User's Manual

MOD9200BNT BACnet Transceiver
Configuration Software
Setup & Configuration

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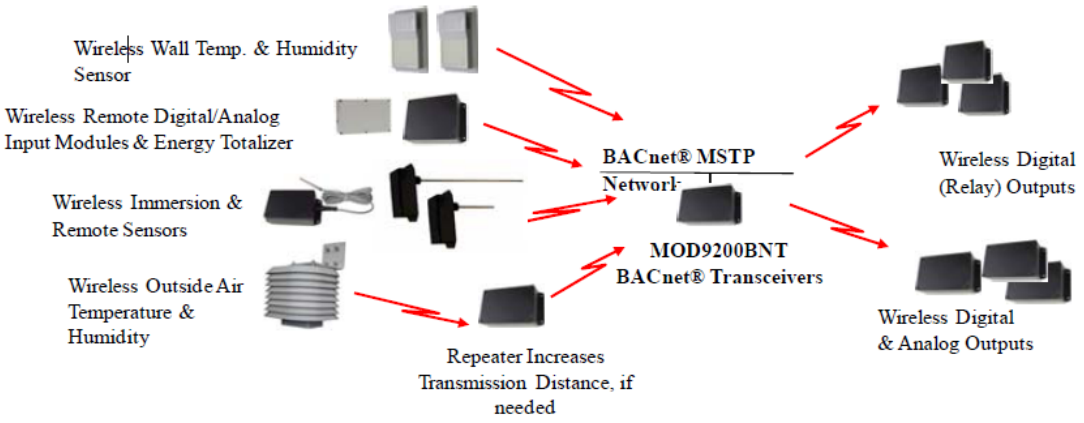
I. Introduction

MOD9000BNT
BACnet Receiver

The ACI MOD9000BNT BACnet network receiver utilizes reliable Spread Spectrum Radio technology. When used with other ACI wireless sensors the system can transmit remote sensor readings and status/alarm indications to a centralized networked monitoring station or controller without the need for extensive wiring. The MOD9000BNT is compatible with any control panels or automation systems that utilize the BACnet MSTP communication protocol.

a. ACI MOD9200 Transceiver System

MOD9200BNT BACnet MSTP Network Transceiver
Receives input from up to 50 remote wireless sensor modules and/or wireless output modules (RD2402 & RD2432) per Transceiver
ACI signal repeater/router RR2552 can be used to extend the wireless sensor transmission distance if needed
MSTP (RS485) network connection
MOD9200 Configuration Software



Sub-System Overview

II. BACnet Transceiver Installation & Network Setup

a. Transceiver Installation

Choose a location close to the computer, network hub or RS485 loop.

Mount the Transceiver on the wall using four #8 screws.

24 VAC Input (500 mA nominal) - Connect 24VAC 60 Hz (no secondary ground) to the input terminals using 20 AWG wire as shown in the product data sheet.

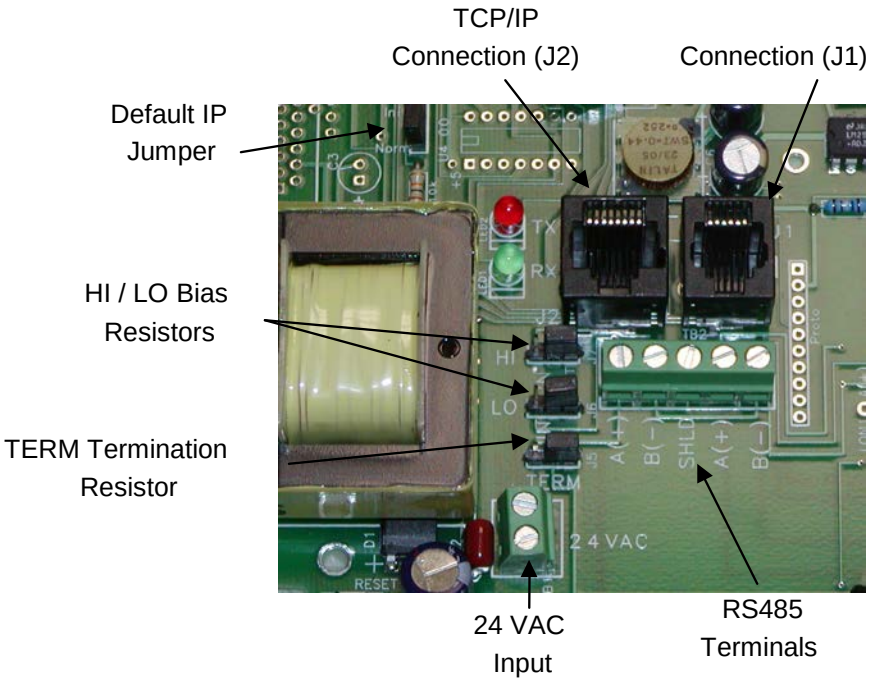


Figure 1

MSTP (RS485) - Use 20 gauge shielded twisted pair wire to connect the Transceiver (Terminals A+ & B-) to the network (See Figure 1).

Multiple RS485 Devices - If more than one RS485 device is used the devices should be "daisy chained" or "straight-line connected" by connecting all the "A" wires to the "A" terminals and the "B" wires to the "B" terminals. Do not use spur lines or a star configuration

RS485 Terminating Resistor - If the MOD9200 is at the end of a RS485 loop a terminating resistor should be installed to match the electrical impedance characteristic of the twisted pair loop and prevent signal echoes from corrupting the data.

b. Network Setup for Transceiver Configuration

A network connection using a RJ45 Crossover cable is required during the initial setup of the Transceiver for transporting the Transceiver Configuration File via FTP.

Connect the MOD9200 Transceiver (J2) to a 10/100Base-T Ethernet network or use a crossover cable to connect directly to the PC.

Apply 24 VAC 60 Hz power to the MOD9200 Transceiver.

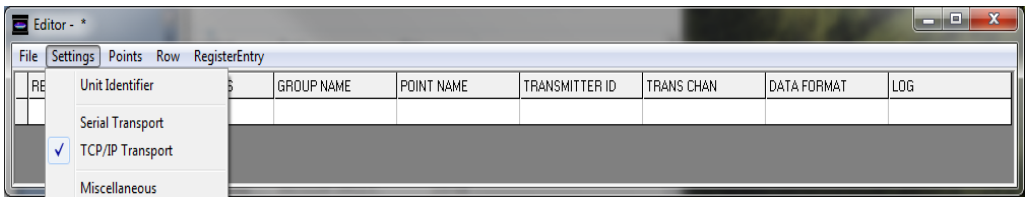
c. Setting A New IP Address

The MOD9200 is shipped from the factory with an IP address of 192.168.0.1 and a subnet mask of 255.255.255.0 .

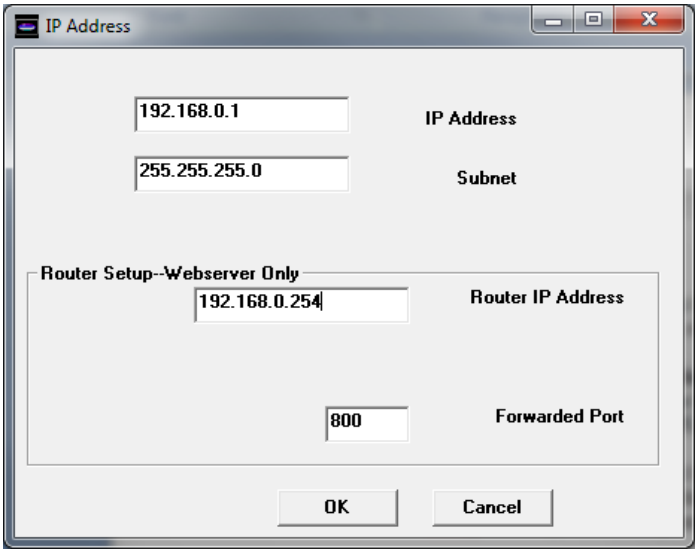
Note: To initially connect to the Transceiver, the networked PC must have a static IP address in the form of 192.168.0.X, where X is > 2 with a subnet mask of 255.255.255.0.

The IP Address can be changed by changing the IP Address in the Transceiver Config File. Open either an existing config file or a new config file using the ACI Programmer Software.

Click on Settings > TCP/IP Transport



Enter the new IP Address and Subnet Mask and click OK. The new IP Address will take affect when the Config File is downloaded to the Transceiver.



Our recommendation is not to change the default factory IP address of the transceiver since the Ethernet connection is used to configure the transceiver only and will not be required when the MSTP network is up and running.

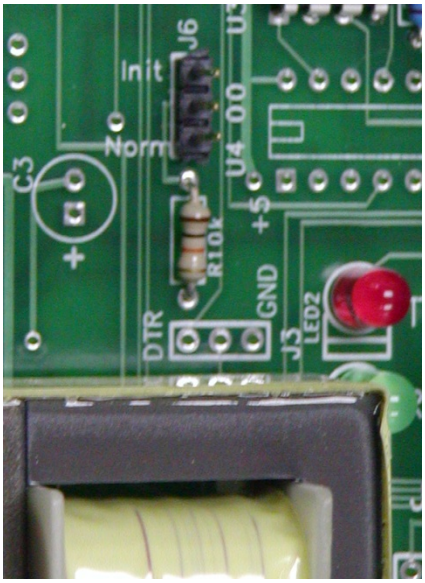
Router Setup – Webserver Only – **NOT USE**. Applicable for RM9500 WebLogger Setup ONLY

d. Manually Resetting The Factory Default IP Address

The Transceiver can manually be reset to the default IP Address by moving the jumper (J6) from “Norm” to “Init”.

