

TECHNICAL INSTRUCTIONS



Follow the instructions below to quickly wire and set up the AERCO ProtoNode between your Building Automation System (BAS) and AERCO equipment - Boiler Management System (ACS/BMS/BMSII); “C-More” Boiler Control on Benchmark (BMK) boilers, Innovation (INN) heaters, KC1000 boilers and heaters; Boiler Control Module (BCM) on Modulex (MLX) boilers; and Eurotherm Controls on AERCO Electronic Control System (ECS) and “SmartPlate” units.

To use these instructions, select the two pages that apply to your configuration:

1. One page from SECTION 1 (pages 4 to 8), which outline the wiring and set up between your BAS and the AERCO ProtoNode.
2. One page from SECTION 2 (pages 9 to 14), which outline the wiring and set up between the AERCO ProtoNode and AERCO equipment.

Refer to the ProtoNode Hardware Reference on the next two pages.

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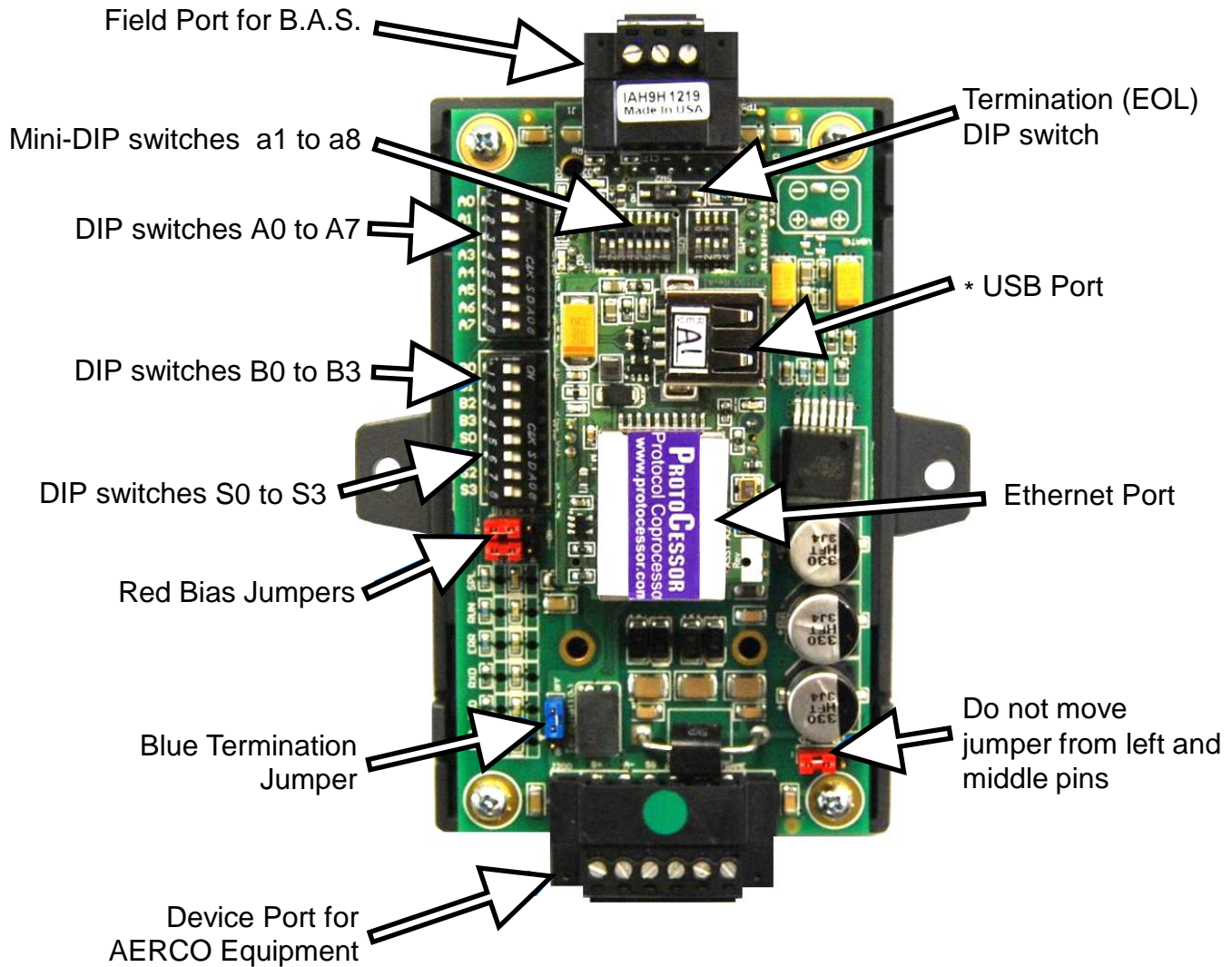
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NOTE: The AERCO ProtoNode uses from 12 – 24 VAC, or 9 to 30 VDC power source. Check the ProtoNode (GF-129) manual for the current draw at the different voltages.

