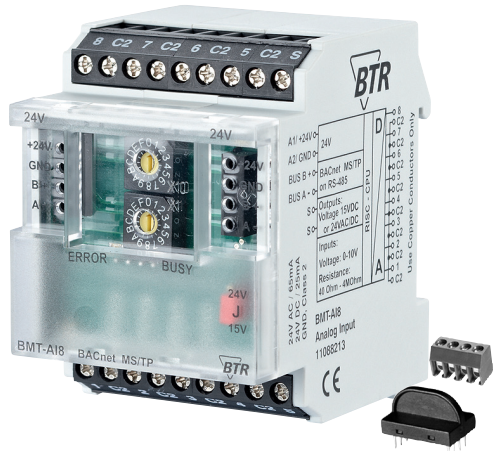


Analoges Eingangsmodul BMT-AI8

11088213

7603/69299-03



1. Beschreibung

Das BACnet MS/TP-Modul mit 8 einzeln konfigurierbaren Widerstands- oder Spannungseingängen wurde für dezentrale Schaltaufgaben entwickelt. Es ist geeignet zur Erfassung von Widerständen und Spannungen von z.B. passiven und aktiven Temperaturfühler, elektrischen Lüftungs- und Mischklappen, Ventilstellungen usw. Von einem BACnet-Client können die Eingänge über Standard-Objekte universell konfiguriert werden. Die Adressierung des Moduls und die Einstellung der Baudrate erfolgt über die beiden Adressschalter (x1 / x10) auf der Frontseite. Es können die Adressen 00 bis F9 sowie die Baudraten 9600 Bd, 19200 Bd, 38400 Bd, 57600, 76800 Bd und 115200 Bd eingestellt werden.

2. Wichtige Hinweise

Konformitätserklärung

Das Gerät wurde nach den geltenden Normen geprüft. Die Konformität wurde nachgewiesen. Die Konformitätserklärung ist beim Hersteller METZ CONNECT GmbH abrufbar.

Hinweise zur Gerätebeschreibung

Die Beschreibung enthält Hinweise zum Einsatz und zur Montage des Geräts. Sollten Fragen auftreten, die nicht mit Hilfe dieser Anleitung geklärt werden können, sind weitere Informationen beim Lieferanten oder Hersteller einzuholen.

Die angegebenen Vorschriften/Richtlinien zur Installation und Montage gelten für die Bundesrepublik Deutschland. Beim Einsatz des Geräts im Ausland sind die nationalen Vorschriften in Eigenverantwortung des Anlagenbauers oder des Betreibers einzuhalten.

Sicherheitshinweise

Für die Montage und den Einsatz des Geräts sind die jeweils gültigen Arbeitsschutz-, Unfallverhütungs- und VDE-Vorschriften einzuhalten.

Facharbeiter oder Installateure werden darauf hingewiesen, dass sie sich vor der Installation oder Wartung der Geräte vorschriftsmäßig entladen müssen.

Montage- und Installationsarbeiten an den Geräten dürfen grundsätzlich nur durch qualifiziertes Fachpersonal durchgeführt werden, siehe Abschnitt "qualifiziertes Fachpersonal".

Jede Person, die das Gerät einsetzt, muss die Beschreibungen dieser Anleitung gelesen und verstanden haben.

Warnung vor gefährlicher elektrischer Spannung

Gefahr



bedeutet, dass bei Nichtbeachtung Lebensgefahr besteht, schwere Körperverletzungen oder erhebliche Sachschäden auftreten können.

Qualifiziertes Fachpersonal

Qualifiziertes Fachpersonal im Sinne dieser Anleitung sind Personen, die mit den beschriebenen Geräten vertraut sind und über eine ihrer Tätigkeit entsprechenden Qualifikation verfügen.

Hierzu gehören zum Beispiel:

- Berechtigung zum Anschluss des Geräts gemäß den VDE-Bestimmungen und den örtlichen EVU-Vorschriften sowie
- Berechtigung zum Ein-, Aus- und Freischalten des Geräts unter Berücksichtigung der innerbetrieblichen Vorschriften;
- Kenntnis der Unfallverhütungsvorschriften;
- Kenntnisse über den Einsatz und Gebrauch des Geräts innerhalb des Anlagensystems usw.

