Config@WEB RTU to IED Protocols Manual

S2200-AAA-00004 V**6.5**

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Config@WEB RTU to IED Protocols Manual

For Reference Only

Manual No. **S2200-AAA-00004**

Rev	Date	Description	ECO #	Review Approval
0.0	08-17-04	Initial Release – RTU to IED protocols were originally part of S2200-AAA-00002	N/A	
1.0	12-07-04	Update to SEL protocol	11504	
2.0	08-17-06	Added S5 (M), Symax, L&N C2100H(M), improved comm. counters & Internal Indications to DNPM, ANA & ACC bit sizes to Transdata, updated screen dumps, spun-off DNP Device Profile to separate manual (C3413-AAA-DNP01)	11595	
3.0	03-12-07	Updated for C9 firmware	11634	
4.0	08-06-07	Updated for CA_P2 firmware	11673	
5.0	06-02-08	Updated for CD firmware	11713	
6.0	10-13-08	Updated for D0 firmware	11750	
6.1	04-28-09	Updated for D2 firmware	11787	
6.2	12-09-11	Modified description of Time Sync Interval for DNPM Modified description of DNPM Direct Operate Control Functions, Added screenshot and description of “Short Messages” counter for Series V Data Display, Added Secure Authentication to DNPM		
6.3	10-04-12	Updated screenshots, general cleanup	N/A	
6.4	01-13-14	Update to Secure Firmware	N/A	
6.5	10-13-14	Scan Type 6	N/A	
				Dan Stark, Manager, RTU S/W Engineering

1 Introduction

The Telvent RTUs that use the Config@WEB interface have built-in point mapping. Point mapping is used on the output comm port, that is, the comm port reporting to a Master, whether that Master is another RTU or a central Master Station.

Your Config@WEB configuration should follow this sequence:

Configure Hardware I/O

Configure IEDs

Configure Master Station interface ports

This manual concerns itself with the second item.

1.1 Communication Port Configuration

With the release of Application version S2200-500-001A6, the DNP protocol is now available over Ethernet. TCP/IP Ethernet supports multiple logical channels over a single physical wire. This means that the Config@WEB interface is totally available at the same time that the Ethernet port is being used for up to sixteen independent DNP sockets.

Additionally, you may also operate DNP (or any other supported protocol) over all serial comm ports. Both Serial Comm operation and Ethernet Comm operation are explained in the following chapters.

1.2 Communications Timers

Telvent microprocessor based RTUs use timers for communications. These timers are CTS Delay, RX Timeout, B4 Time, InterByte Time, and Modem TurnOff Time. Each of the timers and their normal uses are described below. Calculation of the communications timer values are dependent on the baud rate selected, the result of other communication timer values and the mode in which the serial device is used.

1.2.1 Timer Calculations

The timer values are calculated in the following order: InterByte Time, CTS Delay, Modem TurnOff Time, and B4 Time.

InterByte Time (1ms)

The InterByte time is the maximum time allowed between consecutive bytes of a message. This timer is started at the receipt of each byte of the transmission from the MTU to the RTU. The entire message will be discarded if the timer expires between two bytes of a message. The timer value is entered in 1ms increments and has a resolution of 5ms in the RTU.

If a value of 0 (the default) is entered, the timer value will be calculated based on the baud rate using the following formula:

InterByte Time Timer = the greater of 2 or ((14,400/baud rate+1) + 4)/5 + 1

This formula results in a quantity of 5ms ticks. For example, if the baud rate is 1200 baud, the timer would be calculated as ((14,400/1200) + 5)/5 + 1 resulting in a 4 tick timer. A four tick timer results in an actual time of from between 15 and 20 milliseconds since the tick timer begins asynchronously from the actual 5ms interrupt.

If a non-zero value is entered, the 1ms value entered will be rounded up to the nearest number of 5ms ticks plus 1. The formula used is:

InterByte Time Timer = (value entered + 4)/5 + 1

If a value of 1 were entered, the timer would be calculated as (1 + 4)/5 + 1 resulting in a 2 tick timer. A two tick timer results in an actual time of from between 5 and 10 milliseconds since the tick timer begins asynchronously from the actual 5ms interrupt.

Each byte of the MTU to RTU message may be qualified with the hardware DCD option if the modem being used supports this signal. If the DCD input is unasserted when a byte is received, the byte will be discarded.

CTS Delay (1ms) (Clear To Send)

The CTS Delay timer is the delay from the end of the MTU message reception to the start of RTU message transmission. This timer is started when the RTU has received a message from the MTU that requires a response by the RTU and after the RTU has built the response message. When this timer is started, the RTS & DTR pins of the port will be asserted. The Clear To Send timer is used as displayed on the screen for the protocol. This timer is entered in 1ms increments and has a resolution of 1ms in the RTU.
If the Hardware CTS option is not enabled (the default), the RTU firmware will wait the CTS Delay period before transmitting its response to the MTU. If the Hardware CTS option is enabled, the RTU firmware will wait the CTS Delay period before checking the state of the CTS input. If the CTS pin is not asserted, the RTU firmware will check each millisecond until the signal is asserted, and at that time the RTU will transmit its response to the MTU.

Modem TurnOff Time (1ms)

The Modem TurnOff Time timer is the time the Modem is left on after completion of RTU message transmission. This timer is entered in 1ms increments and has a resolution of 1ms in the RTU. This timer is started when the RTU has transmitted the last byte of a message. When this timer expires, the RTS and DTR pins of the port will be deasserted.

If a value of 0 (the default) is entered and the setting for the CTS Delay is non-zero, the timer value will be calculated based on the baud rate using the following formula:

Modem TurnOff Time Timer = the greater of 2 or (14,400/baud rate) + 1

This formula results in a quantity of 1ms ticks. For example, if the baud rate is 1200 baud, the timer would be calculated as ((14,400/1200) + 1 resulting in a 13 tick timer. A thirteen tick timer results in an actual time of from between 12 and 13 milliseconds since the tick timer begins asynchronously from the actual 1ms interrupt. If a value of 0 (the default) is entered and the setting for the CTS Delay is zero, the timer value will be set to zero.

If a non-zero value is entered, the 1ms value entered will be the number of 1ms ticks used. If a value of 3 were entered, the timer would be a 3 tick timer. A three tick timer results in an actual time of from between 2 and 3 milliseconds since the tick timer begins asynchronously from the actual 1ms interrupt.

If a MTO value of 7 were entered and the baud rate were set to 2400, the timer would be a 15 tick timer. A fifteen tick timer results in an actual time of from between 14 and 15.

B4 Time (1ms)

The B4 Time timer is the amount of time the RTU listens for a dead receive line prior to enabling the receiver and accepting a new message. This timer is started at the end of each transmission from the RTU to the MTU. The timer must expire prior to a new message being accepted from the MTU. If any bytes of a message are received by the RTU prior to the time expiring, they will be discarded and the B4 timer restarted. This timer is entered in 1ms increments and has a resolution of 5ms in the RTU.

If a non-zero value is entered, the 1ms value entered will be rounded up to the nearest number of 5ms ticks plus 1. The formula would then appear as:

B4 Time Timer = (value entered + 4)/5 + 1

If a value of 10 were entered, the timer would be calculated as (10 + 4)/5 + 1 resulting in a 3 tick timer. A three tick timer results in an actual time of from between 10 and 15 milliseconds since the tick timer begins asynchronously from the actual 5ms interrupt.

If a value of 0 is entered, the timer value will be calculated based on the modem turnoff time using the following formula:

*B4 Time Timer =((the greater of (MTO/2)*5 or 10) + 4)/5 +1*

This formula results in a quantity of 5ms ticks. For example, if the MTO delay is 2, the timer would be calculated as ((10) + 4)/5 + 1 resulting in a 3 tick timer. A three tick timer results in an actual time of from between 10 and 15 milliseconds since the tick timer begins asynchronously from the actual 5ms interrupt.

RX Timeout (16.67ms)

The RX Timeout timer is the amount of time the RTU receiver waits to hear valid communications from the MTU. This timer is started at the end of each transmission from the RTU to the MTU. If no bytes of a message are received by the RTU prior to the timer expiring, the USART of the port will be be initialized. This timer is entered in 1ms ticks and has a resolution of 16.67ms in the RTU. An entry of 5000ms results in an actual time between 5.183 and 5.200 seconds because the tick timer begins asynchronously from the actual 16.67ms interrupt.

1.3 Timing Diagrams

Figure 1-1 represents request-response cycles between an MTU and an RTU. Figure 1-2 shows an expanded single request-response cycle including the additional RTU signal timing.

Figure 1-1 MTU-RTU Communications Timing Diagram

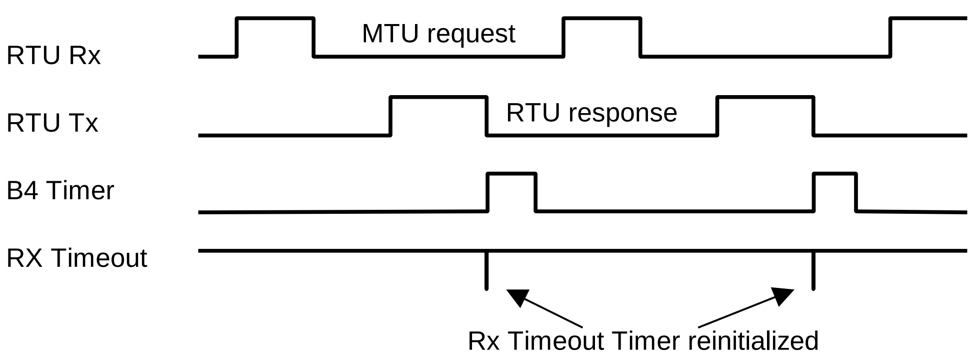
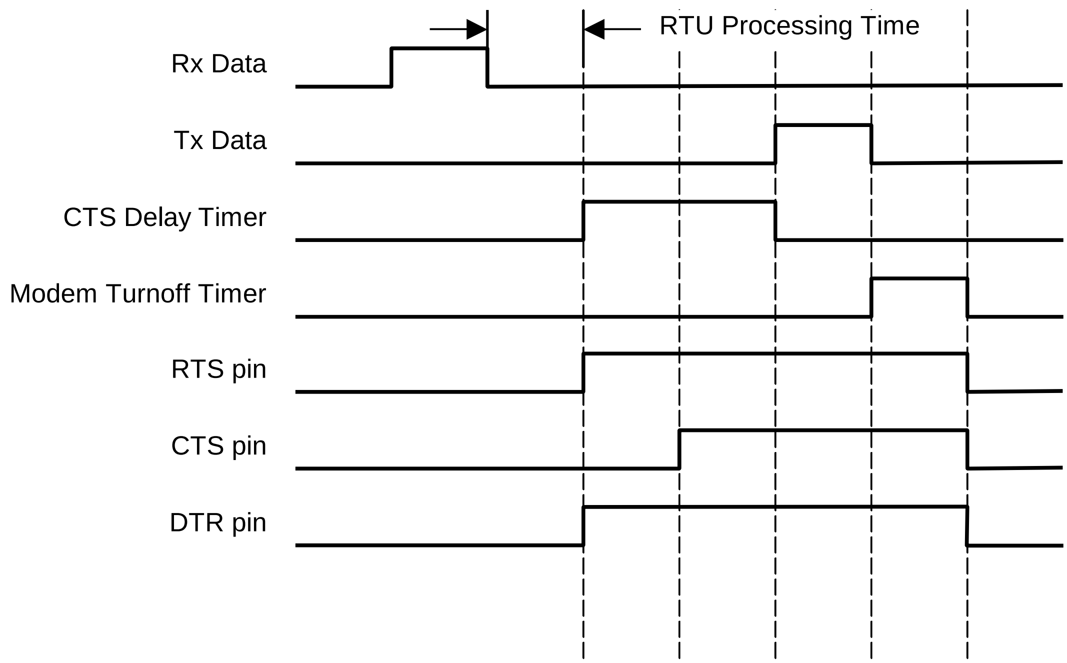


Figure 1-2 DNPR Expanded Communications Timing

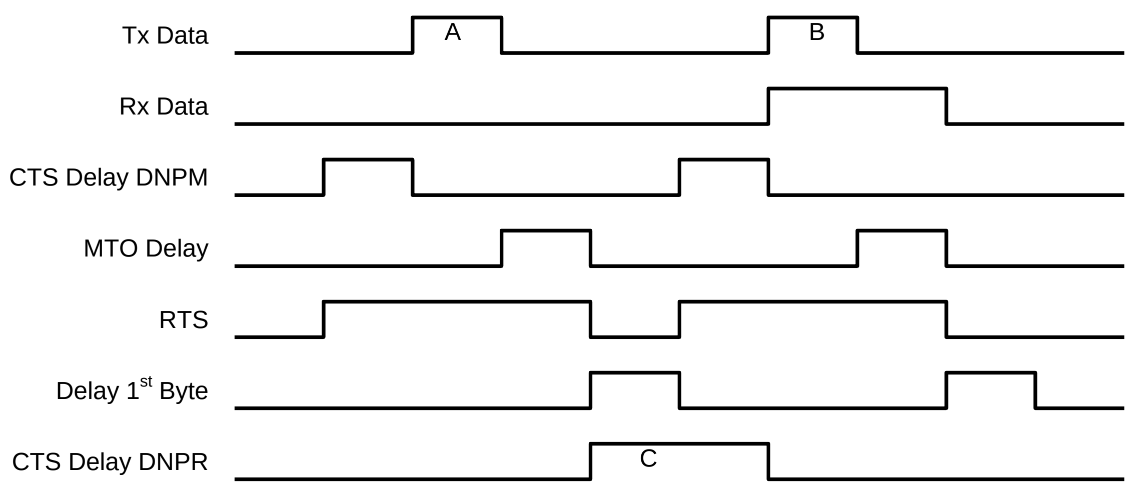


1.4 DNP Timing Problem Examples

1.4.1 CTS Delay Too Long

Common timing problems arise when there are mismatches between the selected timer values. Some of these are illustrated in the following diagrams:

Figure 1-3 Mismatch CTS and 1st Byte Times



Transmit Data A & B
The Tx Data represents polling messages from the DNPM RTU.

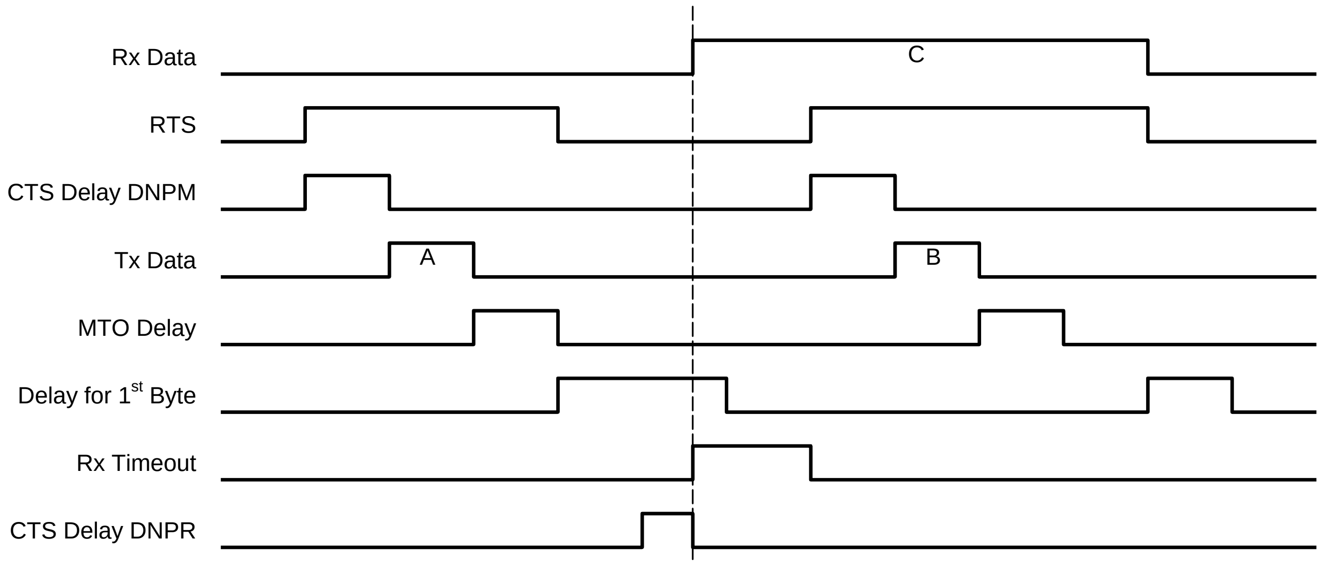
CTS Delay at DNPR (C)
The CTS delay time is set too long or the Delay 1st Byte is set too short.

The mismatch between the DNPR CTS and Delay for 1st Byte causes the DNPM to never hear the DNPR transmission. The defaults set in the PROM may not be appropriate for every communications media. This problem is indicated by rapid polling by the DNPM. It is the purpose for the Delay 1st Byte timer to allow rapid, efficient polling.

1.4.2 Rx Timer Too Short

The DNPR CTS Delay (See Figure 1-4) is properly set since the first byte is received before the Delay for 1st Byte timer expires.

Figure 1-4 DNPM Timing Problem - Rx Timeout Set Incorrectly



Transmit Data A & B

The Tx Data represents polling messages from the DNPM RTU.

Rx Data (C)

The DNPR data transmission (C) starts properly but the RX timeout timer at the DNPM cuts it short. This causes the DNPM to transmit a poll request (B) even while the DNPR is still responding to the first poll request (A).

1.5 Secure Authentication

DNPM now supports Secure Authentication. See the DNPM chapter.

2 DNPM

2.1 Telvent DNP Scan Types (0-5)

The various "Scan Types" available are to ensure interoperability with various vendor's DNP 3.0 implementations. Typically the only scan types that are used in most instances are:

1. Scan Type 0: Poll static data. Use for Meters and other devices that do NOT have time stamped event data.
2. Scan Type 2: Poll event data followed by configurable integrity scan. Use for Relays, Switches and other devices that have time stamped event type data.

A more detailed explanation of the scan types follows.

- Scan Type 0: Typically used for meter data or other non-event polling.
  - Regular scan - Class 0

- Scan Type 1: Obsolete scan type which assigns class (used for older Telvent RTUs). Most IEDs do not support this scan type. Use Scan Type 2 in place of this one.
  - Startup:
    - Assign class for binary objects
    - Assign class for analog objects
  - Freeze/Read ACCs as configured
  - Read running ACCs as configured
  - Integrity scan as configured
    - static DI
    - static AI
    - static AO
  - Regular scan - Class 1,2

- Scan Type 2: Typically used to poll relays and other IEDs which have event type data.
  - Startup:
    - Class 0 Scan
  - Freeze/Read ACCs as configured
  - Read running ACCs as configured
  - Integrity scan as configured
    - Class 0 scan
  - Regular scan - Class 1,2,3 scan

- Scan Type 3: Specialized scan type is not typically used but is designed to limit the quantity of data returned in a poll.
  - Scan object 30 (AIs)
  - Scan object 40 (AOs)
  - Scan object 1 (DIs)
  - Scan object 20 (ACCs)

- Scan Type 4: Specialized scan type is not typically used but is designed to limit the quantity of data returned in a poll.
    - Range read on ACC
    - Range read on DI
    - Range read on AO
    - Range read on AI
    - Status event read

- Scan Type 5: Specialized scan used to poll an IED only when the configured "Scan Type 5 Status Input" point gets set to 1. When set, the RTU will send a Class 0 scan to the IED and resets the status point to 0. There are not checks or retries to guarantee the poll was sent or received correctly. Controls are sent to the IED when needed regardless of the state of the status point. No other scans are sent to the RTU until another status change is detected.

- Scan Type 6: Same as Scan Type 2, except the Integrity Scan is Class 1/2/3/0. This will eliminate potential double status changes for when for long time between settings. In Scan Type 2, the Integrity Scan only sends Class 0.

2.2 Secure Authentication Theory

Under section "**2.7.13.1 IED Name & Authentication Configuration**" is a feature called Secure Authentication Configuration. This feature allows secure communication with an IED that supports Authentication. The following quote is the description from the DNP Secure Authentication documentation.

> "The Session Keys that each device uses to hash the challenge data are the most frequently used keys. A different Session Key is used in each direction, so that if the key for one direction is compromised, it does not compromise communications in the other direction. There is a different set of Session Keys and a different Update Key for each user at the master end, identified by a User Number.
>
> The master initializes the Session Keys immediately after communications is established and regularly changes the Session Keys thereafter. This practice of periodically changing the Session Keys protects them from being compromised through analysis of the communications link.
>
> The master uses a second key, called the Update Key, to encrypt the new Session Keys, together with the challenge data, inside a Key Change message. The use of a second key permits the master to change the Session Key even if the original Session Key was compromised. Both the Session Keys and the Update Key are symmetric keys.
>
> Outstations shall consider all output operations (controls, setpoint adjustments, parameter settings, etc.) to be critical. Other mandatory critical operations are described in 7.5.2.3.2. Each implementation may define additional mandatory critical operations.
>
> To protect against replay attacks, the challenge message contains data that changes randomly each time a challenge is issued.

2.2.1 Aggressive Mode

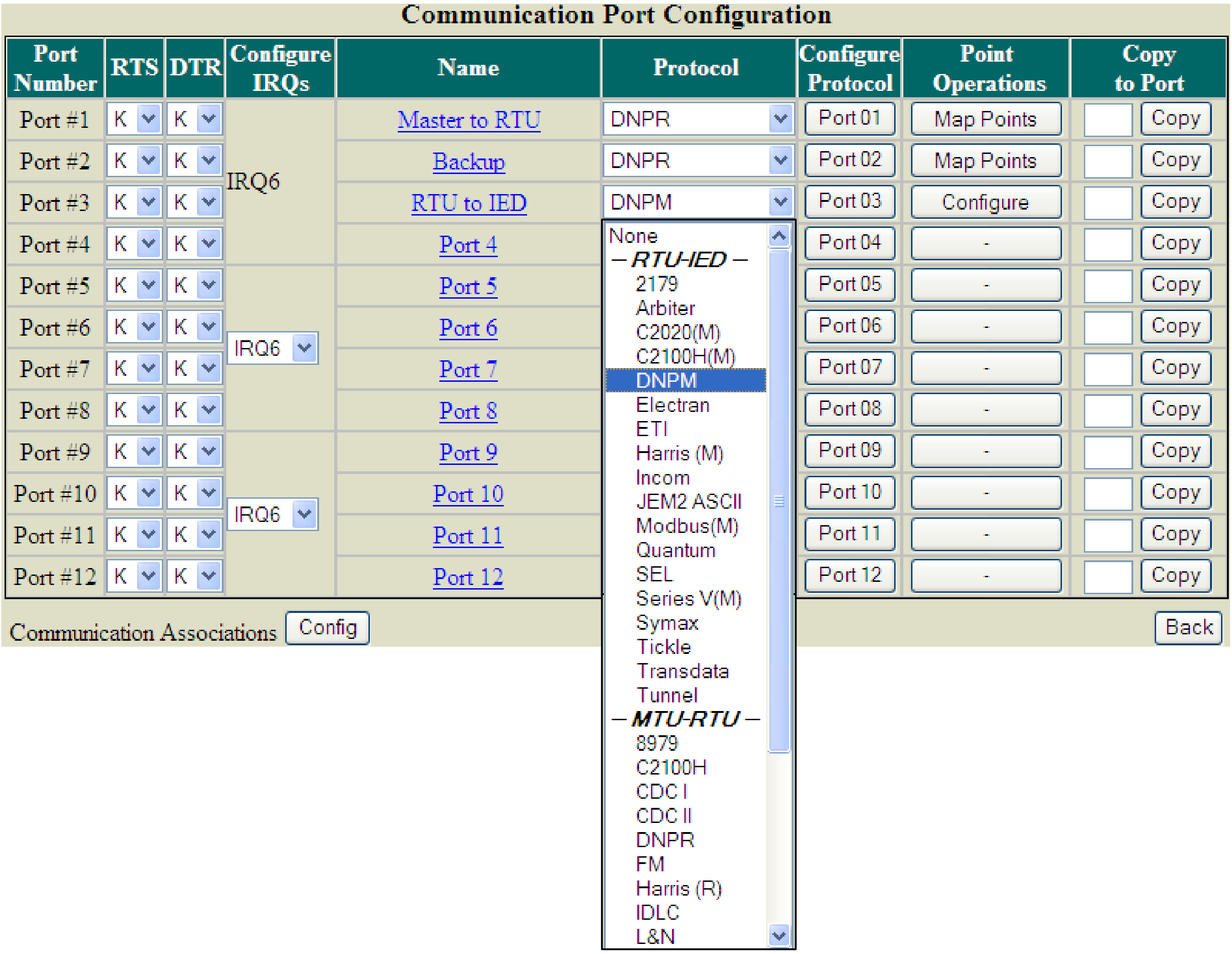
> To reduce bandwidth usage, a responder attempting a critical operation may optionally "anticipate" the challenge and send the MAC Value in the same ASDU being protected. This practice is known as "aggressive mode". It eliminates the challenge and reply messages."

2.3 Serial Comm Port Configuration

DNPM is a protocol that communicates between the RTU and an IED.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click DNPM from the Protocol drop-down menu as shown.

Figure 2-1 DNPM Communication Port Configuration



2.3.1 Port Number

Physical Port number of the RTU.

2.3.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

2.3.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

2.3.2.2 "H" represents Positive RS232 Voltage.

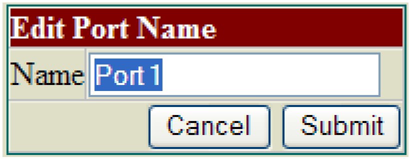
When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

2.3.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

2.3.3 Name

Click on the "blue" name (see below) and rename the port, or accept the default name.



2.3.4 Protocol

From the drop-down list, select the protocol for this port.

2.3.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

2.3.6 Point Operations

Click this button to assign points.

2.3.7 Copy to Port

Enter a port number to copy to, then click the Copy button.

Navigation

Click the Back button to return to the previous screen.

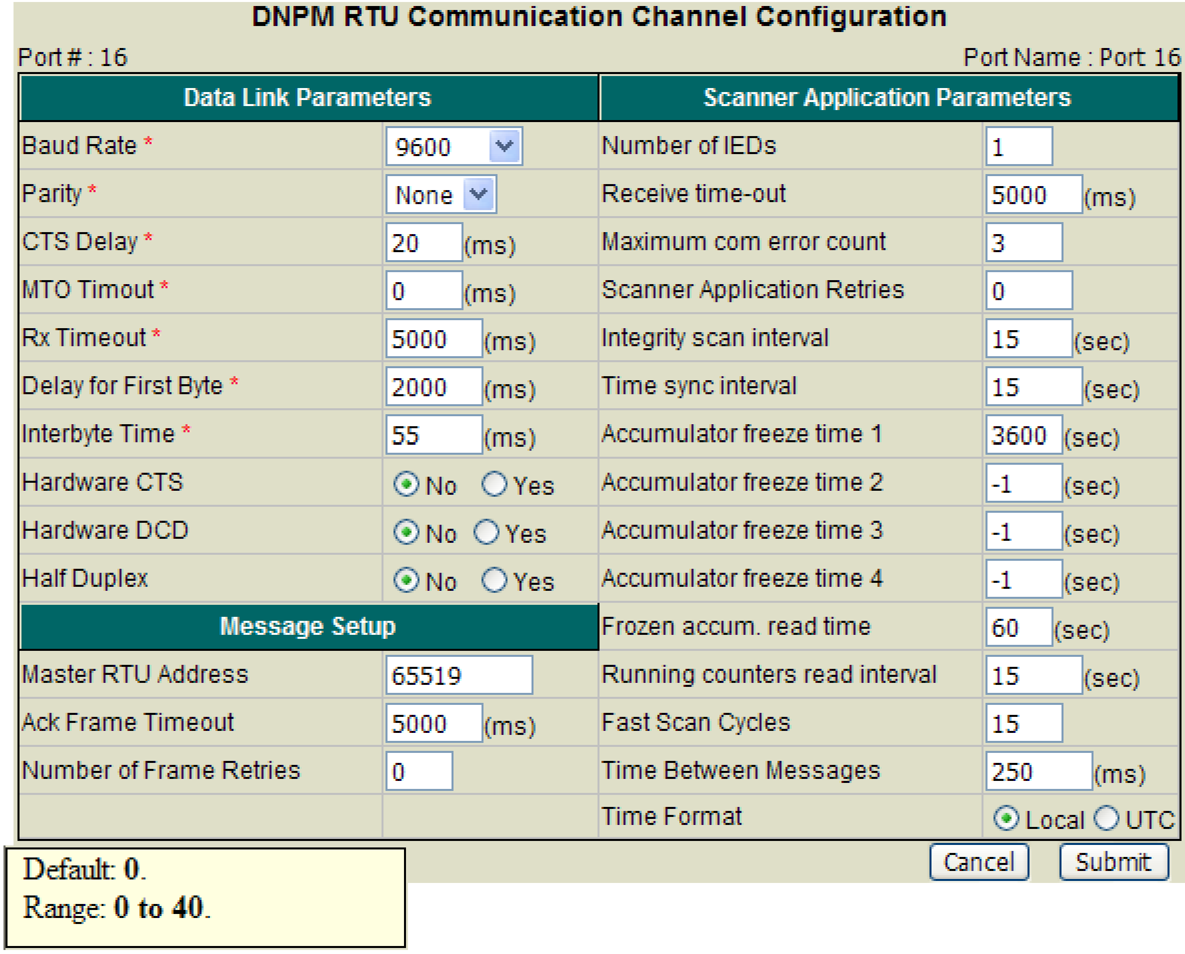
2.3.7.1 Communication Associations

Please see the DNPR chapter of the Config@WEB Protocols-MTU-RTU manual.

2.4 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n* to configure the DNPM port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 2-2 DNPM Communication Channel Configuration



DNPM RTU Communication Channel Configuration

Port # : 16 Port Name : Port 16

Data Link Parameters		Scanner Application Parameters	
Baud Rate *	9600	Number of IEDs	1
Parity *	None	Receive time-out	5000 (ms)
CTS Delay *	20 (ms)	Maximum com error count	3
MTO Timout *	0 (ms)	Scanner Application Retries	0
Rx Timeout *	5000 (ms)	Integrity scan interval	15 (sec)
Delay for First Byte *	2000 (ms)	Time sync interval	15 (sec)
Interbyte Time *	55 (ms)	Accumulator freeze time 1	3600 (sec)
Hardware CTS	No / Yes	Accumulator freeze time 2	-1 (sec)
Hardware DCD	No / Yes	Accumulator freeze time 3	-1 (sec)
Half Duplex	No / Yes	Accumulator freeze time 4	-1 (sec)
Message Setup		Frozen accum. read time	60 (sec)
Master RTU Address	65519	Running counters read interval	15 (sec)
Ack Frame Timeout	5000 (ms)	Fast Scan Cycles	15
Number of Frame Retries	0	Time Between Messages	250 (ms)
		Time Format	Local / UTC

Cancel Submit

Default: 0.
Range: 0 to 40.

Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

2.4.1 Data Link Parameters

2.4.2 Baud Rate (300-38400)

From the drop-down menu, select the baud rate. The default setting is 9600.

2.4.3 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is None.

2.4.4 CTS Delay (0 to 1000ms)

Enter the clear-to-send delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. Valid entries are in the range of 0-1000 msec. The default setting is 20.

2.4.5 MTO Timeout (0 to 250ms)

Enter the Modem Turnoff Delay for the associated channel. The MTO Delay is used to designate the amount of time (in milliseconds) that will elapse after the last byte is transmitted before the modem is turned off. The default setting is 0 ms.

2.4.6 Rx Timeout (0 to 60,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. Valid entries are in the range of 0-60000. The default setting is 5000ms (5 sec).

Note: This timer must be greater than Delay for First Byte timer (below).

2.4.7 Delay for First Byte (1ms) (0 to 60,000)

Enter the delay time for the associated channel. This is the time allowed for a Slave Device to begin its response before the RTU assumes it is not going to reply and moves on to the next device. This parameter is typically set long because of delays in IED response. Valid entries are in the range of 0-60,000 msec. The default setting is 2000 (2 sec).

Note: This timer must be less than Rx Timeout (above).

2.4.8 Inter-byte time (0 to 30,000ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. Valid values range from 0-30,000 milliseconds. The default setting is 55 msec.

2.4.9 Hardware CTS (No, Yes)

Click the radio button for Yes if you want the Hardware Clear-To-Send option selected. When this option is selected, the IEDs will not be polled unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. If no hardware CTS signal is present, the port aborts the transmission and tries again. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. The default setting is No.

2.4.10 Hardware DCD (No, Yes)

Click the radio button for Yes if you want the Hardware DCD selected. When this option is selected, the channel communications driver will accept requested message data bytes only if the carrier is detected by the modem. If the carrier is not detected, the data bytes are discarded. The default setting is No.

2.4.11 Half Duplex (No, Yes)

Click the radio button for Yes if you want half duplex operation. This function enables the RTU to properly condition the RS-232 control lines. The CTS delay is used for carrier conditioning. In full duplex operation, the CTS signal is used for collision avoidance. In Half duplex operation, the DCD signal is used for collision avoidance and to enable the receiver. The default setting is No.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

2.4.12 Message Setup

2.4.13 Master RTU Address (0 to 65534)

This address is a unique address on the assigned communications channel of the polling RTU. Address 65535 is used only to broadcast to all stations by the MTU. Default is 65519.

2.4.14 Ack Frame Timeout (0 to 60,000ms)

The length of time the RTU waits for data link ack from the IED when requested. The ACK Frame Timeout default is 5000ms.

2.4.15 Number of Frame Retries (0 to 9)

The number of frame retries before an error is recorded. The default is 0.

2.4.16 Scanner Application Parameters

2.4.17 Number of IEDs (0 to 40)

Enter the number of Slave Devices connected to this communication channel. Default is 0.

2.4.18 Receive time-out (0-60,000ms)

Enter the receive timeout. The receive timeout is the length of time the DNPM task will wait for the entire message to be received from the IED. The default setting is 5000 (5 seconds).

Note: This value must be equal to, or greater than, the RX Timeout in Data Link Parameters.

2.4.19 Maximum com error count (0 to 100)

Enter the maximum comm error count per Slave Device before marking the points failed or setting the Comm Fail status point. The default is 3.

2.4.20 Scanner application retries (0 to 10)

Enter the number of scanner application retries. The default is 0.

2.4.21 Integrity scan interval (0 to 4320 sec)

Enter the number of seconds for the execution of an Integrity Scan. An integrity scan is a full refresh of all data from every IED on scan. The default is 15.

2.4.22 Time sync interval (0 to 3600 sec)

Enter the time for synchronizing the Slave Devices from the DNPM real-time clock. This is the time in seconds between time sync messages from the DNPM to the IEDs. The default is 15. Setting this value to zero disables the global broadcast of sending the time to the IEDs. If the IED requests the time via the protocol, the RTU will send the time.

2.4.23 Accumulator freeze time 1 (-1 to 3600 sec)

2.4.24 Accumulator freeze time 2 (-1 to 3600 sec)

2.4.25 Accumulator freeze time 3 (-1 to 3600 sec)

2.4.26 Accumulator freeze time 4 (-1 to 3600 sec)

This feature not implemented.

2.4.27 Frozen accum. Read time (1 to 60 sec)

This feature not implemented.

2.4.28 Running counters read interval (0 to 3600 sec)

The running accumulators are read according to this timer when the accumulator freeze schedule above is not populated. The default is 15.

2.4.29 Fast Scan Cycles (0 to 2048)

When an SBO command is issued to an IED, the IED is scanned immediately this amount of times for status changes. This expedites a status change to the RTU in large systems with many IEDs. The default is 15.

2.4.30 Time Between Messages (0 to 60,000 ms)

This is the minimum time between polls. The poll could take longer, depending on the number of IEDs and other factors, but the entered value sets the least time the poll will take. The default is 250 ms.

2.4.31 Time Format (Local, UTC)

Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regards to time syncs, set Time Format to Local Time. See Time Configuration Settings in the Configuration chapter of the hardware manual for time settings under the CPU block.

If you want to send time synchronization to this device, you must know whether the device will accept Local time or UTC time, then set this radio button to match.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

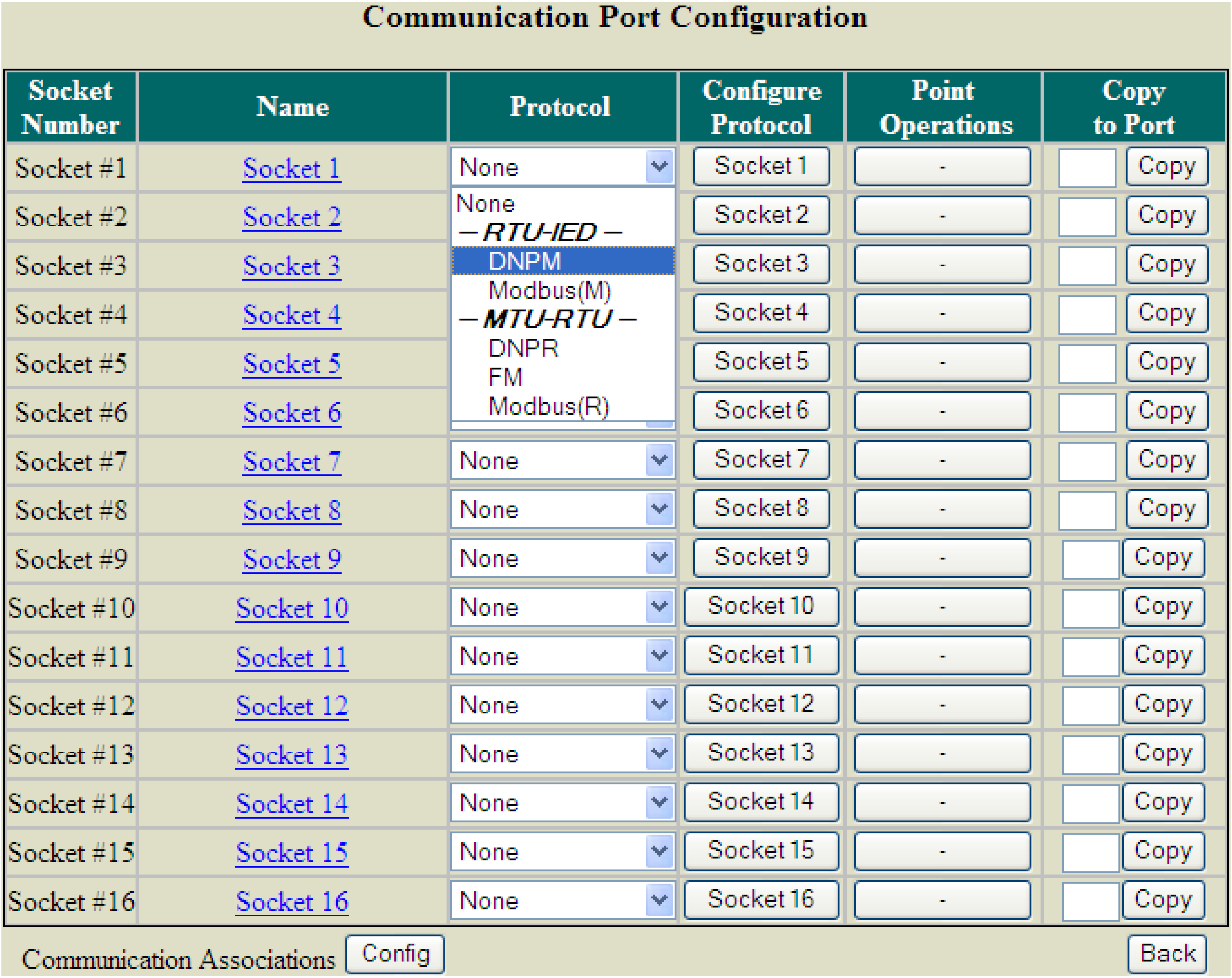
Please note: No configuration changes take effect until the RTU is reset.

2.5 Ethernet Comm Port Configuration

DNPM is a protocol that communicates between the RTU and an IED.

From the Configuration screen, click Ethernet Comm. You will get a screen similar to Figure 2-3. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click DNPM from the Protocol drop-down menu as shown.

Figure 2-3 DNPM Ethernet Comm Port Configuration



Communication Port Configuration

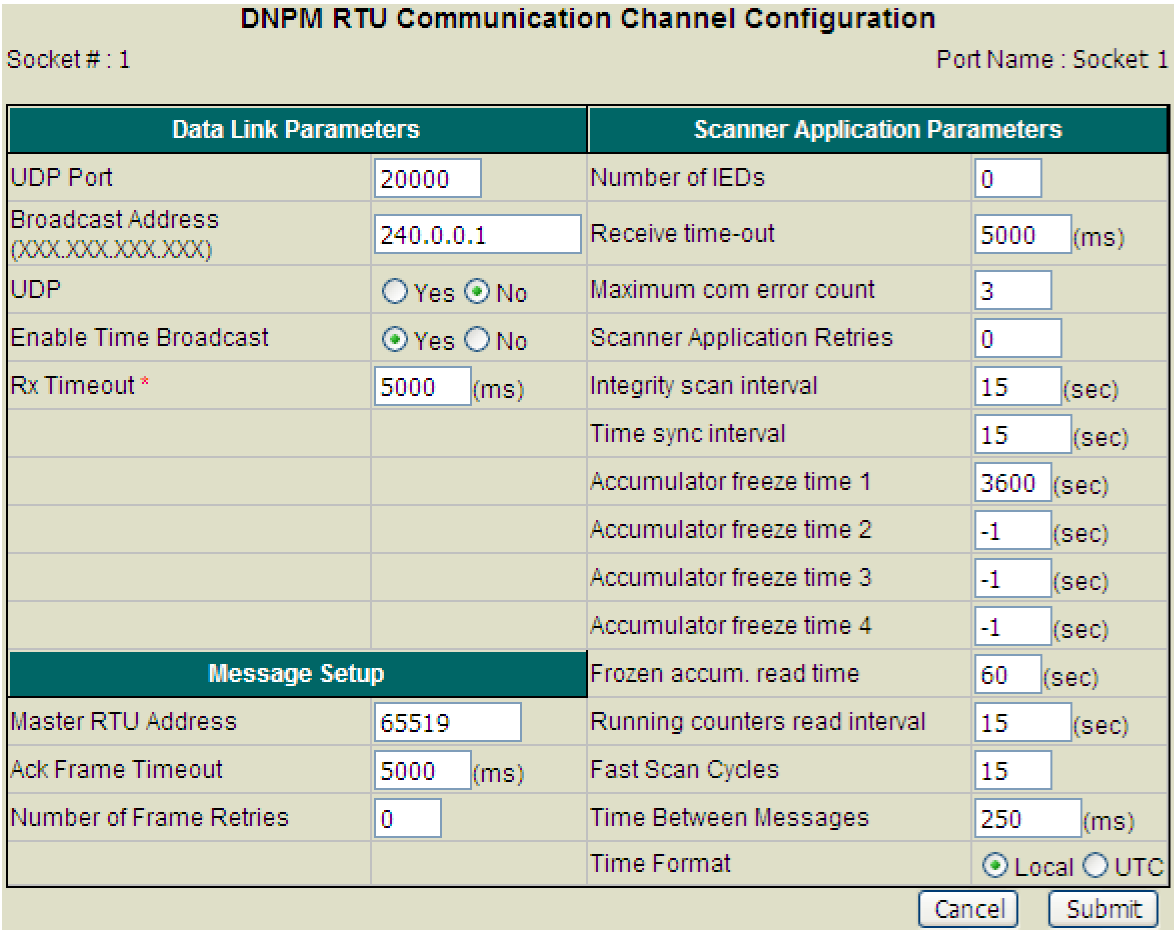
Socket Number	Name	Protocol	Configure Protocol	Point Operations	Copy to Port
Socket #1	Socket 1	None	Socket 1	-	Copy
Socket #2	Socket 2	None — RTU-IED —	Socket 2	-	Copy
Socket #3	Socket 3	DNPM	Socket 3	-	Copy
Socket #4	Socket 4	Modbus(M) — MTU-RTU —	Socket 4	-	Copy
Socket #5	Socket 5	DNPR FM	Socket 5	-	Copy
Socket #6	Socket 6	Modbus(R)	Socket 6	-	Copy
Socket #7	Socket 7	None	Socket 7	-	Copy
Socket #8	Socket 8	None	Socket 8	-	Copy
Socket #9	Socket 9	None	Socket 9	-	Copy
Socket #10	Socket 10	None	Socket 10	-	Copy
Socket #11	Socket 11	None	Socket 11	-	Copy
Socket #12	Socket 12	None	Socket 12	-	Copy
Socket #13	Socket 13	None	Socket 13	-	Copy
Socket #14	Socket 14	None	Socket 14	-	Copy
Socket #15	Socket 15	None	Socket 15	-	Copy
Socket #16	Socket 16	None	Socket 16	-	Copy

Communication Associations Config Back

2.6 Configure Protocol, Ethernet Comm

Under the heading Configure Protocol, click Socket *n* to configure the DNPM port. You may accept all defaults or fill in the form according to the information following the figure below.

Figure 2-4 DNPM Ethernet Comm Channel Configuration



DNPM RTU Communication Channel Configuration

Socket # : 1 Port Name : Socket 1

Data Link Parameters		Scanner Application Parameters	
UDP Port	20000	Number of IEDs	0
Broadcast Address (XXX.XXX.XXX.XXX)	240.0.0.1	Receive time-out	5000 (ms)
UDP	Yes / No (selected)	Maximum com error count	3
Enable Time Broadcast	Yes (selected) / No	Scanner Application Retries	0
Rx Timeout *	5000 (ms)	Integrity scan interval	15 (sec)
		Time sync interval	15 (sec)
		Accumulator freeze time 1	3600 (sec)
		Accumulator freeze time 2	-1 (sec)
		Accumulator freeze time 3	-1 (sec)
		Accumulator freeze time 4	-1 (sec)
Message Setup		Frozen accum. read time	60 (sec)
Master RTU Address	65519	Running counters read interval	15 (sec)
Ack Frame Timeout	5000 (ms)	Fast Scan Cycles	15
Number of Frame Retries	0	Time Between Messages	250 (ms)
		Time Format	Local (selected) / UTC

Cancel Submit

2.6.1 Data Link Parameters

2.6.2 UDP Port

This is the port number for a User Datagram Protocol (UDP) socket connection. This connection is not used for polling IED data but configurable for devices that support this type of connection for broadcast time sync messages. Because almost all IEDs get the time sync message without using broadcast time sync, this can be left at the default. The default setting is 20000. Each additional port must be uniquely numbered. For questions and recommendations about port number assignments, see www.iana.org.

2.6.3 Broadcast Address (XXX.XXX.XXX.XXX)

This is the IP for an IED when using a UDP socket connection. This connection is not used for polling IED data but configurable for devices that support this type of connection for broadcast time sync messages. Because almost all IEDs get the time sync message without using broadcast time sync, this can be left at the default. The default setting is 240.0.0.1.

2.6.4 UDP

???

2.6.5 Enable Time Broadcast

???

2.6.6 Rx Timeout (0 to 60,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. Valid entries are in the range of 0-60000. The default setting is 5000ms (5 sec).

Please note: No configuration changes take effect until the RTU is reset.

2.6.7 Message Setup

2.6.8 Master RTU Address (0 to 65534)

This address is a unique address on the assigned communications channel of the polling RTU. Address 65535 is used only to broadcast to all stations by the MTU. Default is 65519.

2.6.9 Ack Frame Timeout (0 to 60,000ms)

The length of time the RTU waits for data link ack from the IED when requested. The ACK Frame Timeout default is 5000ms.

2.6.10 Number of Frame Retries (0 to 9)

The number of frame retries before an error is recorded. The default is 0.

2.6.11 Scanner Application Parameters

2.6.12 Number of IEDs (0 to 40)

Enter the number of Slave Devices connected to this communication channel. Default is 0.

2.6.13 Receive time-out (0-60,000ms)

Enter the receive timeout. The receive timeout is the length of time the DNPM task will wait for the entire message to be received from the IED. The default setting is 5000 (5 seconds).

Note: This value must be equal to, or greater than, the RX Timeout in Data Link Parameters.

2.6.14 Maximum com error count (0 to 100)

Enter the maximum comm error count per Slave Device before marking the points failed or setting the Comm Fail status point. The default is 3.

2.6.15 Scanner application retries (0 to 10)

Enter the number of scanner application retries. The default is 0.

2.6.16 Integrity scan interval (0 to 4320 sec)

Enter the number of seconds for the execution of an Integrity Scan. An integrity scan is a full refresh of all data from every IED on scan. The default is 15.

2.6.17 Time sync interval (0 to 3600 sec)

Enter the time for synchronizing the Slave Devices from the DNPM real-time clock. This is the time in seconds between time sync messages from the DNPM to the IEDs. The default is 15. Setting this value to zero disables the global broadcast of sending the time to the IEDs. If the IED requests the time via the protocol, the RTU will send the time.

2.6.18 Accumulator freeze time 1 (-1 to 3600 sec)

2.6.19 Accumulator freeze time 2 (-1 to 3600 sec)

2.6.20 Accumulator freeze time 3 (-1 to 3600 sec)

2.6.21 Accumulator freeze time 4 (-1 to 3600 sec)

Four entries are provided as a means of scheduling accumulator reads from the slave RTUs. Each entry represents the number of seconds after the hour. The RTU compares the present time to each entry to determine when to freeze and read the accumulators. It is possible to schedule various freeze times during the hour. Times of 900, 1800, 2700 and 3600 would enable freezes every fifteen minutes during the hour. Each freeze time may be disabled with an entry of -1.

2.6.22 Frozen accum. Read time (1 to 60 sec)

Enter the number of seconds to read the accumulators after an accumulator freeze. The default is 60.

Running counter reads are not performed during this time interval between ACC freeze and the read time expiration.

2.6.23 Running counters read interval (0 to 3600 sec)

The running accumulators are read according to this timer when the accumulator freeze schedule above is not populated. The default is 15.

2.6.24 Fast Scan Cycles (0 to 2048)

When an SBO command is issued to an IED, the IED is scanned immediately this amount of times for status changes. This expedites a status change to the RTU in large systems with many IEDs. The default is 15.

2.6.25 Time Between Messages (0 to 60,000 ms)

This is the minimum time between polls. The poll could take longer, depending on the number of IEDs and other factors, but the entered value sets the least time the poll will take. The default is 250 ms.

2.6.26 Time Format (Local, UTC)

Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regards to time syncs, set Time Format to Local Time. See Time Configuration Settings in the Configuration chapter of the hardware manual for time settings under the CPU block.

If you want to send time synchronization to this device, you must know whether the device will accept Local time or UTC time, then set this radio button to match.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

2.7 Point Operations

2.7.1 Serial Comm

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 2-5 IED Configuration

DNPM IED Configuration

Port # 3 Port Name : RTU to IED

IED #	IED Name	IED Address	Scan Type	Direct Operate	Direct Operate AO	32 bit AO	On Scan	Slave Config	Copy to IEDn	Export Import
1	DNPM_IED_1	1	2	Y	Y	N	Y	Edit	Copy	Exp Imp

Back

2.7.2 IED

The logical number of the IED on this communication channel.

2.7.3 IED Name

Click on the IED Name. A pop-up window will appear. See section 2.7.13.1.

2.7.4 IED Address

Reflects the entry in the pop-up menu. See section 2.7.13.1.

2.7.5 Scan Type

Reflects the entry in the pop-up menu. See section 2.7.13.1.

2.7.6 Direct Operate Function Controls

Reflects the entry in the pop-up menu. See section 2.7.13.1.

2.7.7 Direct Operate AO

Reflects the entry in the pop-up menu. See section 2.7.13.1.

2.7.8 32 bit AO

Reflects the entry in the pop-up menu. See section 2.7.13.1.

2.7.9 On Scan

Reflects the entry in the pop-up menu. See section 2.7.13.1.

Note: DNPM may be switched On Scan to Off Scan and vice versa without the need to reboot.

2.7.10 Slave Config

Click on Edit to edit the IED points. See section "2.7.32.1 Slave Configuration Edit".

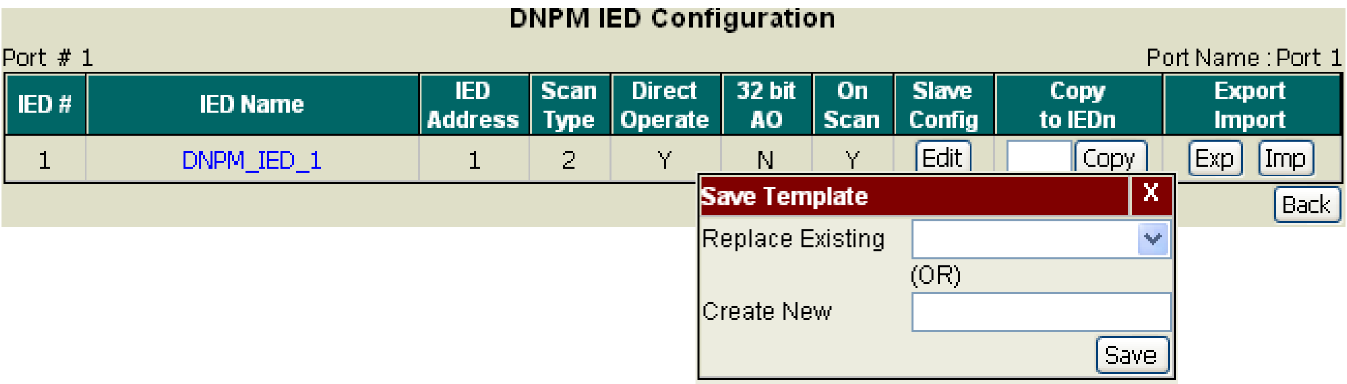
2.7.11 Copy to IEDn

This function copies everything in the IED configuration except the IED Name, the IED Address, and the Scan Type 5 Status Map. Enter the number of the target IED and click Copy.

2.7.12 Export

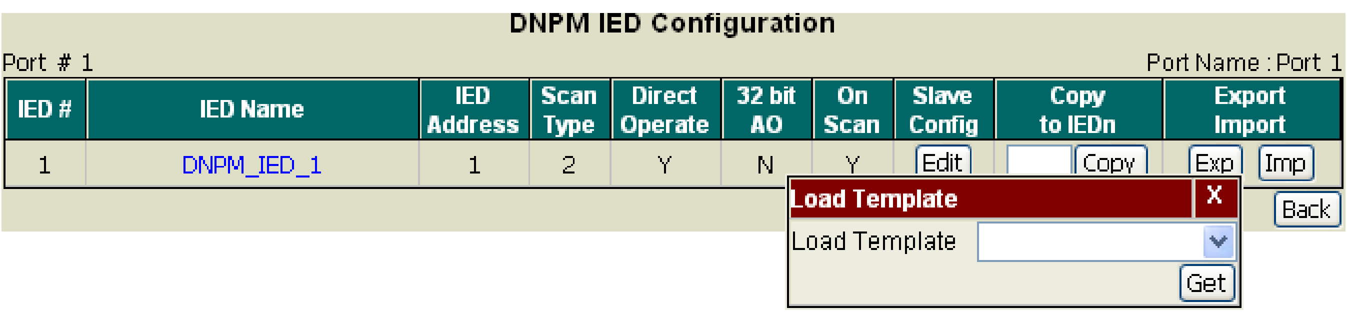
The Export function copies everything in the IED configuration except the IED Name, the IED Address, and the Scan Type 5 Status Map to an xml file. The Exp button exports a configuration in xml format from the IED to the RTU as a template. The templates are protocol/IED specific. This template is stored in the RTU. When you choose Up/Download tab and click on “Get” (get files from RTU), you will transfer these templates to your PC.

Choose from one of the existing file types (if present), or create a new xml file type. Click Save after your selection.



2.7.13 Import

The Imp button imports a configuration in xml format as shown below. Choose from one of the existing file types (if present) shown in the pull-down menu. If a new file type has been created under Export, that file type will also show up in the pull-down menu. When you set up another RTU, choose the Up/Download tab and click “Send” (send files to RTU), the template you save in the first RTU will be downloaded to the second RTU. Click Get after your selection below.



