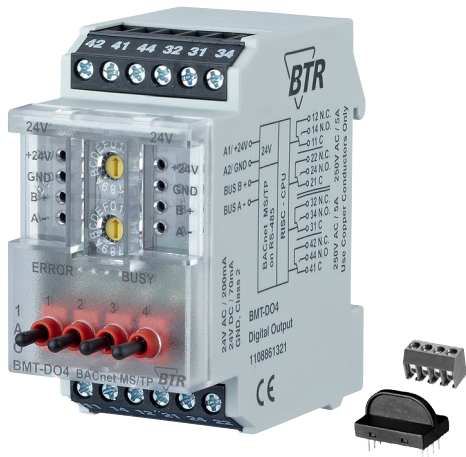


Digital Output Module BMT-DO4

1108861321



1. Description

The BACnet MS/TP module with 4 digital outputs is designed for local switching operations. It is suitable to operate electrical components such as motors, contactors, lamps, sun-blinds etc. We recommend to protect the relay contacts additionally by a RC-element or high inductive loads. The module is provided with a manual control facility for manual switching of the relays. The outputs can be operated by standard objects via a BACnet-Client. Addressing of the module and baud rate setting are done with the two address switches (x1 / x10) on the front. Possible settings are addresses 00 to F9 and baud rates 9600 Bd, 19200 Bd, 38400 Bd, 57600 Bd, 76800 Bd and 115200 Bd.

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 BTR NETCOM 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

Protocol

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

200 mA (AC) / 70 mA (DC)

Relative duty cycle

100 %

Output

Output contacts

4 x changeover contacts

Switching voltage max.

250 V AC

Continuous current max.

5 A per relay

Total current for all contacts

12 A

Switching frequency

360 switching cycles per hour

Housing

Dimensions WxHxD

1.4 x 2.8 x 2.6 in. (35 x 70 x 65 mm)

Weight

95 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
max. AWG 18 (1.0 mm²) stranded wire
min. 0.3 mm up to max. 1.4 mm
(terminal block and jumper plug are included to each packing unit)

Wire diameter

Module connection

Output

max. AWG 12 (4.0 mm²) solid wire
max. AWG 14 (2.5 mm²) stranded wire
min. 0.3 mm up to max 2.7 mm
polarity reversal protection of operating voltage
polarity reversal protection of supply and bus

Wire diameter

Protective circuitry

Temperature range

Operation

-5 °C to +55 °C

Storage

-20 °C to +70 °C

Display

Operating / bus activity

green LED

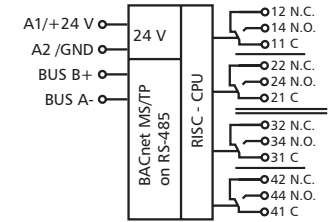
Error indication

red LED

Status of the outputs

yellow LED

4. Wiring Diagram



5. Connection Diagram

42	41	44	32	31	34
A1	24 V AC/DC	A1			
A2	GND	A2			
B+	BUS B+	B+			
A-	BUS A-	A-			
11	14	12	21	24	22

6. Mounting

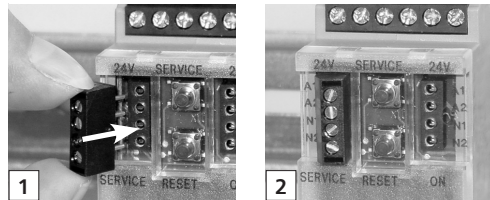
Power down the equipment

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

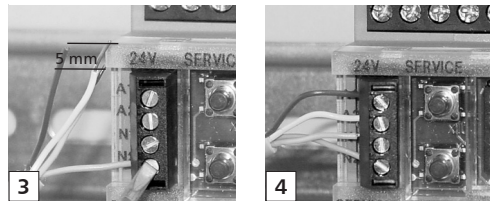
Installation

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

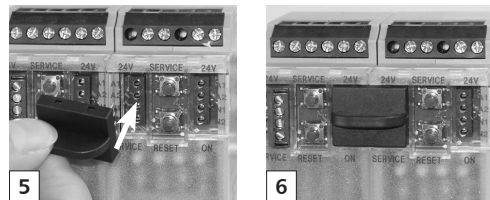
Plug in the terminal block for bus connection