Turn off the power to the Transceiver, and move the jumper from “Norm” to “Init”. Turn on power, and the Transceiver can be communicated with using the Factory Default IP Address 192.168.0.1 Subnet Mask 255.255.255.0. The Config File is no longer active while the jumper is in the “Init” position . A new Config File can be downloaded to the Transceiver if desired.

To reactivate the Config File - turn off the power to the Transceiver and move the jumper back to “Norm”. Turn the power back on and the Config File will become active. The Transceiver will have the IP Address that was set in the Config File.



III. Configuration Software

a. Configuration Software Description

The data registers of the Transceiver need to be configured prior to use.

The configuration program "Trs Programmer.exe" can be downloaded from our website 'www.workaci.com'. The download instructions are included in the shipping document of the MOD9200 Transceiver. The software will be used to configure the 3 different type of data registers as follows:

- Assign the Input Register function – Analog or Discrete
- Assign wireless Digital Output (Coil) Register function
- Assign wireless Analog Output (Holding) Register function
- Assign the register address
- Assign the Wireless Sensor ID and transmission channel
- Assign the data type

The MOD9200 Transceiver can have up to 100 (addresses 0 to 99) data registers configured to be either Analog or Discrete, 50 digital outputs and 50 analog outputs.

b. System Requirements

PC (Notebook or desktop) with Windows 98, XP, Vista or Windows 7

Ethernet connection

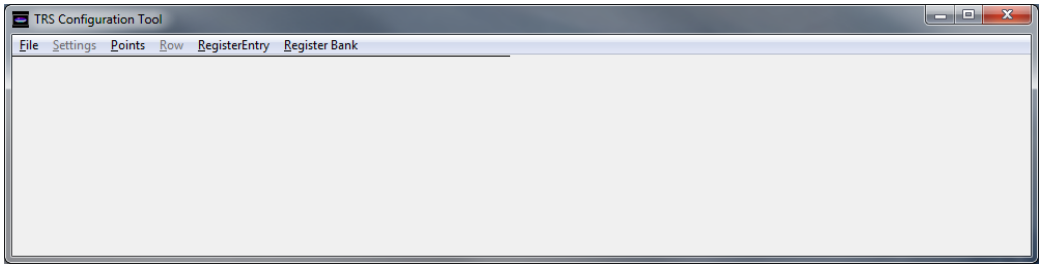
10GB of hard drive memory available

c. Configuration Software Installation

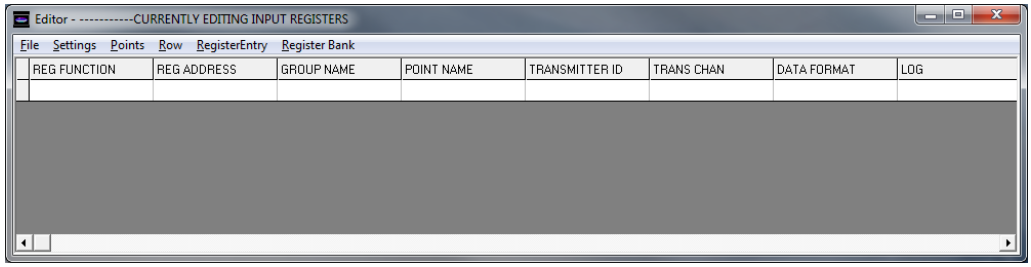
Extract (or unzip) the ACI Programmer zip file and click start the 'setup.exe' program to install the program. Follow the on screen instructions to complete the installation.

d. Creating A MOD9200 Configuration File

To create a new MOD9200 configuration file open the ACI Programmer by clicking on Start > Programs > Trs Programmer 6.XX.



To open a new configuration table Click on File > New Gateway File. A blank configuration table will open.



The default startup is the Input Register configuration table and System Setup page.

By clicking the “RegisterBank” tab, you can go to the Digital Output (Coil) register configuration table or Analog Output(Holding) Register configuration table.

e. Input Register Configuration

Each row of the configuration table is a unique data register having eight special attributes.

REG FUNCTION -- Identifies the function of the register – Analog or Digital (Discrete) Note: If selecting the Digital (Discrete) function be sure to set the appropriate Digital Capture Time (Page 15)

REG ADDRESS -- Assigns the address of the data register (0 to 99).

GROUP NAME -- Assigns a group name to the data register (not used by BACnet). Multiple data registers can have the same group name. This is useful for monitoring and data logging programs.

POINT NAME -- Assigns a unique name to the data register to help identify the location of the sensor/transmitter (Not used by BACnet). Multiple point names can have the same group name.

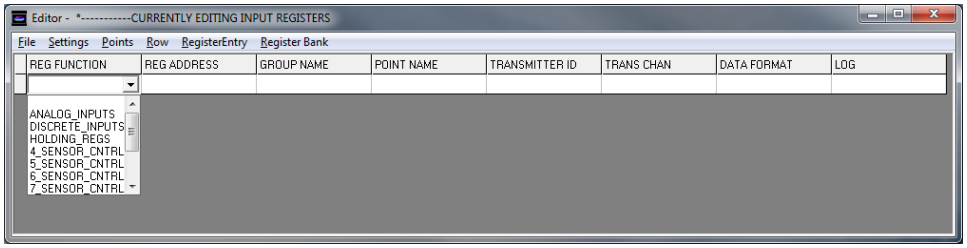
TRANSMITTER ID -- Assigns a wireless sensor/transmitter address to the data register. Each wireless sensor is factory configured with a unique hexadecimal address.

TRANS CHAN -- Assigns a wireless sensor/transmitter data channel to the data register. A wireless sensor/transmitter may have up to four (4) analog channels and (4) digital status/alarm channels.

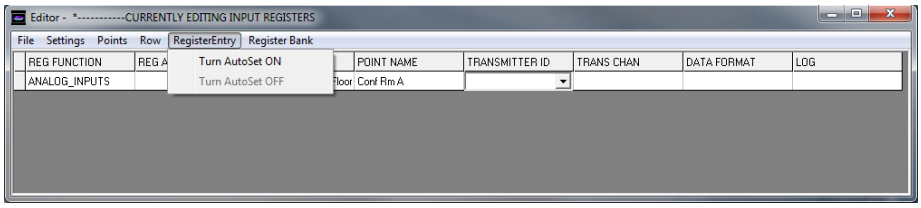
DATA FORMAT -- Assigns the data type to the register – temperature (RTD or Thermistor 20K), analog voltage, totalizer or humidity. This register is left blank if the REG FUNCTION is Digital (Discrete).

LOG -- Not used for MOD9200LON

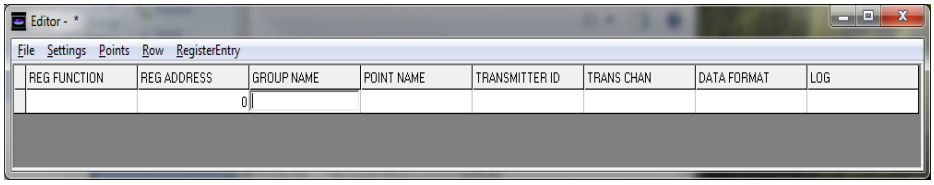
First we will assign the REG FUNCTION by clicking in the REG FUNCTION cell to open a drop down menu. Select the appropriate function.



Use the mouse to move to the next column to assign the REG ADDRESS by clicking in the cell. Before entering register addresses, ensure the "RegisterEntry" AutoSet is turned off as shown:

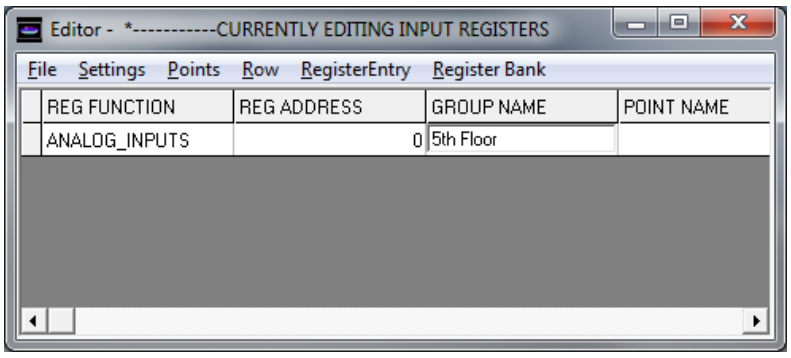


Enter the Register address in the REG ADDRESS window and press down arrow to enter.