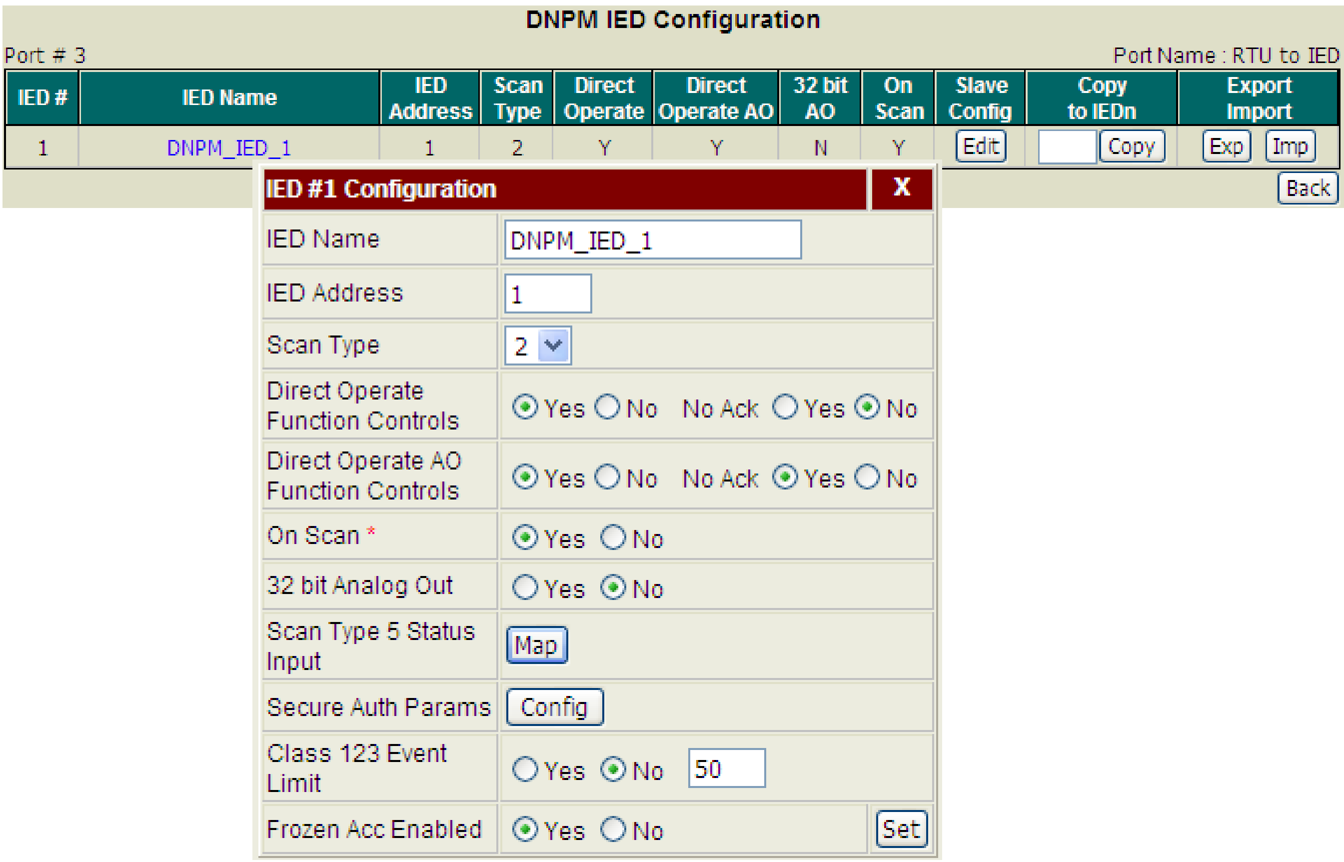
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

2.7.13.1 IED Name & Authentication Configuration

When you click the name of the IED (in blue characters), a pop-up menu will appear, as shown in Figure 2-6. Edit this pop-up window according to the directions below. After editing, your choices are reflected as explained under Figure 2-5.

Figure 2-6 IED Configuration



2.7.14 IED Name

Accept the default name or type a name of your choosing.

2.7.15 IED Address

Enter the IED address. The default is 1.

2.7.16 Scan Type

Enter the scan type. See section 2.1 for an explanation of the DNP scan types. The default is 2.

2.7.17 Direct Operate Function Controls

The DNPM IED configuration allows for three types of operation for controls.

1. Select-Before-Operate (SBO) in which two commands (Select/Execute) are sent to the IED to perform a control operation.

2. Direct Operate (single command) with an acknowledgement response

3. Direct Operate (single command) without an acknowledgment response

The IED's DNP profile should indicate which type of control functionality is appropriate.

The default type is Direct Operate with acknowledge.

Select first "Yes" radio button to enable Direct Operate (single command) controls.

Select first "No" radio button to enable SBO type controls. Note: Selection of "No" for this option renders "**No Ack**" irrelevant.

Select the second "Yes" (after **No Ack**) to send a Direct Operate – No Acknowledge function to the IED to perform a Direct Operate control.

Select the second "No" (after **No Ack**) to send a Direct Operate function to the IED to perform a Direct Operate control. (IED will send an acknowledge message).

Refer to the DNP3 documentation for further information about these functions.

2.7.18 Direct Operate AO Function Controls ???

The DNPM IED configuration allows for three types of operation for AO Function controls.

1. Direct Operate (single command) with an acknowledgement response
2. Direct Operate (single command) without an acknowledgment response

The IED's DNP profile should indicate which type of control functionality is appropriate.

The default type is Direct Operate without acknowledge.

Select first "Yes" radio button to enable Direct Operate (single command) AO.

Select the second "Yes" (after **No Ack**) to send a Direct Operate – No Acknowledge function to the IED to perform a Direct Operate AO.

Select the second "No" (after **No Ack**) to send a Direct Operate function to the IED to perform a Direct Operate AO. (IED will send an acknowledge message).

Refer to the DNP3 documentation for further information about these functions.

2.7.19 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled.

Note: DNPM may be switched On Scan to Off Scan and vice versa without the need to reboot.

2.7.20 32 bit Analog Out

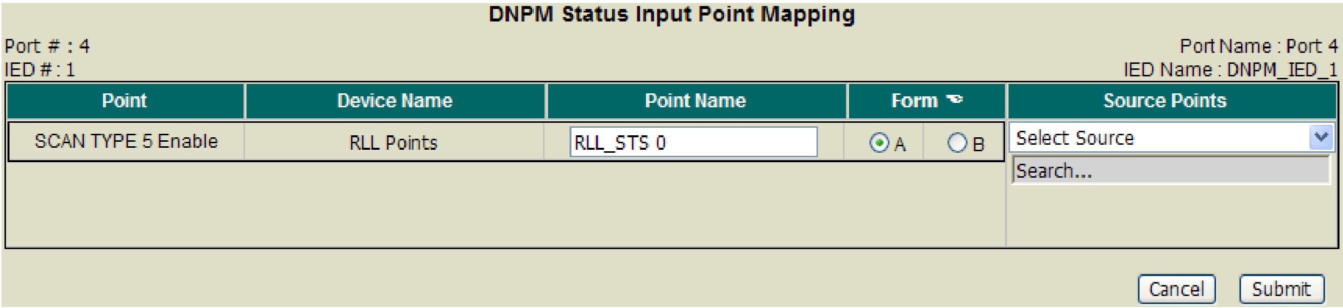
Select Yes if the IED is designed for 32 bit AOs. Select No if the IED is designed for 16 bit AOs.

2.7.21 Scan Type 5 Status Input

Scan Type 5 is a special scan type used when the RTU can't normally scan the IED on a regular schedule. However, controls will be delivered by the RTU to the IED as they are received from a protocol or an application running in the RTU. No scanning of the RTU is performed except when this mapped status point is set to 1. When an application sets the point to 1, the DNPM application detects the state change and then sends a Class 0 scan to the IED and sets the status point to 0. There is no guarantee that the IED answered the Class 0 scan request.

Map a point for use by the firmware to cause a scan of this IED to occur. The point must be one that the DNPM application can update. This is typically a RLL Binary Input type. As shown below.

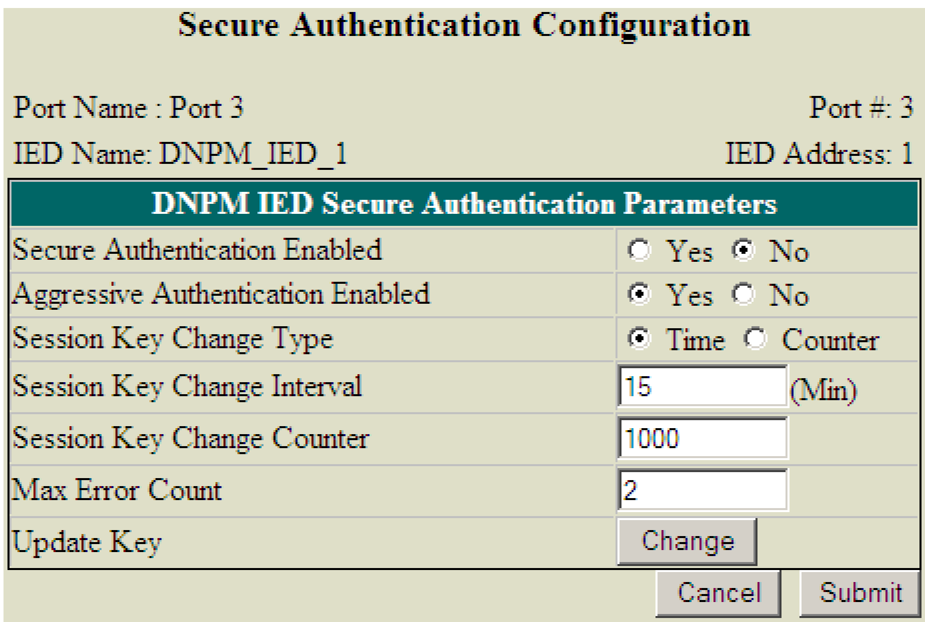
Figure 2-7 SCAN TYPE 5 Status Point Mapping



2.7.22 Secure Auth Params

Click Config next to Secure Auth Params to change those settings The following screen will appear.

Figure 2-8 Secure Auth Configuration Screen



The parameters are the same here as in DNPR with 1 exception/recommendation. The Session Key Change Interval/Counter should be half of the value which is configured in DNPR to ensure that Session Keys do not expire on the remote side, causing Secure Auth Errors and unnecessary messages being passed back and forth while a critical operation is waiting to be performed. Each device maintains its own Session Key Timer or Counter and once that timer expires on a DNPM device, a new Session Key is issued to the DNPR device. However, if the DNPR Session Key has expired but the DNPM Session Key Timer has not expired yet, a new Session Key will not be issued until the Max Error Count is exceeded.

2.7.23 Secure Authentication Enabled

By default, Secure Authentication is disabled. To enable it, click Yes next to Secure Authentication Enabled.

2.7.24 Aggressive Authentication Enabled

Aggressive Authentication is enabled by default. Aggressive authentication is less secure, but saves bandwidth.

2.7.25 Session Key Change Type

This defines whether Session Keys expire after a certain length of time or a certain number of secure authentication messages.

2.7.26 Session Key Change Interval

This number defines (in minutes) the length of time in which a new Session Key will become invalid. The default is 15 minutes.

2.7.27 Session Key Change Counter

This number defines the number of Secure Authentication messages which may be sent with a new Session Key before it becomes invalid.

2.7.28 Max Error Count

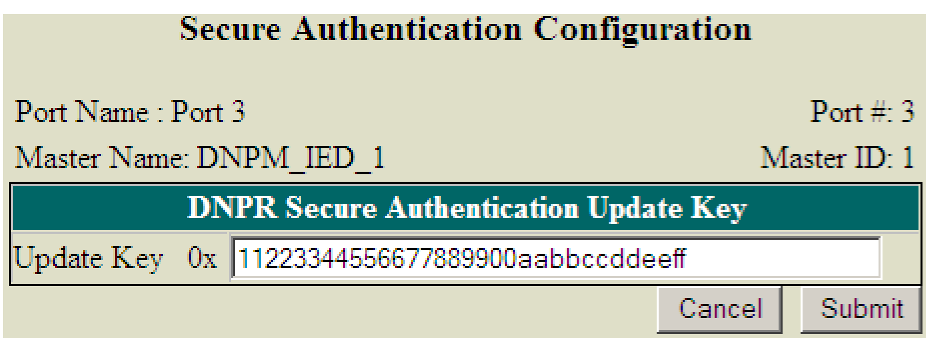
This number defines the maximum number of Secure Auth messages (Obj 120 v 7) may be sent or received with the current session key before it is invalidated.

2.7.29 Update Key

When the Change button is clicked, a Warning dialogue as shown below will appear. Heed the Warning and click OK.

This is the 128 bit Key which is used to decode/encode Session Key Change Messages in order to renegotiate Session Keys. This number should only be changed on a Secure Network or when directly connected to the RTU via a crossover cable, otherwise the security of the DNP messages would be compromised.

Figure 2-9 Secure Authentication Update Key



The Update Key is a 128 bit number which must be entered as 16 Bytes (32 characters). Only the numbers 0-9 and a-f are valid characters. The ASCII values entered are converted to the binary hexadecimal equivalent in the RTU.

2.7.30 Class 123 Event Limit

This information is used in any Class 1,2,3 scan request sent by the RTU to the IED.

If set to No (default), the RTU will request all events in the IED be sent to the RTU in the response (DNP 3.0 qualifier 6 for each of the 3 classes).

If set to yes, the RTU will request the entered value maximum events be sent by the IED in the response (DNP 3.0 qualifier 7 with the number of points set to the number entered from 1 to 255 (default 50) for each of the 3 classes).

2.7.31 Frozen Acc Enabled

Click Yes (default) to allow scanning of frozen accumulators and No to disallow.

2.7.32 Set / X

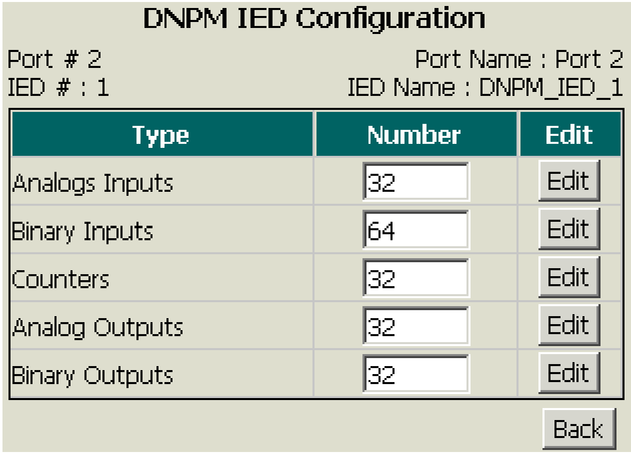
Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

2.7.32.1 Slave Configuration Edit

2.7.33 Slave Config

Click the Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 2-10 IED Configuration



2.7.34 Type

The type of point.

2.7.35 Number

Enter the number of points from your IED.

2.7.36 Edit

Click the Edit button to edit points.

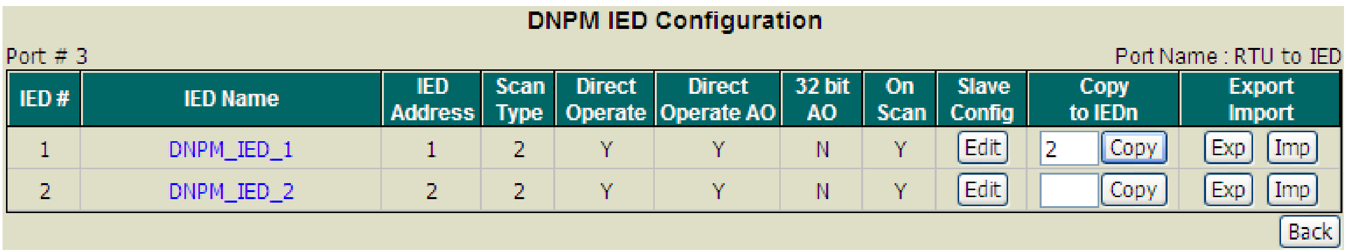
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

2.7.36.1 Copy to IEDn

Note: This function applies only if more than one IED is being set up.

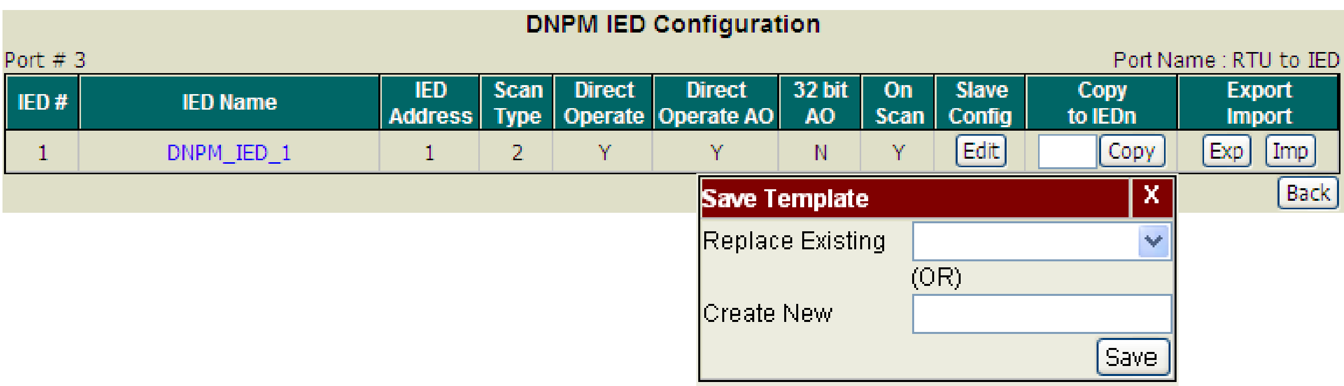
This function copies everything in the IED configuration except the IED Name, the IED Address, and the Scan Type 5 Status Map. Enter the number of the target IED and click Copy, as shown below.



2.7.36.2 Export

The Export function copies everything in the IED configuration except the IED Name, the IED Address, and the Scan Type 5 Status Map to an xml file. The Exp button exports a configuration in xml format from the IED to the RTU as a template. The templates are protocol/IED specific. This template is stored in the RTU. When you choose Up/Download tab and click on "Get" (get files from RTU), you will transfer these templates to your PC.

Choose from one of the existing file types (if present), or create a new xml file type. Click Save after your selection.



2.7.36.3 Import

The Imp button imports a configuration in xml format as shown below. Choose from one of the existing file types (if present) shown in the pull-down menu. If a new file type has been created under Export, that file type will also show up in the pull-down menu. When you set up another RTU, choose the Up/Download tab and click "Send" (send files to RTU), the template you save in the first RTU will be downloaded to the second RTU. Click Get after your selection below.

DNPM IED Configuration

Port # 3 — Port Name : RTU to IED

IED #	IED Name	IED Address	Scan Type	Direct Operate	Direct Operate AO	32 bit AO	On Scan	Slave Config	Copy to IEDn	Export Import
1	DNPM_IED_1	1	2	Y	Y	N	Y	Edit	Copy	Exp Imp

Load Template X

Load Template

Get

2.7.37 Ethernet Comm

From the Ethernet Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-11 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 2-11 IED Configuration

DNPM IED Configuration

Socket # 1 — Port Name : Socket 1

IED #	IED Name	IP Address : Port No.	IED Address	Scan Type	Direct Operate	Direct Operate AO	32 bit AO	On Scan	Slave Config	Copy to IEDn	Export Import
1	DNPM_IED_1	172.18.150.171 : 20000	1	2	Y	Y	N	Y	Edit	Copy	Exp Imp

2.7.38 IED

The logical number of the IED on this communication channel.

2.7.39 IED Name

Click on the IED Name. A pop-up window will appear. See section 2.7.48.1.

2.7.40 IP Address : Port No.

Reflects the entry in the pop-up menu. See section 2.7.48.1.

2.7.41 IED Address

Reflects the entry in the pop-up menu. See section 2.7.48.1.

2.7.42 Scan Type

Reflects the entry in the pop-up menu. See section 2.7.48.1.

2.7.43 Direct Operate

Reflects the entry in the pop-up menu. See section 2.7.48.1.

2.7.44 Direct Operate AO

Reflects the entry in the pop-up menu. See section 2.7.48.1.

2.7.45 32 bit AO

Reflects the entry in the pop-up menu. See section 2.7.48.1.

2.7.46 On Scan

Reflects the entry in the pop-up menu. See section 2.7.48.1.

Note: DNPM may be switched On Scan to Off Scan and vice versa without the need to reboot.

2.7.47 Slave Config

Click on Edit to edit the IED points. See section 2.7.32.1 Slave Configuration Edit.

2.7.48 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

2.7.48.1 IED Name & Address Configuration

When you click the name of the IED (in blue characters), a pop-up menu will appear, as shown in Figure 2-12. Edit this pop-up window according to the directions below. After editing, your choices are reflected as explained under Figure 2-11.

Figure 2-12 IED Configuration

Note: Except for the IED Address : Port No., explained below, the DNP IED Configuration for Ethernet is exactly the same as explained for Serial Comm Setup in **Section 2.7.13.1**

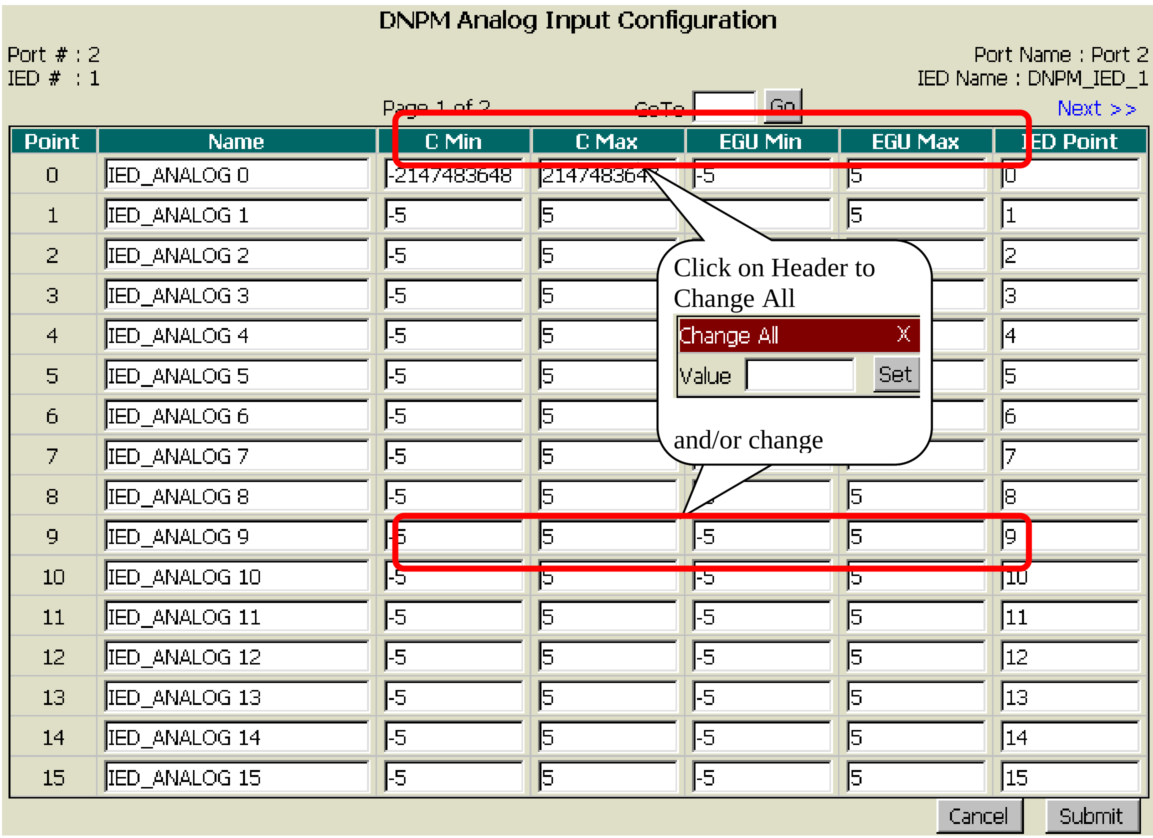
2.7.49 IP Address : Port No.

Enter the IED IP Address and the IED Port Number. Each additional port must be uniquely numbered. For questions and recommendations about port number assignments, see www.iana.org.

2.7.50 IED Analog Configuration

From the DNPM IED Configuration screen, click on Edit for Analogs. A screen similar to Figure 2-13 will appear.

Figure 2-13 DNPM Analog Input Configuration



Point

Protocol logical point number. This number cannot be changed.

2.7.51 Name

Enter the name of the point (or accept the default name).

2.7.52 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

2.7.53 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

2.7.54 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

2.7.55 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

2.7.56 IED Point

Identifies the specific ANA point (DNP index) to be obtained from the IED for each protocol logical point number. Enter the number of the point or accept the default number.

Navigation

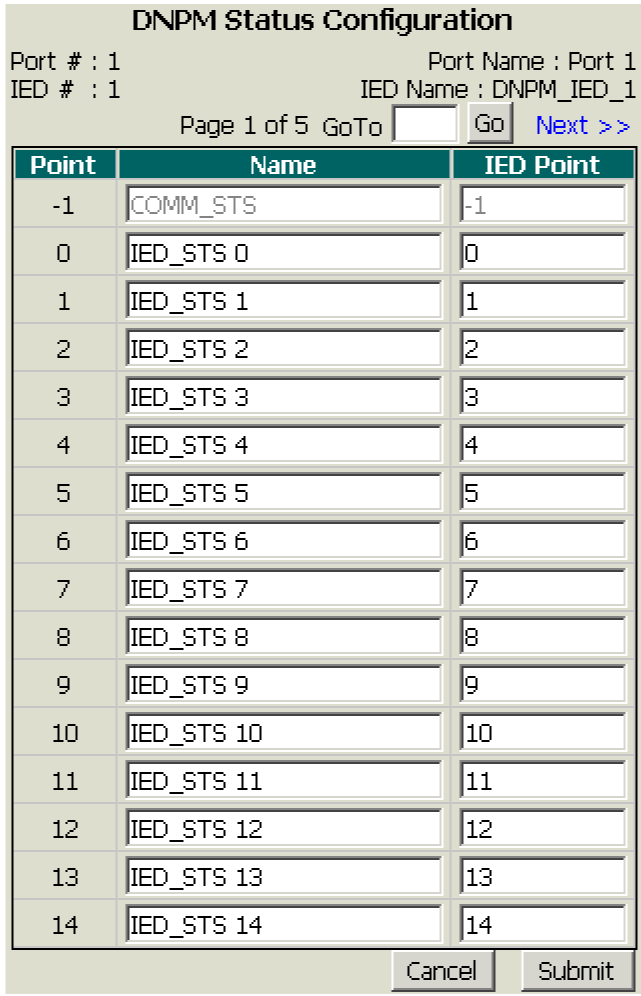
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

2.7.57 IED Status Configuration

From the DNPM IED Configuration screen, click on Edit for Status. A screen similar to Figure 2-14 will appear.

Figure 2-14 DNPM Status Input Configuration



2.7.58 Point

Protocol logical point number. This number cannot be changed. The COMM_STS point is automatically assigned to show whether the DNPM comm. channel is working or not. The RTU for DNPM will support up to 1024 binary input points.

2.7.59 Name

Enter the name of the point (except for COMM_STS which can not be changed) or accept the default name.

2.7.60 IED Point

Identifies the specific STS point (DNP index) to be obtained from the IED for each protocol logical point number. Enter the number of the point (except for COMM_STS which cannot be changed) or accept the default number.

Navigation

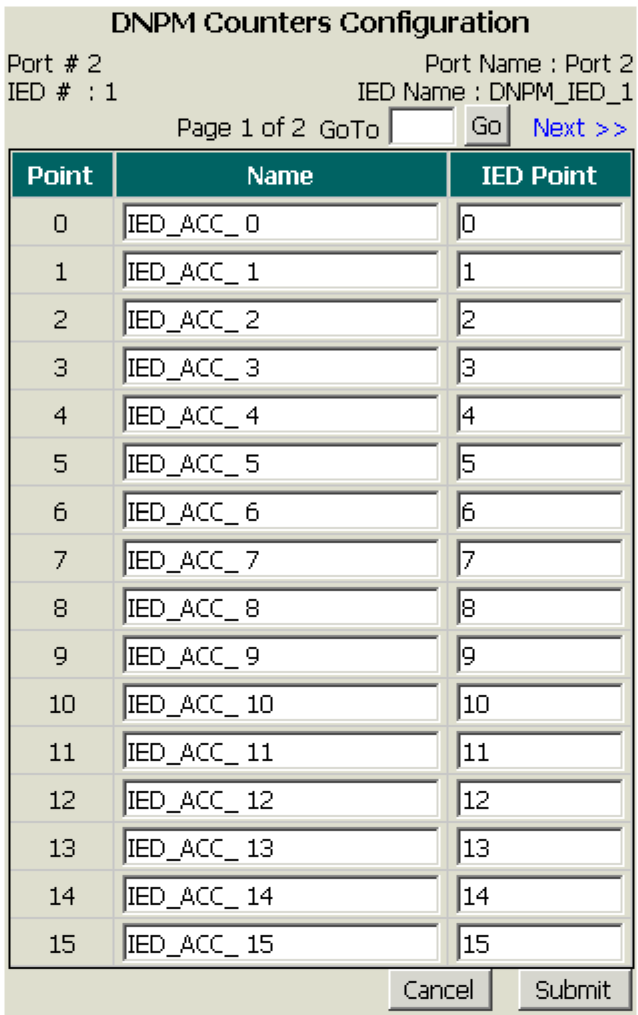
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

2.7.61 IED Counters Configuration

From the DNPM IED Configuration screen, click on Edit for Counters. A screen similar to Figure 2-15 will appear.

Figure 2-15 DNPM Counters Configuration



2.7.62 Point

Protocol logical point number. This number cannot be changed.

2.7.63 Name

Enter the name of the point or accept the default name.

2.7.64 IED Point

Identifies the specific Counter point (DNP index) to be obtained from the IED for each protocol logical point number. Enter the number of the point or accept the default number.

Navigation

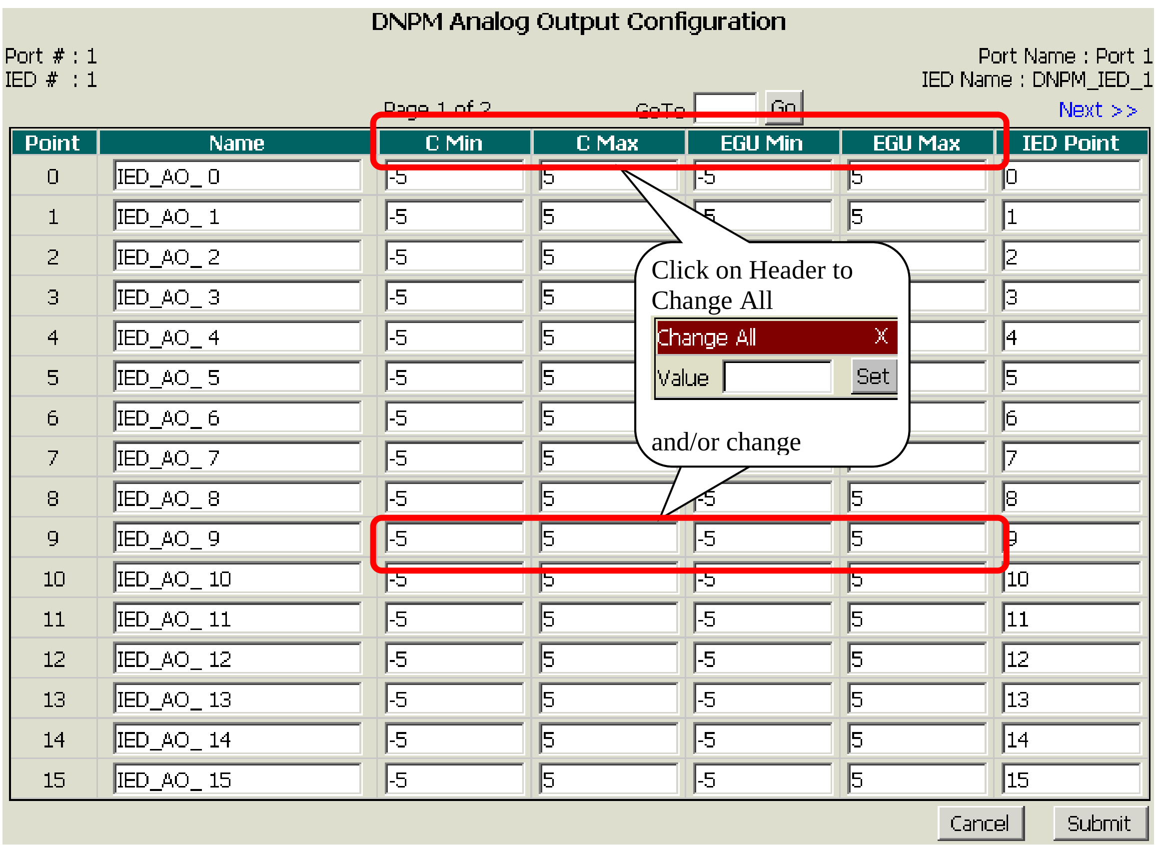
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

2.7.65 IED Analog Output Configuration

From the DNPM IED Configuration screen, click on Edit for Analog Output. A screen similar to Figure 2-16 will appear.

Figure 2-16 DNPM Analog Output Configuration



Point	Name	C Min	C Max	EGU Min	EGU Max	IED Point
0	IED_AO_ 0	-5	5	-5	5	0
1	IED_AO_ 1	-5	5	5	5	1
2	IED_AO_ 2	-5	5			2
3	IED_AO_ 3	-5	5			3
4	IED_AO_ 4	-5	5			4
5	IED_AO_ 5	-5	5			5
6	IED_AO_ 6	-5	5			6
7	IED_AO_ 7	-5	5			7
8	IED_AO_ 8	-5	5	-5	5	8
9	IED_AO_ 9	-5	5	-5	5	9
10	IED_AO_ 10	-5	5	-5	5	10
11	IED_AO_ 11	-5	5	-5	5	11
12	IED_AO_ 12	-5	5	-5	5	12
13	IED_AO_ 13	-5	5	-5	5	13
14	IED_AO_ 14	-5	5	-5	5	14
15	IED_AO_ 15	-5	5	-5	5	15

2.7.66 Point

Protocol logical point number. This number cannot be changed

2.7.67 Name

Enter the name of the point (or accept the default name)

2.7.68 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header

2.7.69 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header

2.7.70 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header

2.7.71 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header

2.7.72 IED Point

Identifies the specific ANA point (DNP index) to be obtained from the IED for each protocol logical point number. Enter the number of the point or accept the default number.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

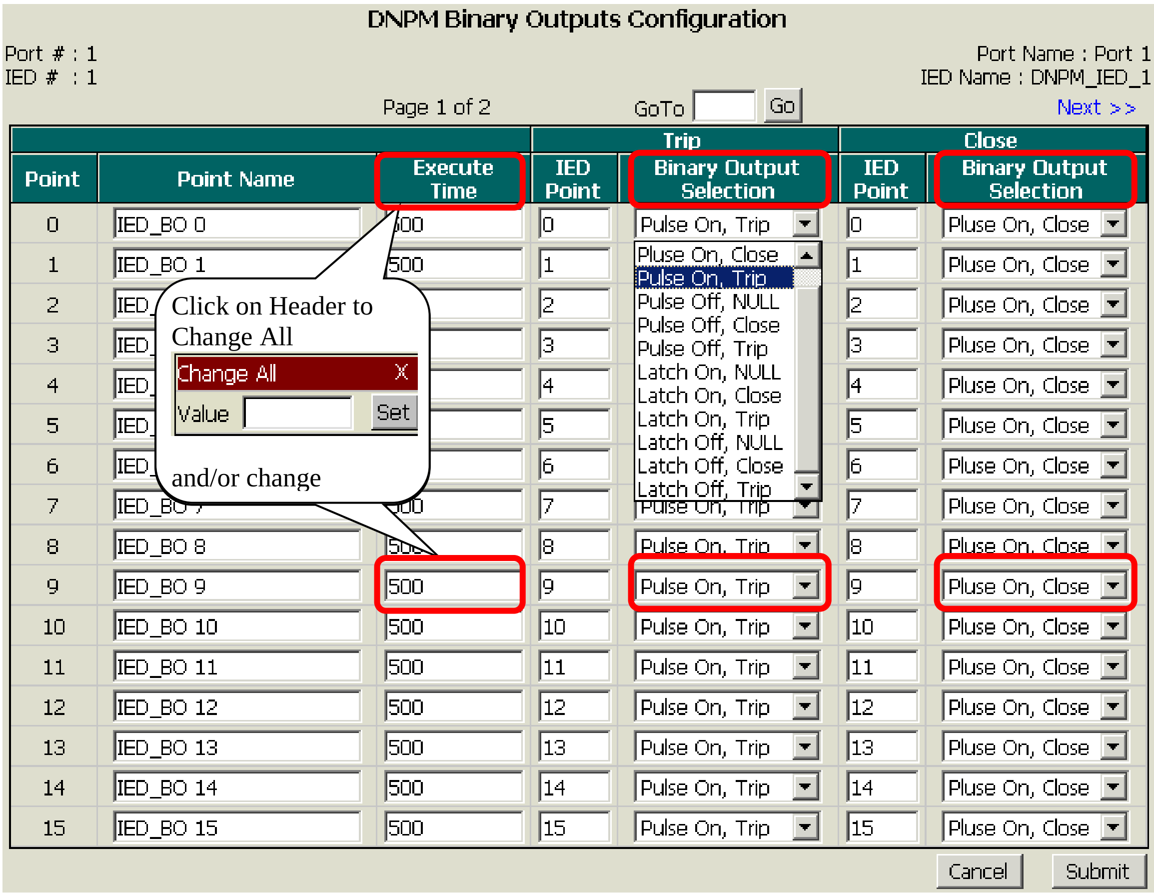
Please note: No configuration changes take effect until the RTU is reset.

2.7.73 IED Binary Outputs Configuration

Click on Edit for Binary Outputs. A screen similar to Figure 2-17 will appear.

IED Binary Outputs provides the correct combinations of Pulse On, Pulse Off, Latch On, Latch Off, Null, Close, and Trip for those IEDs that need this degree of control. The RTU sends the Binary Output codes to the Control Relay Output Block (Data Object 12, Variation 1), code field.

Figure 2-17 DNPM Binary Outputs Configuration



2.7.74 Point

Protocol logical point number. This number cannot be changed

2.7.75 Point Name

Enter the name of the point (or accept the default name)

2.7.76 Execute Time

Enter the Execute Time (or accept the default)

2.7.77 Trip-IED Point

Enter this number from the documentation provided with the Slave.

2.7.78 Trip-Binary Output Selection

From the drop-down menu, select the appropriate function. See the vendor's documentation.

2.7.79 Close-IED Point

Enter this number from the documentation provided with the Slave.

2.7.80 Close-Binary Output Selection

From the drop-down menu, select the appropriate function. See the vendor's documentation.

Navigation

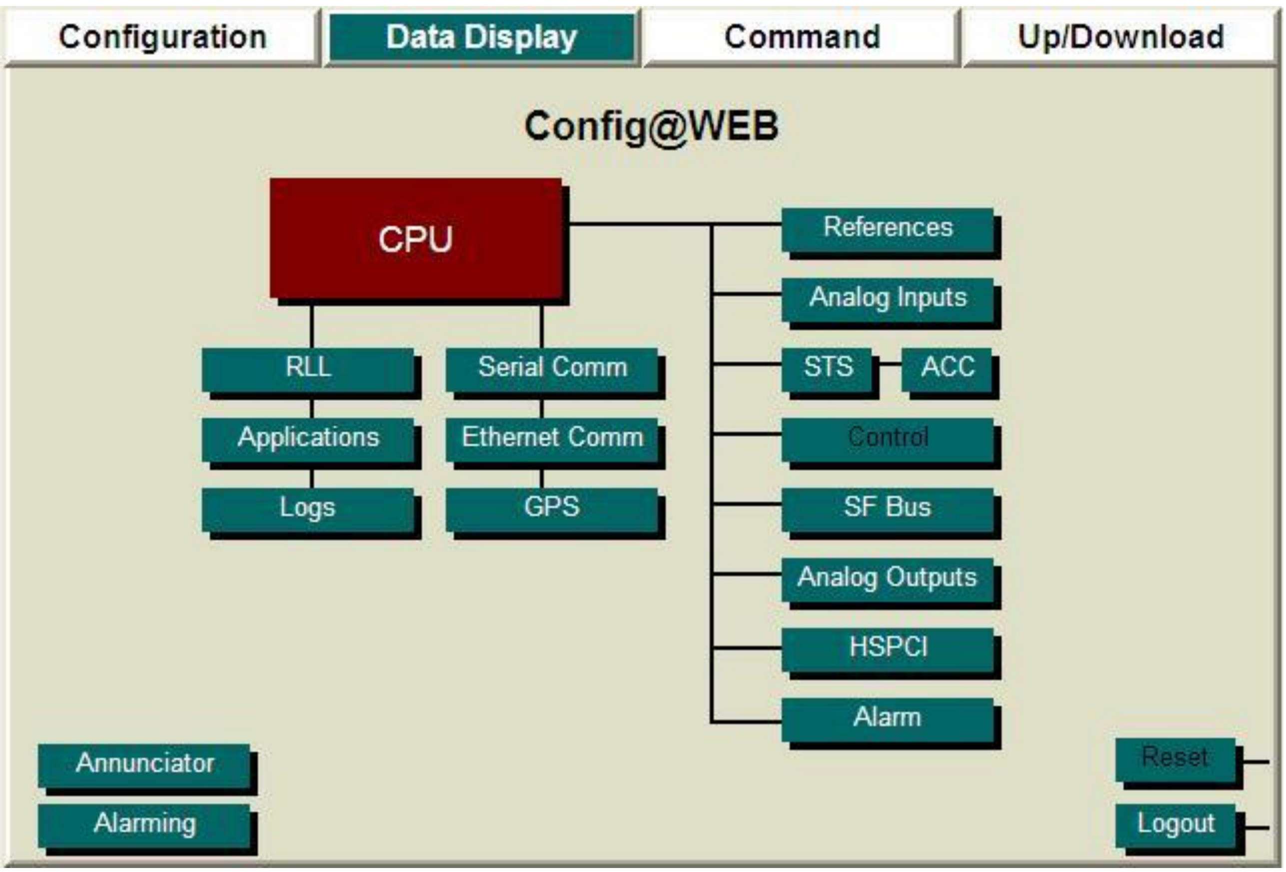
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

2.8 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 2-18 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 2-19 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Master to RTU	DNPR	View	Port Data
Port #2	K	K	Backup	DNPR	View	Port Data
Port #3	K	K	RTU to IED	DNPM	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Display Back

2.8.1 Port Number

Physical Port number of the RTU.

2.8.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

2.8.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

2.8.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

2.8.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

2.8.3 Name

The port name given during configuration or default name accepted.

2.8.4 Protocol

The configured protocol for this port.

2.8.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

2.8.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

Navigation

Click the Back button to return to the previous screen.

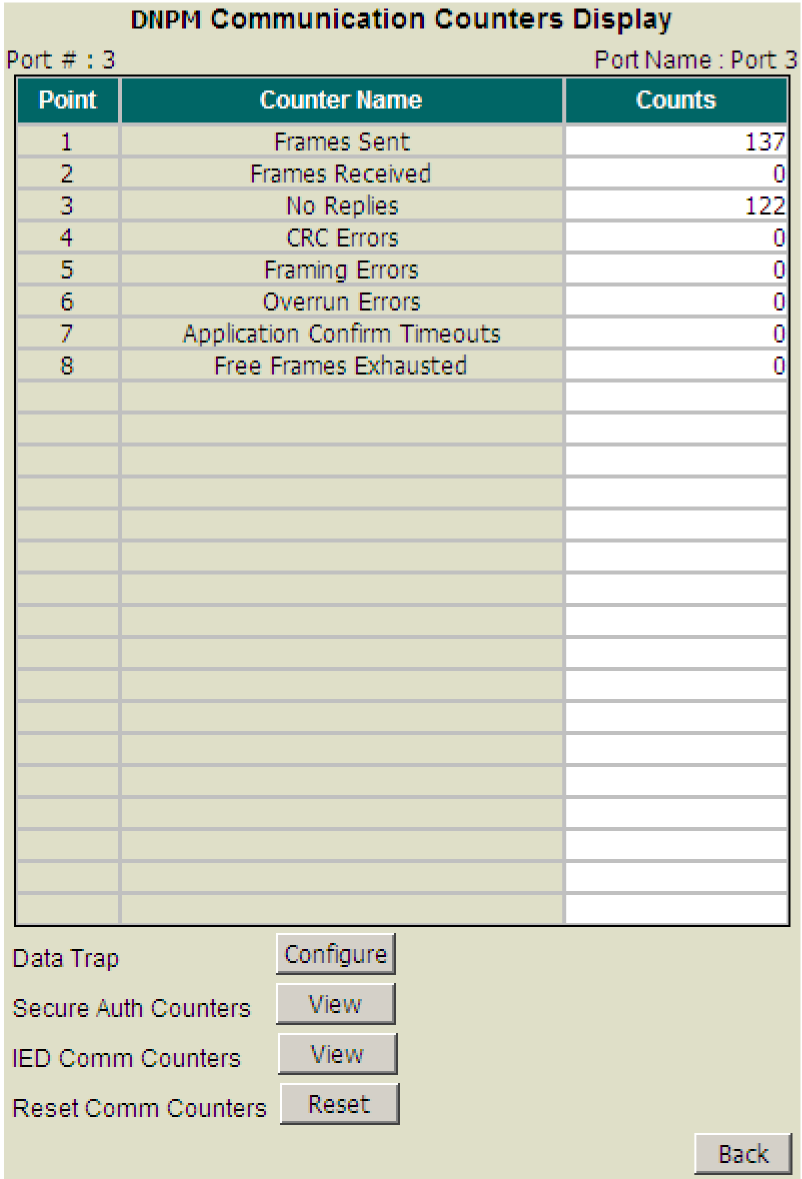
2.8.6.1 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

2.8.7 Serial Comm Counters Display

Under Comm Counters, click View to get the screen shown below.

Figure 2-20 DNPM Serial Communication Counters Display



2.8.8 Point Number

A logical point number for reference only.

2.8.9 Counter Name

The following counters are monitored:

2.8.9.1 Frames Sent

This indicates the cumulative number of transmitted frames since the last reset or power-up.

2.8.9.2 Frames Received

This indicates the cumulative number of received frames since the last reset or power-up.

2.8.9.3 No Replies

This indicates the cumulative number of transmitted frames that did not receive a response since the last reset or power-up. This count can be affected by the Rx timeout delay.

2.8.9.4 CRC Errors

This indicates the cumulative number of received frames with CRC errors since the last reset or power-up. This can be affected by parity and MTO.

2.8.9.5 Framing Errors

This indicates the cumulative number of framing errors since the last reset or power-up. This can be affected by parity.

2.8.9.6 Overrun Errors

This indicates the cumulative number of over-run errors since the last reset or power-up.

2.8.9.7 Application Confirm Timeouts

This indicates the cumulative number of Application Confirm Timeouts since the last reset or power-up.

2.8.9.8 Free Frames Exhausted

This counter increments whenever a message is received and there are no more free frames in memory to store the incoming message. If the counter is incrementing, it indicates a critical memory shortage problem with the DNP Data Link task, and Telvent tech support should be called.

2.8.10 Counts

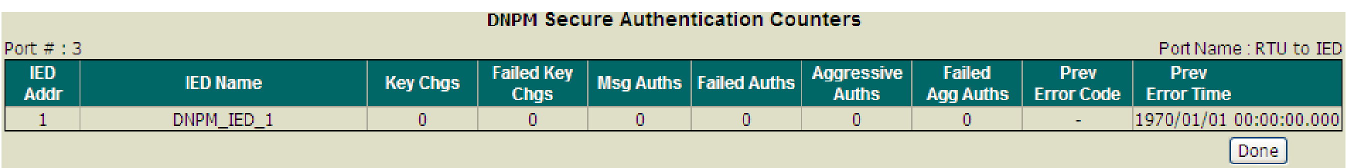
The counts for each type of Counter.

2.8.10.1 Data Trap

Please see the Config@WEB Secure Software Users Guide.

2.8.10.2 Secure Auth Counters

A Secure Authentication Counter is ??? Click this button to see the following breakout.



DNPM Secure Authentication Counters

Port # : 3 Port Name : RTU to IED

IED Addr	IED Name	Key Chgs	Failed Key Chgs	Msg Auths	Failed Auths	Aggressive Auths	Failed Agg Auths	Prev Error Code	Prev Error Time
1	DNPM_IED_1	0	0	0	0	0	0	-	1970/01/01 00:00:00.000

Done

2.8.11 IED Addr

The address of the IED

2.8.12 IED Name

The name of the IED.

2.8.13 Key Chgs

The number of times the Session Key has changed since the last reboot.

2.8.14 Failed Key Chgs

The number of failed Session Key changes since the last reboot.

2.8.15 Msg Auths

The number of critical messages which have been successfully authenticated.

2.8.16 Failed Auths

The number of critical messages in which authentication has failed.

2.8.17 Aggressive Auths

The number of critical messages which have been successfully been authenticated using the Aggressive Authentication method.

2.8.18 Failed Agg Auths

The number of critical message which have failed to be authenticated using the Aggressive Authentication method.

2.8.19 Prev Error Code

The error code associated with the last Authentication failure.

2.8.20 Prev Error Time

The time of the last Authentication failure.

2.8.20.1 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

DNPM IED Comm Counters Display

Port # : 4 Port Name : Port 4

IED #	IED Name	Messages Sent	Messages Received	No Replys	Format Errors	Object Errors	Internal Indications
1	DNPM_IED_1	24	8	16	0	0	0300
2	DNPM_IED_2	22	0	21	0	0	0000

Done

2.8.21 IED

The number of the IED

2.8.22 IED Name

The name of the IED

2.8.23 Messages Sent

Messages sent to this IED since the last reset or since the last time the counters were cleared.

2.8.24 Messages Received

Messages received from this IED since the last reset or since the last time the counters were cleared.

2.8.25 No Replies

The number of no replies from this IED since the last reset or since the last time the counters were cleared.

2.8.26 Format Errors

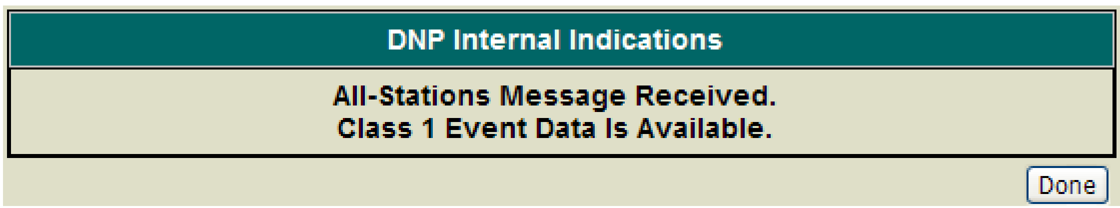
The number of format errors from this IED since the last reset or since the last time the counters were cleared.

2.8.27 Object Errors

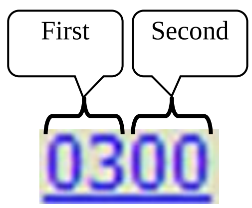
The number of object errors from this IED since the last reset or since the last time the counters were cleared.

2.8.28 Internal Indications

The Internal Indications field show the particular message when you click on it. For instance, in the example above, IED 1 has an internal indication of 0300. When this number is clicked, the message appears as follows.



The code shown in the example above is in hex. Sometimes the message comes and goes too quickly to be clicked on. In that case, it's useful to understand what the code means. Below the following figure is an interpretation of the hex code.



You must translate from hex to binary to interpret this code. For instance, let’s examine the above code reading of 0300. The first octet is 03. The second octet is 00. Converting 03 from hex to binary yields 00000011. Now let’s examine the meaning of this number from the listing below:

From below, 00000011 yields bit position 1 and bit position 0.

Bit Position 0 means All stations message received.

Bit Position 1 means Class 1 data available.

These two messages are displayed in plain English in the example above.

The second octet is all zeros (0), so there is no meaningful state.

The following listing is a direct quote from DNP Basic 4 Document:

The Internal Indications (IIN) field is a two-octet field that follows the function code in all responses. When a request cannot be processed due to formatting errors or the requested data is not available, the IIN is always returned with the appropriate bits set.

First Octet	Second Octet

First Octet

7	6	5	4	3	2	1	0

A one (1) in the bit position indicates the described state.

Bit 0 – All stations message received
– Set when a request is received with the destination address of the all stations address (ffff hexadecimal).
– Cleared after next response (even if response to global request is required)
– Used to let the master station know that a Broadcasted message was received by this station.

Bit 1 – Class 1 data available
– Set when data that has been configured as Class 1 data is ready to be sent to the master
– Master station should request this class data from the Outstation when this bit is set in a response

Bit 2 – Class 2 data available
– Set when data that has been configured as Class 2 data is ready to be sent to the master
– Master station should request this class data from the Outstation when this bit is set in a response

Bit 3 – Class 3 data available
– Set when data that has been configured as Class 3 data is ready to be sent to the master
– Master station should request this class data from the Outstation when this bit is set in a response

Bit 4 – Time- synchronization required from the master. The master synchronizes the time by writing the Time and Date object to the Outstation.
– Cleared when the time is set by the master. This bit is also cleared when the master explicitly writes a 0 into this bit of the Internal Indication object of the Outstation.

Bit 5 – Set when some or all of the Outstation's digital output points are in the Local state. That is, the Outstation's control outputs are NOT accessible through the DNP protocol.
– Clear when the Outstation is in the Remote state. That is, the Outstation's control outputs are accessible through the DNP protocol.

Bit 6 – Device trouble - Set when an abnormal condition exists at the Outstation. The device profile for a given device states the conditions that effect this bit.
– This should only be used when the state can not be described by a combination of one or more of the other IIN bits.

Bit 7: – Device restart
– Set when the user application at the Outstation restarts.

– Cleared when the master explicitly Writes a 0 into this bit of the Internal Indications object in the Outstation.

Second Octet

7	6	5	4	3	2	1	0

Bit 0 – Function code not implemented

Bit 1 – Requested object(s) unknown. The Outstation does not have the specified objects or there are no objects assigned to the requested class.
– This indication should be used for debugging purposes and usually indicates a mismatch in device profiles or configuration problems.

Bit 2 – Parameters in the qualifier, range or data fields are not valid or out of range. This is a catch- all for application request formatting errors.
– This indication should be used for debugging purposes and usually indicates configuration problems.

Bit 3 – Event buffer(s), or other application buffers have overflowed. For example, COS/ SOE buffers have overflowed.
– The master should attempt to recover as much data as possible and indicate to the user that their may be lost data. The appropriate error recovery procedures should be initiated by the user.

Bit 4 – Request understood but requested operation is already executing.

Bit 5 – Set to indicate that the current configuration in the Outstation is corrupt and that the master application layer should inform the user of this exception. The master may download another configuration to the Outstation. Note that sometimes a corrupt configuration will disable an Outstation, making it impossible to communicate this condition to a master station.

Bit 6 – Reserved for use by agreement, currently always returned as zero (0).

Bit 7 – Reserved for use by agreement, currently always returned as zero (0).

Click Done to return to the overall comm. counters screen.

2.8.28.1 Reset Comm Counters

Click this button to reset all comm. counters.

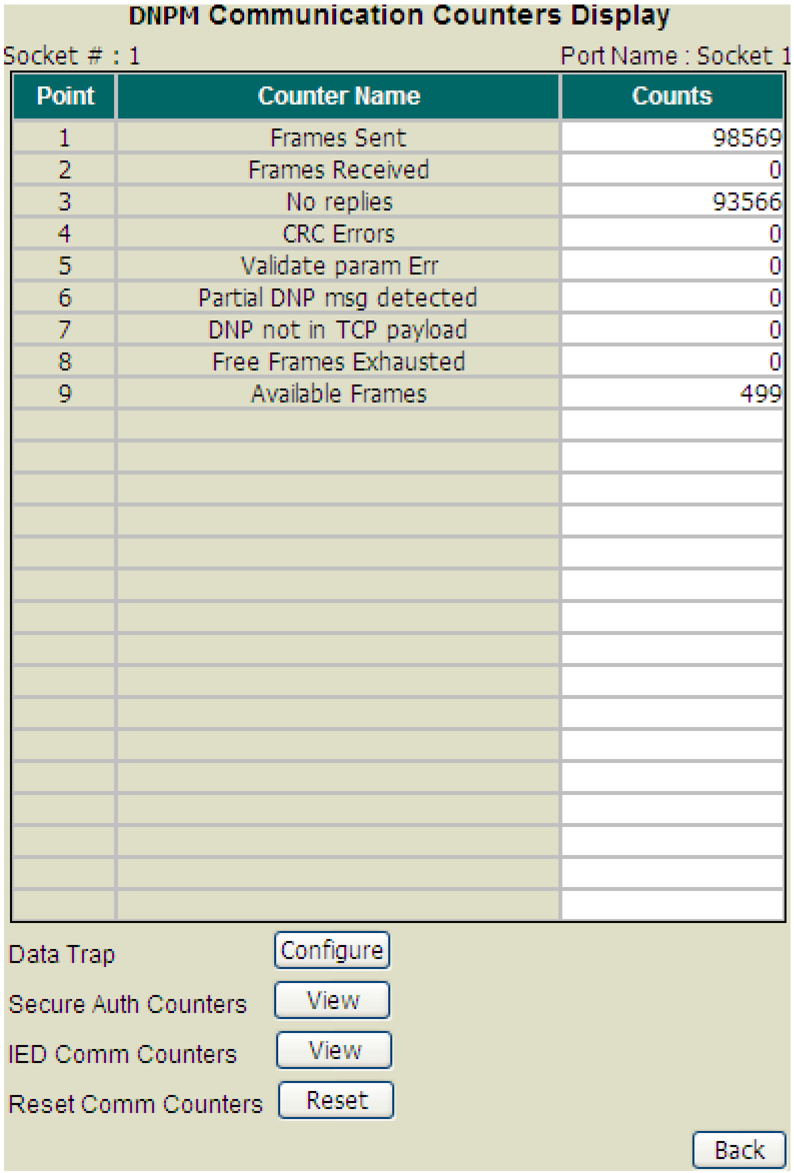
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

2.8.29 Ethernet Comm Counters Display

Under Comm Counters, click View to get the screen shown below.

Figure 2-21 DNPM Ethernet Communication Counters Display



2.8.30 Point Number

A logical point number for reference only.

2.8.31 Counter Name

The following counters are monitored:

2.8.31.1 Frames Sent

This indicates the cumulative number of transmitted frames since the last reset or power-up.

2.8.31.2 Frames Received

This indicates the cumulative number of received frames since the last reset or power-up.

2.8.31.3 No Replies

This indicates the cumulative number of transmitted frames that did not receive a response since the last reset or power-up. This count can be affected by the Rx timeout delay.

2.8.31.4 CRC Errors

This indicates the cumulative number of received frames with CRC errors since the last reset or power-up. This can be affected by parity and MTO.

2.8.31.5 Validate param Err

This counter indicates that a key parameter needed by the “Validation” parser was out of specification, and prevented the parser from examining the message buffer. This is a rare occurrence, but may provide useful troubleshooting information if it is happening.