3. Technische Daten

BACnet-Schnittstelle

Protokoll BACnet MS/TP
9600 ... 115200 Bd
(Werkseinstellung 9600 Bd)
Übertragungsrunde
RS485 Zweidrahtbus mit Potentialausgleich in Bus-/Linientopologie; mit 120 Ohm abschließen

Versorgung

Betriebsspannungsbereich 20 ... 28 V AC/DC (SELV)
Stromaufnahme 65 mA (AC) / 25 mA (DC)
Einschaltdauer relativ 100 %
Eingangssseite
Widerstandsbereich 40 Ohm bis 4 MOhm
Spannungseingang 0 ... 10 V DC
Auflösung 10 mV
Fehler ca. ±100 mV

Gehäuse

Abmessungen BxHxT 50 x 70 x 65 mm
Gewicht 104 g
Einbaulage beliebig
Montage Tragschiene TH35 nach IEC 60715
Anreihbar ohne Abstand
Nach dem Anreihen von 15 Modulen oder einer maximalen Stromaufnahme von 2 A (AC oder DC) pro Anschluss am Netzgerät muss mit der Versorgungsspannung neu extern angefahren werden.

Material

Gehäuse Polyamid 6.6 V0
Klemmen Polyamid 6.6 V0
Blende Polycarbonat

Schutzart (IEC 60529)

Gehäuse IP40
Klemmen IP20

Anschlussklemmen

Versorgung und Bus
4-polige Anschlussklemme max. 1,5 mm² eindrätig
max. 1,0 mm² feinstdrätig
0,3 mm bis max. 1,4 mm
(Anschlussklemme und
Brückenstecker als Zubehör in der
Verpackung)
Aderndurchmesser
Geräteanschluss max. 4 mm² eindrätig
max. 2,5 mm² feinstdrätig
Eingänge
Aderndurchmesser 0,3 mm bis max. 2,7 mm
Schutzbeschaltung
Verpolschutz der Betriebsspannung
Verpolschutz von Speisung und Bus

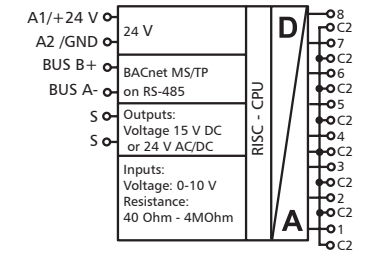
Temperaturbereich

Betrieb -5 °C ... +55 °C
Lagerung -20 °C ... +70 °C

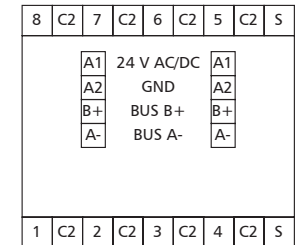
Anzeige

Betrieb und Bustätigkeit grüne LED
Fehlermeldung rote LED

4. Prinzipbild



5. Anschlussbild



6. Montage

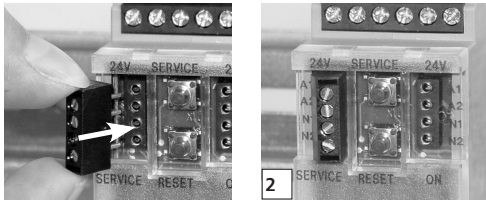
Anlage spannungsfrei schalten

Gerät auf Tragschiene (TH35 nach IEC 60715, Einbau in Elektroverteiler / Schalttafel) setzen

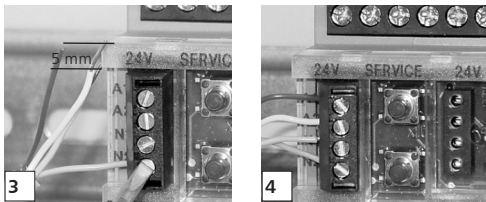
Installation

Die Elektroinstallation und der Geräteanschluss dürfen nur durch qualifiziertes Fachpersonal unter Beachtung der VDE-Bestimmungen und örtlicher Vorschriften vorgenommen werden.

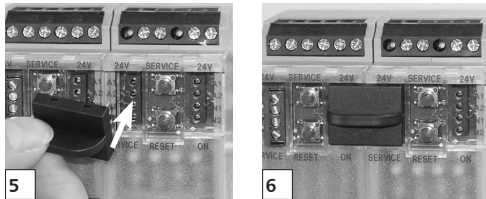
Anschlussklemme für Busanschluss einstecken.



