

**EXPANSION MODULE
BACNET MS/TP,
MODBUS RTU**



**BACNET-MS/TP-
SCHNITTSTELLE**

TYPE EM-BAC-MOD

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

Modbus®

MODBUS-SCHNITTSTELLE

Application

Application

- Expansion module Type EM-BAC-MOD 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, operating 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

TECHNICAL INFORMATION

Function, Technical data, Specification text, Order code, Related products

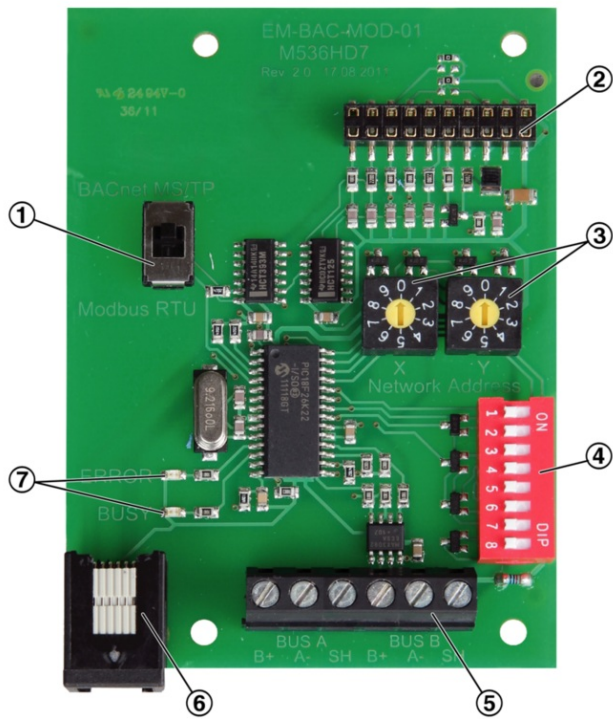
Functional description

The expansion module EM-BAC-MOD 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



- 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 |
| Communication interface | EIA-485 standard |
| Protocol | BACnet MS/TP standard rev. 12 or Modbus RTU |
| Data transmission speeds | BACnet: 9600, 19200, 38400, 76800 Bd, Modbus: 9600, 19200, 38400, 57600 Bd |
| Parity checks for data transmission security | None, odd, even |
| Configurable network addresses | 01 ... 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/EC |
| 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/EC

Data points for a single controller

- Volume flow rate 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 an 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)

- Any attachments are to be defined with the order code of the VAV terminal unit.
- Retrofit possible

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

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

Erweiterungsmodule

- B** EM-BAC-MOD für BACnet MS/TP
M EM-BAC-MOD für Modbus RTU

EM – BAC – MOD

Single controller, EASYLAB room, BACnet interface, Modbus interface, Product details ▼

Single controller

Interface for one EASYLAB controller

- Local data interface for a fume cupboard controller, supply air controller, extract air controller, or adapter module TAM

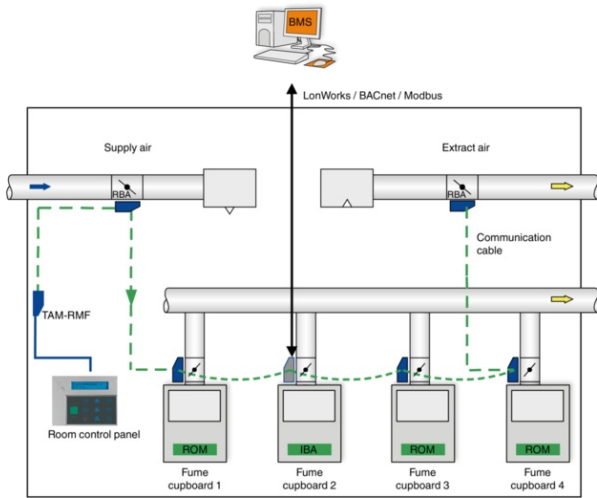
Data points for a single controller

- Volume flow rate 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 within the EASYLAB system
- Integration of volume flows
- Status of the digital inputs and outputs