2.8.31.6 Partial DNP msg detected

This counter indicates that it took more than one read of the TCP/IP message buffer to obtain a complete DNP request message. A DNP request message is usually relatively small (~15 – 30 bytes), so it should be unusual for the request to be broken out over multiple TCP/IP buffers. This may provide useful troubleshooting information.

2.8.31.7 DNP not in TCP payload

This counter indicates that when the TCP/IP buffer was read and examined, no valid DNP message was found in the buffer. This may provide useful troubleshooting information.

2.8.31.8 Free Frames Exhausted

This counter increments whenever a message is received and there are no more free frames in memory to store the incoming message. If the counter is incrementing, it indicates a critical memory shortage problem with the DNP Data Link task, and Telvent tech support should be called.

2.8.31.9 Available Frames

This counter keeps track of how many frames out of the original 500 are left for messages. Normally, the number will be 499, because after a frame gets used, it is returned to the Available Frames pool.

2.8.32 Counts

The counts for each type of Counter.

2.8.33 Data Trap

Please see the Config@WEB Secure Software Users Guide.

2.8.34 Secure Auth Counters

Please see Secure Auth Counters under Serial Comm Counters Display.

2.8.35 IED Comm Counters

Please see IED Comm Counters under Serial Comm Counters Display.

2.8.36 Reset Comm Counters

Click this button to reset all comm. counters.

2.8.37 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 2-22 DNPM IED Display

DNPM IED Display

Socket # : 1

Port Name : Socket 1

IED #	IED Name	IED Address	Scan Type	Direct Operate Function Controls	Direct Operate AO Function Controls	On Scan	Slave Data
1	DNPM_IED_1	1	2	Y	Y	Y	View

Back

2.8.38 IED

The logical number of the IED on this communication channel.

2.8.39 IED Name

The name that was chosen, or accepted as default, during configuration.

2.8.40 IED Address

The IED Address chosen during configuration.

2.8.41 Scan Type

The scan type that was chosen during configuration. See section 2.1 for an explanation of the DNP scan types.

2.8.42 Direct Operate Function Controls

Reflects the choice made during configuration.

2.8.43 Direct Operate AO Function Controls

Reflects the choice made during configuration.

2.8.44 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

2.8.45 Slave Data

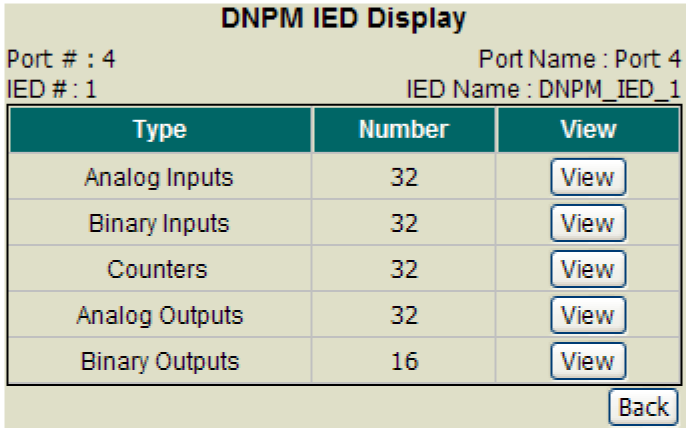
Click View to examine the data being returned from this device. A screen similar to the one below will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the DNP IED Display screen, click View under Slave Data to get the screen shown below.

Figure 2-23 DNPM IED Display



2.8.46 Type

The type of point.

2.8.47 Number

The number of points from your IED.

2.8.48 View

Click the View button to view points.

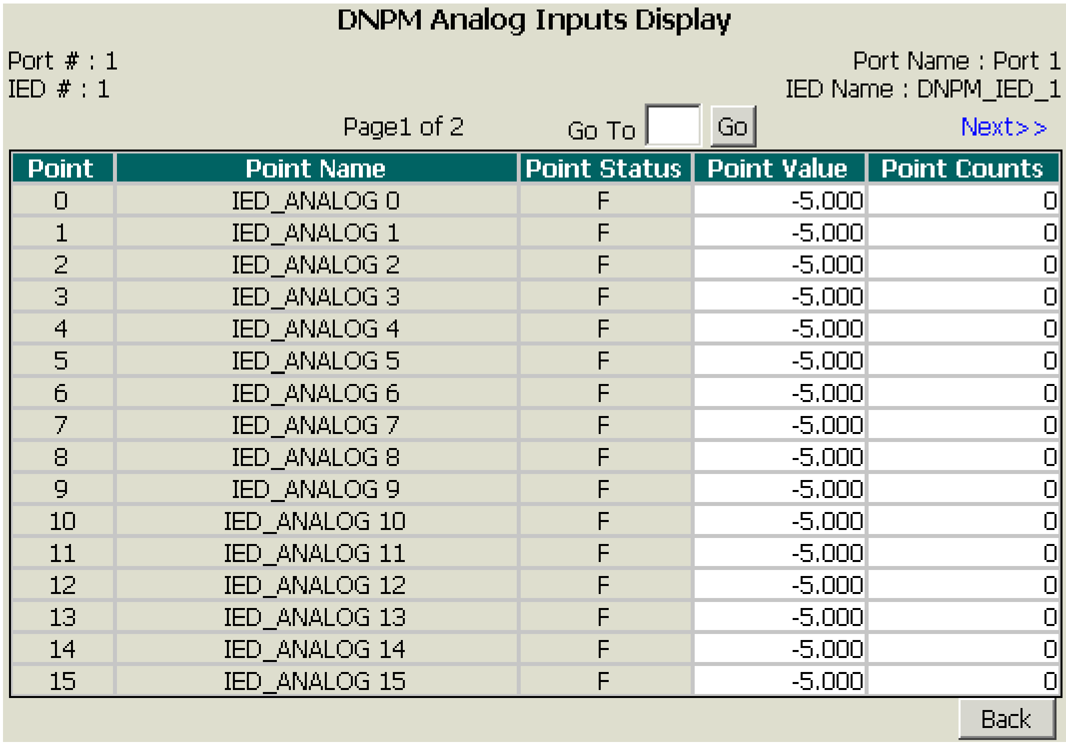
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the previous screen.

2.8.48.1 Analog Inputs

From the DNPM IED Display screen, click View for Analog Inputs to get the screen shown in Figure 2-24.

Figure 2-24 DNPM Analog Inputs Display



DNPM Analog Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : DNPM_IED_1

Page1 of 2 Go To Go Next>>

Point	Point Name	Point Status	Point Value	Point Counts
0	IED_ANALOG 0	F	-5.000	0
1	IED_ANALOG 1	F	-5.000	0
2	IED_ANALOG 2	F	-5.000	0
3	IED_ANALOG 3	F	-5.000	0
4	IED_ANALOG 4	F	-5.000	0
5	IED_ANALOG 5	F	-5.000	0
6	IED_ANALOG 6	F	-5.000	0
7	IED_ANALOG 7	F	-5.000	0
8	IED_ANALOG 8	F	-5.000	0
9	IED_ANALOG 9	F	-5.000	0
10	IED_ANALOG 10	F	-5.000	0
11	IED_ANALOG 11	F	-5.000	0
12	IED_ANALOG 12	F	-5.000	0
13	IED_ANALOG 13	F	-5.000	0
14	IED_ANALOG 14	F	-5.000	0
15	IED_ANALOG 15	F	-5.000	0

Back

2.8.49 Point

Protocol logical point number.

2.8.50 Point Name

The name of the point assigned during configuration.

2.8.51 Point Status

Please see the Point Status Codes section of the Config@WEB Secure Software Users Guide.

2.8.52 Point Value

The engineering unit (EGU) value.

2.8.53 Point Counts

The counts from the IED.

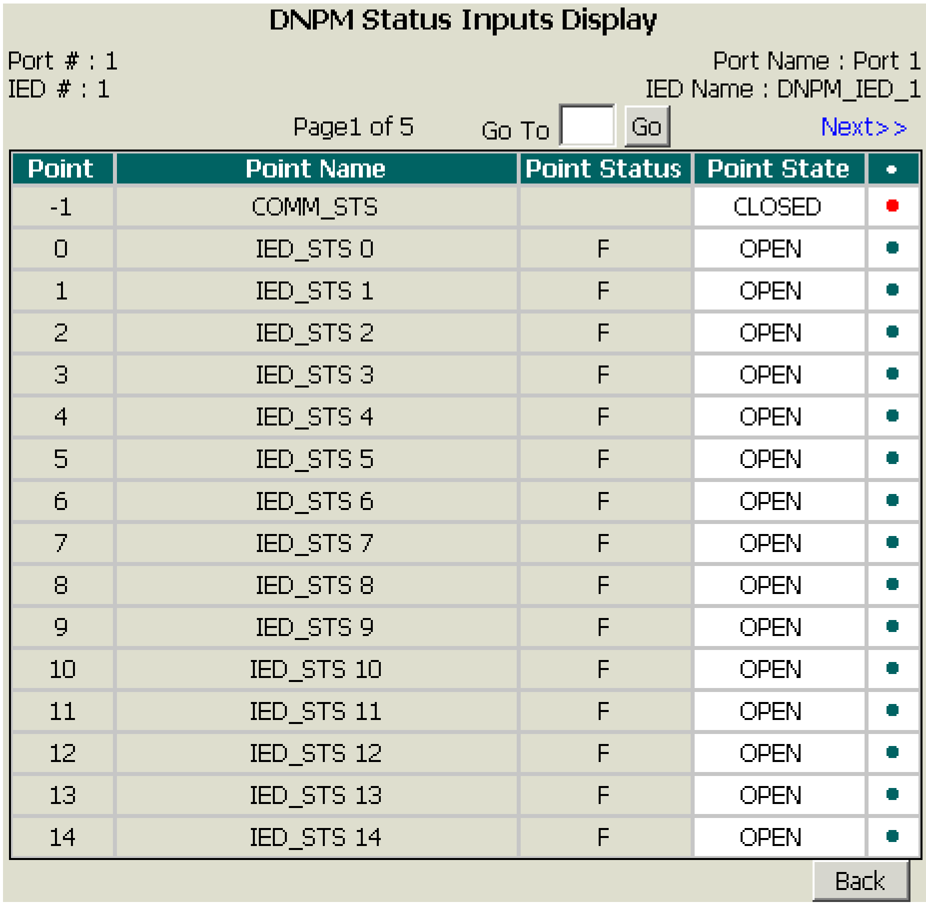
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

2.8.53.1 Status Inputs

From the DNPM IED Display screen, click View for Status Inputs to get the screen shown in Figure 2-25.

Figure 2-25 DNPM Status Inputs Display


DNPM Status Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : DNPM_IED_1

Page1 of 5 Go To Go Next>>

Point	Point Name	Point Status	Point State	•
-1	COMM_STS		CLOSED	•
0	IED_STS 0	F	OPEN	•
1	IED_STS 1	F	OPEN	•
2	IED_STS 2	F	OPEN	•
3	IED_STS 3	F	OPEN	•
4	IED_STS 4	F	OPEN	•
5	IED_STS 5	F	OPEN	•
6	IED_STS 6	F	OPEN	•
7	IED_STS 7	F	OPEN	•
8	IED_STS 8	F	OPEN	•
9	IED_STS 9	F	OPEN	•
10	IED_STS 10	F	OPEN	•
11	IED_STS 11	F	OPEN	•
12	IED_STS 12	F	OPEN	•
13	IED_STS 13	F	OPEN	•
14	IED_STS 14	F	OPEN	•

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not the comm. channel is operational. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

2.8.54 Point

Protocol logical point number.

2.8.55 Point Name

The name of the point assigned during configuration.

2.8.56 Point Status

Please see the Point Status Codes section of the Config@WEB Secure Software Users Guide.

2.8.57 Point State

Indicates that point is either OPEN or CLOSED.

2.8.58 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

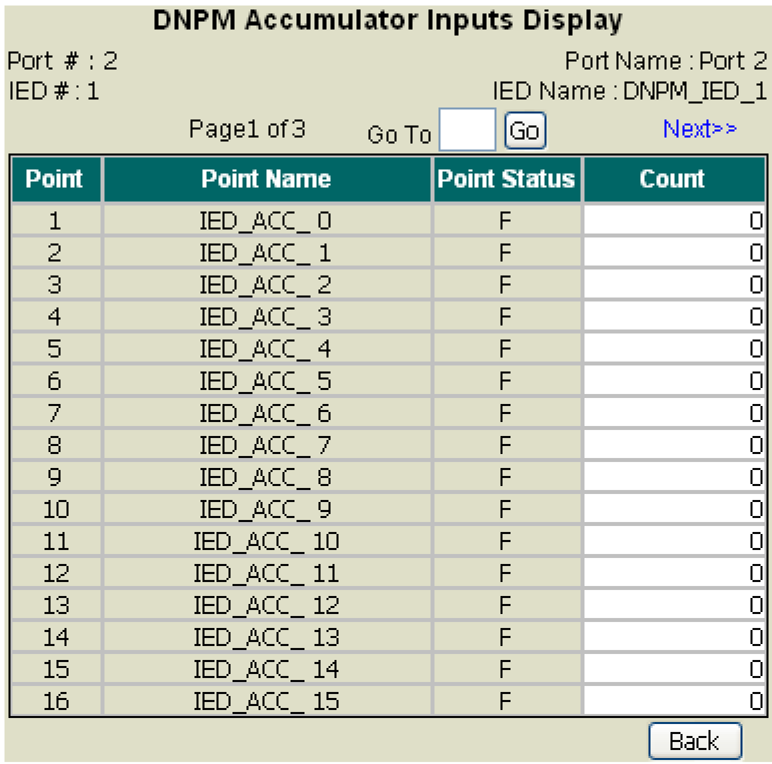
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

2.8.58.1 Counter Inputs

From the DNPM IED Display screen, click View for Counters to get the screen shown in Figure 2-26.

Figure 2-26 DNPM Counter Inputs Display



DNPM Accumulator Inputs Display

Port # : 2 Port Name : Port 2

IED # : 1 IED Name : DNPM_IED_1

Page1 of 3 Go To Go Next>>

Point	Point Name	Point Status	Count
1	IED_ACC_ 0	F	0
2	IED_ACC_ 1	F	0
3	IED_ACC_ 2	F	0
4	IED_ACC_ 3	F	0
5	IED_ACC_ 4	F	0
6	IED_ACC_ 5	F	0
7	IED_ACC_ 6	F	0
8	IED_ACC_ 7	F	0
9	IED_ACC_ 8	F	0
10	IED_ACC_ 9	F	0
11	IED_ACC_ 10	F	0
12	IED_ACC_ 11	F	0
13	IED_ACC_ 12	F	0
14	IED_ACC_ 13	F	0
15	IED_ACC_ 14	F	0
16	IED_ACC_ 15	F	0

Back

2.8.59 Point

Protocol logical point number.

2.8.60 Point Name

The name of the point assigned during configuration.

2.8.61 Point Status

Please see the Point Status Codes section of the Config@WEB Secure Software Users Guide.

2.8.62 Count

The accumulated count.

Navigation

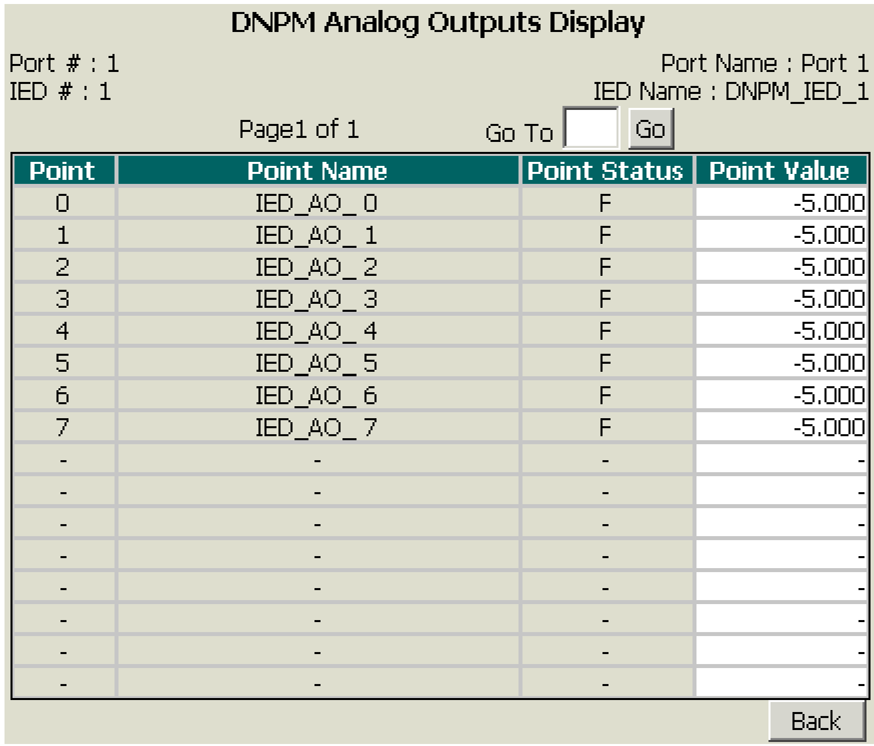
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are

on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

2.8.62.1 Analog Outputs

From the DNPM IED Display screen, click View for Analog Outputs to get the screen shown in Figure 2-27.

Figure 2-27 DNPM Analog Outputs Display



Point	Point Name	Point Status	Point Value
0	IED_AO_ 0	F	-5.000
1	IED_AO_ 1	F	-5.000
2	IED_AO_ 2	F	-5.000
3	IED_AO_ 3	F	-5.000
4	IED_AO_ 4	F	-5.000
5	IED_AO_ 5	F	-5.000
6	IED_AO_ 6	F	-5.000
7	IED_AO_ 7	F	-5.000
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

2.8.63 Point

Protocol logical point number.

2.8.64 Point Name

The name of the point assigned during configuration.

2.8.65 Point Status

Please see the Point Status Codes section of the Config@WEB Secure Software Users Guide.

2.8.66 Point Value

The engineering unit (EGU) value.

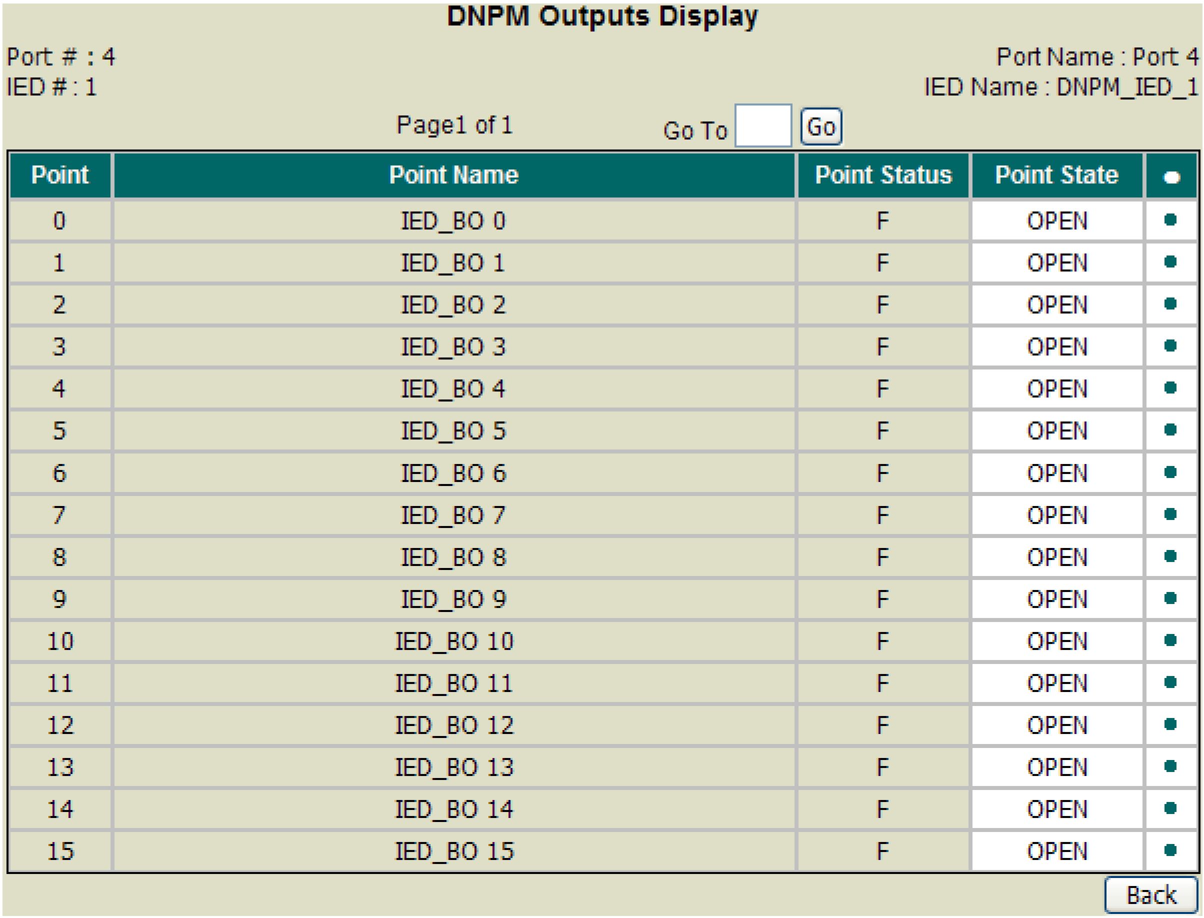
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

2.8.66.1 Binary Outputs

From the DNPM IED Display screen, click View for Binary Outputs to get the screen shown in below.

Figure 2-28 DNPM Binary Outputs Display


DNPM Outputs Display

Port # : 4 Port Name : Port 4
IED # : 1 IED Name : DNPM_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point State	●
0	IED_BO 0	F	OPEN	●
1	IED_BO 1	F	OPEN	●
2	IED_BO 2	F	OPEN	●
3	IED_BO 3	F	OPEN	●
4	IED_BO 4	F	OPEN	●
5	IED_BO 5	F	OPEN	●
6	IED_BO 6	F	OPEN	●
7	IED_BO 7	F	OPEN	●
8	IED_BO 8	F	OPEN	●
9	IED_BO 9	F	OPEN	●
10	IED_BO 10	F	OPEN	●
11	IED_BO 11	F	OPEN	●
12	IED_BO 12	F	OPEN	●
13	IED_BO 13	F	OPEN	●
14	IED_BO 14	F	OPEN	●
15	IED_BO 15	F	OPEN	●

Back

2.8.67 Point

Protocol logical point number.

2.8.68 Point Name

The name of the point assigned during configuration.

2.8.69 Point Status

Please see the Point Status Codes section of the Config@WEB Secure Software Users Guide.

2.8.70 Point State

Indicates that point is either OPEN or CLOSED.

2.8.71 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

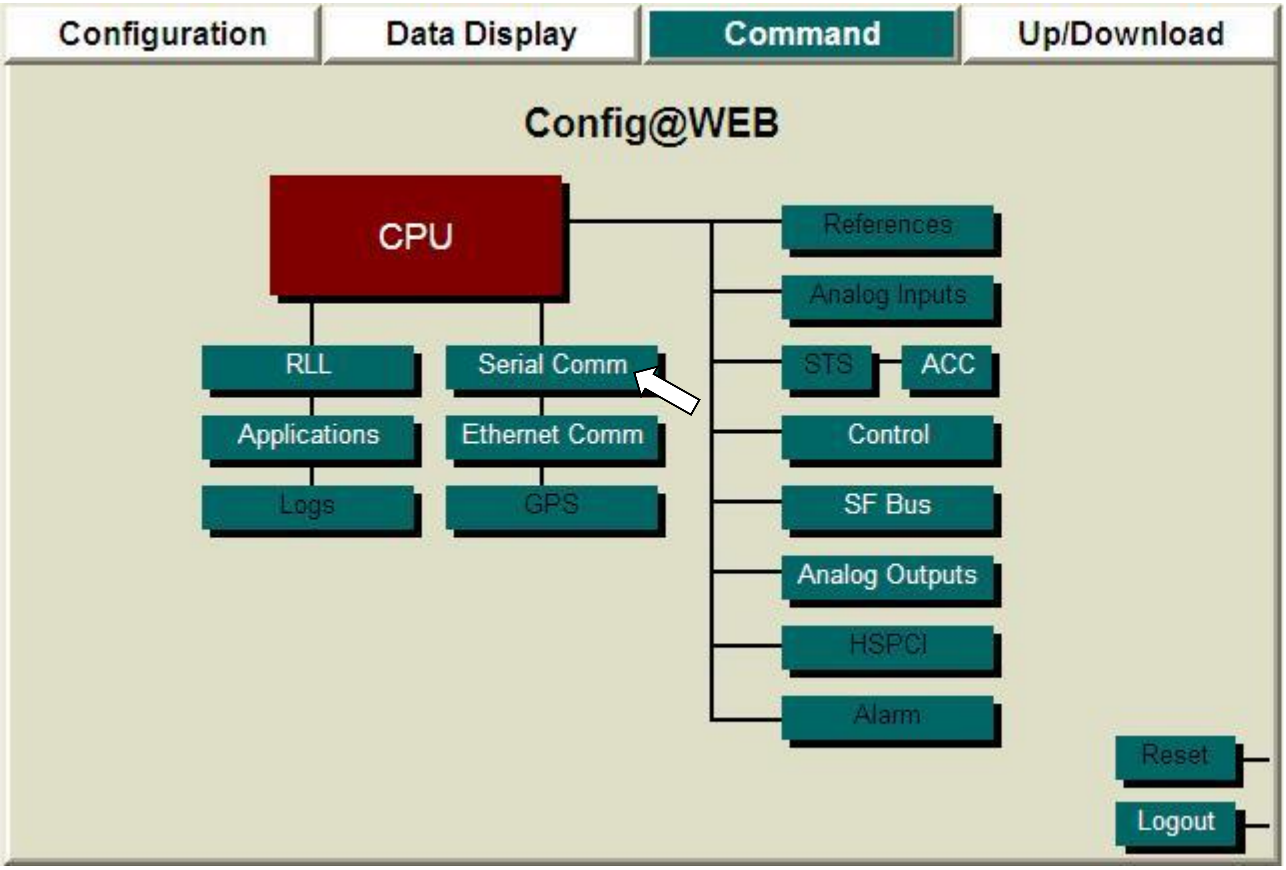
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

2.9 Command Serial Comm

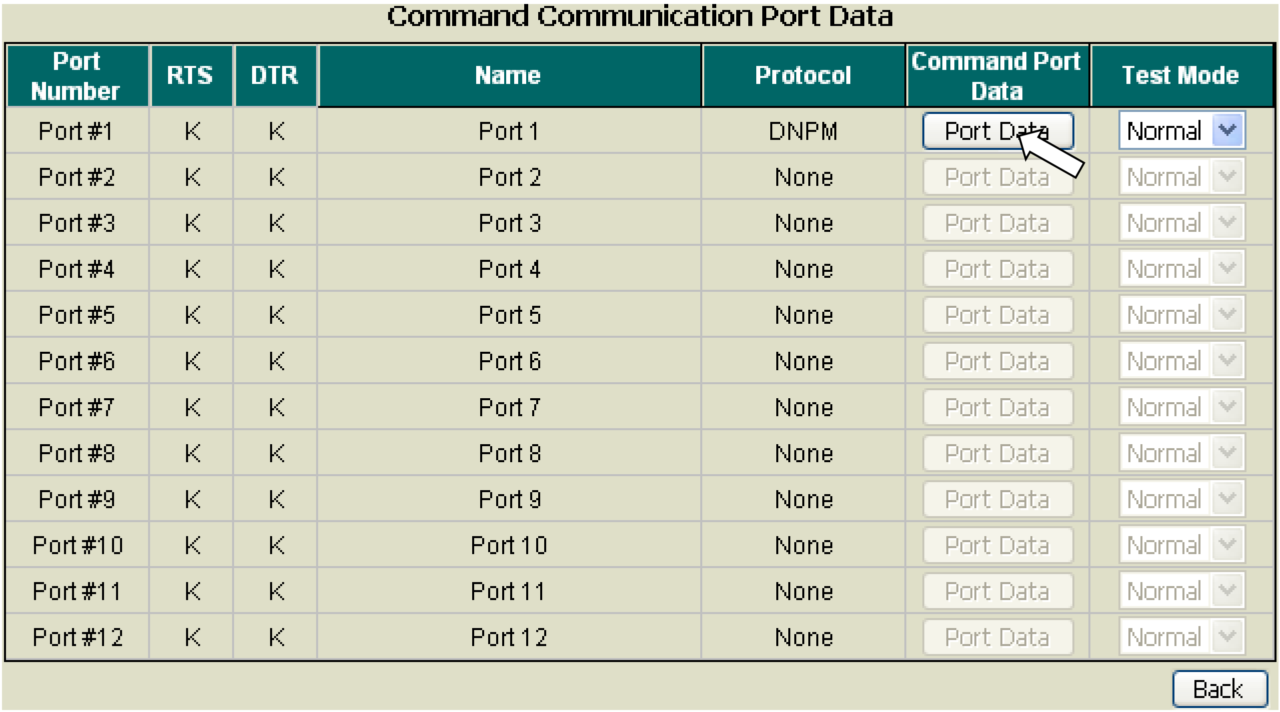
Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 2-29 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2200 manual. Under Command Port Data, click Port Data.

Figure 2-30 Serial Comm Command Communications Port Data



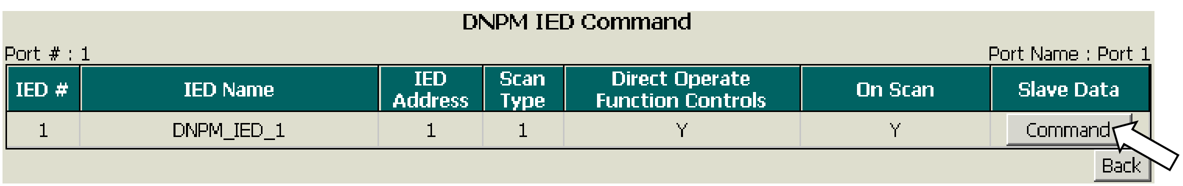
Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	DNPM	Port Data	Normal
Port #2	K	K	Port 2	None	Port Data	Normal
Port #3	K	K	Port 3	None	Port Data	Normal
Port #4	K	K	Port 4	None	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button as shown.

Figure 2-31 DNPM IED Command



DNPM IED Command

Port # : 1 Port Name : Port 1

IED #	IED Name	IED Address	Scan Type	Direct Operate Function Controls	On Scan	Slave Data
1	DNPM_IED_1	1	1	Y	Y	Command

Back

The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command Analog Outputs and Binary Outputs.

Figure 2-32 DNPM IED Command

DNPM IED Command.

Port # : 3 Port Name : RTU to IED
IED # : 1 IED Name : DNPM_IED_1

Type	Number	Command
Analog Inputs	32	
Binary Inputs	117	
Counters	40	
Analog Outputs	12	Command
Binary Outputs	56	Command

Back

The Analog Outputs Command will give you a screen similar to Figure 2-33. You may enter a value between 0 and 1 to drive the AO, then click the Execute button for a result similar to Point 1 of Figure 2-33.

Figure 2-33 DNPM Analog Outputs Command

DNPM Analog Outputs Command

Port # : 3 Port Name : RTU to IED
IED # : 1 IED Name : DNPM_IED_1

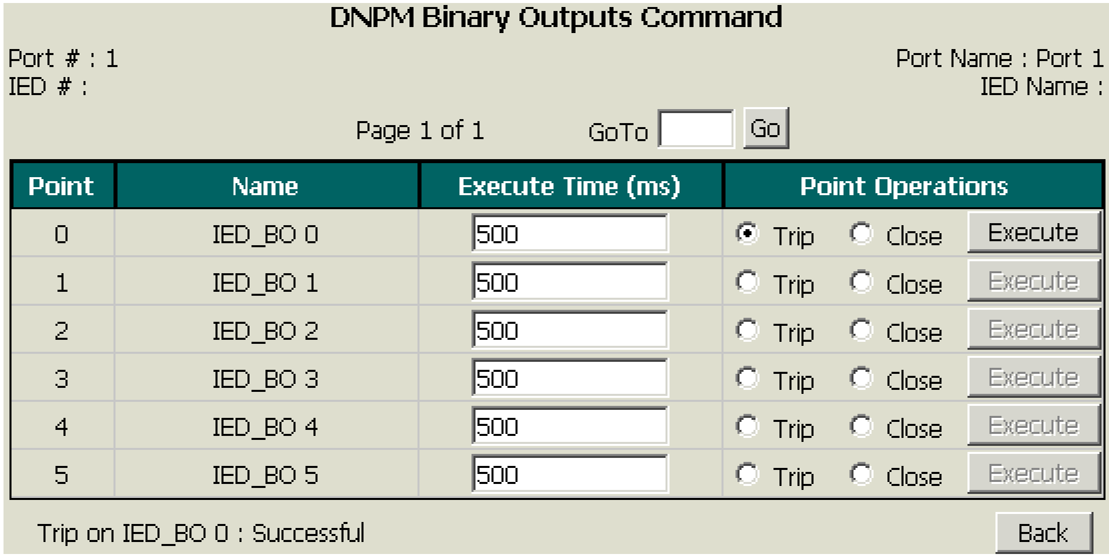
Page 1 of 1 Go To Go

Point	Name	Range	Value	Operation
0	IED_AO_ 0	-100.000 to 100.000	-100.000	Execute
1	IED_AO_ 1	-100.000 to 100.000	-100.000	Execute
2	IED_AO_ 2	-100.000 to 100.000	-100.000	Execute
3	IED_AO_ 3	-100.000 to 100.000	-100.000	Execute
4	IED_AO_ 4	-100.000 to 100.000	-100.000	Execute
5	IED_AO_ 5	-100.000 to 100.000	-100.000	Execute
6	IED_AO_ 6	-100.000 to 100.000	-100.000	Execute
7	IED_AO_ 7	-100.000 to 100.000	-100.000	Execute
8	IED_AO_ 8	-100.000 to 100.000	-100.000	Execute
9	IED_AO_ 9	-100.000 to 100.000	-100.000	Execute
10	IED_AO_ 10	-100.000 to 100.000	-100.000	Execute
11	IED_AO_ 11	-100.000 to 100.000	-100.000	Execute

Back

The Binary Outputs Command will give you a screen similar to Figure 2-34. You may Trip or Close, then click the Execute button for a result similar to Point 0 of Figure 2-34.

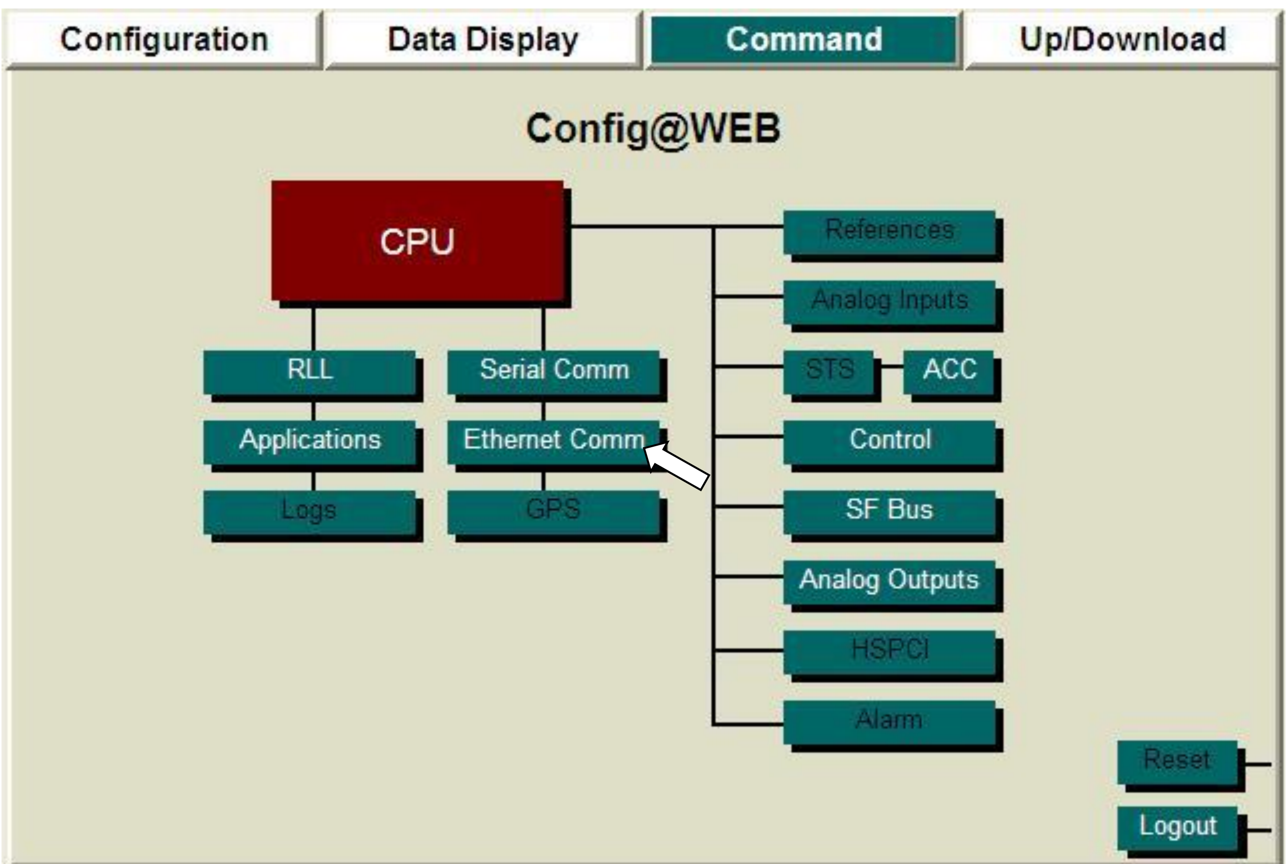
Figure 2-34 DNPM Binary Outputs Command



2.10 Command Ethernet Comm

Devices on the DNPM Ethernet Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Ethernet Comm button as shown in Figure 2-35.

Figure 2-35 Command Tab Page



The resultant screen will be similar to Figure 2-36. Under Command Port Data, click Port Data for DNPM.

Figure 2-36 Ethernet Comm Command Communications Port Data

Command Communication Port Data

Socket Number	Name	Protocol	Command Port Data
Socket # 1	Socket 1	DNPM	Port Data
Socket # 2	Socket 2	None	Port Data
Socket # 3	Socket 3	None	Port Data
Socket # 4	Socket 4	None	Port Data
Socket # 5	Socket 5	None	Port Data
Socket # 6	Socket 6	None	Port Data
Socket # 7	Socket 7	None	Port Data
Socket # 8	Socket 8	None	Port Data
Socket # 9	Socket 9	None	Port Data
Socket # 10	Socket 10	None	Port Data
Socket # 11	Socket 11	None	Port Data
Socket # 12	Socket 12	None	Port Data
Socket # 13	Socket 13	None	Port Data
Socket # 14	Socket 14	None	Port Data
Socket # 15	Socket 15	None	Port Data
Socket # 16	Socket 16	None	Port Data

Back

The resultant screen will be similar to the one below. Click on the Command button as shown.

Figure 2-37 DNPM IED Command

DNPM IED Command

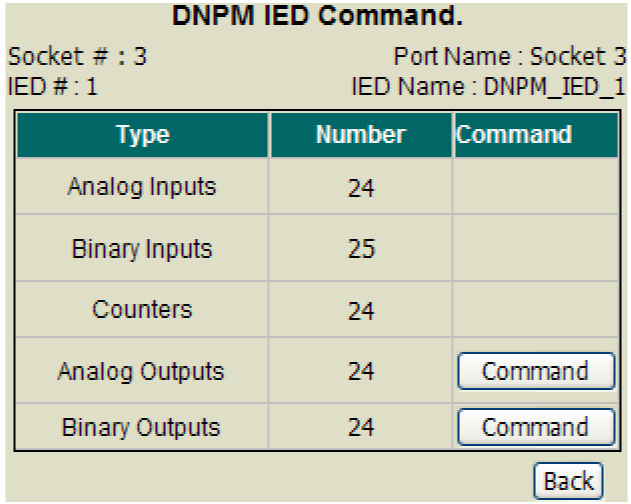
Socket # : 3 Port Name : Socket 3

IED #	IED Name	IED Address	Scan Type	Direct Operate Function Controls	On Scan	Slave Data
1	DNPM_IED_1	1	2	Y	Y	Command

Back

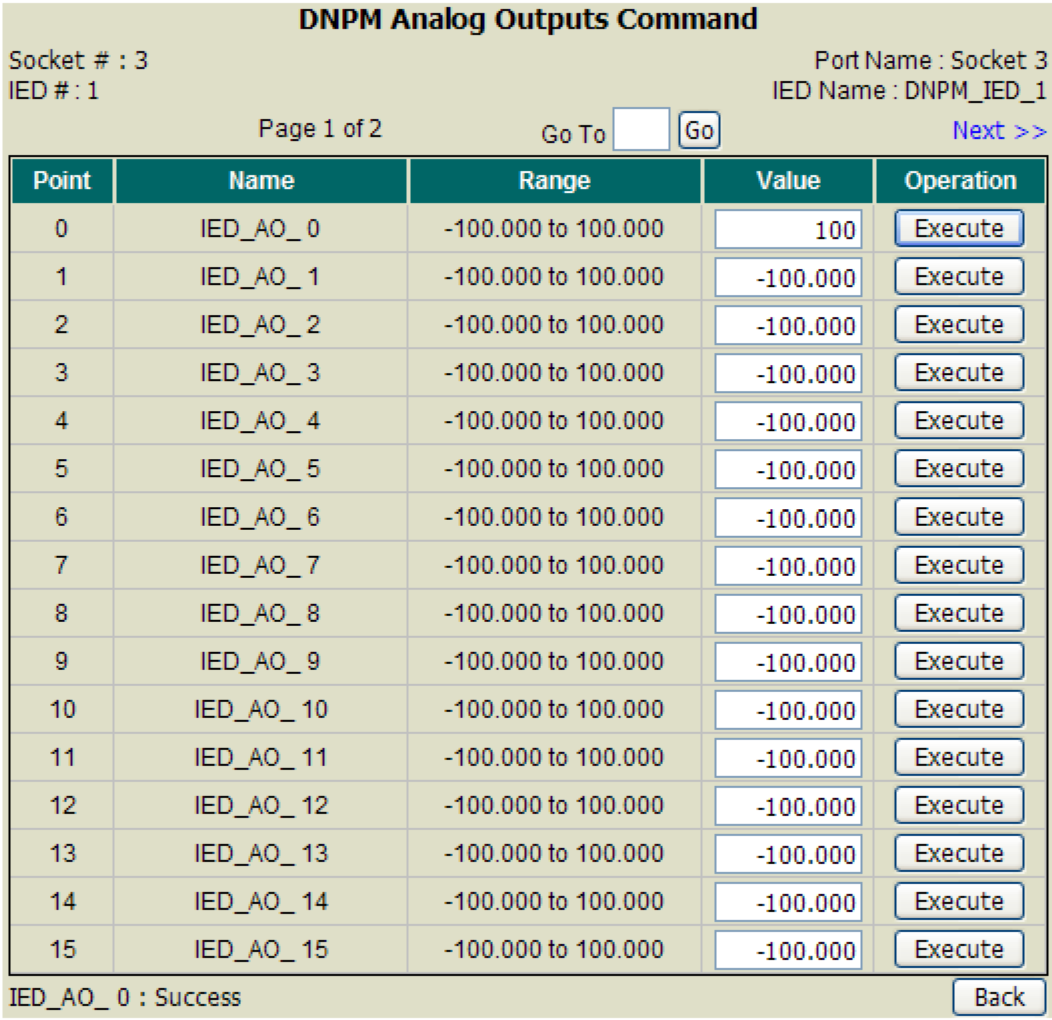
The resultant screen will be similar to the one below. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command Analog Outputs and Binary Outputs.

Figure 2-38 DNPM IED Command



The Analog Outputs Command will give you a screen similar to Figure 2-39. You may enter a value between -100 and 100 to drive the AO, then click the Execute button for a result similar to Point 1 of the figure below.

Figure 2-39 DNPM Analog Outputs Command



DNPM Analog Outputs Command

Socket # : 3 Port Name : Socket 3

IED # : 1 IED Name : DNPM_IED_1

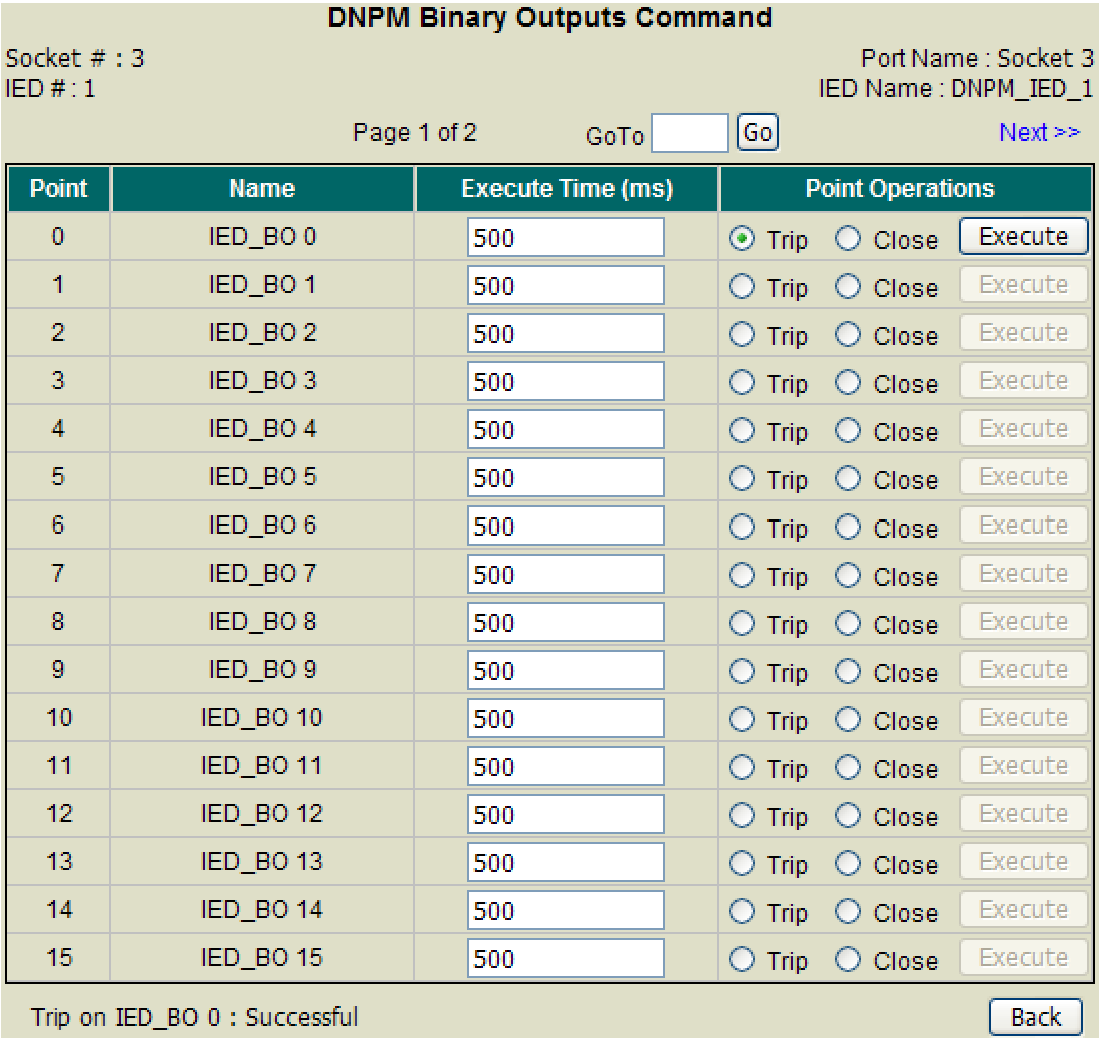
Page 1 of 2 Go To Go Next >>

Point	Name	Range	Value	Operation
0	IED_AO_ 0	-100.000 to 100.000	100	Execute
1	IED_AO_ 1	-100.000 to 100.000	-100.000	Execute
2	IED_AO_ 2	-100.000 to 100.000	-100.000	Execute
3	IED_AO_ 3	-100.000 to 100.000	-100.000	Execute
4	IED_AO_ 4	-100.000 to 100.000	-100.000	Execute
5	IED_AO_ 5	-100.000 to 100.000	-100.000	Execute
6	IED_AO_ 6	-100.000 to 100.000	-100.000	Execute
7	IED_AO_ 7	-100.000 to 100.000	-100.000	Execute
8	IED_AO_ 8	-100.000 to 100.000	-100.000	Execute
9	IED_AO_ 9	-100.000 to 100.000	-100.000	Execute
10	IED_AO_ 10	-100.000 to 100.000	-100.000	Execute
11	IED_AO_ 11	-100.000 to 100.000	-100.000	Execute
12	IED_AO_ 12	-100.000 to 100.000	-100.000	Execute
13	IED_AO_ 13	-100.000 to 100.000	-100.000	Execute
14	IED_AO_ 14	-100.000 to 100.000	-100.000	Execute
15	IED_AO_ 15	-100.000 to 100.000	-100.000	Execute

IED_AO_ 0 : Success Back

The Binary Outputs Command will give you a screen similar to the one below. You may Trip or Close, then click the Execute button for a result similar to Point 0 below.

Figure 2-40 DNPM Binary Outputs Command


DNPM Binary Outputs Command

Socket # : 3 Port Name : Socket 3
IED # : 1 IED Name : DNPM_IED_1

Page 1 of 2 GoTo Go Next >>

Point	Name	Execute Time (ms)	Point Operations
0	IED_BO 0	500	Trip Close Execute
1	IED_BO 1	500	Trip Close Execute
2	IED_BO 2	500	Trip Close Execute
3	IED_BO 3	500	Trip Close Execute
4	IED_BO 4	500	Trip Close Execute
5	IED_BO 5	500	Trip Close Execute
6	IED_BO 6	500	Trip Close Execute
7	IED_BO 7	500	Trip Close Execute
8	IED_BO 8	500	Trip Close Execute
9	IED_BO 9	500	Trip Close Execute
10	IED_BO 10	500	Trip Close Execute
11	IED_BO 11	500	Trip Close Execute
12	IED_BO 12	500	Trip Close Execute
13	IED_BO 13	500	Trip Close Execute
14	IED_BO 14	500	Trip Close Execute
15	IED_BO 15	500	Trip Close Execute

Trip on IED_BO 0 : Successful Back

2.11 DNP Device Profile Document

Please see the manual, Config@WEB DNP Device Profile, number C3413-AAA-DNP01.

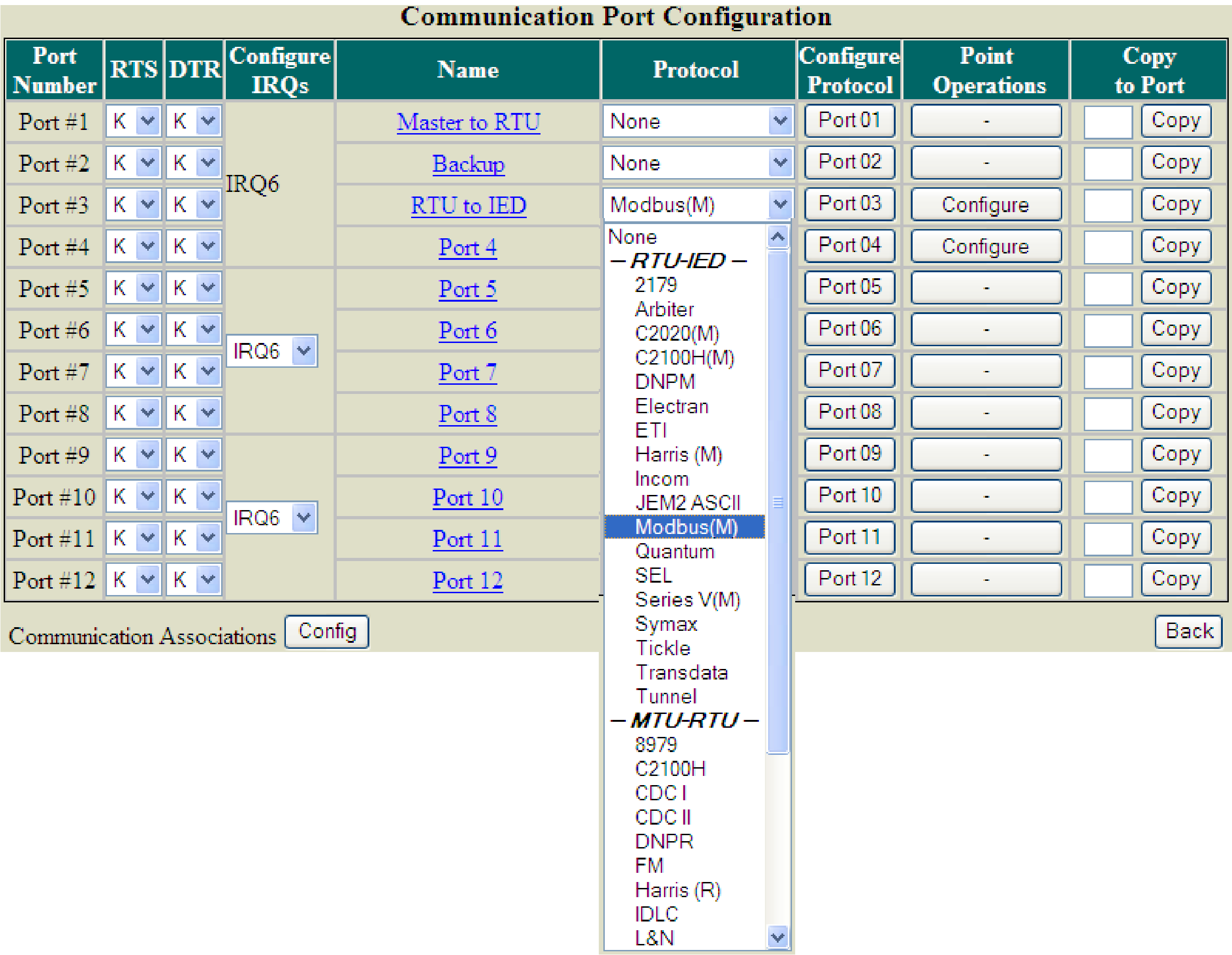
3 Modbus Master

3.1 Serial Comm Port Configuration

Modbus Master is a highly configurable protocol implementation designed to provide communication between the RTU and 1 or more Modbus IED. This implementation supports 2048 maximum configurable points for all types.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. From this screen, click Modbus(M) from the Protocol drop-down menu as shown.

Figure 3-1 Modbus Master Communication Port Configuration



3.1.1 Port Number

Physical Port number of the RTU.

3.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

3.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

3.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

3.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

3.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.

3.1.4 Protocol

From the drop-down list, select the protocol for this port.

3.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

3.1.6 Point Operations

Click this button to assign points.

3.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

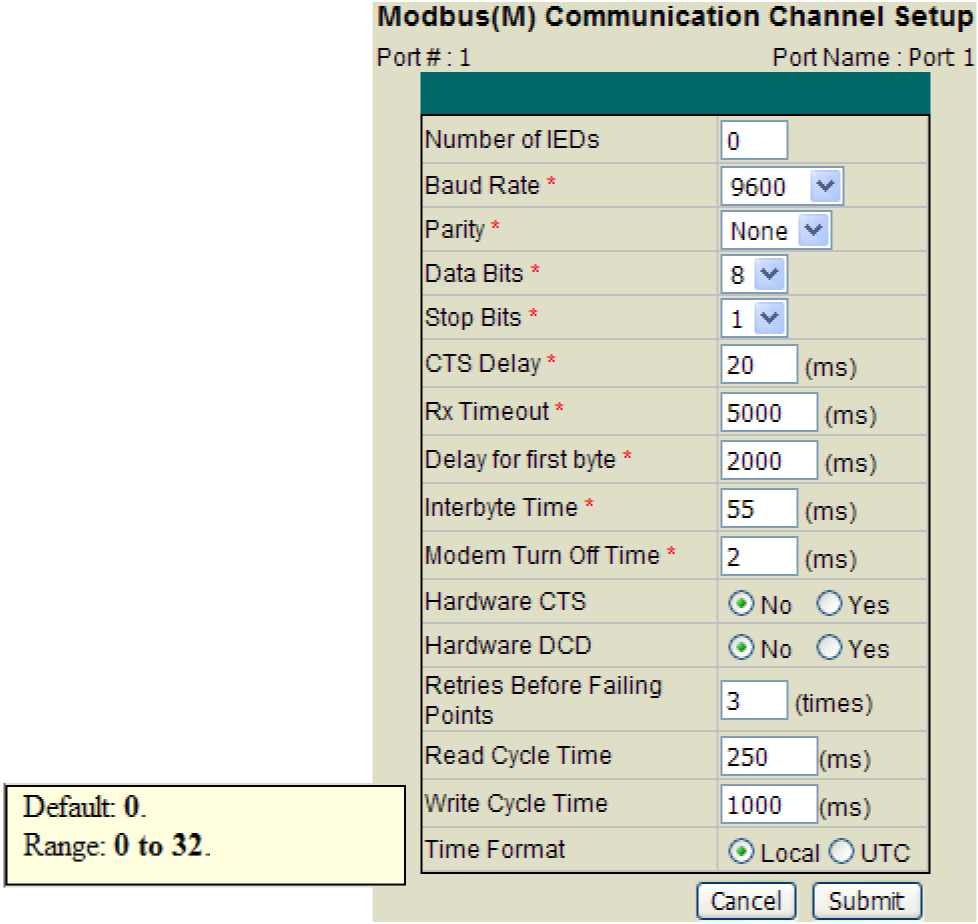
Navigation

Click the Back button to return to the previous screen.