Kabel für Busanschluss anschließen



Reihenmontage



Das Modul ist ohne Abstand anreihbar. Bei Reihenmontage Brückenstecker aufstecken, er verbindet Bus und Versorgungsspannung bei nebeneinander montierten Modulen.

Nach dem Anreihen von 15 Modulen oder einer maximalen Stromaufnahme von 2 A (AC oder DC) pro Anschluss am Netzgerät muss mit der Versorgungsspannung neu extern angefahren werden.

7. Netzwerkadresse und Bitrate einstellen

Schalter zur Konfiguration

Hexadezimalschalter x10, x1 definieren die Netzwerkadresse (00 - F9; z.B. F9h = 15x16+9 = 249d) und die Baudrate (FA - FF)

- Schalter x10 auf E drehen (Gerät ist als Slave konfiguriert)
- Schalter x1 auf A-F drehen, um die Baudrate einzustellen
- Schalter x10 auf F drehen und 1 Sekunde warten
- Die rote und grüne LED blinken, wenn die Baudrate im EEPROM gespeichert wurde
- Schalter x10 drehen um die Netzwerkadresse einzustellen
- Schalter x1 drehen um die Netzwerkadresse einzustellen

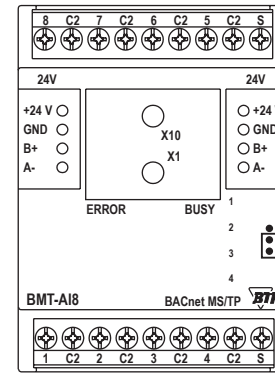
MS/TP Master bei Verwendung der Netzwerkadresse 0x00 ... Max_Master,

MS/TP Slave bei Verwendung der Netzwerkadresse Max_Master + 1 ... 0xF9.

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

Werkseinstellung: 9600 Bit/s

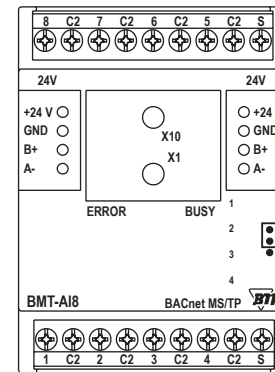
8. Position der Steckbrücke für die Speisung von aktiven Fühlern.



Jumper unter der Blende
Jumper below the faceplate

Jumper unten:
Klemmen S = 15 V DC
(Werkseinstellung)

Jumper in bottom position:
Contacts S = 15 V DC
(Factory setting)

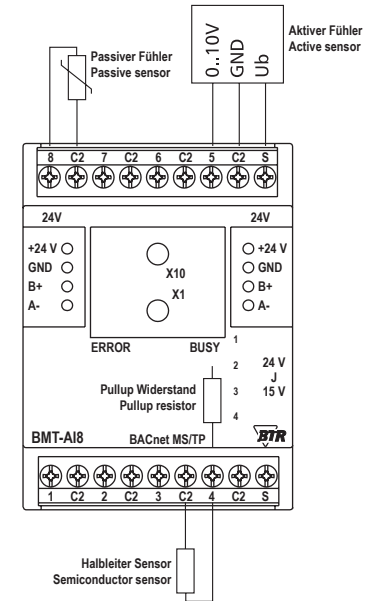


Jumper unter der Blende
Jumper below the faceplate

Jumper oben:
Klemmen S = 24 V AC/DC

Jumper in top position:
Contacts S = 24 V AC/DC

9. Anschlussbeispiele



10. Beschreibung der Software

Device Object

Property	Remark / Value	RW
Object_Identifier	device, default instance: 421000 + Network-Address	RW-E
Object_Name	max. 63 Bytes, default "BMT-AI8 " + 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-AI8"	R
Description	max. 127 Bytes, default ""	RW-E
Location	max. 63 Bytes, default ""	RW-E
Firmware_Revision	"1.2"	R
Application_Software_Version	"1"	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_INPUT, ANALOG_VALUE, MULTISTATE_VALUE, GROUP	R
Object_List [49]	device, analog-input 1...8, analog-value 1...28, multistate-value 1...9, group 1...3	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. 10 Subscriptions, for analog-input 1...8, Confirmed / Unconfirmed, Lifetime = 0...65535 sec.	R