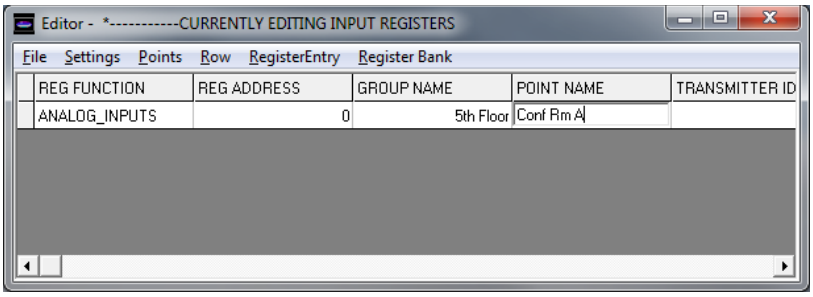
Again use the mouse to move to the next column. Enter a GROUP NAME for the data set by typing the group name in the cell. Enter the name in the cell by using the mouse to click on the next column.

Note: DO NOT use commas or semicolons in the Group Name.

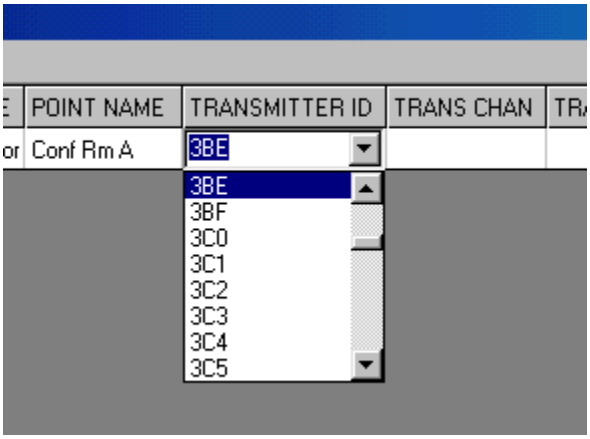


Enter a POINT NAME for the data point by typing the name in the cell. Enter the name in the cell by using the mouse to click on the next column.

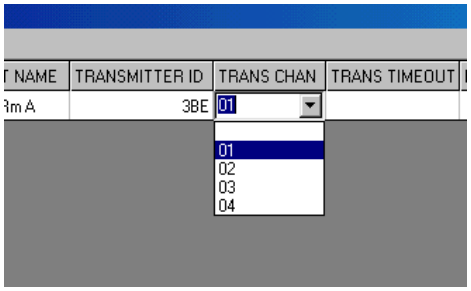
Note: DO NOT use commas or semicolons in the Point Name.



Assign a sensor/transmitter to the data register by clicking in the TRANSMITTER ID cell to open a drop down menu. Use the scroll bar to scroll to the correct address or automatically scroll to the address by typing the hexadecimal address in the cell. To select the address click on the appropriate ID in the drop down menu. Each ACI wireless transmitter is factory configured with a unique ID – refer to the sensor product data sheet for the location of the transmitter ID.



Assign the appropriate sensor transmission channel to the data register by clicking in the cell to open a drop down menu. Click on the appropriate transmission channel (01 to 04) to select.

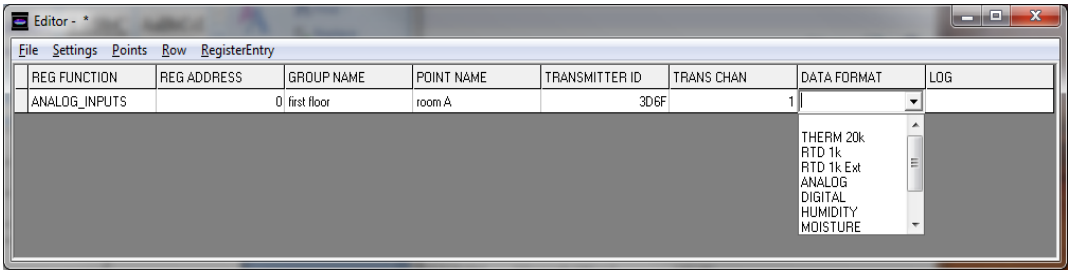


The active transmission channels are factory configured as follows:

Device	Analog CH-01	Analog CH-02	Digital CH-01
WT2630A	Space Temp (Therm 20K)		
WT2630B	Space Temp (Therm 20K)	SetPoint (Analog)	Override (Discrete) See page 15 to set the Digital Capture Time
WT2630C	Space Temp (Therm 20K)		Override (Discrete) See page 15 to set the Digital Capture Time
WH2630A	Humidity		
WH2630B	Space Temp (Therm 20K)	Humidity	
OA2630A	Outdoor Temp (Therm 20K)	Outdoor Humidity	
OST2630A	Outdoor Temp (Therm 20K)		
DT2630A	Duct Temperature (Therm 20K)		
DT2650A	Ave Temperature (Therm 20K)		
DH2630A	Duct Humidity		
DH2630B	Duct Temperature (Therm 20K)	Duct Humidity	
FT2630A	Fluid Temperature (Therm 20K)		
RT2630A,B,C	See Device Label for Analog (4) and Digital (4) Configuration		
RT2620A	See Device Label for Digital (4) Configuration		
RT2602B	Digital (2) Inputs		
SST2630A	Temperature (Therm 20K)		
SST5630AE	Temperature (RTD 1K)		

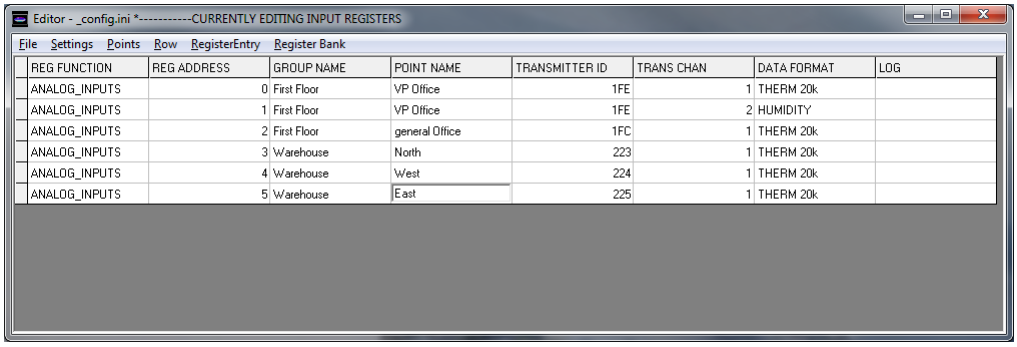
Note: For RT2630B (0-10V, 0-5V & 4 Dig. Inputs), The “Data Format” shall be “ANALOG” for the analog inputs. The values will be displayed as 0 to 409.5 with the transmitter input from 0 to 10VDC (or 0 to 5VDC)

Select the appropriate DATA FORMAT value by clicking in the cell to open a drop down menu.



To create a new data register row click on Row > Append. Continue to do this for each row/data register that needs to be configured.

The completed configuration example for an office building is as follows:

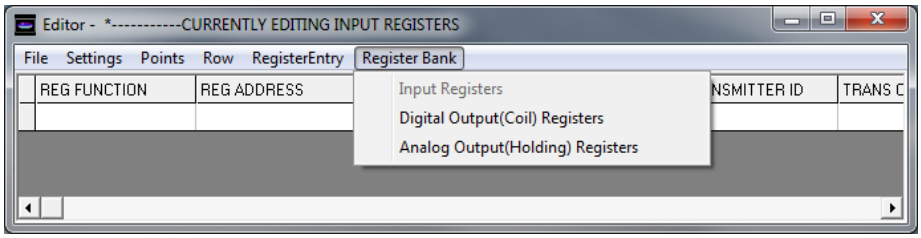


REG FUNCTION	REG ADDRESS	GROUP NAME	POINT NAME	TRANSMITTER ID	TRANS CHAN	DATA FORMAT	LOG
ANALOG_INPUTS	0	First Floor	VP Office	1FE	1	THERM 20k	
ANALOG_INPUTS	1	First Floor	VP Office	1FE	2	HUMIDITY	
ANALOG_INPUTS	2	First Floor	general Office	1FC	1	THERM 20k	
ANALOG_INPUTS	3	Warehouse	North	223	1	THERM 20k	
ANALOG_INPUTS	4	Warehouse	West	224	1	THERM 20k	
ANALOG_INPUTS	5	Warehouse	East	225	1	THERM 20k	

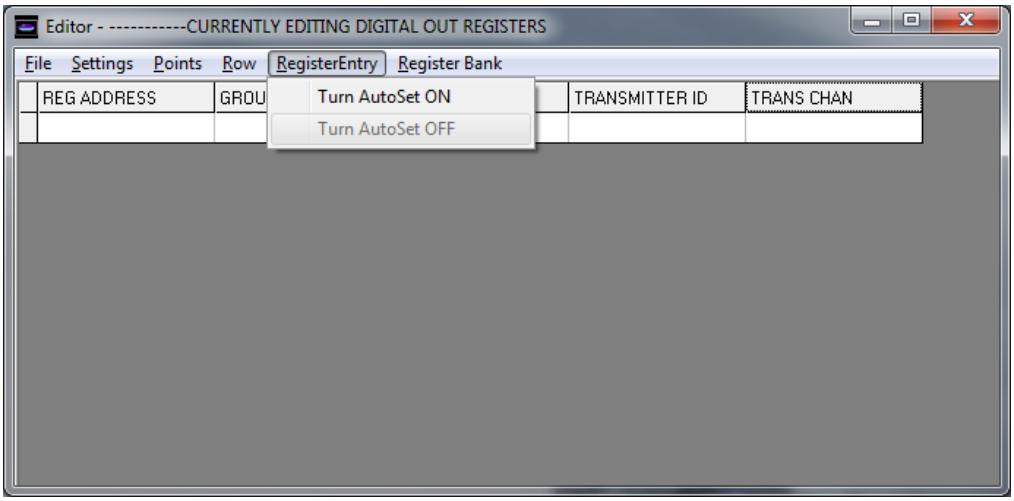
The columns may be resized by placing the cursor over one side of the column. When the cursor changes to two arrows hold down the left mouse button and drag the side of the column to resize it.