3.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n* to configure the Modbus Master port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 3-2 Modbus Master Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

3.2.1 Number of IEDs (0 – 32)

Enter the number of IEDs connected to this port. The default setting is 0.

3.2.2 Baud Rate (300 – 38400)

From the drop-down menu, select the baud rate. The default setting is 9600.

3.2.3 Parity (None, Odd, Even)

From the drop-down menu, select the parity for the associated channel. The default setting is None.

3.2.4 Data Bits (5,6,7,8)

From the drop-down menu, select the data bits for the associated channel. The default setting is 8.

3.2.5 Stop Bits (0,1,2)

From the drop-down menu, select the stop bits for the associated channel. The default setting is 1.

3.2.6 CTS Delay (0 – 1000ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 20.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

3.2.7 Rx Timeout (0 – 60,000 msec)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 5000 msec.

Note: This timer must be greater than Delay for First Byte timer (below).

3.2.8 Delay for First Byte (0 to 60,000)

Enter the delay time for the associated channel. This is the time allowed for a Slave Device to begin its response before the MTU assumes it is not going to reply and moves on to the next device. This parameter is typically set long because of delays in IED response. Valid entries are in the range of 0-60,000 msec. The default setting is 2000 (2 sec).

Note: This timer must be less than Rx Timeout (above).

3.2.9 Interbyte Time (0 – 250ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 55 msec.

3.2.10 Modem Turn Off Time (0 – 250ms)

Enter the delay time that the modem will maintain the carrier after the last data byte has been transmitted. Default setting is 2.

3.2.11 Hardware CTS (No, Yes)

If the hardware Clear-To-Send option is selected for a channel, then reply data bytes will not be transmitted unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. Default setting is No.

3.2.12 Hardware DCD (No, Yes)

If the hardware data carrier detect option is selected for a channel, then the channel communications driver will accept requested message data bytes only if carrier is detected. If carrier is not detected, the data bytes are discarded. Default setting is No.

3.2.13 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

3.2.14 Read Cycle Time (0 – 10,000ms)

This is the delay between read polls of the device and is used to slow down polling of an IED. If the read cycle time is 1000 ms, the RTU will wait 1 second after polling the IED before polling it again. Default is 250ms

3.2.15 Write Cycle Time (0 – 10,000ms)

This is the period of time between which the RTU will issue an opcode 16 (preset multiple holding registers) to the IED to refresh all analog setpoints configured as “cyclic”. Default is 1000ms

3.2.16 Time Format (Local, UTC)

Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regards to time syncs, set Time Format to Local Time. See Time Configuration Settings in the Configuration chapter of the Config@WEB Secure Software Users Guide.

If you want to send time synchronization to this device, you must know whether the device will accept Local time or UTC time, then set this radio button to match.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

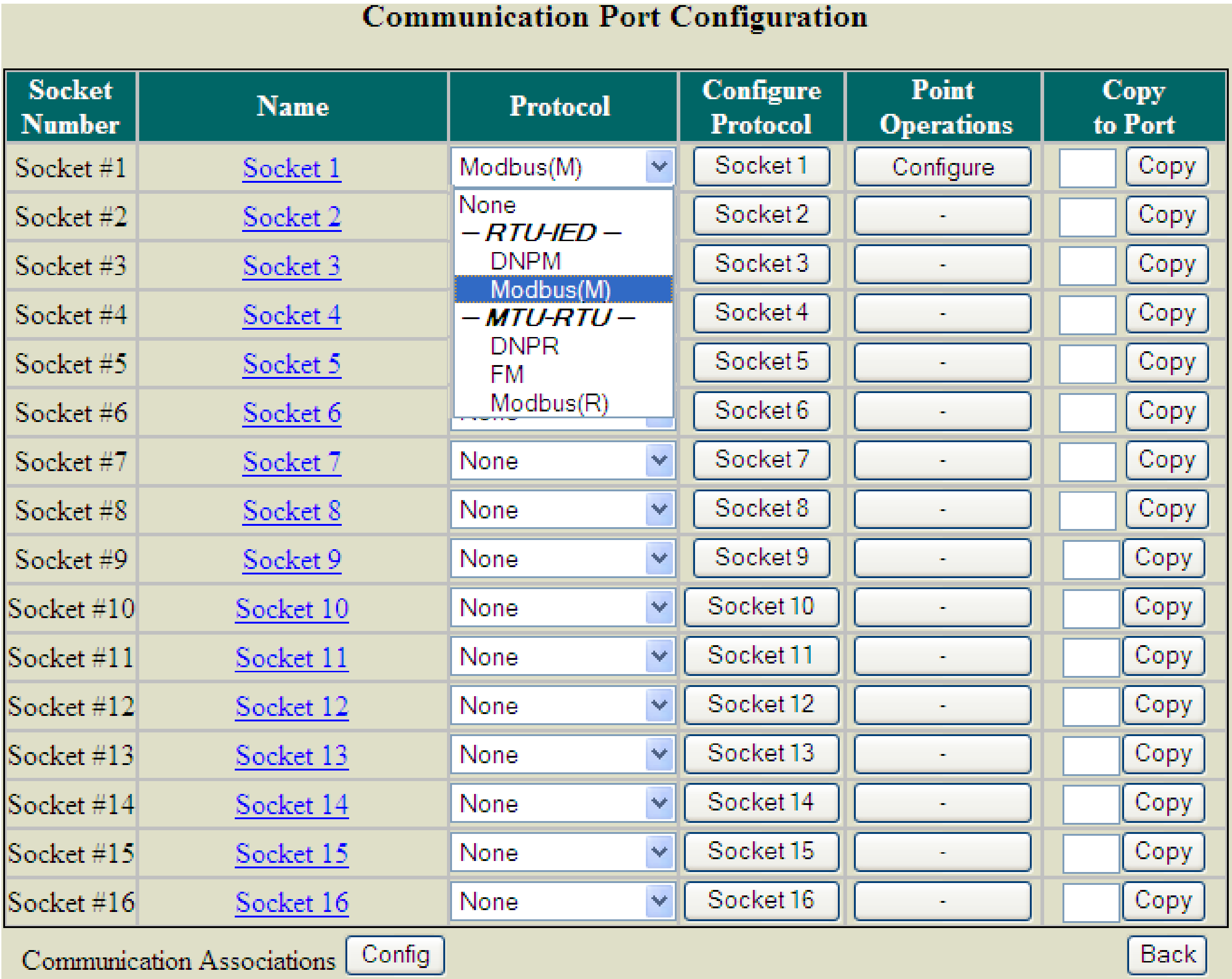
Please note: No configuration changes take effect until the RTU is reset.

3.3 Ethernet Comm Port Configuration

Modbus Master is a protocol that communicates between the RTU and an IED.

From the Configuration screen, click Ethernet Comm. You will get a screen similar to Figure 2-3. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Modbus(M) from the Protocol drop-down menu as shown.

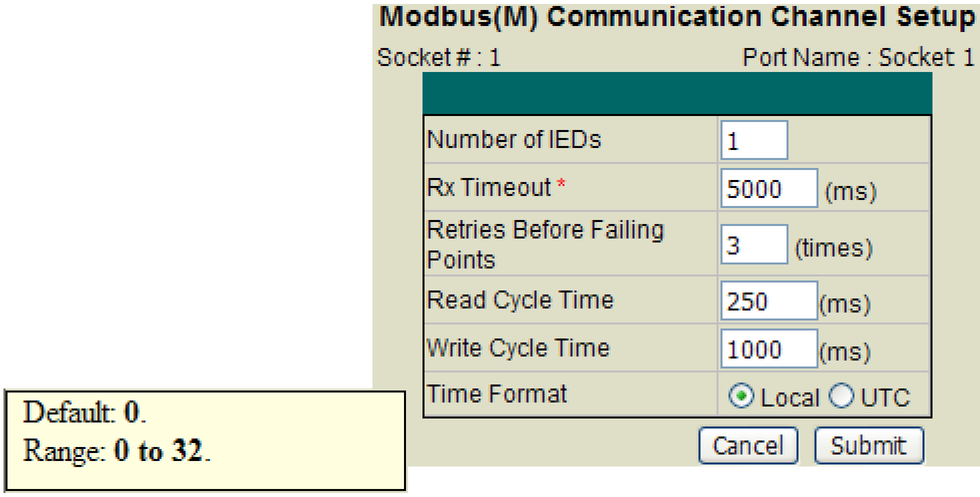
Figure 3-3 Modbus Master Ethernet Comm Port Configuration



3.4 Configure Protocol, Ethernet Comm

Under the heading Configure Protocol, click Socket *n* to configure the Modbus(M) port. You may accept all defaults or fill in the form according to the information following the figure below.

Figure 3-4 Modbus(M) Ethernet Comm Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

3.4.1 Number of IEDs (0 – 32)

Enter the number of IEDs connected to this port. The default setting is 0.

3.4.2 Rx Timeout (0 – 60,000 msec)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 5000 msec.

3.4.3 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

3.4.4 Read Cycle Time (0 – 10,000ms)

This is the delay between read polls of the device and is used to slow down polling of an IED. If the read cycle time is 1000 ms, the RTU will wait 1 second after polling the IED before polling it again. Default is 250ms

3.4.5 Write Cycle Time (0 – 10,000ms)

This is the period of time between which the RTU will issue an opcode 16 (preset multiple holding registers) to the IED to refresh all analog setpoints configured as “cyclic”. Default is 1000ms

3.4.6 Time Format (Local, UTC)

Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regards to time syncs, set Time Format to Local Time. See Time Configuration Settings in the Configuration chapter of the Config@WEB Secure Software Users Guide.

If you want to send time synchronization to this device, you must know whether the device will accept Local time or UTC time, then set this radio button to match.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

3.5 Point Operations

From the Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 3-5 IED Configuration

Modbus(M) IED Configuration

Socket # 1 Port Name : Socket 1

IED #	IED Name	IP Address : Port No.	IED Address	1 Relative Register #	On Scan	Slave Config	Copy to IEDn	Export Import
1	MB_IED_1	: 0	1	N	Y	Edit	Copy	Exp Imp

Back

3.5.1 IED

The logical number of the IED on this communication channel.

3.5.2 IED Name

Click on the IED Name. A pop-up window will appear. See section 3.5.17.

3.5.3 IED Address : Port No.

Reflects the entry in the pop-up menu. See section 3.5.17.

3.5.4 1 Relative Register

Reflects the entry in the pop-up menu. See section 2.7.13.1.

3.5.5 On Scan

Reflects the entry in the pop-up menu. See section 2.7.13.1.

3.5.6 Slave Config

Click on Edit to edit the IED points. See section 3.5.26.

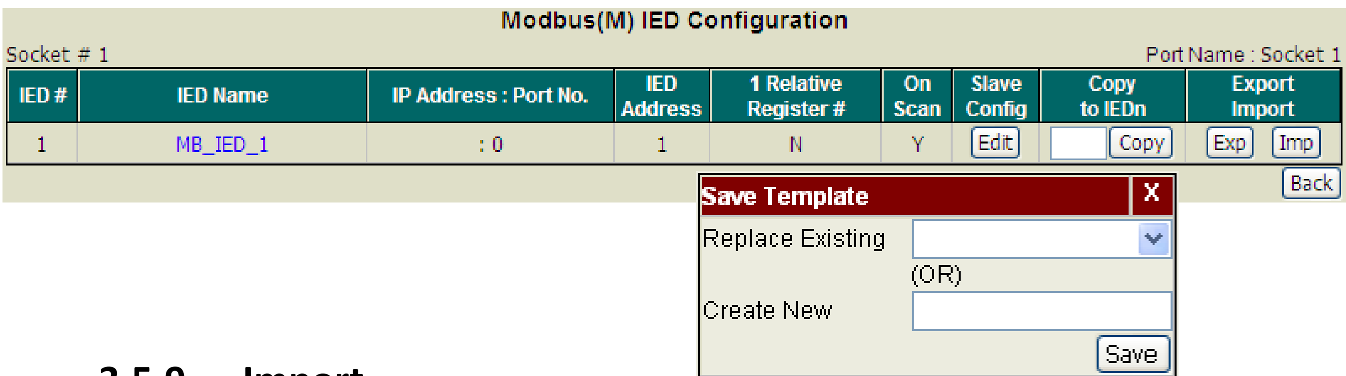
3.5.7 Copy to IEDn

This function copies everything in the IED configuration except the IED Name and the IED Address. Enter the number of the target IED and click Copy.

3.5.8 Export

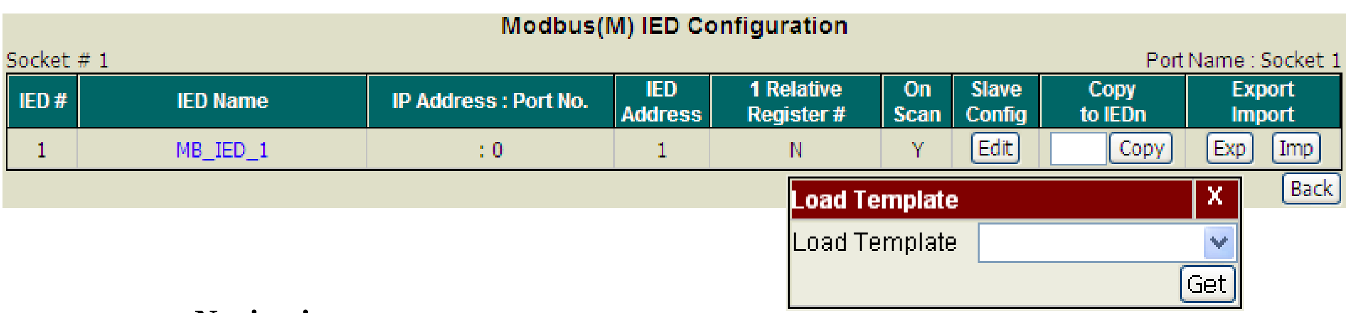
This function copies everything in the IED configuration except the IED Name and the IED Address to an xml file template. The templates are protocol/IED specific. This template is stored in the RTU. When you choose Up/Download tab and click on "Get" (get files from RTU), you will transfer these templates to your PC.

Choose from one of the existing file types (if present), or create a new xml file type. Click Save after your selection.



3.5.9 Import

The Imp button imports a configuration in xml format as shown below. Choose from one of the existing file types (if present) shown in the pull-down menu. If a new file type has been created under Export, that file type will also show up in the pull-down menu. When you set up another RTU, choose the Up/Download tab and click "Send" (send files to RTU), the template you save in the first RTU will be downloaded to the second RTU. Click Get after your selection below.



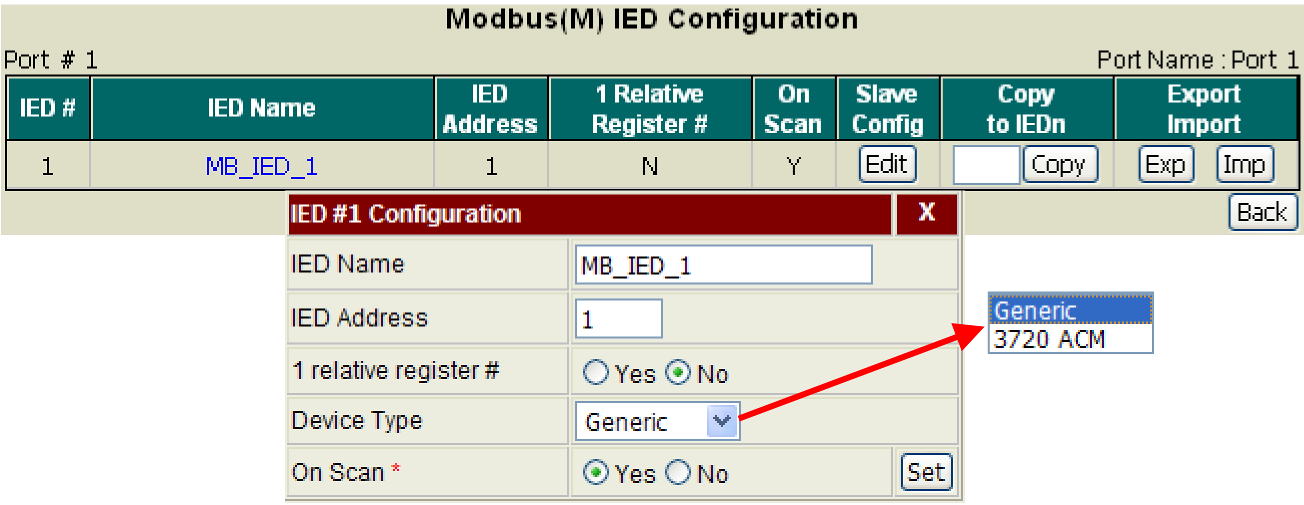
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

3.5.10 Serial IED Name & Address Configuration

When you click the name of the IED (in blue characters), a pop-up menu will appear, as shown below. Edit this pop-up window according to the directions below. After you edit and click Set, your choices are reflected as shown in the columns below.

Figure 3-6 IED Configuration



3.5.11 IED Name

Accept the default name or type a name of your choosing.

3.5.12 IED Address (1 – 255)

Enter the IED address. The default is 1.

3.5.13 1 relative register

Accept the default (No) if the registers will be listed on the configuration tables as 0 relative (ie. 0 – n). Click Yes if you wish to renumber the registers as 1 relative (ie. 1 – n). Modbus standard is 0 relative but some vendor's documentation lists points starting at 1. If 1 relative is selected, you must renumber the register numbers to reflect this as the protocol will subtract one (1) from the register number before using it to poll the IED.

3.5.14 Device Type

Modbus Master has been enhanced to handle the real-time subset of registers from the 3720 ACM meter. For the subset from 40031 (real-time KW phase A) through 40042 (real-time total power factor), register 40050 must be read to obtain the polarities of the data. Each bit of the polarity register indicates the polarity of one of the associated data points. For any block of registers which includes a register in the range 31 through 42, the Modbus Master will first read the polarity register (50) and retain it in memory for reference while processing the associated data registers. When the polarity bit for a point is set, its value is negated.

To activate this feature, the user must click on the Device Type selection box on the Modbus IED setup pop-up display (see above), and select the 3720 ACM option for each IED that is a 3720 meter. Having done this, any of the analog input registers in the range 31 through 42 will be processed as described above. Note that the user must also set up each 3270 meter to report all registers (not skipping unused registers) in order for the Modbus Master to locate the appropriate registers within the received data stream.

The default device type option is "Generic", which applies to all other IED types.

3.5.15 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled. This function will work on the fly. That is, select either Yes or No, then click Set. There is no need to Reset.

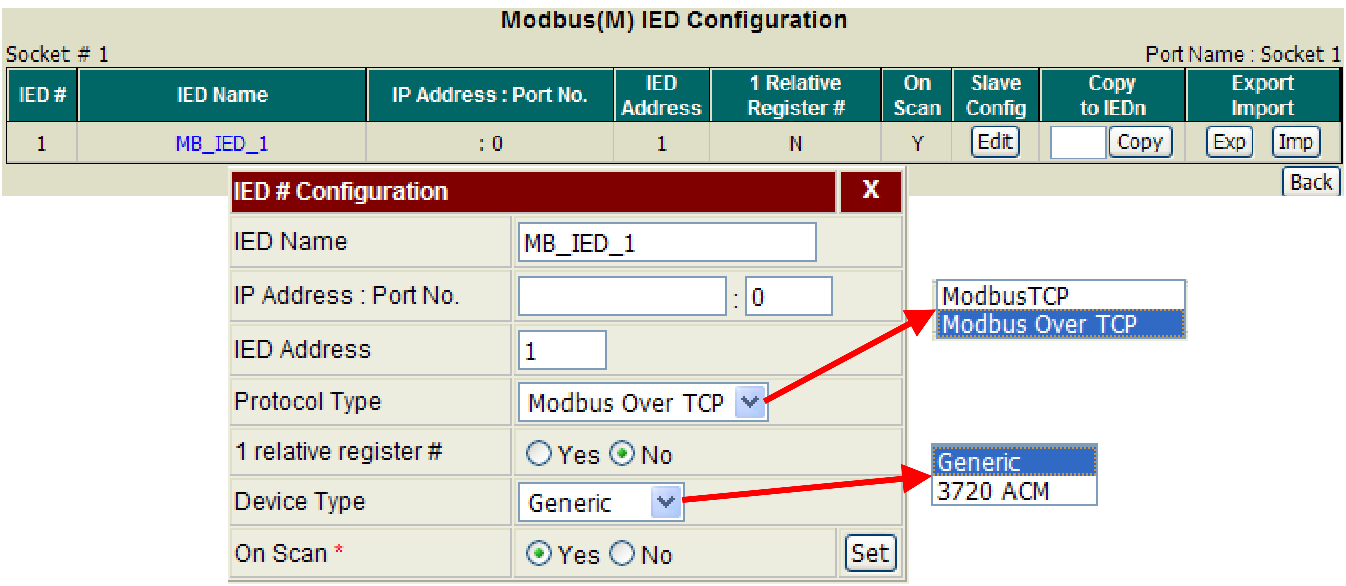
3.5.16 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

3.5.17 Ethernet IED Name & Address Configuration

When you click the name of the IED (in blue characters) a pop-up menu will appear, as shown below. Edit this pop-up window according to the directions below. After you edit and click Set, your choices are reflected as shown in the columns below.

Figure 3-7 IED Configuration



3.5.18 IED Name

Accept the default name or type a name of your choosing.

3.5.19 IP Address : Port No.

Enter the IP address of the Ethernet Modbus slave. Port number 502 has been reserved for Modbus, but you may use any port number that does not conflict with standard port numbers.

3.5.20 IED Address (1 – 255)

Enter the IED address. The default is 1.

3.5.21 Protocol Type

You must determine whether the type is native Modbus TCP.

a. “ModbusTCP” includes a six-byte preamble containing a sequence number that the IED should echo back. For this protocol, the User may set the IED ID to zero, since the IP address determines the actual address. The code still checks the ID, however, so the User must enter either a zero or the actual ID matching that of the IED.

b. “Modbus over TCP” encapsulates the serial Modbus RTU message inside a TCP/IP envelope.

3.5.22 1 relative register

See section 2.7.13.1.

3.5.23 Device Type

See section 2.7.13.1.

3.5.24 On Scan

See section 2.7.13.1.

3.5.25 Set / X

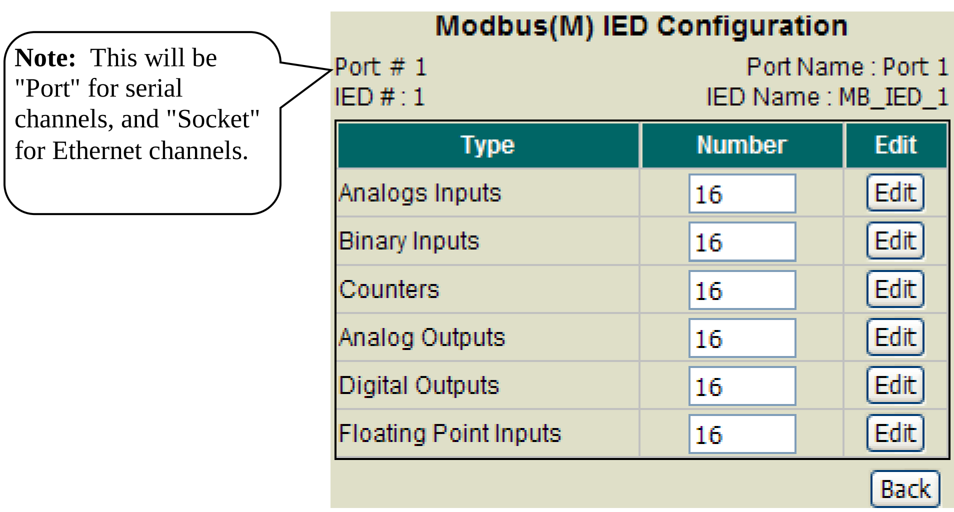
Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

3.5.26 Slave Configuration Edit

3.5.27 Slave Config

Click on Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 3-8 IED Configuration



3.5.28 Type

The type of point.

3.5.29 Number

Enter the number of points from your IED.

3.5.30 Edit

Click on the Edit button to edit points.

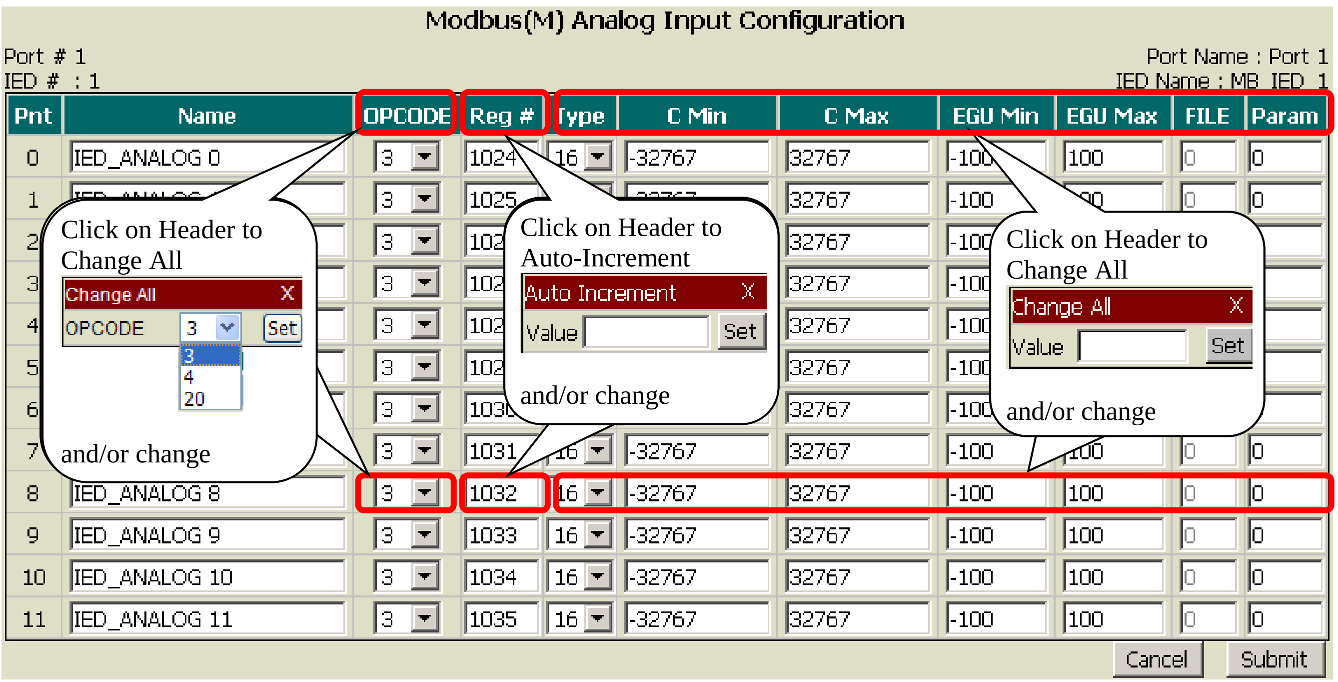
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

3.5.31 IED Analog Input Configuration

From the Modbus Master IED Configuration screen, click on Edit for Analogs. A screen similar to Figure 2-13 will appear.

Figure 3-9 Modbus Master Analog Input Configuration



3.5.32 Pnt

Protocol logical point number. This number cannot be changed.

3.5.33 Name

Enter the name of the point (or accept the default name).

3.5.34 OPCODE (3, 4, 20)

Enter the opcode used to poll the point (or accept the default). All entries in this column may be changed at once by clicking on the header.

3.5.35 Reg

Enter the Register number of the point (or accept the default). Click on the header to Auto-increment and/or change individual values.

3.5.36 Type

Change the type to define how the data is formatted in the response from the IED. The default type is 16 bit integer (1 register).

16 – 16 bit integer. Request one holding register, response is one holding register.

32 – 32 bit integer. Two holding registers, most significant word in the 1st holding register and the lease significant word in the 2nd holding register. Request is two holding registers, response contains two holding registers.

FP – 32 bit single precision IEEE 754-1985 Floating Point number. Two holding registers, most significant word in the 1st holding register and least significant word in 2nd holding register. The byte order is sign and exponent, most significant byte of mantissa, middle byte of mantissa, and least significant byte of mantissa. Request is two holding registers, response contains two holding registers.

F2 – just like FP except the request and response. Request is one holding register, response is two holding registers. The firmware expects this type to be used in a contiguous range of registers. It can’t be mixed with other types. Points in this range may be mapped or unmapped. Unmapped points are treated like F2 type analogs. This point type is scanned separately from other analog points as it ignores the MODBUS protocol document.

All entries in this column may be changed at once by clicking on the header.

3.5.37 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

3.5.38 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

3.5.39 EGU Min

Enter a minimum engineering unit value for the point that will be used to scale the value when viewed. All entries in this column may be changed at once by clicking on the header.

3.5.40 EGU Max

Enter a maximum engineering unit value for the point that will be used to scale the value when viewed. All entries in this column may be changed at once by clicking on the header.

3.5.41 FILE

This is the file number to be used when opcode 20 is selected. If opcode 20 is not selected for this point the value is not used. All entries in this column may be changed at once by clicking on the header.

3.5.42 Param

Enter the Param number of the point or accept the default number. All entries in this column may be changed at once by clicking on the header. This value is not currently used. It is reserved to support odd implementations of the analog data types.

Navigation

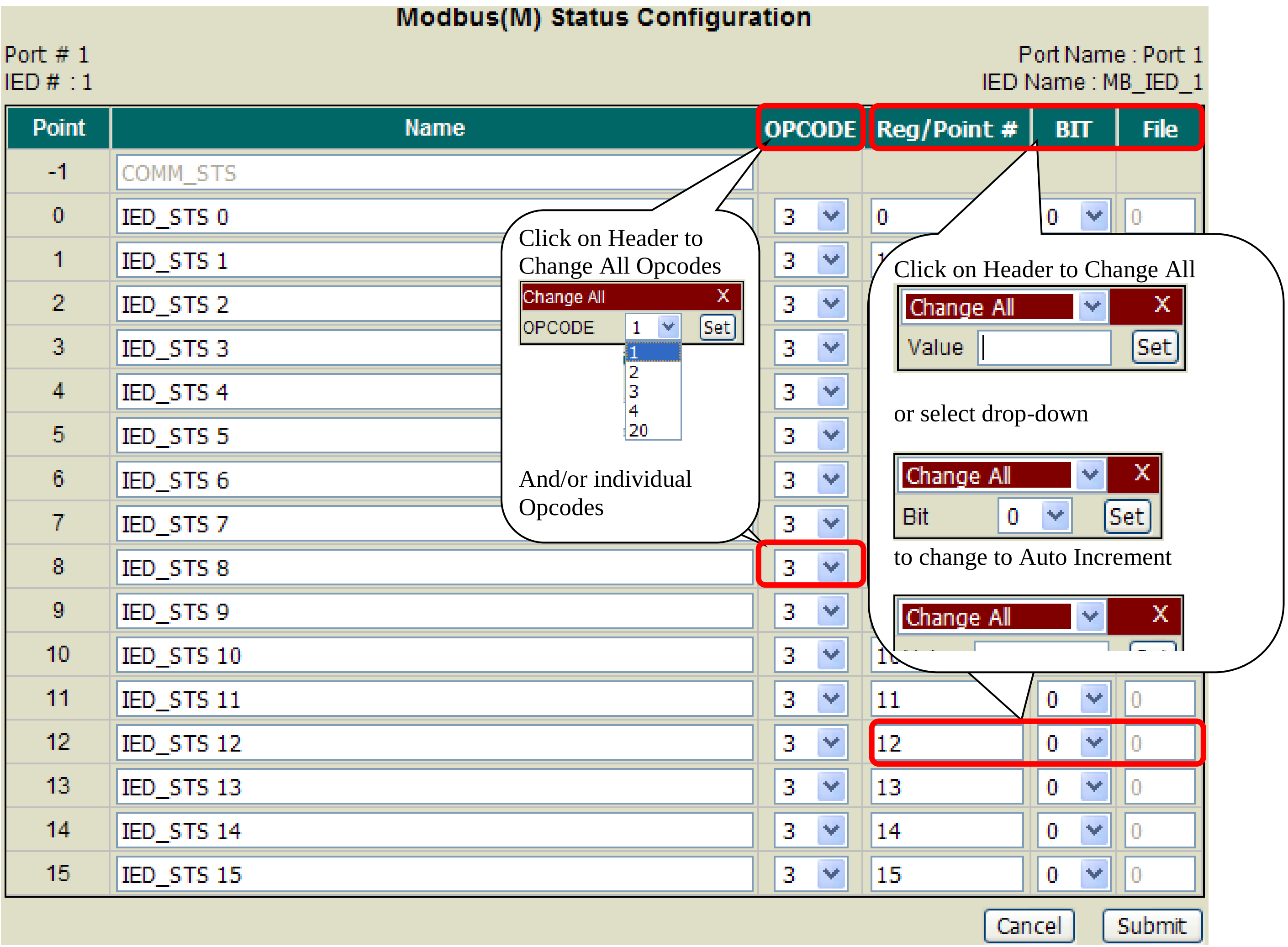
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

3.5.43 IED Status Configuration

From the Modbus Master IED Configuration screen, click on Edit for Binary Inputs. A screen similar to Figure 2-14 will appear.

Figure 3-10 Modbus Master Status Input Configuration



3.5.44 Point

Protocol logical point number. This number cannot be changed. The COMM_STS point is automatically assigned to show whether the Modbus IED is in communication failure or not.

3.5.45 Name

Enter the name of the point (except for COMM_STS which cannot be changed) or accept the default name.

3.5.46 OPCODE (1, 2, 3, 4, 20)

Enter the opcode used to poll the point (or accept the default). All entries in this column may be changed at once by clicking on the header.

3.5.47 Reg/Point

Binary input points configured to use opcodes 1 or 2 are bit-oriented, not register-oriented. The header of the column has been changed from Register # to Reg/Point #, since it is possible to define both bit-oriented and register-oriented points on the same page. The User should be aware that when using opcodes 1 or 2, the Reg/Point # column represents the point number. For example, status input point 0 is addressed as point 0, regardless of the starting register number on the Modbus RTU side. When opcodes 3 or 4 are used, the User enters the register numbers, and should expect the points to be packed 16 bits to a register.

3.5.48 BIT

This field is used when polling status points by holding register (opcode 3 or 4). Enter the BIT number within the register that will correspond to this status point (or accept the default). All entries in this column may be changed at once by clicking on the header.

3.5.49 File

This is the file number to be used when opcode 20 is selected. If opcode 20 is not selected for this point the value is not used. All entries in this column may be changed at once by clicking on the header.

Navigation

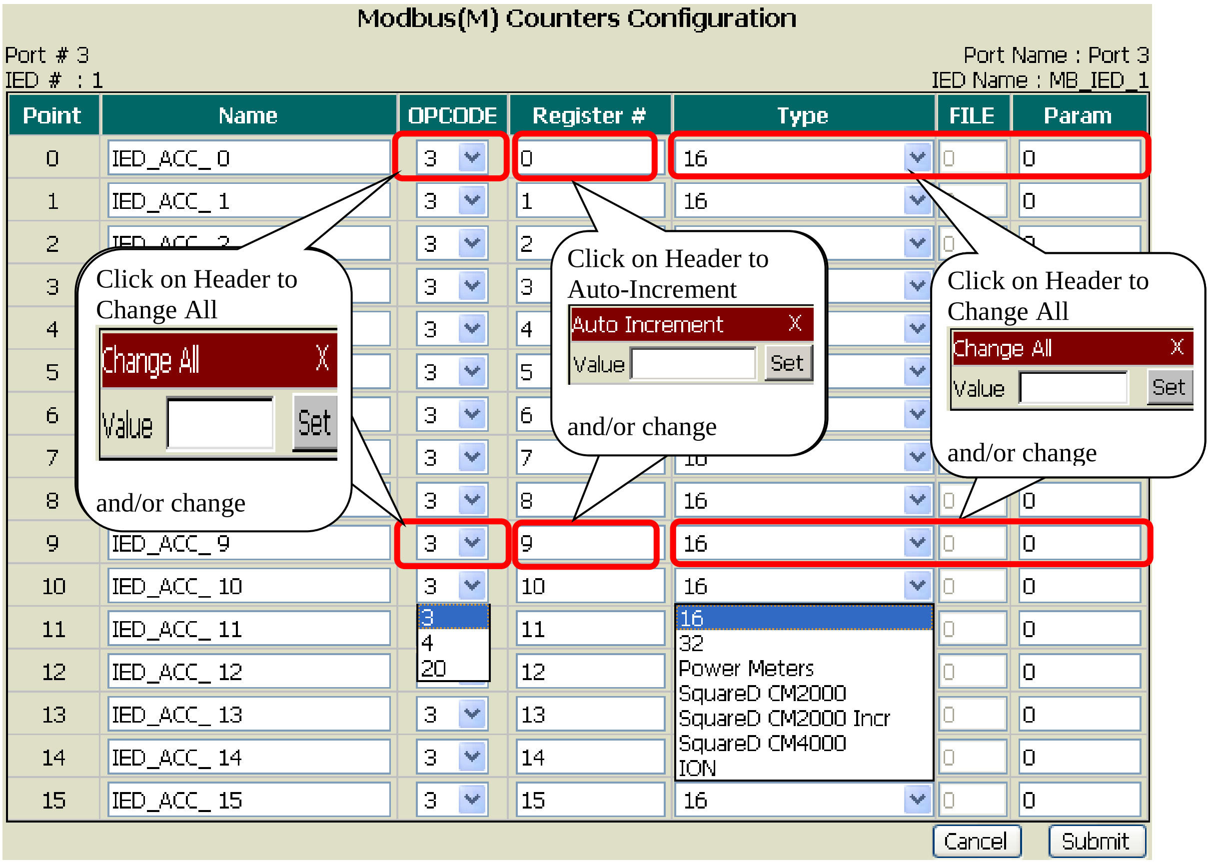
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

3.5.50 IED Counters Configuration

From the Modbus Master IED Configuration screen, click on Edit for Counters. A screen similar to Figure 2-15 will appear.

Figure 3-11 Modbus Master Counters Configuration



3.5.51 Point

Protocol logical point number. This number cannot be changed.

3.5.52 Name

Enter the name of the point (or accept the default name).

3.5.53 OPCODE (3, 4, 20)

Enter the opcode used to poll the point (or accept the default). All entries in this column may be changed at once by clicking on the header.

3.5.54 Register

Enter the Register number of the point (or accept the default). Click on the header to Auto-increment and/or change individual values.

3.5.55 Type

Change the type to define how the data is to be formatted. Default is 16 bits per point (1 register). All entries in this column may be changed at once by clicking on the header.

3.5.55.1 16

16-bit binary counter in one Modbus register

3.5.55.2 32

32-bit binary counter in two successive ModBus registers, first register treated as containing the high-order 16 bits. Selecting 32 bits will cause the protocol to combine the value from the next logical register with that of the current register value. I.e., If you configure point 1 to be a 32 bit point, the RTU will poll the IED for registers 1 and 2 and combine their values to create 1 32 bit number. Point 2 then should be configured to get register number 3 instead of register 2.

3.5.55.3 Power Meters, Square D CM2000, Square D CM2000 Incr., Square D CM4000

All counters are treated as three 16-bit registers. The two bytes of each register are reversed. First register is divided by 1000 to convert from watts to kilowatts. The second register is multiplied by 1000 and added to the first. The third register is multiplied by 100,000 and added to the previous result. The resulting value runs from 0 to 999,999,999 kilowatts.

3.5.55.4 ION

ABB ION meter accumulators are received in two registers. The first register is multiplied by 10,000 and added to the second register. Counters run from 0 to 99,999,999.

3.5.56 FILE

This is the file number to be used when opcode 20 is selected. If opcode 20 is not selected for this point the value is not used. All entries in this column may be changed at once by clicking on the header.

3.5.57 Param

Enter the Param number of the point or accept the default number. All entries in this column may be changed at once by clicking on the header. This value is not currently used. It is reserved to support odd implementations of the accumulator data types.

Navigation

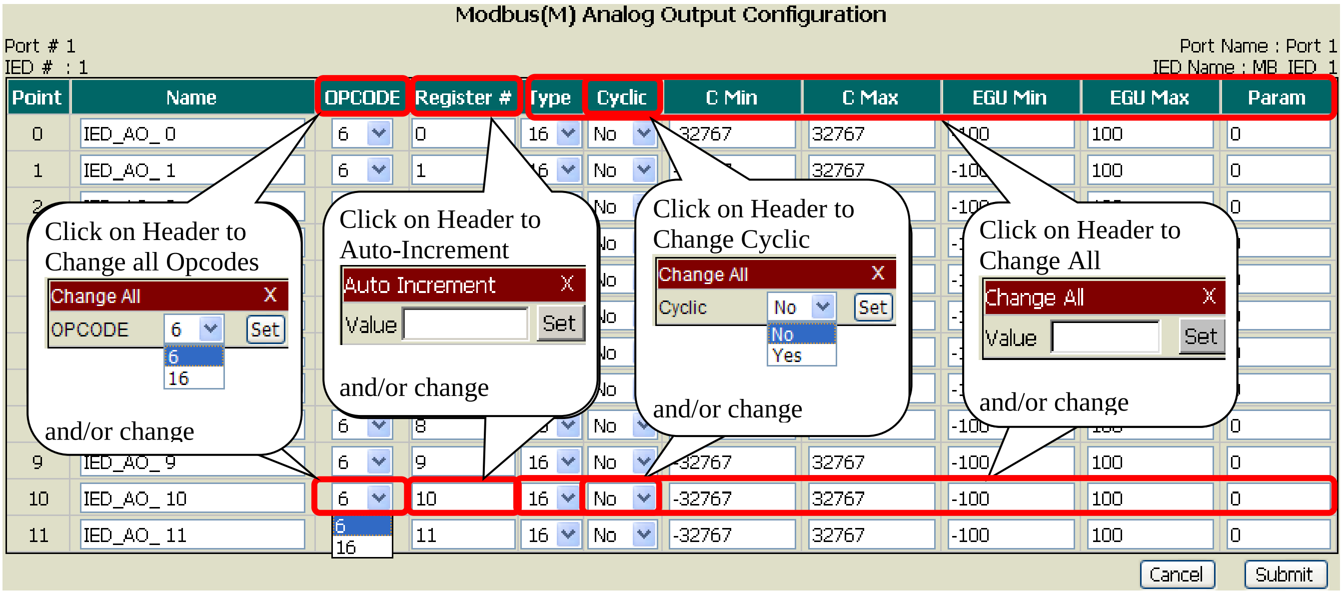
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

3.5.58 IED Analog Output Configuration

From the Modbus Master IED Configuration screen, click on Edit for Analog Output. A screen similar to Figure 2-16 will appear.

Figure 3-12 Modbus Master Analog Output Configuration



3.5.59 Point

Protocol logical point number. This number cannot be changed.

3.5.60 Name

Enter the name of the point (or accept the default name).

3.5.61 OPCODE (6, 16)

Enter the opcode used to command the point (or accept the default). All entries in this column may be changed at once by clicking on the header.

3.5.62 Register

Enter the Register number of the point (or accept the default). Click on the header to Auto-increment and/or change individual values.

3.5.63 Type

Change the type to define how the data is to be formatted. All entries in this column may be changed at once by clicking on the header.

3.5.63.1 16

16-bit binary counter in one Modbus register (default)

3.5.63.2 32

Note: To use this type, OPCODE for this point must be 16.

Selecting 32 bits will cause the protocol to write two consecutive holding registers for a 32 bit long word analog output value. The 4 bytes of the 32 bit long word is written in the following order:

Holding Register

N+0	Most significant byte of most significant word
N+0	Least significant byte of most significant word
N+1	Most significant byte of least significant word
N+1	Least significant byte of least significant word

For example, if you were writing a hex value of 12345678, to holding registers 7 and 8 in the slave with an RTU address of 5,

The bytes in the protocol, if examined with a protocol analyzer, would be:

05 – RTU address

10 – Write Multiple registers

00 – Starting address most significant byte

07 – Starting address least significant byte

00 – Quantity of registers most significant byte

02 – Quantity of registers least significant byte

04 – Byte count

12 – Most significant byte of most significant word

34 – Least significant byte of most significant word

56 – Most significant byte of least significant word

78 – Least significant byte of least significant word

XX – CRC-16

XX – CRC-16

The values in the holding registers would read the following:

Holding register 7, 1234 (Most significant word)

Holding register 8, 5678 (Least significant word)

3.5.64 Cyclic

Enter “Yes” to periodically reissue the setpoint command to the AO point in the IED. See the section on Communication Channel Configuration on configuring the “Write Cycle Time”. If left to the default of No the RTU will issue an AO command to the IED only after receiving a new AO value for that point from the GUI or a master protocol.

Note: If Cyclic is set to "Yes", then OPCODE must be set to 16.

3.5.65 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

3.5.66 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

3.5.67 EGU Min

Enter a minimum engineering unit value for the point that will be used to scale the value when viewed. All entries in this column may be changed at once by clicking on the header.

3.5.68 EGU Max

Enter a maximum engineering unit value for the point that will be used to scale the value when viewed. All entries in this column may be changed at once by clicking on the header.

3.5.69 Param

Enter the Param number of the point or accept the default number. All entries in this column may be changed at once by clicking on the header.

Navigation

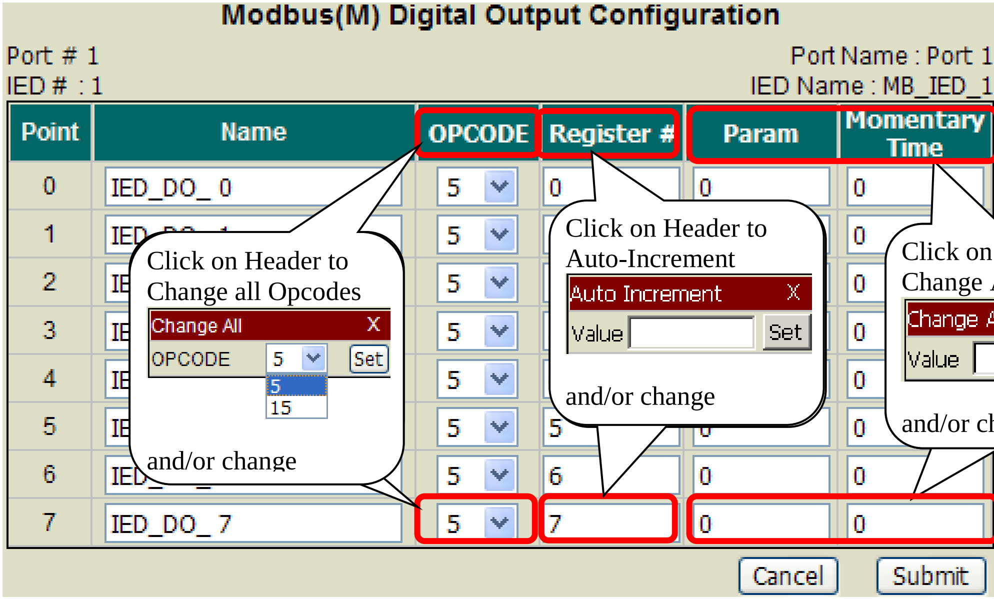
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

3.5.70 IED Digital Output Configuration

Click on Edit for Digital Output. A screen similar to Figure 2-17 will appear.

Figure 3-13 Modbus Master Binary Outputs Configuration



3.5.71 Point

Protocol logical point number. This number cannot be changed.

3.5.72 Name

Enter the name of the point (or accept the default name).

3.5.73 OPCODE (5, 15)

Enter the opcode used to command the point (or accept the default). All entries in this column may be changed at once by clicking on the header.

3.5.74 Register

Enter the Register number of the point (or accept the default). Click on the header to Auto-increment and/or change individual values.

3.5.75 Param

Enter the Param number of the point or accept the default number. All entries in this column may be changed at once by clicking on the header.

3.5.76 Momentary Time

If anything other than 0 is entered, the following sequence will occur: 1) Close control received by Modbus(M) to be sent to IED; 2) Close is sent by MBM; 3) MBM waits until confirmation is received; 4) If confirmation is not received, do nothing; 5) If confirmation received, wait the number of msec entered, then send an Open command to the same point on the same IED. Default is 0.

Navigation

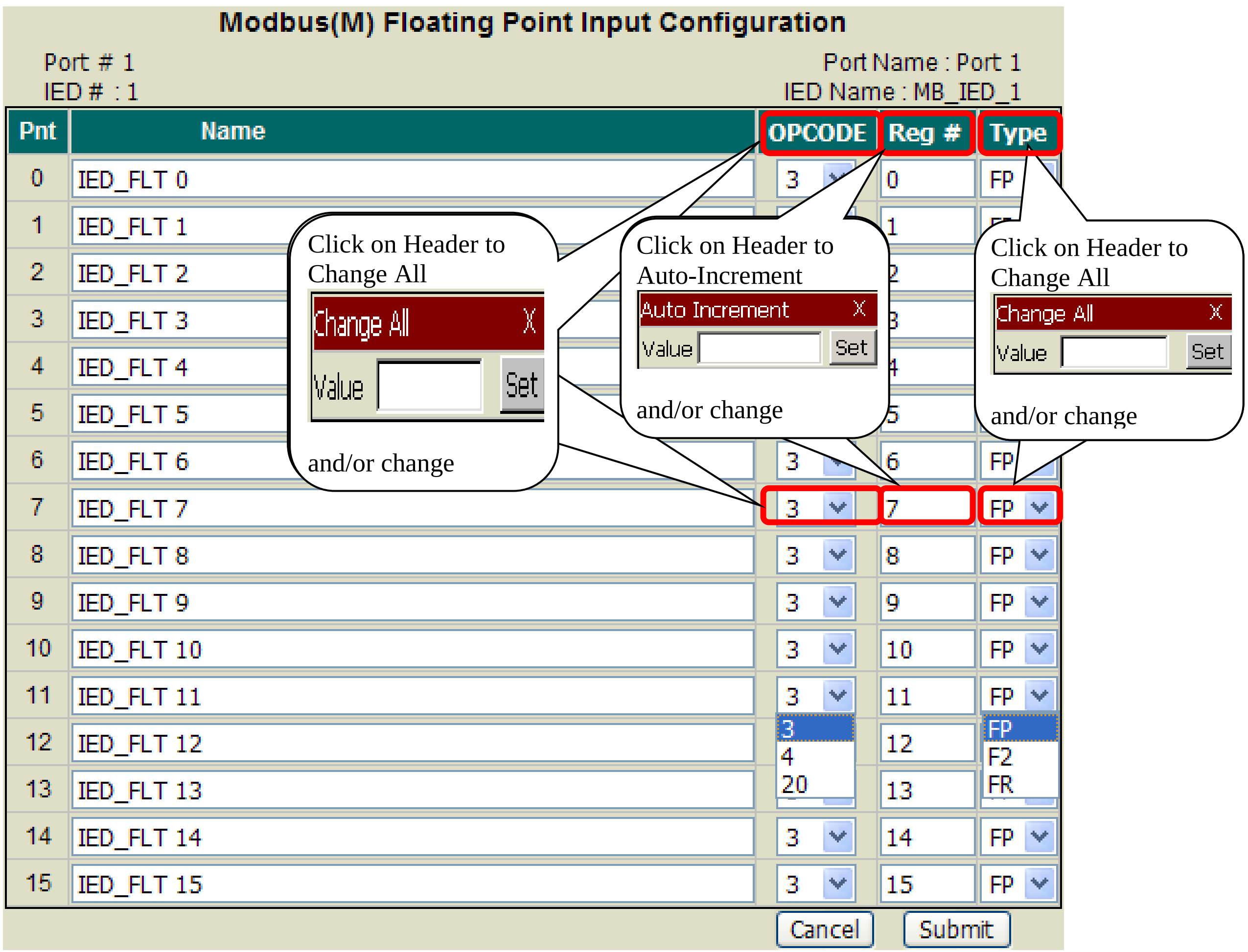
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

3.5.77 IED Floating Point Input Configuration

From the Modbus Master IED Configuration screen, click on Edit for Floating Points Inputs. A screen similar to the one below will appear.

Figure 3-14 Modbus Master Floating Point Input Configuration



3.5.78 Pnt

Protocol logical point number. This number cannot be changed.

3.5.79 Name

Enter the name of the point (or accept the default name).

3.5.80 OPCODE (3, 4, 20)

Enter the opcode used to poll the point (or accept the default). All entries in this column may be changed at once by clicking on the header.

3.5.81 Reg

Enter the Register number of the point (or accept the default). Click on the header to Auto-increment and/or change individual values.

3.5.82 Type (FP, F2, FR)

Change the type to define how the data is formatted in the response from the IED. The default type is FP. All entries in this column may be changed at once by clicking on the header.

FP – 32 bit single precision IEEE 754-1985 Floating Point number. Two holding registers, most significant word in the 1^{st} holding register and least significant word in 2^{nd} holding register. The byte order is sign and exponent, most significant byte of mantissa, middle byte of mantissa, and least significant byte of mantissa. Request is two holding registers, response contains two holding registers.

F2 – just like FP except the request and response. Request is one holding register, response is two holding registers. The firmware expects this type to be used in a contiguous range of registers. It can't be mixed with other types. Points in this range may be mapped or unmapped. Unmapped points are treated like F2 type analogs. This point type is scanned separately from other analog points as it ignores the MODBUS protocol document.

FR – Type "FR" (float reversed) has the high-order half of the 32-bit floating point value in the second register (FP with words reversed).

Navigation

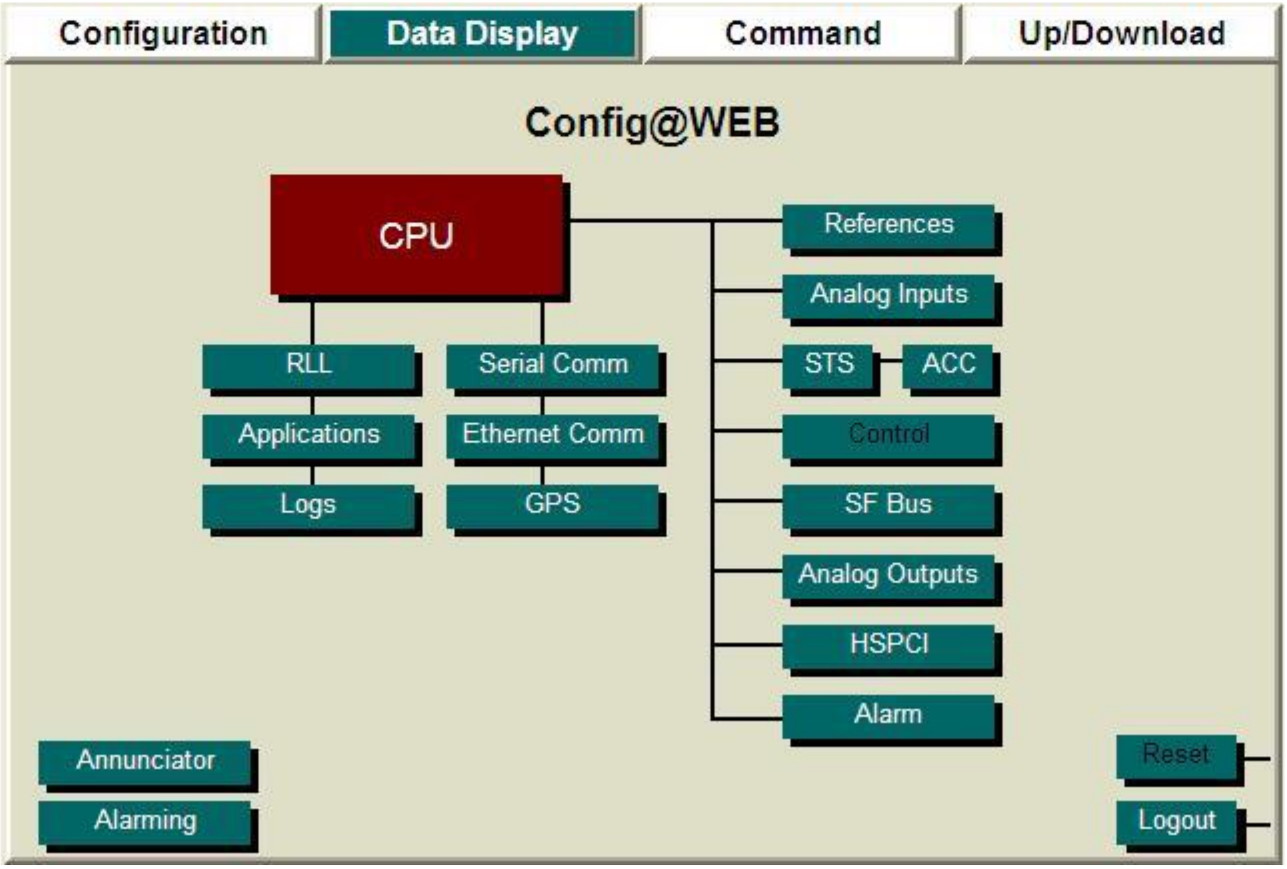
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

3.6 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 3-15 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 3-16 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Port 1	DNPR	View	Port Data
Port #2	K	K	Port 2	DNPR	View	Port Data
Port #3	K	K	Port 3	Modbus(M)	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

3.6.1 Port Number

Physical Port number of the RTU.

3.6.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

3.6.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

3.6.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

3.6.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

3.6.3 Name

The port name given during configuration or default name accepted.

3.6.4 Protocol

The configured protocol for this port.

3.6.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

3.6.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

Navigation

Click the Back button to return to the previous screen.

