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C | Logline

# Analog Output Module BMT-AO4

## 1108851302

7628/899299-07


## 1. Description

The BACnet MS/TP module with 4 analog outputs was developed for decentralized switching tasks. It is suitable as encoder for control variables, for example for electrical vent and mixing valves, valve positions, etc.

The outputs can be output by means of standard objects via a BACnet client. The module is addressed and the baud rate is set by means of two address switches on the front.

Suitable for decentralized mounting in serial sub-distributor.

## 2. Declaration of Conformity

The device was tested according to the applicable standards. Conformity was proofed. The declaration of conformity is available at the manufacturer METZ CONNECT GmbH.

### Notes Regarding Device Description

These instructions include indications for use and mounting of the device. In case of questions that cannot be answered with these instructions please consult supplier or manufacturer.

The indicated installation directions or rules are applicable to the Federal Republic of Germany. If the device is used in other countries it applies to the equipment installer or the user to meet the national directions.

### Safety Instructions

Keep the applicable directions for industrial safety and prevention of accidents as well as the VDE rules.

Technicians and/or installers are informed that they have to electrically discharge themselves as prescribed before installation or maintenance of the devices.

Only qualified personnel shall do mounting and installation work with the devices, see section "qualified personnel".

The information of these instructions have to be read and understood by every person using this device.

### Symbols

Warning of dangerous electrical voltage

Danger

means that non-observance may cause risk of life, grievous bodily harm or heavy material damage.

### Qualified Personnel

Qualified personnel in the sense of these instructions are persons who are well versed in the use and installation of such devices and whose professional qualification meets the requirements of their work.

This includes for example:

- Qualification to connect the device according to the VDE specifications and the local regulations and a qualification to put this device into operation, to power it down or to activate it by respecting the internal directions.
- Knowledge of safety rules.
- Knowledge about application and use of the device within the equipment system etc.

## 3. Technical Data

### BACnet Interface

| | |
|---|---|
| Protocoll | BACnet MS/TP |
| Transmission rate | 9600 to 115200 Bd (factory setting 9600 Bd) |
| Cabling | RS485 two wire bus with voltage equalizing cable in bus / line topology; terminate with 120 Ohms |

### Supply

| | |
|---|---|
| Operating voltage range | 20 to 28 V AC/DC (SELV) |
| Current consumption | 50 mA (AC) / 20 mA (DC) |
| Relative duty cycle | 100 % |

### Output

| | |
|---|---|
| Output voltage | 4 x 0 to 10 V DC |
| Output current | 5 mA at 10 V DC |
| Resolution | 10 mV / Digit |

### Housing

| | |
|---|---|
| Dimensions WxHxD | 1.4 x 2.8 x 2.6 in. (35 x 70 x 65 mm) |
| Weight | 72 g |
| Mounting position | any |
| Mounting | standard rail TH35 per IEC 60715 |
| Mounting in series without space | the maximum quantity of modules connected in line is limited to 15 or to a maximum power consumption of 2 Amps (AC or DC) per connection to the power supply. For any similar block of additional modules a separate connection to the power supply is mandatory. |
| Material | |
| Housing | Polyamide 6.6 V0 |
| Terminal blocks | Polyamide 6.6 V0 |
| Cover plate | Polycarbonate |
| Type of protection (IEC 60529) | |
| Housing | IP40 |
| Terminal blocks | IP20 |

### Terminal blocks

| | |
|---|---|
| Supply and bus | |
| 4 pole terminal block | max. AWG 16 (1.5 mm²) solid wire<br>max. AWG 18 (1.0 mm²) stranded wire |
| Wire diameter | min. 0.3 mm up to max. 1.4 mm (terminal block and jumper plug are included to each packing unit) |
| Module connection | |
| Outputs | max. AWG 12 (4.0 mm²) solid wire<br>max. AWG 14 (2.5 mm²) stranded wire |
| Wire diameter | min. 0.3 mm up to max 2.7 mm |
| Protective circuitry | polarity reversal protection of operating voltage<br>polarity reversal protection of supply and bus |

