BRYAN® BOILERS
Originators of the "Flexible Water Tube" design

Universal Communication Gateway Reference Manual

The Universal Communication Gateway (UCG) is an external, high performance Building Automation multi-protocol gateway that is preconfigured to automatically communicate between Bryan Steam's products (hereafter called "device") connected to the UCG and automatically configures them for BACnet®MS/TP, BACnet IP, Metasys®N2 by JCI, Modbus TCP/IP or LonWorks®. All Honeywell SOLA, Siemens RWF 40/55, Siemens LMV, Honeywell RM7800 Series and the Precision Digital Trident PD765 boiler configurations and Node-ID's are selected through the UCG Web GUI Configurator for fast and easy installation. A mix of multiple devices can be used on a single UCG. It is not necessary to download any configuration files to support the required applications. The UCG is pre-loaded with tested Profiles/Configurations for the supported devices. This document provides the necessary information to facilitate installation of the UCG on BACnet MS/TP, BACnet/IP, Metasys N2 and LonWorks network.

The UCG is provided as a 10" x 12" x 6" NEMA Type 1 control panel that must be mounted and supplied with 120 VAC. Additional specifications can be found in Section 7.

Important

1. **If your boiler is equipped with a Bryan Boilers Printed Circuit Board (WD-857), devices should be pre-wired. See section 3.1.8.**
2. **Each boiler device Modbus settings must be configured to communicate to the UCG.**

CONTENTS

FIGURES

TABLES

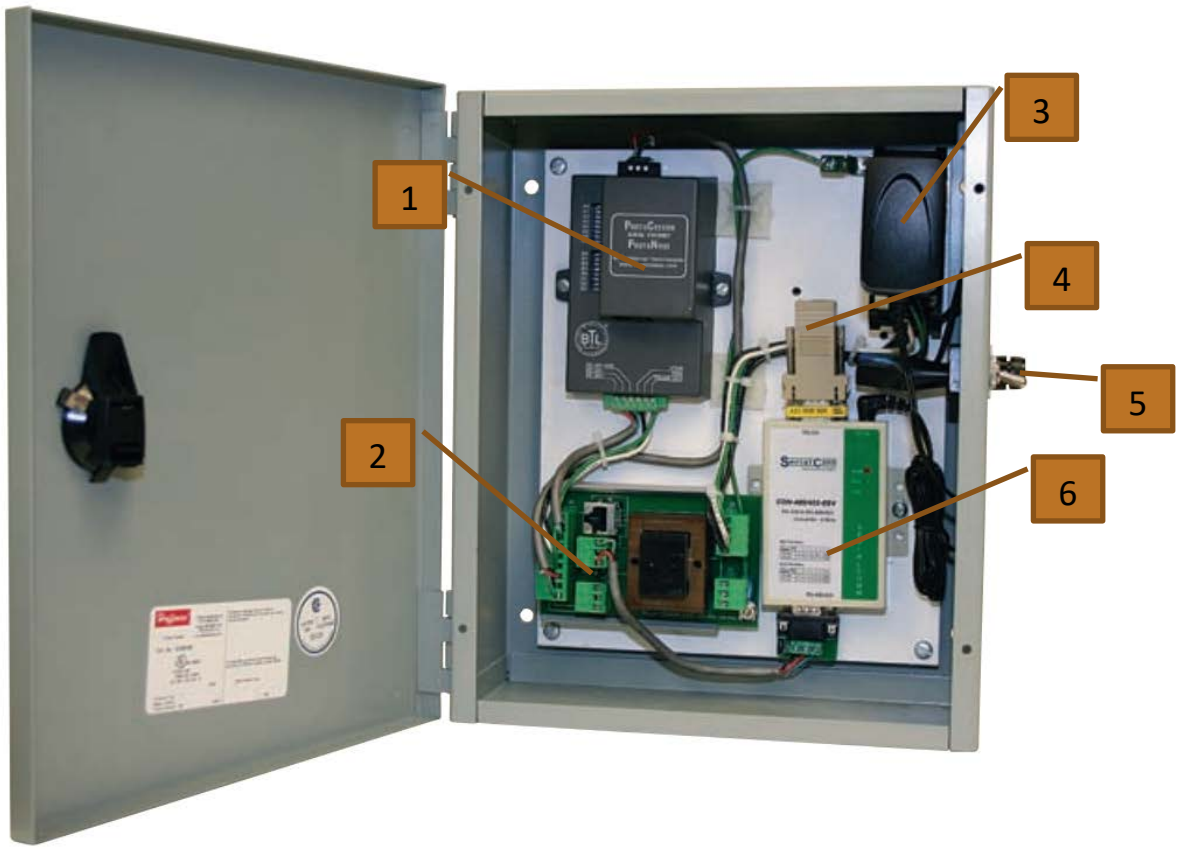


Figure 1 - UCG Component Description

Item	Description
1	ProtoNode
2	UCG-PCB WD-856
3	Power Adapter 120Vac to 9 Vdc (only for Siemens AZL)
4	RJ45 Adapter (only for Siemens AZL)
5	UCG Power Switch
6	RS232 to RS485 Converter (only for Siemens AZL)

Table 1 - UCG Component Description

1 HOW TO USE THIS MANUAL

This manual may be used in its entirety or as a reference. **You may need to reference your device's manual for information not covered in this UCG manual**. The three main sections are as follows:

Section 2: Mounting UCG – This section is for mounting the UCG control panel, connecting power and building management connections.

Section 3: Connect and Setup for Boiler Devices to the UCG – This section is for the connections and set-up of each device for the Modbus communication to the UCG.

Section 4: Setup for UCG – The section is for the set-up of the UCG to communicate to the devices (Modbus) and to your building management system.

All other sections are supportive of the sections above.

2 MOUNTING UCG

2.1 MOUNTING

Mount the UCG in a suitable location that is easy to access. Verify that the UCG power switch is in the "off" position. Connect J1-1(L1), J1-2(L2) and J1-3(G) of the UCG-PCB WD-856 to a 120VAC power source.

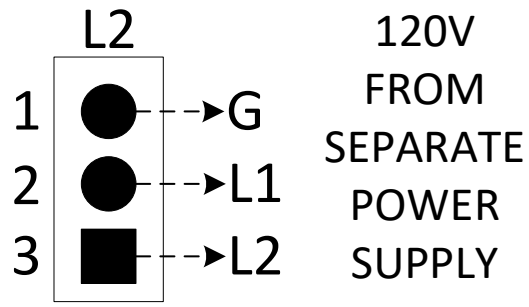


Figure 2 - Power Connection

2.2 BUILDING MANAGEMENT SYSTEM (BMS) WIRING

Building Management wiring is determined by the protocol of the BMS.

- ***MODBUS TCP/IP and BACnet/IP*** see section 2.2.1
- ***BACNET MS/TP and METYASYS N2*** see section 2.2.2
- ***LONWORKS*** see section 2.2.3

2.2.1 MODBUS TCP/IP AND BACNET/IP

Use Cat5 cable to connect the field BMS computer to the UCG via the Ethernet (RJ45) connection of the ProtoNode inside the UCG. See Figure 3. After BMS connection, skip to section 3.

Figure 3 - Ethernet Connection on the ProtoNode

2.2.2 BACNET MS/TP AND METASYS N2

Use CAT5 twisted pair cable to connect from the field BMS computer to terminals J2-1(GND), J2-2(Data -), and J2-3(Data +) of the UCG-PCB WD-856 located inside UCG. After BMS connection, skip to section 3.

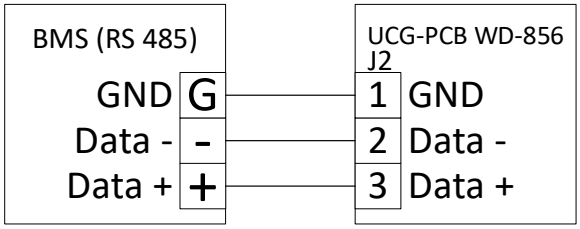


Figure 4 - BACnet MS/TP and Metasys N2 BMS Connection

2.2.3 LONWORKS NETWORK

Use CAT5 twisted pair cable to connect the field BMS computer to J2-2(-) and J2-3(+) of the UCG-PCB WD-856 located inside UCG. After BMS connection, skip to section 3.

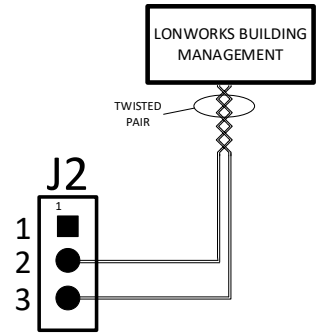


Figure 5 - LonWorks BMS connection

3 CONNECT AND SETUP OF BOILER DEVICES TO UCG

3.1 WIRING DEVICES TO THE UCG

If your boiler is equipped with a Bryan Boilers Printed Circuit Board (WD-857), see section 3.1.8. Otherwise connect all devices directly to the UCG-PCB WD-856 located inside UCG. The devices on this bus can be wired in a daisy chain configuration. The order of the interconnection is not important.

- ***HONEYWELL SOLA*** see section 3.1.1
- ***SIEMENS RWF40*** see section 3.1.2
- ***SIEMENS RWF55*** see section 3.1.3
- ***SIEMENS LMV2…/LMV3…*** see section 3.1.4
- ***SIEMENS LMV5…*** see section 3.1.5
- ***HONEYWELL RM7800 SERIES KEYBOARD DISPLAY OR MODBUS MODULE*** see section 3.1.6
- ***PRECISION DIGITAL TRIDENT PD765 PANEL METER*** see section 3.1.7

3.1.1 HONEYWELL SOLA

Use shielded cable to connect the Honeywell system display's COM2 port to terminals J3-1(GND), J3-2(Data -), and J3-3(Data +) of the UCG-PCB WD-856 inside the UCG. Up to 8 SOLA controls can be controlled from one UCG. See Figure 6.

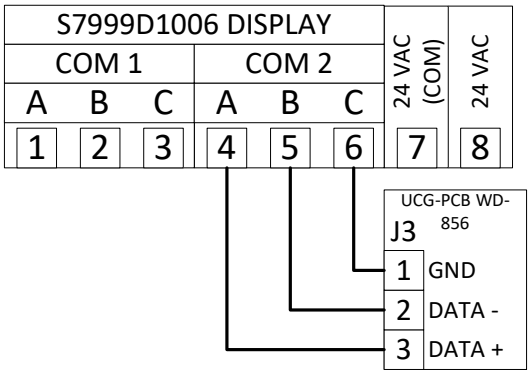


Figure 6 - Honeywell S7999 Display and UCG Connection

3.1.2 SIEMENS RWF40

Use shielded cable to connect terminals CG, CB, and CA of the Siemens RWF40 to terminals J3-1(GND), J3-2(-), and J3-3(+) of the UCG-PCB WD-856 inside the UCG. See Figure 7.

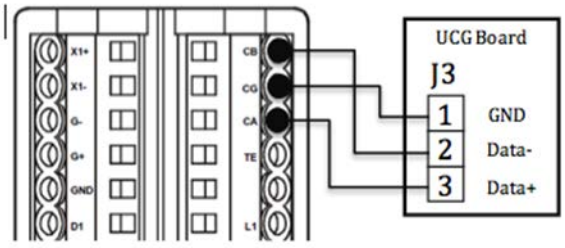


Figure 7 - Siemens RWF40 and UCG Connection

3.1.3 SIEMENS RWF55

Use shielded cable to connect terminals R-, and R+ of the Siemens RWF55 to terminals J3-2(-), and J3-3(+) of the UCG-PCB WD-856 inside the UCG. See Figure 8.

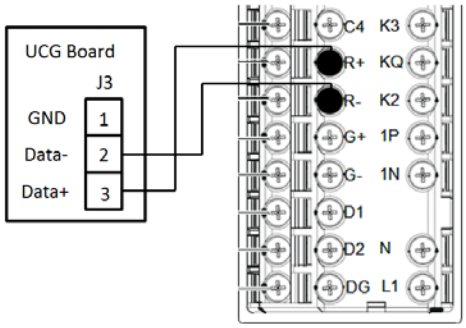


Figure 8 - Siemens RWF55 and UCG Connection

3.1.4 SIEMENS LMV2…/LMV3…

Use shielded cable to connect the burner mounted OCI412.10 RS-485 interface terminals X20.1, X20.2, and X20.3 to terminals J3-1(GND), J3-2(-), and J3-3(+) of the UCG-PCB WD-856 inside the UCG.

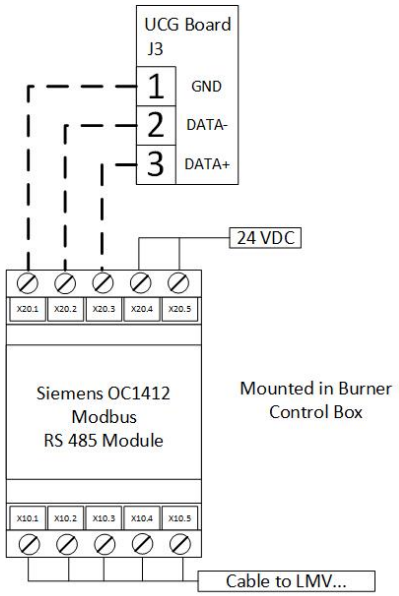


Figure 9 - Siemens LMV2.../LMV3... and UCG Connection

3.1.5 SIEMENS LMV5…

Use CAT5 twisted pair cable to connect from the RJ45 jack, COM2, of the Siemens AZL to the RJ45 jack of the UCG Serial Comm inside the UCG. See Figure 10.

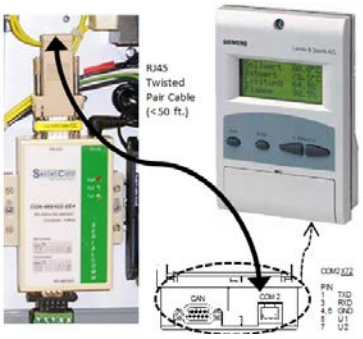


Figure 10 - LMV 5... And UCG Connection

3.1.6 HONEYWELL RM7800 SERIES

The RM7800 Series flame safeguard requires a Modbus compatible Display Keyboard or Modbus Module. Please see your flame safeguard manual for details.

3.1.6.1 S7800A1142 KEYBOARD DISPLAY MODULE

Use shielded cable to connect terminals 1, 2, and 3 of the Honeywell keyboard display to terminals J3-1(GND), J3-2(-), and J3-3(+) of the UCG-PCB WD-856 inside the UCG. (The 203541 Connector may be required for connection)

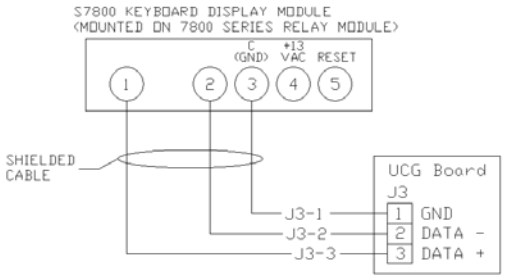


Figure 11 - Honeywell RM7800 with S7800 Keyboard Display

3.1.6.2 S7810M MODBUS™ MODULE

Use shielded cable to connect terminals 6(GND), 7(+), and 8(-) of the Honeywell S7810M ModBus Module to terminals J3-1(GND), J3-2(-), and J3-3(+) of the UCG-PCB WD-856 inside the UCG.