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)

LonWorks, BACnet or Modbus interface on a single controller, e.g. fume cupboard controller



BMS central building management system
 RMF Controller with active room management function
 ROM Room operating mode, from the room control panel
 IOM Individual operating mode, transmitted via BACnet or Modbus interface

EASYLAB room

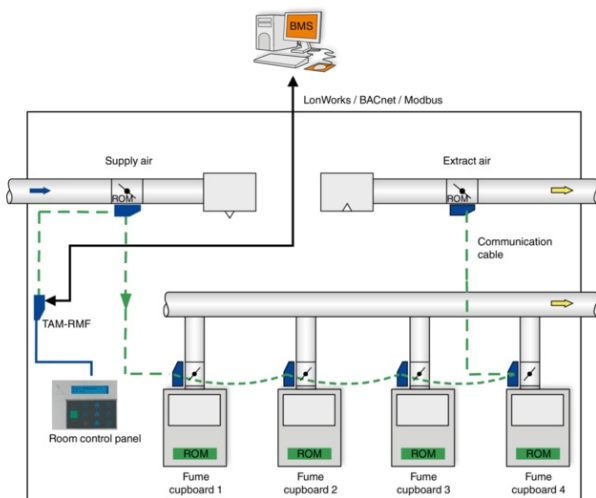
Interface for one EASYLAB room

- Local data interface for a TCU3 room controller (supply air or extract air) or TAM adapter module with active room management function
- Room management function reduces the required number of network data points and hence the commissioning costs
- Transmission of local data for the single controller and for the room

Data points for an EASYLAB room controller

- 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)
- Control input signal for sun protection/blinds (to be provided by others)

LonWorks, BACnet or Modbus interface for an EASYLAB room, e.g. on a room controller with active room management function



BMS central building management system

RMF Controller with active room management function

ROM Room operating mode, from the controller with room management function

BACnet interface

Application

The expansion module EM-BAC-MOD supports the following interface functions on an EASYLAB controller TCU3 or an adapter module TAM if the BACnet protocol has been selected:

- Native BACnet, i.e. the BACnet interface is implemented on the field module (EASYLAB volume flow controller)
- External hardware components such as physical gateways are not required
- BACnet interface documentation includes the following documents: Protocol Implementation Conformance Statement (PICS), BACnet Interoperability Building Blocks Supported (BIBBS), as well as a description of the device object and the supported objects
- For more information on each data point see the Details section

BACnet PICS (Protocol Implementation Conformance Statement) – Overview

| Principal categories | Values |
|-----------------------------|---|
| Date | 2014-01-21 |
| Vendor name | TROX GmbH |
| Vendor identifier | 329 |
| Product name | EM-BAC-MOD |
| Model no. | M536HD7 |
| Application | 4.0 |
| Firmware Revision | 4.0 |
| BACnet Protocol Revision | 12 |
| Standardised Device Profile | BACnet Application Specific Controller (B-ASC) |
| Segmentation Capability | No |
| Data Link Layer Options | MS/TP master (Clause 9), Baudrates 9600, 19200, 38400, 76800 |
| Device Address Binding | No |
| Network Security Options | Non-secure Device - is capable of operating without BACnet Network Security |
| Character Sets Supported | ISO 10646 (UTF-8) |

Configuration switches

| Hexadecimal Switches X, Y | Network address | | | |
|---------------------------|-----------------|-------|-------|-------|
| | | | | |
| DIP Switch 1 | OFF | ON | | |
| Controller | EASYLAB TCU3 | Other | | |
| DIP Switch 2 | OFF | ON | OFF | ON |
| DIP Switch 3 | OFF | OFF | ON | ON |
| Baud rate | 9600 | 19200 | 38400 | 76800 |

BIBBS - BACnet Interoperability Building Blocks Supported

| | |
|--|-----------|
| Data Sharing-ReadProperty-B | DS-RP-B |
| Data Sharing-WriteProperty-B | DS-WP-B |
| Data Sharing-COV-Unsolicited-B | DS-COVU-B |
| Device Management-Dynamic Device Binding-B | DM-DDB-B |
| Device Management-Dynamic Object Binding-B | DM-DOB-B |
| Device Management-Device Communication Control-B | DM-DCC-B |
| Device Management-ReinitialiseDevice-B | DM-RD-B |