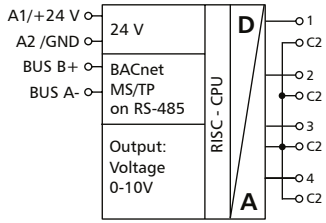
### Temperature range

| | |
|---|---|
| Operation | -5 °C to +55 °C |
| Storage | -20 °C to +70 °C |

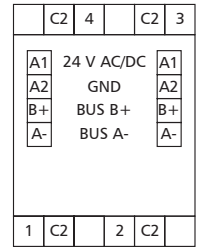
### Display

| | |
|---|---|
| Operating / bus activity | green LED |
| Error indication | red LED |

## 4. Wiring Diagram




## 5. Connection Diagram

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Mounting instruction see www.metz-connect.com

## 6. Mounting

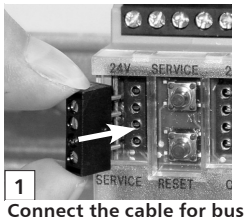
### Power down the equipment

Mount the module on standard rail (TH35 per IEC 60715 in junction boxes and/or on distribution panels).

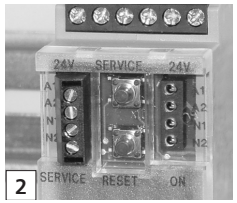
Installation

Electric installation and device termination shall be done by qualified persons only, by respecting all applicable specifications and regulations.

### Plug in the terminal block for bus connection

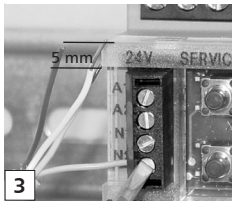


1



2

### Connect the cable for bus supply



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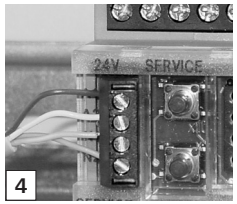

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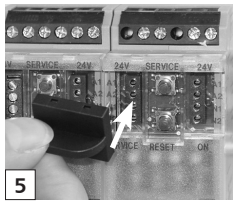
### Mounting in series



5

6

The module can be aligned without interspace. Use the jumper plug to connect bus and supply voltage when the modules are mounted in series.

**The maximum quantity of modules connected in line is limited to 15 or to a maximum power consumption of 2 Amps (AC or DC) per connection to the power supply. For any similar block of additional modules a separate connection to the power supply is mandatory.**

## 7. Network adress and Bit rate setting

Configuration Switches

Hexadecimal Switches x10, x1 define the Network Address (00 - F9; e.g. F9h = 15x16+9 = 249d) and Baud rate (FA – FF).

- Turn Switch x10 to E (Device is temporaryly configured as Slave)
- Turn Switch x1 to A – F to select Baud rate
- Turn Switch x10 to F, wait 1 second
- Red and green LEDs are blinking when Baud rate ist stored in EEPROM
- Turn Switch x10 to select Network Address
- Turn Switch x1 to select Network Address

MS/TP Master if using Network Address 0x00 … Max_Master,

MS/TP Slave if using Network Address Max_Master + 1 … 0xF9.

| Adress switch x10 | F | F | F | F | F | F |
|---|---|---|---|---|---|---|
| Adress switch x1 | A | B | C | D | E | F |
| Bit rate (Bit/s) | 9600 | 19200 | 38400 | 57600 | 76800 | 115200 |