3.6.7 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 3-17 Modbus Master Communication Counters Display

Modbus(M) Communication Counters Display

Port # : 1 Port Name : Port 1

Point	Counter Name	Counts
1	Messages Sent	0
2	Good Replies	0
3	Bad/No Replies	0
4	Write Failures	0
5	RX Timeouts	0
6	IB Timer Violations	0
7	Security Errors	0
8	Hardware DCD Errors	0
9	Hardware CTS Errors	0
10	Overrun Errors	0
11	Framing Errors	0
12	Parity Errors	0

Data Trap [Configure]

IED Comm Counters [View]

Reset Comm Counters [Reset]

[Back]

3.6.8 Point Number

A logical point number for reference only.

3.6.9 Counter Name

The following counters are monitored:

3.6.9.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

3.6.9.2 Good Replies

This indicates the cumulative number of good replies since the last reset or power-up.

3.6.9.3 Bad/No Replies

This indicates the cumulative number of transmitted frames that did not receive a valid response since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

3.6.9.4 Write Failures

This indicates the cumulative number of times that a write has failed. This could be a force coil, preset register or preset multiple register used in controlling AO or DO IED points.

3.6.9.5 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

3.6.9.6 IB Timer Violations

This indicates the cumulative number of Interbyte timer violations since the last reset or power-up. This count can be affected by the setting of the Interbyte Time in configuration.

3.6.9.7 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

3.6.9.8 Hardware DCD Errors

This indicates the cumulative number of DCD errors since the last reset or power-up.

3.6.9.9 Hardware CTS Errors

This indicates the cumulative number of CTS errors since the last reset or power-up.

3.6.9.10 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

3.6.9.11 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

3.6.9.12 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

3.6.10 Counts

The counts for each type of Counter.

3.6.11 Data Trap

Please see the Config@WEB Secure Software Users Guide.

3.6.12 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

Modbus(M) IED Comm Counters Display

Port # : 2 Port Name : Port 2

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts	Security Errors	Framing Errors	Overrun Errors	Parity Errors
1	MB_IED_1	0	0	0	0	0	0	0	0
2	MB_IED_2	0	0	0	0	0	0	0	0

Done

3.6.12.1 IED

The number of the IED

3.6.12.2 IED Name

The name of the IED

3.6.12.3 Messages Sent

Messages sent to this IED since the last reset or since the last time the counters were cleared.

3.6.12.4 Valid Replies

Valid messages received from this IED since the last reset or since the last time the counters were cleared.

3.6.12.5 No Replies

The number of no replies from this IED since the last reset or since the last time the counters were cleared.

3.6.12.6 Timeouts

The number of timeouts from this IED since the last reset or since the last time the counters were cleared.

3.6.12.7 Security Errors

The number of security errors from this IED since the last reset or since the last time the counters were cleared.

3.6.12.8 Framing Errors

The number of framing errors from this IED since the last reset or since the last time the counters were cleared.

3.6.12.9 Overrun Errors

The number of overrun errors from this IED since the last reset or since the last time the counters were cleared.

3.6.12.10 Parity Errors

The number of parity errors from this IED since the last reset or since the last time the counters were cleared.

3.6.13 Reset Comm Counters

Click this button to reset all comm. counters.

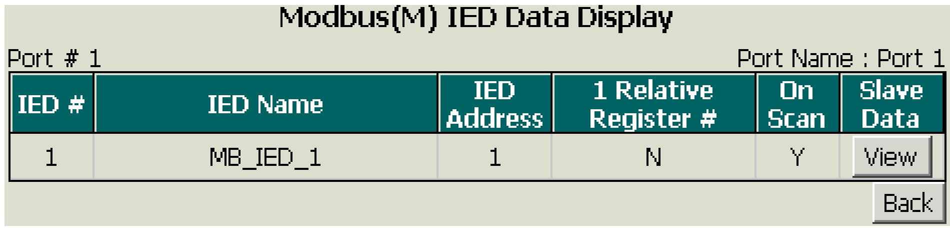
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

3.6.14 IED Data Display

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 3-18 Modbus Master IED Display



3.6.15 IED

The logical number of the IED on this communication channel.

3.6.16 IED Name

The name that was chosen, or accepted as default, during configuration.

3.6.17 IED Address

The IED Address chosen during configuration.

3.6.18 1 Relative Register

Displays whether or not 1 relative register # was chosen during configuration.

3.6.19 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

3.6.20 Slave Data

Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the Modbus Master IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 3-19 Modbus Master IED Display

Modbus(M) IED Data Display

Port # : 2 Port Name : Port 2

IED # : 1 IED Name : MB_IED_1

Type	Number	View
Analog Inputs	32	View
Binary Inputs	32	View
Counters	32	View
Analog Outputs	24	View
Digital Outputs	16	View
Floating Point Inputs	16	View

Back

3.6.21 Type

The type of point.

3.6.22 Number

The number of points from your IED.

3.6.23 View

Click the View button to view points.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the previous screen.

3.6.23.1 Analog Inputs

From the Modbus Master IED Display screen, click View for Analog Inputs to get the screen shown in Figure 2-24.

Figure 3-20 Modbus Master Analog Inputs Display

Modbus(M) Analog Inputs Display

Port # : 3 Port Name : Port 3
IED # : 1 IED Name : MB_IED_1

Page1 of 1 Go To Go

Point	Reg	Point Name	Point Status	Point Value	Point Counts
0	0	IED_ANALOG 0	F	0.000	-32767
1	1	IED_ANALOG 1	F	0.000	-32767
2	2	IED_ANALOG 2	F	0.000	-32767
3	3	IED_ANALOG 3	F	0.000	-32767
4	4	IED_ANALOG 4	F	0.000	-32767
5	5	IED_ANALOG 5	F	0.000	-32767
6	6	IED_ANALOG 6	F	0.000	-32767
7	7	IED_ANALOG 7	F	0.000	-32767
8	8	IED_ANALOG 8	F	0.000	-32767
9	9	IED_ANALOG 9	F	0.000	-32767
10	10	IED_ANALOG 10	F	0.000	-32767
11	11	IED_ANALOG 11	F	0.000	-32767
12	12	IED_ANALOG 12	F	0.000	-32767
13	13	IED_ANALOG 13	F	0.000	-32767
14	14	IED_ANALOG 14	F	0.000	-32767
15	15	IED_ANALOG 15	F	0.000	-32767

Back

3.6.24 Point

Protocol logical point number.

3.6.25 Reg

The Register number as configured.

3.6.26 Point Name

The name of the point assigned during configuration.

3.6.27 Point Status

Please see the Config@WEB Secure Software Users Guide.

3.6.28 Point Value

The engineering unit (EGU) value that has been calculated based on min/max EGU scaling entered during configuration.

3.6.29 Point Counts

The counts from the IED.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to

the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

3.6.29.1 Status Inputs

From the Modbus Master IED Display screen, click View for Binary Inputs to get the screen shown in Figure 2-25.

Figure 3-21 Modbus Master Status Inputs Display

Modbus(M) Status Inputs Display

Port # : 3
IED # : 1

Port Name : Port 3
IED Name : MB_IED_1

Page1 of 2 Go To [ ] Go Next >>

Point	Reg	Bit	Point Name	Point Status	Point State	●	Total Changes	Last Change
-1	0	0	COMM_STS		Closed	●	1	10/02/2012 08:04:02.094
0	0	0	IED_STS 0	F	Open	●	0	--/--/-- --:--:--.---
1	1	0	IED_STS 1	F	Open	●	0	--/--/-- --:--:--.---
2	2	0	IED_STS 2	F	Open	●	0	--/--/-- --:--:--.---
3	3	0	IED_STS 3	F	Open	●	0	--/--/-- --:--:--.---
4	4	0	IED_STS 4	F	Open	●	0	--/--/-- --:--:--.---
5	5	0	IED_STS 5	F	Open	●	0	--/--/-- --:--:--.---
6	6	0	IED_STS 6	F	Open	●	0	--/--/-- --:--:--.---
7	7	0	IED_STS 7	F	Open	●	0	--/--/-- --:--:--.---
8	8	0	IED_STS 8	F	Open	●	0	--/--/-- --:--:--.---
9	9	0	IED_STS 9	F	Open	●	0	--/--/-- --:--:--.---
10	10	0	IED_STS 10	F	Open	●	0	--/--/-- --:--:--.---
11	11	0	IED_STS 11	F	Open	●	0	--/--/-- --:--:--.---
12	12	0	IED_STS 12	F	Open	●	0	--/--/-- --:--:--.---
13	13	0	IED_STS 13	F	Open	●	0	--/--/-- --:--:--.---
14	14	0	IED_STS 14	F	Open	●	0	--/--/-- --:--:--.---

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not the comm. channel is operational. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

3.6.30 Point

Protocol logical point number.

3.6.31 Reg

The Register number as configured.

3.6.32 Bit

The Bit number as configured.

3.6.33 Point Name

The name of the point assigned during configuration.

3.6.34 Point Status

Please see the Config@WEB Secure Software Users Guide.

3.6.35 Point State

Indicates that point is either OPEN or CLOSED.

3.6.36 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

3.6.37 Total Changes

Displays the number of changes since last Reset.

3.6.38 Last Change

Displays the Date and Time of the last change since reset.

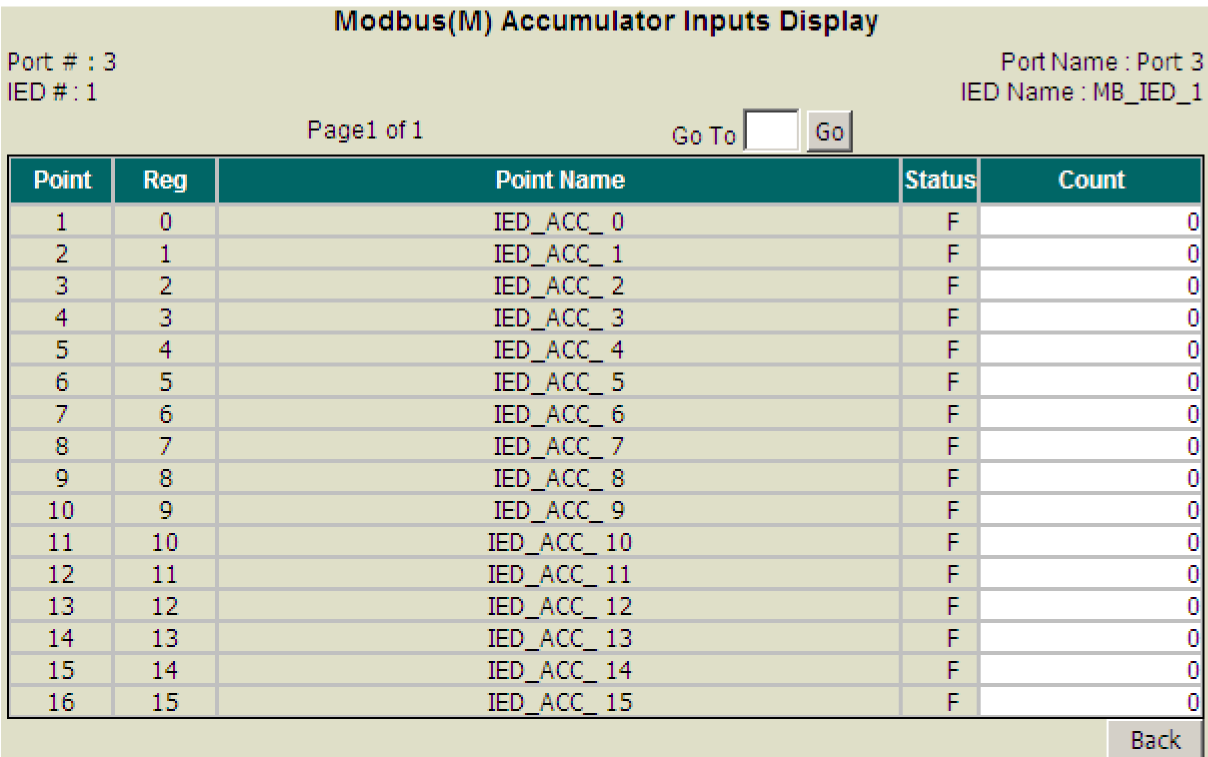
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

3.6.38.1 Counter Inputs

From the Modbus Master IED Display screen, click View for Counters to get the screen shown in Figure 2-26.

Figure 3-22 Modbus Master Accumulator Inputs Display



Point	Reg	Point Name	Status	Count
1	0	IED_ACC_ 0	F	0
2	1	IED_ACC_ 1	F	0
3	2	IED_ACC_ 2	F	0
4	3	IED_ACC_ 3	F	0
5	4	IED_ACC_ 4	F	0
6	5	IED_ACC_ 5	F	0
7	6	IED_ACC_ 6	F	0
8	7	IED_ACC_ 7	F	0
9	8	IED_ACC_ 8	F	0
10	9	IED_ACC_ 9	F	0
11	10	IED_ACC_ 10	F	0
12	11	IED_ACC_ 11	F	0
13	12	IED_ACC_ 12	F	0
14	13	IED_ACC_ 13	F	0
15	14	IED_ACC_ 14	F	0
16	15	IED_ACC_ 15	F	0

3.6.39 Point

Protocol logical point number.

3.6.40 Reg

The Register number as configured.

3.6.41 Point Name

The name of the point assigned during configuration.

3.6.42 Status

Please see the Config@WEB Secure Software Users Guide.

3.6.43 Count

The accumulated count.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

3.6.43.1 Analog Outputs

From the Modbus Master IED Display screen, click View for Analog Outputs to get the screen shown in Figure 2-27.

Figure 3-23 Modbus Master Analog Outputs Display

Modbus(M) Analog Outputs Display

Port # : Port # : 3 Port Name : Port 3
IED # : 1 IED Name : MB_IED_1

Page1 of 1 Go To Go

Point	Reg	Point Name	Point Status	Point Value
0	0	IED_AO_ 0		-100.000
1	1	IED_AO_ 1		-100.000
2	2	IED_AO_ 2		-100.000
3	3	IED_AO_ 3		-100.000
4	4	IED_AO_ 4		-100.000
5	5	IED_AO_ 5		-100.000
6	6	IED_AO_ 6		-100.000
7	7	IED_AO_ 7		-100.000
8	8	IED_AO_ 8		-100.000
9	9	IED_AO_ 9		-100.000
10	10	IED_AO_ 10		-100.000
11	11	IED_AO_ 11		-100.000
12	12	IED_AO_ 12		-100.000
13	13	IED_AO_ 13		-100.000
14	14	IED_AO_ 14		-100.000
15	15	IED_AO_ 15		-100.000

Back

3.6.44 Point

Protocol logical point number.

3.6.45 Reg

The Register number as configured.

3.6.46 Point Name

The name of the point assigned during configuration.

3.6.47 Point Status

Please see the Config@WEB Secure Software Users Guide.

3.6.48 Point Value

The engineering unit (EGU) value.

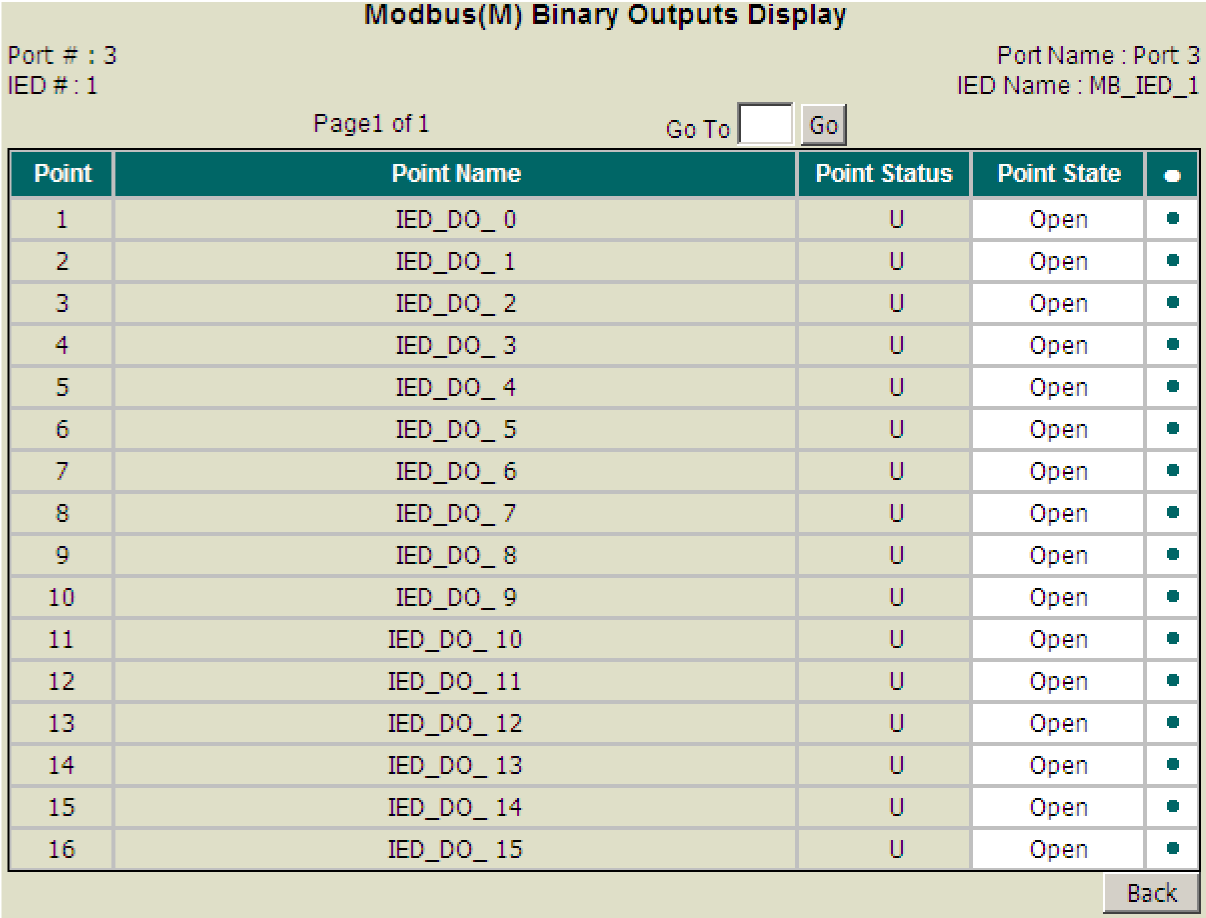
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

3.6.48.1 Digital Outputs

From the Modbus Master IED Display screen, click View for Digital Outputs to get the screen shown in Figure 2-25.

Figure 3-24 Modbus Master Status Inputs Display



Point	Point Name	Point Status	Point State	●
1	IED_DO_ 0	U	Open	●
2	IED_DO_ 1	U	Open	●
3	IED_DO_ 2	U	Open	●
4	IED_DO_ 3	U	Open	●
5	IED_DO_ 4	U	Open	●
6	IED_DO_ 5	U	Open	●
7	IED_DO_ 6	U	Open	●
8	IED_DO_ 7	U	Open	●
9	IED_DO_ 8	U	Open	●
10	IED_DO_ 9	U	Open	●
11	IED_DO_ 10	U	Open	●
12	IED_DO_ 11	U	Open	●
13	IED_DO_ 12	U	Open	●
14	IED_DO_ 13	U	Open	●
15	IED_DO_ 14	U	Open	●
16	IED_DO_ 15	U	Open	●

3.6.49 Point

Protocol logical point number.

3.6.50 Point Name

The name of the point assigned during configuration.

3.6.51 Point Status

Please see the Config@WEB Secure Software Users Guide.

3.6.52 Point State

Indicates that point is either OPEN or CLOSED.

3.6.53 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

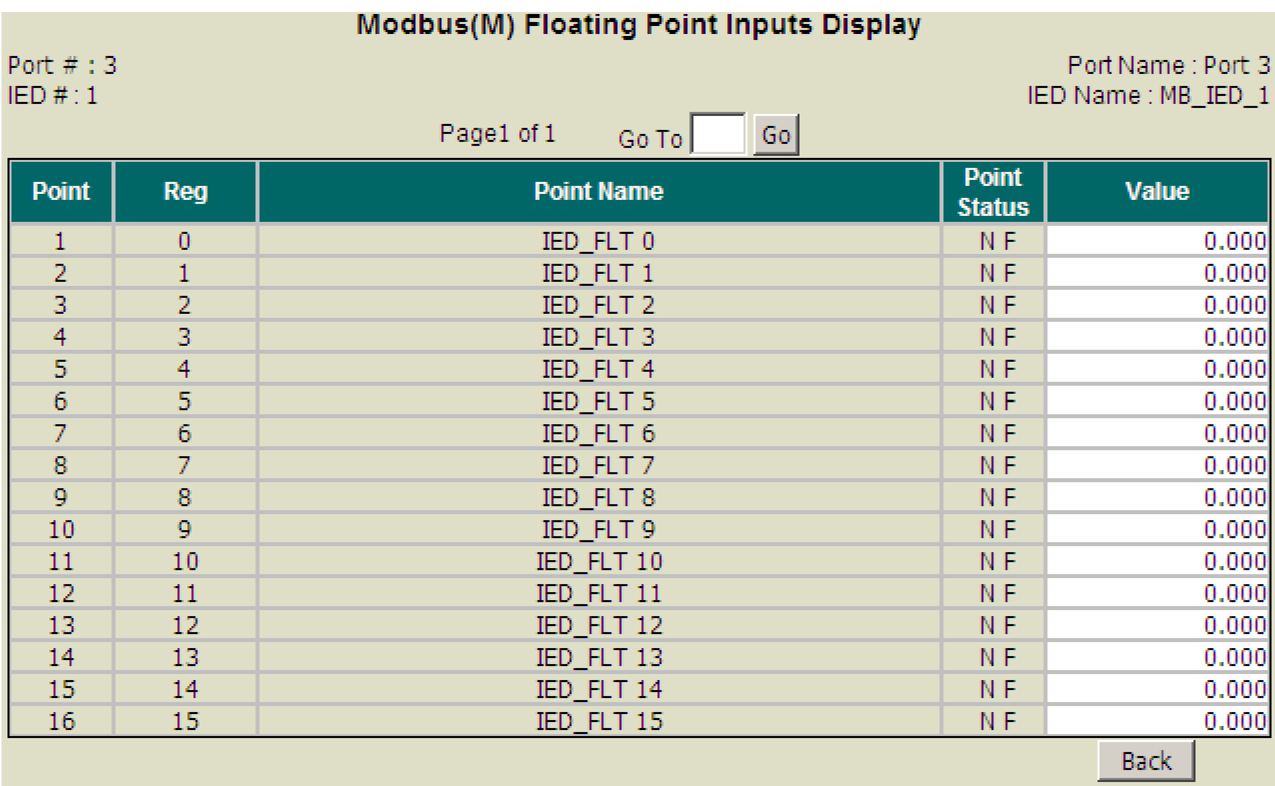
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

3.6.53.1 Floating Point Inputs

Click View for Floating Point Inputs to get a screen similar to the one below.

Figure 3-25 Modbus Master Floating Point Inputs Display



Modbus(M) Floating Point Inputs Display

Port # : 3 Port Name : Port 3

IED # : 1 IED Name : MB_IED_1

Page1 of 1 Go To Go

Point	Reg	Point Name	Point Status	Value
1	0	IED_FLT 0	N F	0.000
2	1	IED_FLT 1	N F	0.000
3	2	IED_FLT 2	N F	0.000
4	3	IED_FLT 3	N F	0.000
5	4	IED_FLT 4	N F	0.000
6	5	IED_FLT 5	N F	0.000
7	6	IED_FLT 6	N F	0.000
8	7	IED_FLT 7	N F	0.000
9	8	IED_FLT 8	N F	0.000
10	9	IED_FLT 9	N F	0.000
11	10	IED_FLT 10	N F	0.000
12	11	IED_FLT 11	N F	0.000
13	12	IED_FLT 12	N F	0.000
14	13	IED_FLT 13	N F	0.000
15	14	IED_FLT 14	N F	0.000
16	15	IED_FLT 15	N F	0.000

Back

3.6.54 Point

Protocol logical point number.

3.6.55 Reg

The Register number as configured.

3.6.56 Point Name

The name of the point assigned during configuration.

3.6.57 Point Status

Please see the Config@WEB Secure Software Users Guide.

3.6.58 Point Value

The engineering unit (EGU) value.

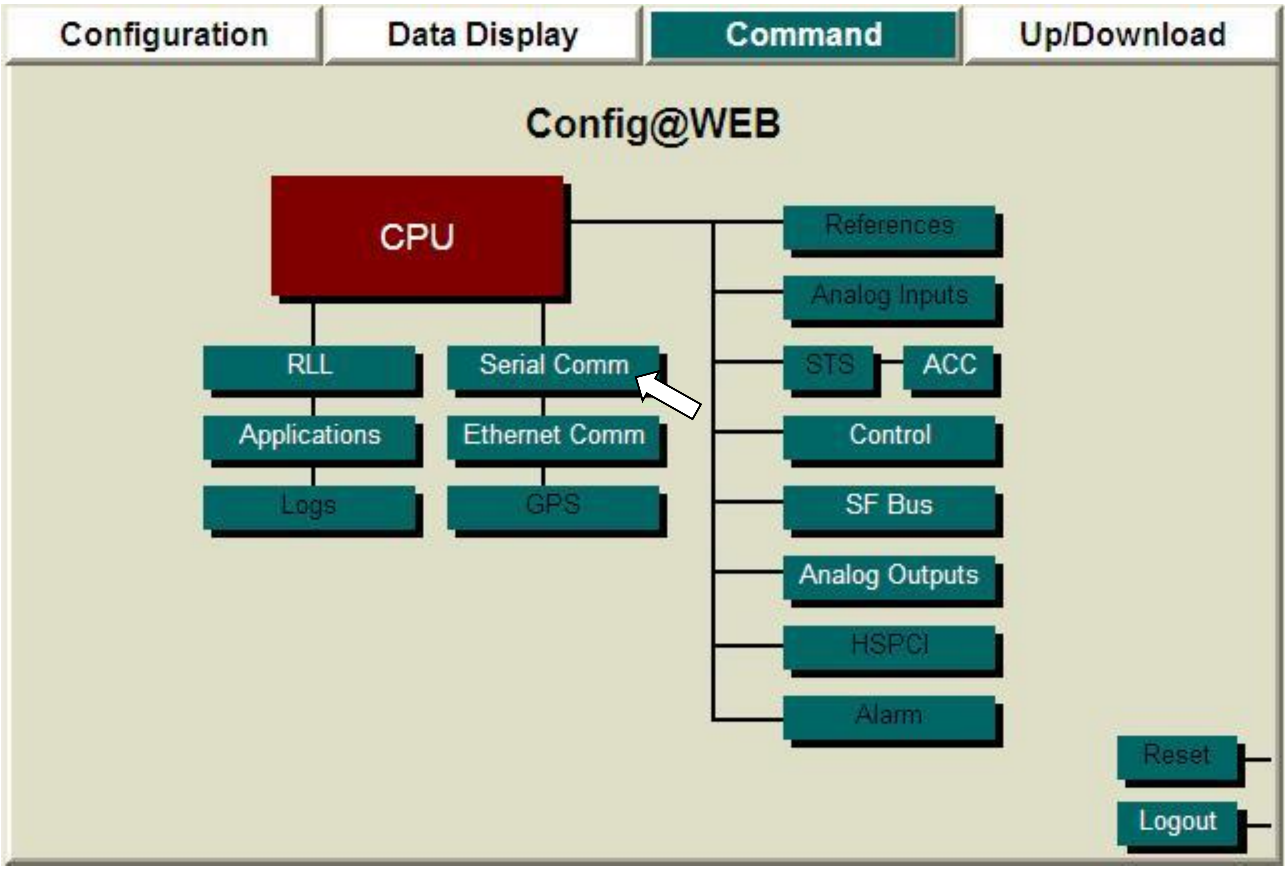
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

3.7 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 3-26 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2200 manual. Under Command Port Data, click Port Data.

Figure 3-27 Serial Comm Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	Modbus(M)	Port Data	Normal
Port #2	K	K	Port 2	None	Port Data	Normal
Port #3	K	K	Port 3	None	Port Data	Normal
Port #4	K	K	Port 4	None	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button as shown.

Figure 3-28 Modbus Master IED Command

Modbus(M) IED Command

Port # 1 Port Name : Port 1

IED #	IED Name	IED Address	1 Relative Register #	On Scan	Slave Data
1	MB_IED_1	1	N	Y	Command

Back

The resultant screen will be similar to Figure 2-32. If the outputs exist on the IED, and if you have them configured as in this example, you will be able to command Analog Outputs and Digital Outputs.

Figure 3-29 Modbus Master IED Command

Modbus(M) IED Command

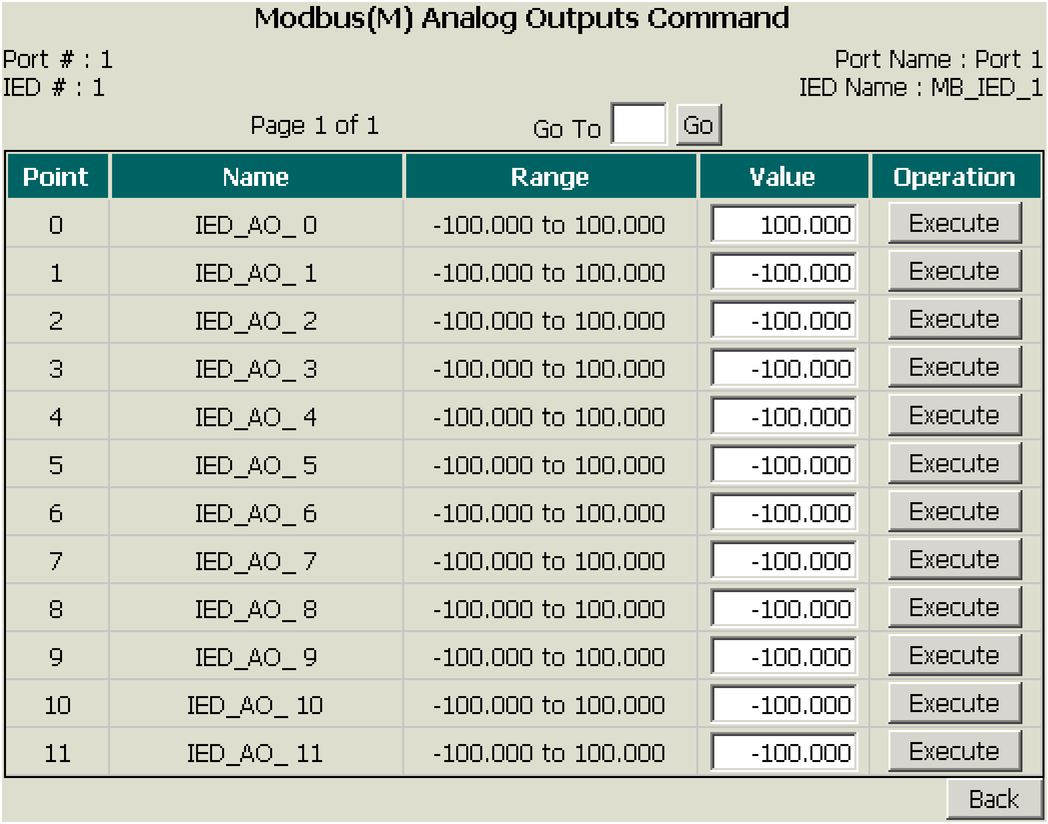
Port # : 1 Port Name : Port 1
IED # : 1 IED Name : MB_IED_1

Type	Number	Command
Analog Inputs	12	
Binary Inputs	16	
Counters	32	
Analog Outputs	12	Command
Digital Outputs	8	Command

Back

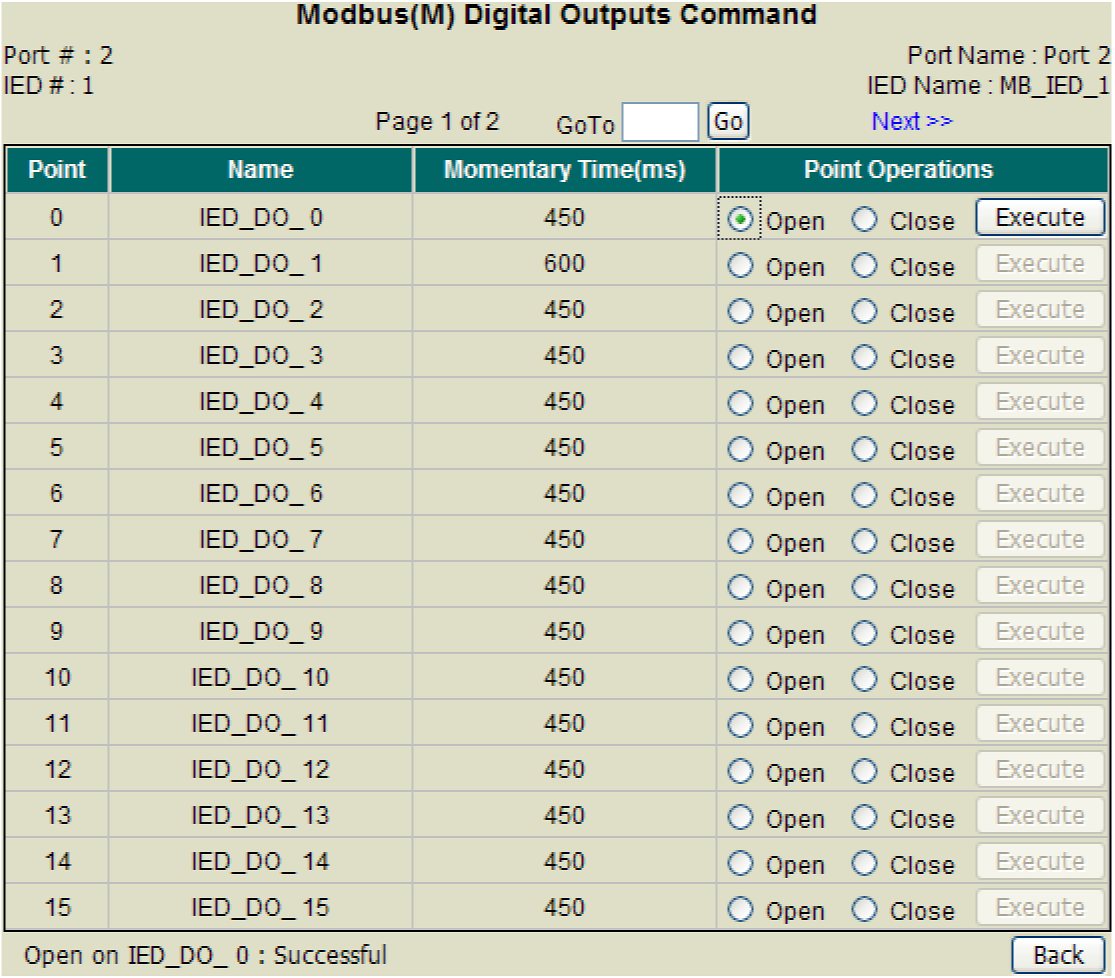
The Analog Outputs Command will give you a screen similar to Figure 2-33. You may enter a value within the "Range" to drive the AO, then click the Execute button for a result similar to Point 0 of Figure 2-33.

Figure 3-30 Modbus Master Analog Outputs Command



The Digital Outputs Command will give you a screen similar to Figure 2-34. You may Open or Close, then click the Execute button for a result similar to Point 0 of Figure 2-34. The Momentary Time reflects the momentary time in ms set up in Configuration.

Figure 3-31 Modbus Master Digital Outputs Command



Modbus(M) Digital Outputs Command

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : MB_IED_1

Page 1 of 2 GoTo Go Next >>

Point	Name	Momentary Time(ms)	Point Operations
0	IED_DO_ 0	450	Open Close Execute
1	IED_DO_ 1	600	Open Close Execute
2	IED_DO_ 2	450	Open Close Execute
3	IED_DO_ 3	450	Open Close Execute
4	IED_DO_ 4	450	Open Close Execute
5	IED_DO_ 5	450	Open Close Execute
6	IED_DO_ 6	450	Open Close Execute
7	IED_DO_ 7	450	Open Close Execute
8	IED_DO_ 8	450	Open Close Execute
9	IED_DO_ 9	450	Open Close Execute
10	IED_DO_ 10	450	Open Close Execute
11	IED_DO_ 11	450	Open Close Execute
12	IED_DO_ 12	450	Open Close Execute
13	IED_DO_ 13	450	Open Close Execute
14	IED_DO_ 14	450	Open Close Execute
15	IED_DO_ 15	450	Open Close Execute

Open on IED_DO_ 0 : Successful Back

4 2179

The 2179 protocol is a protocol that communicates between the RTU and an IED. This protocol is provided as a standard on many reclosers and regulators.

The RTU can be configured to periodically poll one or more IEDs using 2179 protocol for transducer-like inputs. In addition, the RTU will accept commands from the master station for transmission to a Recloser unit. The subsequent reply is returned to the master station.

Multiple IEDs can be physically connected to the RTU via a single RS-232 communication port when the units are party-lined through another media (modem, fiber optics, etc.) connected to the port. Each IED is assigned a unique address.

The communication protocol used between the RTU and the IEDs is described in the document from Cooper Power Systems entitled "Serial Communications Protocol, Data 2179-Revision 2", dated April 1997, reference number R280-90-12. This document describes the generic protocol used to communicate with the Cooper Power Systems CL-4C Regulator Control and the LTC-4C Power Transformer Control units. The point database for the Form 4C Recloser Control is described in the document from Cooper Power Systems titled "Communications Point Data Base, Data 2180 - Revision 3", dated April 1997, reference number R280-90-11. An additional document, DATA 2180A, contains information about status sequence numbers used in 2-bit data processing.

4.1 Polled Data

The remote periodically polls one or more IEDs for analog, status and pulse accumulator data. The poll rate is configurable at the RTU.

4.2 Database Mapping Theory

The RTU database mapping varies depending on the model of the connected device. Refer to the vendor documentation supplied with the unit for the sequence number assignments.

4.2.1 Pulse Accumulator Data

The user may configure from 0 to 32 values to be processed into the RTU accumulator database.

4.2.2 2 Bit Status Change Option

Newer Form 4C Reclosers have firmware that allows the Form 4C to detect changes and set change bits to report to the RTU. The RTU IED database may then be configured to cause the RTU to scan the IED status points to acquire the change bits from the IED. The following parameters apply to the 2 bit status change data acquisition:

1. Change bits are ignored on initial scans of the IED by the RTU and after lost communications has been restored with the IED.
2. Table 4-1 defines the action taken by the RTU firmware when the combinations of state/change bits are received from the IED:

Table 4-1 2179 Two Bit Status

RTU Current State	2179 Current State	2179 Change Bit	RTU Events Queued
1	1	0	none
0	0	0	none
1	0	0	change to 0
0	1	0	change to 1
1	1	1	change to 0, change to 1
0	0	1	change to 1, change to 0
1	0	1	change to 0, change to 1, change to 0
0	1	1	change to 1, change to 0, change to 1

4.2.3 Simple Status Data

The user may configure from 0 to 256 points. Values that have been configured are stored in the status database so that they may be mapped. Refer to the vendor documents for sequence number assignments.

Status Data in Cooper Form 4C devices containing software version 5.05 and above and display version 6.05 and above contain firmware which enables 2-Bit Status with Change function codes. If the Form 4C supports this function code, use "Two Bit Status Configuration" editor to enable the status points from the Form 4C device to store into the RTU status database. If the Form 4C does not support the function code or the change detection feature is not desired, use "Simple Status Configuration" to configure the status points.

If status points are defined on both "Two Bit Status Configuration" and "Simple Status Configuration", data scans will be made only for status with change detection and the simple status data will be derived from the status with change detection data.

4.2.4 Analog Data

The user may configure from 0 to 128 points to store in the RTU analog database. Configured values are stored in the analog database so that they may be mapped. Refer to the vendor documents for sequence number assignments.

4.2.5 Control Outputs

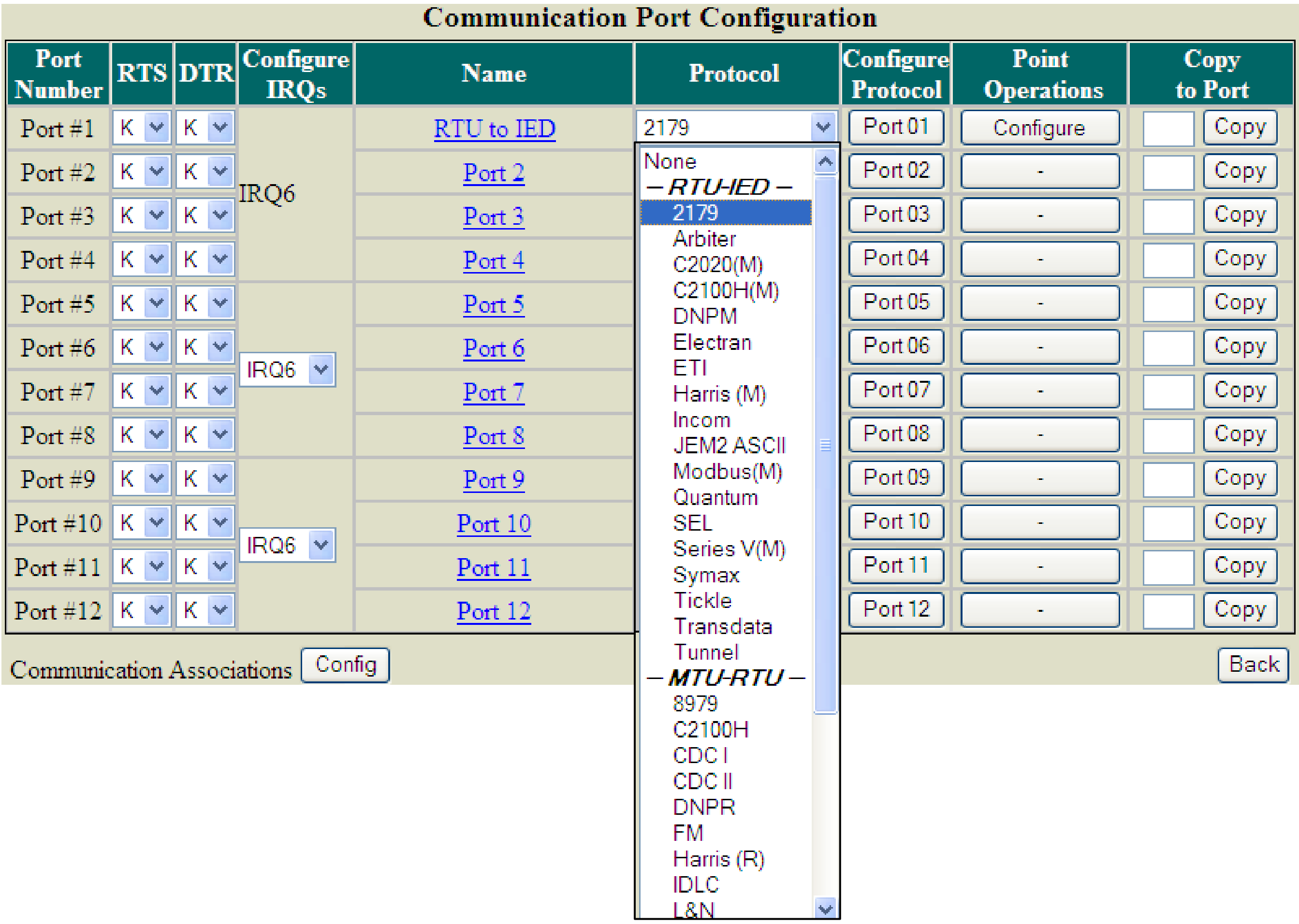
Control operations supported by the Form 4C Recloser are implemented as pseudo SBO control points within the RTU. The user may configure from 0 to 256 control points associated with the RTU SBO control point database.

For Cooper Form 4C Reclosers, control sequence numbers 00,01 and 02 provide Close operation only. The Trip for these sequence numbers acts as a no-op and performs no useful function. Refer to the vendor documents for sequence number assignments.

4.3 Communication Port Configuration

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click 2179 from the Protocol drop-down menu as shown.

Figure 4-1 2179 Communication Port Configuration



4.3.1 Port Number

Physical Port number of the RTU.

4.3.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

4.3.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

4.3.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset.

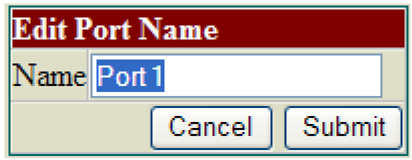
While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

4.3.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

4.3.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.



4.3.4 Protocol

From the drop-down list, select the protocol for this port.

4.3.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

4.3.6 Point Operations

Click this button to assign points.

4.3.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

4.3.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

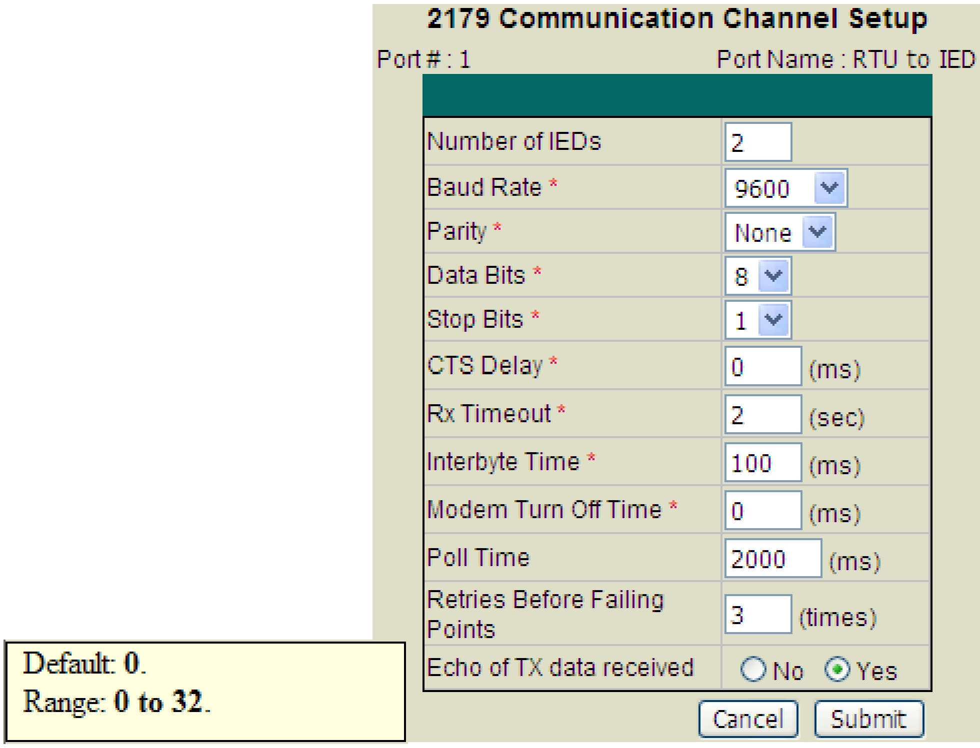
Navigation

Click the Back button to return to the previous screen.

4.4 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the 2179 port. As a minimum, you must enter the "Number of IEDs" this port will be connected to. You may accept all other defaults or fill in the form according to the information following Figure 2-2.

Figure 4-2 2179 Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

4.4.1 Number of IEDs (0 – 32)

Enter the number of IEDs connected to this port. The default setting is 0.

4.4.2 Baud Rate (300 – 19200)

From the drop-down menu, select the baud rate. The default setting is 9600.

4.4.3 Parity (None, Odd, Even)

From the drop-down menu, select the parity for the associated channel. The default setting is None.

4.4.4 Data Bits (5,6,7,8)

From the drop-down menu, select the data bits for the associated channel. The default setting is 8.

4.4.5 Stop Bits (0,1,2)

From the drop-down menu, select the stop bits for the associated channel. The default setting is 1.

4.4.6 CTS Delay (0 – 250ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 0.

Note: The RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the communications user interface.

4.4.7 Rx Timeout (0 – 30sec)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 2 sec.

4.4.8 Inter-byte time (0 – 250ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 100 msec.

4.4.9 Modem Turn Off Time (0 – 250ms)

Enter the delay time that the modem will maintain the carrier after the last data byte has been transmitted. Default setting is 0.

4.4.10 Poll Time (0 – 10,000ms)

Enter the time to delay between a sequence of polling all the devices connected to this communications port with the 2179 protocol. The default is 2000 msec.

4.4.11 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications with a 2179 device before marking all points attached to the device as failed. The default is 3.

4.4.12 Echo of TX data received (No, Yes)

Set this button to Yes if the protocol driver is to be used in "ECHO" mode (i.e., one or more IEDs in a fiber optic loop [the RTU receives the message it transmits]). Set this button to No if the protocol driver is to be used in the "NON ECHO" mode of operation (i.e., point-to-point fiber optic, radio or direct RS-232 connection).

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

4.5 Point Operations

From the Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 4-3 IED Configuration

2179 IED Configuration

Port # : 1 Port Name : RTU to IED

IED #	IED Name	IED Address	On Scan	Device Type	Message Timers(ms)	Slave Config	Copy to IEDn
1	2179_IED_1	1	Y	Standard	TBM-150,SOT-500,AOT-3500	Edit	Copy
2	2179_IED_2	2	Y	Standard	TBM-150,SOT-500,AOT-3500	Edit	Copy

Back

4.5.1 IED

The number of the IED on this communication channel.

4.5.2 IED Name

Click on the IED Name. A pop-up window will appear. See section 4.5.8.1 below.

4.5.3 IED Address

Reflects the entry in the pop-up menu. See section 4.5.8.1 below.

4.5.4 On Scan

Reflects the entry in the pop-up menu. See section 4.5.8.1 below

4.5.5 Device Type

Reflects the entry in the pop-up menu. See section 4.5.8.1 below.

4.5.6 Message Timers(ms)

Reflects the entries in the pop-up menu. See section 4.5.8.1 below.

4.5.7 Slave Config

Click on Edit to edit the IED points. See section "4.5.16.1 Slave Configuration Edit".

4.5.8 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

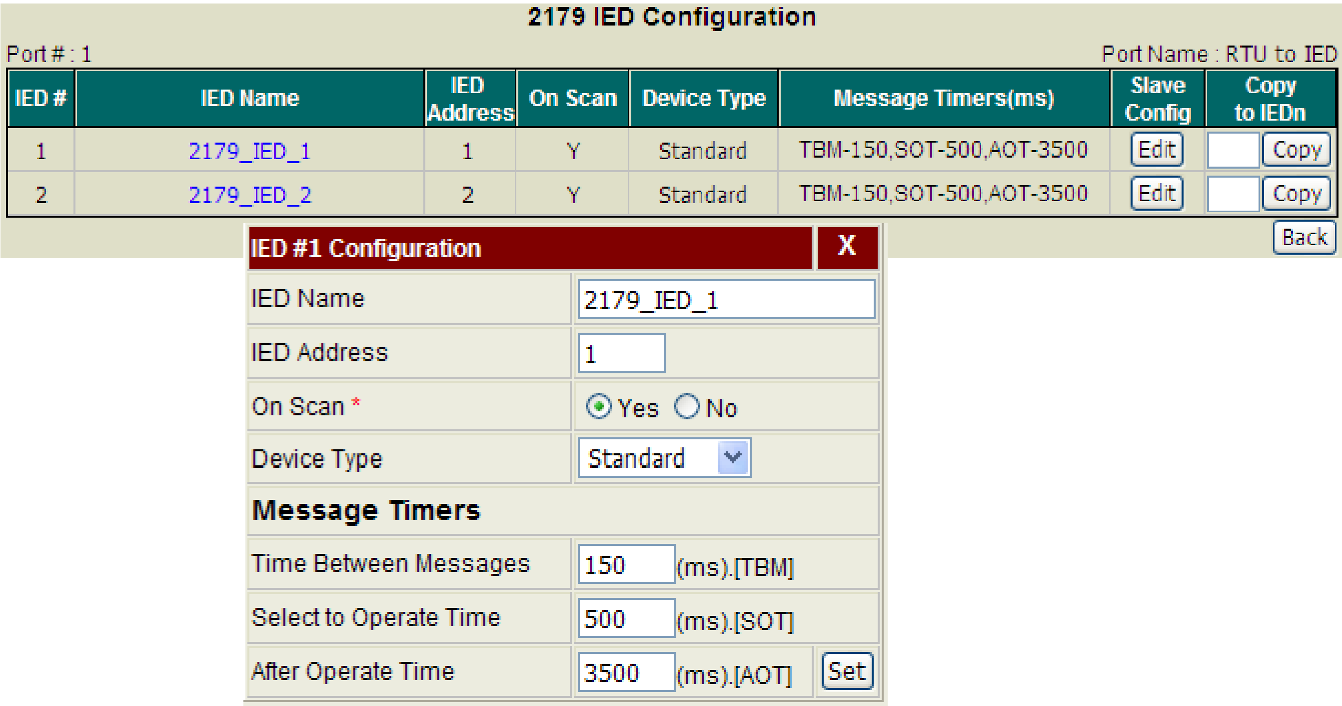
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

4.5.8.1 IED Name & Address Configuration

When you click the name of the IED (in blue characters), a pop-up menu will appear, as shown in Figure 2-6. Edit this pop-up window according to the directions below. After editing, your choices are reflected as explained under Figure 2-5.

Figure 4-4 IED Configuration



4.5.9 IED Name

Accept the default name or type a name of your choosing.

4.5.10 IED Address

Enter the IED address. The default is 1.

4.5.11 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled.

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

4.5.12 Device Type

Enter the scan type from the drop-down menu. The ENERGYLINE devices use a different opcode to send the analog data from the IED to the RTU. The default is Standard.

4.5.13 Time Between Messages (0 – 12750ms)

Enter the time to wait between the receipt of a valid message from a data request until the next data request is made. The default time of 150ms is correct for a Cooper Form 4C.

4.5.14 Select to Operate Time (0 – 12750ms)

Enter the time to wait between the receipt of a valid message from a select message until the operate message is sent. The default time of 500ms is correct for a Cooper Form 4C.

4.5.15 After Operate Time (0 – 12750ms)

Enter the time to wait after the receipt of a valid message from a operate message. The default time of 3500ms is correct for a Cooper Form 4C.

Not all operate messages require this long a timeout. The user may wish to shorten the timeouts if multiple 2179 devices are in the loop or if a few communications errors on a single device are acceptable.

4.5.16 Set / X

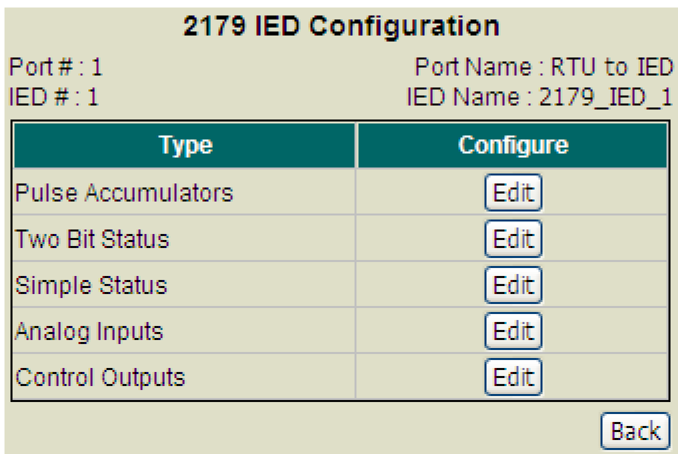
Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

4.5.16.1 Slave Configuration Edit

4.5.17 Slave Config

Click on Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 4-5 IED Configuration



4.5.18 Type

The type of point.

4.5.19 Edit

Click on Edit to edit points. The editing of each point type will be covered in the following sections.

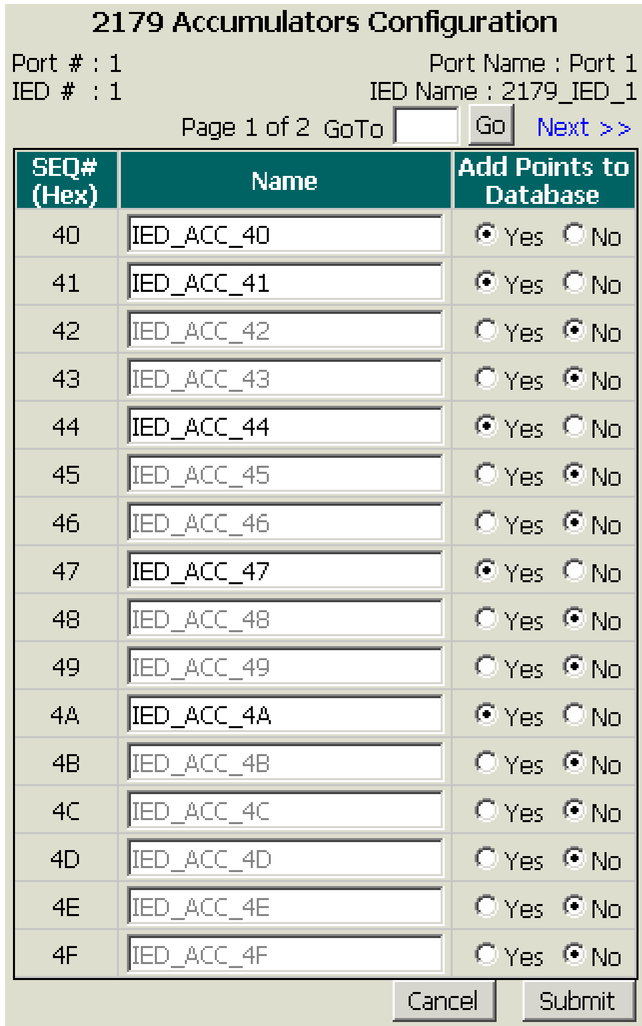
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

4.5.20 IED Pulse Accumulators Configuration

From the 2179 IED Configuration screen, click on Edit for Pulse Accumulators. A screen similar to Figure 2-13 will appear.

Figure 4-6 2179 Accumulators Configuration



4.5.21 SEQ# (Hex)

The sequence number in hex code. This number cannot be changed.