DeviceObject

| Property | Value | Access |
|---------------------------------|---|-----------|
| Object identifier | Device instance; default instance = 32900 + set network address | WR, RD; E |
| Object name | Default="EM-BACnet"; project-specific description can be entered, 62 characters max. | WR, RD; E |
| Object type | Device (8) | RD |
| System_Status | OPERATIONAL (0) | RD |
| Vendor_Name | "TROX GmbH" | RD |
| Vendor_Identifier | 329 | RD |
| Model_Name | "EM-BAC-MOD" | RD |
| Description | Default = "EASYLAB"; description can be entered, 126 characters max. | WR, RD; E |
| Location | Default = ""; description can be entered, 62 characters max. | WR, RD; E |
| Firmware_Revision | "4.0" (EASYLAB) | RD |
| Application_Software_Version | "4.0" (EASYLAB) | RD |
| Protocol_Version | 1 | RD |
| Protocol_Revision | 12 | RD |
| Protocol Services Supported | Who-is, Who-has, Read-Property, Write-Property, Device-communication-control, Reinitialize-device | RD |
| Protocol_Object_Types_Supported | DEVICE, ANALOG_VALUE, BINARY_VALUE, MULTISTATE_VALUE | RD |
| Object_List | EASYLAB: device, analog-value 1...36, binary-value 1...30, multistate-value 1...8 | RD |
| Max_ADPU_Length_Accepted | 480 | RD |
| Segmentation_Supported | NO_SEGMENTATION (3) | RD |
| APDU_Timeout | 10000 | RD |
| Number_Of_APDU_Retries | 3 | RD |
| Device_Address_Binding | - | RD |
| Database_Revision | 0 | RD |
| Description | Controller Type "EASYLAB" | RD |
| Max_Master | Default 127 | WR, RD; E |
| Max_Info_Frames | Default 1 | WR, RD; E |

Multistate Value Objects

| Instance | Designation | Unit | | | | | | Access |
|----------|--------------------|-----------------------------------|----|--------|--------|-----|---------|--------|
| | | TCU3 | | | TAM | | | Access |
| Instance | Designation | Available with equipment function | | | | | | Access |
| | | FH | RR | RR RMF | EC, SC | TAM | TAM RMF | Access |
| 1 | COVU mode | x | x | x | x | x | x | WR, RD |
| 2 | Mode | x ¹ | | x | | | x | WR, RD |
| 3 | ModeAct | x | x | x | x | | | RD |
| 4 | RoomModeAct | | | x | | | x | RD |
| 5 | SwitchPos | x | | | | | | RD |
| 6 | Sunblind | | | x | | | x | WR, RD |
| 7 | SC_SetLockHighPrio | | | | | | | WR, RD |
| 8 | SC_GetLockHighPrio | | | | | | | RD |

¹ only for individually selected operating mode (stand-alone operation)

FH: Fume cupboard controller

RR: Room controller for supply air or extract air (RS, RE, PC)

RR RMF: Room controller with active room management function

EC, SC: Single controller for supply air or extract air (EC, SC)

