BACnet/MSTP Adapter Setup

Building **A**utomation **C**ontrols **net**work/**M**aster - **S**lave **T**oken **P**assing

Ⅰ. Wiring connections:

Description of ports:

A Contains four ports at the top left corner which are from top to bottom：

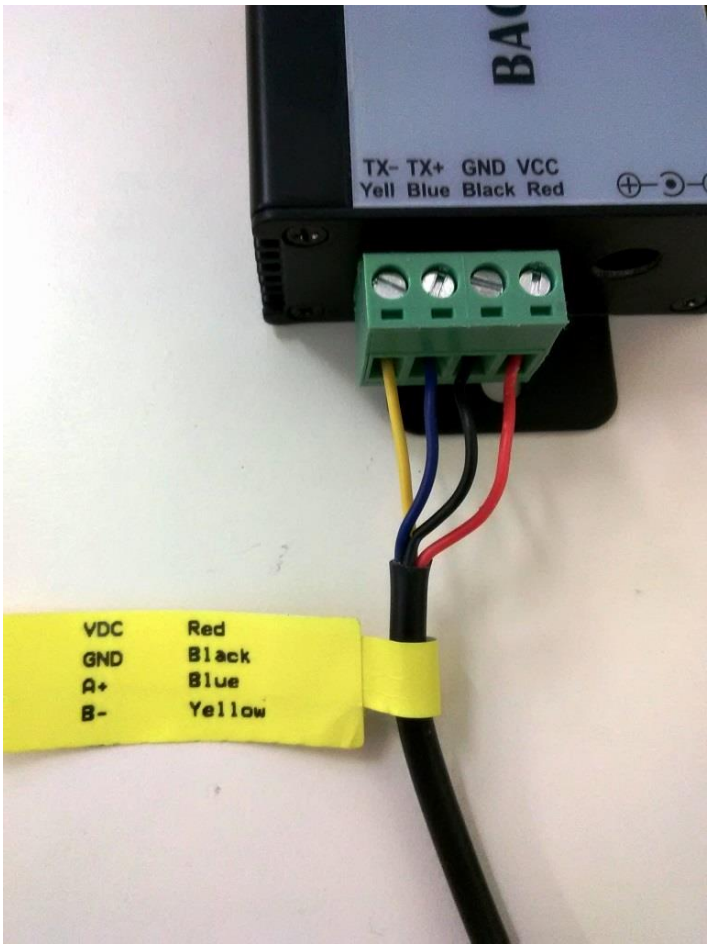
TX485- (Yellow) TX485+ (Blue) GND (Black) VCC (9VDC to 12VDC out) (Red) The VCC output is used to power a 280W or 280T meter cap interface electronics.
The TX485 ports connect to Meters that have the RS485 interface.

B Connects to a RS485 BACnet interface: GND, T/R - and T/R+ (usually to a concentrator), Building Monitor System (BMS), or field server interface.

C Is a round jack for the power supply voltage input (9 VDC to 12 VDC in), this powers the device and supplies the VCC output voltage on **A**.
Note: When used with EF40, BACnet adapter can be powered by connecting F24V and FGND on EF40 to VCC and GND on adapter.

Note: MODBUS/RS485 is not an input to a BACnet/MSTP adapter, only a RS485 output made for a BACnet/MSTP adapter works.

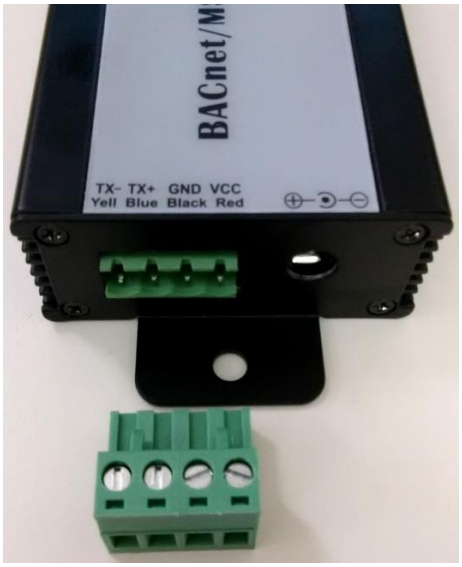
Wiring connection example of a 280T (similar connection to the 280W meter):



Note: the above cable is a RS485 output (not MODBUS)

Ⅱ. BACnet Subassembly (To change Baud rate and Device ID or flash firmware):

To open the case, remove both green quick connects, then remove 4 Philips screws from the side with the power plug connection. The module can then slide out of the case (make note of how it slides out of the slot).



Module removed from the case

Note: See "BACnet MSTP Work Instruction - EF10 and TP10" on flashing firmware.