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

Analog Input Object 1...8

Property	Remark / Value	RW
Object_Identifier	analog-input, instance 1 ... 8	R
Object_Type	ANALOG_INPUT (0)	R
Object_Name	max. 42 Bytes, default "Input 1" ... "Input 8"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Measured value, writable if Out_Of_Service, Measurement Range defined in Multistate Value 1...8	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
Units	Defined in Multistate Value 1...8	R
COV_Increment	Minimum change of Present_Value for COV notification, default 1.0	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

Fortsetzung Beschreibung der Software

Analog Value Object 21...28

Property	Remark / Value	RW
Object_Identifier	analog-value, instance 21 ... 28	R
Object_Type	ANALOG_VALUE (2)	R
Object_Name	max. 42 Bytes, default "Offset 1" ... "Offset 8"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Offset is added to measured value (Analog Input 1 ... 8), default 0.0	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	same as Analog Input 1 ... 8	R

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

Multistate Value Object 1...8

Property	Remark / Value	RW
Object_Identifier	multistate-value, instance 1 ... 8	R
Object_Type	MULTISTATE_VALUE (19)	R
Object_Name	max. 42 Bytes, default "Measurement Range 1" ... "Measurement Range 8"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Measurement Range of Analog Input 1...8 Voltage (% , Volt) Voltage, Pullup Resistor 2kOhm to 5V (% P, Volt P) Resistance (Ohm) User defined Sensor Standard Temperature Sensors	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
Number_Of_States	19	R
State_Text	max. 20 Bytes, default see next Table	RW-E

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

Fortsetzung Beschreibung der Software

Measurement Ranges		
State	State_Text	Units of Analog Input
1 default	„0-10V %“	percent (98)
2	„0-10V % P“	percent (98)
3	„0-10 Volt“	volts (5)
4	„0-10 Volt P“	volts (5)
5	„Ohm“	ohms (4)
6	„User Defined“	set in Analog Value Object X1...X10
7	„PT100“	degrees-Celsius (62)
8	„PT500“	degrees-Celsius (62)
9	„PT1000“	degrees-Celsius (62)
10	„NI1000-TC5000“	degrees-Celsius (62)
11	„NI1000-TC6180“	degrees-Celsius (62)
12	„BALCO500“	degrees-Celsius (62)
13	„KTY81_110“	degrees-Celsius (62)
14	„KTY81_210“	degrees-Celsius (62)
15	„NTC1k8-T“	degrees-Celsius (62)
16	„NTC5k-T“	degrees-Celsius (62)
17	„NTC10k-T“	degrees-Celsius (62)
18	„NTC20k-T“	degrees-Celsius (62)
19	„LM235Z“	degrees-Celsius (62)

Analog Value Object 1...20

Property	Remark / Value	RW
Object_Identifier	analog-value, instance 1 ... 20	R
Object_Type	ANALOG_VALUE (2)	R
Object_Name	max. 42 Bytes, default "X 1", "Y 1" ... "X 10", "Y 10"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Interpolation Table in User Defined Measurement Range	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	X1...X10: Units of Analog Input Object (default °C) Y1...Y10: Defined in Multistate Value 9	RW-E R

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

Interpolation Table					
Instance	Name	Default Value	Instance	Name	Default Value
1	"X 1"	-10.0	2	"Y 1"	960.86
3	"X 2"	10.0	4	"Y 2"	1039.03
5	"X 3"	30.0	6	"Y 3"	1116.73
7	"X 4"	50.0	8	"Y 4"	1193.97
9	"X 5"	70.0	10	"Y 5"	1270.75
11	"X 6"	0.0	12	"Y 6"	0.0
13	"X 7"	0.0	14	"Y 7"	0.0
15	"X 8"	0.0	16	"Y 8"	0.0
17	"X 9"	0.0	18	"Y 9"	0.0
19	"X 10"	0.0	20	"Y 10"	0.0

The Interpolation Table by default provides an example for PT1000 Temperature Sensors. In the example X values are Temperature in °C, Y values are Resistance in Ohms. X and Y values must be sorted in ascending or descending order. The table ends where both values are 0.0. Measurement Range at Input must be selected in Multistate Value 9.