4.5.22 Name

If the Add Points to Database button is Yes, you may assign a name to the point or accept the default name.

4.5.23 Add Points to Database

Click the Yes button to add this point to the database. The default is No.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in

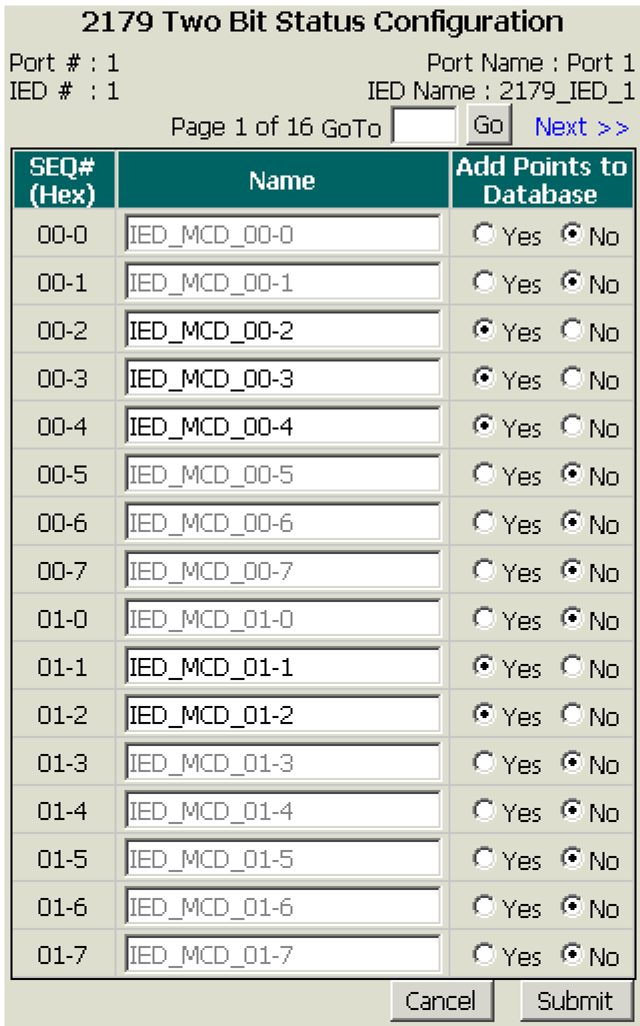
the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

4.5.24 IED Two Bit Status Configuration

From the 2179 IED Configuration screen, click on Two Bit Status. A screen similar to the one below will appear.

Figure 4-7 2179 Two Bit Status Configuration



4.5.25 SEQ# (Hex)

The sequence number in hex code. This number cannot be changed. The first number is the sequence number. The second number is the bit number.

4.5.26 Name

If the Add Points to Database button is Yes, you may assign a name to the point or accept the default name.

4.5.27 Add Points to Database

Click the Yes button to add this point to the database. The default is No.

Navigation

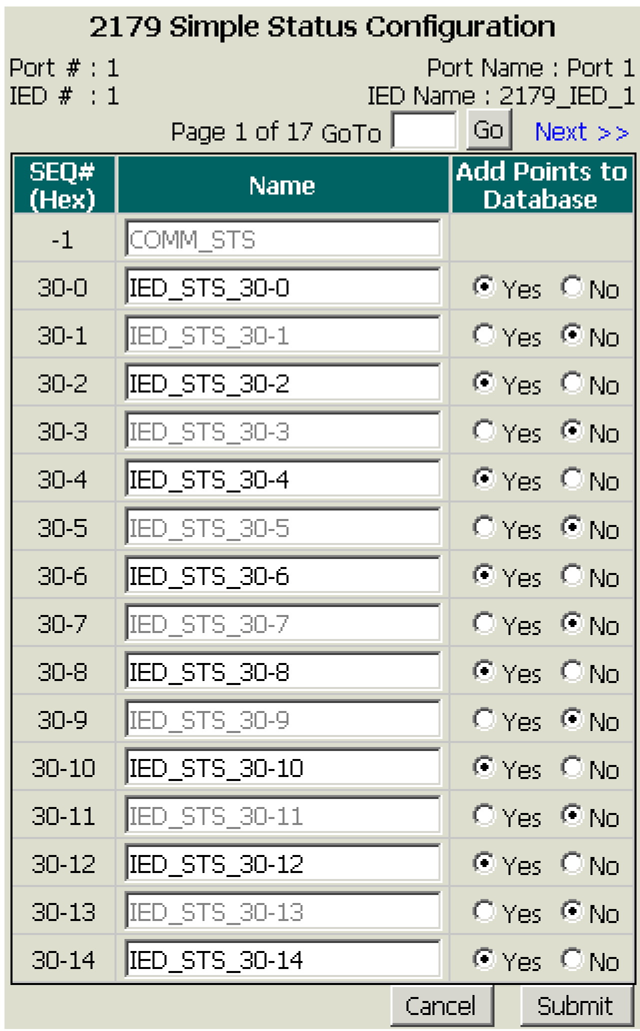
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

4.5.28 IED Simple Status Configuration

From the 2179 IED Configuration screen, click on Simple Status. A screen similar to the one below will appear.

Figure 4-8 2179 Simple Status Configuration



4.5.29 SEQ# (Hex)

The sequence number in hex code. This number cannot be changed. The first number is the sequence number. The second number is the bit number.

4.5.30 Name

If the Add Points to Database button is Yes, you may assign a name to the point or accept the default name.

4.5.31 Add Points to Database

Click the Yes button to add this point to the database. The default is No.

Navigation

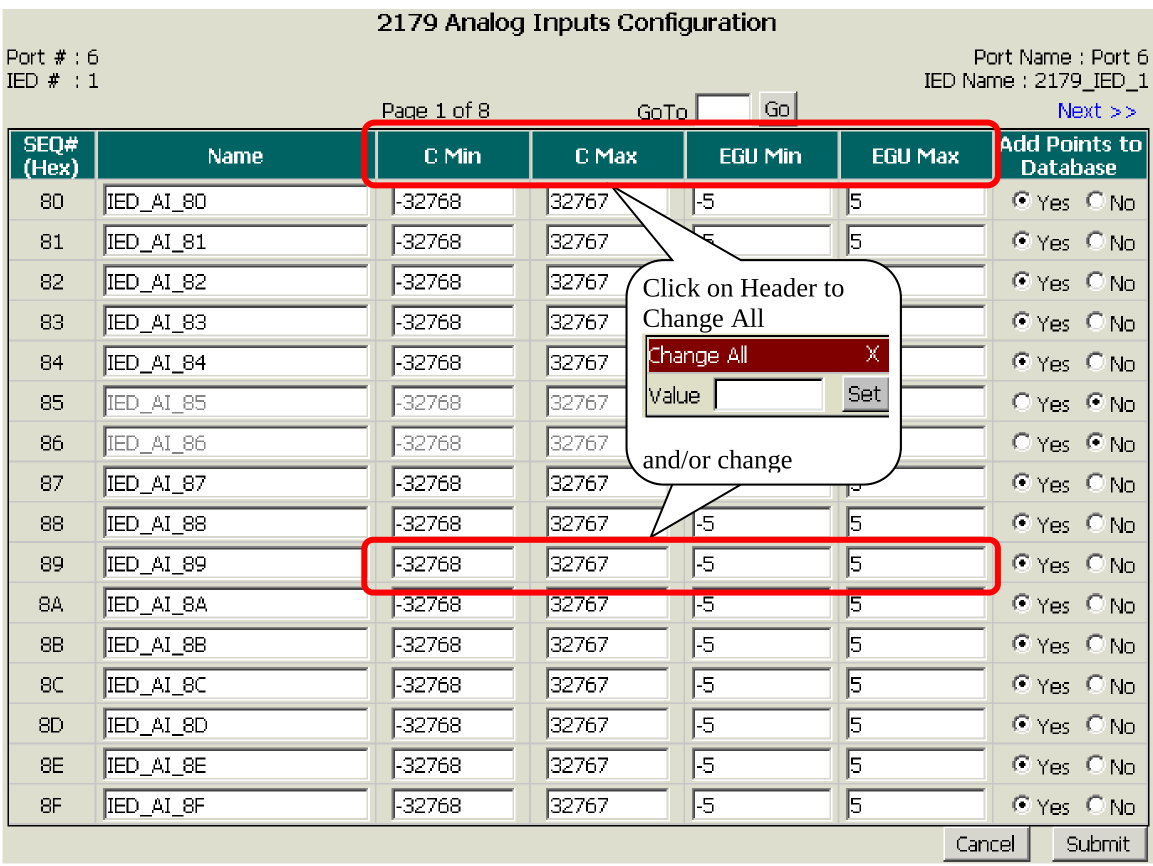
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

4.5.32 IED Analog Configuration

From the 2179 IED Configuration screen, click on Edit for Analogs. A screen similar to Figure 4-9 will appear.

Figure 4-9 2179 Analog Input Configuration



4.5.33 Point

The protocol sequence number in hex.

4.5.34 Name

Enter the name of the point (or accept the default name).

4.5.35 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

4.5.36 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

4.5.37 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

4.5.38 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

4.5.39 Add Points to Database

Click Yes to add the point to the database. If the point is not added, the point will be grayed out.

Navigation

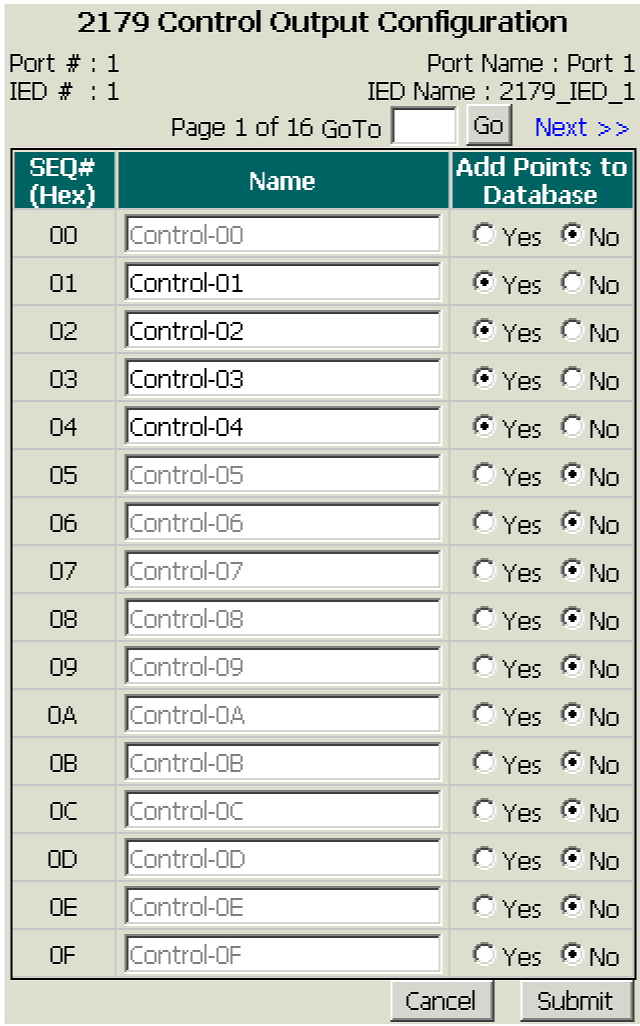
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

4.5.40 IED Control Output Configuration

From the 2179 IED Configuration screen, click on Control Output. A screen similar to the one below will appear.

Figure 4-10 2179 Control Output Configuration



2179 Control Output Configuration

Port # : 1 Port Name : Port 1

IED # : 1 IED Name : 2179_IED_1

Page 1 of 16 GoTo Go Next >>

SEQ# (Hex)	Name	Add Points to Database
00	Control-00	Yes No (No selected)
01	Control-01	Yes No (Yes selected)
02	Control-02	Yes No (Yes selected)
03	Control-03	Yes No (Yes selected)
04	Control-04	Yes No (Yes selected)
05	Control-05	Yes No (No selected)
06	Control-06	Yes No (No selected)
07	Control-07	Yes No (No selected)
08	Control-08	Yes No (No selected)
09	Control-09	Yes No (No selected)
0A	Control-0A	Yes No (No selected)
0B	Control-0B	Yes No (No selected)
0C	Control-0C	Yes No (No selected)
0D	Control-0D	Yes No (No selected)
0E	Control-0E	Yes No (No selected)
0F	Control-0F	Yes No (No selected)

Cancel Submit

4.5.41 SEQ# (Hex)

The sequence number in hex code. This number cannot be changed.

4.5.42 Name

If the Add Points to Database button is Yes, you may assign a name to the point or accept the default name.

4.5.43 Add Points to Database

Click the Yes button to add this point to the database. The default is No.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in

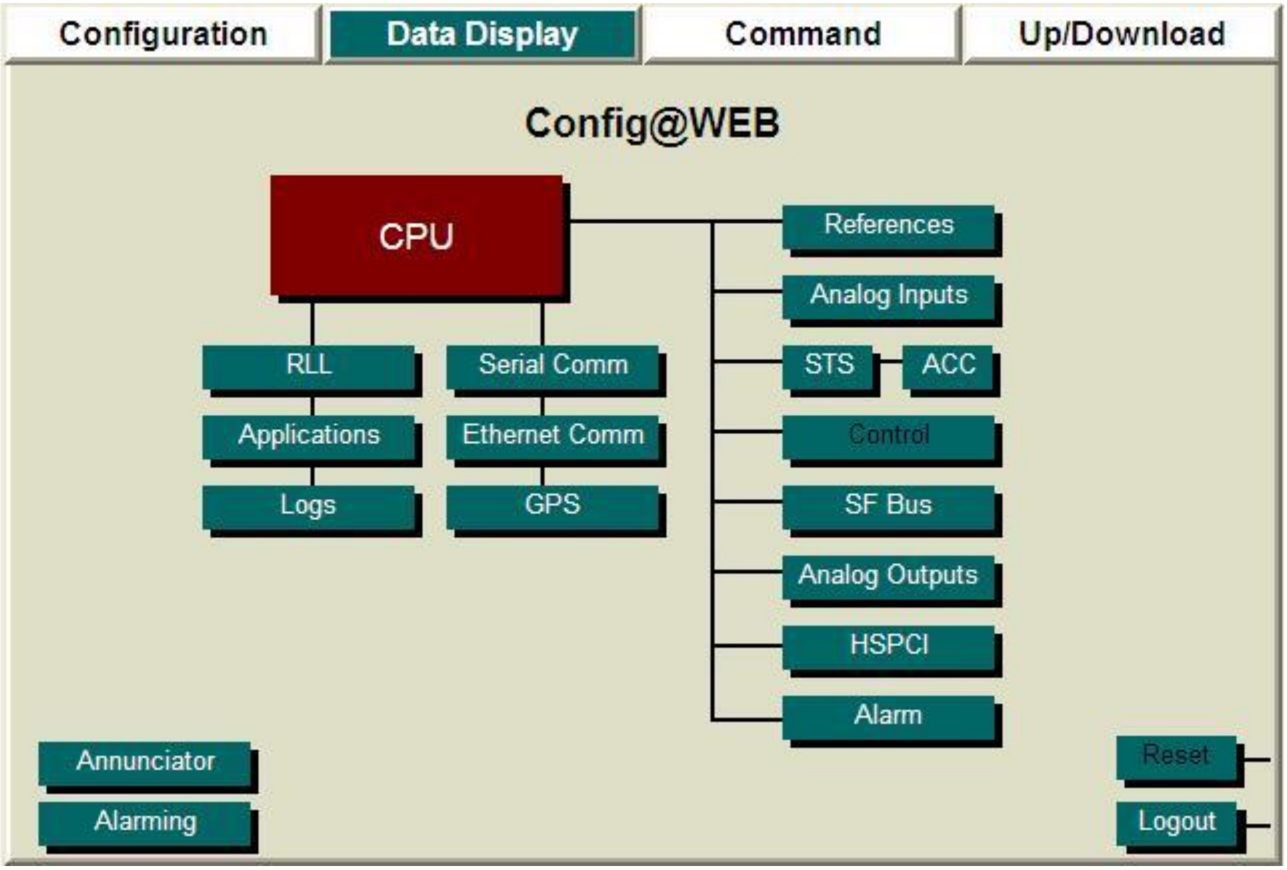
the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

4.6 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 4-11 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 4-12 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	RTU to IED	2179	View	Port Data
Port #2	K	K	Port 2	None	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

4.6.1 Port Number

Physical Port number of the RTU.

4.6.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

4.6.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

4.6.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

4.6.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

4.6.3 Name

The port name given during configuration or default name accepted.

4.6.4 Protocol

The configured protocol for this port.

4.6.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

4.6.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

4.6.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

4.6.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 4-13 2179 Communication Counters Display

4.6.9 Point Number

A logical point number for reference only.

4.6.10 Counter Name

The following counters are monitored:

4.6.10.1 Attempts

This indicates the cumulative number of transmitted messages since the last reset or power-up.

4.6.10.2 Good Replies

This indicates the cumulative number of transmitted messages that received a response since the last reset or power-up. This count can be affected by the Rx timeout delay value selected.

4.6.10.3 No Replies

This indicates the cumulative number of transmitted messages that did not receive a response since the last reset or power-up. This count can be affected by the Rx timeout delay value selected.

4.6.10.4 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

4.6.10.5 CRC Errors

This indicates the cumulative number of received messages with CRC errors since the last reset or power-up. This can be affected by parity and MTO.

4.6.10.6 Framing Errors

This indicates the cumulative number of framing errors since the last reset or power-up. This can be affected by parity.

4.6.10.7 Overruns

This indicates the cumulative number of over-run errors since the last reset or power-up.

4.6.10.8 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

4.6.11 Counts

The counts for each type of Counter.

4.6.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

4.6.13 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

2179 IED Comm Counters Display

Port # : 2 Port Name : Port 2

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts	Security Errors	Framing Errors	Overrun Errors	Parity Errors
1	2179_IED_1	0	0	0	0	0	0	0	0
2	2179_IED_2	0	0	0	0	0	0	0	0

Done

4.6.13.1 IED

The number of the IED

4.6.13.2 IED Name

The name of the IED

4.6.13.3 Messages Sent

Messages sent to this IED since the last reset or since the last time the counters were cleared.

4.6.13.4 Valid Replies

Valid messages received from this IED since the last reset or since the last time the counters were cleared.

4.6.13.5 No Replies

The number of no replies from this IED since the last reset or since the last time the counters were cleared.

4.6.13.6 Timeouts

The number of timeouts from this IED since the last reset or since the last time the counters were cleared.

4.6.13.7 Security Errors

The number of security errors from this IED since the last reset or since the last time the counters were cleared.

4.6.13.8 Framing Errors

The number of framing errors from this IED since the last reset or since the last time the counters were cleared.

4.6.13.9 Overrun Errors

The number of overrun errors from this IED since the last reset or since the last time the counters were cleared.

4.6.13.10 Parity Errors

The number of parity errors from this IED since the last reset or since the last time the counters were cleared.

4.6.14 Reset Comm Counters

Click this button to reset all comm. counters.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

4.6.15 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 4-14 2179 IED Display

2179 IED Display

Port # : 1 Port Name : RTU to IED

IED #	IED Name	IED Address	On Scan	Device Type	Message Timers(ms)	Slave Data
1	2179_IED_1	1	Y	Standard	TBM-150, SOT-500, AOT-3500	View
2	2179_IED_2	2	Y	Standard	TBM-150, SOT-500, AOT-3500	View

Back

4.6.16 IED

The number of the IED on this communication channel.

4.6.17 IED Name

The name that was chosen, or accepted as default, during configuration.

4.6.18 IED Address

The IED Address chosen during configuration.

4.6.19 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

4.6.20 Device Type

The device type that was chosen during configuration. The possible types are Standard and Energyline.

4.6.21 Message Timers (ms)

The Message Timers in milliseconds. TBM is Time Between Message, SOT is Select to Operate Time, and AOT is After Operate Time.

4.6.22 Slave Data

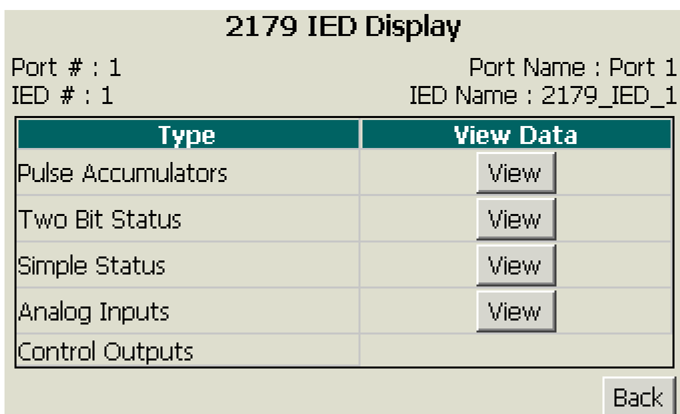
Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the 2179 IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 4-15 2179 IED Display



4.6.23 Type

The type of point.

4.6.24 View Data

Click the View button to view points.

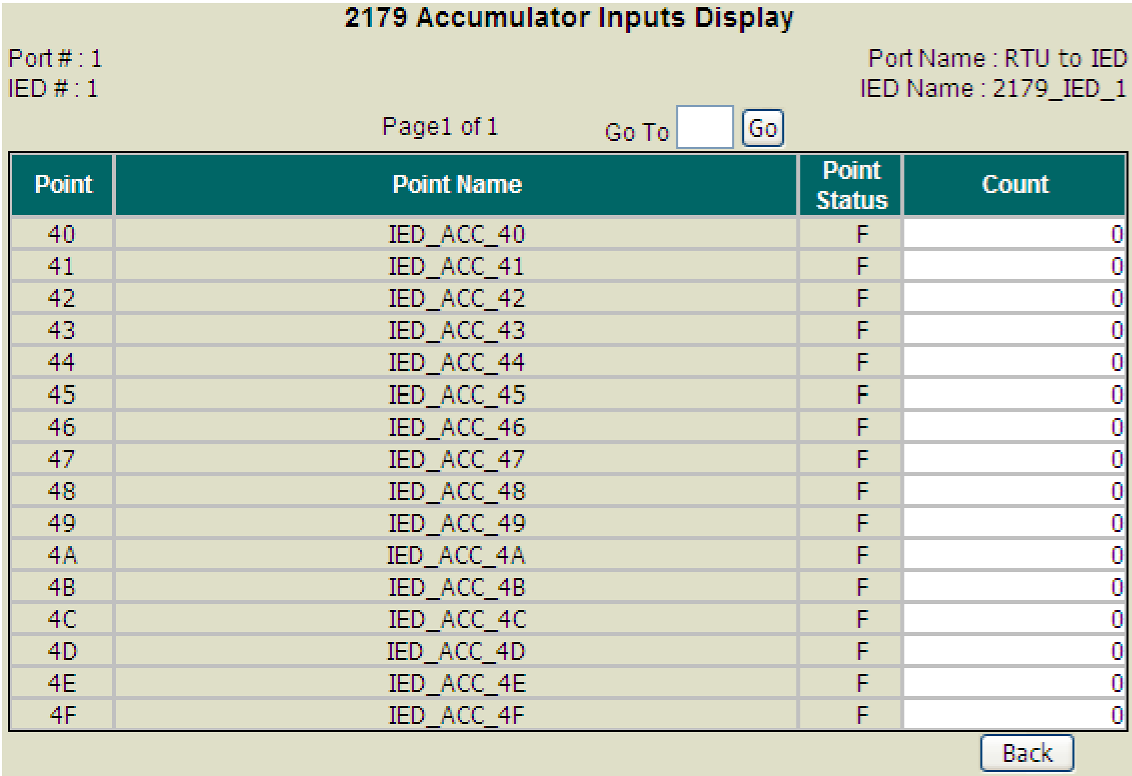
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the previous screen.

4.6.24.1 Pulse Accumulators

From the 2179 IED Display screen, click View for Pulse Accumulators to get the screen shown in Figure 2-24.

Figure 4-16 2179 Accumulators Input Display



2179 Accumulator Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : 2179_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Count
40	IED_ACC_40	F	0
41	IED_ACC_41	F	0
42	IED_ACC_42	F	0
43	IED_ACC_43	F	0
44	IED_ACC_44	F	0
45	IED_ACC_45	F	0
46	IED_ACC_46	F	0
47	IED_ACC_47	F	0
48	IED_ACC_48	F	0
49	IED_ACC_49	F	0
4A	IED_ACC_4A	F	0
4B	IED_ACC_4B	F	0
4C	IED_ACC_4C	F	0
4D	IED_ACC_4D	F	0
4E	IED_ACC_4E	F	0
4F	IED_ACC_4F	F	0

Back

4.6.25 Point

Protocol sequence number.

4.6.26 Point Name

The name of the point assigned during configuration.

4.6.27 Point Status

Please see the Config@WEB Secure Software Users Guide.

4.6.28 Count

The counts from the IED.

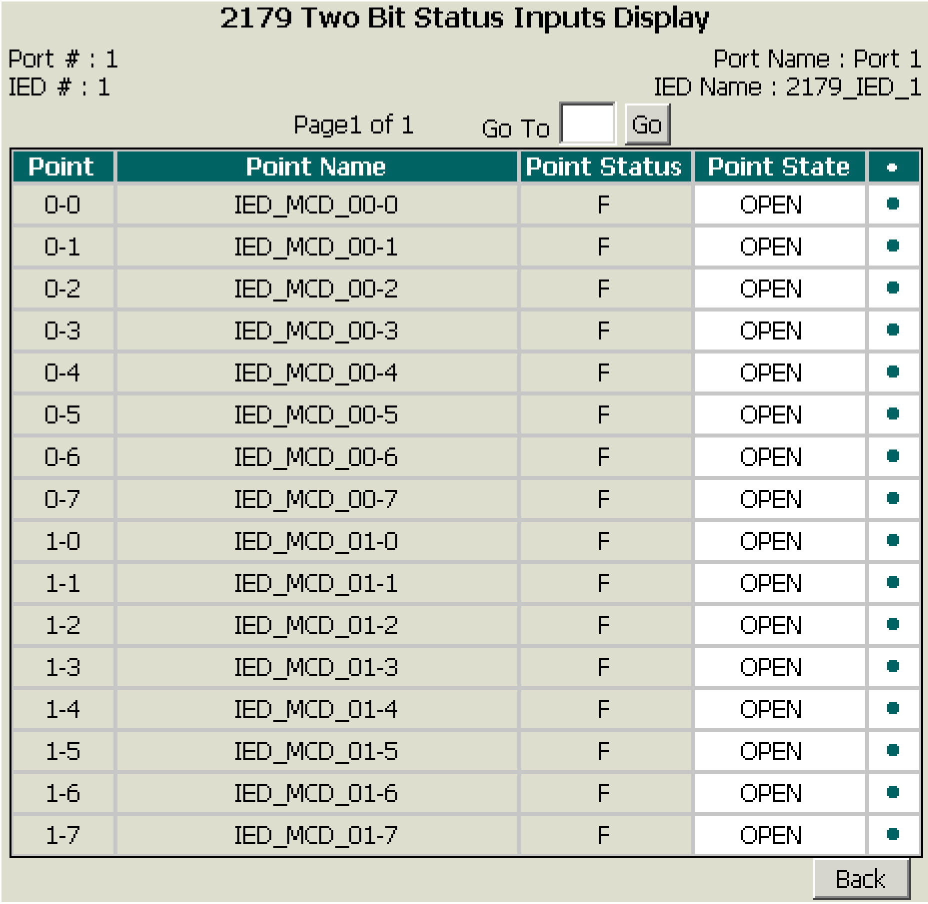
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

4.6.28.1 Two Bit Status

From the 2179 IED Display screen, click View for Two Bit Status to get the screen shown in Figure 2-25.

Figure 4-17 2179 Two Bit Status Inputs Display



2179 Two Bit Status Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : 2179_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point State	•
0-0	IED_MCD_00-0	F	OPEN	•
0-1	IED_MCD_00-1	F	OPEN	•
0-2	IED_MCD_00-2	F	OPEN	•
0-3	IED_MCD_00-3	F	OPEN	•
0-4	IED_MCD_00-4	F	OPEN	•
0-5	IED_MCD_00-5	F	OPEN	•
0-6	IED_MCD_00-6	F	OPEN	•
0-7	IED_MCD_00-7	F	OPEN	•
1-0	IED_MCD_01-0	F	OPEN	•
1-1	IED_MCD_01-1	F	OPEN	•
1-2	IED_MCD_01-2	F	OPEN	•
1-3	IED_MCD_01-3	F	OPEN	•
1-4	IED_MCD_01-4	F	OPEN	•
1-5	IED_MCD_01-5	F	OPEN	•
1-6	IED_MCD_01-6	F	OPEN	•
1-7	IED_MCD_01-7	F	OPEN	•

Back

4.6.29 Point

Protocol sequence number and bit.

4.6.30 Point Name

The name of the point assigned during configuration.

4.6.31 Point Status

Please see the Config@WEB Secure Software Users Guide.

4.6.32 Point State

Indicates the current state of the point is either OPEN or CLOSED.

4.6.33 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Navigation

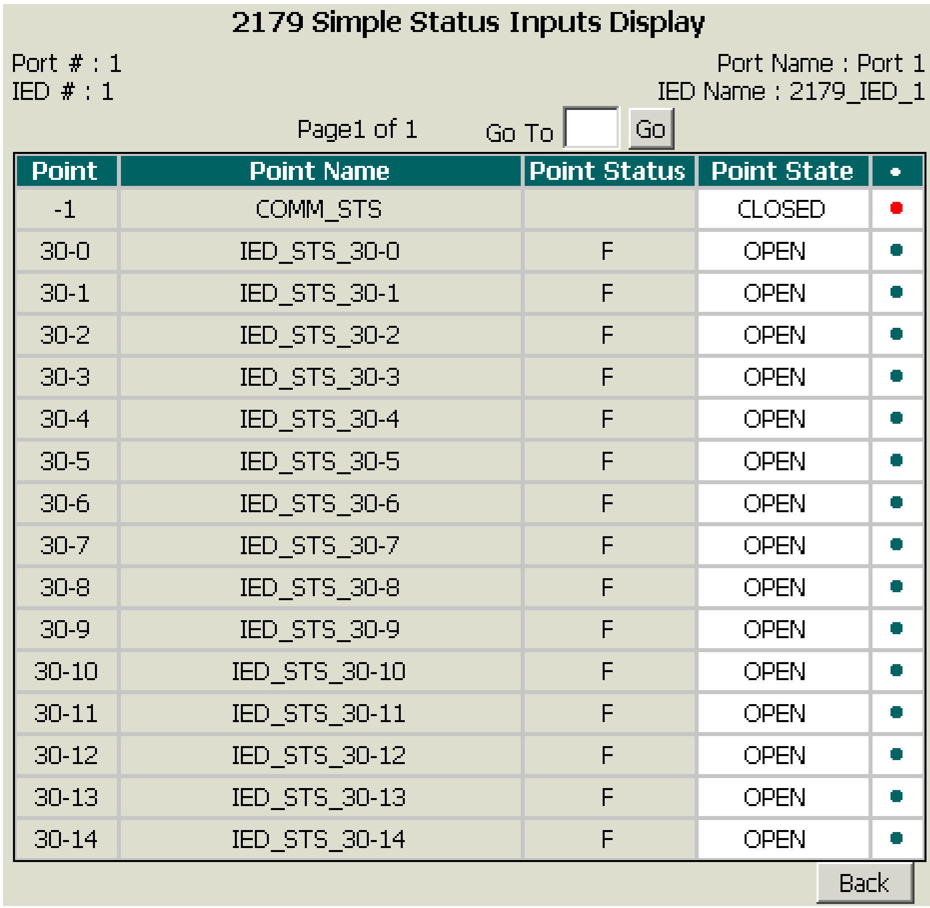
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to

return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

4.6.33.1 Simple Status

From the 2179 IED Display screen, click View for Simple Status to get the screen shown in Figure 4-18.

Figure 4-18 2179 Simple Status Inputs Display



2179 Simple Status Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : 2179_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point State	•
-1	COMM_STS		CLOSED	●
30-0	IED_STS_30-0	F	OPEN	●
30-1	IED_STS_30-1	F	OPEN	●
30-2	IED_STS_30-2	F	OPEN	●
30-3	IED_STS_30-3	F	OPEN	●
30-4	IED_STS_30-4	F	OPEN	●
30-5	IED_STS_30-5	F	OPEN	●
30-6	IED_STS_30-6	F	OPEN	●
30-7	IED_STS_30-7	F	OPEN	●
30-8	IED_STS_30-8	F	OPEN	●
30-9	IED_STS_30-9	F	OPEN	●
30-10	IED_STS_30-10	F	OPEN	●
30-11	IED_STS_30-11	F	OPEN	●
30-12	IED_STS_30-12	F	OPEN	●
30-13	IED_STS_30-13	F	OPEN	●
30-14	IED_STS_30-14	F	OPEN	●

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not the comm. channel is operational. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

4.6.34 Point

Protocol sequence number and bit.

4.6.35 Point Name

The name of the point assigned during configuration.

4.6.36 Point Status

Please see the Config@WEB Secure Software Users Guide.

4.6.37 Point State

Indicates the current state of the point is either OPEN or CLOSED.

4.6.38 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

4.6.38.1 Analog Inputs

From the 2179 IED Display screen, click View for Analog Inputs to get the screen shown in Figure 4-19.

Figure 4-19 2179 Analog Inputs Display

2179 Analog Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : 2179_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point Value	Point Counts
80	IED_AI_80	F	-5.000	-32768
81	IED_AI_81	F	-5.000	-32768
82	IED_AI_82	F	-5.000	-32768
83	IED_AI_83	F	-5.000	-32768
84	IED_AI_84	F	-5.000	-32768
85	IED_AI_85	F	-5.000	-32768
86	IED_AI_86	F	-5.000	-32768
87	IED_AI_87	F	-5.000	-32768
88	IED_AI_88	F	-5.000	-32768
89	IED_AI_89	F	-5.000	-32768
8A	IED_AI_8A	F	-5.000	-32768
8B	IED_AI_8B	F	-5.000	-32768
8C	IED_AI_8C	F	-5.000	-32768
8D	IED_AI_8D	F	-5.000	-32768
8E	IED_AI_8E	F	-5.000	-32768
8F	IED_AI_8F	F	-5.000	-32768

Back

4.6.39 Point

Protocol sequence number.

4.6.40 Point Name

The name of the point assigned during configuration.

4.6.41 Point Status

Please see the Config@WEB Secure Software Users Guide.

4.6.42 Point Value

The engineering unit (EGU) value.

4.6.43 Point Counts

The counts from the IED.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

4.6.43.1 Control Outputs

There is no display for Control Outputs.

4.7 Implementation Details

The following functions are supported by the driver:

4.7.1 Basic Scan

1. Simple status data (Function code 0, command 1)
   The simple status data is returned as status points in the RTU database.
2. 2 bit Status change data(Function code 0, command 4)
   The 2 bit status change data is returned as status points in the RTU database.
3. 16-bit signed Analog data (Function code 0, command 8, if ENERGYLINE option, command 10)
   The analog data is stored in the RTU analog database as 16 bit signed analog data.
4. 16-bit Pulse Accumulator data (Function code 0, command 40)
   The accumulator data is stored in the RTU accumulator database as a 16 bit quantity. The rollover value is 65535.

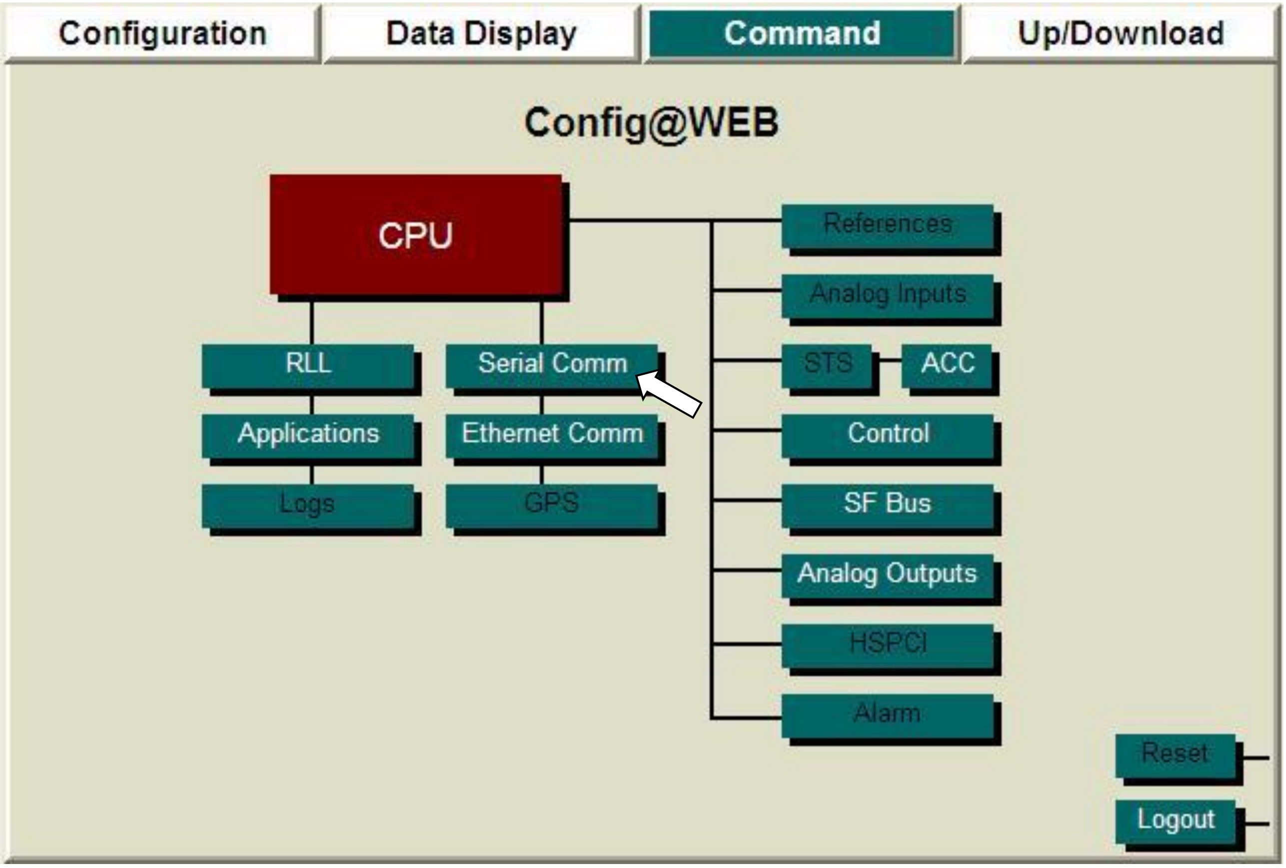
4.7.2 Supervisory Control

1. Select Open (Function code 10, command 10)
2. Select Close (Function code 10, command 11)
3. Operate (Function code 10, command 20)
4. Reset Select (Function code 10, command 21)

4.8 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 4-20 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2200 manual. Under Command Port Data, click Port Data.

Figure 4-21 Serial Comm Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	2179	Port Data	Normal
Port #2	K	K	Port 2	None	Port Data	Normal
Port #3	K	K	Port 3	None	Port Data	Normal
Port #4	K	K	Port 4	None	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button as shown.

Figure 4-22 2179 IED Command

2179 IED Command

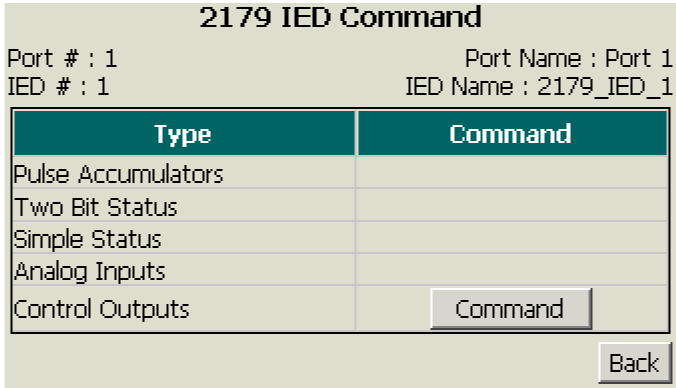
Port # : 1 Port Name : RTU to IED

IED #	IED Name	IED Address	On Scan	Device Type	Message Timers(ms)	Slave Data
1	2179_IED_1	1	Y	Standard	TBM-150, SOT-500, AOT-3500	Command
2	2179_IED_2	2	Y	Standard	TBM-150, SOT-500, AOT-3500	Command

Back

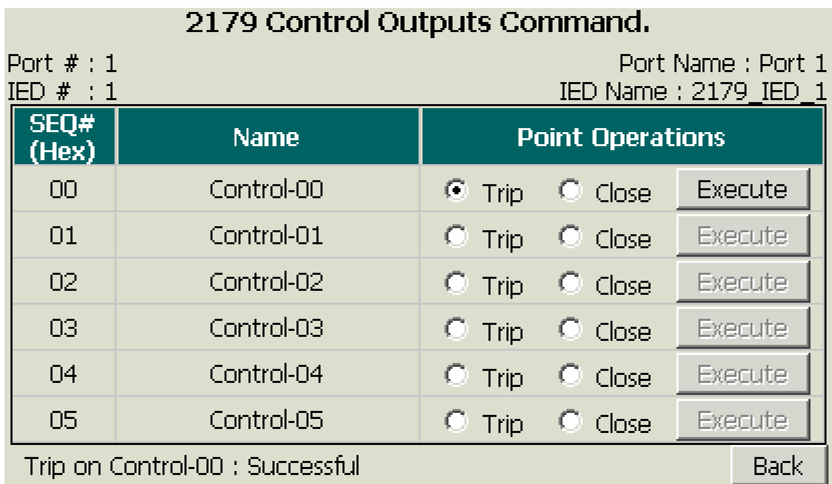
The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command Control Outputs.

Figure 4-23 2179 IED Command



The Control Outputs Command will give you a screen similar to Figure 2-34. You may Trip or Close, then click the Execute button for a result similar to Point 0 of Figure 2-34.

Figure 4-24 2179 Control Outputs Command



4.9 Cooper Form 4C Configuration

The following codes must be verified or changed for successful communications between the RTU and the Cooper Form 4C. Information about these codes is contained in the publication R280-90-11 Communications Point Data Base Data 2180 from Cooper Power Systems.

4.9.1 Code 81

Code 81 must be set according to the baud rate selected for use by the RTU. Refer to the Cooper document for the correct setting to match the RTU configuration.

4.9.2 Code 82

Code 82 must be set to the correct address as specified by the RTU database record.

4.9.3 Code 83

Code 83 should be set to mode 2.

4.9.4 Code 84

Code 84 must be changed from 1 to 5 for 4800 baud operation. Telvent has not verified this setting for other baud rates.

4.9.5 Code 85

Code 85 should be set to 50ms.

To ensure that the values displayed are those that are actually being used after changing any parameters, both DC and AC should be removed and reapplied to the device to force a hardware reset by following the directions provided with the Form 4C.

The Cooper Form 4C may show nonzero Number of failures on the RTU communications display in the following conditions:

1. Any device is connected to the Data Port.
2. Any reclosing operation is in progress.
3. Any supervisory control has been sent through the Digital Communications Accessory for the device to execute.

In the above cases, when the Form 4C is performing any of these functions, it considers the requests through the Digital Communications Accessory to be of lower priority and ignores the requests issued on this port.

4.9.6 SBO Immediate Operate

An SBO Immediate Operate function was added to the driver. If the MTU protocol supports this mode of operation of SBO control, the function may now be passed to the 2179 driver for transmission to the 2179 protocol IED. The driver will translate the Immediate Operate to Select/Operate messages in the 2179 protocol.

Note: If no data points are configured to be acquired from the slave device in the 2179 database record, the slave device will not be scanned, even if the device is otherwise correctly configured for scanning in the database.

5 TransData

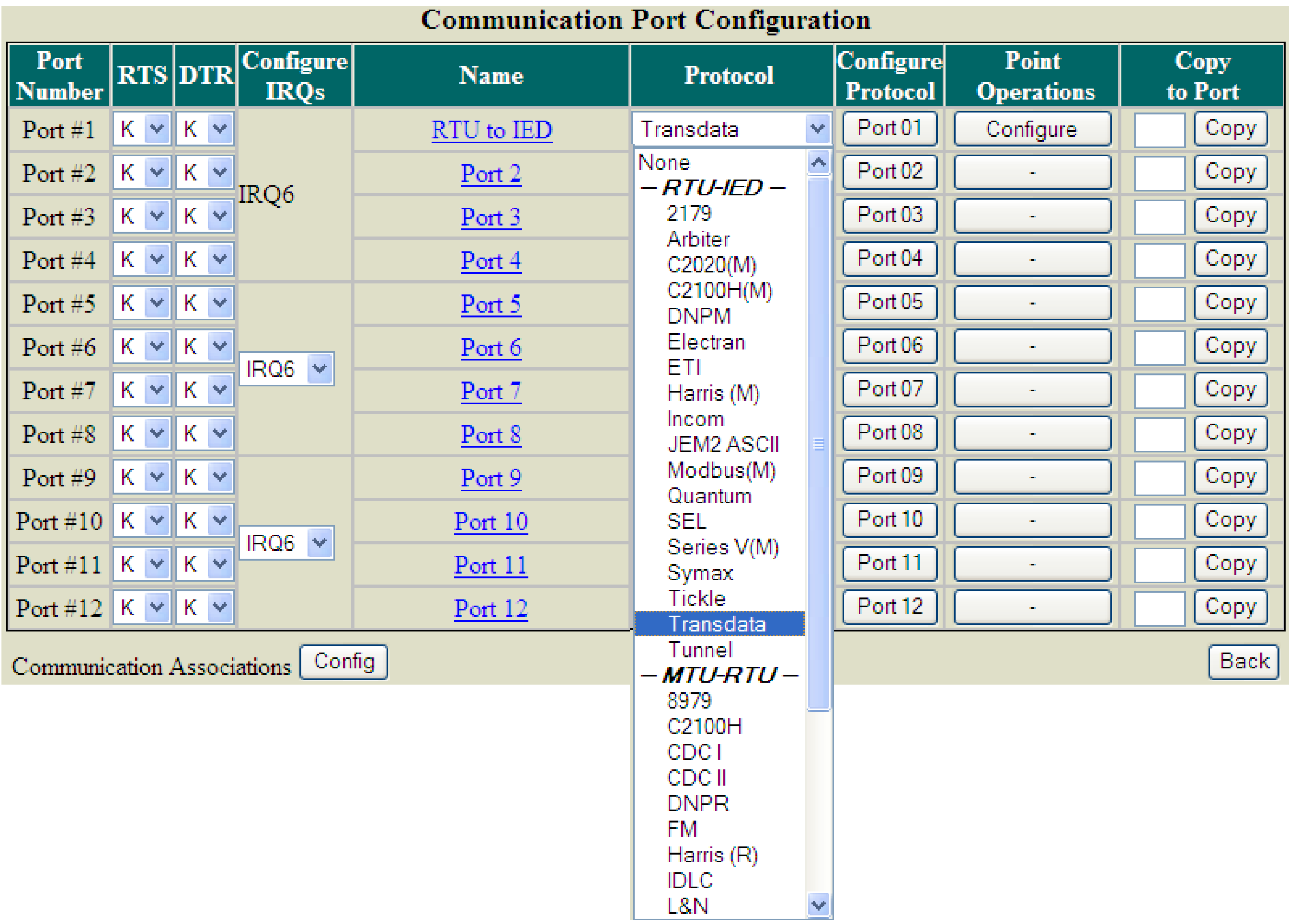
5.1 Communication Port Configuration

TransData is a protocol that communicates between the RTU and the TransData MARK V Meter. The communication protocol used between the RTU and the meters is described in the document from TransData, Inc., entitled "Mark V Digital Transducer Output Protocol", dated June 29, 1995.

Note: The IED interface must be configured in the PERCENT OF RANGE SCALING mode for proper operation.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Transdata from the Protocol drop-down menu as shown.

Figure 5-1 Transdata Communication Port Configuration



5.1.1 Port Number

Physical Port number of the RTU.

5.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

5.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

5.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

5.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

5.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.

5.1.4 Protocol

From the drop-down list, select the protocol for this port.

5.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

5.1.6 Point Operations

Click this button to assign points.

5.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

5.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

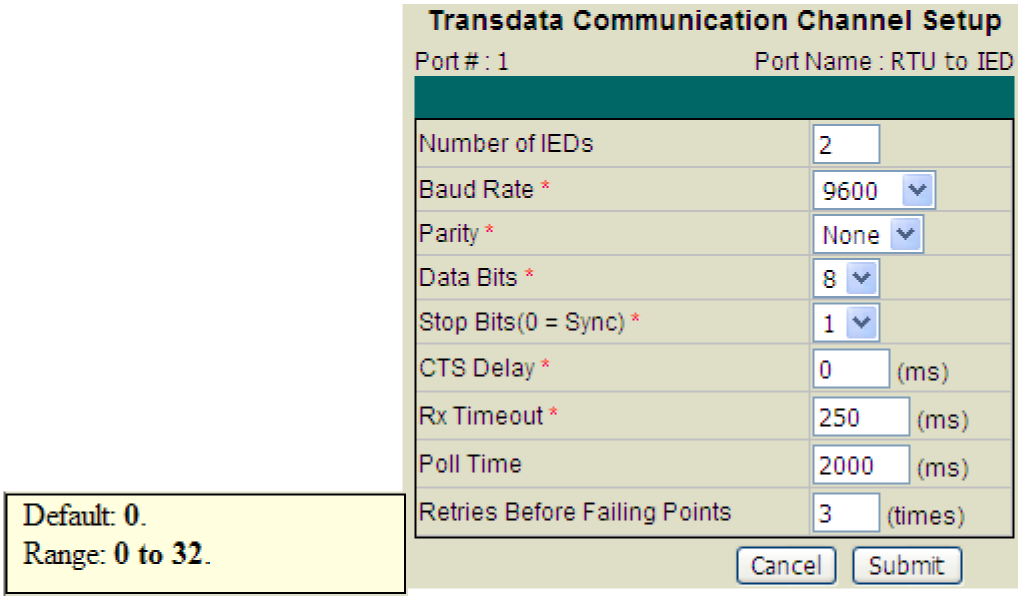
Navigation

Click the Back button to return to the previous screen.

5.2 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the Transdata port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 5-2 Transdata Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

5.2.1 Number of IEDs (0 – 32)

Enter the number of TransData meters connected to this port. The default setting is 0.

5.2.2 Baud Rate (300 – 19200)

From the drop-down menu, select the baud rate. The default setting is 9600.

5.2.3 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is None.

5.2.4 Data Bits (5,6,7,8)

Enter the data bits for the associated channel. The default setting is 8.

5.2.5 Stop Bits (0,1,2)

Enter the stop bits for the associated channel. The default setting is 1.

5.2.6 CTS Delay (0 – 250ms)

Enter the clear-to-send delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 0.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

5.2.7 Rx Timeout (0 – 30,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 250.

5.2.8 Poll Time (0 – 10,000ms)

Enter the time to delay between a sequence of polling all the devices connected to this communications port. The default is 2000.

5.2.9 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications with a device before marking all points attached to the device as failed. The default is 3.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

5.3 Point Operations

From the Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 5-3 IED Configuration

Transdata IED Configuration

Port # : 1 Port Name : RTU to IED

IED #	IED Name	Address		ANA Size (Bit)	ACC Size (Bit)	On Scan	Slave Config	Copy to IEDn
		Meter	Base					
1	TD_IED_1	1	0	16	24	Y	Edit	Copy
2	TD_IED_2	2	0	16	24	Y	Edit	Copy

Back

5.3.1 IED

The logical number of the IED on this communication channel.

5.3.2 IED Name

Click on the IED Name. A pop-up window will appear. See section 5.3.9 below.

5.3.3 IED Address

Reflects the entries in the pop-up menu. See section 5.3.9 below.

5.3.4 ANA Size (Bit)

Reflects the entries in the pop-up menu. See section 5.3.9 below.

5.3.5 ACC Size (Bit)

Reflects the entries in the pop-up menu. See section 5.3.9 below.

5.3.6 On Scan

Reflects the entry in the pop-up menu. See section 5.3.9 below.

5.3.7 Slave Config

Click on Edit to edit the IED points. See section "5.3.17 Slave Configuration Edit".

5.3.8 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

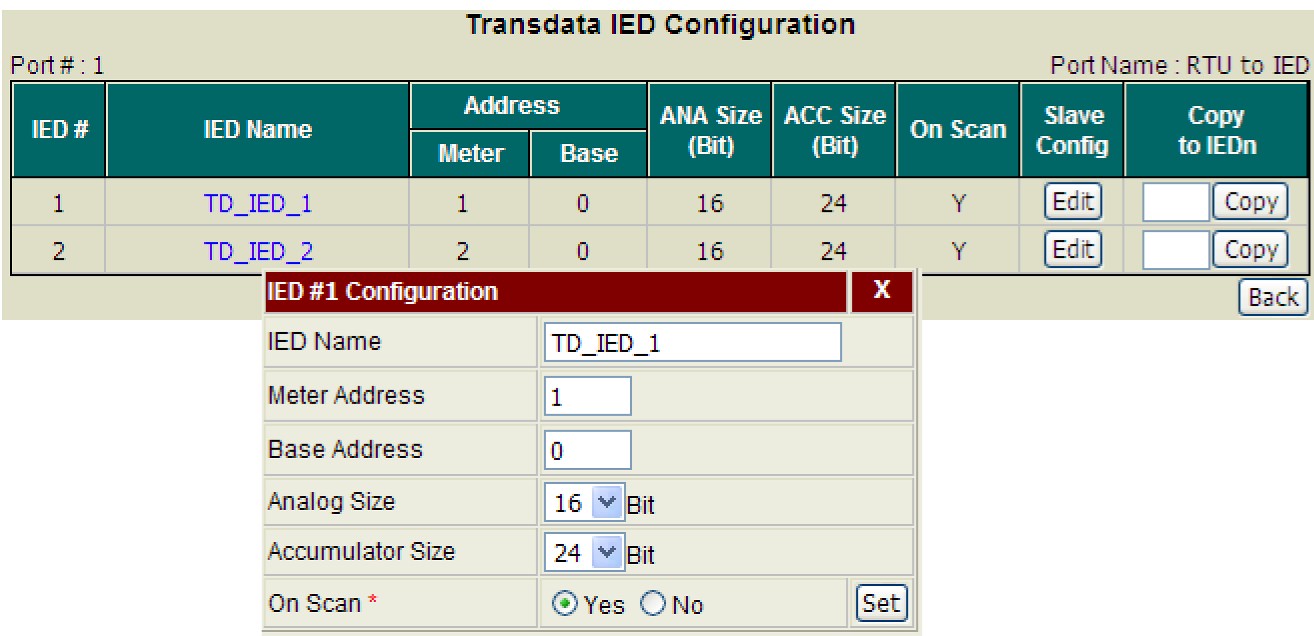
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

5.3.9 IED Name & Address Configuration

When you click the name of the IED (in blue characters), a pop-up menu will appear, as shown in Figure 2-6. Edit this pop-up window according to the directions below. After editing, your choices are reflected as explained under Figure 2-5.

Figure 5-4 IED Configuration



5.3.10 IED Name

Accept the default name or type a name of your choosing.

5.3.11 Meter Address

Enter the Meter address. The default is 1.

5.3.12 Base Address

Enter the address for the base unit. The default is 0.

5.3.13 ANA Size (Bit) (16, 12)

Select the Analog bit size. Default is 16.

5.3.14 ACC Size (Bit) (24, 20)

Select the Accumulator size. Default is 24.

5.3.15 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled.

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

5.3.16 Set / X

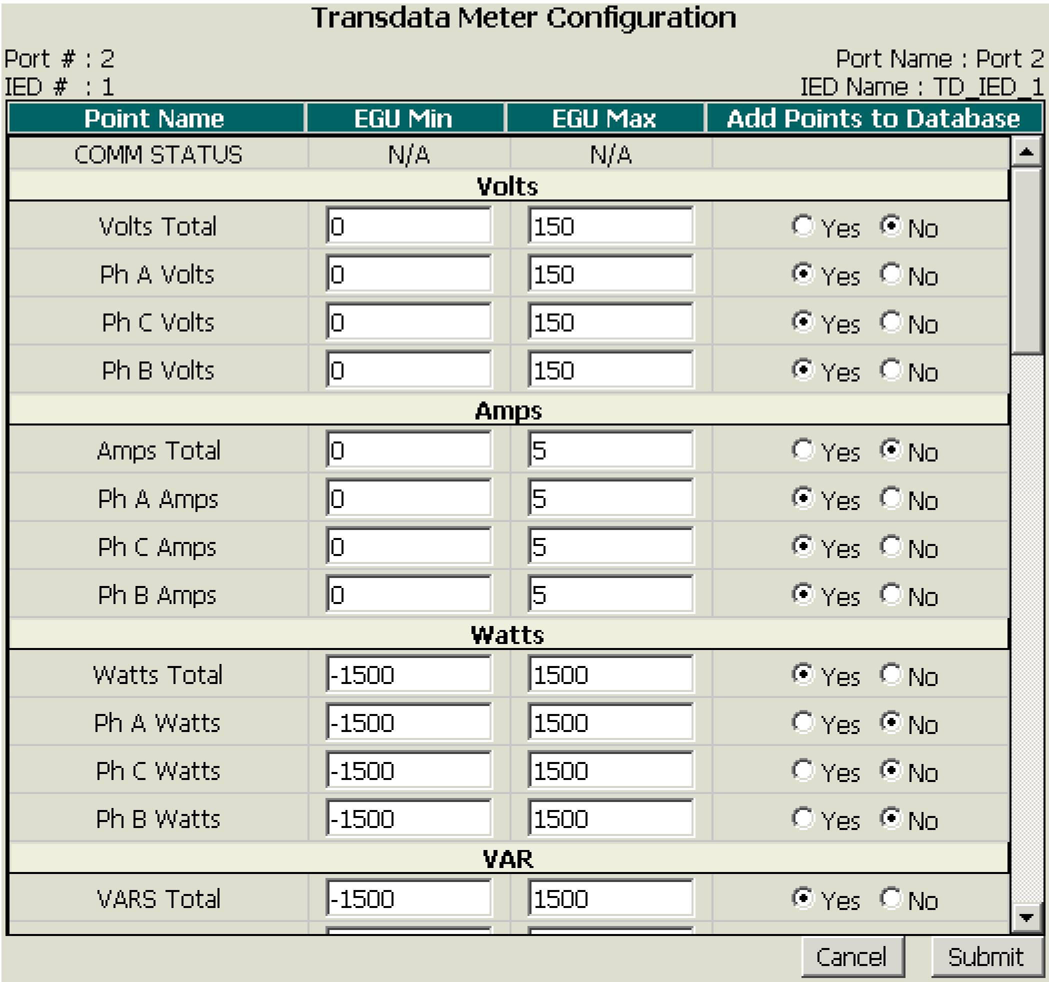
Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

5.3.17 Slave Configuration Edit

5.3.18 Slave Config

Click Edit to continue. A screen similar to Figure 2-10 will appear. The screen has certain values as default and some points are added to database as default. You may change these defaults according to the situation.