Factory setting: 9600 Bit/s

## 8. Software Description

### Device Object

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | device, default instance: 421000 + Network-Address | RW-E |
| Object_Name | max. 63 Bytes,<br>default "BMT-AO4_" + Network-Address (Hexadecimal) | RW-E |
| Object_Type | DEVICE (8) | R |
| System_Status | OPERATIONAL (0) | R |
| Vendor_Name | "BTR Netcom GmbH" | R |
| Vendor_Identifier | 421 | R |
| Model_Name | "BMT-AO4" | R |
| Description | max. 127 Bytes, default "" | RW-E |
| Location | max. 63 Bytes, default "" | RW-E |
| Firmware_Revision | "1.2" | R |
| Application_Software_Version | "1.0" | R |
| Protocol_Version | 1 | R |
| Protocol_Revision | 12 | R |
| Protocol_Services_Supported | read-property, write-property, subscribe-cov, who-has, who-is, device-communication-control, reinitialize-device | R |
| Protocol_Object_Types_Supported | DEVICE, ANALOG_OUTPUT, ANALOG_VALUE | R |
| Object_List [6] | device, analog-output 1…4, analog-value 1 | R |
| Max_APDU_Length_Accepted | 480 | R |
| Segmentation_Supported | NO_SEGMENTATION (3) | R |
| APDU_Timeout | 10000 | R |
| Number_Of_APDU_Retries | 3 | R |
| Device_Address_Binding | - | R |
| Database_Revision | 0 | R |
| Max_Master | 0…127, default 127 | RW-E |
| Max_Info_Frames | 1…255, default 1 | RW-E |
| Active_COV_Subscriptions | max. 6 Subscriptions, for analog-output 1…4,<br>Confirmed / Unconfirmed, Lifetime = 0…65535 sec. | R |
| R: Read Property, W: Write Property, | -E: Storage in EEPROM / Flash | |

### Analog Output Object 1...4

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | analog-output, instance 1 … 4 | R |
| Object_Type | ANALOG_OUTPUT (1) | R |
| Object_Name | max. 42 Bytes, default "Output 1" … "Output 4" | RW-E |
| Description | max. 84 Bytes, default "" | RW-E |
| Present_Value | 0.0 … 102.4 (0V … 10.24V) | RW |
| Status_Flags | IN_ALARM: 0<br>FAULT: 0<br>OVERRIDDEN: 0<br>OUT_OF_SERVICE: 0 / 1 | R |
| Event_State | NORMAL (0) | R |
| Out_Of_Service | FALSE (0) / TRUE (1) | RW |
| Units | Percent (98) | R |
| Priority_Array [16] | NULL / 0.0 … 102.4 (0V … 10.24V) | R |
| Relinquish_Default | 0.0 … 102.4 (0V … 10.24V) | RW-E |
| COV_Increment | Minimum change of Present_Value for COV notification,<br>default 1.0 | RW-E |
| Notification_Class | Unsubscribed UnconfirmedCOVNotification<br>0: no COV notification, default,<br>1: local broadcast,<br>2: global broadcast | RW-E |
| Resolution | 0.00625 (0.625 mV) | - |
| R: Read Property, W: Write Property, | -E: Storage in EEPROM / Flash | |

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## Continuation Software Description

| Function Table for Analog Output | | | | |
|---|---|---|---|---|
| Out_Of_Service | Priority_Array | Present_Value | Analog Output | OUT_OF_SERVICE |
| 0 | NULL | Relinquish_Default | Relinquish_Default | 0 |
| | Value | Value | Value | |
| 1 | NULL | Relinquish_Default | unchanged | 1 |
| | Value | Value | | |

### Analog Value Object 1

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | analog-value, instance 1 | R |
| Object_Type | ANALOG_VALUE (2) | R |
| Object_Name | max. 42 Bytes, default “Watchdog Time” | RW-E |
| Description | max. 84 Bytes, default “” | RW-E |
| Present_Value | Time Constant of Watchdog Timer,<br>0: Watchdog is inactive, Maximum: 655.34 seconds | RW-E |
| Status_Flags | IN_ALARM: 0<br>FAULT: 0<br>OVERRIDDEN: 0<br>OUT_OF_SERVICE: 0 | R |
| Event_State | NORMAL (0) | R |
| Out_Of_Service | FALSE (0) | R |
| Units | seconds (73) | R |
| R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash | | |

The Watchdog Timer resets Present_Value of all output objects to Relinquish_Default, if BACnet communication fails permanently. The timer is re-started, when a BACnet message with an APDU is received.

When the timer times out, the priority arrays of all output objects are completely cleared to NULL.

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