Fortsetzung Beschreibung der Software

Multistate Value Object 9

Property	Remark / Value	RW
Object_Identifier	multistate-value, instance 9	R
Object_Type	MULTISTATE_VALUE (19)	R
Object_Name	max. 42 Bytes, default "User Defined Range"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Selection of Measurement Range at Input Voltage (Volt) Voltage, Pullup Resistor 2kOhm to 5V (Volt P) Resistance (Ohm) and Usage of Interpolation Table approximately linear sensor (e.g. PT1000) approximately exponential sensor (e.g. NTC) default 3, for PT1000 example	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
Number_Of_States	6	R
State_Text	max. 20 Bytes, default see next Table	RW-E

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

User Defined Range

State	State_Text	Units of Analog Values Y
1	„Volt lin“	volts (5)
2	„Volt P lin“	volts (5)
3	„Ohm lin“	ohms (4)
4	„Volt exp“	volts (5)
5	„Volt P exp“	volts (5)
6	„Ohm NTC exp“	ohms (4)

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 Analog 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

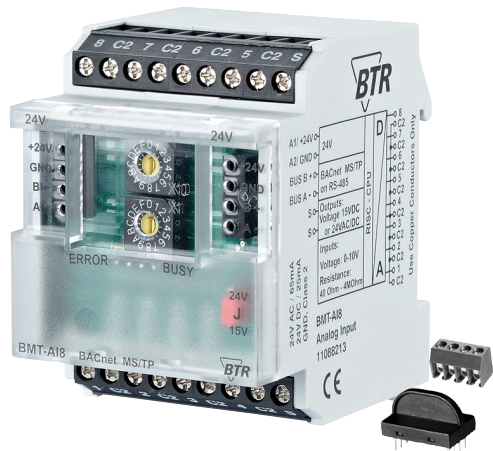
Group	Analog Input							
	1	2	3	4	5	6	7	8
1	x	x	x	x	x	x	x	x
2	x	x	x	x				
3					x	x	x	x

Analog Input Module

BMT-AI8

11088213

7603/899299.03



1. Description

The BACnet MS/TP module with 8 individually configurable resistance or voltage inputs is designed for local switching operations. It is suitable to record resistance or voltage values of for example passive and active temperature sensors electrical ventilation or mixing valves, valve positions etc. The inputs are universally configurable by standard object 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, 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 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

Protocol 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 65 mA (AC) / 25 mA (DC)
Relative duty cycle 100 %

Input

Resistance range 40 Ohms to 4 MOhms
Voltage input 0 ... 10 V DC
Resolution 10 mV
Error about ±100 mV

Housing

Dimensions WxHxD 2.0 x 2.8 x 2.6 in. (50 x 70 x 65 mm)
Weight 104 g
Mounting position any
Mounting standard rail TH35 per IEC 60715
Mounting in series the maximum quantity of modules connected in line is limited to 15 or without space 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
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

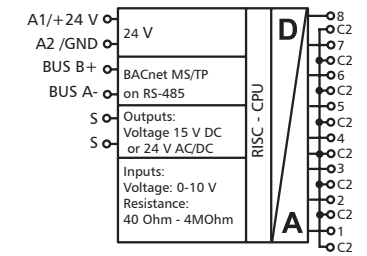
Temperature range

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

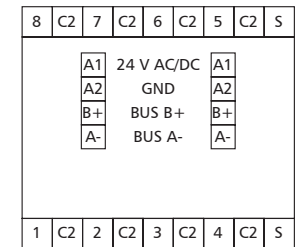
Display

Operating and bus activity green LED
Error indication red LED

4. Wiring Diagram



5. Connection Diagram



6. Mounting

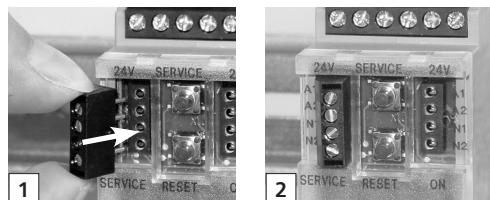
Power down the equipment

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

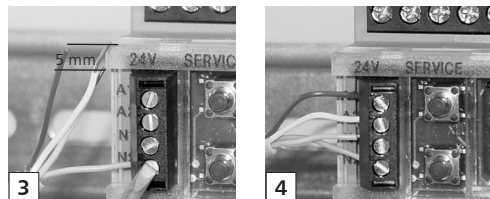
Installation

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

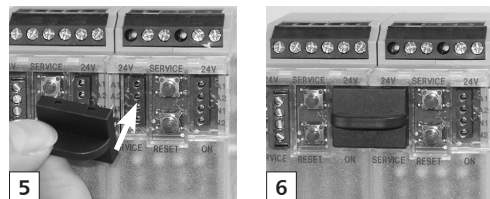
Plug in the terminal block for bus connection