f. Digital Output (Coil) Register Configuration

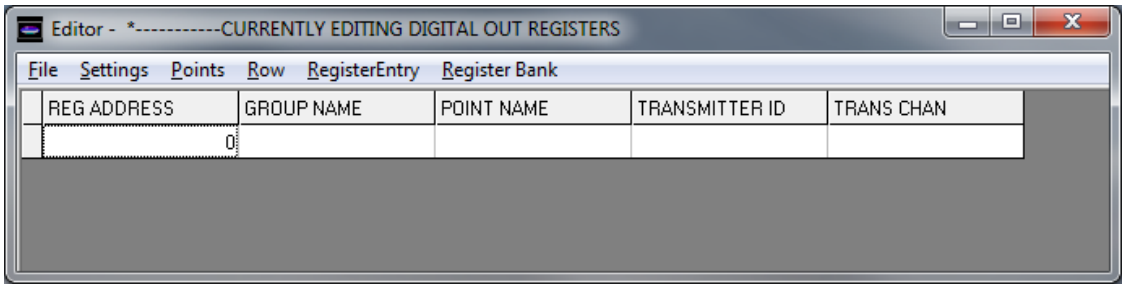
Select the Digital Output (Coil) Register table by clicking the “RegisterBank” tab.



First we will assign the REG ADDRESS by clicking in the cell. Before entering register addresses, ensure the "RegisterEntry" AutoSet is turned off as shown:

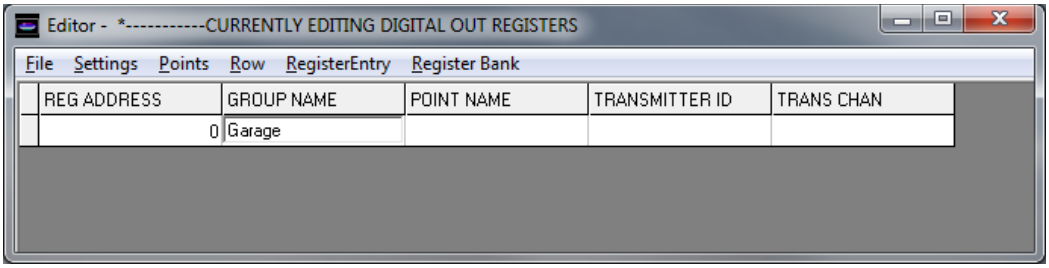


Enter the Register address in the REG ADDRESS window. The valid range is 0 to 49.



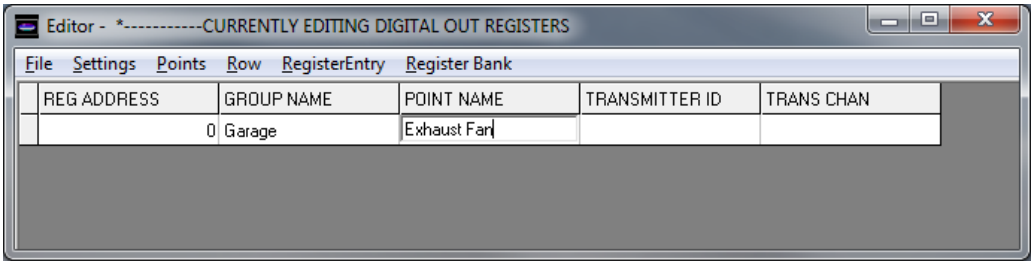
Again use the mouse to move to the next column. Enter a GROUP NAME, if desired, for the data set by typing the group name in the cell. Enter the name in the cell by using the mouse to click on the next column.

Note: DO NOT use commas or semicolons in the Group Name.

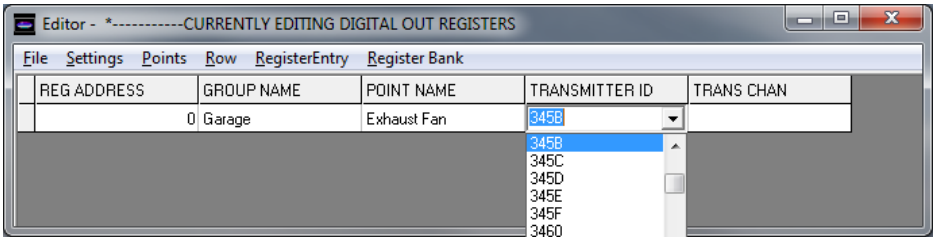


Enter a POINT NAME, if desired, for the data point by typing the name in the Cell. Enter the name in the cell by using the mouse to click on the next column.

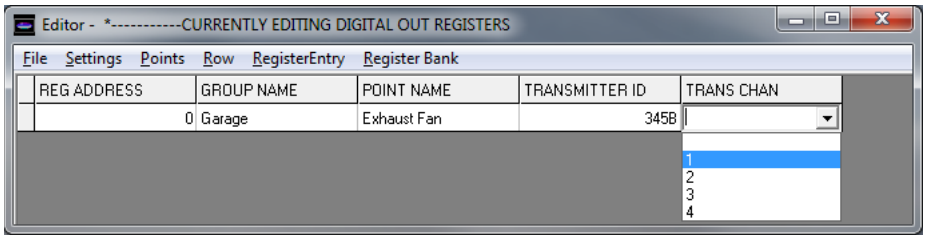
Note: DO NOT use commas or semicolons in the Point Name



Assign a sensor/transmitter to the data register by clicking in the TRANSMITTER ID cell to open a drop down menu. This is the device ID of the remote output devices (RD2402 & RD2432). Use the scroll bar to scroll to the correct address, or automatically scroll to the address by typing the hexadecimal address in the cell. To select the address click on the appropriate ID in the drop down menu.



Assign the appropriate digital or relay output “TRANS CHAN” to the data register by clicking in the cell to open a drop down menu. Click on the appropriate transmission channel (01 to 04) to select.

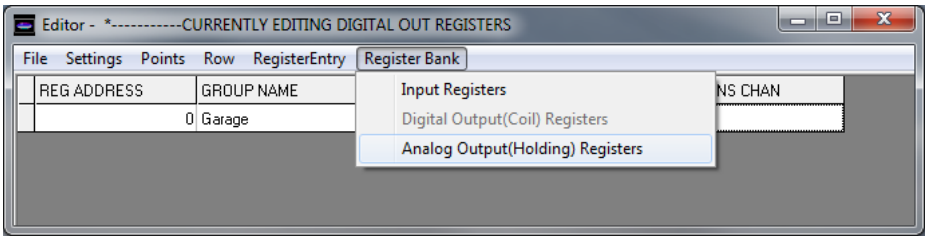


The active transmission channels or output number are factory set as follows:

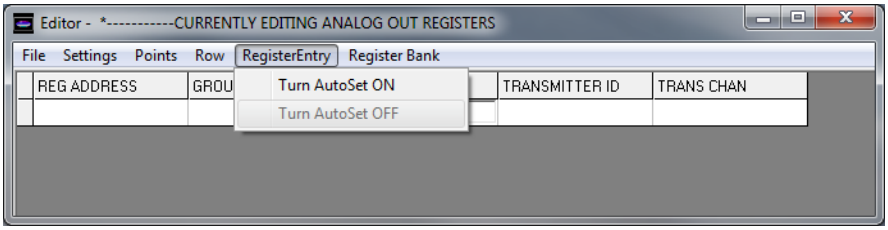
Device	Digital	Analog	
RD2402	1 to 2 for relay #1 and relay #2	NA	Wireless relay output module
RD2432	1 to 4 for relay #1 to relay #4	1 to 4 for analog output 1 to 4	Wireless digital & analog output module

g. Analog Output (Holding) Register Configuration

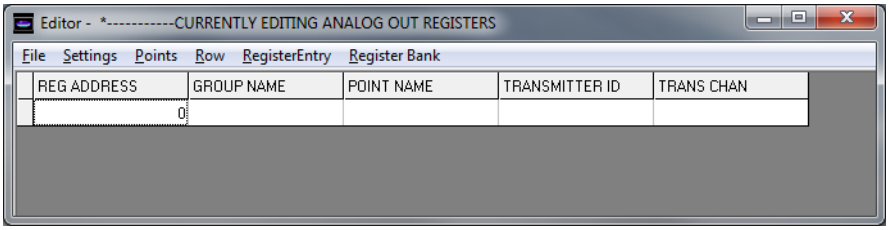
Select the Analog Output (Holding) Register table by clicking the "RegisterBank" tab.