Figure 5-5 IED Configuration



Transdata Meter Configuration

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : TD_IED_1

Point Name	EGU Min	EGU Max	Add Points to Database
COMM STATUS	N/A	N/A	
Volts			
Volts Total	0	150	Yes ◉ No
Ph A Volts	0	150	◉ Yes No
Ph C Volts	0	150	◉ Yes No
Ph B Volts	0	150	◉ Yes No
Amps			
Amps Total	0	5	Yes ◉ No
Ph A Amps	0	5	◉ Yes No
Ph C Amps	0	5	◉ Yes No
Ph B Amps	0	5	◉ Yes No
Watts			
Watts Total	-1500	1500	◉ Yes No
Ph A Watts	-1500	1500	Yes ◉ No
Ph C Watts	-1500	1500	Yes ◉ No
Ph B Watts	-1500	1500	Yes ◉ No
VAR			
VARS Total	-1500	1500	◉ Yes No

Cancel Submit

5.3.19 Point Name

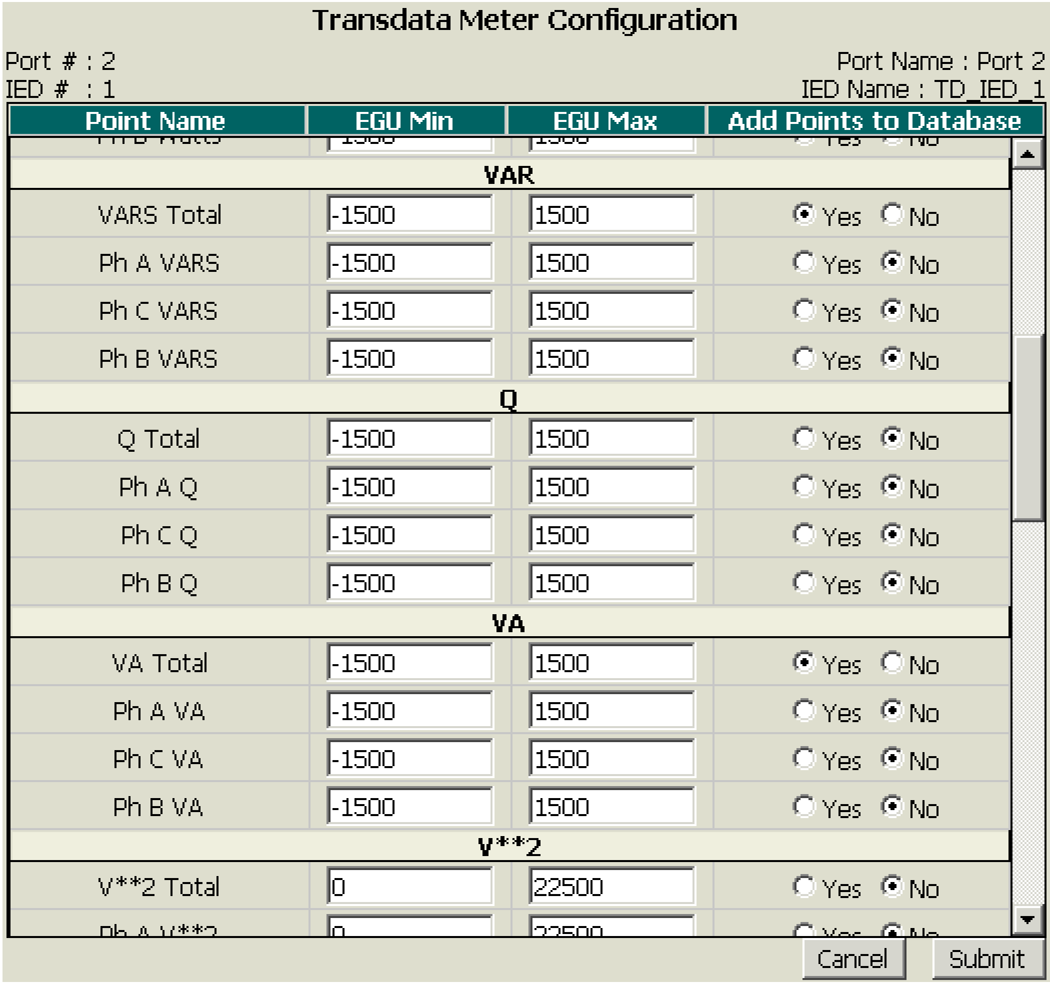
The name of the point. These names are hard-coded and match the values returned from the meter.

5.3.20 EGU Min/EGU Max

Enter the engineering units minimum and maximum for the point.

5.3.21 Add Points to Database

Click Yes to add the point to the database. Some points are defaulted to Yes. Points that are not set to Yes will not be mappable as I/O points in the RTU.

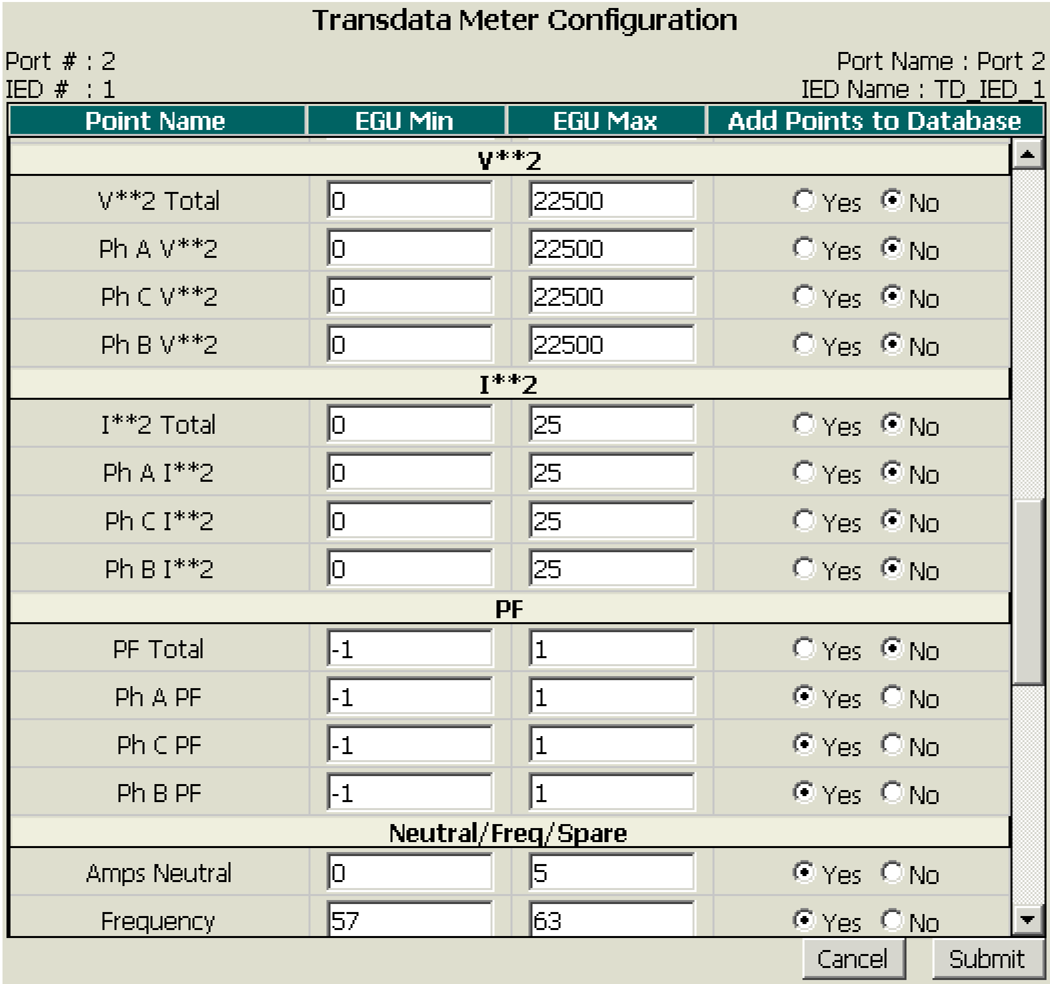


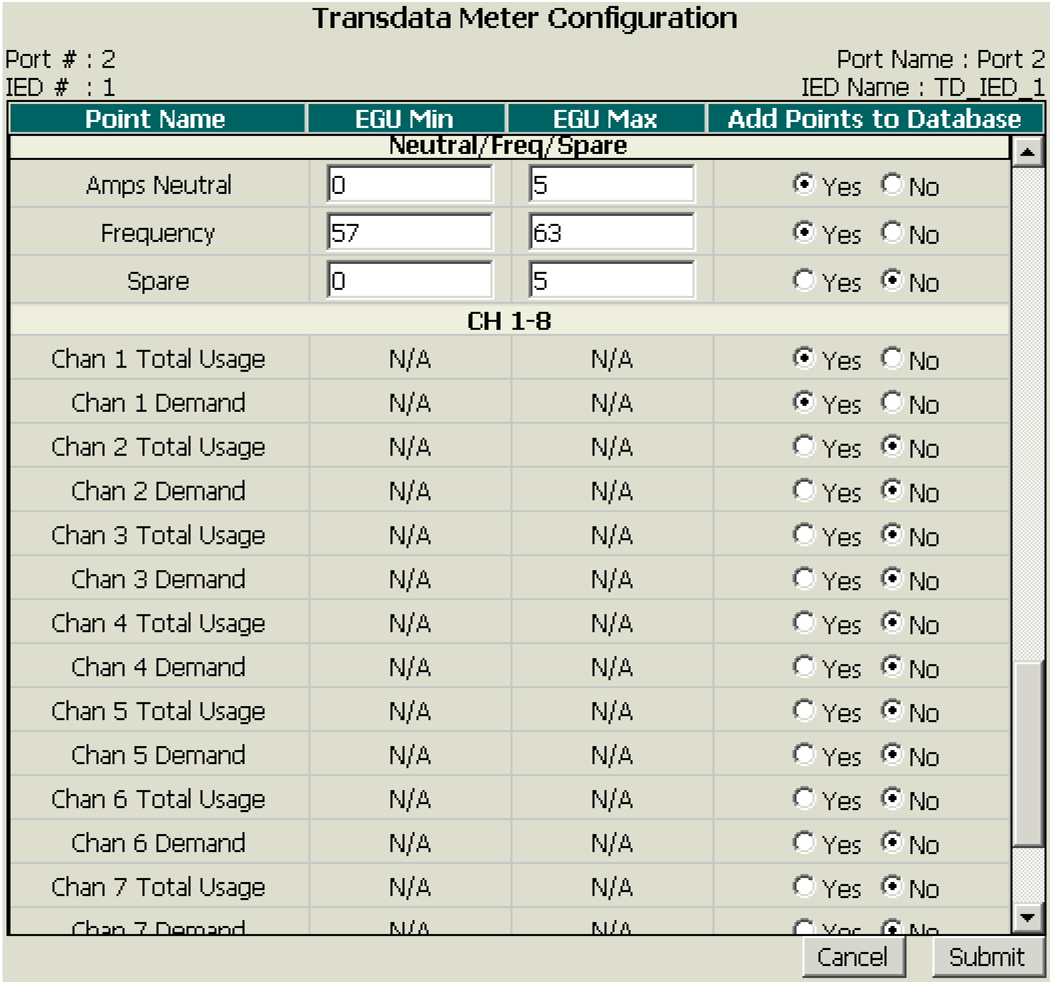
Transdata Meter Configuration

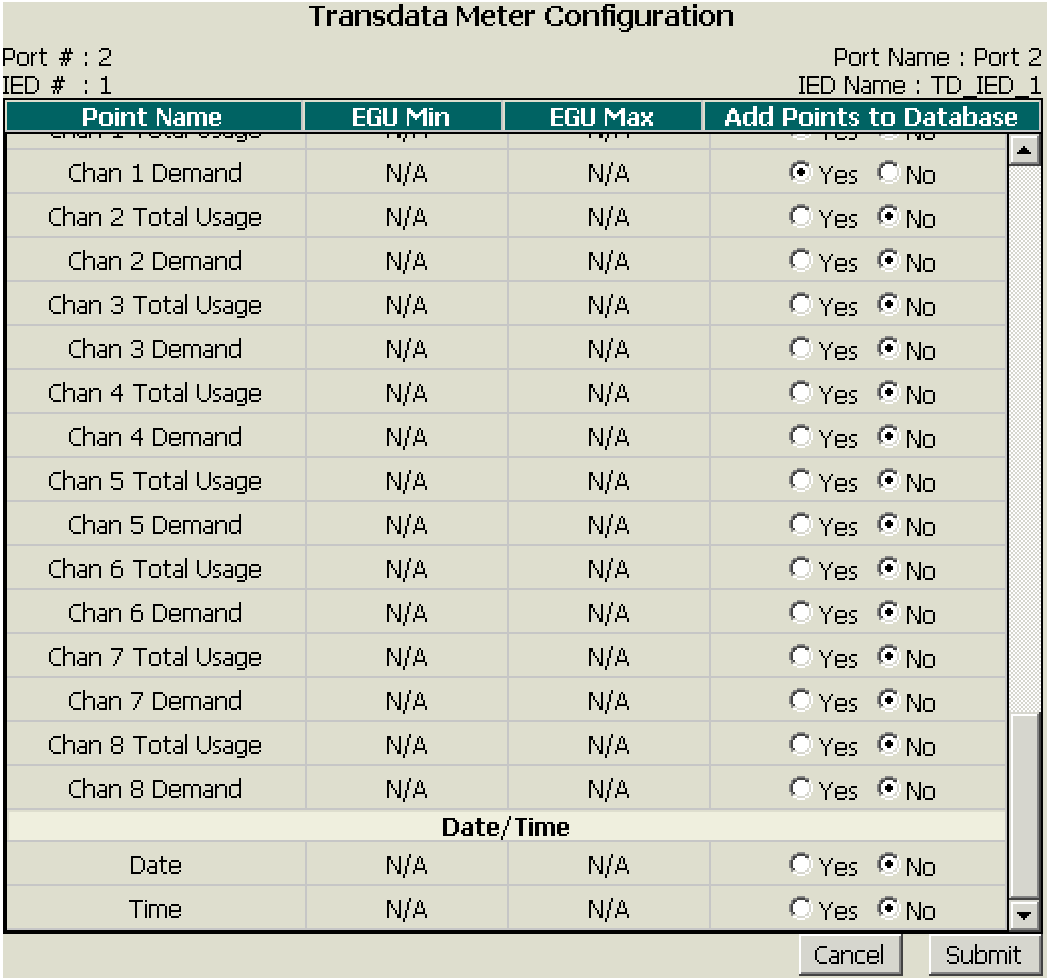
Port # : 2 Port Name : Port 2
IED # : 1 IED Name : TD_IED_1

Point Name	EGU Min	EGU Max	Add Points to Database
VAR			
VARS Total	-1500	1500	(•) Yes ( ) No
Ph A VARS	-1500	1500	( ) Yes (•) No
Ph C VARS	-1500	1500	( ) Yes (•) No
Ph B VARS	-1500	1500	( ) Yes (•) No
Q			
Q Total	-1500	1500	( ) Yes (•) No
Ph A Q	-1500	1500	( ) Yes (•) No
Ph C Q	-1500	1500	( ) Yes (•) No
Ph B Q	-1500	1500	( ) Yes (•) No
VA			
VA Total	-1500	1500	(•) Yes ( ) No
Ph A VA	-1500	1500	( ) Yes (•) No
Ph C VA	-1500	1500	( ) Yes (•) No
Ph B VA	-1500	1500	( ) Yes (•) No
V2**			
V**2 Total	0	22500	( ) Yes (•) No

Cancel Submit


Transdata Meter Configuration
Port # : 2
Port Name : Port 2
IED # : 1
IED Name : TD_IED_1
Point Name
EGU Min
EGU Max
Add Points to Database
V**2
V**2 Total 0 22500 Yes No
Ph A V**2 0 22500 Yes No
Ph C V**2 0 22500 Yes No
Ph B V**2 0 22500 Yes No
I**2
I**2 Total 0 25 Yes No
Ph A I**2 0 25 Yes No
Ph C I**2 0 25 Yes No
Ph B I**2 0 25 Yes No
PF
PF Total -1 1 Yes No
Ph A PF -1 1 Yes No
Ph C PF -1 1 Yes No
Ph B PF -1 1 Yes No
Neutral/Freq/Spare
Amps Neutral 0 5 Yes No
Frequency 57 63 Yes No
Cancel
Submit


Transdata Meter Configuration
Port # : 2
IED # : 1
Port Name : Port 2
IED Name : TD_IED_1
Point Name
EGU Min
EGU Max
Add Points to Database
Neutral/Freq/Spare
Amps Neutral 0 5 Yes No
Frequency 57 63 Yes No
Spare 0 5 Yes No
CH 1-8
Chan 1 Total Usage N/A N/A Yes No
Chan 1 Demand N/A N/A Yes No
Chan 2 Total Usage N/A N/A Yes No
Chan 2 Demand N/A N/A Yes No
Chan 3 Total Usage N/A N/A Yes No
Chan 3 Demand N/A N/A Yes No
Chan 4 Total Usage N/A N/A Yes No
Chan 4 Demand N/A N/A Yes No
Chan 5 Total Usage N/A N/A Yes No
Chan 5 Demand N/A N/A Yes No
Chan 6 Total Usage N/A N/A Yes No
Chan 6 Demand N/A N/A Yes No
Chan 7 Total Usage N/A N/A Yes No
Chan 7 Demand
Cancel
Submit



Transdata Meter Configuration

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : TD_IED_1

Point Name	EGU Min	EGU Max	Add Points to Database
Chan 1 Demand	N/A	N/A	(•) Yes ( ) No
Chan 2 Total Usage	N/A	N/A	( ) Yes (•) No
Chan 2 Demand	N/A	N/A	( ) Yes (•) No
Chan 3 Total Usage	N/A	N/A	( ) Yes (•) No
Chan 3 Demand	N/A	N/A	( ) Yes (•) No
Chan 4 Total Usage	N/A	N/A	( ) Yes (•) No
Chan 4 Demand	N/A	N/A	( ) Yes (•) No
Chan 5 Total Usage	N/A	N/A	( ) Yes (•) No
Chan 5 Demand	N/A	N/A	( ) Yes (•) No
Chan 6 Total Usage	N/A	N/A	( ) Yes (•) No
Chan 6 Demand	N/A	N/A	( ) Yes (•) No
Chan 7 Total Usage	N/A	N/A	( ) Yes (•) No
Chan 7 Demand	N/A	N/A	( ) Yes (•) No
Chan 8 Total Usage	N/A	N/A	( ) Yes (•) No
Chan 8 Demand	N/A	N/A	( ) Yes (•) No
Date/Time			
Date	N/A	N/A	( ) Yes (•) No
Time	N/A	N/A	( ) Yes (•) No

Cancel Submit

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Move the scroll bar on the right to access all the points. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

5.3.22 Analog Database

The configured analogs are stored in the RTU database in the following order:

Table 5-1 TransData Stored Analog Types

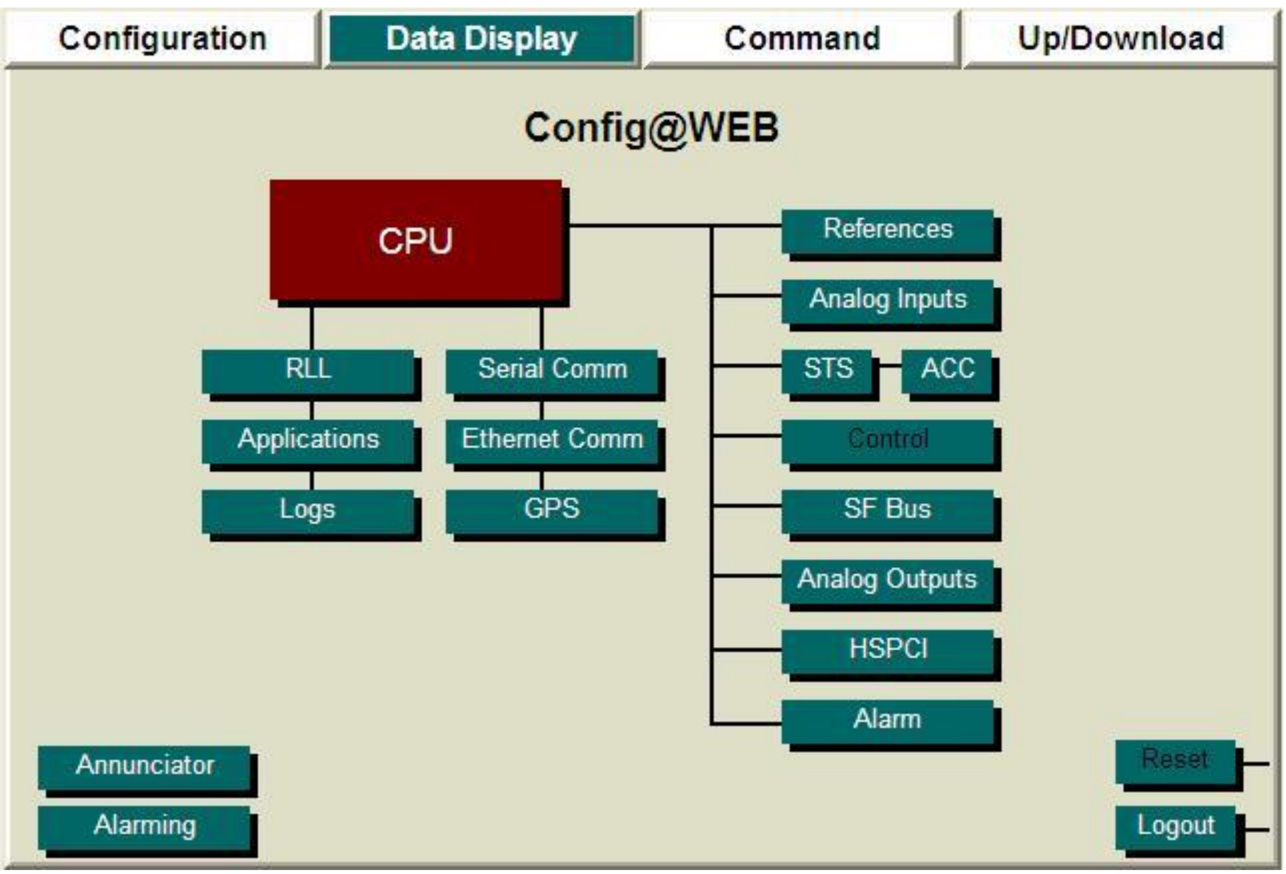
Fields		Type
Volts	T, A, C, B	unsigned
Amps	T, A, C, B	unsigned
Watts	T, A, C, B	signed
VAR	T, A, C, B	signed
Q	T, A, C, B	signed
VA	T, A, C, B	signed
V2	T, A, C, B	unsigned
I2	T, A, C, B	unsigned
PF	T, A, C, B	signed
INeutral		unsigned
Frequency		signed
Spare		unsigned

The channel data is stored as 24 bit integer values and roll over from the maximum value of 16,777,215 to 0. Date and time values are the decimal equivalents of the raw data values from the meter.

5.4 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 5-6 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 5-7 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	RTU to IED	Transdata	View	Port Data
Port #2	K	K	Port 2	None	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

5.4.1 Port Number

Physical Port number of the RTU.

5.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

5.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

5.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

5.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

5.4.3 Name

The port name given during configuration or default name accepted.

5.4.4 Protocol

The configured protocol for this port.

5.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

5.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

5.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

5.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 5-8 Transdata Communication Counters Display


Transdata Communication Counters Display

Port # : 3 Port Name : Port 3

Point	Counter Name	Counts
1	Attempts	85
2	Good Replies	0
3	No Replies	85
4	RX Timeouts	0
5	CRC Errors	0
6	Framing Errors	0
7	Overruns	0
8	Parity Errors	0

5.4.9 Point Number

A logical point number for reference only.

5.4.10 Counter Name

The following counters are monitored:

5.4.10.1 Attempts

This indicates the cumulative number of transmitted messages since the last reset or power-up.

5.4.10.2 Good Replies

This indicates the cumulative number of transmitted messages that received a response since the last reset or power-up. This count can be affected by the Rx timeout delay value selected.

5.4.10.3 No Replies

This indicates the cumulative number of transmitted messages that did not receive a response since the last reset or power-up. This count can be affected by the Rx timeout delay value selected.

5.4.10.4 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

5.4.10.5 CRC Errors

This indicates the cumulative number of received messages with CRC errors since the last reset or power-up. This can be affected by parity and MTO.

5.4.10.6 Framing Errors

This indicates the cumulative number of framing errors since the last reset or power-up. This can be affected by parity.

5.4.10.7 Overruns

This indicates the cumulative number of over-run errors since the last reset or power-up.

5.4.10.8 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

5.4.11 Counts

The counts for each type of Counter.

5.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

5.4.13 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

Transdata IED Comm Counters Display

Port # : 2 Port Name : Port 2

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts	Security Errors	Framing Errors	Overrun Errors	Parity Errors
1	TD_IED_1	74	0	74	0	0	0	0	0
2	TD_IED_2	74	0	74	0	0	0	0	0

Done

5.4.13.1 IED

The number of the IED

5.4.13.2 IED Name

The name of the IED

5.4.13.3 Messages Sent

Messages sent to this IED since the last reset or since the last time the counters were cleared.

5.4.13.4 Valid Replies

Valid messages received from this IED since the last reset or since the last time the counters were cleared.

5.4.13.5 No Replies

The number of no replies from this IED since the last reset or since the last time the counters were cleared.

5.4.13.6 Timeouts

The number of timeouts from this IED since the last reset or since the last time the counters were cleared.

5.4.13.7 Security Errors

The number of security errors from this IED since the last reset or since the last time the counters were cleared.

5.4.13.8 Framing Errors

The number of framing errors from this IED since the last reset or since the last time the counters were cleared.

5.4.13.9 Overrun Errors

The number of overrun errors from this IED since the last reset or since the last time the counters were cleared.

5.4.13.10 Parity Errors

The number of parity errors from this IED since the last reset or since the last time the counters were cleared.

5.4.14 Reset Comm Counters

Click this button to reset all comm. counters.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

5.4.15 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 5-9 Transdata IED Display

Transdata IED Configuration

Port # : 1 Port Name : RTU to IED

IED #	IED Name	Address		On Scan	Slave Data
		Meter	Base		
1	TD_IED_1	1	0	Y	View
2	TD_IED_2	2	0	Y	View

Back

5.4.16 IED

The logical number of the IED on this communication channel.

5.4.17 IED Name

The name that was chosen, or accepted as default, during configuration.

5.4.18 Meter Address

The Meter address chosen, or accepted as default, during configuration.

5.4.19 Base Address

The Base address chosen, or accepted as default, during configuration.

5.4.20 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

5.4.21 Slave Data

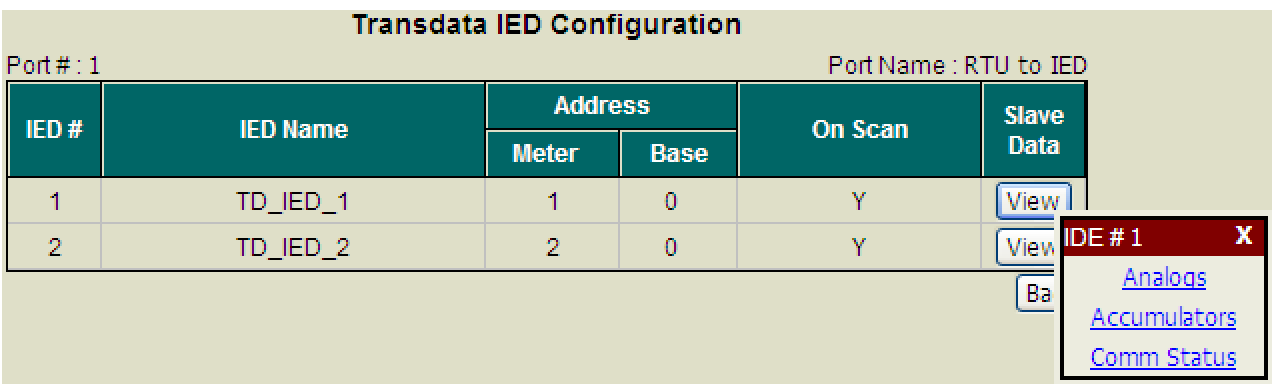
Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the Transdata IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23. Click either Analogs, Accumulators, or Comm Status.

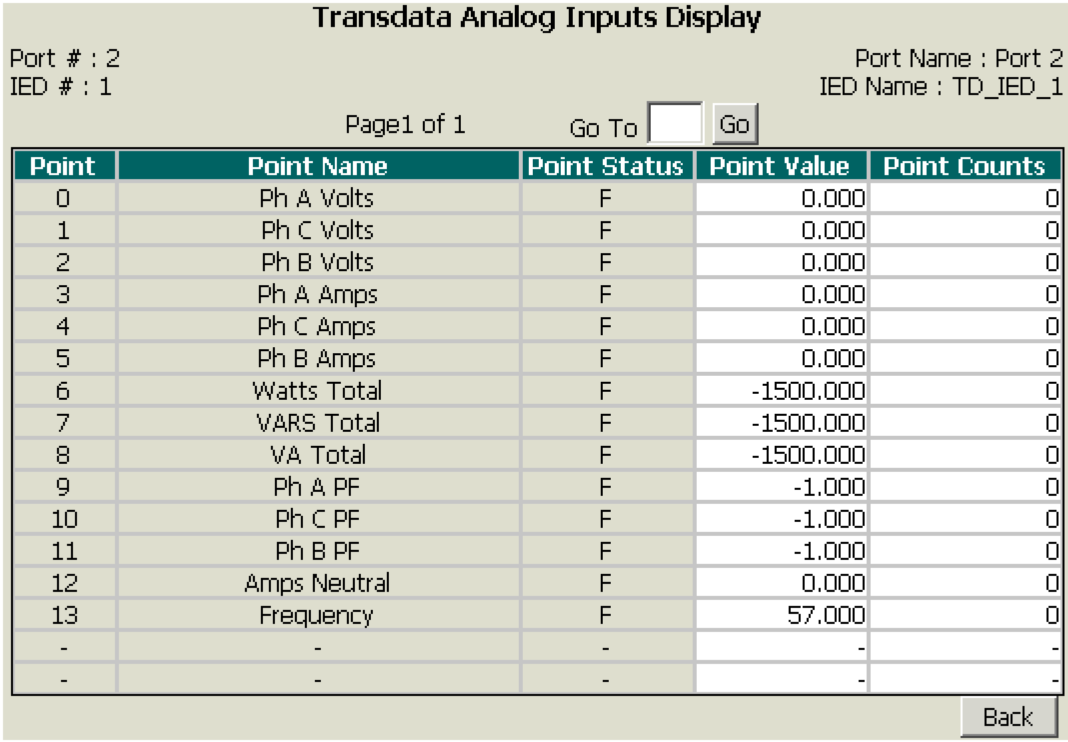
Figure 5-10 Transdata IED Display



5.4.21.1 Analogs

From the Transdata IED Configuration screen, click View, then click Analogs. Reference the screen shown in Figure 5-11.

Figure 5-11 Transdata Analog Inputs Display



Transdata Analog Inputs Display

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : TD_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point Value	Point Counts
0	Ph A Volts	F	0.000	0
1	Ph C Volts	F	0.000	0
2	Ph B Volts	F	0.000	0
3	Ph A Amps	F	0.000	0
4	Ph C Amps	F	0.000	0
5	Ph B Amps	F	0.000	0
6	Watts Total	F	-1500.000	0
7	VARS Total	F	-1500.000	0
8	VA Total	F	-1500.000	0
9	Ph A PF	F	-1.000	0
10	Ph C PF	F	-1.000	0
11	Ph B PF	F	-1.000	0
12	Amps Neutral	F	0.000	0
13	Frequency	F	57.000	0
-	-	-	-	-
-	-	-	-	-

Back

5.4.22 Point

The logical number of the point.

5.4.23 Point Name

The point name. Only those points that were set to Yes under Add Points to Database will appear here.

5.4.24 Point Status

Please see the Config@WEB Secure Software Users Guide.

5.4.25 Point Value

The engineering unit (EGU) value being calculated by the RTU based on the settings of the EGU min, EGU max, and the current binary value being returned by the meter.

5.4.26 Point Counts

The binary counts being returned from the meter for each point.

Navigation

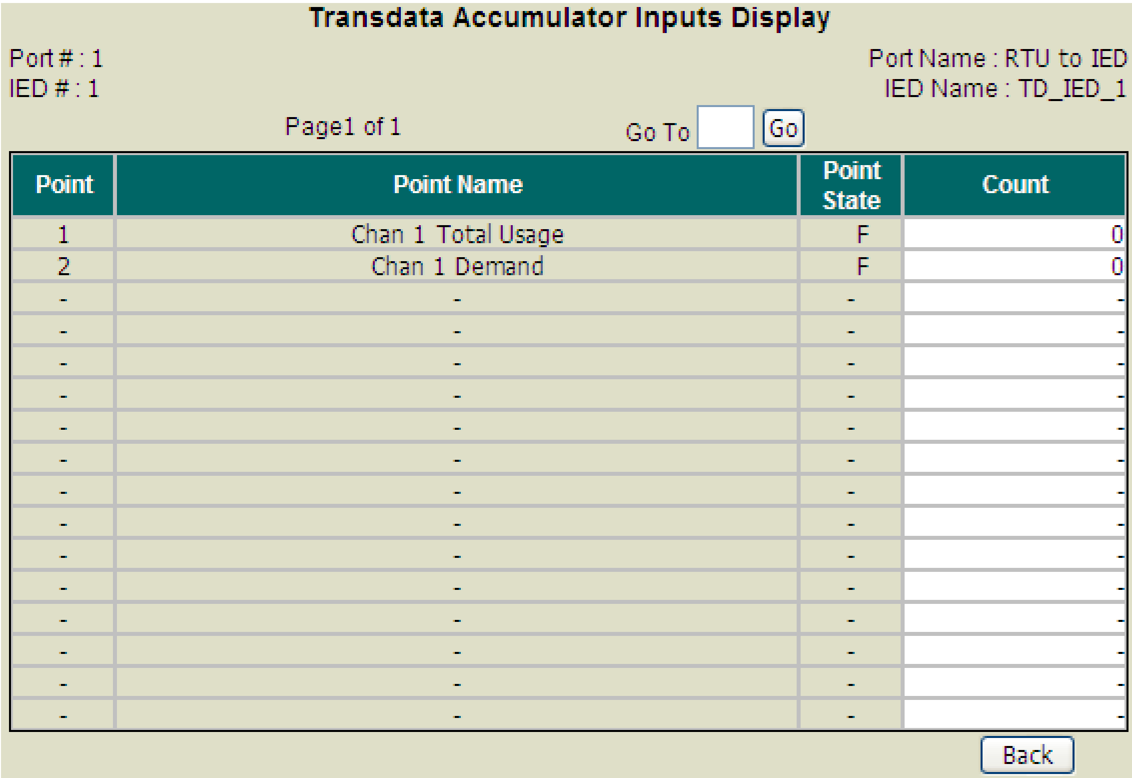
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in

the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

5.4.26.1 Accumulators

From the Transdata IED Configuration screen, click View, then click Accumulators. Reference the screen shown in Figure 5-12.

Figure 5-12 Transdata Accumulators Inputs Display



Transdata Accumulator Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : TD_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point State	Count
1	Chan 1 Total Usage	F	0
2	Chan 1 Demand	F	0
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Back

5.4.27 Point

Protocol logical point number.

5.4.28 Point Name

The point name. Only those points that were set to Yes under Add Points to Database will appear here.

5.4.29 Point State

Please see the Config@WEB Secure Software Users Guide.

5.4.30 Count

The counts from the IED.

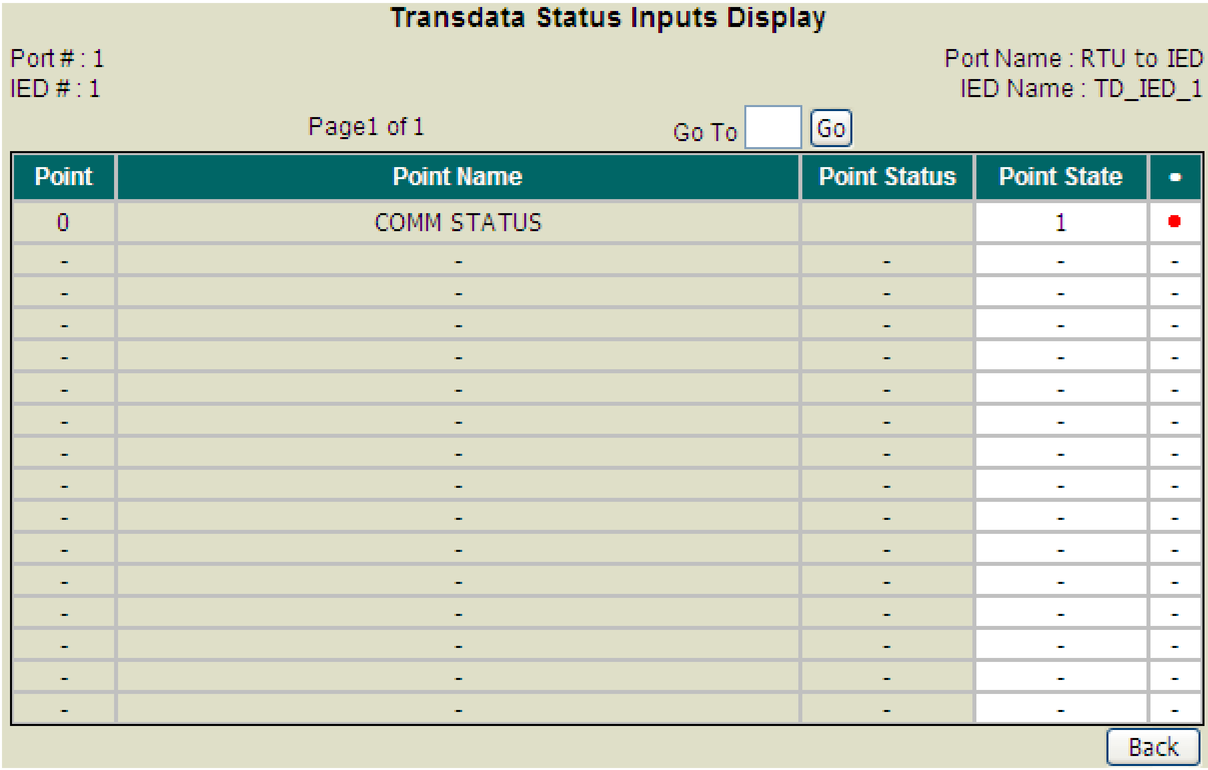
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

5.4.30.1 Comm Status

From the Transdata IED Configuration screen, click View, then click Comm Status. Reference the screen shown in Figure 5-13.

Figure 5-13 Transdata Status Inputs Display



Transdata Status Inputs Display

Port # : 1
IED # : 1

Port Name : RTU to IED
IED Name : TD_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point State	•
0	COMM STATUS		1	•
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Back

5.4.31 Point

Logical point number.

5.4.32 Point Name

Hard-coded name of the communications failure bit.

5.4.33 Point Status

Not used.

5.4.34 Point State

A Point State of 1 = Closed means the IED is in communications failure. A state of 0 = Open means there is good communications to the IED.

5.4.35 •

A red dot indicates the IED is in comm. failure; a green dot indicates the IED has valid communications.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in

the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

5.5 Cable Connections

The TransData Mark V Meter communications cable connections are shown in Table 5-2. The TransData end of the cable may be a quick disconnect.

Table 5-2 TransData Cable Connections

RTU DB9M	TransData DB25F
RXD-2	TXD-23
TXD-3	RXD-10
DGND-5	DGND-11

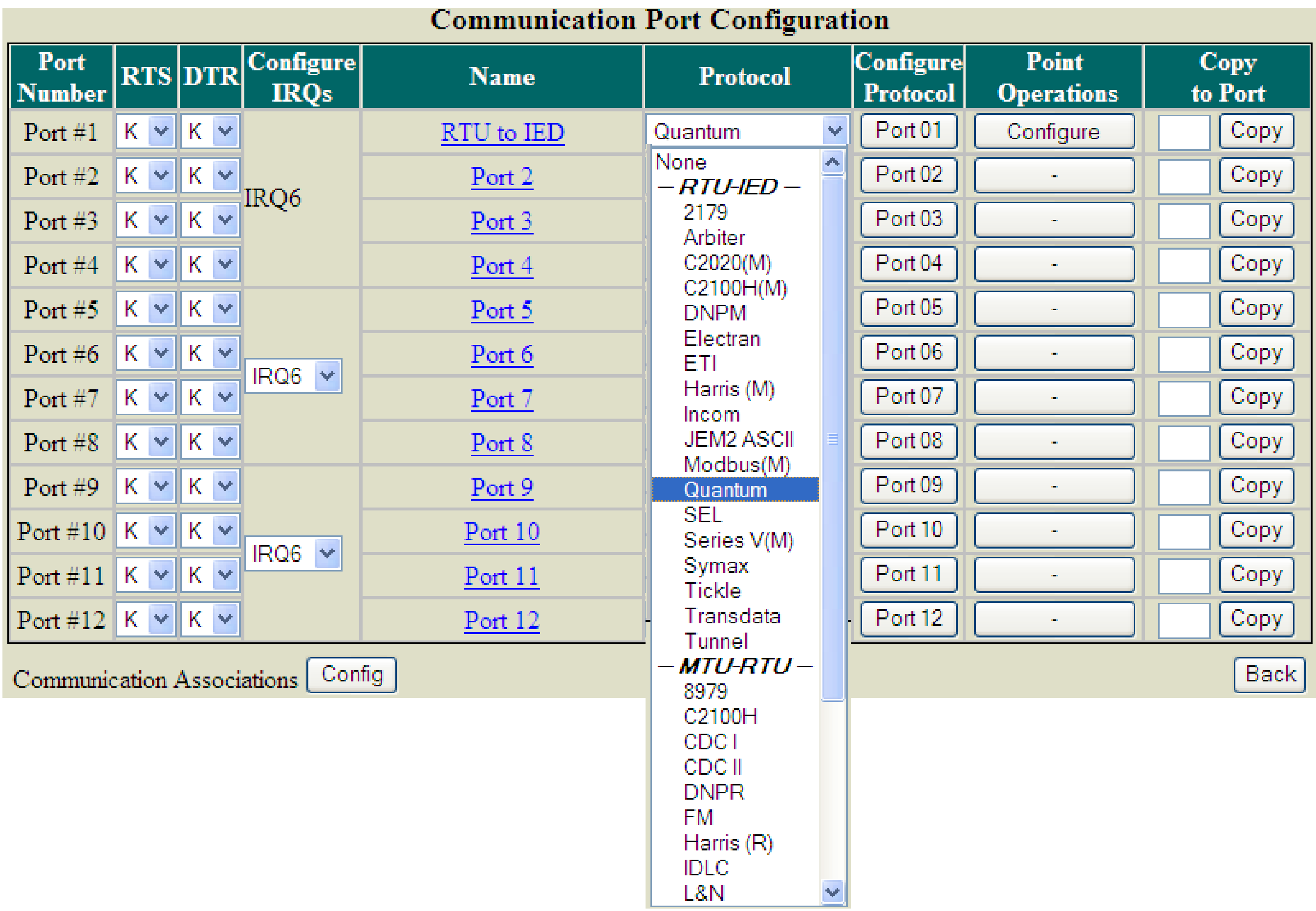
6 Quantum Protocol

6.1 Communication Port Configuration

The Quantum protocol is a protocol that communicates between the RTU and a Quantum meter using the Quantum Digital Interface Protocol (QDIP). The RTU may be configured to periodically poll one or more Quantum meters.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Quantum from the Protocol drop-down menu as shown.

Figure 6-1 Quantum Communication Port Configuration



6.1.1 Port Number

Physical Port number of the RTU.

6.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

> **Note:** This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

6.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

6.1.2.2 "H" represents Positive RS232 Voltage.

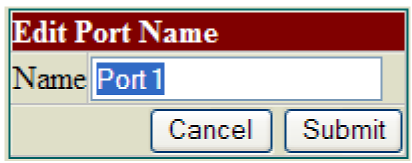
When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

6.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

6.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.



6.1.4 Protocol

From the drop-down list, select the protocol for this port.

6.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

6.1.6 Point Operations

Click this button to assign points.

6.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

6.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

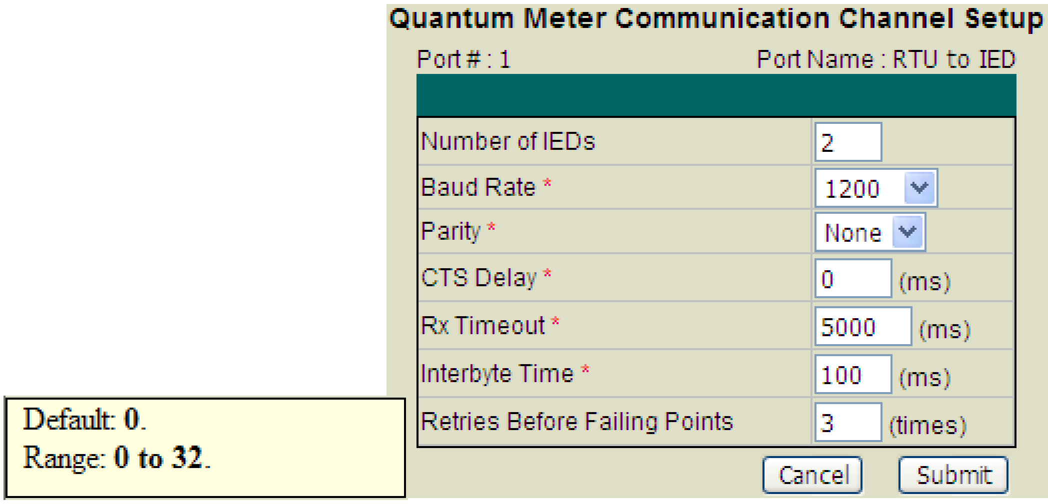
Navigation

Click the Back button to return to the previous screen.

6.2 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the Quantum port. As a minimum, you must enter the "Number of IEDs" this port will be connected to. You may accept all other defaults or fill in the form according to the information following Figure 2-2.

Figure 6-2 Quantum Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

6.2.1 Number of IEDs (0 – 32)

Enter the number of IEDs connected to this port. The default setting is 0.

6.2.2 Baud Rate (300 – 19200)

From the drop-down menu, select the baud rate. The default setting is 1200.

6.2.3 Parity (None, Odd, Even)

From the drop-down menu, select the parity for the associated channel. The default setting is None.

6.2.4 CTS Delay (0 – 250ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 0.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

6.2.5 Rx Timeout (0 – 30,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 5000ms.

6.2.6 Interbyte time (0 – 250ms)

Enter the interbyte time for the associated channel. The interbyte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 100 msec.

6.2.7 Retries Before Failing Points (0-99)

Enter the number of times the RTU will attempt communications with a device before marking all points attached to the device as failed. The default setting is 3.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

6.3 Point Operations

From the Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 6-3 IED Configuration

Quantum IED Configuration

Port # : 1 Port Name : RTU to IED

IED #	IED Name	IED Address	On Scan	Slave Config	Copy to IEDn
1	QM_IED_1	1	Y	Edit	Copy
2	QM_IED_2	2	Y	Edit	Copy

Back

6.3.1 IED

The logical number of the IED on this communication channel.

6.3.2 IED Name

Click on the IED Name. A pop-up window will appear. See section 6.3.6.1 below.

6.3.3 IED Address

Reflects the entry in the pop-up menu. See section 6.3.6.1 below.

6.3.4 On Scan

Reflects the entry in the pop-up menu. See section 6.3.6.1 below.

6.3.5 Slave Config

Click on Edit to edit the IED points. See section "4.5.16.1 Slave Configuration Edit".

6.3.6 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

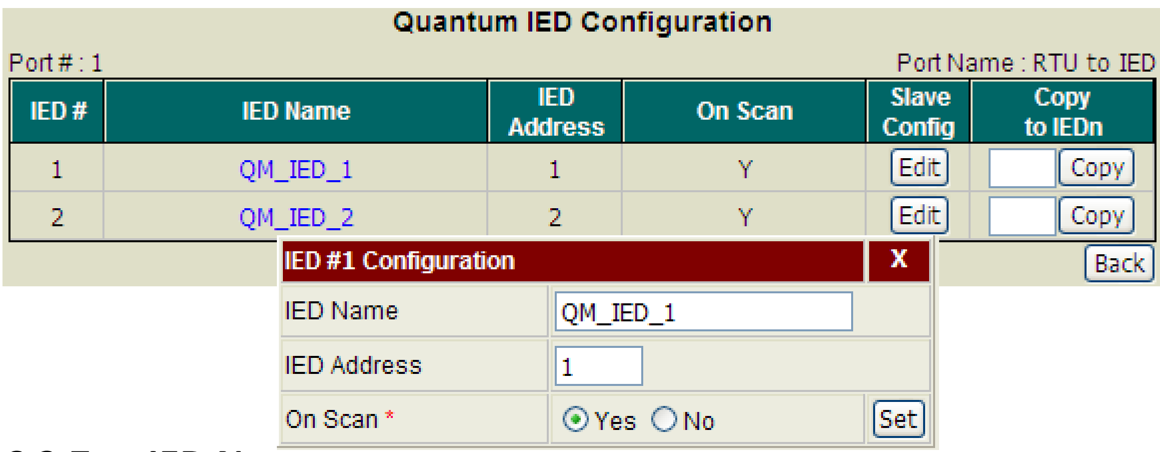
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

6.3.6.1 IED Name & Address Configuration

When you click the name of the IED (in blue characters), a pop-up menu will appear, as shown in Figure 2-6. Edit this pop-up window according to the directions below. After editing, your choices are reflected as explained under Figure 2-5.

Figure 6-4 IED Configuration



6.3.7 IED Name

Accept the default name or type a name of your choosing.

6.3.8 IED Address (1 – 65534)

Enter the IED address. The default is 1.

6.3.9 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled.

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

6.3.10 Set / X

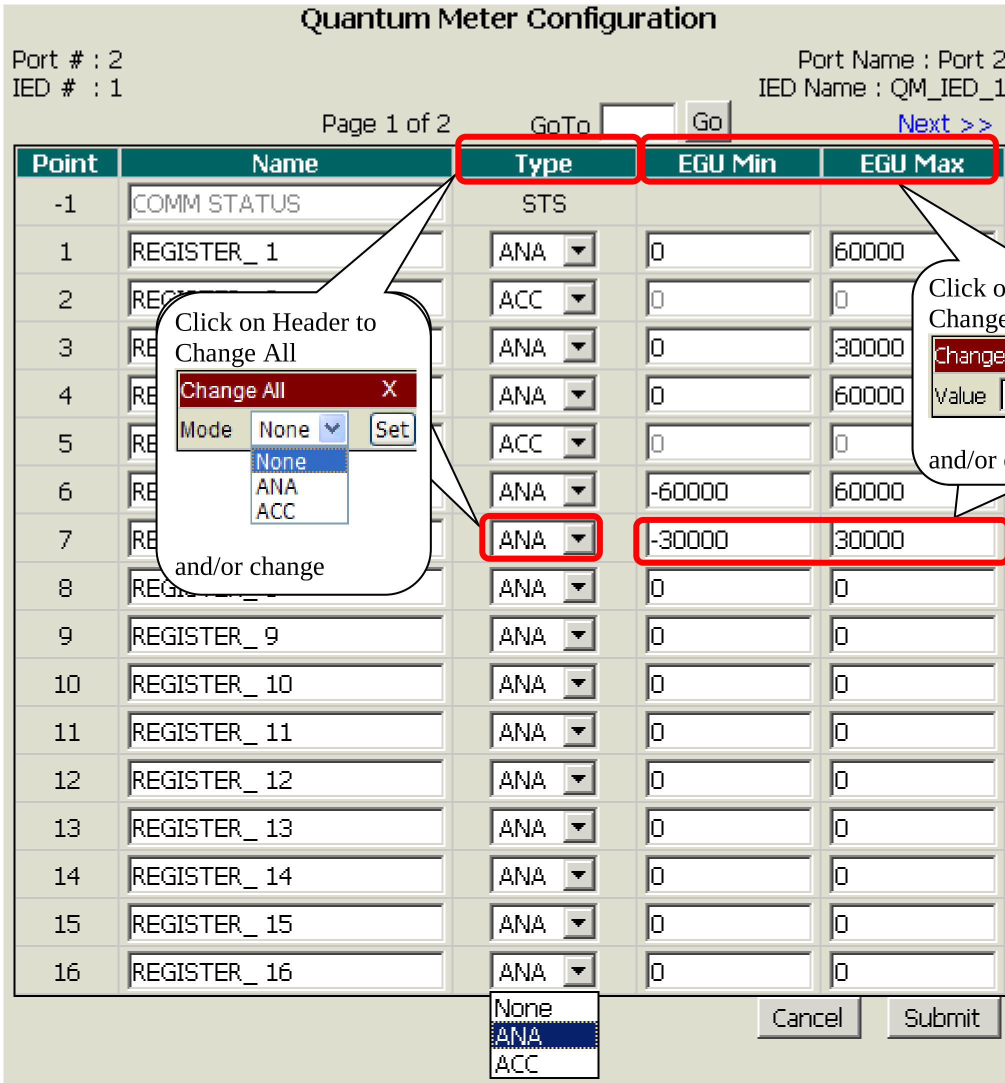
Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

6.3.10.1 Slave Configuration Edit

6.3.11 Slave Config

Click the Edit button to continue. A screen similar to Figure 2-10 will appear. The Quantum meter has a set of 32 registers that must be configured in the meter prior to having the RTU begin polling. The configuration on this screen should match the configuration of the meter.

Figure 6-5 IED Configuration



6.3.12 Point

Protocol logical point number. This number cannot be changed.

6.3.13 Name

Enter the name of the point (or accept the default name). Notice that there is an automatically-assigned Name (which cannot be changed) for the Comm Status.

6.3.14 Type (None, ANA, ACC)

From the drop-down menu, select None, ANA, or ACC to define to the RTU how the register is to be used. An entry of None defines the register to be unused and this register will not be available for mapping within the RTU. An entry of ANA (Analog) defines this register to be an analog quantity and it will be available for mapping as an analog point within the RTU. An entry of ACC (Accumulator) defines this register to be an accumulator quantity and it will be available for mapping as an accumulator point within the RTU. By selecting Type in the header, a drop-down menu will appear that allows all the register types on this page to be defined at once.

6.3.15 EGU Min

Enter a minimum engineering unit value for the point. This value is only used for registers defined as analog quantities. All entries in this column may be changed at once by clicking on the header. If ACC or None was chosen as the type of point, EGU Min will be grayed out.

6.3.16 EGU Max

Enter a maximum engineering unit value for the point. This value is only used for registers defined as analog quantities. All entries in this column may be changed at once by clicking on the header. If ACC or None was chosen as the type of point, EGU Max will be grayed out.