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

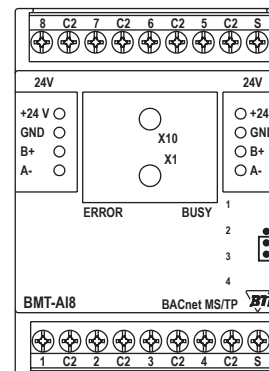
Hexadecimal Switches x10, x1 define the Network Address (00 - F9; e.g. F9h = $15 \times 16 + 9 = 249d$) and Baud rate (FA - FF).

- 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

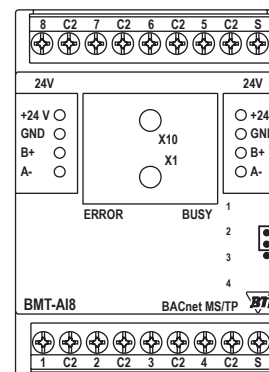
8. Jumper positions for voltage feeding of active sensors



Jumper unter der Blende
Jumper below the faceplate

Jumper unten:
Klemmen S = 15 V DC
(Werkseinstellung)

Jumper in bottom position:
Contacts S = 15 V DC
(Factory setting)

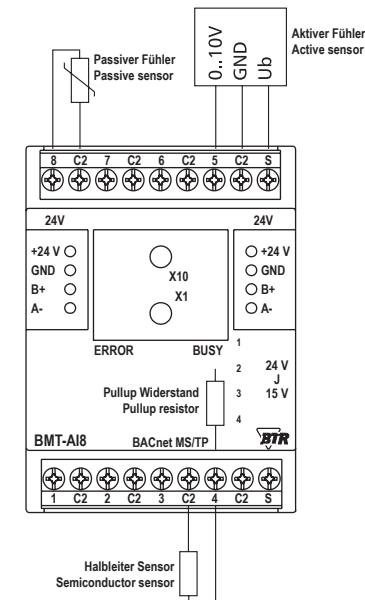


Jumper unter der Blende
Jumper below the faceplate

Jumper oben:
Klemmen S = 24 V AC/DC

Jumper in top position:
Contacts S = 24 V AC/DC

9. Connection examples



10. 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-AI8 " + 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-AI8"	R
Description	max. 127 Bytes, default ""	RW-E
Location	max. 63 Bytes, default ""	RW-E
Firmware_Revision	"1.2"	R
Application_Software_Version	"1"	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_INPUT, ANALOG_VALUE, MULTISTATE_VALUE, GROUP	R
Object_List [49]	device, analog-input 1...8, analog-value 1...28, multistate-value 1...9, group 1...3	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. 10 Subscriptions, for analog-input 1...8, Confirmed / Unconfirmed, Lifetime = 0...65535 sec.	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Analog Input Object 1...8

Property	Remark / Value	RW
Object_Identifier	analog-input, instance 1 ... 8	R
Object_Type	ANALOG_INPUT (0)	R
Object_Name	max. 42 Bytes, default "Input 1" ... "Input 8"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Measured value, writable if Out_Of_Service, Measurement Range defined in Multistate Value 1...8	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
Units	Defined in Multistate Value 1...8	R
COV_Increment	Minimum change of Present_Value for COV notification, default 1.0	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		

Continuation Software Description

Analog Value Object 21...28

Property	Remark / Value	RW
Object_Identifier	analog-value, instance 21 ... 28	R
Object_Type	ANALOG_VALUE (2)	R
Object_Name	max. 42 Bytes, default "Offset 1" ... "Offset 8"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Offset is added to measured value (Analog Input 1 ... 8), default 0.0	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	same as Analog Input 1 ... 8	R
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Multistate Value Object 1...8