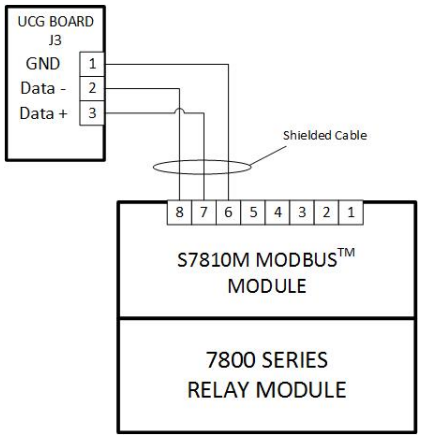


Figure 12 - RM7800 with S7810M ModBus Module

3.1.7 PRECISION DIGITAL TRIDENT PD765 PANEL METER

Use shielded cable to connect terminals DO, $\overline{DO}$, $\overline{DI}$ and DI of the PDA7422 Trident RS-485 Serial Adapter to terminals J3-1(GND), J3-2(-), and J3-3(+) of the UCG-PCB WD-856 inside the UCG. Connect the PDA7420 modular cable to the serial port of the meter and adapter.

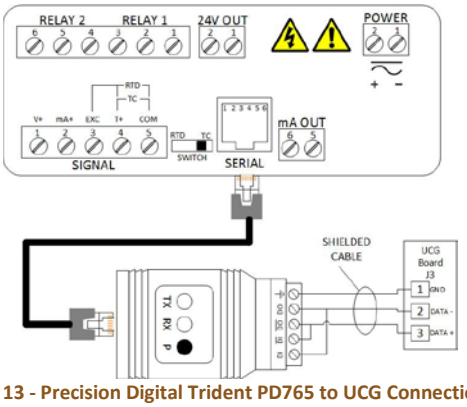


Figure 13 - Precision Digital Trident PD765 to UCG Connection

3.1.8 BOILERS EQUIPPED WITH BRYAN STEAM PRINTED CIRCUIT BOARD (WD-857)

Boilers equipped with a Bryan Steam Communication PCB (WD-857) can be interconnected using the two RJ45 jacks installed on the board. Standard CAT5 cable wired as T-568A or T-568B straight through can be used for the interconnection between the devices that are factory wired to the Bryan Steam Communication PCB (WD-857) and P1 of the UCG-PCB WD-856 inside the UCG.

The Bryan Steam Communication PCB does not need to be wired in sequential order as this will be handled in the device addressing.

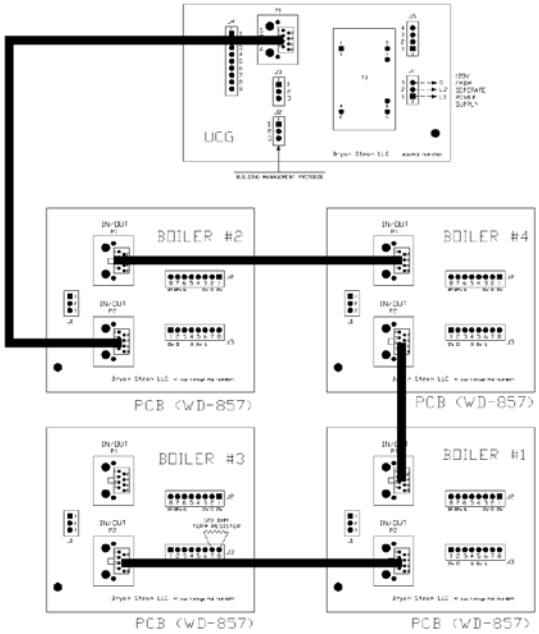


Figure 14 - Bryan Steam Communication PCB (WD-857) and Multi Boiler Connection

3.1.8.1 END OF LINE TERMINATION SWITCH

Long RS-485 cabling runs of 20ft. or more should be properly terminated at each end. If needed a 120Ω terminating resistor should be between J3-7 and J3-8 of the UCG-PCB WD-857 on each end of the trunk (See Figure 12, Boiler #3). If the UCG is placed at one of the ends of the trunk, the blue RS-485 End-of-Line Terminating switch inside the UCG will need to be moved to the ON position. Remove the cover of the ProtoNode and move the Modbus RS-485 EOL Switch to the ON position.

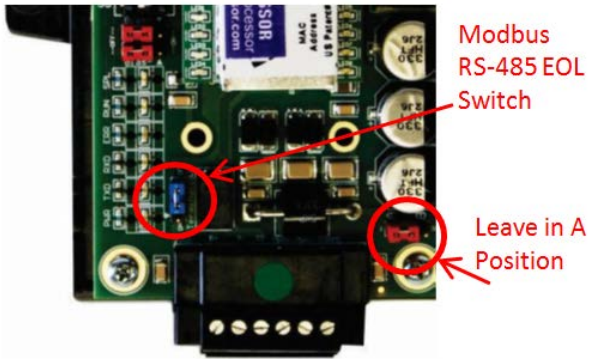


Figure 15 - End of Line Termination

Always leave the single Red Jumper in the A position.

On short cabling runs which most applications are, the EOL switch does not need to be turned ON. The default setting for this Blue EOL switch is OFF.

3.2 DEVICE MODBUS RTU COM SETTINGS

All devices connected to the UCG **MUST HAVE the same Baud Rate, Data Bits, Stop Bits, and Parity.** Refer to the UCG configuration sheet or the multi-device wiring drawing (generally shipped with boiler) for the appropriate address and baud rate settings for each device.

Section 7.1 defines the installed default serial port settings for each device.

If your boiler device has a Bryan Steam ModBus Address label (Form 2445) attached to the boiler device, it has been set up and will have the address written on the label.

Set Modbus Node-ID for each of the devices attached to UCG. The Modbus Node-IDs need to be uniquely assigned between 1 and 255. Use the table in section 8 to record boilers, devices and Node-ID.

- The Modbus Node-ID's assigned are used for designating the **Device Instance** for BACnet/IP and BACnet MS/TP.

- The Metasys N2 and Modbus TCP/IP field protocol Node-IDs are automatically set to be the same value as the Node-ID of the Modbus RTU device.

Select the device below:

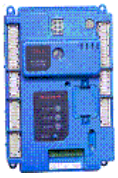
- Honeywell SOLA see section 3.2.1
- Siemens RWF40 see section 3.2.2
- Siemens RWF55 see section 3.2.3
- Siemens LMV2…/LMV3… see section 3.2.4
- Siemens LMV5…… see section 3.2.5
- Honeywell RM7800 Series see section 3.2.6
- Trident Model PD765 Universal Input Meter section 3.2.7

3.2.1 HONEYWELL SOLA

3.2.1.1 SET SOLA ADDRESS

If you are prompted for a Passcode use **Bryan**.

Each individual SOLA will now need its own unique address. Follow these steps to setup the addressing for each SOLA:



- Select the SOLA controller
- Select *Configure*
- *System Identification and Address*
- Scroll to the bottom
- Change *MB1* and *MB2* to the same Modbus address.

- Press the *Home* button
- Select *Setup*
- Select *Display Diagnostics*
- Select *Display Reset*
- **Repeat for each boiler. Numbering them accordingly.**

3.2.1.2 SOLA BMS ACTIVATION

3.2.1.2.1 TOUCH SCREEN S7999B

The S7999B display's Modbus gateway must be enabled for BAS control. From the S7999B home screen follow these steps to enable the Modbus gateway.

- Setup
- Advanced Setup
- User Preferences
- Com 2 Tab

Check the "**Enable Modbus Gateway**" box.

3.2.1.2.2 TOUCH SCREEN S7999D

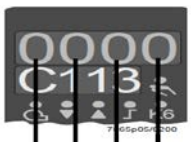
Before powering on any of the boilers make sure that all communication wires are disconnected from each boiler and BMS. Apply power to all boilers. From the S7999D home screen follow these steps to enable the Modbus gateway for each SOLA:

- Setup
- Display Setup
- COM2 Tab
  - ✓ "**Enable COM2 port**"
- Check that Modbus baud rate is set at 38400 bps
- Select the Gateway tab
  - ✓ "**Enable Modbus gateway**"
- Select "**Gateway on COM2 port**"
- Select Save

Return to the home screen by pressing the home button in the upper left corner of the screen.
Reconnect all communication wires back to the boilers and BMS.

3.2.2 SIEMENS RWF40

Each RWF40 device will need to be setup with its own unique address. The decimal place, unit, and Baud rate will need to be setup the same on all devices.



Modbus settings

Press **PGM** and hold for 3 seconds, and then release to access the parameter level.
From the parameter level, advance to the configuration level by pressing **PGM** again, holding for 3 seconds, and release.

Press **PGM** and release it, to advance to C112, press **PGM** again and release it, to advance to C113.

Changing Values

Select the desired digit that needs adjusted by pressing ▼ once and releasing it.
(Each time ▼ is pressed and released it will cycle, thru each digit, right-to-left and back again)
To change the value of the flashing digit, press ▲ and release it.
(Pressing ▲ and releasing will cycle up thru the allowable values, and back again.)
Once the desired value is displayed and flashing, accept it by pressing **PGM** once and release it. If no keys are pressed for 30 seconds, at any time, the controller will automatically return to the basic display.

Unit Address		
Address 0	0	0
Address 1	0	1
…		…
Address 99	9	9

Decimal place, unit, Baud rate	
No decimal place, degrees Celsius, 9600 Bd	0
One decimal place, degrees Celsius, 9600 Bd	1
No decimal place, degrees Fahrenheit, 9600 Bd	2
One decimal place, degrees Fahrenheit, 9600 Bd	3
No decimal place, degrees Celsius, 19200 Bd	4
One decimal place, degrees Celsius, 19200 Bd	5
No decimal place, degrees Fahrenheit, 19200 Bd	6
One decimal place, degrees Fahrenheit, 19200 Bd	7
No decimal place, degrees Celsius, 4800 Bd	8
One decimal place, degrees Celsius, 4800 Bd	9
No decimal place, degrees Fahrenheit, 4800 Bd	A
One decimal place, degrees Fahrenheit, 4800 Bd	b

Signal for out-of-range	
Limit comparators OFF	0
Limit comparators ON	1

Address 1, no decimal, °F, 9600 BAUD, compare off	0	1	2	0

Press **EXIT** and release, to immediately return to the basic display.

The Remote Detection Timer setting is defaulted to 30 seconds. This setting will check for a signal from building management. If there is no signal, the controller will revert back to local control. To disable this set dtt equal to 0.

ConF ➔ IntF ➔ dtt

3.2.3 SIEMENS RWF55

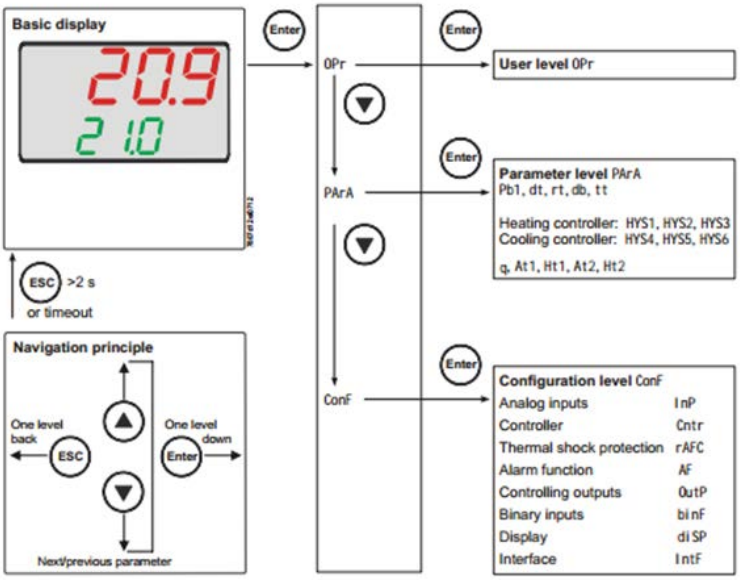


Figure 16 - Siemens RWF55 Programing

- From the basic display, press Enter so that **0Pr** appears
- Press ▼ so that **PArA** appears
- Press ▼ so that **ConF** appears
- Press Enter so that the first parameter of the **ConF** level is displayed
- Press ▼ until **IntF** appears
- Press Enter and **r485** appears. Press Enter again and the first parameter **bdrt** appears.

Note: The baud rate will need to be the same on all devices connected to the UCG.

- Press Enter again and the **bdrt** will begin to flash.
- Use the ▼ to choose the following:
  - 1 for 9600 Baud
- Press Enter so that the **bdrt** stops flashing.
- Press ▼ and **Adr** is displayed.
- Press Enter again and the **Adr** will begin to flash.

Note: The device address will need to be different on all devices connected to the UCG. Refer to the UCG configuration sheet (generally shipped with boiler) for the appropriate address and baud rate settings for each device.

- The device address can be set from 0-254.
- Use the arrow keys to choose the device address.
- Press Enter and the RWF55 Setup is complete.

- The Remote Detection Timer setting is defaulted to 30 seconds. This setting will check for a signal from building management. If there is no signal, the controller will revert back to local control. To disable this set dtt equal to 0.

ConF ➔ IntF ➔ dtt

3.2.4 SIEMENS LMV2…/LMV3…

3.2.4.1 PASSCODE

The Passcode can be dependent on the burner manufacturer. The LMV2…/LMV3… passcode is “2345” or “Entry”. If the passcode is incorrect, check inside the burner control box panel. You may need to contact the burner manufacturer for the correct passcode.

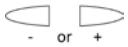
- Hold 

simultaneously for 3 seconds, **Co d E** will momentarily be displayed
- Press 

to adjust for each digit of the password
- Press 

after each correct character is displayed
- Press 

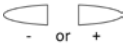
again after the password is complete
- **PA r A** is momentarily displayed, press 

simultaneously
- **400: S E t** should be displayed, press 

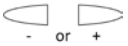
until **100:PArA** is displayed
- Press 

3.2.4.2 ADDRESS

Each LMV2.../LMV3... device will need to be setup with its own unique address. Refer to the UCG configuration sheet (generally shipped with boiler) for the appropriate address and baud rate settings for each device.

- Press 

until **145: 0** is displayed, press 

- Press 

to change **145: 0** to **145: (*)**, press 

- Press 

simultaneously

*This is the address of the individual device.

3.2.5 SIEMENS LMV5…

3.2.5.1 PASSCODE

You may need a passcode. The passcode can be dependent on the burner manufacturer. The LMV5… passcode is "9876" or "WES". If the passcode is incorrect, check inside the burner control box panel. You may need to contact the burner manufacturer for the correct passcode.

3.2.5.2 BMS ACTIVATION

Activation takes place with the AZL5 menus.

- Operation
- OptgModeSelect
- GatewayBASon

When GatewayBASon is activated, plant operation and diagnostics via the AZL… are still possible.

The internal load controller must be turned on for controlling the load with BMS. Use the display menus as shown to activate the internal load controller.

- Params&Display
- LoadController
- Configuration
- LC_OptMode
- IntLCbus

3.2.5.3 ADDRESS

The address can be selected via the AZL menu. The address can be set between 1 and 247.

- Params&Display
- AZL
- Modbus
- Address

3.2.5.4 TRANSMISSION PARAMETERS

The Baud Rate can be set via the AZL menu. This can be set to 9600 bit/s or 19200 bit/s.

- Params&Display
- AZL
- Modbus
- Baud Rate

The Parity can also be setup via the AZL menu.

- Params&Display
- AZL
- Modbus
- Parity

This can be set to "none", "even", or "odd"

3.2.5.5 TIMEOUT COMMUNICATION FAILURE

The AZL will timeout when there is no communication from the BMS. The time can be set from 0 to 7200 seconds. When this time has elapsed the BMS control mode will change from remote to local control. This can be changed via the AZL menu.