TAM: Adapter module

TAM RMF: Adapter module with active room management function

Analogue Value Objects

| Instance | Designation | Unit | Unit | | | | | | Access |
|----------|---------------|--------------|-----------------------------------|----|--------|--------|-----|---------|-----------------|
| | | | Available with equipment function | | | | | | TCU3 TAM Access |
| Instance | Designation | Unit | Available with equipment function | | | | | | Access |
| | | | FH | RR | RR RMF | EC, SC | TAM | TAM RMF | Access |
| 1 | VolflowSet | l/s (87) | x | x | x | x | | x | RD |
| 2 | VolflowAct | l/s (87) | x | x | x | x | | x | RD |
| 3 | VolTotalExh | l/s (87) | x | x | x | x | x | x | RD |
| 4 | VolTotalSup | l/s (87) | x | x | x | x | x | x | RD |
| 5 | PressSet | Pa (53) | | | x | | | x | RD |
| 6 | PressAct | Pa (53) | | | x | | | x | RD |
| 7 | VelocitySet | m/s (74) | x | | | | | | RD |
| 8 | VelocityAct | m/s (74) | x | | | | | | RD |
| 9 | WireSensorPos | percent (98) | x | | | | | | RD |
| 10 | DampPos | percent (98) | x | x | x | x | | | RD |
| 11 | DampPosMax_FH | percent (98) | x | x | x | x | x | x | RD |
| 12 | DampPosMin_FH | percent (98) | x | x | x | x | x | x | RD |
| 13 | DampPosMax_RE | percent (98) | x | x | x | x | x | x | RD |

| | | | | | | | | | |
|----|---------------|---------------|---|---|---|---|---|---|--------|
| 14 | DampPosMin_RE | percent (98) | x | x | x | x | x | x | RD |
| 15 | DampPosMax_TE | percent (98) | x | x | x | x | x | x | RD |
| 16 | DampPosMin_TE | percent (98) | x | x | x | x | x | x | RD |
| 17 | DampPosMax_RS | percent (98) | x | x | x | x | x | x | RD |
| 18 | DampPosMin_RS | percent (98) | x | x | x | x | x | x | RD |
| 19 | VolOffset_T | percent (98) | | | x | | | x | WR, RD |
| 20 | VolOffset_P | percent (98) | | | x | | | x | WR, RD |
| 21 | SystemDevices | no units (95) | x | x | x | x | x | x | RD |
| 22 | VolflowExh | l/s (87) | x | x | x | | x | x | WR, RD |
| 23 | VolflowSup | l/s (87) | x | x | x | | x | x | WR, RD |
| 24 | SC_SetPos | percent (98) | | | | | | | WR, RD |
| 25 | SC_GetPos | percent (98) | | | | | | | RD |
| 26 | DampPosMax_EC | percent (98) | x | x | x | x | x | x | RD |
| 27 | DampPosMin_EC | percent (98) | x | x | x | x | x | x | RD |
| 28 | DampPosMax_SC | percent (98) | x | x | x | x | x | x | RD |
| 29 | DampPosMin_SC | percent (98) | x | x | x | x | x | x | RD |
| 30 | DampPosMax_TS | percent (98) | x | x | x | x | x | x | RD |
| 31 | DampPosMin_TS | percent (98) | x | x | x | x | x | x | RD |
| 32 | VolflowSet_R | l/s (87) | | | | | | | WR, RD |
| 33 | PressSet | pascal (57) | | | | | | | WR, RD |
| 34 | Volt_AI2 | volt (5) | x | x | x | x | x | x | RD |
| 35 | Volt_AI3 | volt (5) | x | x | x | x | x | x | RD |
| 36 | Volt_AO2 | volt (5) | x | x | x | x | x | x | WR, RD |

FH: Fume cupboard controller

RR: Room controller for supply air or extract air (RS, RE, PC)

RR RMF: Room controller with active room management function

EC, SC: Single controller for supply air or extract air (EC, SC)