Property	Remark / Value	RW
Object_Identifier	multistate-value, instance 1 ... 8	R
Object_Type	MULTISTATE_VALUE (19)	R
Object_Name	max. 42 Bytes, default "Measurement Range 1" ... "Measurement Range 8"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Measurement Range of Analog Input 1...8 Voltage (% Volt) Voltage, Pullup Resistor 2kOhm to 5V (% P, Volt P) Resistance (Ohm) User defined Sensor Standard Temperature Sensors	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
Number_Of_States	19	R
State_Text	max. 20 Bytes, default see next Table	RW-E
R: Read Property, W: Write Property, -E: Storage in EEPROM / Flash		

Continuation Software Description

Measurement Ranges		
State	State_Text	Units of Analog Input
1 default	„0-10V %“	percent (98)
2	„0-10V % P“	percent (98)
3	„0-10 Volt“	volts (5)
4	„0-10 Volt P“	volts (5)
5	„Ohm“	ohms (4)
6	„User Defined“	set in Analog Value Object X1...X10
7	„PT100“	degrees-Celsius (62)
8	„PT500“	degrees-Celsius (62)
9	„PT1000“	degrees-Celsius (62)
10	„NI1000-TC5000“	degrees-Celsius (62)
11	„NI1000-TC6180“	degrees-Celsius (62)
12	„BALCO500“	degrees-Celsius (62)
13	„KTY81_110“	degrees-Celsius (62)
14	„KTY81_210“	degrees-Celsius (62)
15	„NTC1k8-T“	degrees-Celsius (62)
16	„NTC5k-T“	degrees-Celsius (62)
17	„NTC10k-T“	degrees-Celsius (62)
18	„NTC20k-T“	degrees-Celsius (62)
19	„LM235Z“	degrees-Celsius (62)

Analog Value Object 1...20

Property	Remark / Value	RW
Object_Identifier	analog-value, instance 1 ... 20	R
Object_Type	ANALOG_VALUE (2)	R
Object_Name	max. 42 Bytes, default "X 1", "Y 1" ... "X 10", "Y 10"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Interpolation Table in User Defined Measurement Range	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	X1...X10: Units of Analog Input Object (default °C) Y1...Y10: Defined in Multistate Value 9	RW-E R

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

Interpolation Table

Instance	Name	Default Value	Instance	Name	Default Value
1	"X 1"	-10.0	2	"Y 1"	960.86
3	"X 2"	10.0	4	"Y 2"	1039.03
5	"X 3"	30.0	6	"Y 3"	1116.73
7	"X 4"	50.0	8	"Y 4"	1193.97
9	"X 5"	70.0	10	"Y 5"	1270.75
11	"X 6"	0.0	12	"Y 6"	0.0
13	"X 7"	0.0	14	"Y 7"	0.0
15	"X 8"	0.0	16	"Y 8"	0.0
17	"X 9"	0.0	18	"Y 9"	0.0
19	"X 10"	0.0	20	"Y 10"	0.0

The Interpolation Table by default provides an example for PT1000 Temperature Sensors. In the example X values are Temperature in °C, Y values are Resistance in Ohms. X and Y values must be sorted in ascending or descending order. The table ends where both values are 0.0. Measurement Range at Input must be selected in Multistate Value 9.

Continuation Software Description

Multistate Value Object 9

Property	Remark / Value	RW
Object_Identifier	multistate-value, instance 9	R
Object_Type	MULTISTATE_VALUE (19)	R
Object_Name	max. 42 Bytes, default "User Defined Range"	RW-E
Description	max. 84 Bytes, default ""	RW-E
Present_Value	Selection of Measurement Range at Input Voltage (Volt) Voltage, Pullup Resistor 2kOhm to 5V (Volt P) Resistance (Ohm) and Usage of Interpolation Table approximately linear sensor (e.g. PT1000) approximately exponential sensor (e.g. NTC) default 3, for PT1000 example	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
Number_Of_States	6	R
State_Text	max. 20 Bytes, default see next Table	RW-E

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

User Defined Range

State	State_Text	Units of Analog Values Y
1	„Volt lin“	volts (5)
2	„Volt P lin“	volts (5)
3	„Ohm lin“	ohms (4)
4	„Volt exp“	volts (5)
5	„Volt P exp“	volts (5)
6	„Ohm NTC exp“	ohms (4)

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 Analog 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	Analog Input							
	1	2	3	4	5	6	7	8
1	x	x	x	x	x	x	x	x
2	x	x	x	x				
3					x	x	x	x