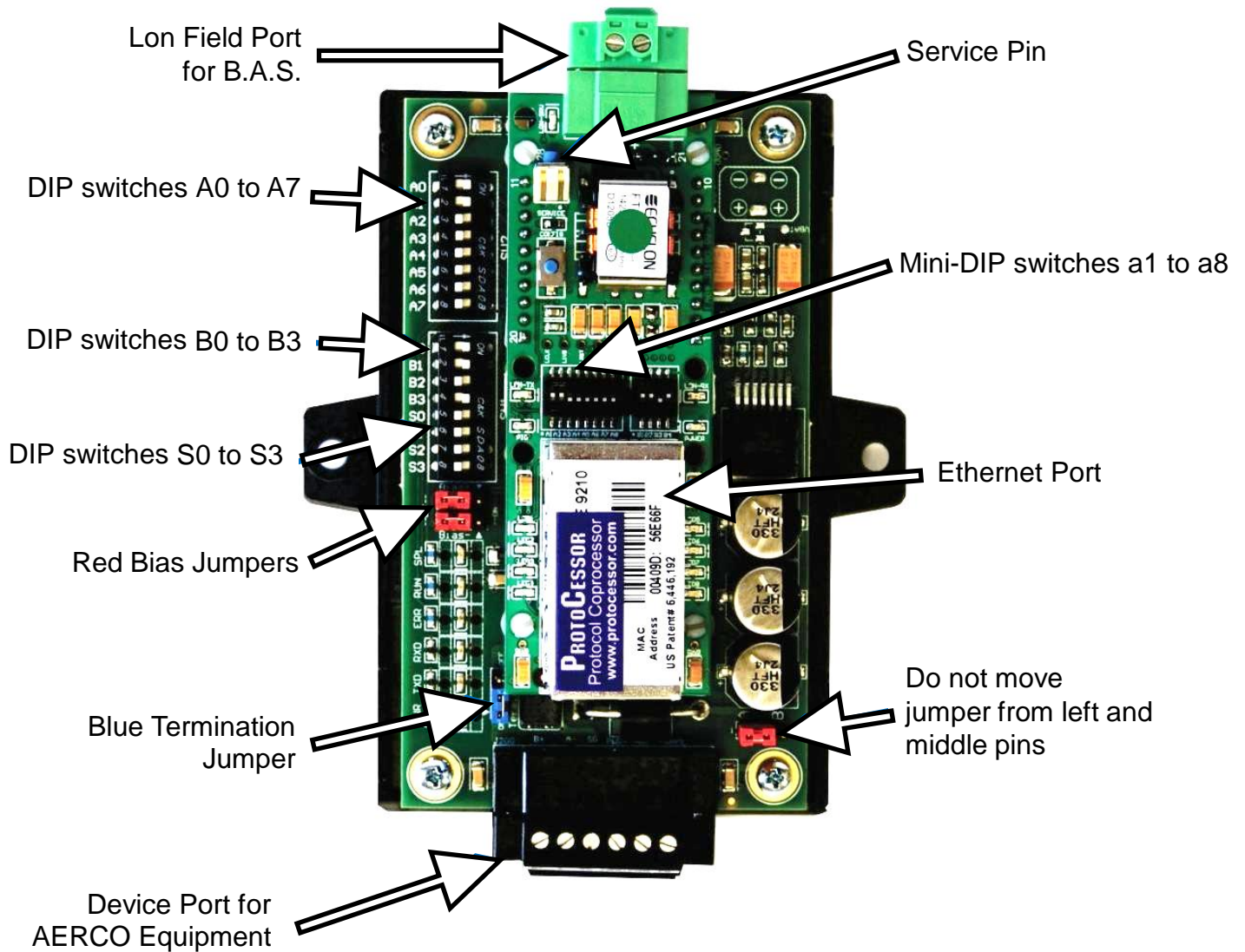
ProtoNode RER Hardware Reference



* NOTE

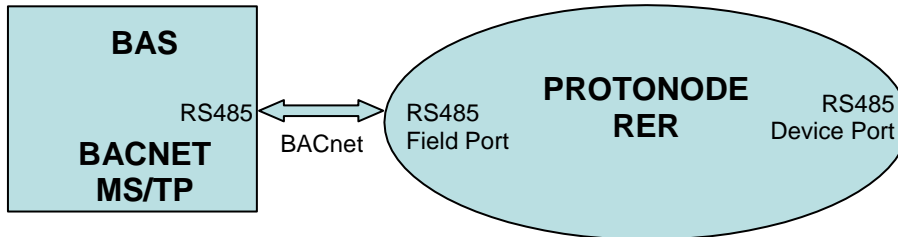
Your hardware may or may not include a USB port; it was added to a later revision of the hardware.

ProtoNode LER Hardware Reference



SECTION 1: Connecting BAS to ProtoNode

1. BACNET MS/TP TO AERCO PROTONODE RER



Field Port: Wire “+” terminal to “RS 485+”, “-” terminal to “RS 485-”, and connect shield at one end only. If shield is connected to ProtoNode then wire to “RS 485 GND” connector.

DIP switch A0 to A7: Set to BACnet Device Instance and MAC address of ProtoNode. (Use the on-board GUI to set a BACnet Device Instance above 255. See GF-129)

DIP switch B0 to B3: Set to the BACnet baud rate.

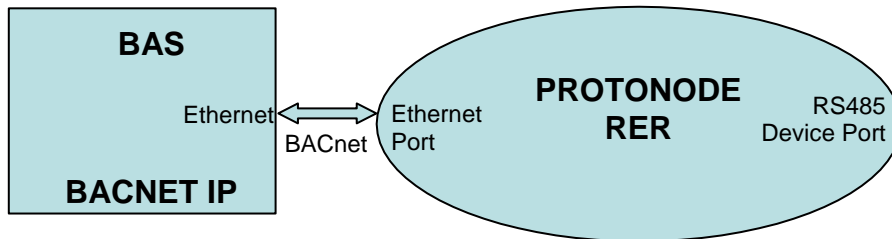
DIP switch S0 to S3, and mini-DIP a1 to a8: Set to the proper BACnet points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

Termination (EOL) DIP switch: Switch on if termination is needed. (When using AERCO’s or some other RS232-RS485 converters, this may need to be switched on to work properly.)

BE SURE TO CYCLE AERCO PROTONODE POWER AFTER MAKING ANY DIP SWITCH OR JUMPER CHANGES, OR AFTER ANY NEW FIRMWARE DOWNLOAD.