First we will assign the REG ADDRESS by clicking in the cell. Before entering register addresses, ensure the "RegisterEntry" AutoSet is turned off as shown:

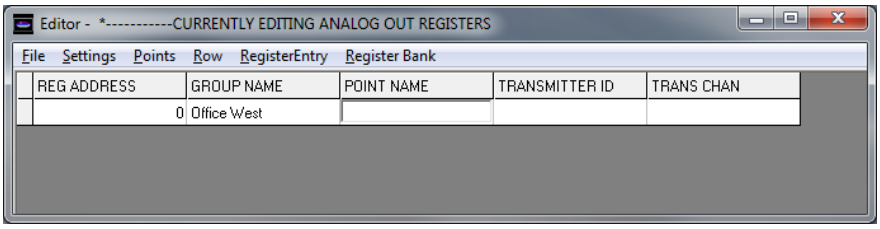


Enter the Register address in the REG ADDRESS window. The valid range is 0 to 49.



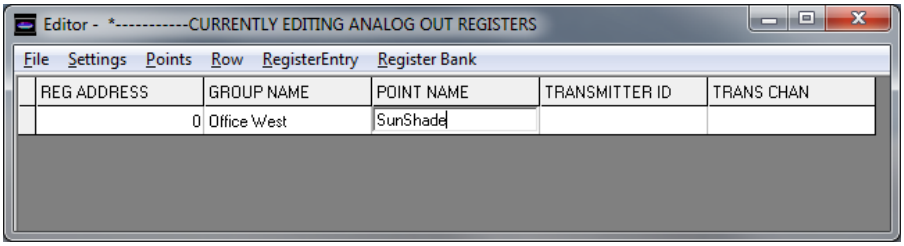
Again use the mouse to move to the next column. Enter a GROUP NAME, if desired, for the data set by typing the group name in the cell.
Enter the name in the cell by using the mouse to click on the next column.

Note: DO NOT use commas or semicolons in the Group Name.

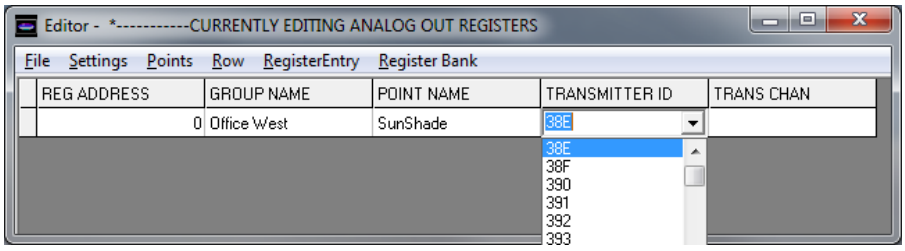


Enter a POINT NAME, if desired, for the data point by typing the name in the cell. Enter the name in the cell by using the mouse to click on the next column.

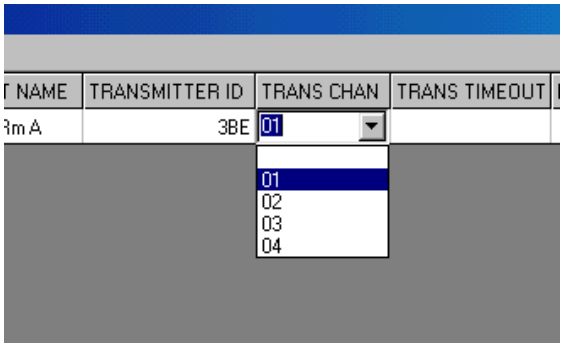
Note: DO NOT use commas or semicolons in the Point Name



Assign a sensor/transmitter to the data register by clicking in the TRANSMITTER ID cell to open a drop down menu. This is the device ID of the remote output devices (RD2432). Use the scroll bar to scroll to the correct address or automatically scroll to the address by typing the hexadecimal address in the cell. To select the address click on the appropriate ID in the drop down menu.



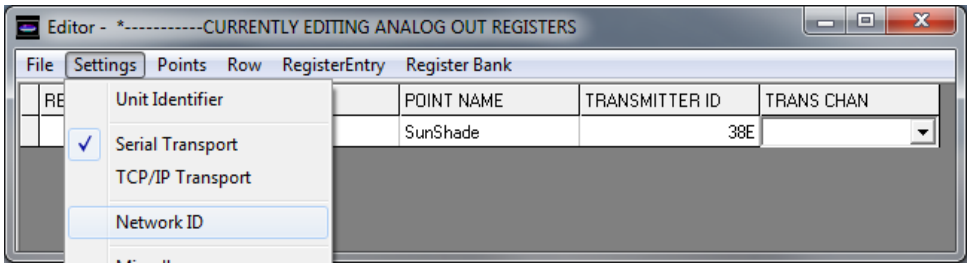
Assign the appropriate digital or relay output “TRANS CHAN” to the data register by clicking in the cell to open a drop down menu. Click on the appropriate transmission channel (01 to 04) to select.



The active transmission channels or output number are factory set as follows:

Device	Digital	Analog	
RD2402	1 to 2 for relay #1 and relay #2	NA	Wireless relay output module
RD2432	1 to 4 for relay #1 to relay #4	1 to 4 for analog output 1 to 4	Wireless digital & analog output module

h. Setting the Mesh Network ID for the repeater/router devices

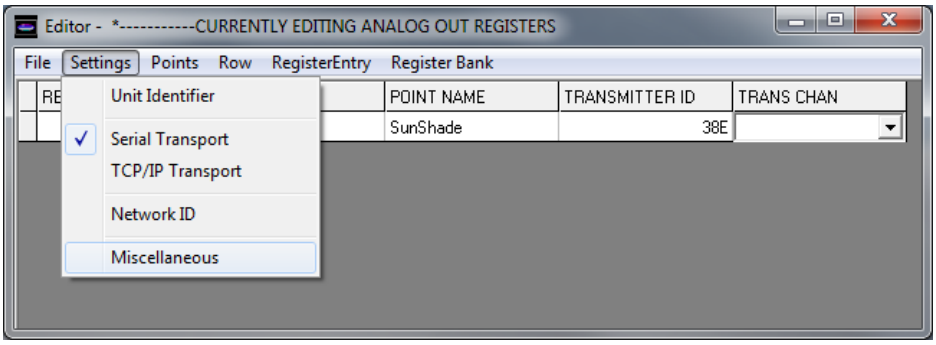


The mesh network ID of the MOD9200 Gateway can be set to specific network # from 1 to 64. The MOD9200 functions as a network coordinator. Any repeater/router that has the same network ID will be able to communicate and channel sensor information to the MOD9200

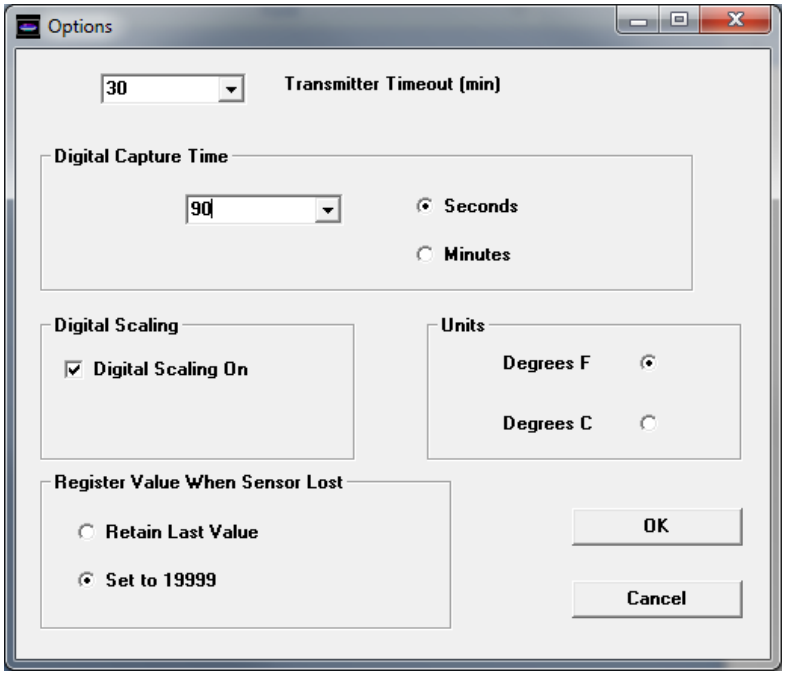
i. Miscellaneous Menu

The transmitter timeout interval, default temperature degrees (C/F), and Digital Input Capture Time are set globally for all sensors using the Miscellaneous Dialog Screen.

Click on Settings > Miscellaneous



Set the **transmitter transmission timeout interval** (***requires a minimum of 30 min.***) by clicking in the Transmitter Timeout cell to open a drop down menu. Use the scroll bar to scroll down to the appropriate value (1 to 60 min.) or type the value in the cell to automatically scroll to the appropriate value. This will be used to generate an error message if the transmitter fails to transmit in the specified time interval.



To select the timeout interval click on the appropriate value in the drop down menu.

The **Digital Input Capture Time** can be set to hold a momentary contact closure such as the override button on the WT2630B/C for a period of time (Default is 0 min. & recommended value is 1 min.) so the controller has time to recognize the contact closure.

The Digital Capture Time can be set up to 240 minutes (4 hours) in applications where an extended period of time is needed such as "unoccupied period by-pass".

Set the Digital Capture Time interval (seconds or minutes) by clicking on "Seconds" or "Minutes". Click in the Digital Capture Time cell to open a drop down menu. Use the scroll bar to scroll down to the appropriate value (0 to 240) or type the value in the cell to automatically scroll to the appropriate value. To select the timeout interval click on the appropriate value in the drop down menu.