- Params&Display
- AZL
- Modbus
- Timeout

3.2.5.6 REMOTE/LOCAL

The AZL has an internal remote / local switch. This switch can only be operated from the display menus.

- ManualOperation
- Auto/Manual/Off

There are three settings for this switch.

Off – Manually turn the boiler off. All set points are ignored.

Manual – Operates in manual based on the operator's inputted value. All set points are ignored. Normally used for commissioning the boiler.

Auto – Allows the boiler to be controlled by the BMS.

3.2.5.7 BMS OPERATING MODE

When the BAS remote / local switch is active and set to remote, control of the boiler is based on the operating mode selection.
There are three operating modes:

Off – The burner will remain off regardless of set point.

On – The burner will be controlled based on the fuel rate register #45. (Remote Firing Rate Control)

Auto – The burner will be controlled based on external set point register #44. (Remote Set point)

3.2.6 HONEYWELL RM7800 SERIES

There are two types of modules that can be used to set up communication on the RM7800.

- Keyboard Display Module S7800A see section 3.2.6.2
- Modbus Module S7810M see section 3.2.6.1

3.2.6.1 MODBUS MODULE S7810M

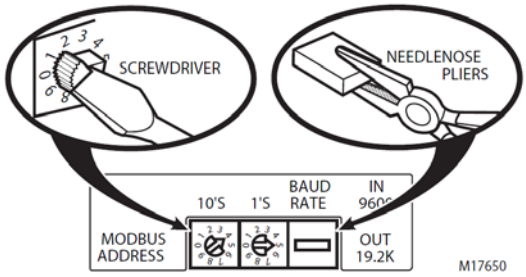


Figure 17 - 7810M Address Switches and Baud Rate Jumper

Assign a device address number from 01 to 99. "00" is not an acceptable address number and will not work.
The default baud rate is 9600. To change the baud rate to 19.2K, use needle nose pliers to remove the jumper. See Fig. 17.

3.2.6.2 KEYBOARD DISPLAY MODULE S7800A

3.2.6.2.1 BMS ACTIVATION

Press the left three buttons of the Keyboard Display Module for one second, then release.

DISPLAY Setup will appear. If you have a personal password, enter it to enter Setup.

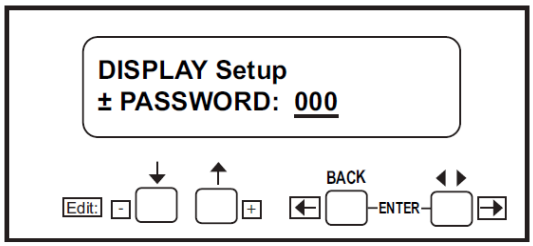
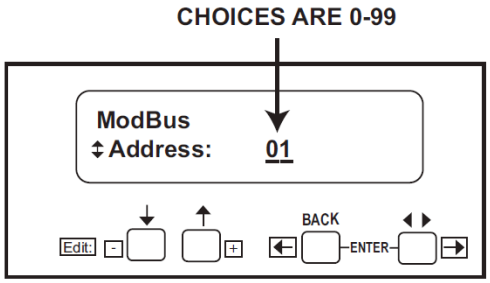


Figure 18 – Honeywell RM7800 Display Setup Screen

Press ENTER by pressing the two ENTER buttons simultaneously.

Choose Select.

Select: M B A D D R E S S, then ENTER.



00 is the default address(Modbus off). Refer to the UCG configuration sheet (generally shipped with boiler) for the appropriate address and baud rate settings for each device.

01-99 are available addresses.

Use ↑ and ↓ to select address. Press ENTER.

The left box blinking means ModBus activity is occurring. The right box blinking means this address is receiving activity (see Fig. 17).

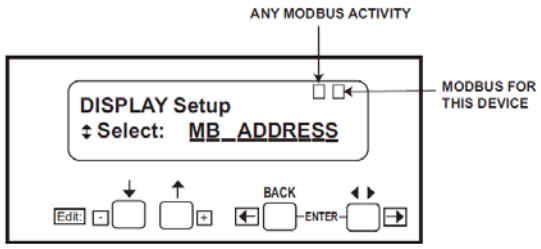
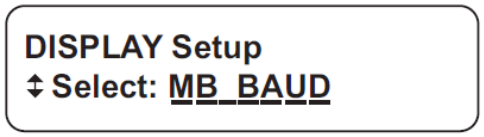


Figure 19 - Modbus Activity on RM7800

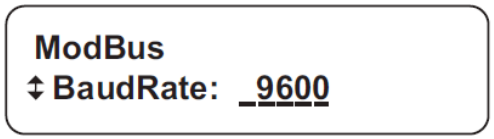
With default address 00 terminals 1, 2, 3 of the 203541 connector are available for the S7830 Expanded Annunciator or additional keyboard displays. With the addresses 01-99 enabled, ModBus is active and the S7830 Expanded Annunciator or additional displays will NOT work. If the Expanded Annunciator or additional displays are required, then order the S7810M1003 ModBus card to support the ModBus Function.

3.2.6.2.2 SETTING BAUD RATE



Display Setup MB Baud by pressing Enter.
Scroll to MB BAUD screen.
Select: M B B A U D.

Press ↓ to select.

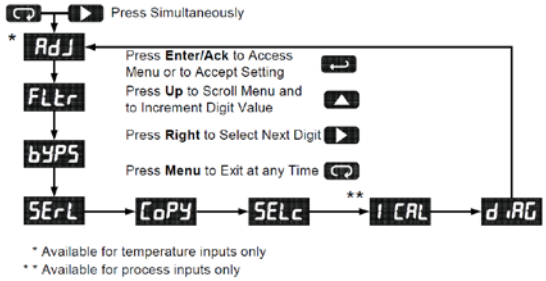


Use the ↑ and ↓ keys to change rates (choices are 9600, 19200, and 38400).

Press ENTER at the Save Changes/Exit No Save screen.

3.2.7 PRECISION DIGITAL TRIDENT PD765 PANEL METER

Press the Right arrow and Menu button simultaneously or hold the Menu button for approximately 3 seconds to access the Advanced Features Menu of the meter.



Prot - Verify that Protocol is set to Modbus.

Addr - Each meter must be provided with its own unique address from 1 to 247.

bAud – Rate must match all other devices connected to UCG.

trdE – Rate must match all other devices connected to UCG.

4 SETUP UCG

4.1 DEVICES AND POINT COUNT AVAILABILITY

- The total number of devices attached to UCG (RER) cannot exceed 1500 Modbus registers for BACnet MS/TP, BACnet/IP, Modbus TCP/IP or Metasys N2.

- The total number of devices attached to UCG (LER) cannot exceed 1000 Modbus registers for LonWorks

Devices	Point Count
SOLA	28
RWF40	15
LMV5...	32
RM7800	37
LMV3...	9
PD765	32

Table 2 - Modbus Registers

4.2 UCG PROTOCOL SETUP

4.2.1 CONFIGURE THE DIP SWITCHES

DIP switches on the ProtoNode, located inside UCG, may need to be set for the appropriate devices and communication settings. These DIP switches are factory preset when the field device and protocol are known at the time of ordering. If needed, remove the cover of the ProtoNode located inside the UCG.

Note: If the DIP switches need to be changed then the power to the unit will need to be shut off before proceeding.

4.2.1.1 BMS PROTOCOL (DIP SWITCH S0 – S3)

The S bank of DIP switches (S0 – S3) are used to select BACnet MS/TP, BACnet IP, Modbus TCP, or Metasys N2 configurations on the UCG (RER). The "S0 – S3" bank of DIP switches on the UCG (LER) (LonWorks) are disabled. See Table 2 below and set S bank Dip switches to the desired configuration.

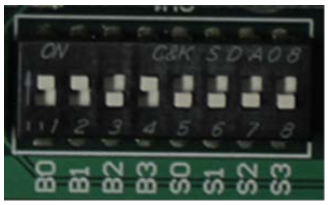


Figure 20 - S Bank DIP Switches

UCG RER	S Bank DIP Switches			
Profile	S0	S1	S2	S3
BACnet IP	Off	Off	Off	Off
BACnet MSTP (multi-node)	On	Off	Off	Off
BACnet MSTP (single node)	Off	Off	On	Off
Metasys N2	Off	On	Off	Off
Modbus TCP/IP	On	On	Off	Off

Table 3 - BMS Protocol Selection

4.2.1.2 SETTING THE SERIAL BAUD RATE

DIP Switches B0 – B3 can be used to set the serial baud rate to match the baud rate provided by BMS. See Table 4 for B bank configurations.

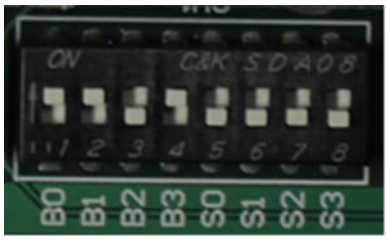


Figure 21 - B Bank DIP Switches

Baud	B0	B1	B2	B3
9600	On	On	On	Off
19200	Off	Off	Off	On
38400	On	On	Off	On
57600	Off	Off	On	On
76800	On	Off	On	On

Table 4 - Baud Rate

Note: **Metasys N2 is always defaulted to 9600 baud and the B bank is disabled.**

Set up the specific protocol needed:

- ***BACnet MSTP*** see section 4.2.2
- ***Modbus TCP/IP*** see section 4.2.3
- ***BACnet IP*** see section 4.2.4
- ***Metasys N2*** see section 4.2.5
- ***LonWorks*** see section 4.2.6

4.2.2 BACNET MSTP SETUP

4.2.2.1 SET MAC ADDRESS

Only 1 MAC address is set for ProtoNode regardless of how many devices are connected to UCG.

Set the BACnet MSTP MAC addresses of the UCG to a value between 1 and 127 (Master MAC addresses); this is so that the BMS Front End can find the UCG via BACnet auto discovery.

Note: Never set a BACnet MSTP MAC Address of the UCG to a value from 128 to 255. Addresses from 128 to 255 are Slave Addresses and cannot be discovered by BMS Front Ends that support Auto-Discovery of BACnet MSTP devices**.**

Set DIP switches A0 – A7 to assign MAC Address for BACnet MSTP.
Please refer to Section 7.2 for the complete range of MAC Addresses and DIP switch settings.

NOTE: When setting DIP Switches, ensure that power to the UCG is OFF.

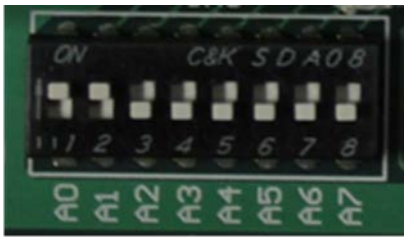


Figure 22 - A Bank DIP Switches (MAC Address)

4.2.2.2 SETTING THE DEVICE INSTANCE (NODE-ID)

The BACnet MSTP Node-ID will be set by taking the Node Offset found in the Web Configurator and adding to the value of the A Bank DIP switches (MAC Address). When more than one device is connected to the UCG, the subsequent BACnet Node-ID will be sequential. The BACnet Node-ID can range from 1 to 4,194,303.

For example:

- Node Offset (default) = 50,000
- A Bank DIP Switch (MAC Address)= 23
- Device 1 Node-ID = 50,023

To change the Node_offset see Section 4.3.2. The node offset can be changed from 50,000 to 1 to 4,194,302 via the Web Configurator.

4.2.2.2.1 SET NODE_OFF TO ASSIGN SPECIFIC DEVICE INSTANCES FOR BACNET MS/TP

If the Device Instances need to be set for addresses other than 50,000 to 50,127, change the Node+-Offset (50,000 is the default for Node+Offset). See section 3.3.1 to set the PC's IP address to the same Subnet as the ProtoNode see section 3.3.2 to connect to the ProtoNode's Web Configurator.

- The BACnet Device Instance can range from 1 to 4,194,303.
- BACnet MS/TP Addressing: The BACnet device instances will be set by taking the Node_Offset found in Web Configurator and adding it to the Modbus Node-ID that was assigned to the device.
- Set the PC's IP- address to be on the same subnet as the ProtoNode.
- Open the PC browser; enter the default IP address of ProtoNode 192.168.1.24, which will bring you to the FST Web Configurator landing page for the ProtoNode.
- Change the Node+Offset to meet the required device instance.

For example: Required Device Instance = 20,001

- Node_Offset changed to = 20,000.
- Device 1 has a Modbus Node-ID of 1, Device 2 has a Modbus Node-ID of 2, Device 3 has a Modbus Node-ID of 3

- Device 1 - Device Instance = 20,001
- Device 2 - Device Instance = 20,002
- Device 3 - Device Instance = 20,003

NOTE: The Modbus Node address + Node_Offset = Device Instance setting

4.2.3 MODBUS TCP/IP SETUP

When using Modbus/TCP, the A Bank of DIP switches are disabled and not used. They should be set to OFF.

4.2.3.1 SETTING THE DEVICE NODE-ID FOR MODBUS/TCP

- The Modbus RTU Node-ID's assigned to the devices attached to the UCG in section 2 and will be the Modbus TCP/IP Node_ID's for the field protocols.

- Modbus/TCP Node-ID Addressing range from 1-255.

4.2.4 BACNET/IP SETUP

4.2.4.1 SETTING THE DEVICE INSTANCE

The A Bank of DIP switches are also used to set the BACnet/IP Device Instances.

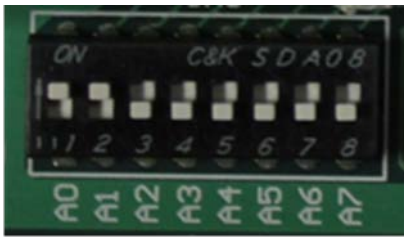


Figure 23 - A Bank DIP Switches (BACnet Address)

The BACnet/IP device instance will be set by taking the Node Offset found in section 3.3.2 Web Configurator and adding to the value of the A Bank DIP switches. When more than one device is connected to the UCG, the subsequent BACnet device instances will be sequential. The BACnet Device Instance can range from 1 to 4,194,303.

For example:

- Node Offset (default) = 50,000
- A Bank DIP Switch = 23
- Device 1 Device Instance = 50,023

4.2.4.1.1 SET NODE_OFF TO ASSIGN SPECIFIC DEVICE INSTANCES FOR BACNET/IP

If the Device Instances need to be set for addresses other than 50,000 to 50,127, change the Node+-Offset (50,000 is the default for Node+Offset). See section 4.3.1 to set the PC's IP address to the same Subnet as the ProtoNode and section 4.3.2 to connect to the ProtoNode's Web Configurator.

- The BACnet Device Instance can range from 1 to 4,194,303.

- BACnet/IP Addressing: The BACnet device instances will be set by taking the Node_Offset found in Web Configurator and adding it to the Modbus Node-ID that was assigned to the device.

- Set the PC's IP- address to be on the same subnet as the ProtoNode.

- Open the PC browser; enter the default IP address of ProtoNode 192.168.1.24, which will bring you to the FST Web Configurator landing page for the ProtoNode.

- Change the Node+Offset to meet the required device instance.

For example: Required Device Instance = 20,001

- Node_Offset changed to = 20,000.