SECTION 1: Connecting BAS to ProtoNode

2. BACNET IP TO AERCO PROTONODE RER



Field Port: Plug the Ethernet cable from the Building Automation System (BAS) into the Ethernet port of the protonode.

DIP switch A0 to A7: Set to BACnet Device Instance and MAC address of ProtoNode. (Use the on-board GUI to set a BACnet Device Instance above 255. See GF-129)

DIP switch B0 to B3: Set to the BACnet baud rate.

DIP switch S0 to S3, and mini-DIP a1 to a8: Set to the proper BACnet points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

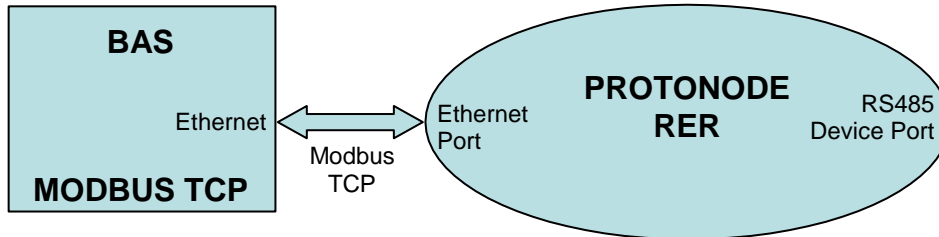
Termination (EOL) DIP switch: Not Applicable.

Connect to the ProtoNode using RUINET or the on-board GUI interface and set the IP Address desired. See the GF-129 manual.

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SECTION 1: Connecting BAS to ProtoNode

3. MODBUS TCP TO AERCO PROTONODE RER



Field Port: Plug the Ethernet cable from the Building Automation System (BAS) into the Ethernet port of the ProtoNode.

DIP switch A0 to A7: Set the ProtoNode Modbus Address.

DIP switch B0 to B3: Set to the Modbus baud rate from the BAS.

