METZ CONNECT

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C | Logline

Digital I/O Module BMT-DIO4/2

1108831326

7624/899299-04

1. Description

The BACnet MS/TP module with 4 digital inputs and 2 relay outputs with manual control was developed for decentralized switching tasks. It is suitable for accommodating, for example, light switches and window contacts in a room, switching two light strips or controlling louvers. It can also be used to control 2 motorized fire dampers. With strong inductive loads, we recommend protecting the relay contacts with an RC element. The inputs can be used as contact or voltage inputs. The inputs and outputs can be switched and scanned by means of standard objects via a BACnet client. The module address and the baud rate are 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 ... 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 ... 28 V AC/DC (SELV)
Current consumption	200 mA (AC) / 75 mA (DC)
Relative duty cycle	100 %

Input

Voltage input	30 V AC/DC
High-signal recognition	>7 V AC/DC

Output

Output contacts	2 changeover contacts
Switching voltage max.	250 V AC
Continuous current max.	16 A / relay (80 A / 20 ms)
Total current for all contacts	25 A

Housing

Dimensions WxHxD	2.0 x 2.8 x 3.0 in. (50 x 70 x 75 mm)
Weight	126 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 wireg 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 Input/Output	max. AWG 12 (4.0 mm²) solid wire 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 polarity reversal protection of supply and bus

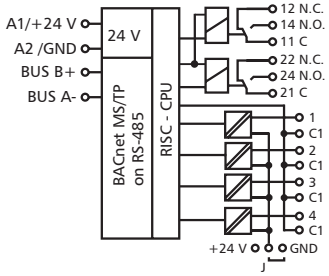
Temperature range

Operation	-5 °C ... +55 °C
Storage	-20 °C ... +70 °C

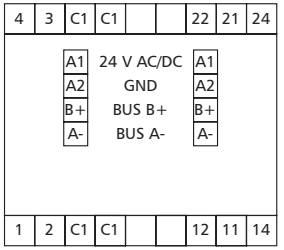
Display

Operating / bus activity	green LED
Error indication	red LED
Status of the inputs & outputs	yellow LED

4. Wiring Diagram



5. Connection Diagram



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Mounting instruction see www.metz-connect.com

6. Mounting

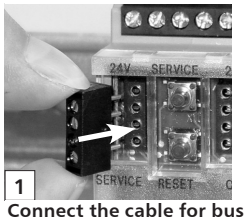
Power down the equipment

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

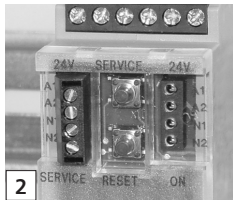
Installation

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

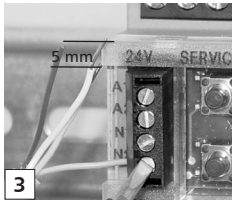


1

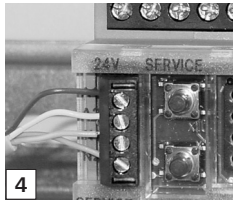


2

Connect the cable for bus supply

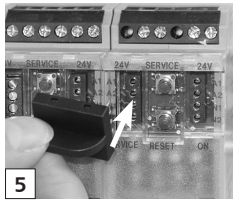


3

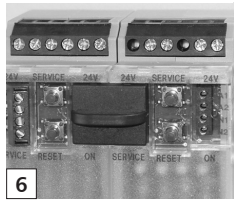


4

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 Baudrate (FA – FF).