Connect the cable for bus supply



Mounting in series



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 address and Bit rate setting

Configuration Switches

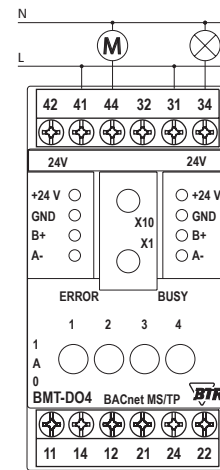
Hexadecimal Switches x10, x1 define the Network Address (00 - F9; e.g. F9h = 15x16+9 = 249d) and Baud rate (FA - FF).

- Turn Switch x10 to E (Device is temporarily 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 is 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.

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

Factory setting: 9600 Bit/s

8. Connection examples



9. Software Description

Device Object

Property	Remark / Value	RW
Object_Identifier	device, default instance: 421000 + Network-Address	RW-E
Object_Name	max. 63 Bytes, default "BMT-DO4." + 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-DO4"	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, BINARY_OUTPUT, ANALOG_VALUE	R
Object_List [6]	device, binary-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 binary-output 1...4, Confirmed / Unconfirmed, Lifetime = 0...65535 sec.	R

R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash

Continuation Software Description

Binary Output Object 1...4

Property	Remark / Value	RW
Object_Identifier	binary-output, instance 1 ... 4	R
Object_Type	BINARY_OUTPUT (4)	R
Object_Name	max. 42 Bytes, default "Relay 1" ... "Relay 4"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	NULL (write only) / INACTIVE (0) / ACTIVE (1)	RW
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 = Switch A (Auto) 1 = Switch 0 (Off) or 1 (On) OUT_OF_SERVICE: 0 / 1	R
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0) / TRUE (1)	RW
Polarity	NORMAL (0) / REVERSE (1)	RW-E
Priority_Array [16]	NULL / INACTIVE (0) / ACTIVE (1)	R
Relinquish_Default	INACTIVE (0)	R
Inactive_Text	max. 20 Bytes, default "Off"	RW-E
Active_Text	max. 20 Bytes, default "On"	RW-E
Notification_Class	Unsubscribed UnconfirmedCOVNotification 0: no COV notification, default, 1: local broadcast, 2: global broadcast	RW-E
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Function Table for Binary Output

Out_Of_Service	Polarity	Switch	Priority_Array	Present_Value	Binary Output	OVERRIDDEN	OUT_OF_SERVICE
0	0	A	NULL / 0 / 1	0 / 0 / 1	0 / 0 / 1	0	0
0	0	0	NULL / 0 / 1	0	0	1	0
0	0	1	NULL / 0 / 1	1	1	1	0
0	1	A	NULL / 0 / 1	0 / 0 / 1	1 / 1 / 0	0	0
0	1	0	NULL / 0 / 1	1	0	1	0
0	1	1	NULL / 0 / 1	0	1	1	0
1	0	A	NULL / 0 / 1	0 / 0 / 1	0	0	1
1	0	0	NULL / 0 / 1	0 / 0 / 1	0	0	1
1	0	1	NULL / 0 / 1	0 / 0 / 1	1	0	1
1	1	A	NULL / 0 / 1	0 / 0 / 1	1	0	1
1	1	0	NULL / 0 / 1	0 / 0 / 1	0	0	1
1	1	1	NULL / 0 / 1	0 / 0 / 1	1	0	1

Continuation Software Description

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, 0: Watchdog is inactive, Maximum: 655.34 seconds	RW-E
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 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 restarted, 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.