DIP switch S0 to S3, and mini-DIP a1 to a8: Set to the proper Modbus points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

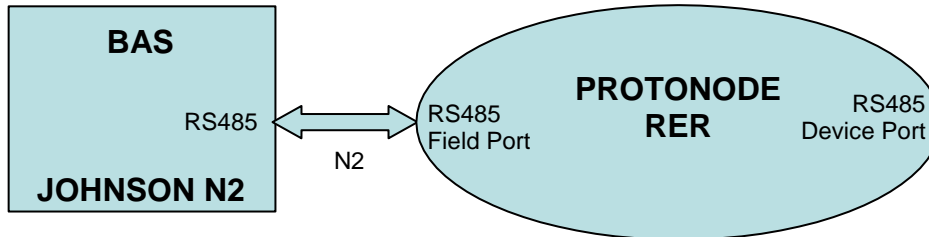
Termination (EOL) DIP switch: Not Applicable.

Connect to the ProtoNode using RUINET or the on-board GUI interface and set the IP Address desired. See the GF-129 manual.

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SECTION 1: Connecting BAS to ProtoNode

4. JOHNSON N2 TO AERCO PROTONODE RER



Field Port: Wire “+” terminal to “RS 485+”, “-” terminal to “RS 485-”, and connect shield at one end only. If shield is connected to ProtoNode then wire to “RS 485 GND” connector.

DIP switch A0 to A7: Set the N2 ID or address of the ProtoNode.

DIP switch B0 to B3: The N2 baud rate will automatically be 9600 so this DIP switch is ignored.

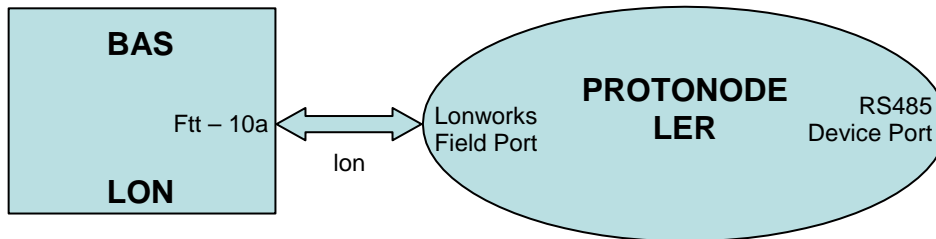
DIP switch S0 to S3, and mini-DIP a1 to a8: Set to the proper N2 points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

Termination (EOL) DIP switch: Switch on if termination is needed. (When using AERCO’s or some other RS232-RS485 converters this may need to be switched on to work properly.)

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SECTION 1: Connecting BAS to ProtoNode

5. LON TO AERCO PROTONODE LER



Field Port: Wire from BAS lonworks port to ProtoNode “Lonworks” field port. Polarity does not matter in this case. Connect shield at one end only.

DIP switch A0 to A7: The DIP switch settings are irrelevant for Lonworks.

DIP switch B0 to B3: Set to the Lonworks baud rate.

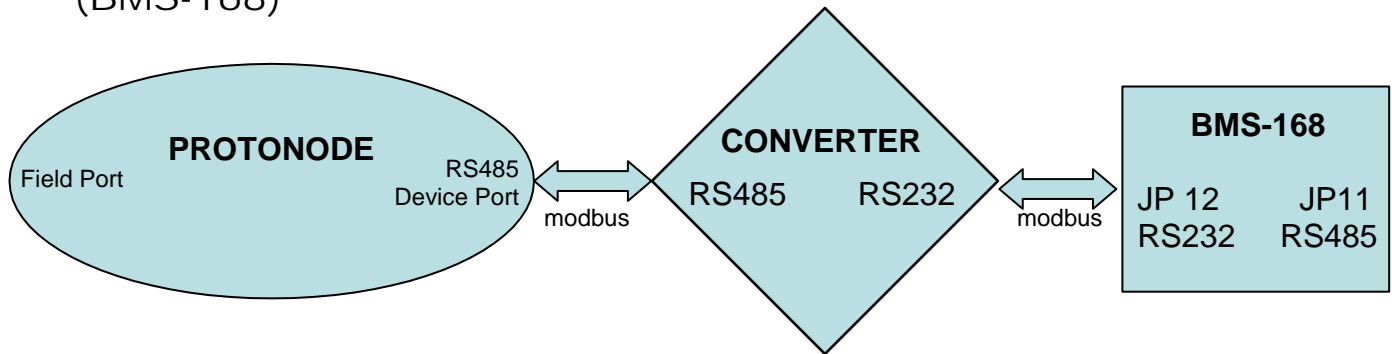
DIP switch S0 to S3, and mini-DIP a1 to a8: Set to the proper Lonworks points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

Note: The LER must be commissioned by the LonWorks administrator. To activate the Service Pin insert a small screwdriver in the hole and push the top of the screwdriver towards the top of the protonode away from “AERCO” name on the cover.