TAM: Adapter module

TAM RMF: Adapter module with active room management function

Binary Value Objects

| Instance | Designation | Unit | | | | | | Access |
|----------|---------------------|-----------------------------------|----|--------|--------|-----|---------|--------|
| | | TCU3 | | | TAM | | | Access |
| Instance | Designation | Available with equipment function | | | | | | Access |
| | | FH | RR | RR RMF | EC, SC | TAM | TAM RMF | Access |
| 1 | LocalAlarm (COVU) | x | x | x | x | x | x | RD |
| 2 | SummaryAlarm (COVU) | | | x | | | x | RD |
| 3 | PressAlarm (COVU) | | | x | | | x | RD |
| 4 | ManOP_Disable | x ¹ | | x | | | x | WR, RD |
| 5 | PressSetSel | | | x | | | x | WR, RD |
| 6 | DI1 | x | x | x | x | x | x | RD |
| 7 | DI2 | x | x | x | x | x | x | RD |
| 8 | DI3 | x | x | x | x | x | x | RD |
| 9 | DI4 | x | x | x | x | x | x | RD |
| 10 | DI5 | x | x | x | x | x | x | RD |
| 11 | DI6 | x | x | x | x | x | x | RD |
| 12 | DO1 | x | x | x | x | x | x | RD |
| 13 | DO2 | x | x | x | x | x | x | RD |
| 14 | DO3 | x | x | x | x | x | x | RD |
| 15 | DO4 | x | x | x | x | x | x | RD |
| 16 | DO5 | x | x | x | x | x | x | RD |
| 17 | DO6 | x | x | x | x | x | x | RD |
| 18 | SC_Alarm | | | | | | | RD |
| 19 | DO1_Set | x | x | x | x | x | x | WR, RD |
| 20 | DO2_Set | x | x | x | x | x | x | WR, RD |
| 21 | DO3_Set | x | x | x | x | x | x | WR, RD |
| 22 | DO4_Set | x | x | x | x | x | x | WR, RD |
| 23 | DO5_Set | x | x | x | x | x | x | WR, RD |
| 24 | DO6_Set | x | x | x | x | x | x | WR, RD |
| 25 | DO1_SetByLocal | x | x | x | x | x | x | RD |
| 26 | DO2_SetByLocal | x | x | x | x | x | x | RD |
| 27 | DO3_SetByLocal | x | x | x | x | x | x | RD |
| 28 | DO4_SetByLocal | x | x | x | x | x | x | RD |
| 29 | DO5_SetByLocal | x | x | x | x | x | x | RD |
| 30 | DO6_SetByLocal | x | x | x | x | x | x | RD |

¹ only for individually selected operating mode (stand-alone operation)

FH: Fume cupboard controller

RR: Room controller for supply air or extract air (RS, RE, PC)

RR RMF: Room controller with active room management function

EC, SC: Single controller for supply air or extract air (EC, SC)

TAM: Adapter module

TAM RMF: Adapter module with active room management function

Modbus interface

Application

The expansion module EM-BAC-MOD supports the following interface functions on an EASYLAB controller TCU3 or an adapter module TAM if the Modbus protocol has been selected:

- Modbus is an open serial master-slave communication protocol which has become a de facto standard for the industry
- The master (e.g. central BMS) can address a number of slaves (EASYLAB volume flow controllers) and use Modbus functions to request information from individual data points
- Data access is based on numbered data registers which the master has to define in order to request data using Modbus functions
- The slave responds by either returning the requested information or an exception code (error)
- Example: The Read Holding Registers function (register no. 3) returns the volume flow rate actual value of the addressed controller
- General information for a Modbus device can be read out using the Read Device Identification function

Modbus functions

| Function no. | Designation | Meaning |
|--------------|----------------------------|--|
| 1 (0x01) | Read Coils | Read states of 1 to 8 bits according to bit list |
| 3 (0x03) | Read Holding Registers | Read several consecutive registers |
| 4 (0x04) | Read Input Registers | Read several consecutive registers |
| 5 (0x05) | Write Single Coil | Write state of a single bit |
| 6 (0x06) | Write Single Register | Write single register |
| 8 (0x08) | Diagnostics | Check Modbus communication |
| 16 (0x10) | Write Multiple Registers | Write several consecutive registers |
| 43 (0x2B) | Read Device Identification | Read identification data for the device |
| 14 (0x0E) | Read Device Identification | Read identification data for the device |

Exception codes

| Codes | Designation | Meaning |
|-------|-----------------------|---|
| 1 | Illegal Function Code | Unknown function or subfunction code |
| 2 | Illegal Data Address | Invalid register address |
| 3 | Illegal Data Value | Inconsistent coding for number of registers/bytes, data value |

Exception codes (error codes) are returned in case of invalid function or register access.