- Device 1 has a Modbus Node-ID of 1, Device 2 has a Modbus Node-ID of 2, Device 3 has a Modbus Node-ID of 3

- Device 1 - Device Instance = 20,001
- Device 2 - Device Instance = 20,002
- Device 3 - Device Instance = 20,003

NOTE: The Modbus Node address + Node_Offset = Device Instance setting

4.2.5 METASYS N2

When using Metasys N2 the A Bank of DIP switches are disabled and not used. They should be set to OFF.

4.2.5.1 SETTING THE NODE-ID

The Modbus RTU Node-ID assigned to each device attached to the UCG in section 2 will be the Metasys N2 Node-ID for the field protocols. Metasys N2 Node-ID's range from 1-255.

4.2.6 LONWORKS

Commissioning may only be performed by the LonWorks administrator.

4.2.6.1 COMMISSIONING PROTONODE FPC-N35 ON A LONWORKS NETWORK

The User will be prompted by the LonWorks Administrator to hit the Service Pin on the ProtoNode FPC-N35 at the correct step of the Commissioning process which is different for each LonWorks Network Management Tool.

Figure 24 - LonWorks Service Pin Location

If an XIF file is required, see steps in section 4.2.6.2 to generate XIF

4.2.6.2 Instructions to Upload XIF File from the UCG (LER) using Field Server GUI Web Server

- Follow the steps in section 4.3.1
- Open a web browser and go to the following address: IP address of ProtoCessor/fserver.xif
- Example: 192.168.1.24/fserver.xif
- If the web browser prompts you to save file, save the file onto the PC. If the web browser displays the xif file as a web page, save the file on your PC as fserver.xif. See Figure 20.

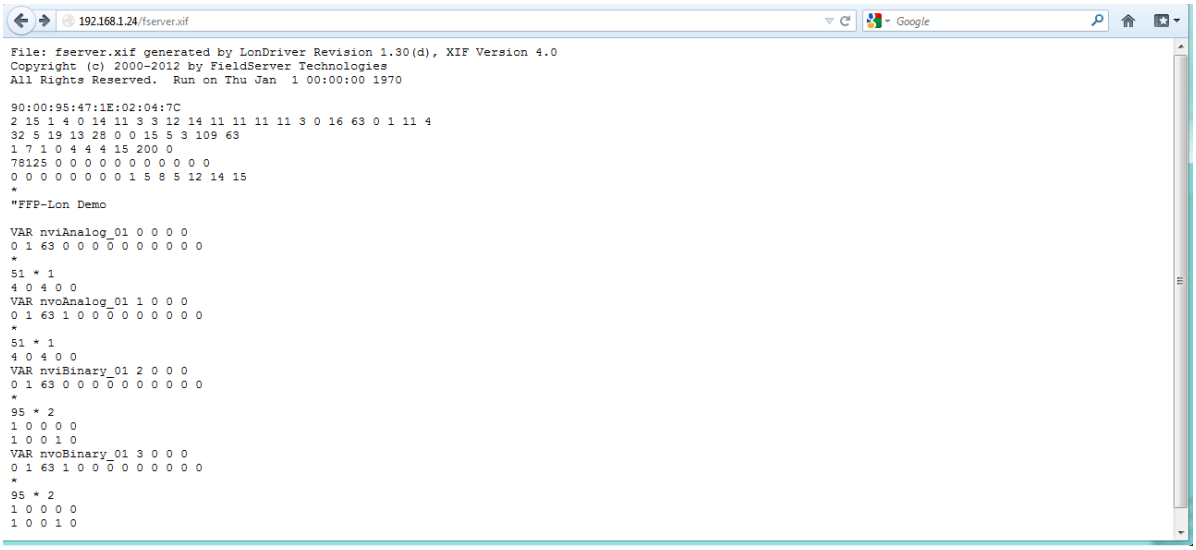


Figure 25 - Sample of Fserver.XIF File Being Generated

4.3 SETUP UCG VIA WEB CONFIGURATOR

Through the ProtoNode Web GUI Configurator parameters such as the Modbus Node-ID, Network Number, device profiles, and many other options can be set. This interface gives a quick and intuitive way to setup communication if needed.

4.3.1 CONNECT THE PC TO THE PROTONODE VIA THE ETHERNET PORT

Figure 26 - ProtoNode Ethernet Port

- Disable any wireless Ethernet adapters on the PC/Laptop.
- Disable firewall and virus protection software.
- Connect a standard CAT5 Ethernet cable (straight through **or** cross) between the PC and ProtoNode inside the UCG.
- The default IP Address of the ProtoNode is 192.168.1.24, Subnet Mask is 255.255.255.0. If the PC and the ProtoNode are on different IP Networks, assign a static IP Address to the PC on the 192.168.1.xxx network.

- **For Windows XP**

Go to start >

Control Panel > Network Connections

Right-click on Local Area Connection > Properties

Highlight

Internet Protocol (TCP/IP) >

Properties

- **For Windows 7**

Go to > Control Panel >

Network and Internet >

Network and Sharing Center >

Change adapter settings

Right-click on:

Local Area Connection > Properties

Highlight

Internet Protocol Version 4 (TCP/IPv4)

Properties

>

- **For Windows XP and Windows 7, select:**

Use the following IP address:

IP address: 192 . 168 . 1 . 11

Subnet mask: 255 . 255 . 255 . 0

Default gateway:

Click OK twice

4.3.2 CONFIGURE PROFILES IN PROTONODE'S WEB CONFIGURATOR

- Follow the steps in section 4.3.1 .
- Open PC web browser and enter the default IP address of the ProtoNode 192.168.1.24
- When the S bank of DIP switches are set for BACnet MS/TP or BACnet/IP or Metasys N2 or Modbus TCP/IP, profiles for all of the devices for that particular protocol will be listed in the Configurator.

4.3.2.1 SELECTING THE DEVICE'S PROFILES THAT WILL BE CONNECTED PROTONODE

When you open the Web Configurator, you will see the available device Profiles on the lower left side of the screen. Use the drop-down box under "Current Profile" to view all of the available profiles.
To active a profile for a device, select the device from the drop-down list, then click the "Add" button. For every device that will be connected, you will need to add an Active Profile and declare the Modbus Node Address that was assigned to the device.

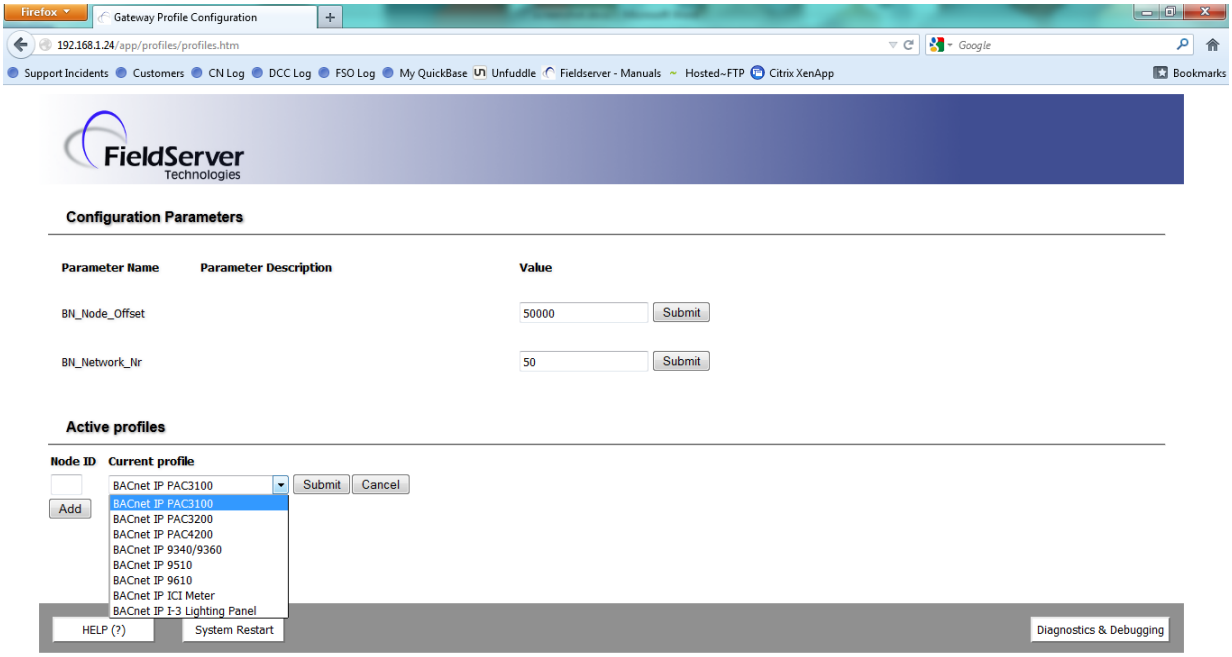


Figure 27 - Web Configurator Showing the Active Profiles to Select From

Once the Profile has been selected and the Modbus Node Address has been declared, click the “Add” button to activate the Profile for inclusion in the configuration.

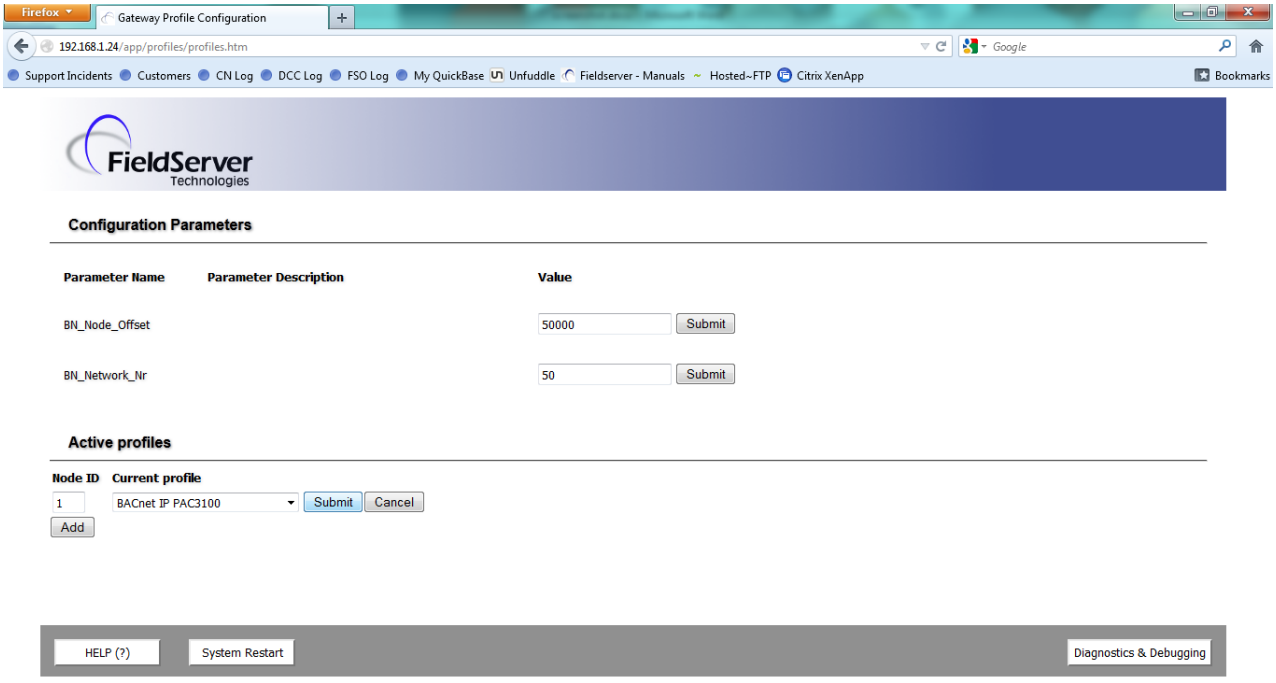


Figure 28 - Web Configurator Showing a Profile Selected

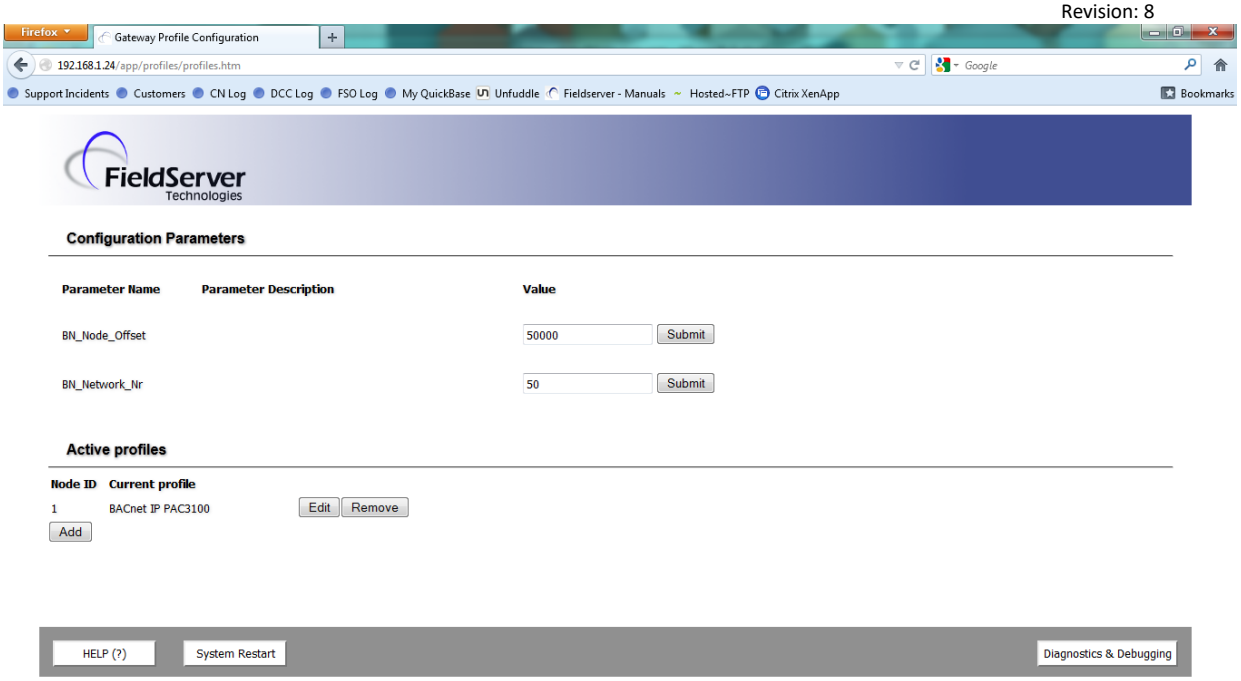


Figure 29 - Web Configurator Showing a Completed Profile Added

Continue this process until all devices have been added.