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SECTION 2: Connecting ProtoNode to Equipment

6. AERCO PROTONODE TO BOILER MANAGEMENT SYSTEM (BMS-168)



ProtoNode Device Port to Converter RS485 Port:

- Wire ProtoNode “TX/+” to Converter “TD(B)” or “485+”. Wire ProtoNode “RX/-” to Converter “TD(A)” or “485-”.
- Place the ProtoNode **BLUE** termination (EOL) jumper in the **ON** position for the AERCO converter.
- Leave the ProtoNode **RED** bias jumpers in the **OFF** position for the AERCO converter. (AERCO converter has internal bias.) You may try the bias jumpers in the **ON** position if using a non-AERCO converter and you get no communication after setup is completed;

Converter RS232 Port to BMS-168 Port JP12:

- Wire Converter “TX” (pin 2) to BMS-168 “RXD”. Wire Converter “RX” (pin 3) to BMS-168 “TXD”. Wire Converter “Signal Ground” (pin 5) to BMS-168 “GND”.
- Connect Shield at one end only. If to the BMS-168 at the “SHIELD” input.
- Wire Converter “+12V” to BMS-168 “Setback +”.
- Wire Converter “GND” to BMS-168 “Setback -”.

ProtoNode DIP switch/Software Setup:

- *DIP switch S0 to S3, and mini-DIP a1 to a8:* Set to the proper points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

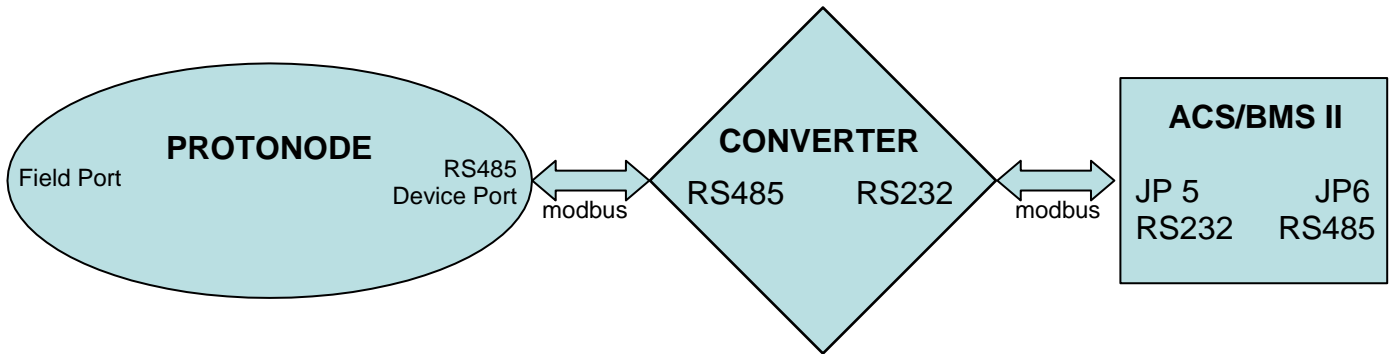
BMS “RS232 MENU” Software Setup:

- RS232 Mode = Modbus Slave; RS232 Baud rate = 9600; Modbus Address = 128; Modbus Pass Thru = Enabled (if reading information from boilers, else leave Disabled);

BE SURE TO CYCLE AERCO PROTONODE POWER AFTER MAKING ANY DIP SWITCH OR JUMPER CHANGES, OR AFTER A FIRMWARE DOWNLOAD.

SECTION 2: Connecting ProtoNode to Equipment

7. AERCO PROTONODE TO ACS OR BMS II



ProtoNode Device Port to Converter RS485 Port:

- Wire ProtoNode “TX/+” to Converter “TD(B)” or “485+”. Wire ProtoNode “RX/-” to Converter “TD(A)” or “485-”.
- Place the ProtoNode **BLUE** termination (EOL) jumper in the **ON** position for the AERCO converter.
- Leave the ProtoNode **RED** bias jumpers in the **OFF** position for the AERCO converter. (AERCO converter has internal bias.) You may try the bias jumpers in the **ON** position if using a non-AERCO converter and you get no communication after setup is completed;

Converter RS232 Port to ACS/BMSII Port JP5:

- Wire Converter “TX” (pin 2) to ACS/BMSII “RXD”. Wire Converter “RX” (pin 3) to ACS/BMSII “TXD”. Wire Converter “Signal Ground” (pin 5) to ACS/BMSII “232 ISO GND”.
- Connect Shield at one end only. If to the ACS/BMSII at the “SHLD” input (terminal 3).
- Wire Converter “+12V” to ACS/BMSII “ISO 12V”.