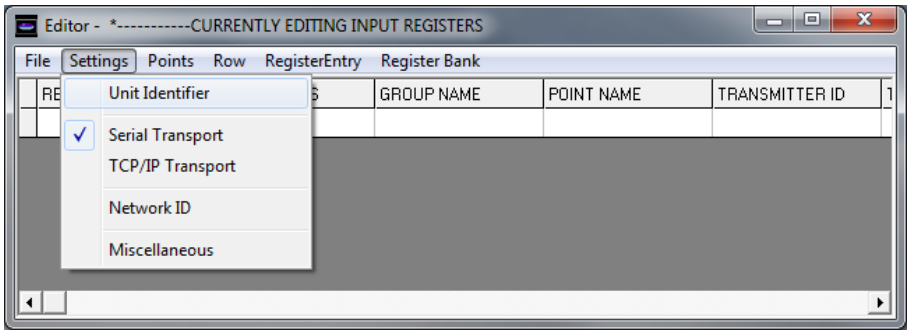
Digital Scaling On check box – Should be checked when configuring the MOD9200BNT BACnet® transceiver or the MOD9200LON LonWorks® Transceiver.

Units - Select the appropriate default temperature scale F/C.

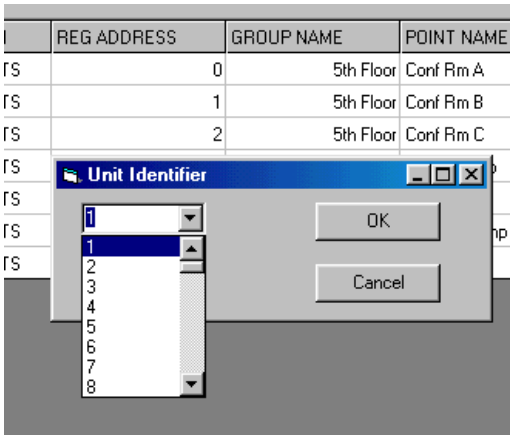
Register Value When Sensor Lost – The user has the options to select whether the sensor value should remain unchanged or set to 19999 when the communication link is lost with the sensor (after the transmitter timeout period)

j. Configuring The Transceiver For MSTP (RS485) Network

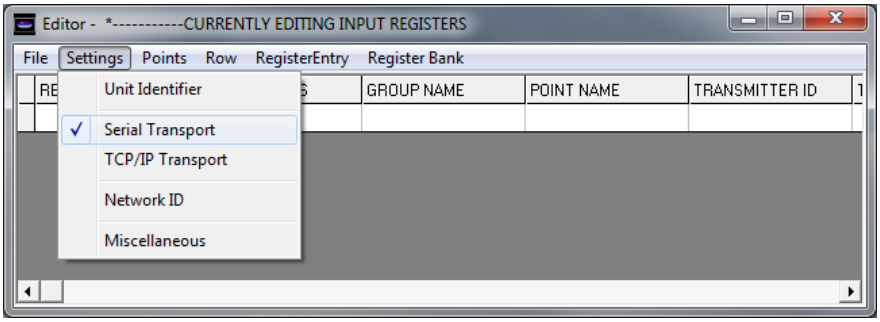
The Transceiver needs to be assigned an Identifier Address for device internal use. To enter the Transceiver Unit ID into the Configuration File click on the Menu Comm > Unit Identifier.



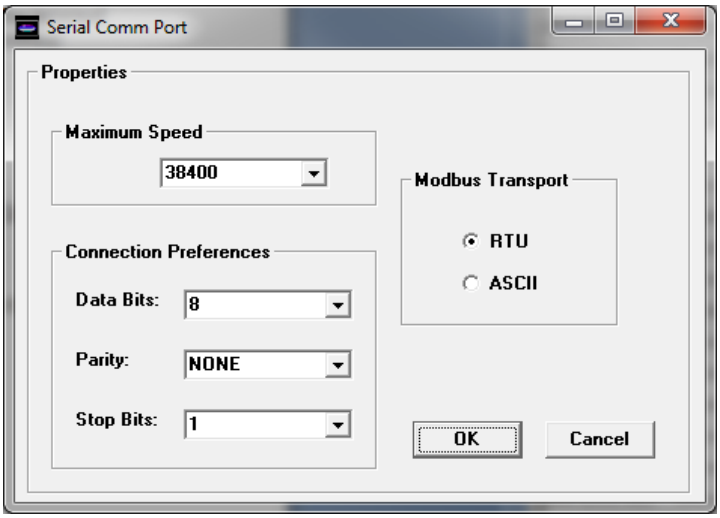
Click on the drop down menu arrow and select the Transceiver Unit Default ID of "1" from the drop down menu and click "OK".



Click on Menu - Comm > Serial Transport to activate the Serial Comm Port dialog box.



Use the Serial Comm Port configuration dialog box to select the appropriate internal communication parameters (Connect Speed, Connect Preferences, and Transport Mode) for the Transceiver.



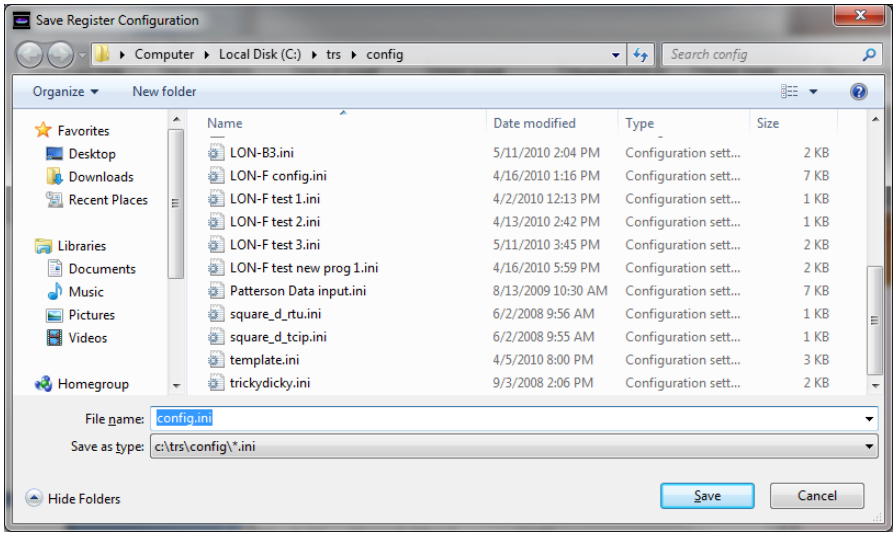
The MOD9200BNT requires internal communication parameters to be set as follows:

Maximum Speed = 38400 BPS (**This communication speed is set for internal use by the MOD9200BNT Transceiver and it will not change the external BACnet MSTP communication speed of 76800BPS**)

Data Bits = 8
Parity = none
Stop Bit = 1
Modbus Transport = RTU

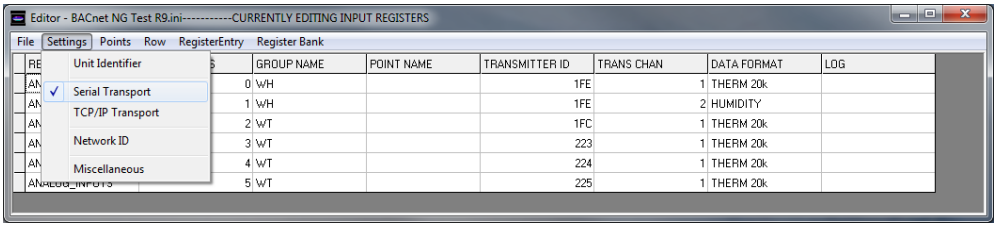
The MOD9200BNT Transceiver transmission mode and serial port parameters need to be exactly the same as shown above.

To Save the configuration file click on File > Save. It is recommended that the .cfg file be saved in the Trs folder already setup. i.e. C:\trs\config



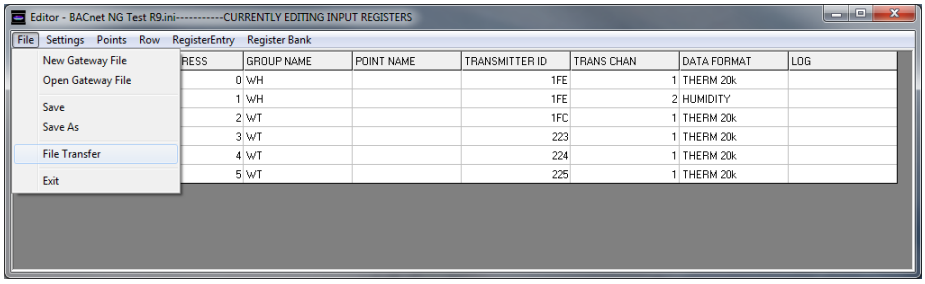
k. Sending The Configuration File To The MOD9200