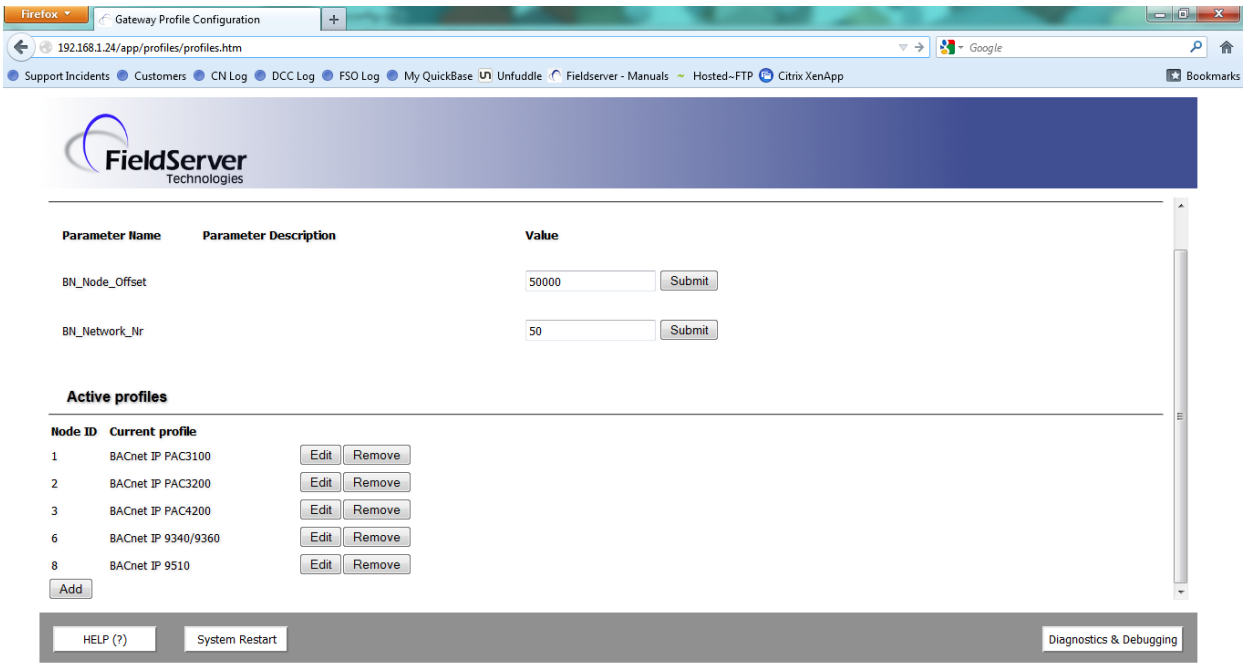


Figure 30 - Web Configurator Showing Completed Profiles Added

4.3.3 SET IP ADDRESS FOR BACNET/IP VIA GUI

- Open a PC web browser, enter the default IP address of ProtoNode 192.168.1.24 and connect to ProtoNode.
- The Default GUI landing page is the Web Configurator.
- Press the Diagnostics and Debugging button at the bottom right corner of the page to go to FSGUI utility.

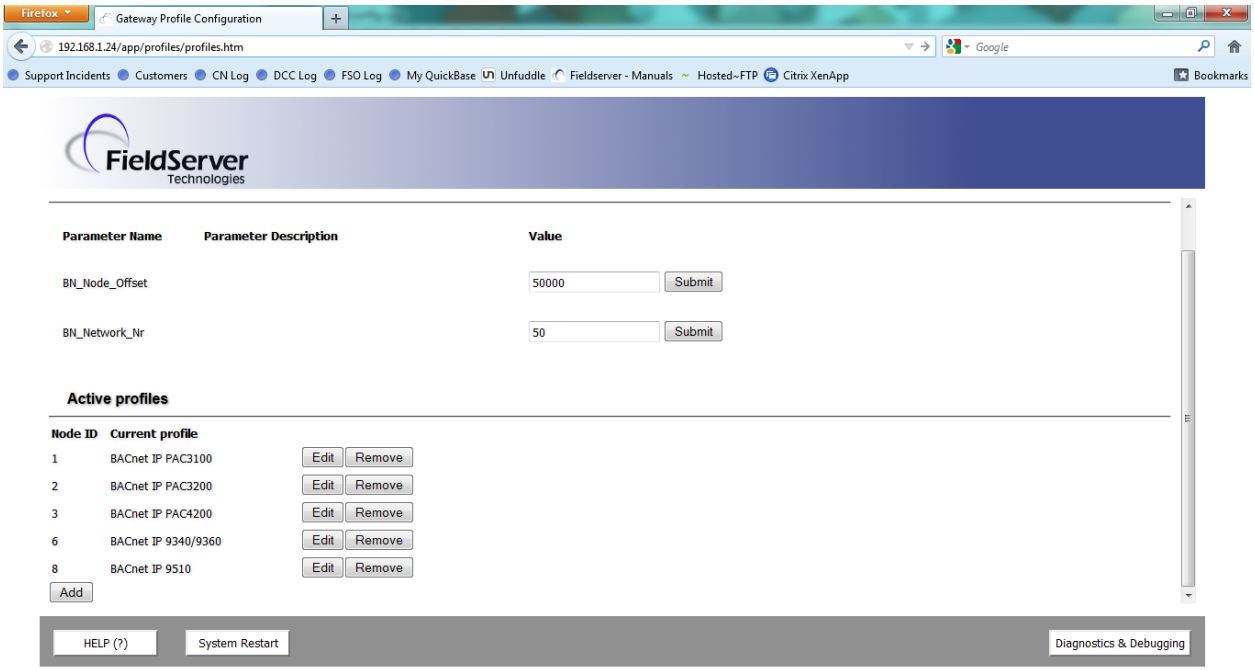


Figure 31 - Default FS Web GUI Landing Page

- Click on setup and then Network Settings to enter the Edit IP Address Settings menu.

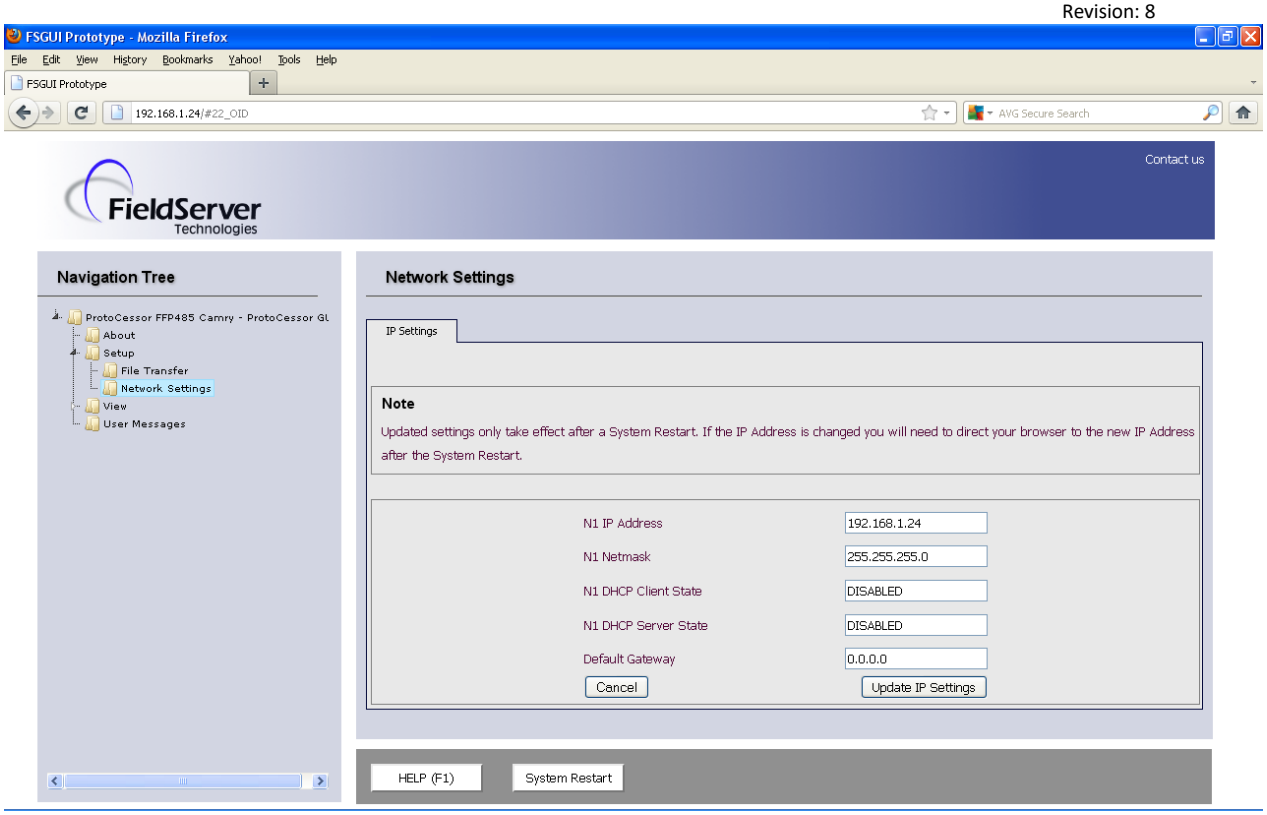


Figure 32 - Changing IP Address via FST Web GUI

- Modify the IP address (N1 IP address field) of ProtoNode Ethernet port.
- If necessary, change the Netmask (N1 Netmask field).
- Type in a new Subnet Mask.
- If necessary, change the IP Gateway (Default Gateway field).
- Type in a new IP Gateway.
- Note: If ProtoNode is connected to a router, the IP Gateway of ProtoNode should be set to the IP address of the router that it is connected to.
- Reset ProtoNode.
- **Unplug Ethernet cable from PC and connect it to the network hub or router.**

5 POINTS LISTS

5.1 HONEYWELL SOLA MODBUS RTU MAPPINGS TO BACNET, METASYS N2 AND LONWORKS

See Honeywell SOLA device manual for more information.

		FPC-N34				FPC-N35	
Point Name	**Description**	**BACnet Data Type**	**BACnet Object Id**	**N2 Data Type**	**N2 Point Address**	**Lon Name**	**Lon SNVT Type**
Com Status	1 = Communication Established 0 = No Communication	BI	1	DI	1	nvoComStatus_XXX	SNVT_switch
Demand source	Current demand source: 0=Unknown, 1=No source demand, 2=CH, 3=DHW, 4=Lead Lag slave, 5=Lead Lag master, 6=CH frost protection, 7=DHW frost protection, 8=No demand due to burner switch turned off, 9=DHW storage, 10=Reserved, 11=Warm weather shutdown	AI	1	AI	1	nvoDemSrc_XXX	SNVT_count_f
Outlet sensor	Boiler supply water temperature.	AI	2	AI	2	nvoOutletSen_XXX	SNVT_temp_f
Fan speed	Speed of the combustion air blower in rpm.	AI	3	AI	3	nvoFanSpeed_XXX	SNVT_count_f
Flame signal	Signal strength of the flame 0 – 15 VDC.	AI	4	AI	4	nvoFlmSignal_XXX	SNVT_count_f
Inlet sensor	Boilers return water temperature.	AI	5	AI	5	nvoInletSen_XXX	SNVT_temp_f
DHW sensor	Domestic hot water temperature.	AI	6	AI	6	nvoDHW_Sen_XXX	SNVT_temp_f
S5 sensor	Header water temperature or outdoor temperature.	AI	7	AI	7	nvoS5Sensor_XXX	SNVT_temp_f
Stack sensor	Temperature of the flue gasses.	AI	8	AI	8	nvoStackSen_XXX	SNVT_temp_f
4-20 mA remote ctl input	The mA value for S2 (J8-6) (remote set point) & (remote modulation).	AI	9	AI	9	nvoRemCtlIn_XXX	SNVT_count_f
Burner control status	0=Disabled, 1=Locked out, 4=Anti-short cycle, 5=Unconfigured safety data, 34=Standby Hold, 35=Standby Delay, 48=Normal Standby, 49=Preparing, 50=Ignition, 51=Firing, 52=Postpurge	AI	10	AI	10	nvoBrnCtlSt_XXX	SNVT_count_f
Lockout code	0 = No lockout 1 – 4096 (see table 9 of the SOLA Modbus Interface Manual)	AI	11	AI	11	nvoLockotCod_XXX	SNVT_count_f
Annunciator first out	0 = None or undetermined 1 = Running interlock (Air flow switch) 2 = Pre ignition interlock (Proof of valve closure when provided) 11 = Boiler low water 12 = High internal burner temperature 13 = Water flow switch 14 = High gas pressure 15 = Low gas pressure	AI	12	AI	12	nvoAnn1stOut_XXX	SNVT_count_f

	16 = Low pilot gas pressure 17 = High air exchanger pressure 18 = High burner air pressure						
Burner cycle count	0-999,999 (U32)	AI	13	AI	13	nvoBrnCycCnt_XXX	SNVT_count_f
Burner run time	Hours (U32)	AI	14	AI	14	nvoBrnRunTim_XXX	SNVT_count_f
CH pump cycle count	0-999,999 (U32)	AI	15	AI	15	nvoCHPmpCyCn_XXX	SNVT_count_f
DHW pump cycle count	0-999,999 (U32)	AI	16	AI	16	nvoDHWPmCyCt_XXX	SNVT_count_f
System pump cycle count	0-999,999 (U32)	AI	17	AI	17	nvoSysPmCyCt_XXX	SNVT_count_f
Boiler pump cycle count	0-999,999 (U32)	AI	18	AI	18	nvoBlrPmCyCt_XXX	SNVT_count_f
Outdoor temperature	Temperature of the remote outdoor sensor	AI	19	AI	19	nvoOutdrTmp_XXX	SNVT_temp_f
Burner switch	Used to Enable/Disable boiler firing 1 = Enabled 0 = Disabled	BV	20	DO	20	nvi/nvoBurnerSw_XXX	SNVT_switch
CH enable	Enable/Disable central heating 1 = Enabled 0 = Disabled	BV	21	DO	21	nvi/nvoCH_Enable_XXX	SNVT_switch
CH setpoint	Change Boiler Set point[1]	AV	22	AO	22	nvi/nvoCH_SP_XXX	SNVT_temp_f
CH TOD setpoint	Boiler Set point when Time of Day switch is on[1]	AV	23	AO	23	nvi/nvoCH_TOD_SP_XXX	SNVT_temp_f
DHW Enable	Enable/Disable domestic hot water. 1 = Enabled 0 = Disabled	BV	24	DO	24	nvi/nvoDHW_Enabl_XXX	SNVT_switch
DHW Setpoint	Change the domestic hot water set point[1]	AV	25	AO	25	nvi/nvoDHW_SP_XXX	SNVT_temp_f
Lead Lag setpoint	Change the lead lag set point[1]	AV	26	AO	26	nvi/nvoLeadLagSP_XXX	SNVT_temp_f
Lead Lag enable	Enable/ Disable Lead Lag 1 = Enabled 0 = Disabled	BV	27	DO	27	nvi/nvoLdLgEnabl_XXX	SNVT_switch

[1] All temperature registers are expressed in °C regardless what Temperature units (register 179) is set to. Temperature range is -40°C to 130°C with values given in 0.1°C units (for example, 32.0°C = 320). A temperature that is NOT applicable in this SOLA, i.e., not enabled, has a value of 0x8FFF. This temperature setting is denoted as “UNCONFIGURED” at the user interface.

5.2 SEIMENS RWF55 MODBUS RTU MAPPINGS TO BACNET, METASYS N2 AND LONWORKS

See Siemens RWF55 device manual for more information.