ProtoNode DIP Switch/Software Setup:

- *DIP switch S0 to S3, and mini-DIP a1 to a8:* Set to the proper points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

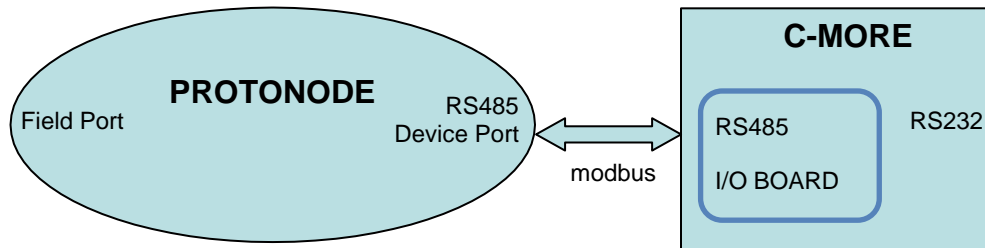
ACS/BMSII “RS232 MENU” Software Setup:

- RS232 Mode = Modbus Slave; RS232 Baud rate = 9600; Modbus Address = 128; Modbus Pass Thru = Enabled (if reading information from boilers, else leave Disabled);

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SECTION 2: Connecting ProtoNode to Equipment

8. AERCO PROTONODE TO C-MORE WITHOUT BST OR WHM



ProtoNode Device Port to Cmore (I/O Box) RS485:

- Wire ProtoNode “TX/+” to “RS485+”, and wire “RX/-” to “RS485-”, and Shield connected at one end only - to the C-More (I/O Box) at the “SHLD” input. Daisy chain to the other units.
- Place the ProtoNode **BLUE** termination (EOL) jumper in the **ON** position.
- Place the ProtoNode **RED** bias jumpers in the **ON** position. (Leave the C-More BIAS1 and BIAS2 DIP switches in the **OFF** position. Turn **ON** the termination “modbus” DIP switch in the I/O Box of the last unit on the daisy-chain.)

ProtoNode DIP Switch/Software Setup:

- DIP switch S0 to S3, and mini-DIP a1 to a8: Set to the proper points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

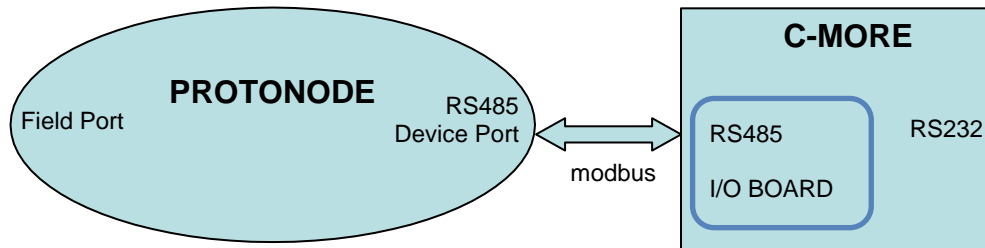
Cmore Setup:

- For Monitor Only → “Comm Address” = Boiler address, starting with “1”;
- For Monitor and Remote Setpt Control via Modbus → Set “Comm Address” as above; Set “Boiler Mode” to “Remote Setpt”; Set “Remote Signal” to “Network”.
- For Monitor and Direct Drive Control via Modbus → Set “Comm Address” as above; Set “Boiler Mode” to “Direct Drive”; Set “Remote Signal” to “Network”.

BE SURE TO CYCLE AERCO PROTONODE POWER AFTER MAKING ANY DIP SWITCH OR JUMPER CHANGES, OR AFTER A FIRMWARE DOWNLOAD

SECTION 2: Connecting ProtoNode to Equipment

9. AERCO ProtoNode To C-More WITH BST or WHM



BEFORE CONNECTING THE PROTONODE, BE SURE BST OR WHM IS WORKING PROPERLY!!