Bit list for ReadCoil/WriteSingleCoil functions

| Bit | | Unit | | | | | | Access |
|-----|--------------------|-----------------------------------|----|--------|--------|-----|---------|--------|
| Bit | | TCU3 | | | TAM | | | Access |
| Bit | | Available with equipment function | | | | | | Access |
| No. | Designation | FH | RR | RR-RMF | EC, SC | TAM | TAM-RMF | Access |
| 0 | ManOP_Disable | x ¹ | | x | | | x | WR |
| 1 | PressSetSel | | | x | | | x | WR |
| 2 | Local Alarm | x | x | x | x | x | x | RD |
| 3 | SummaryAlarm | | | x | | | x | RD |
| 4 | PressAlarm | | | x | | | x | RD |
| 5 | SC_SetlockHighPrio | | | | | | | WR |
| 6 | SC_GetLockHighPrio | | | | | | | RD |
| 7 | SC_Alarm | | | | | | | RD |

¹ only for individually selected operating mode (stand-alone operation)

Bits are read with function 1 (RD) or written with function 5 (WR).

FH: Fume cupboard controller

RR: Room controller for supply air or extract air (RS, RE, PC)

RR RMF: Room controller with active room management function

EC, SC: Single controller for supply air or extract air (EC, SC)

TAM: Adapter module

TAM RMF: Adapter module with active room management function

Register list for Read***Registers and Write***Registers functions

| Register | | Unit | | | | | | Access |
|----------|---------------|-----------------------------------|----|--------|--------|-----|---------|--------|
| Register | | TCU3 | | | TAM | | | Access |
| Register | | Available with equipment function | | | | | | Access |
| No. | Designation | FH | RR | RR-RMF | EC, SC | TAM | TAM-RMF | Access |
| 0 | Mode | x ¹ | | x | | | x | WR |
| 1 | ManOP_Disable | x ¹ | | x | | | x | WR |
| 2 | ModeAct | x | x | x | x | | | RD |
| 3 | VolflowAct | x | x | x | x | | | RD |
| 4 | VolflowSet | x | x | x | x | | | RD |
| 5 | VelocityAct | x | | | | | | RD |
| 6 | VelocitySet | x | | | | | | RD |
| 7 | VolTotalExh | x | x | x | x | x | x | RD |
| 8 | VolTotalSup | x | x | x | x | x | x | RD |
| 9 | VolOffset_T | | | x | | | x | WR |
| 10 | VolOffset_P | | | x | | | x | WR |
| 11 | PressAct | | | x | | | x | RD |

| | | | | | | | | |
|----|------------------------|---|---|---|---|---|---|----|
| 12 | PressSet | | | x | | | x | RD |
| 13 | PressSetSel | | | x | | | x | WR |
| 14 | DampPos | x | x | x | x | | | RD |
| 15 | DampPosMax_FH - Value | x | x | x | x | x | x | RD |
| 16 | DampPosMax_FH - Status | x | x | x | x | x | x | RD |
| 17 | DampPosMin_FH - Value | x | x | x | x | x | x | RD |
| 18 | DampPosMin_FH - Status | x | x | x | x | x | x | RD |
| 19 | DampPosMax_RE - Value | x | x | x | x | x | x | RD |
| 20 | DampPosMax_RE - Status | x | x | x | x | x | x | RD |
| 21 | DampPosMin_RE - Value | x | x | x | x | x | x | RD |
| 22 | DampPosMin_RE - Status | x | x | x | x | x | x | RD |
| 23 | DampPosMax_TE - Value | x | x | x | x | x | x | RD |
| 24 | DampPosMax_TE - Status | x | x | x | x | x | x | RD |
| 25 | DampPosMin_TE - Value | x | x | x | x | x | x | RD |
| 26 | DampPosMin_TE - Status | x | x | x | x | x | x | RD |
| 27 | DampPosMax_RS - Value | x | x | x | x | x | x | RD |
| 28 | DampPosMax_RS - Status | x | x | x | x | x | x | RD |
| 29 | DampPosMin_RS - Value | x | x | x | x | x | x | RD |
| 30 | DampPosMin_RS - Status | x | x | x | x | x | x | RD |
| 31 | LocalAlarm | x | x | x | x | x | x | RD |
| 32 | SummaryAlarm | | | x | | | x | RD |
| 33 | PressAlarm | | | x | | | x | RD |
| 34 | WireSensorPos | x | | | | | | RD |
| 35 | SwitchPos | x | | | | | | RD |
| 36 | RoomModeAct | | | x | | | x | RD |
| 37 | SystemDevices | x | x | x | x | x | x | RD |
| 38 | SunBlind | | | x | | | x | WR |
| 39 | StateDI | x | x | x | x | x | x | RD |
| 40 | StateDO | x | x | x | x | x | x | RD |
| 41 | VolflowExh | x | x | x | | x | x | WR |
| 42 | VolflowSup | x | x | x | | x | x | WR |
| 43 | SC_SetLockHighPrio | | | | | | | WR |
| 44 | SC_GetLockHighPrio | | | | | | | RD |