		FPC-N34				FPC-N35	
Point Name		**BACnet Data Type**	**BACnet Object Id**	**N2 Data Type**	**N2 Point Address**	**Lon Name**	**Lon SNVT Type**
Com Status		BI	1	DI	1	nvoComStatus_XXX	SNVT_switch
Analog Input InP1		AI	1	AI	1	nvoInP1_XXX	SNVT_count_inc_f
Analog Input InP2		AI	2	AI	2	nvoInP2_XXX	SNVT_count_inc_f
Analog Input InP3		AI	3	AI	3	nvoInP3_XXX	SNVT_count_inc_f
Actual Setpoint		AI	4	AI	4	nvoActSP_XXX	SNVT_count_inc_f
Setpoint 1		AV	5	AO	5	nvi/nvoSP_1_XXX	SNVT_count_inc_f
Setpoint 2		AV	6	AO	6	nvi/nvoSP_2_XXX	SNVT_count_inc_f
Analog Input InP3		AI	7	AI	7	nvoInP3Unfil_XXX	SNVT_count_inc_f
Actual Angular Positioning		AI	8	AI	8	nvoActAngPos_XXX	SNVT_count_inc_f
Burner Alarm		AI	9	AI	9	nvoBrnrAlm_XXX	SNVT_count_inc_f
Activation Remote Operation		AV	10	AO	10	nvi/nvoREM_XXX	SNVT_count_inc_f
Controller Off In Remote Setpoint		AV	11	AO	11	nvi/nvorOFF_XXX	SNVT_count_inc_f
Switch-On Threshold Remote		AV	12	AO	12	nvi/nvorHYS1_XXX	SNVT_count_inc_f
Switch-Off Threshold Down Remote		AV	13	AO	13	nvi/nvorHYS2_XXX	SNVT_count_inc_f
Switch-Off Threshold Up Remote		AV	14	AO	14	nvi/nvorHYS3_XXX	SNVT_count_inc_f
Setpoint Remote		AV	15	AO	15	nvi/nvoSPr_XXX	SNVT_count_inc_f
Burner Release Remote Operation		AV	16	AO	16	nvi/nvoRK1_XXX	SNVT_count_inc_f
Relay K2 Remote Operation		AV	17	AO	17	nvi/nvoRK2_XXX	SNVT_count_inc_f
Relay K3 Remote Operation		AV	18	AO	18	nvi/nvoRK3_XXX	SNVT_count_inc_f
Relay K6 Remote Operation		AV	19	AO	19	nvi/nvoRK6_XXX	SNVT_count_inc_f
Step-By-Step Control Rem Operation		AV	20	AO	20	nvi/nvorStEP_XXX	SNVT_count_inc_f
Angular Pos Output Remote Operation		AV	21	AO	21	nvi/nvorY_XXX	SNVT_count_inc_f
Switch-On Threshold Remote		AV	22	AO	22	nvi/nvorHYS4_XXX	SNVT_count_inc_f
Switch-Off Threshold Down Remote		AV	23	AO	23	nvi/nvorHYS5_XXX	SNVT_count_inc_f
Switch-Off Threshold Up Remote		AV	24	AO	24	nvi/nvorHYS6_XXX	SNVT_count_inc_f

5.3 SIEMENS LMV52 MODBUS RTU MAPPINGS TO BACNET, METASYS N2 AND LONWORKS

See Siemens LMV52 device manual for more information.

LMV52 Modbus RTU Mappings to BACnet, Metasys N2 and LonWorks							
Ref.	Point Name	BACnet Object Type	BACnet Object ID	N2 Data Type	N2 Address	LonWorks Name	LonWorks SNVT
1	Com Status	BI	1	DI	1	nvoComStatus_XXX	SNVT_switch
2	Process Value	AI	1	AI	1	nvoProcVal_XXX	SNVT_count_f
3	Flame Signal	AI	2	AI	2	nvoFlameSig_XXX	SNVT_lev_percent
4	Fuel Rate Volume	AI	3	AI	3	nvoFuelRtVol_XXX	SNVT_count_f
5	O2 Level	AI	4	AI	4	nvoO2Level_XXX	SNVT_lev_percent
6	Supply Air	AI	5	AI	5	nvoSupplyAir_XXX	SNVT_count_f
7	Flue Gas	AI	6	AI	6	nvoFlueGas_XXX	SNVT_count_f
8	Combustion Efficiency	AI	7	AI	7	nvoCombstEff_XXX	SNVT_lev_percent
9	Control Mode	BV	8	DO	8	nvi/nvoCtrlMode_XXX	SNVT_switch
10	Operating Mode	AV	9	AO	9	nvi/nvoOpMode_XXX	SNVT_count_f
11	External Setpoint	AV	10	AO	10	nvi/nvoExtSP_XXX	SNVT_count_f
12	Fuel Rate	AV	11	AO	11	nvi/nvoFuelRate_XXX	SNVT_count_f
13	Process Setpoint	AV	12	AO	12	nvi/nvoProcSP_XXX	SNVT_count_f
14	Hours	AI	13	AI	13	nvoHours_XXX	SNVT_time_hour
15	Current Lockout Error code	AI	14	AI	14	nvoCrntErCd_XXX	SNVT_count_f
16	Current Lockout Error diagnosis	AI	15	AI	15	nvoCrntErDg_XXX	SNVT_count_f
17	Current Lockout Error class	AI	16	AI	16	nvoCrntErCls_XXX	SNVT_count_f
18	Current Lockout Error phase	AI	17	AI	17	nvoCrntErPh_XXX	SNVT_count_f
19	Current Lockout Fuel	AI	18	AI	18	nvoCrntFuel_XXX	SNVT_count_f
20	Current Lockout Output	AI	19	AI	19	nvoCrntOutpt_XXX	SNVT_count_f
21	Current Lockout Date: Year	AI	20	AI	20	nvoCrntTPDYr_XXX	SNVT_count_f
22	Current Lockout Date: Month	AI	21	AI	21	nvoCrntTPDMn_XXX	SNVT_count_f
23	Current Lockout Date: Day	AI	22	AI	22	nvoCrntTPDDy_XXX	SNVT_count_f
24	Current Lockout Time of day: hours	AI	23	AI	23	nvoCrntTODHr_XXX	SNVT_count_f
25	Current Lockout Time of day: minutes	AI	24	AI	24	nvoCrntTODMn_XXX	SNVT_count_f
26	Current Lockout Time of day: Seconds	AI	25	AI	25	nvoCrntTODSc_XXX	SNVT_count_f
27	Current Lockout Startup counter total	AI	26	AI	26	nvoCrntStCtT_XXX	SNVT_count_f
28	Current Lockout Hours run total	AI	27	AI	27	nvoCrntHrRnT_XXX	SNVT_time_hour
29	Lockout Error Code	AI	140	AI	140	nvoLckotErCd_XXX	SNVT_count_f
30	Lockout Diagnostic Code	AI	141	AI	141	nvoLckotDgCd_XXX	SNVT_count_f
31	Fuel Selected	AI	142	AI	142	nvoFuelSel_XXX	SNVT_count_f
32	Firing Rate	AI	143	AI	143	nvoFirRate_XXX	SNVT_count_f

5.4 HONEYWELL RM7800 MODBUS RTU MAPPINGS TO BACNET, METASYS N2 AND LONWORKS

See Honeywell RM7800 device manual for operation.

RM7800 Modbus RTU Mappings to BACnet, Metasys N2 and LonWorks							
Ref.	Point Name	BACnet Object Type	BACnet Object ID	N2 Data Type	N2 Address	LonWorks Name	LonWorks SNVT
1	Com Status	BI	1	DI	1	nvoComStatus_XXX	SNVT_switch
2	Flame Signal	AI	1	AI	1	nvoFlameSig_XXX	SNVT_count_f
3	Burner Cycles	AI	2	AI	2	nvoBrnCyc_XXX	SNVT_count_f
4	Burner Hours	AI	3	AI	3	nvoBrnHrs_XXX	SNVT_time_hour
5	Burner Fault Code	AI	4	AI	4	nvoBrnFltCod_XXX	SNVT_count_f
6	Initiate	AI	53	AI	53	nvoInitiate_XXX	SNVT_switch
7	Standby	AI	54	AI	54	nvoStandby_XXX	SNVT_switch
8	Purge	AI	55	AI	55	nvoPurge_XXX	SNVT_switch
9	Pilot Ignition	AI	56	AI	56	nvoPilotIgn_XXX	SNVT_switch
10	Main Ignition	AI	57	AI	57	nvoMainIgn_XXX	SNVT_switch
11	Run	AI	58	AI	58	nvoRun_XXX	SNVT_switch
12	Postpurge	AI	59	AI	59	nvoPostpurge_XXX	SNVT_switch
13	Pre-Ignition	AI	60	AI	60	nvoPreIgntn_XXX	SNVT_switch
14	Valve Proving	AI	61	AI	61	nvoVlvProv_XXX	SNVT_switch
15	Alarm	AI	62	AI	62	nvoAlarm_XXX	SNVT_switch
16	Hold	AI	63	AI	63	nvoHold_XXX	SNVT_switch
17	Lockout	AI	64	AI	64	nvoLockout_XXX	SNVT_switch
18	First Out Code *	AI	65	AI	65	nvo1stOutCod_XXX	SNVT_count_f
19	Main Valve Proof of Closure *	BI	66	DI	66	nvoMnVlvCls_XXX	SNVT_switch
20	Burner Switch *	BI	67	DI	67	nvoBrnrSw_XXX	SNVT_switch
21	Operating Control *	BI	68	DI	68	nvoOpCtrl_XXX	SNVT_switch
22	Auxiliary Limit 1 *	BI	69	DI	69	nvoAuxLim1_XXX	SNVT_switch
23	Auxiliary Limit 2 *	BI	70	DI	70	nvoAuxLim2_XXX	SNVT_switch
24	Low Water Cutoff *	BI	71	DI	71	nvoLoWtrCut_XXX	SNVT_switch
25	High Limit *	BI	72	DI	72	nvoHiLim_XXX	SNVT_switch
26	Auxiliary Limit 3 *	BI	73	DI	73	nvoAuxLim3_XXX	SNVT_switch
27	Oil Select Switch *	BI	74	DI	74	nvoOilSelSw_XXX	SNVT_switch
28	High Oil Pressure *	BI	75	DI	75	nvoHiOilPrs_XXX	SNVT_switch
29	Low Oil Pressure *	BI	76	DI	76	nvoLoOilPrs_XXX	SNVT_switch
30	High Oil Temperature *	BI	77	DI	77	nvoHiOilTmp_XXX	SNVT_switch
31	Low Oil Temperature *	BI	78	DI	78	nvoLoOilTmp_XXX	SNVT_switch
32	Gas Select Switch *	BI	79	DI	79	nvoGasSelSw_XXX	SNVT_switch
33	High Gas Pressure *	BI	80	DI	80	nvoHiGasPrs_XXX	SNVT_switch
34	Low Gas Pressure *	BI	81	DI	81	nvoLoGasPrs_XXX	SNVT_switch
35	Air Flow Switch *	BI	82	DI	82	nvoAirFLoSw_XXX	SNVT_switch
36	Auxiliary Interlock 4 *	BI	83	DI	83	nvoAuxIntlk4_XXX	SNVT_switch
37	Auxiliary Interlock 5 *	BI	84	DI	84	nvoAuxIntlk5_XXX	SNVT_switch
*Requires S7830 Expanded Annunciator							

5.5 SEIMENS LMV 36 MODBUS RTU MAPPINGS TO BACNET, METASYS N2 AND LONWORKS

See Seimens LMV 36 device manual for operation.

LM36 Modbus RTU Mappings to BACnet, Metasys N2 and LonWorks							
Ref.	Point Name	BACnet Object Type	BACnet Object ID	N2 Data Type	N2 Address	LonWorks Name	LonWorks SNVT
1	Com Status	BI	1	DI	1	nvoComStatus_XXX	SNVT_switch
2	Flame Signal	AI	1	AI	1	nvoFlameSig_XXX	SNVT_lev_percent
3	Lockout Error Code	AI	2	AI	2	nvoLckotErCd_XXX	SNVT_count_f
4	Lockout Diagnostic Code	AI	3	AI	3	nvoLckotDgCd_XXX	SNVT_count_f
5	Control Mode	BV	4	DO	4	nvi/nvoCtrlMode_XXX	SNVT_switch
6	Operating Mode	AV	5	AO	5	nvi/nvoOp_Mode_XXX	SNVT_count_f
7	Fuel Rate	AV	6	AO	6	nvi/nvoFuelRate_XXX	SNVT_count_f
8	Fuel Selected	AI	7	AI	7	nvoFuelSel_XXX	SNVT_count_f
9	Firing Rate	AI	8	AI	8	nvoFirRate_XXX	SNVT_count_f

5.6 PRECISION DIGITAL TRIDENT PD765 MODBUS RTU MAPPINGS TO BACNET, METASYS N2 AND LONWORKS

See Precision Digital Trident PD765 device manual for operation.

PD765 Modbus RTU Mappings to BACnet, Metasys N2 and LonWorks							
Ref.	Point Name	BACnet Object Type	BACnet Object ID	N2 Data Type	N2 Address	LonWorks Name	LonWorks SNVT
1	Com Status	BI	1	DI	1	nvoComStatus_XXX	SNVT_switch
2	Display Value	AI	1	AI	1	nvoDispVal_XXX	SNVT_count_f
3	Relay 1 Status	BV	2	DO	2	nvi/nvoRel1Stat_XXX	SNVT_switch
4	Relay 2 Status	BV	3	DO	3	nvi/nvoRel2Stat_XXX	SNVT_switch
5	Alarm 1 Status	BI	4	DI	4	nvoAlm1Stat_XXX	SNVT_switch
6	Alarm 2 Status	BI	5	DI	5	nvoAlm2Stat_XXX	SNVT_switch
7	Alarm 1 Acknowledge	BV	6	DO	6	nvi/nvoAlm1Ack_XXX	SNVT_switch
8	Alarm 2 Acknowledge	BV	7	DO	7	nvi/nvoAlm2Ack_XXX	SNVT_switch
9	Relay 1 Set Point	AV	8	AO	8	nvi/nvoRl1SP_XXX	SNVT_count_f
10	Relay 1 Reset Point	AV	9	AO	9	nvi/nvoRl1ResPt_XXX	SNVT_count_f
11	Relay 1 Turn-on Delay	AV	10	AO	10	nvi/nvoRl1TnOnDl_XXX	SNVT_count_f
12	Relay 1 Turn-off Delay	AV	11	AO	11	nvi/nvoRl1TnOfDl_XXX	SNVT_count_f
13	Relay 1 Normal/Fail-Safe	BV	12	DO	12	nvi/nvoRl1NrFlSf_XXX	SNVT_switch
14	Relay 1 Operation	AV	13	AO	13	nvi/nvoRl1Oper_XXX	SNVT_count_f
15	Relay 2 Set Point	AV	14	AO	14	nvi/nvoRl2SP_XXX	SNVT_count_f
16	Relay 2 Reset Point	AV	15	AO	15	nvi/nvoRl2ResPt_XXX	SNVT_count_f
17	Relay 2 Turn-on Delay	AV	16	AO	16	nvi/nvoRl2TnOnDl_XXX	SNVT_count_f
18	Relay 2 Turn-off Delay	AV	17	AO	17	nvi/nvoRl2TnOfDl_XXX	SNVT_count_f
19	Relay 2 Normal/Fail-Safe	BV	18	DO	18	nvi/nvoRl2NrFlSf_XXX	SNVT_switch
20	Relay 2 Operation	AV	19	AO	19	nvi/nvoRl2Oper_XXX	SNVT_count_f
21	4-20mA Out-Mode Output Option	BV	20	DO	20	nvi/nvo420MdOtOp_XXX	SNVT_switch
22	4-20mA Out-Mode Data Source	AV	21	AO	21	nvi/nvo420MdDtSr_XXX	SNVT_count_f
23	4-20mA Out–Sensor Break Value	AV	22	AO	22	nvi/nvo420SnBkVl_XXX	SNVT_count_f
24	4-20mA Out–Overrange value	AV	23	AO	23	nvi/nvo420OvrVal_XXX	SNVT_count_f
25	4-20mA Out–Underrange value	AV	24	AO	24	nvi/nvo420UndVal_XXX	SNVT_count_f
26	4-20mA Out–Max value Allowed	AV	25	AO	25	nvi/nvo420MxVlAl_XXX	SNVT_count_f
27	4-20mA Out–Min value Allowed	AV	26	AO	26	nvi/nvo420MnVlAl_XXX	SNVT_count_f
28	4-20mA Out–Display Value 1	AV	27	AO	27	nvi/nvo420DspVl1_XXX	SNVT_count_f
29	4-20mA Out–Display Value 2	AV	28	AO	28	nvi/nvo420DspVl2_XXX	SNVT_count_f
30	4-20mA Out–Output 1	AV	29	AO	29	nvi/nvo420Outpt1_XXX	SNVT_count_f
31	4-20mA Out–Output 2	AV	30	AO	30	nvi/nvo420Outpt2_XXX	SNVT_count_f
32	4-20mA Out–Data in mA or Data in bit	AV	31	AO	31	nvi/nvo420DtmABt_XXX	SNVT_count_f

6 TROUBLESHOOTING

1. **Data received by BMS is all zeros or blank.** To fix, check the following:
    a. Visual observations of LEDs on ProtoNode. Section 6.1
    b. Check baud rate, parity, data bits, stop bits
    c. Check Modbus device address
    d. Verify wiring
    e. Verify device is connected to the same subnet as the ProtoNode
    f. Verify the Modbus device was discovered in Web Configurator Section 4

2. **BMS unable to see any points or devices.** To fix, check the following:
    a. Visual dipswitch settings (using correct baud rate and device instance)
    b. Verify IP address setting
    c. Verify wiring

If the problem still exists, a Diagnostic Capture needs to be taken and sent to Bryan Steam. **Section 6.2**

6.1 LED DIAGNOSTICS FOR COMMUNICATIONS BETWEEN THE UCG AND DEVICES

Please see the diagram below for ProtoNode FPC-N34 and FPC-N35 LED Locations.