ProtoNode Device Port to C-More (I/O Box) RS485:

- Wire ProtoNode “TX/+” to “RS485+”, and wire “RX/-” to “RS485-”, and Shield connected at one end only - to the C-More (I/O Box) at the “SHLD” input. Daisy chain to the other units.
- Place the ProtoNode **BLUE** termination (EOL) jumper in the **ON** position.
- Place the ProtoNode **RED** bias jumpers in the **ON** position. (Leave the C-More BIAS1 and BIAS2 DIP switches in the **OFF** position. Turn **ON** the termination “modbus” DIP switch in the I/O Box of the last unit on the daisy-chain.)

ProtoNode DIP Switch/Software Setup:

- DIP switch S0 to S3, and mini-DIP a1 to a8: Set to the proper “SSD” points profile as shown in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

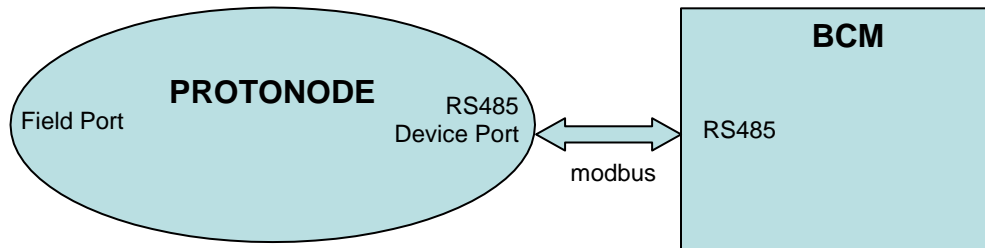
C-More Setup:

- Be sure BST or WHM is working properly and ProtoNode DIP switch is set as above before proceeding.
- Set “SSD Address” in the master unit to “**247**” in order to beginning talking to the ProtoNode.
- Set “SSD Temp Format” to “Points” in all the boilers and water heaters.

BE SURE TO CYCLE AERCO PROTONODE POWER AFTER MAKING ANY DIP SWITCH OR JUMPER CHANGES, OR AFTER A FIRMWARE DOWNLOAD

SECTION 2: Connecting ProtoNode to Equipment

10. AERCO ProtoNode to BCM *(on MLX or MLX EXT Boiler)*



ProtoNode Device Port to BCM Port Y2:

- Wire ProtoNode “TX/+” to Y2 pin 1; Wire “RX/-” to Y2 pin 2; and connect Shield at one end only – if to the ProtoNode at the “GND” input. Daisy chain to the other units.
- No termination or bias should be needed unless it is a long run. If they are needed:
 - Place the ProtoNode **BLUE** termination (EOL) jumper in the **ON** position.
 - Place the ProtoNode **RED** bias jumpers in the **ON** position.

ProtoNode DIP Switch/Software Setup:

- *DIP switch S0 to S3, and mini-DIP a1 to a8:* Set to the proper points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

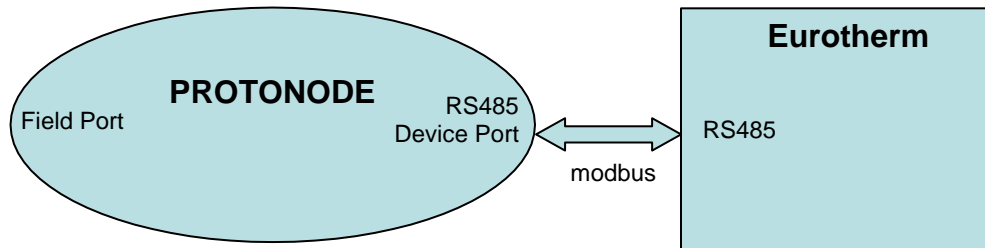
BCM Setup:

- Set the Address DIP switch on each BCM starting from 1. Keep termination jumper off on the last unit in the chain unless bias and termination was activated at the ProtoNode Device Port.

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SECTION 2: Connecting ProtoNode to Equipment

11. AERCO ProtoNode To Eurotherm *(on ECS or SmartPlate)*



ProtoNode Device Port to Eurotherm Port H:

- Wire ProtoNode “TX/+” to “HF”; Wire ProtoNode “RX/-” to “HE”; and connect Shield at one end only – if to the ProtoNode at the “GND” input. Daisy chain to the other units.
- No termination or bias should be needed unless it is a long run. If they are needed:
 - Place the ProtoNode **BLUE** termination (EOL) jumper in the **ON** position.
 - Place the ProtoNode **RED** bias jumpers in the **ON** position.

ProtoNode DIP Switch/Software Setup:

- *DIP switch S0 to S3, and mini-DIP a1 to a8:* Set to the proper points profile in the rear of this document. Refer to manual GF-129 for the points list and point definitions.

