus: 9600, 19200, 38400, 57600 baud
- Parity checks for data security: none, odd, even
- Configurable network addresses: 01 ... 99
- Operating temperature: 0 to 50 °C
- IEC protection class: III (protective extra-low voltage)
- Protection level: IP 20
- EC conformity: EMC to 2004/108/EG

Data points for a single controller

- Volume flow actual and setpoint values
- Damper blade position
- Operating mode
- Alarm/status messages
- Total supply air and total extract air actual values (room)
- Evaluated damper blade positions for all controllers in a room
- Number of controllers
- Integration of volume flows

Additional data points for a fume cupboard controller

- Operating mode default setting for the fume cupboard controller equipped with the expansion module
- Selection of priority for operating mode default setting
- Face velocity actual value and setpoint value (only for fume cupboard controllers with face velocity transducer, equipment function FH-VS)

Data points for EASYLAB room

- Operating mode default setting for the room: Just one data point is required to set the default operating mode for all controllers in a room
- Selection of priority for operating mode default setting (central BMS or room)
- Room operating mode
- Volume flow rate setpoint change (by the central BMS, for example) for an external temperature or differential pressure control
- Setpoint value switching for differential pressure control: Switching between two differential pressure setpoint values
- Total supply air and total extract air actual values (room)
- Evaluated damper blade positions for all controllers in a room
- Room differential pressure actual and setpoint values
- Room pressure alarm
- Number of controllers within the EASYLAB system
- Integration of volume flows
- Status of the digital inputs and outputs
- Configurable consolidated alarm (operating statuses, hardware faults)

**Order code detail for control component
ELAB (TCU3) or TAM**

ELAB / ...B... / ...
ELAB / ...M... / ...

Expansion module EM-BAC-MOD-01 for retrofit

EM – BAC – MOD – 01