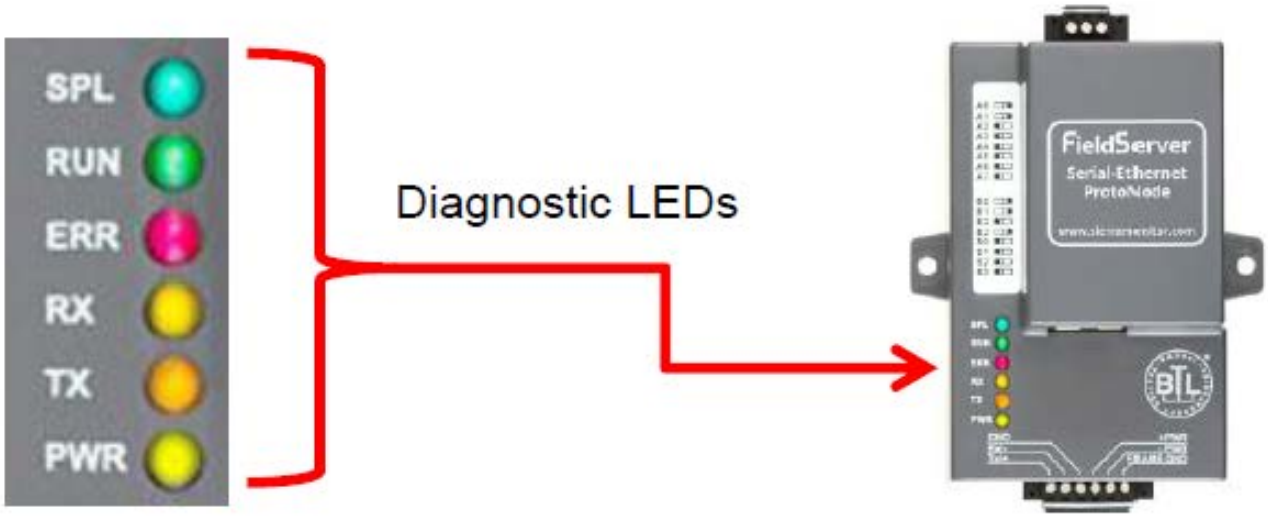


Figure 33 - Diagnostic LEDs

Tag	Description
SPL (Blue)	The SPL LED will light if the unit is not getting a response from one or more of the configured devices. **For LonWorks units**, LED will light until the unit is commissioned on the LonWorks network.
RUN (Green)	The RUN LED will start flashing 20 seconds after power indicating normal operation.
ERR (Red)	The SYS ERR LED will go on solid 15 seconds after power up. It will turn off after 5 seconds. A steady red light will indicate there is a system error on the unit. If this occurs, immediately report the related “system error” shown in the error screen of the GUI interface to support for evaluation.
RX (Orange)	The RX LED will flash when a message is received on the host port.
TX (Yellow)	The TX LED will flash when a message is sent on the host port.
PWR (Green)	This is the power light and should show steady green at all times when ProtoNode is powered.

Table 5 Diagnostic LEDs

6.2 TAKE DIAGNOSTIC CAPTURE WITH THE FIELDSERVER UTILITIES

1. Once the Diagnostic Capture is complete, email it to sales@bryansteam.com. The Diagnostic Capture will accelerate diagnosis of the problem.

2. Ensure that ***FieldServer Toolbox*** is loaded on the PC that is currently being used, or download FieldServer-Toolbox.zip on the Sierra Monitor webpage, under Customer Care: Resource Center, Software Downloads:
http://www.sierramonitor.com/customer-care/resource-center?filters=software-downloads

3. Extract the executable file and complete the installation.

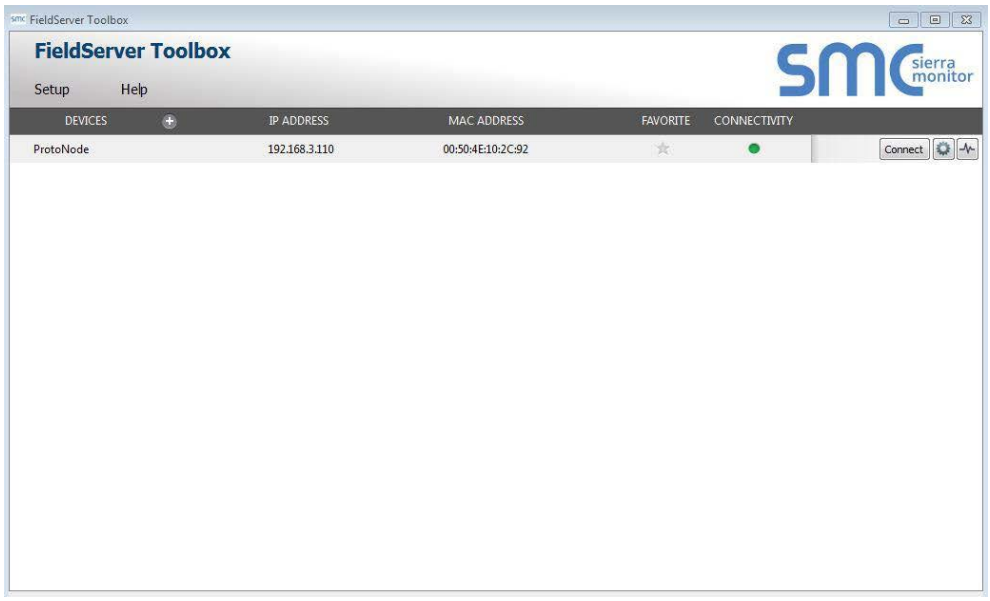
4. Disable any wireless Ethernet adapters on the PC/Laptop.

5. Disable firewall and virus protection software if possible.

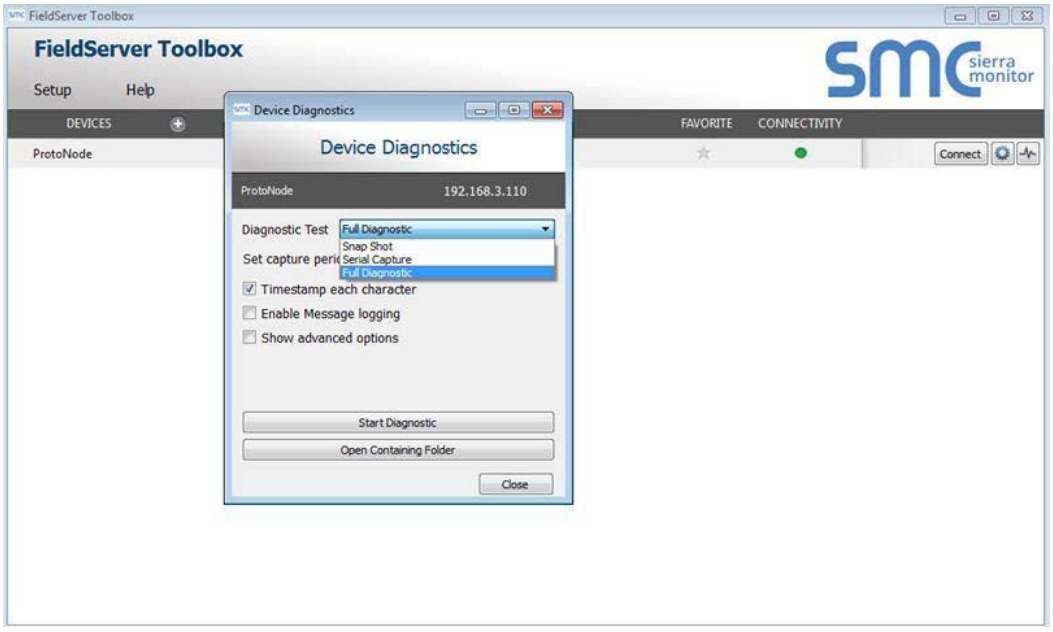
6. Connect a standard CAT5 Ethernet cable between the PC and ProtoNode.

7. Double click on the FS Toolbox Utility.

8. Step 1: Take a Log
    a. Click on the diagnose icon  of the desired device

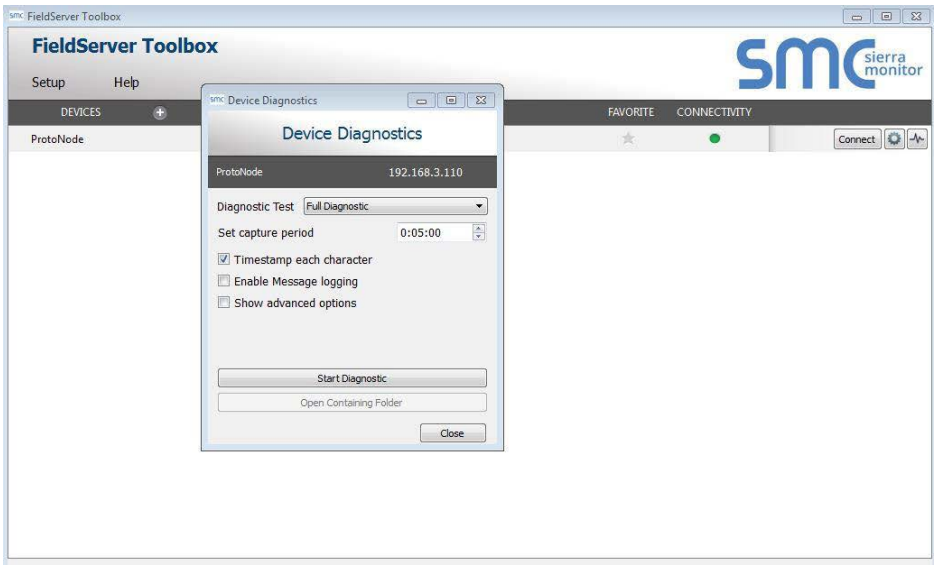


b. Select “Full Diagnostic"



NOTE: If desired, the default capture period can be changed

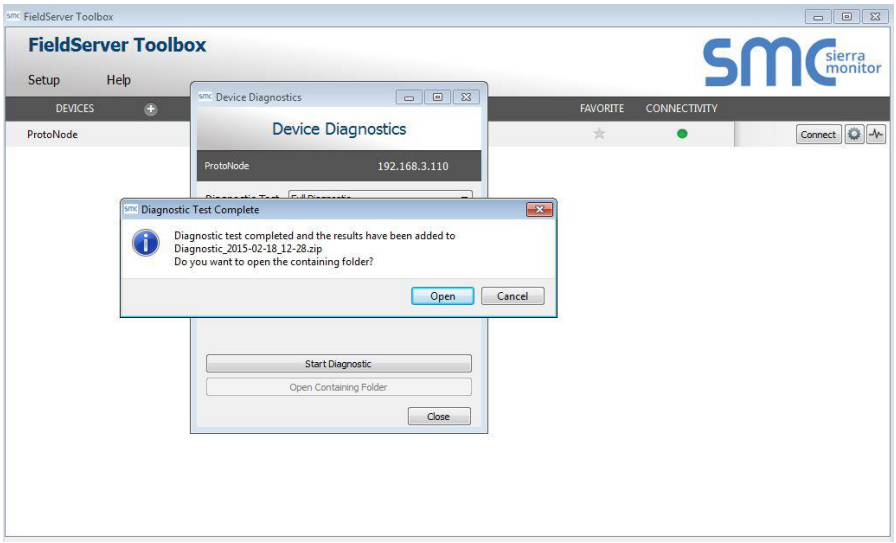
c. Click on “Start Diagnostic”



d. When the capture period is finished, the "Diagnostic Test Complete" window will appear

9. Step 2: Send Log

a. Once the diagnostic test is complete, a .zip file is saved on the PC



b. Choose "Open" to launch explorer and have it point directly at the correct folder

c. Send the Diagnostic zip file to sales@bryansteam.com

7 SPECIFICATIONS

	Electrical Connections	
	BACnet/Metasys N2/Modbus TCP/IP	LonWorks
RJ45	10/100 Ethernet port	10/100 Ethernet port
J1-1	120 Vac line voltage	120 Vac line voltage
J1-2	120 Vac return voltage	120 Vac return voltage
J1-3	PE Ground	PE Ground
RJ45	SOLA Port	SOLA Port
J3-3	Device RS485 Data+	Device RS485 Data+
J3-2	Device RS485 Data-	Device RS485 Data-
J3-1	Device RS485 Ground	Device RS485 Ground
J2-3	BMS RS485 Data+	BMS FTT-10 LonWorks port
J2-2	BMS RS485 Data-	BMS FTT-10 LonWorks port
J2-1	BMS RS485 Ground	NA
Power Requirements	120 Vac @ < 3.5 Watts	
Physical Dimensions	10 in. x 12 in. x 6 in.	
Weight:	13.2 lbs.	
Operating Temperature:	-40°C to 75°C (-40°F to167°F)	
Surge Suppression	EN61000-4-2 ESD EN61000-4-3 EMC EN61000-4-4 EFT	
Humidity:	5 - 90% RH (non-condensing)	
(Specifications subject to change without notice)		