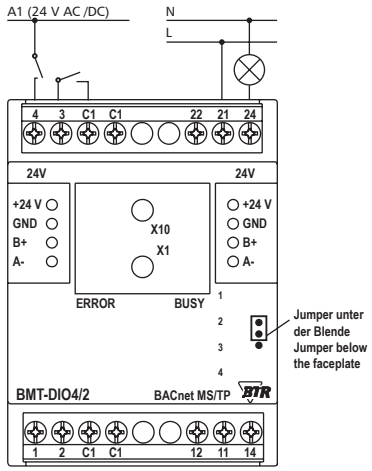
- Turn Switch x10 to E (Device is temporaryly configured as Slave)
- Turn Switch x1 to A – F to select Baudrate
- Turn Switch x10 to F, wait 1 Second
- Red and green LEDs are blinking when Baudrate ist stored in EEPROM
- Turn Switch x10 to select Network-Address
- Turn Switch x1 to select Network-Address

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

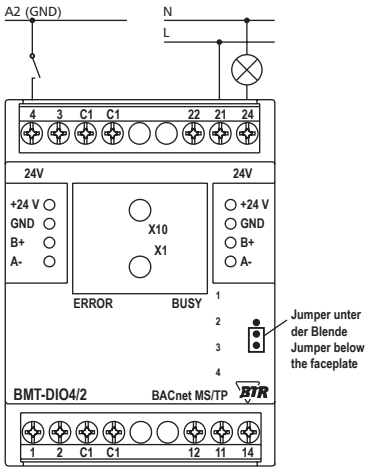
Factory setting: 9600 Bit/s

8. Connection examples

Connection examples 1+2



Connection example 3



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-DIO4/2_" + 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-DIO4/2"	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, BINARY_INPUT, GROUP, ANALOG_VALUE	R
Object_List [11]	device, binary-output 1…2, binary-input 1…4, group 1…3, 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. 8 Subscriptions, for binary-input / binary-output, Confirmed / Unconfirmed, Lifetime = 0…65535 sec.	R
R: Read Property, W: Write Property,	-E: Storage in EEPROM / Flash	

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Continuation Software Description

Binary Output Object 1…2

Property	Remark / Value	RW
Object_Identifier	binary-output, instance 1 … 2	R
Object_Type	BINARY_OUTPUT (4)	R
Object_Name	max. 42 Bytes, default “Relay 1” … “Relay 2”	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 1	NULL / 0 / 1 NULL / 0 / 1	0 1	0 1	1	0
0	1	A	NULL / 0 / 1	0 / 0 / 1	1 / 1 / 0	0	0
0	1	0 1	NULL / 0 / 1 NULL / 0 / 1	1 0	0 1	1	0
1	0	A	NULL / 0 / 1	0 / 0 / 1	0	0	1
1	0	0 1	NULL / 0 / 1 NULL / 0 / 1	0 / 0 / 1 0 / 0 / 1	0 1	0	1
1	1	A	NULL / 0 / 1	0 / 0 / 1	1	0	1
1	1	0 1	NULL / 0 / 1 NULL / 0 / 1	0 / 0 / 1 0 / 0 / 1	0 1	0	1

Continuation Software Description

Binary Input Object 1…4

Property	Remark / Value	RW
Object_Identifier	binary-input, instance 1 … 4	R
Object_Type	BINARY_INPUT (3)	R
Object_Name	max. 42 Bytes, default “Input 1” … “Input 4”	RW-E
Description	max. 84 Bytes, default “”	RW-E
Present_Value	INACTIVE (0) / ACTIVE (1), writable if Out_Of_Service	R RW
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 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
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 Input

Out_Of_Service	Polarity	BinaryInput	Present_Value	OUT_OF_SERVICE
0	0	0 1	0 1	0
0	1	0 1	1 0	0
1	0	0 1	x	1
1	1	0 1	x	1
x: Present_Value is writable and not affected by inputs				

Group Object 1…3

Property	Remark / Value	RW
Object_Identifier	group, instance 1 … 3	R
Object_Type	GROUP (11)	R
Object_Name	max. 42 Bytes, default “Group 1” … “Group 3”	RW-E
Description	max. 84 Bytes, default “”	RW-E
Present_Value	Present_Value of Binary Inputs, see next Table	R
List_Of_Group_Members	see next Table	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Members of Groups

Group	Binary Input			
	1	2	3	4
1	x	x	x	x
2	x	x		
3			x	x

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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 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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