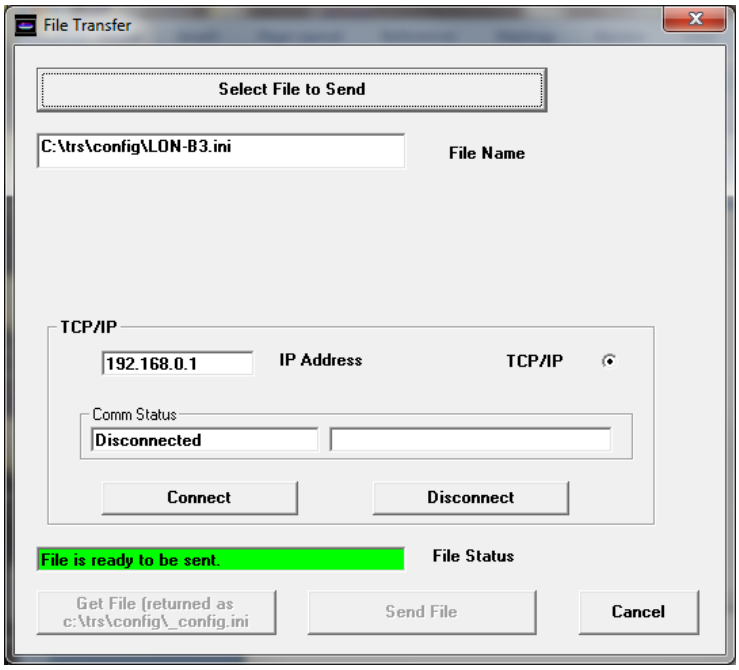
Before sending the file to the MOD9200, it is *important* to ensure that the "Serial Transport" setting is checked as shown:



Always save the configuration file to the folder "trs" before sending it to the MOD9200 Transceiver.

To send the new configuration file to the MOD9200 Transceiver click on File > File Transfer and a dialog box will appear.

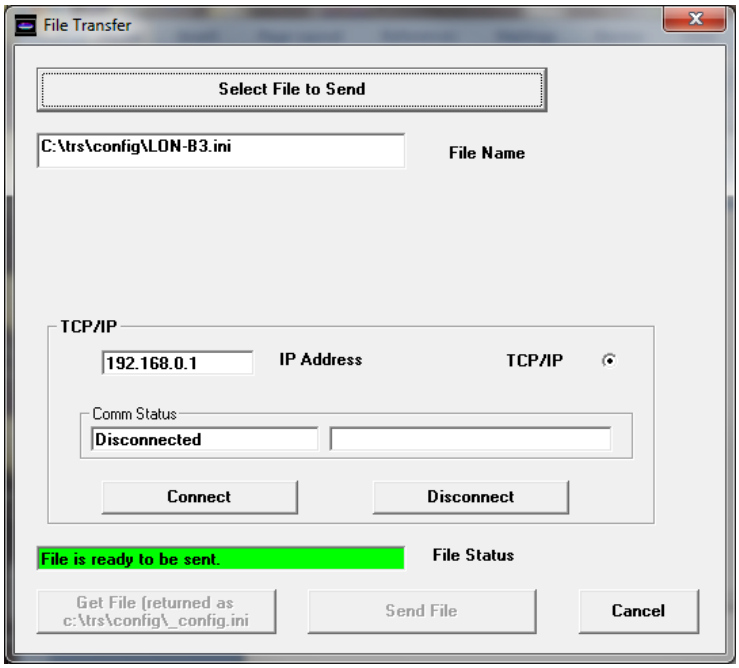




Click on “Select File” and a window will open. Move to the Trs directory and select the appropriate file from the list.

Click on “Open” to automatically enter the selected file path as the File Name.

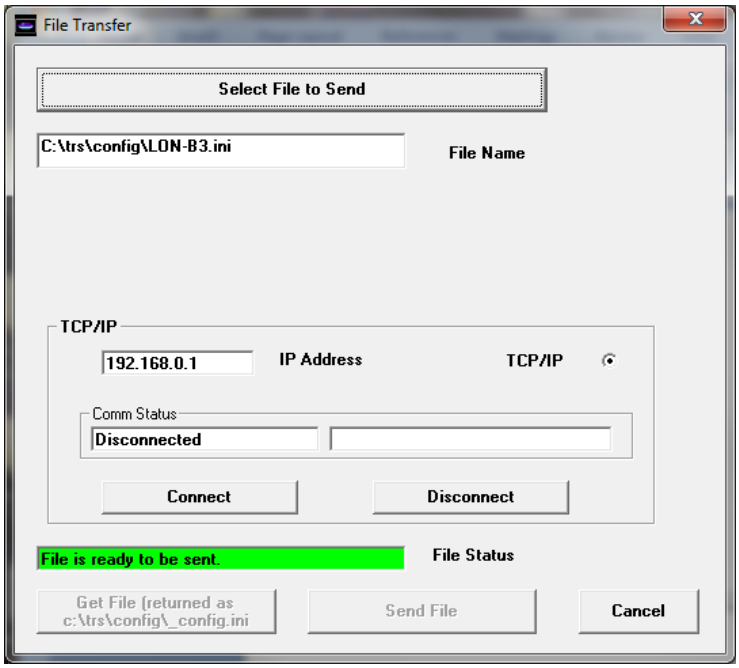
Enter the current IP Address of the Transceiver (Note: This can be different than the IP Address entered into the configuration file.)



Click on “Connect” and the status of the connection will be displayed in the Comm Status window. When the Transceiver is connected click on “Send File” to the send the config file to the Transceiver.

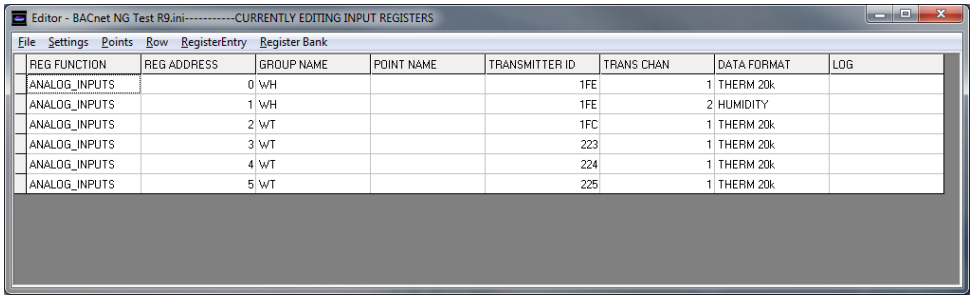
l. Activating The Config File

Once the config file has been sent to the Transceiver it will become active immediately. If you have changed the IP Address in the config file you will lose your connection and have to reconnect using the IP Address and Subnet Mask that was sent in the **new config file**.



To confirm that the appropriate configuration file is saved on the Transceiver – reopen the File Transfer Dialog and click on “Get File” to retrieve a copy of the active configuration file from the Transceiver. The Editor will automatically save this file in the folder “trs” with the file name of “ _config.ini”.

Click on File > Open Config File and select the “_config.ini” file. Click on “Open” to open the file in the Editor. Confirm that the file is the same as the original configuration file. Since the “Group Name” and the “Point Name” fields are not used by the MOD9200 transceiver, these fields will now be blank. All the other fields and settings should be the same as the original ,ini file.



REG FUNCTION	REG ADDRESS	GROUP NAME	POINT NAME	TRANSMITTER ID	TRANS CHAN	DATA FORMAT	LOG
ANALOG_INPUTS	0	WH		1FE	1	THERM 20k	
ANALOG_INPUTS	1	WH		1FE	2	HUMIDITY	
ANALOG_INPUTS	2	WT		1FC	1	THERM 20k	
ANALOG_INPUTS	3	WT		223	1	THERM 20k	
ANALOG_INPUTS	4	WT		224	1	THERM 20k	
ANALOG_INPUTS	5	WT		225	1	THERM 20k	

NOTE: The "_config.ini" file is a dynamic file. If multiple MOD9200 Transceivers are being administered from the same PC the "_config.ini" file will be a copy of the configuration file from the last Transceiver administered.

IV. Data Acquisition

a. BACnet Standard

BACnet refers to the open communications protocol, ANSI/ASHRAE STD 135, created by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and adopted shortly after its creation as a standard by the American National Standards Institute (ANSI).

The BACnet standard defines a protocol for transmitting messages between various devices in a Building Automation or Control System. The standard also specifies the networks over which these messages are exchanged:

- BACnet Ethernet & BACnet/IP – Utilizing standard LAN technology
- BACnet MSTP (Master Slave Token Passing) – relies on the EIA-485 serial communication signaling standard.
- BACnet PTP (point-to point) – For temporary connections between Devices

b. MOD9200BNT BACnet Transceiver Parameters

The MOD9200BNT Transceiver BACnet MSTP device communicating at 76800BPS. It receives data from up to fifty (50) wireless sensors and updates its data registers on a real time basis.

BACnet Object Types Supported:

AI (Analog Input) Objects – AI01 to AI200
BV (Binary Value) Objects – BV01 to BV100
AV (Analog Value) Objects – AV01 to AV100

The Present Value of AI01 through AI100 will correspond to the MOD9200 data register 0 through 99 [For AIXX, XX = Trs MOD9200 Register Num + 1].

- All wireless sensor information (analog and discrete input) will be displayed as numeric values.
- All digital status/alarms will be received and stored by MOD9200 as 1 or 0 (1=input contact closed & 0=input contact open). The Digital Capture Time can be set to “hold” momentary contact closures long enough to be “picked up by the system”.