Table 6 - Specifications

8 REFERENCE

8.1 WD857

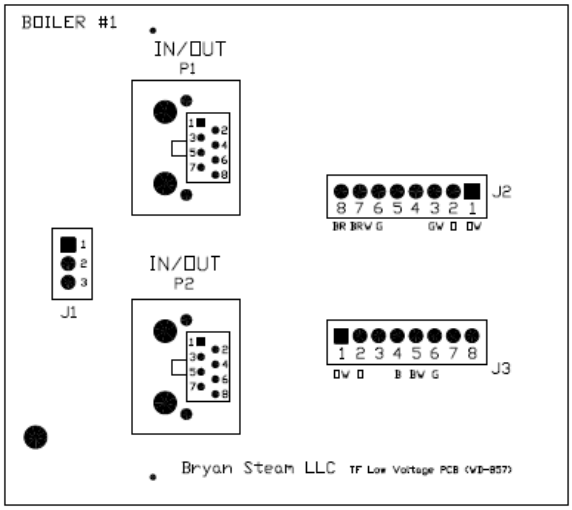


Figure 34 - WD-857 Printed Circuit Board

8.2 DEVICE RTU COM SETTINGS

	Sola*	RWF40	RWF55	LMV3…	LMV5…	RM7800
Protocol	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU
Baud Rate	38400	9600	9600	9600	9600	9600
Parity	None	None	None	None	None	None
Data Bits	8	8	8	8	8	8
Stop Bits	1	1	1	1	1	1

8.3 ADDRESS DIP SWITCH SETTINGS

A7	A6	A5	A4	A3	A2	A1	A0	Address
Off	Off	Off	Off	Off	Off	Off	Off	0
Off	Off	Off	Off	Off	Off	Off	On	1
Off	Off	Off	Off	Off	Off	On	Off	2
Off	Off	Off	Off	Off	Off	On	On	3
Off	Off	Off	Off	Off	On	Off	Off	4
Off	Off	Off	Off	Off	On	Off	On	5
Off	Off	Off	Off	Off	On	On	Off	6
Off	Off	Off	Off	Off	On	On	On	7
Off	Off	Off	Off	On	Off	Off	Off	8
Off	Off	Off	Off	On	Off	Off	On	9
Off	Off	Off	Off	On	Off	On	Off	10
Off	Off	Off	Off	On	Off	On	On	11
Off	Off	Off	Off	On	On	Off	Off	12
Off	Off	Off	Off	On	On	Off	On	13
Off	Off	Off	Off	On	On	On	Off	14
Off	Off	Off	Off	On	On	On	On	15
Off	Off	Off	On	Off	Off	Off	Off	16
Off	Off	Off	On	Off	Off	Off	On	17
Off	Off	Off	On	Off	Off	On	Off	18
Off	Off	Off	On	Off	Off	On	On	19
Off	Off	Off	On	Off	On	Off	Off	20
Off	Off	Off	On	Off	On	Off	On	21
Off	Off	Off	On	Off	On	On	Off	22
Off	Off	Off	On	Off	On	On	On	23
Off	Off	Off	On	On	Off	Off	Off	24
Off	Off	Off	On	On	Off	Off	On	25
Off	Off	Off	On	On	Off	On	Off	26
Off	Off	Off	On	On	Off	On	On	27
Off	Off	Off	On	On	On	Off	Off	28
Off	Off	Off	On	On	On	Off	On	29
Off	Off	Off	On	On	On	On	Off	30
Off	Off	Off	On	On	On	On	On	31
Off	Off	On	Off	Off	Off	Off	Off	32
Off	Off	On	Off	Off	Off	Off	On	33
Off	Off	On	Off	Off	Off	On	Off	34
Off	Off	On	Off	Off	Off	On	On	35

A7	A6	A5	A4	A3	A2	A1	A0	Address
Off	Off	On	Off	Off	On	Off	Off	36
Off	Off	On	Off	Off	On	Off	On	37
Off	Off	On	Off	Off	On	On	Off	38
Off	Off	On	Off	Off	On	On	On	39
Off	Off	On	Off	On	Off	Off	Off	40
Off	Off	On	Off	On	Off	Off	On	41
Off	Off	On	Off	On	Off	On	Off	42
Off	Off	On	Off	On	Off	On	On	43
Off	Off	On	Off	On	On	Off	Off	44
Off	Off	On	Off	On	On	Off	On	45
Off	Off	On	Off	On	On	On	Off	46
Off	Off	On	Off	On	On	On	On	47
Off	Off	On	On	Off	Off	Off	Off	48
Off	Off	On	On	Off	Off	Off	On	49
Off	Off	On	On	Off	Off	On	Off	50
Off	Off	On	On	Off	Off	On	On	51
Off	Off	On	On	Off	On	Off	Off	52
Off	Off	On	On	Off	On	Off	On	53
Off	Off	On	On	Off	On	On	Off	54
Off	Off	On	On	Off	On	On	On	55
Off	Off	On	On	On	Off	Off	Off	56
Off	Off	On	On	On	Off	Off	On	57
Off	Off	On	On	On	Off	On	Off	58
Off	Off	On	On	On	Off	On	On	59
Off	Off	On	On	On	On	Off	Off	60
Off	Off	On	On	On	On	Off	On	61
Off	Off	On	On	On	On	On	Off	62
Off	Off	On	On	On	On	On	On	63
Off	On	Off	Off	Off	Off	Off	Off	64
Off	On	Off	Off	Off	Off	Off	On	65
Off	On	Off	Off	Off	Off	On	Off	66
Off	On	Off	Off	Off	Off	On	On	67
Off	On	Off	Off	Off	On	Off	Off	68
Off	On	Off	Off	Off	On	Off	On	69
Off	On	Off	Off	Off	On	On	Off	70
Off	On	Off	Off	Off	On	On	On	71
Off	On	Off	Off	On	Off	Off	Off	72
Off	On	Off	Off	On	Off	Off	On	73

A7	A6	A5	A4	A3	A2	A1	A0	Address
Off	On	Off	Off	On	Off	On	Off	74
Off	On	Off	Off	On	Off	On	On	75
Off	On	Off	Off	On	On	Off	Off	76
Off	On	Off	Off	On	On	Off	On	77
Off	On	Off	Off	On	On	On	Off	78
Off	On	Off	Off	On	On	On	On	79
Off	On	Off	On	Off	Off	Off	Off	80
Off	On	Off	On	Off	Off	Off	On	81
Off	On	Off	On	Off	Off	On	Off	82
Off	On	Off	On	Off	Off	On	On	83
Off	On	Off	On	Off	On	Off	Off	84
Off	On	Off	On	Off	On	Off	On	85
Off	On	Off	On	Off	On	On	Off	86
Off	On	Off	On	Off	On	On	On	87
Off	On	Off	On	On	Off	Off	Off	88
Off	On	Off	On	On	Off	Off	On	89
Off	On	Off	On	On	Off	On	Off	90
Off	On	Off	On	On	Off	On	On	91
Off	On	Off	On	On	On	Off	Off	92
Off	On	Off	On	On	On	Off	On	93
Off	On	Off	On	On	On	On	Off	94
Off	On	Off	On	On	On	On	On	95
Off	On	On	Off	Off	Off	Off	Off	96
Off	On	On	Off	Off	Off	Off	On	97
Off	On	On	Off	Off	Off	On	Off	98
Off	On	On	Off	Off	Off	On	On	99
Off	On	On	Off	Off	On	Off	Off	100
Off	On	On	Off	Off	On	Off	On	101
Off	On	On	Off	Off	On	On	Off	102
Off	On	On	Off	Off	On	On	On	103
Off	On	On	Off	On	Off	Off	Off	104
Off	On	On	Off	On	Off	Off	On	105
Off	On	On	Off	On	Off	On	Off	106
Off	On	On	Off	On	Off	On	On	107
Off	On	On	Off	On	On	Off	Off	108
Off	On	On	Off	On	On	Off	On	109
Off	On	On	Off	On	On	On	Off	110
Off	On	On	Off	On	On	On	On	111

A7	A6	A5	A4	A3	A2	A1	A0	Address
Off	On	On	On	Off	Off	Off	Off	112
Off	On	On	On	Off	Off	Off	On	113
Off	On	On	On	Off	Off	On	Off	114
Off	On	On	On	Off	Off	On	On	115
Off	On	On	On	Off	On	Off	Off	116
Off	On	On	On	Off	On	Off	On	117
Off	On	On	On	Off	On	On	Off	118
Off	On	On	On	Off	On	On	On	119
Off	On	On	On	On	Off	Off	Off	120
Off	On	On	On	On	Off	Off	On	121
Off	On	On	On	On	Off	On	Off	122
Off	On	On	On	On	Off	On	On	123
Off	On	On	On	On	On	Off	Off	124
Off	On	On	On	On	On	Off	On	125
Off	On	On	On	On	On	On	Off	126
Off	On	On	On	On	On	On	On	127
On	Off	Off	Off	Off	Off	Off	Off	128
On	Off	Off	Off	Off	Off	Off	On	129
On	Off	Off	Off	Off	Off	On	Off	130
On	Off	Off	Off	Off	Off	On	On	131
On	Off	Off	Off	Off	On	Off	Off	132
On	Off	Off	Off	Off	On	Off	On	133
On	Off	Off	Off	Off	On	On	Off	134
On	Off	Off	Off	Off	On	On	On	135
On	Off	Off	Off	On	Off	Off	Off	136
On	Off	Off	Off	On	Off	Off	On	137
On	Off	Off	Off	On	Off	On	Off	138
On	Off	Off	Off	On	Off	On	On	139
On	Off	Off	Off	On	On	Off	Off	140
On	Off	Off	Off	On	On	Off	On	141
On	Off	Off	Off	On	On	On	Off	142
On	Off	Off	Off	On	On	On	On	143
On	Off	Off	On	Off	Off	Off	Off	144
On	Off	Off	On	Off	Off	Off	On	145
On	Off	Off	On	Off	Off	On	Off	146
On	Off	Off	On	Off	Off	On	On	147
On	Off	Off	On	Off	On	Off	Off	148
On	Off	Off	On	Off	On	Off	On	149

A7	A6	A5	A4	A3	A2	A1	A0	Address
On	Off	Off	On	Off	On	On	Off	150
On	Off	Off	On	Off	On	On	On	151
On	Off	Off	On	On	Off	Off	Off	152
On	Off	Off	On	On	Off	Off	On	153
On	Off	Off	On	On	Off	On	Off	154
On	Off	Off	On	On	Off	On	On	155
On	Off	Off	On	On	On	Off	Off	156
On	Off	Off	On	On	On	Off	On	157
On	Off	Off	On	On	On	On	Off	158
On	Off	Off	On	On	On	On	On	159
On	Off	On	Off	Off	Off	Off	Off	160
On	Off	On	Off	Off	Off	Off	On	161
On	Off	On	Off	Off	Off	On	Off	162
On	Off	On	Off	Off	Off	On	On	163
On	Off	On	Off	Off	On	Off	Off	164
On	Off	On	Off	Off	On	Off	On	165
On	Off	On	Off	Off	On	On	Off	166
On	Off	On	Off	Off	On	On	On	167
On	Off	On	Off	On	Off	Off	Off	168
On	Off	On	Off	On	Off	Off	On	169
On	Off	On	Off	On	Off	On	Off	170
On	Off	On	Off	On	Off	On	On	171
On	Off	On	Off	On	On	Off	Off	172
On	Off	On	Off	On	On	Off	On	173
On	Off	On	Off	On	On	On	Off	174
On	Off	On	Off	On	On	On	On	175
On	Off	On	On	Off	Off	Off	Off	176
On	Off	On	On	Off	Off	Off	On	177
On	Off	On	On	Off	Off	On	Off	178
On	Off	On	On	Off	Off	On	On	179
On	Off	On	On	Off	On	Off	Off	180
On	Off	On	On	Off	On	Off	On	181
On	Off	On	On	Off	On	On	Off	182
On	Off	On	On	Off	On	On	On	183
On	Off	On	On	On	Off	Off	Off	184
On	Off	On	On	On	Off	Off	On	185
On	Off	On	On	On	Off	On	Off	186
On	Off	On	On	On	Off	On	On	187

A7	A6	A5	A4	A3	A2	A1	A0	Address
On	Off	On	On	On	On	Off	Off	188
On	Off	On	On	On	On	Off	On	189
On	Off	On	On	On	On	On	Off	190
On	Off	On	On	On	On	On	On	191
On	On	Off	Off	Off	Off	Off	Off	192
On	On	Off	Off	Off	Off	Off	On	193
On	On	Off	Off	Off	Off	On	Off	194
On	On	Off	Off	Off	Off	On	On	195
On	On	Off	Off	Off	On	Off	Off	196
On	On	Off	Off	Off	On	Off	On	197
On	On	Off	Off	Off	On	On	Off	198
On	On	Off	Off	Off	On	On	On	199
On	On	Off	Off	On	Off	Off	Off	200
On	On	Off	Off	On	Off	Off	On	201
On	On	Off	Off	On	Off	On	Off	202
On	On	Off	Off	On	Off	On	On	203
On	On	Off	Off	On	On	Off	Off	204
On	On	Off	Off	On	On	Off	On	205
On	On	Off	Off	On	On	On	Off	206
On	On	Off	Off	On	On	On	On	207
On	On	Off	On	Off	Off	Off	Off	208
On	On	Off	On	Off	Off	Off	On	209
On	On	Off	On	Off	Off	On	Off	210
On	On	Off	On	Off	Off	On	On	211
On	On	Off	On	Off	On	Off	Off	212
On	On	Off	On	Off	On	Off	On	213
On	On	Off	On	Off	On	On	Off	214
On	On	Off	On	Off	On	On	On	215
On	On	Off	On	On	Off	Off	Off	216
On	On	Off	On	On	Off	Off	On	217
On	On	Off	On	On	Off	On	Off	218
On	On	Off	On	On	Off	On	On	219
On	On	Off	On	On	On	Off	Off	220
On	On	Off	On	On	On	Off	On	221
On	On	Off	On	On	On	On	Off	222
On	On	Off	On	On	On	On	On	223
On	On	On	Off	Off	Off	Off	Off	224
On	On	On	Off	Off	Off	Off	On	225

A7	A6	A5	A4	A3	A2	A1	A0	Address
On	On	On	Off	Off	Off	On	Off	226
On	On	On	Off	Off	Off	On	On	227
On	On	On	Off	Off	On	Off	Off	228
On	On	On	Off	Off	On	Off	On	229
On	On	On	Off	Off	On	On	Off	230
On	On	On	Off	Off	On	On	On	231
On	On	On	Off	On	Off	Off	Off	232
On	On	On	Off	On	Off	Off	On	233
On	On	On	Off	On	Off	On	Off	234
On	On	On	Off	On	Off	On	On	235
On	On	On	Off	On	On	Off	Off	236
On	On	On	Off	On	On	Off	On	237
On	On	On	Off	On	On	On	Off	238
On	On	On	Off	On	On	On	On	239
On	On	On	On	Off	Off	Off	Off	240
On	On	On	On	Off	Off	Off	On	241
On	On	On	On	Off	Off	On	Off	242
On	On	On	On	Off	Off	On	On	243
On	On	On	On	Off	On	Off	Off	244
On	On	On	On	Off	On	Off	On	245
On	On	On	On	Off	On	On	Off	246
On	On	On	On	Off	On	On	On	247
On	On	On	On	On	Off	Off	Off	248
On	On	On	On	On	Off	Off	On	249
On	On	On	On	On	Off	On	Off	250
On	On	On	On	On	Off	On	On	251
On	On	On	On	On	On	Off	Off	252
On	On	On	On	On	On	Off	On	253
On	On	On	On	On	On	On	Off	254
On	On	On	On	On	On	On	On	255

8.4 DEVICE LOG

Modbus Side		
Boiler	Device	Node ID

Record the boiler number, device name and the node id that you have assigned to each device. Copy the record and provide it to your building management station for reference.

Example:

Modbus Side		
Boiler	Device	Node ID
1	RM7800	1
1	RWF55	2
2	RM7800	3
2	RWF55	4
3	RM7800	5
3	RWF55	6

9 INDEX