BFM-A Series BACnet MS/TP Analog Input/Output Modules

Parameter Setup Manual

(To Be Undertaken by Authorized Servicing Agent Only)

The BFM-A analog input/output modules are plug and play devices which will go online automatically and be discovered by the BACnet system when connected to the BACnet MS/TP RS485 network trunk. Make sure that the baud rate of the BFM-A modules is set to match the network baud rate.

Through the BACnet browser, the objects of the modules will be displayed as follows:

BFM-0800A

OBJECT	DEFAULT NAME	INITIAL VALUE
DEV	BFM-0800A	Operational
BV1	Setting	OFF
AI1	INPUT_1	0
AI2	INPUT_2	0
AI3	INPUT_3	0
AI4	INPUT_4	0
AI5	INPUT_5	0
AI6	INPUT_6	0
AI7	INPUT_7	0
AI8	INPUT_8	0

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OBJECT	DEFAULT NAME	INITIAL VALUE
DEV	BFM-0404A	Operational
BV1	Setting	OFF
AI1	INPUT_1	0
AI2	INPUT_2	0
AI3	INPUT_3	0
AI4	INPUT_4	0
AI5	OUTPUT_1	0
AI6	OUTPUT_2	0
AI7	OUTPUT_3	0
AI8	OUTPUT_4	0

Device Object
The device object's default name can be changed by the BACnet system operator and the new name will be stored in the EEPROM chip in the module. Interruption of power supply will not lose the new name.

The BV1 object is used to set the unique device ID of the module in the BACnet network. The device ID address is a 7-digit decimal integer which is divided into 2 parts:

The first 5 digits are set in the BV1 object from 1 to 39999;
The last 2 digits are the module's MAC address set by the DIP switches on the module from 1 to 63.

To Set device ID
This is a two-step operation:
1. Change the Setting value from OFF to ON.
2. Enter the description property of the object in text command format as a string of characters as "/IDxxxxx" where xxxxx denotes the first 5 digits of the device ID address and its highest number is 39999.

After the setting, the module will be re-initialized and its new device ID address will be automatically discovered by the BACnet system and displayed in the system browser. Interruption of power supply will not lose the new device ID. In the mean time, the original device ID address will go offline and can be deleted manually from the screen.

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There are 8 analog input objects in each module with input channels ranging from AI1 through AI8. The default names INPUT_1 through INPUT_8 can be changed by the BACnet system operator and the new names will be stored in the EEPROM chip in the module. Interruption of power supply will not lose the new names.

The current value of each object has read only property and denotes the measuring result. Configure the device type property (or description property) of each object in text command format as a string of characters as:

For DC voltage input, the configuration format being "/V (a, b, c, d)" where a, b, c and d are parameters. Parameters a and b, which are floating point values denoting the voltage input's lower limit and upper limit respectively, with precision up to 2 decimal places, must meet the following conditions:

$0.00 \le a \le 10.00$
$0.00 \le b \le 10.00$
$a < b$

Parameters c and d, which are floating point values denoting the span's lower limit and upper limit respectively, with precision up to 2 decimal places, must meet the following conditions:

$-1{,}000{,}000.00 \le c \le 1{,}000{,}000.00$
$-1{,}000{,}000.00 \le d \le 1{,}000{,}000.00$
$c < d$

Example: "/V (0, 5, -80.92, 130.00)" = 0~5 VDC input, -80.92~130.00 span

For 4-20 mA input, connect a 500 Ω resistor across the corresponding AI input terminal and GND terminal. This will convert the current signal input into voltage signal input and hence the parameters can be configured accordingly just like a voltage input.

For NTC thermistor input, the configuration format being “/Tab (c)” where a, b and c are parameters.

Parameter a is a single character denoting the type of NTC thermistor used.

a = 1 for 10k NTC thermistor corresponding to B (25/50ºC) = 3380 kΩ, B (25/85ºC) = 3435 kΩ		
Resistance Value @0ºC	Resistance Value @25ºC	Resistance Value @50ºC
27.3 kΩ	10 kΩ	4.16 kΩ
a = 2 for Type II 10k NTC thermistor		
Resistance Value @0ºC	Resistance Value @25ºC	Resistance Value @50ºC
29.5 kΩ	10 kΩ	3.89 kΩ
a = 3 for Type III 10k NTC thermistor		
Resistance Value @0ºC	Resistance Value @25ºC	Resistance Value @50ºC
32.7 kΩ	10 kΩ	3.60 kΩ

Parameter b is a single character denoting the temperature engineering unit:
b = C = Celsius
b = F = Fahrenheit.

Parameters c, which is a floating point value denoting the offset adjustment value of the measured temperature, with precision up to 2 decimal places, must meet the following condition:

$-10.00 \leq c \leq 10.00$.

Examples:
“/T2C (0)” = Type II 10k NTC thermistor, in ºC, no offset adjustment.

“/T3F (-0.33)” = Type III 10k NTC thermistor, in ºF, with -0.33 R offset adjustment.

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There are 4 analog input objects and 4 analog output objects in each module with input channels ranging from AI1 through AI4 and output channels from AO1 through AO4. The default names INPUT_1 through INPUT_4 and OUTPUT_1 through OUTPUT_4 can be changed by the BACnet system operator and the new names will be stored in the EEPROM chip in the module. Interruption of power supply will not lose the new names.

The configuration procedure of each analog input object is same as that for the BFM0800A. See Pages 2 and 3.

The current value of each analog output object has read/write property and is related to its voltage output. The AO object supports 16 priority arrays where write action of the higher priority array overrides that of the lower priority array until the write action of the higher priority array is relinquished. Configure the device type property (or description property) of each AO object in text command format as a string of characters as:

"/V (a, b, c, d)" where a, b, c and d are parameters.

Parameters a and b, which are floating point values denoting the voltage output's lower limit and upper limit respectively, with precision up to 2 decimal places, must meet the following conditions:

$0.00 \leq a \leq 10.00$
$0.00 \leq b \leq 10.00$
$a < b$

Parameters c and d, which are floating point values denoting the current values of the AO object corresponding to the voltage output's lower limit and upper limit respectively, with precision up to 2 decimal places, must meet the following conditions:

$-1{,}000{,}000.00 \leq c \leq 1{,}000{,}000.00$
$-1{,}000{,}000.00 \leq d \leq 1{,}000{,}000.00$
$c < d$

Example:
"/V (0, 10, 0, 100.00)" = 0~10 VDC output voltage, 0-100% output value if engineering unit "%" is specified.