- The Digital Capture Time can be set up to 240 minutes (4 hours) in applications where an extended period of time is needed such as “unoccupied period by-pass”.

- For data types (DATA FORMAT as described previously) THERM 20k, RTD 1k, RTD 1k Ext, and HUMIDITY, the analog data will be received and stored as real values with one decimal position (i.e. 82.5 F).

- For the data type (DATA FORMAT as described previously) ANALOG, the data will be displayed in counts (0 to 409.5). In applications where WT2630Bs are used. The setpoint adjustment is represented as analog value from 0 to 409.5 (Heat position to Cool position on the setpoint adjustment scale).

- For the data type (DATA FORMAT as described previously) TOTALIZER, the data is displayed in counts (24 bits) with a value of 0.1 representing one count. When the count reaches 1,677,721.5 (24 bits) the count value rolls over to 0 and begins again.

The Present Value of BV01 through BV50 objects will correspond to the MOD9200 Digital Output (Coil) Register 0 through 49 [For BVXX, XX = Trs MOD9200 Register Num + 1].

- The BV01 to BV50 Objects are used for command remote wireless digital outputs (relays) module i.e. ED2402D & the SD2432D devices. Values to be entered (or sent) is 1=on and 0=off.

- The BV51 through BV100 Objects will be automatically assigned by the MOD9200BNT. These 50 registers/objects will display the status of the relays commanded via the previous BV1 thru BV50 objects. After the remote unit executed the command issued by the MOD9200, It will send a feedback status of the relays to the MOD9200.

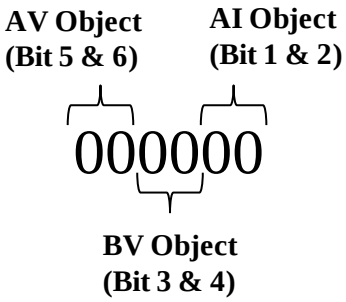
The Present Value of AV01 through AV50 objects will correspond to the MOD9200 Analog Output (Holding) Register 0 through 49 [For AVXX, XX = Trs MOD9200 Register Num + 1].

- The AV01 to AV50 Objects are used to command remote wireless analog outputs (0-10VDC or 0-5VDC) module such as the SD2432D devices. Value to be entered (or sent) is from 1.0 to 100.0 representing the percentage of full output range.

- The AV51 through AV100 Objects will be automatically assigned by the MOD9200BNT. These 50 registers/objects will display the status of the analog output commanded via the previous AV1 thru AV50 objects. After

the remote unit executed the command issued by the MOD9200, It will send a feedback status of the analog output value to the MOD9200.

The AI101 through AI200 Objects are the alarm registers for all the input and output data points (AI01-100, BV01-50 and AV01-50). Each point utilizes 6 binary bits of information representing the alarm conditions of the "Input Registers/AI Object", "Digital Output (Coil) Register/BV Object" and "Analog Output (Holding) Register/AV Object".



The Present Value of each register displays a decimal value representing the alarm status of all 3 point types. Each point type returns an individual alarm value in decimal format. All 3 point types decimal values are added together to represent the status of the 3 alarm status.

The decimal values of different point types are:

- The Input Register/AI Object alarms
  - "0"= Normal
  - "1"= Low Battery Alarm (Bit 1 set)
  - "2"= Lost Communication Alarm (Bit 2 set)

- The Digital Output (Coil) Registers/BV Object alarm
  - "0" Normal
  - "8"= Lost Communication Alarm (Bit 4 set)

- The Analog Output (Holding) Registers/AV Object alarm
  - "0" Normal
  - "32"= Lost Communication Alarm (Bit 6 set)

Alarm Status Examples:

- Example 1 – AI108 returns a value of 33 representing AI08 (Low Battery Alarm), BV08 (Normal) & AV08 (Lost Communication).

- Example 2 – AI108 returns a value of 40 representing AI08 (Normal), BV08 (Lost Communication) & AV08 (Lost Communication).

- Example 3 – AI128 returns a value of 42 representing AI28 (Lost Communication), BV08 (Lost Communication) & AV08 (Lost Communication).

- Example 4 – AI128 returns a value of 9 representing AI28 (Low Battery Alarm), BV08 (Lost Communication) & AV08 (Normal).

The MOD9200BNT Device Instance and MSTP MAC address will be preset from the factory and can be obtained using the BACnet Device Scan function. To ensure no duplication of Instance/address, verify that no other node with the same address is present at the sub-net where the MOD9200BNT will be residing.

For more implementation information please refer to the BACnet website www.BACnet.org or the ASHRAE (American Society of Heating, Refrigeration & Air-conditioning Engineers) website www.ashrae.org.

V. Quick Setup Instructions

a. Configuration of the MOD9200BNT

1. Connect the Transceiver to the TCP/IP network using RJ45 Category 5 Ethernet cable or a crossover cable (see Fig. 1 page 4) to a notebook or a desktop PC.

2. Apply 24 VAC 60 Hz power to the input terminals of the Transceiver. The Transceiver current draw is less than 0.5 Amp.

3. The Transceiver is shipped with an IP address of 192.168.0.1 and a subnet mask of 255.255.255.0 (see page 8 for instructions on changing the IP address).

4. **To initially connect to the Transceiver the networked PC must have a static IP address of 192.168.0.X (X can be any number except 1 or 2) with a subnet mask of 255.255.255.0.**

5. Installing The MOD9200 Configuration Software

6. Configure the MOD9200BNT Transceiver

b. Installing the MSTP (RS485) Network

1. Choose a location close to the computer or RS485 loop.

2. Mount the Transceiver on the wall using four #8 screws.

3. MSTP (RS485) - Use 20 gauge shielded twisted pair wire to connect the Transceiver (Terminals A+ & B-) to the network (See Figure 1).

4. Multiple RS485 Devices - If more than one RS485 device is used the devices should be "daisy chained" or "straight-line connected" by connecting all the "A" wires to the "A" terminals and the "B" wires to the "B" terminals. Do not use spur lines or a star configuration.

5. RS485 Terminating Resistor - If the MOD9200 is at the end of a RS485 loop a terminating resistor should be installed to match the electrical impedance characteristic of the twisted pair loop and prevent signal echoes from corrupting the data.

6. 24 VAC Input - Connect 24VAC 60 Hz and earth ground to the input terminals using 20 AWG wire as shown in the product data sheet.

7. Power up the MOD9200 Transceiver with the BACnet MSTP network.

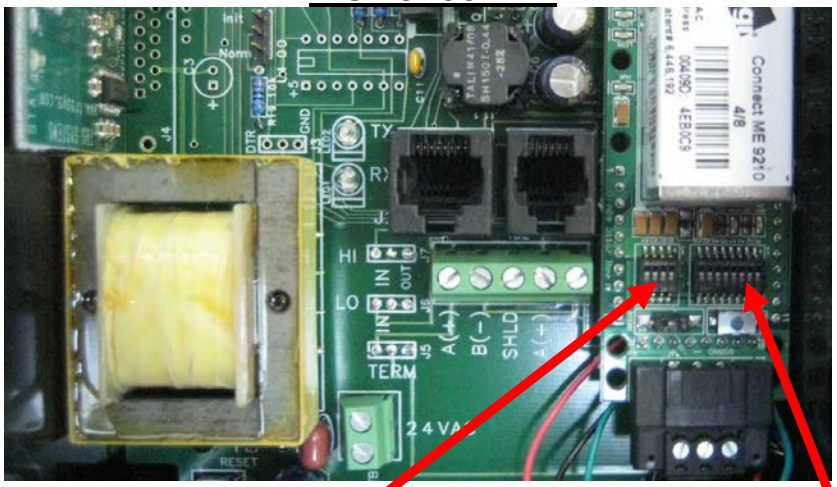
8. Use BACnet Device Scan function to identify the MOD9200 Device Instance & MSTP address.

9. Verify there is no address conflict with other node in the subnet.

10. Proceed to read object AI01 to AIXX & AI101 to AI1XX alarm property (where XX is the last data register configured using the Trs Programmer Configuration software [For AIXX, XX = Trs MOD9200 data Register Number + 1]).

For more information, please contact:
ACI
2305 Pleasant View Rd.
Middleton, WI 53562
Telephone: 1-608-831-2585
www.workaci.com

MOD9200BNT



Switch A8	Switch A7	Switch A6	Switch A5	Switch A4	Switch A3	Switch A2	Switch A1	Network 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	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	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

Network Node(or Instance) Address Setting
(from Node #1 to Node #127 maximum)

Baud Rate	Switch B4	Switch B3	Switch B2	Switch B1
Auto	OFF	OFF	OFF	OFF
110	OFF	OFF	OFF	ON
300	OFF	OFF	ON	OFF
600	OFF	OFF	ON	ON
1200	OFF	ON	OFF	OFF
2400	OFF	ON	OFF	ON
4800	OFF	ON	ON	OFF
9600	OFF	ON	ON	ON
19200	ON	OFF	OFF	OFF
20833	ON	OFF	OFF	ON
28800	ON	OFF	ON	OFF
38400	ON	OFF	ON	ON
57600	ON	ON	OFF	OFF
76800	ON	ON	OFF	ON
115200	ON	ON	ON	OFF

Caution: Unit should be powered down before changes can be made without damaging the MOD9200