| | | | | | | | | |
|----|------------------------|---|---|---|---|---|---|--------|
| 45 | SC_SetPos - Value | | | | | | | WR |
| 46 | SC_SetPos - Status | | | | | | | WR |
| 47 | SC_GetPos | | | | | | | RD |
| 48 | SC_Alarm | | | | | | | RD |
| 49 | DampPosMax_EC - Value | x | x | x | x | x | x | RD |
| 50 | DampPosMax_EC - Status | x | x | x | x | x | x | RD |
| 51 | DampPosMin_EC - Value | x | x | x | x | x | x | RD |
| 52 | DampPosMin_EC - Status | x | x | x | x | x | x | RD |
| 53 | DampPosMax_SC - Value | x | x | x | x | x | x | RD |
| 54 | DampPosMax_SC - Status | x | x | x | x | x | x | RD |
| 55 | DampPosMin_SC - Value | x | x | x | x | x | x | RD |
| 56 | DampPosMin_SC - Status | x | x | x | x | x | x | RD |
| 57 | DampPosMax_TS - Value | x | x | x | x | x | x | RD |
| 58 | DampPosMax_TS - Status | x | x | x | x | x | x | RD |
| 59 | DampPosMin_TS - Value | x | x | x | x | x | x | RD |
| 60 | DampPosMin_TS - Status | x | x | x | x | x | x | RD |
| 61 | DO_Set | x | x | x | x | x | x | WR |
| 62 | DO_SetByLocal | x | x | x | x | x | x | RD |
| 63 | VofflowSet_R | | | | | | | WR, RD |
| 64 | PressSet | | | | | | | WR, RD |
| 65 | Volt_AI2 | x | x | x | x | x | x | RD |
| 66 | Volt_AI3 | x | x | x | x | x | x | RD |
| 67 | Volt_AO2 | x | x | x | x | x | x | WR, RD |

¹ only for individually selected operating mode (stand-alone operation)

FH: Fume cupboard controller

RR: Room controller for supply air or extract air (RS, RE, PC)

RR RMF: Room controller with active room management function

EC, SC: Single controller for supply air or extract air (EC, SC)

TAM: Adapter module

TAM RMF: Adapter module with active room management function

Data points – detailed description

The following is a detailed description of the information that each data point provides; input variables and output variables are described separately:

- Name of data point
- Access as viewed from the central BMS
- WR – Defaults for the volume flow controller or room, from the central BMS
- RD – Data provided by the volume flow controller or room
- List of volume flow controller equipment functions for which the variable is available
- Unit of measure (applies only to BACnet objects of type Analogue Value Object)
- Function and special functional values with their meaning
- Access to the data point using a BACnet object or Modbus register

Installation details



Installation and commissioning

Installation

- As attachment for the EASYLAB base component: factory mounted
- For retrofitting: Mount the expansion module into the base casing
- Make connection to the BACnet/Modbus EIA-485 network

Commissioning

- The EASYLAB controller identifies the expansion module automatically
- Select BACnet or Modbus protocol using slide switch
- Set network address and communication parameters using the coding switches
- If necessary, activate terminal resistor of the network segment
- Integrate data interface with the central BMS (system integration)

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