Eurotherm Setup:

- Set “Addr” on the Eurotherm starting from “29” up to “32” maximum. Do not install the termination resistor on the last unit in the chain unless bias and termination was activated at the ProtoNode Device Port.

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SECTION 3: DIP Switch Settings

12. ProtoNode RER and LER S0 to S3 DIP Switch (and mini-DIP a1& a3) Settings

The “a1” and “a3” DIP switches listed in the chart below refer to the mini-DIP switches, **NOT** the “A” Bank DIP switches (A0 – A7) that are accessible with the cover on. To access the mini-DIP Switches you must remove the cover.

Except for those listed below, all other mini-DIP switches are in the **Off** position.

Please see the AERCO ProtoNode gateway User Manual (GF-129) for more detailed information or explanations,

ProtoNode RER S0 to S3 DIP Switch (and mini-DIP a1, a3*) Settings						
S0	S1	S2	S3	a1	Profile	
off	off	off	off	off	BACnet/IP/BACnet MS/TP, 1 ACS/BMS II, 4 C-More Controlled Boilers	
ON	off	off	off	off	BACnet/IP/BACnet MS/TP, 1 ACS/BMS II, 8 C-More Controlled Boilers	
off	ON	off	off	off	BACnet/IP/BACnet MS/TP, 1 ACS/BMS II, 12 C-More Controlled Boilers	
ON	ON	off	off	off	BACnet/IP/BACnet MS/TP, 1 ACS/BMS II, 4 Modulex Boilers With BCMs	
off	off	ON	off	off	BACnet/IP/BACnet MS/TP, 4 ECS/SP Systems	
ON	off	ON	off	off	BACnet/IP/BACnet MS/TP, 12 C-More, 6 ECS/SP, 4 Modulex and 2	
off	ON	ON	off	off	Metasys N2, 1 ACS/BMS II, 4 C-More Controlled Boilers	
ON	ON	ON	off	off	Metasys N2, 1 ACS/BMS II, 8 C-More Controlled Boilers	
off	off	off	ON	off	Metasys N2, 1 ACS/BMS II CS, 12 C-More Controlled Boilers	
ON	off	off	ON	off	Metasys N2, 1 ACS/BMS II, 4 Modulex Boilers with BCMs	
off	ON	off	ON	off	Metasys N2, 4 ECS/SP Systems	
ON	ON	off	ON	off	Metasys N2, 12 C-More, 6 ECS/SP, 4 Modulex and 2 ACS/BMS II	
off	off	ON	ON	off	Modbus TCP, 1 ACS/BMS II, 4 C-More Controlled Boilers	
ON	off	ON	ON	off	Modbus TCP, 1 ACS/BMS II, 8 C-More Controlled Boilers	
off	ON	ON	ON	off	Modbus TCP, 1 ACS/BMS II, 12 C-More Controlled Boilers	
ON	ON	ON	ON	off	Modbus TCP, 1 ACS/BMS II, 4 Modulex Boilers With BCMs	
off	off	off	off	ON	Modbus TCP, 4 ECS/SP	
ON	off	off	off	ON	Modbus TCP, 12 C-More, 6 ECS/SP, 4 Modulex and 2 ACS/BMS II	
S0	S1	S2	S3	a1	a3	Profile
ON	off	off	off	off	ON	Slave/Slave Device (SSD) Modbus – for WHM and BST systems
off	ON	off	off	off	ON	Slave/Slave Device (SSD) BACnet – for WHM and BST systems
ON	ON	off	off	off	ON	Slave/Slave Device (SSD) N2 – for WHM and BST systems

ProtoNode LER SO to S3 DIP Switch Settings				
S0	S1	S2	S3	Profile
Off	Off	Off	Off	1 ACS/BMS II, 4 C-More Controlled Boilers
ON	Off	Off	Off	1 ACS/BMS II, 8 C-More Controlled Boilers
Off	ON	Off	Off	1 ACS/BMS II, 12 C-More Controlled Boilers
ON	ON	Off	Off	1 ACS/BMS II, 4 Modulex Boilers With BCMs
Off	Off	ON	Off	4 ECS/SP Systems
ON	Off	ON	Off	12 C-More, 6 ECS/SP, 4 Modulex and 2 ACS/BMS II
Off	ON	ON	ON	Slave/Slave Device (SSD) – for WHM and BST systems

--- END ---

Change Log

Date	Description	Changed By
04/06/2015	Rev A: Initial release	Chris Blair