Ⅲ. MAC Address of BACnet (or BACnet ID)

Instructions :

1. The *default* MAC address is 0. The above module has been set to 53, which in binary is (00110101). The address is set by turning on each bit to match the ID number you require.

Switch A8 ----------to----------A1

128	64	32	16	8	4	2	1
0	0	1	1	0	1	0	1

32 + 16 + 4 + 1 = **53**

2. The *default* baud rate for the BACnet ***output*** is set to 0 and must be set to your intended baud rate. To set the baud rate on anything but an EF40 select only **one** switch from the following list:

9600 – B1 19200 – B2 38400 – B3 76800 – B4

New Settings for EF40 adapter:	B1	B2	B3	B4	Baud
	Off	Off	**On**	Off	9600
	On	Off	**On**	Off	19200
	Off	**On**	**On**	Off	38400
	On	**On**	**On**	Off	76800

Additional notes:

Online decimal to binary converter:

https://www.binaryhexconverter.com/decimal-to-binary-converter

For Wall mount meters only:

On an EF11-1 module, you tie the VDC 12V 1 ma power supply together for both BACnet and the meter, so it powers both modules. The BACnet module is then attached with Velcro to the inside back of the EF11 enclosure. Also use a 1-foot length of wire (TRX+, TRX-, GND) and wire BACnet output signals out with the power supply input cable. It is also good practice to mark the cable connections on the wires outside of the enclosure. This procedure is also used on other wall mount meters.

Optional way to test BACnet adapters:

To test the configuration, attach the output wires to a FieldServer adapter, the EF11 must be configured to Modbus RTU only, and a baud rate of 2400, Even,8,1 Also the FieldServer adapter must be set to match the baud rate of the BACnet module as programmed, using a discover command it should find the BACnet ID, and by using the FieldServer website, you can look at the lower bits of the serial number of the EF11 to verify it is communicating with the meter.

All BACnet modules are programmed for the meter type:

All BACnet modules must be programmed at the factory with the correct firmware to match the meter it is paired with, i.e. Mag meter, Water meter, BTU meter, or Wall mount meter.

Additional power for Water meters:

Water and BTU meters use an internal Lithium-thionyl Chloride (Li-SOCl2) battery which is **non**-rechargeable and powers the meter for many years. The additional power supplied by the BACnet adapter is only used to power the meters cap interface electronics, so the meter can interface to an external device.

BACnet/MSTP Points Table: 1. Metric 2.English

Index	Variable Name	Data Type	Notes
1	Flow Rate	REAL	Unit: 1. L/h (Liters per hour) 2. Gal/m (gallons per minute)
2	Flow Total	INT	Unit: 1. m3 (cubic meters) 2. Gal (gallons)
3	Heat Energy Rate	INT	Unit: W (Watts)
4	Heat Energy Total	INT	Unit: KWH (Kilowatt Hours)
5	Supply Temp	REAL	Unit: 1. C (Degrees Celsius) 2. F (Degrees Fahrenheit)
6	Return Temp	REAL	Unit: 1. C (Degrees Celsius) 2. F (Degrees Fahrenheit)
7	SN#	BCD	Serial Number of meter
8	Meter Type	BCD	Type of meter: TP10 EF10 280T 280W-CI 280W-R 280W-D T-MAG MAG888

Note: If no baud rate is set on the adapter it will autobaud to the speed of the interface, as long as the interface is set to any of the following baud rates (9600, 19200. 38400, 76800). If the interface baud rate is changed, the adapter must be power cycled for the autobaud function to work correctly. Make sure all attached adapters are running the same baud rate.

Chart to determine 280 meter output type

Type	No. of Wires	Colors
Encoder	3	Black, Red, Yellow
MBus	2	Red, Black
Pulse (with battery)	2	Yellow, White
Pulse (No battery)	4	Yellow, White, Red, Black
Modbus *or* 485 bus	4	Red, Black, Blue, Yellow (See label on wire)
Modbus + 4-20mA	6	Red, (Orange or Brown, White, Black, Yellow, Green

Pinout for the output type

ENCODER (3 WIRES)
BLACK GND
RED VDC
YELLOW D+

MBUS (2 WIRES)
RED MBUS +
BLACK MBUS –

Pulse (with battery) (2 WIRES)
YELLOW B-
WHITE A+

Pulse (without battery) (4 WIRES)
RED VDC
BLACK GND
YELLOW B-
WHITE A+

MODBUS *OR* 485 ONLY(4 WIRES) "CHECK LABEL ON THE CABLE"
RED VDC
BLACK GND
BLUE A+
YELLOW B-

MODBUS + 4-20MA (6 WIRES)
RED VDC
ORANGE AO+ (AFTER JUNE 1, 2018 THE COLOR MAY ALSO BE BROWN)
WHITE AO-
BLACK GND
YELLOW 485B
GREEN 485A