Navigation

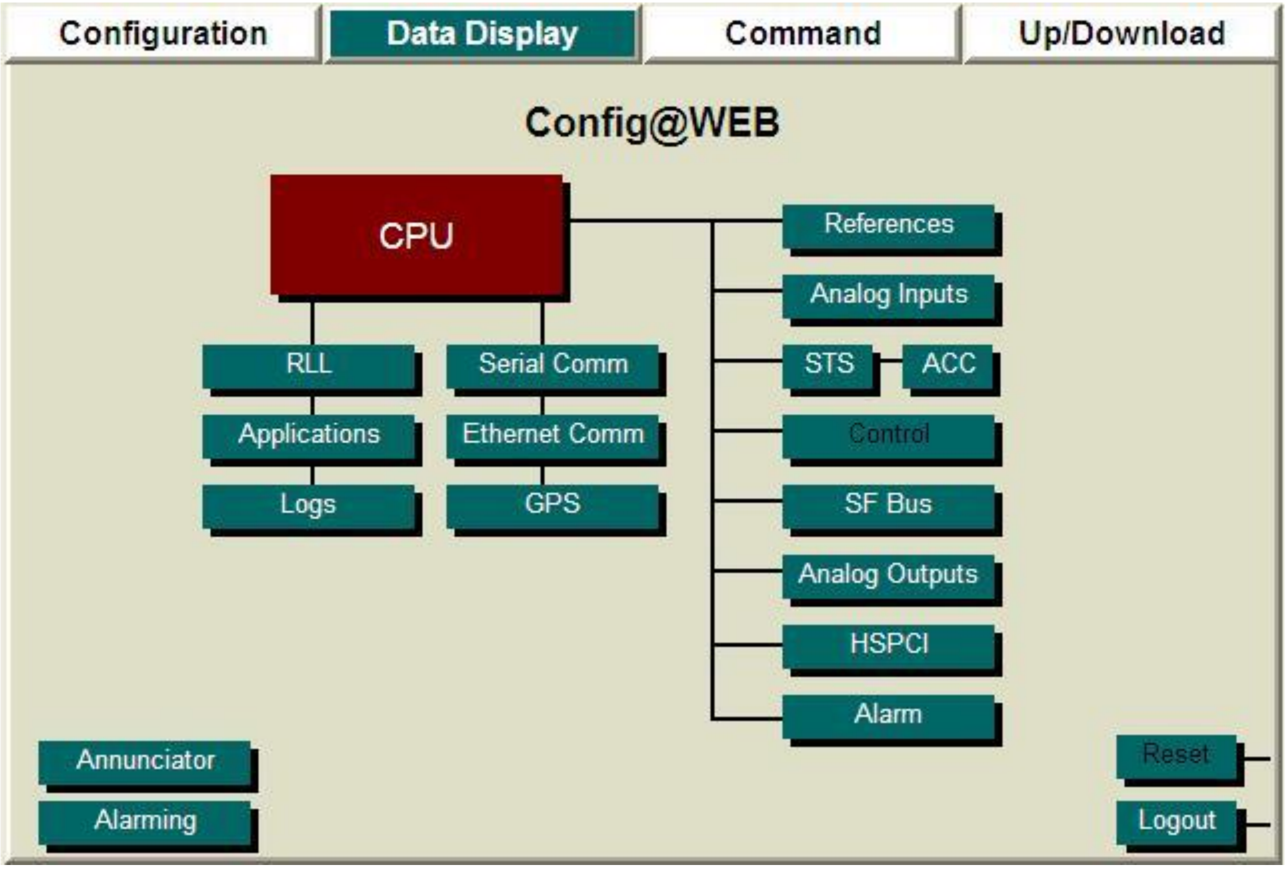
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click Next>> to go to the next 16 points, if applicable. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click the Cancel button to discard changes and return to the IED Configuration screen. Click the Submit button to accept the changes and return to the IED Configuration screen.

Please note: No configuration changes take effect until the RTU is reset.

6.4 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 6-6 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 6-7 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	RTU to IED	Quantum	View	Port Data
Port #2	K	K	Port 2	None	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

6.4.1 Port Number

Physical Port number of the RTU.

6.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

6.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

6.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

6.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

6.4.3 Name

The port name given during configuration or default name accepted.

6.4.4 Protocol

The configured protocol for this port.

6.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

6.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

6.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

6.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 6-8 Quantum Communication Counters Display

Quantum Communication Counters Display

Port # : 4 Port Name : Port 4

Point	Counter Name	Counts
1	Messages Sent	64
2	Messages Received	0
3	No Replies	63
4	Rx Timeouts	0
5	Security Errors	0
6	IB Timer Errors	0
7	Overrun Errors	0
8	Framing Errors	0
9	Parity Errors	0

Data Trap Configure

Back

6.4.9 Point Number

A logical point number for reference only.

6.4.10 Counter Name

The following counters are monitored:

6.4.10.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

6.4.10.2 Messages Received

This indicates the cumulative number of received messages since the last reset or power-up.

6.4.10.3 No Replies

This indicates the cumulative number of transmitted messages that did not receive a response since the last reset or power-up. This count can be affected by the Rx timeout delay value.

6.4.10.4 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

6.4.10.5 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

6.4.10.6 IB Timer Errors

This indicates the cumulative number of Interbyte timer errors since the last reset or power-up. This count can be affected by the setting of the Interbyte Time in configuration.

6.4.10.7 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

6.4.10.8 Framing Errors

This indicates the cumulative number of framing errors since the last reset or power-up. This can be affected by parity.

6.4.10.9 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

6.4.11 Counts

The counts for each type of Counter.

6.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

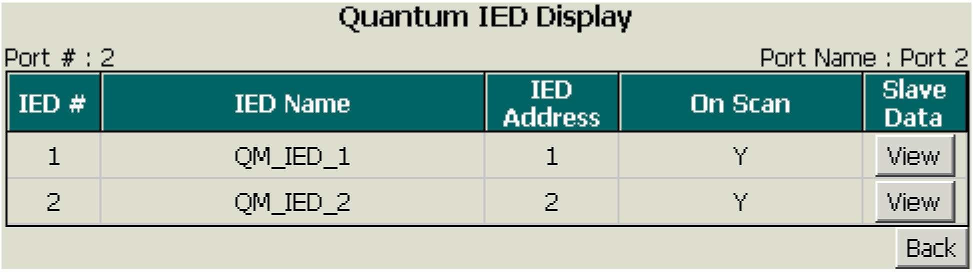
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

6.4.13 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 6-9 Quantum IED Display



Quantum IED Display

Port # : 2 Port Name : Port 2

IED #	IED Name	IED Address	On Scan	Slave Data
1	QM_IED_1	1	Y	View
2	QM_IED_2	2	Y	View

Back

6.4.14 IED

The logical number of the IED on this communication channel.

6.4.15 IED Name

The name that was chosen, or accepted as default, during configuration.

6.4.16 IED Address

The IED Address chosen during configuration.

6.4.17 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

6.4.18 Slave Data

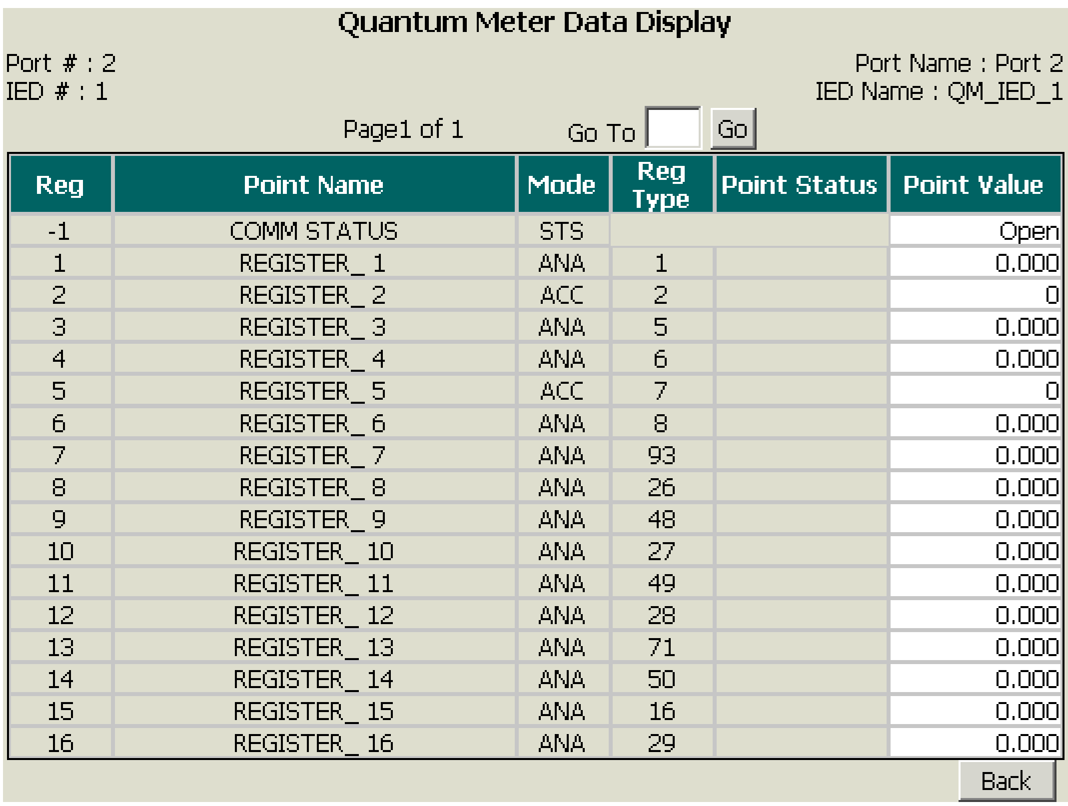
Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the Quantum IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 6-10 Quantum IED Display


Quantum Meter Data Display

Port # : 2
IED # : 1
Port Name : Port 2
IED Name : QM_IED_1

Page1 of 1 Go To Go

Reg	Point Name	Mode	Reg Type	Point Status	Point Value
-1	COMM STATUS	STS			Open
1	REGISTER_ 1	ANA	1		0.000
2	REGISTER_ 2	ACC	2		0
3	REGISTER_ 3	ANA	5		0.000
4	REGISTER_ 4	ANA	6		0.000
5	REGISTER_ 5	ACC	7		0
6	REGISTER_ 6	ANA	8		0.000
7	REGISTER_ 7	ANA	93		0.000
8	REGISTER_ 8	ANA	26		0.000
9	REGISTER_ 9	ANA	48		0.000
10	REGISTER_ 10	ANA	27		0.000
11	REGISTER_ 11	ANA	49		0.000
12	REGISTER_ 12	ANA	28		0.000
13	REGISTER_ 13	ANA	71		0.000
14	REGISTER_ 14	ANA	50		0.000
15	REGISTER_ 15	ANA	16		0.000
16	REGISTER_ 16	ANA	29		0.000

Back

6.4.19 Reg

The Register number that is the source of the point.

6.4.20 Point Name

The name that was chosen, or accepted as default, during configuration.

6.4.21 Mode

Displays the data type as defined in the RTU for each register.

6.4.22 Reg Type

This number shows the variables coming back from the IED. This value is returned in Octet 2 of the program table. Consult the IED manufacturer's documentation that came with the meter.

6.4.23 Point State

Please see the Config@WEB Secure Software Users Guide.

6.4.24 Point Value

The value being returned from the meter for each register.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

6.5 RS-232 Interface

Unless a splitter or other multi-dropline device is used, only one meter may be connected to an RS-232 communication port at the RTU (i.e., two or more meters may not share the same communication port). However, additional RTU RS-232 communication ports may be connected to additional meters.

Figure 6-11 shows the connections between an RS-232 RTU and a Quantum Meter using a direct RS-232 connection.

Figure 6-11 Quantum Meter Cable

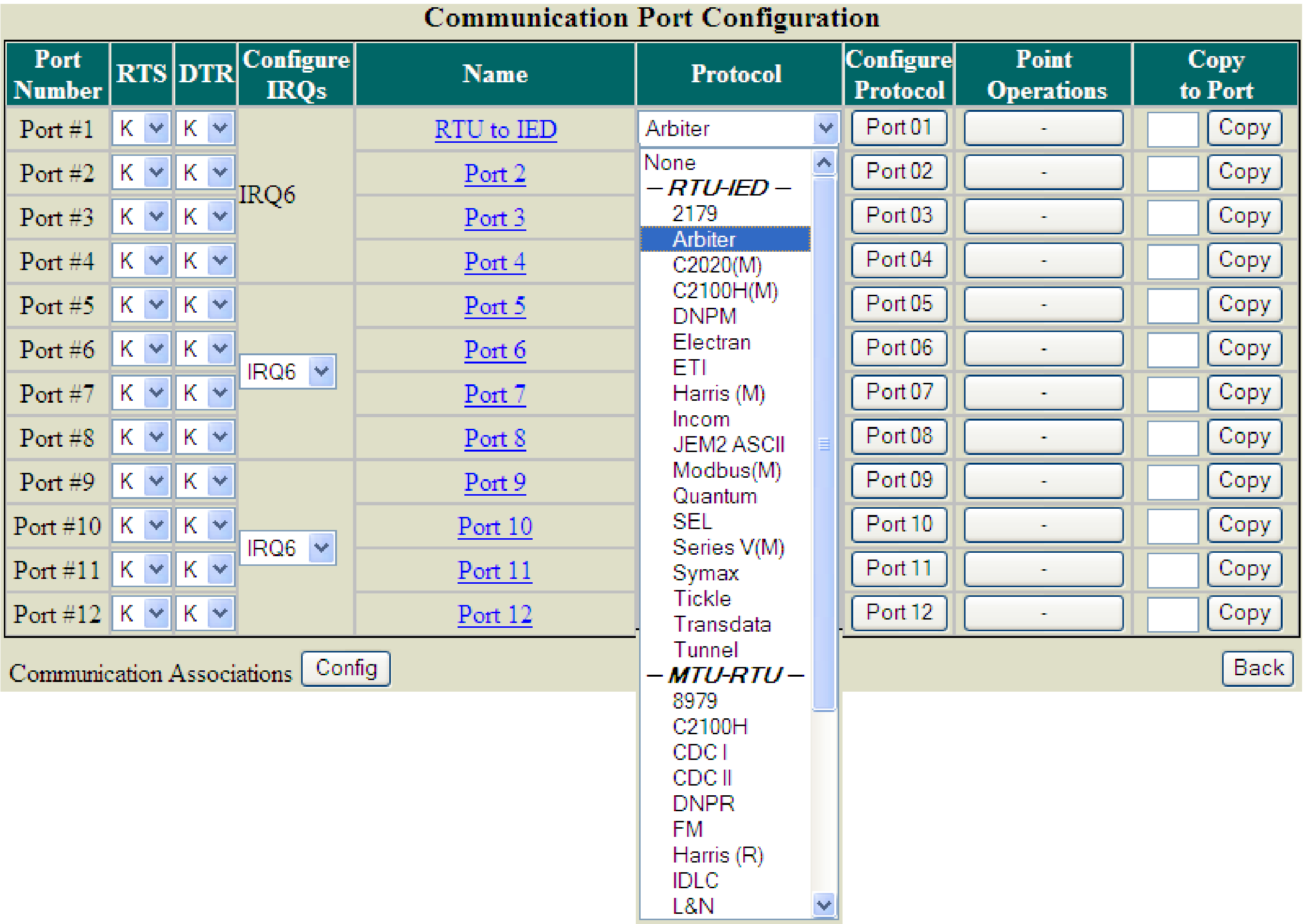
Qmeter Male DB25		**RTU Male DB9**	
Signal	**Pin**	**Pin**	**Signal**
Tx Data	21	2	Rx Data
Rx Data	22	3	Tx Data
RTS	23		
CTS	24		
CD	25	7	RTS
GND	13	5	GND

7 Arbiter

Arbiter is a protocol that communicates between the RTU and the Arbiter Systems GPS Satellite-Controlled Clock. This clock supplies time syncs once per second from an RS232 port.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Arbiter from the Protocol drop-down menu as shown.

Figure 7-1 Arbiter Communication Port Configuration



7.1.1 Port Number

Physical Port number of the RTU.

7.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

7.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

7.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

7.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

7.1.3 Name

Click on the "blue" name (see below) and rename the port, or accept the default name.

7.1.4 Protocol

From the drop-down list, select the protocol for this port.

7.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

7.1.6 Point Operations

Click this button to assign points.

7.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

7.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

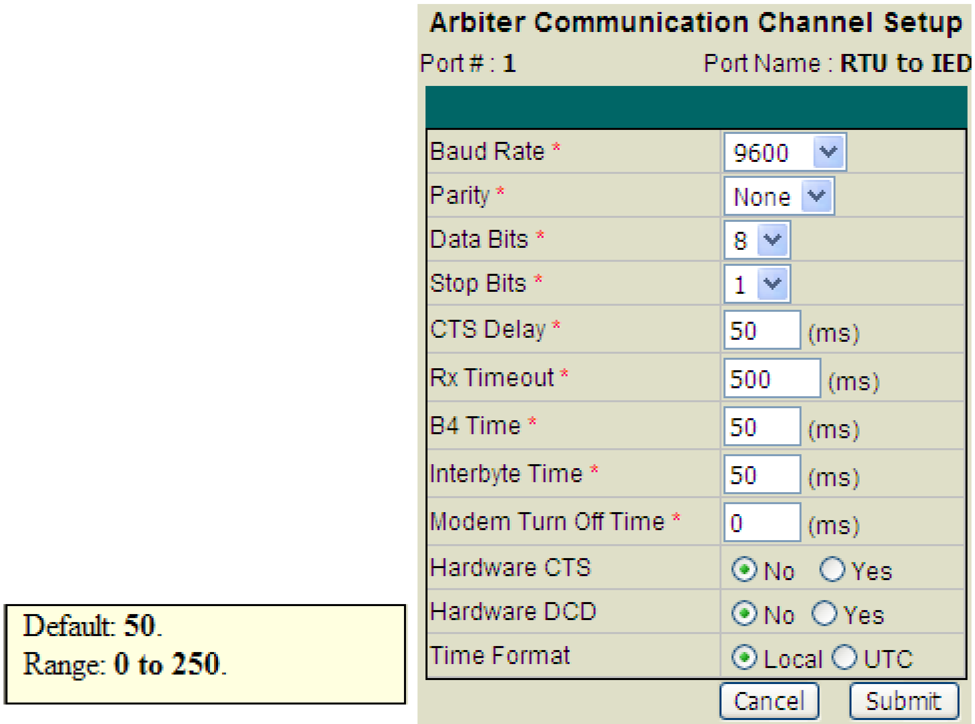
Navigation

Click the Back button to return to the previous screen.

7.2 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the Arbiter port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 7-2 Arbiter Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for CTS Delay.

7.2.1 Baud Rate (300 – 19200)

From the drop-down menu, select the baud rate. The default setting is 9600.

7.2.2 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is None.

7.2.3 Data Bits (5,6,7,8)

Enter the data bits for the associated channel. The default setting is 8.

7.2.4 Stop Bits (0,1,2)

Enter the stop bits for the associated channel. The default setting is 1.

7.2.5 CTS Delay (0 – 250ms)

Enter the clear-to-send delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 50.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

7.2.6 Rx Timeout (0 – 30,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 500.

7.2.7 B4 Time (0 – 250ms)

Enter the B4 time for the associated channel. The B4 time is the length of quiet time required on the channel following a transmission from the RTU prior to turning on the RTU's receive interrupts. Default setting 50.

7.2.8 Inter-byte time (0 – 250ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 50 msec.

7.2.9 Modem Turn Off Time (0 – 250ms)

Enter the delay time that the modem will maintain the carrier after the last data byte has been transmitted. Default setting is 0.

7.2.10 Hardware CTS (No, Yes)

Click the radio button for Yes if you want the Hardware Clear-To-Send option selected. When this option is selected, the Arbiter will not be polled unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. The default setting is No.

7.2.11 Hardware DCD (No, Yes)

Click the radio button for Yes if you want the Hardware DCD selected. When this option is selected, the channel communications driver will accept requested message data bytes only if the carrier is detected by the modem. If the carrier is not detected, the data bytes are discarded. The default setting is No.

7.2.12 Time Format (Local, UTC)

Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regards to time syncs, set Time Format to Local Time. See Time Configuration Settings in the Configuration chapter of the hardware manual for time settings under the CPU block.

If you want time synchronization from this device, you must know whether the device is sending Local time or UTC time, then set this radio button to match.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

7.3 Point Operations

The Arbiter has no point operations.

7.4 Data Display

The Arbiter has no Data Display functions.

7.5 Arbiter Systems Satellite-Controlled Clock Interface

7.5.1 Arbiter Systems Model 1084A/B/C

7.5.2 GPS Satellite-Controlled Clock

The following example configures the Arbiter Systems Satellite-Controlled Clock for use with the Telvent SAGE RTU.

In the following example:

1. [ENTER] means to press the [ENTER] key on the Arbiter keypad.
2. [SETUP] means to press the [SETUP] key on the Arbiter keypad.
3. All other information between the characters "[" and "]" is directions used to set the value.

The firmware interface for the Arbiter Systems Satellite-Controlled Clock expects the clock to be configured in the following way:

Set Main RS-232? [ENTER]
  Set Port Config? [ENTER]
    Set Baud Rate = 9600 [change to 9600] [ENTER]
    Set Word Length = 8 Bits [change to 8 bits] [ENTER]
    Set Stop Bits = 1 [change to 1] [ENTER]
    Set Parity = OFF [change to OFF] [ENTER]
Set Broadcast? [ENTER]
  Set Broadcast = EXT. ASCII [change to EXT. ASCII] [ENTER]
  Select UTC or Local = Local [change to UTC] [ENTER]
Set A Event [SETUP]
Set Local Hour [ENTER]
  Set Daylight Saving = ON [change to ON] [ENTER]
  Set local offset = 5 [change to correct value for local time] [ENTER]
All other setup items, use [SETUP]

When configured in this manner, the Arbiter will transmit the UTC time once each second at the top of the second.

As there is no security for the broadcast message, the RTU does reasonability checks on the data received from the clock.

The clock data is rejected for any of the following reasons:

1. Total of 26 bytes not received from clock
2. 1st byte not <CR>
3. 2nd byte not <LF>
4. Time Quality Indicator not ' ' or '?'

5. 4th byte not ' '
6. Year digits not in range of 00 through 99
7. 7th byte not ' '
8. Day digits not in the range of 001 through 365 for normal year or 001 through 366 for leap year
9. 11th byte not ' '
10. Hour digits not in the range of 00 to 23
11. 14th byte not ':'
12. Minute digits not in the range of 00 to 59
13. 17th byte not ':'
14. Second digits not in the range of 00 to 59
15. 20th byte not '.'
16. Milliseconds digits not "000"
17. 24th, 25th or 26th byte not ' '

Since the year field is only two digits, any year received from the clock that is 70 or greater is assumed to be in the 20th century (19XX).

Any year received that is 70 or less is assumed to be in the 21st century (20XX).

If the RTU does not receive a valid time message from the Arbiter, the RTU will transmit a "B5" ASCII message to the clock in an attempt to cause the clock to change its time message to the correct format for the RTU firmware to interpret.

The Arbiter sends the time to the RTU every second; the Arbiter driver uses every tenth time sample to set the system time.

8 Electran

The Config@WEB RTU is programmed to accept data in burst mode from one or more Electran units.

The Electran is a substation metering device that accepts metered analog inputs, performs A/D conversion of these inputs, mathematically processes them, and outputs them in digital form as pseudo-analog and pseudo-accumulator quantities.

8.1 Burst Mode Data Transmission

The user can configure the RTU to operate with one or more Electran units. The meter data is stored in the RTU internal database for transmission to the master station.

Data communication with the RTU is at 4800 bps asynchronous. Analog points and accumulator points are transmitted in burst mode, with an updated data burst transmitted every three seconds.

Each analog data point uses a 3-byte packet as follows:

Bit #	7	6	5	4	3	2	1	0
1st byte	0	point # 0 - 127						
2nd byte	1	1	MS 6 Data Bits					
3rd byte	1	1	LS 6 Data Bits					

Bit 6 of the first byte allocates RTU space for 64 or 128 analogs (0=64).

Each accumulator data point uses a 3 byte packet as follows:

Bit #	7	6	5	4	3	2	1	0
1st byte	1	0	0	point # 0 - 31				
2nd byte	1	1	MS 6 Data Bits					
3rd byte	1	1	LS 6 Data Bits					

Bit 4 of the first byte allocates RTU space for 16 or 32 analogs (0=16).

Binary	**Sign**	**Analog**
111111111111	+	Full Scale Positive
100000000001	+	1/2048 Full Scale Positive
100000000000	0	Zero
011111111111	-	1/2048 Full Scale Negative
000000000000	-	Full Scale Negative

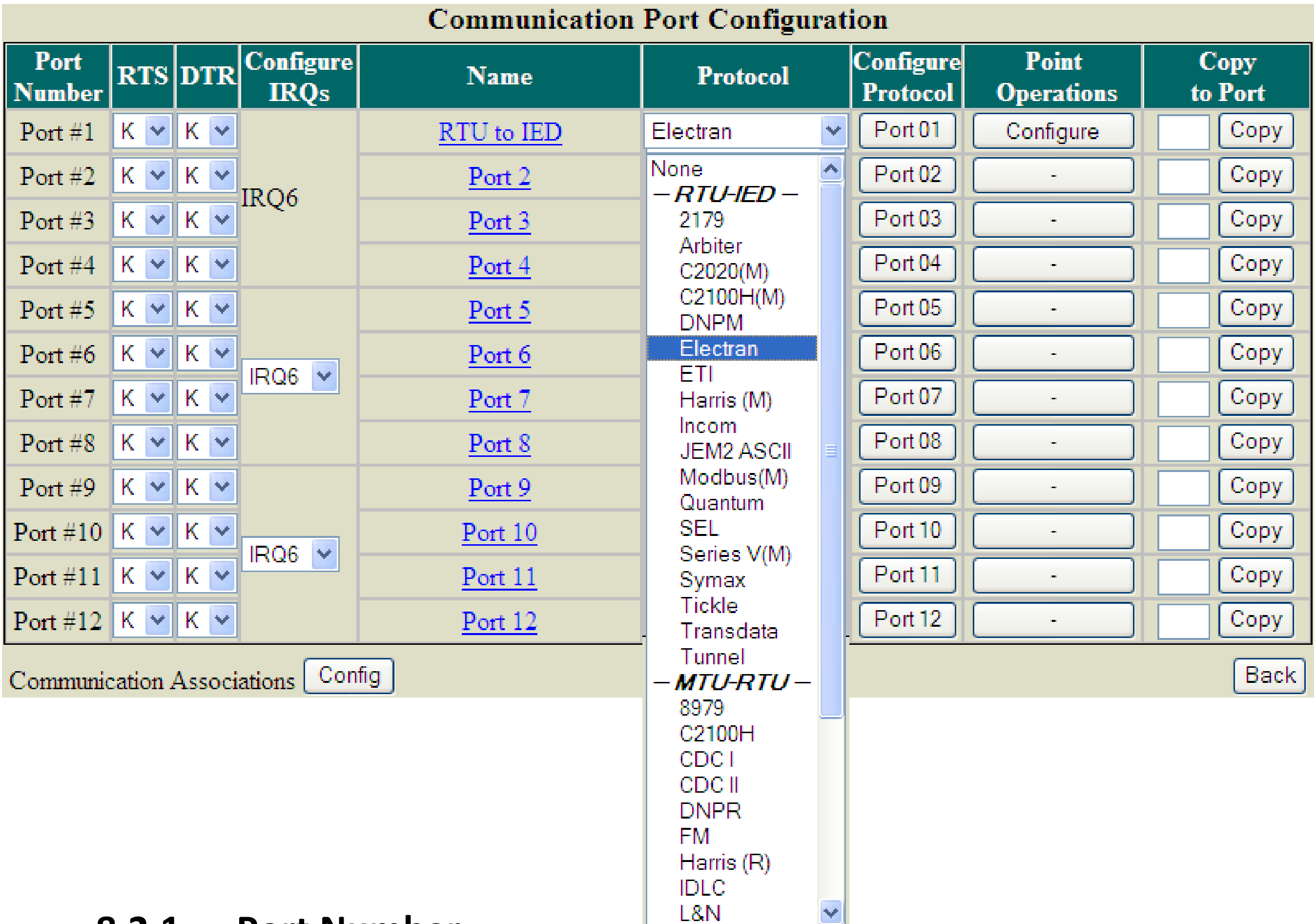
Where one channel with 128 pseudo-analogs and 32 pseudo-accumulators is used, one bit in the first of the three data bytes for each pseudo data point will be set for pseudo analog points 64 through 127 and pseudo accumulator points 17 through 31.

The Electran accumulator count continually cycles and has a rollover of FFE (Hex). The RTU increments its accumulator count by a delta amount equal to the present value received from the Electran minus the previous value. If loss of power causes the RTU to reinitialize, the Electran will send a value of FFF (Hex) to the RTU for a period of 10-15 seconds. This will reset the RTU accumulator reference to zero, thereby resynchronizing the RTU accumulators.

8.2 Communication Port Configuration

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Electran from the Protocol drop-down menu as shown.

Figure 8-1 Communication Port Configuration



8.2.1 Port Number

Physical Port number of the RTU.

8.2.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

8.2.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

8.2.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power

RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

8.2.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

8.2.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.

8.2.4 Protocol

From the drop-down list, select the protocol for this port.

8.2.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

8.2.6 Point Operations

Click this button to assign points.

8.2.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

8.2.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

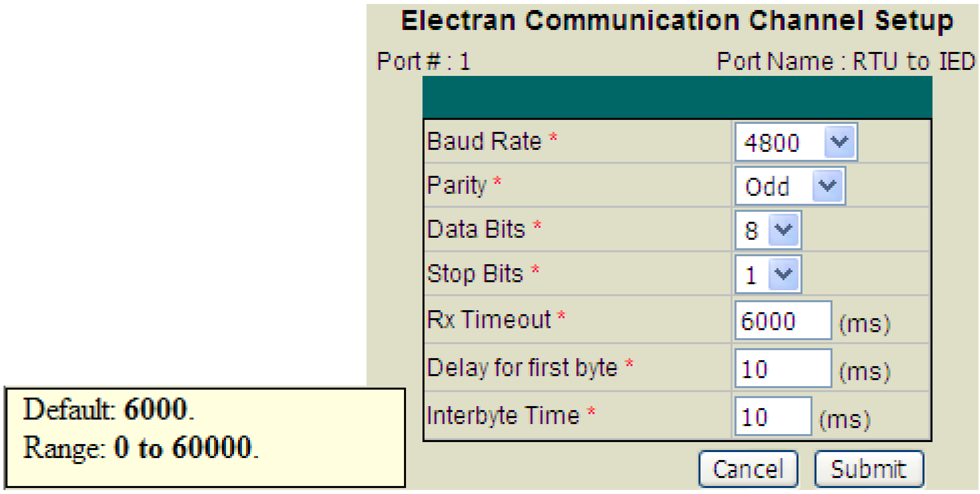
Navigation

Click the Back button to return to the previous screen.

8.3 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the Electran port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 8-2 Electran Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Rx Timeout.

8.3.1 Baud Rate (300 – 19200)

From the drop-down menu, select the baud rate. The default setting is 4800.

8.3.2 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is Odd.

8.3.3 Data Bits (5,6,7,8)

Enter the data bits for the associated channel. The default setting is 8.

8.3.4 Stop Bits (0,1,2)

Enter the stop bits for the associated channel. The default setting is 1.

8.3.5 Rx Timeout (0 – 60,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 6000.

8.3.6 Delay for First Byte (1ms) (0 to 60,000)

Enter the delay time for the associated channel. This is the time allowed for a Slave Device to begin its response before the MTU assumes it is not going to reply and moves on to the next device. This parameter is typically set long because of delays in IED response. Valid entries are in the range of 0-60,000 ms. The default setting is 10 ms.

Note: This timer must be <u>less</u> than Rx Timeout (above).

8.3.7 Interbyte time (0 – 250ms)

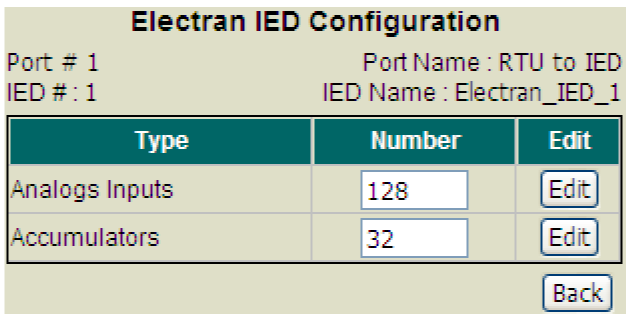
Enter the interbyte time for the associated channel. The interbyte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 10 msec.

Please note: No configuration changes take effect until the RTU is reset.

8.4 Point Operations

From the Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear.

Figure 8-3 Electran IED Configuration



8.4.1 Type

The type of point.

8.4.2 Number

8.4.2.1 Analog Inputs (0 – 128)

Enter the number of Analog points.

8.4.2.2 Accumulators (0 – 32)

Enter the number of Accumulators points.

8.4.3 Edit

Click the Edit button to edit points.

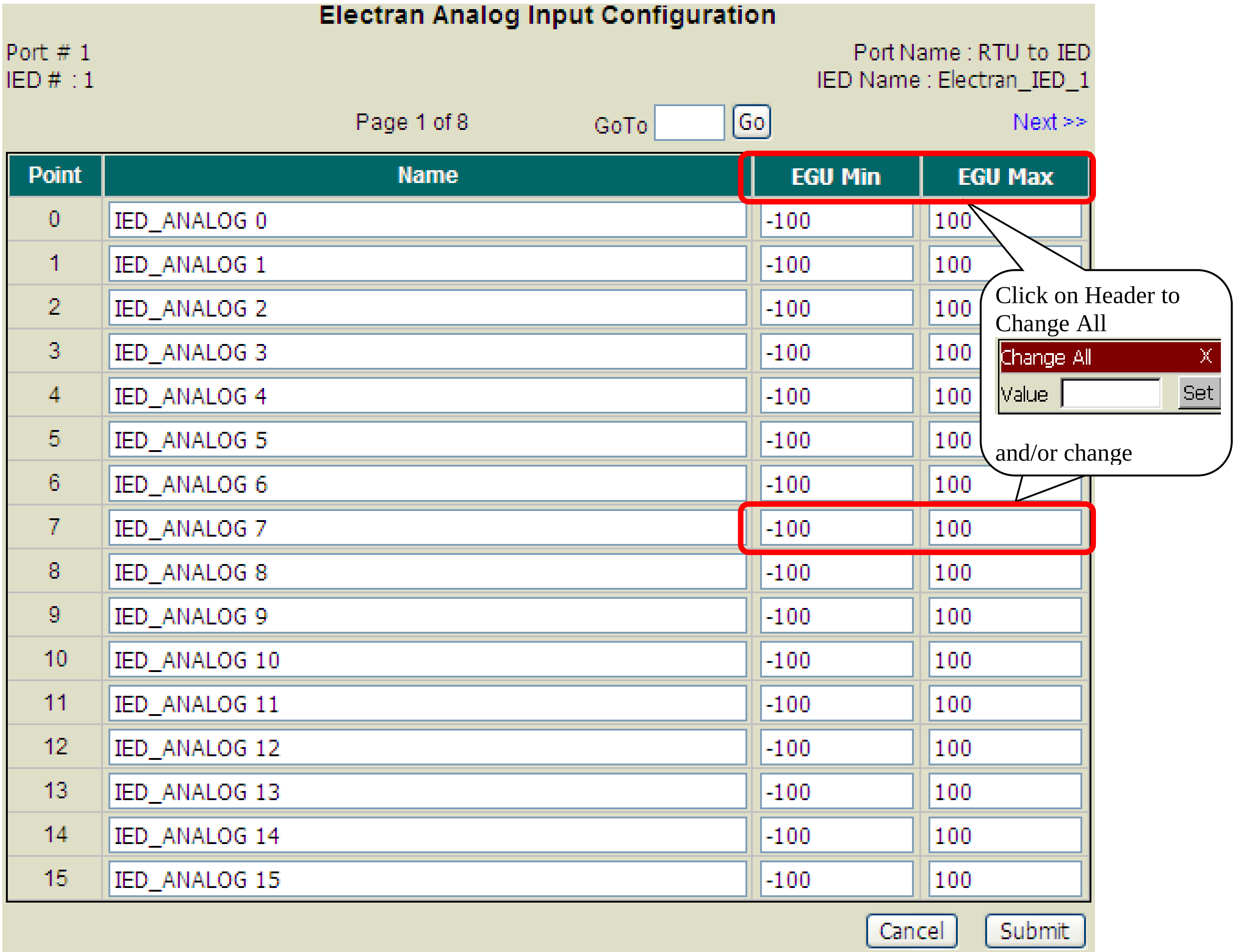
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

8.4.4 Electran Analog Input Configuration

From the Electran IED Configuration screen, click on Edit for Analogs. A screen similar to Figure 2-13 will appear.

Figure 8-4 Electran Analog Input Configuration



8.4.5 Point

Protocol logical point number. This number cannot be changed.

8.4.6 Name

Enter the name of the point (or accept the default name).

8.4.7 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

8.4.8 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

Navigation

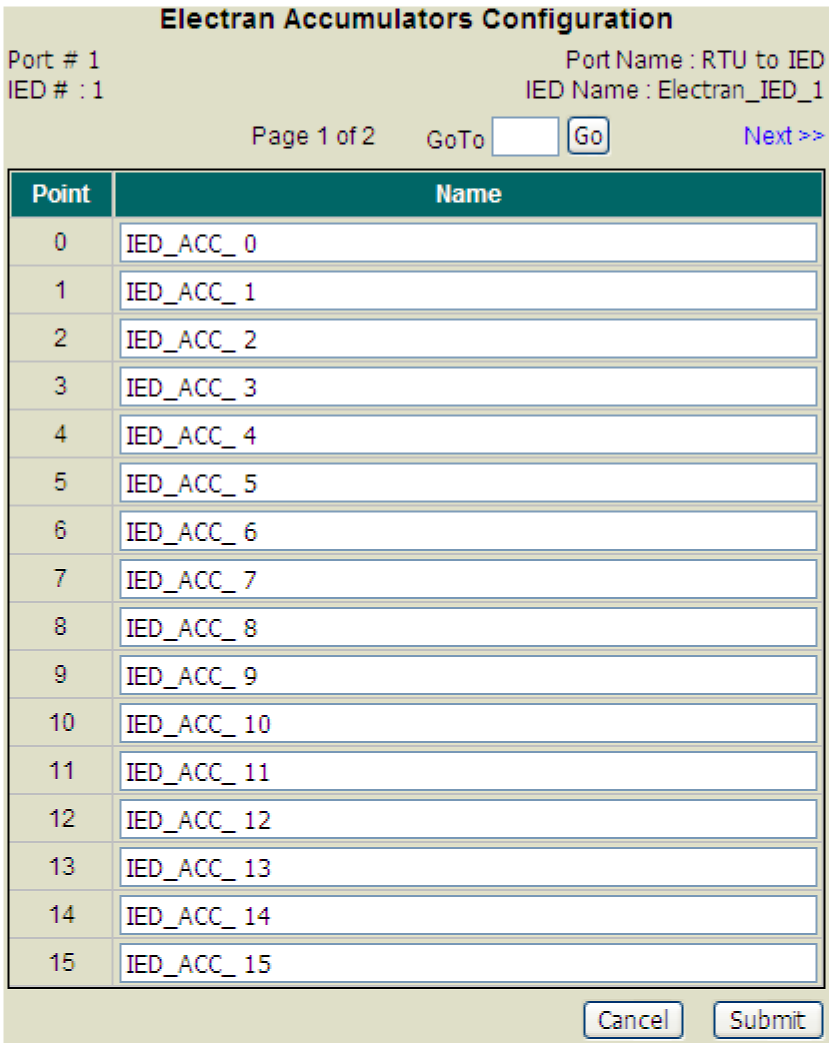
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

8.4.9 Electran Accumulators Configuration

From the Electran IED Configuration screen, click on Edit for Accumulators. A screen similar to Figure 8-5 will appear.

Figure 8-5 Electran Accumulators Configuration



8.4.10 Point

Protocol logical point number. This number cannot be changed.

8.4.11 Name

Enter the name of the point (or accept the default name).

Navigation

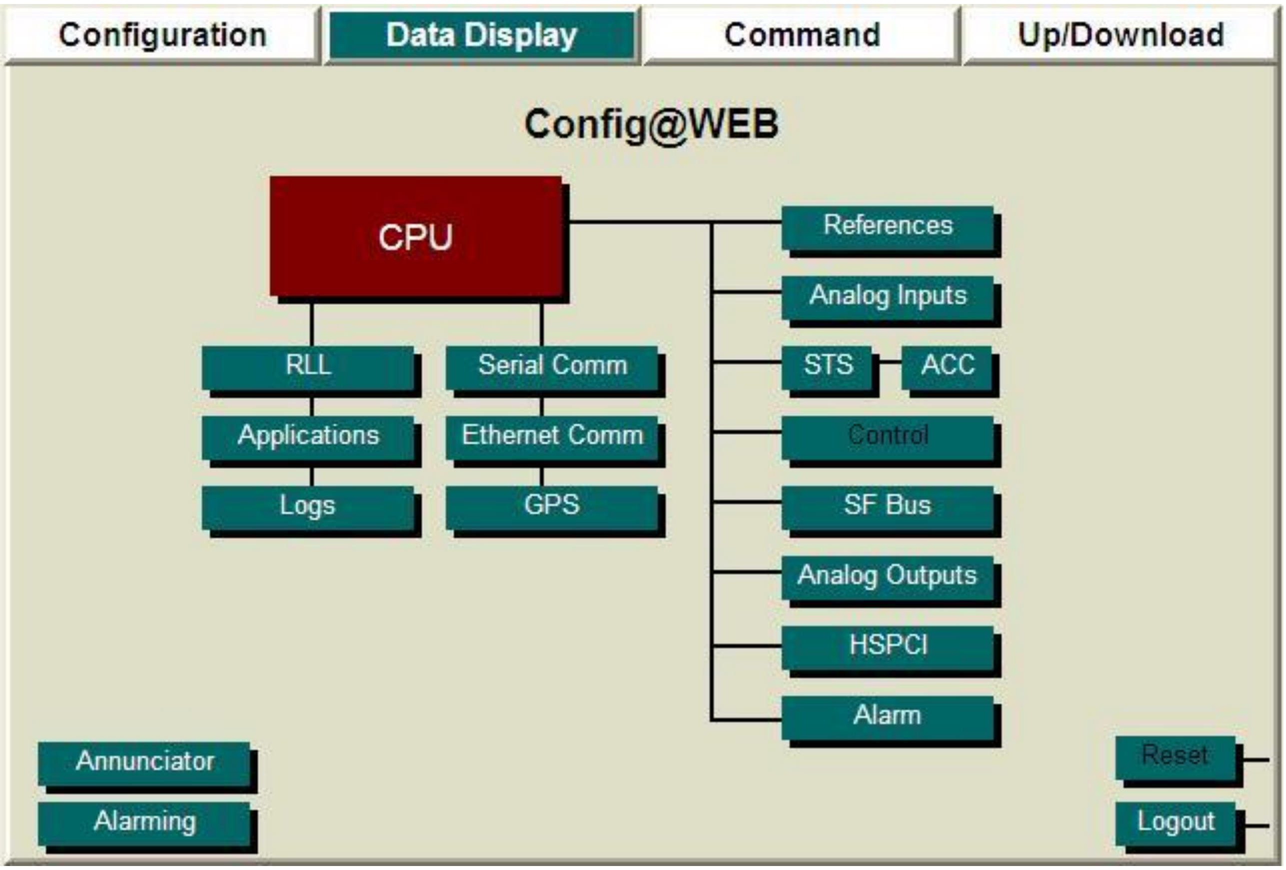
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

8.5 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 8-6 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 8-7 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	RTU to IED	Electran	View	Port Data
Port #2	K	K	Port 2	None	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

8.5.1 Port Number

Physical Port number of the RTU.

8.5.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

8.5.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

8.5.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

8.5.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

8.5.3 Name

The port name given during configuration or default name accepted.

8.5.4 Protocol

The configured protocol for this port.

8.5.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

8.5.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

8.5.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

8.5.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 8-8 Electran Communication Counters Display

8.5.9 Point

A logical point number for reference only.

8.5.10 Counter Name

The following counters are monitored:

8.5.10.1 Messages Received

This indicates the cumulative number of valid received messages since the last reset or power-up.

8.5.10.2 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

8.5.10.3 B4 Timeouts

This indicates the cumulative number of B4 Timer Violations. This count can be affected by the setting of the Delay for first byte in configuration.

8.5.10.4 IB Timer Errors

This indicates the cumulative number of IB Timer errors since the last reset or power-up.. This count can be affected by the setting of the Interbyte Time in configuration.

8.5.10.5 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

8.5.10.6 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

8.5.10.7 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

8.5.11 Counts

The counts for each type of Counter.

8.5.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

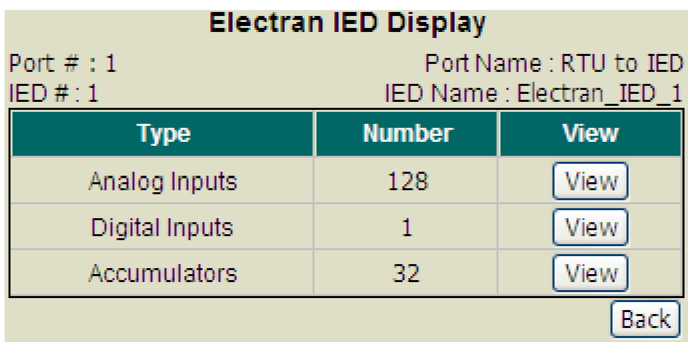
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

8.5.13 Electran IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 8-9 Electran IED Display



8.5.14 Type

The type of point.

8.5.15 Number

The number of points of each type configured for this logical RTU.

8.5.16 View

Click the View button to view points.

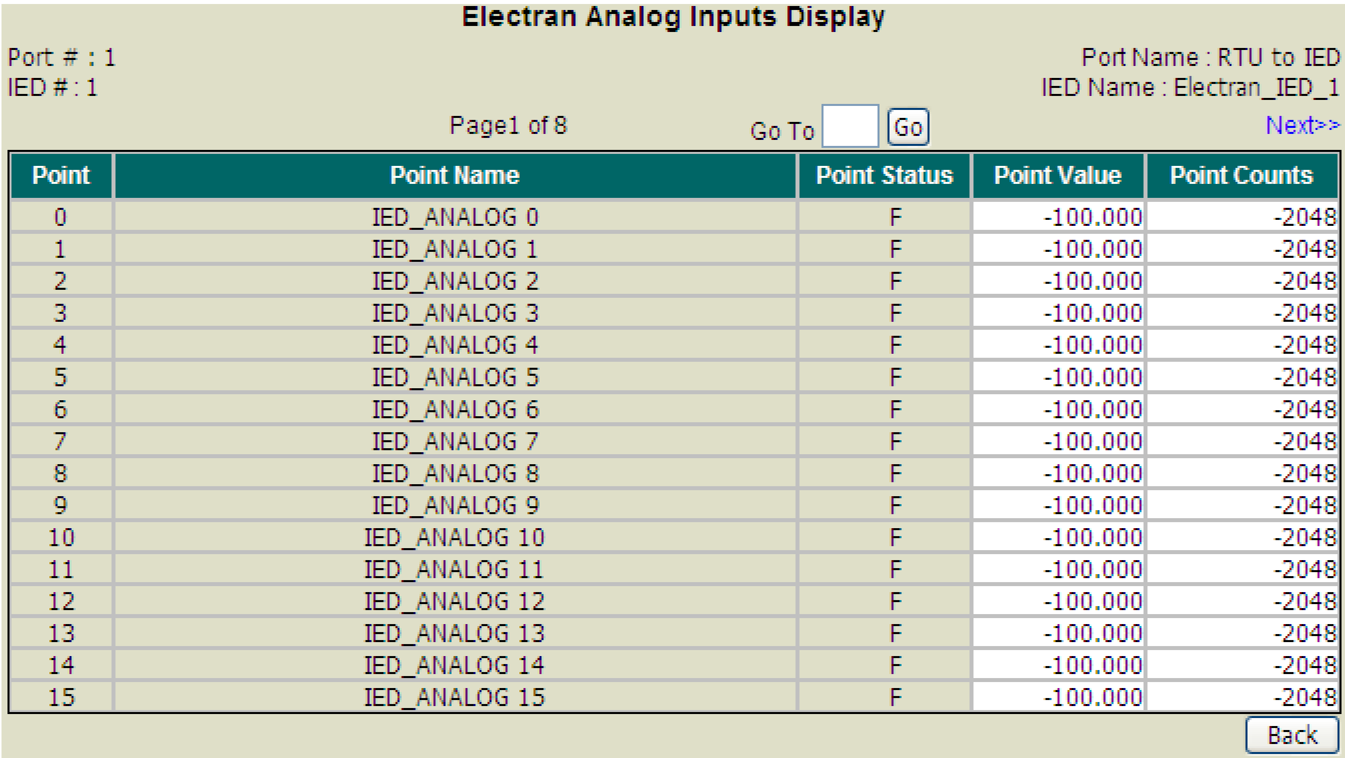
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

8.5.16.1 Analog Inputs

From the Electran IED Configuration screen, click View for Analog Inputs. Reference the screen shown in Figure 5-11.

Figure 8-10 Electran Analog Inputs Display



Electran Analog Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : Electran_IED_1

Page1 of 8 Go To Go Next>>

Point	Point Name	Point Status	Point Value	Point Counts
0	IED_ANALOG 0	F	-100.000	-2048
1	IED_ANALOG 1	F	-100.000	-2048
2	IED_ANALOG 2	F	-100.000	-2048
3	IED_ANALOG 3	F	-100.000	-2048
4	IED_ANALOG 4	F	-100.000	-2048
5	IED_ANALOG 5	F	-100.000	-2048
6	IED_ANALOG 6	F	-100.000	-2048
7	IED_ANALOG 7	F	-100.000	-2048
8	IED_ANALOG 8	F	-100.000	-2048
9	IED_ANALOG 9	F	-100.000	-2048
10	IED_ANALOG 10	F	-100.000	-2048
11	IED_ANALOG 11	F	-100.000	-2048
12	IED_ANALOG 12	F	-100.000	-2048
13	IED_ANALOG 13	F	-100.000	-2048
14	IED_ANALOG 14	F	-100.000	-2048
15	IED_ANALOG 15	F	-100.000	-2048

Back

8.5.17 Point

The logical number of the point.

8.5.18 Point Name

The point name.

8.5.19 Point State

Please see the Config@WEB Secure Software Users Guide.

8.5.20 Point Value

The engineering unit (EGU) value being calculated by the RTU based on the settings of the EGU min, EGU max, and the current binary value being returned by the meter.

8.5.21 Point Counts

The binary counts being returned from the meter for each point.

Navigation

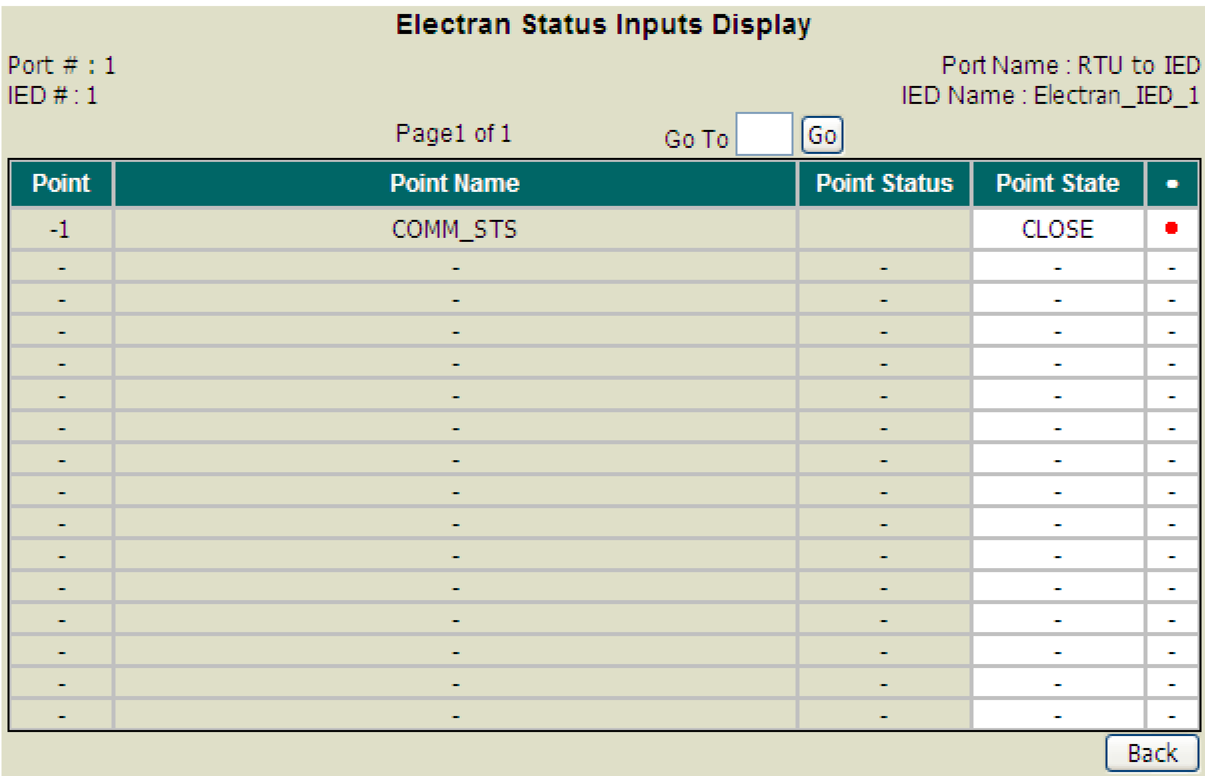
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

8.5.21.1 Digital Inputs

From the Electran IED Configuration screen, click View for Digital Inputs. Reference the screen shown in Figure 8-11.

Note: The only Digital Input point available is the COMM_STS.

Figure 8-11 Electran Digital Inputs Display



8.5.22 Point

The logical number of the point.

8.5.23 Point Name

The point name. The only Digital Input point available is the COMM_STS.

8.5.24 Point Status

Not applicable to Electran.

8.5.25 Point State

Indicates that point is either OPEN or CLOSED.

8.5.26 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Note: A CLOSED (red) point indicates that the comm. channel is failed. An OPEN (green) point indicates that the comm. channel is operational.

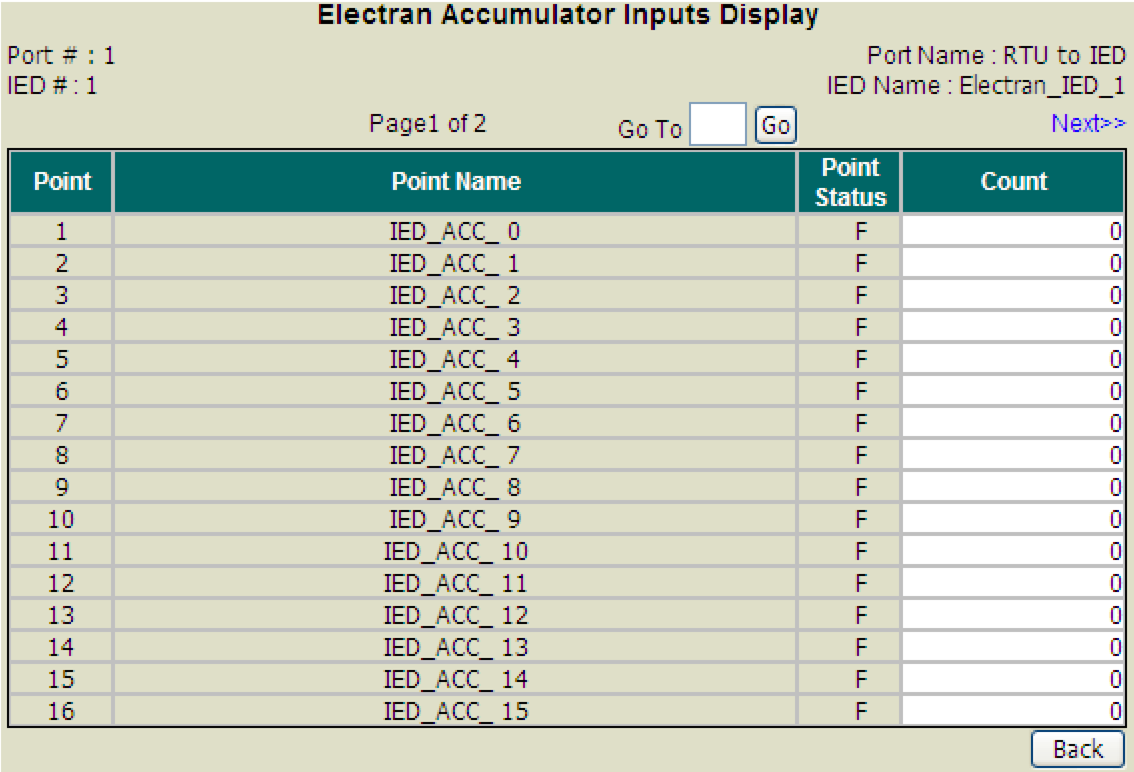
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

8.5.26.1 Accumulators

From the Electran IED Display screen, click View, then click Accumulators. Reference the screen shown below.

Figure 8-12 Electran Accumulators Inputs Display



Point	Point Name	Point Status	Count
1	IED_ACC_ 0	F	0
2	IED_ACC_ 1	F	0
3	IED_ACC_ 2	F	0
4	IED_ACC_ 3	F	0
5	IED_ACC_ 4	F	0
6	IED_ACC_ 5	F	0
7	IED_ACC_ 6	F	0
8	IED_ACC_ 7	F	0
9	IED_ACC_ 8	F	0
10	IED_ACC_ 9	F	0
11	IED_ACC_ 10	F	0
12	IED_ACC_ 11	F	0
13	IED_ACC_ 12	F	0
14	IED_ACC_ 13	F	0
15	IED_ACC_ 14	F	0
16	IED_ACC_ 15	F	0

8.5.27 Point

Protocol logical point number.

8.5.28 Point Name

The point name.

8.5.29 Point State

Please see the Config@WEB Secure Software Users Guide.

8.5.30 Count

The counts from the IED.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

9 SEL

9.1 Special Features

The SEL protocol communicates between the RTU and a SEL relay controller. The SEL interface allows for fast meter, fast target, and fast operate communications between the RTU and the SEL relay controller.

The RTU can be configured to poll one or more SEL controllers using SEL protocol. Each SEL controller requires its own physical connection to the RTU via a communications port because this type of SEL interface cannot be party-lined. Most of the newer SEL relays support the DNP protocol, which can be party-lined. However, DNP does not support the port tunneling function most relay personnel are interested in (see below).

9.1.1 Auto Configuration

The Auto Configuration feature saves time. When you click on AUTO_CONFIG, the RTU interrogates the newer-style relay controllers for their configuration, including point names, and populates the RTU's database. Once the SEL device's configuration is uploaded to the RTU, it is a simple drag-and-drop task to map the points of interest to the protocols or applications within the RTU.

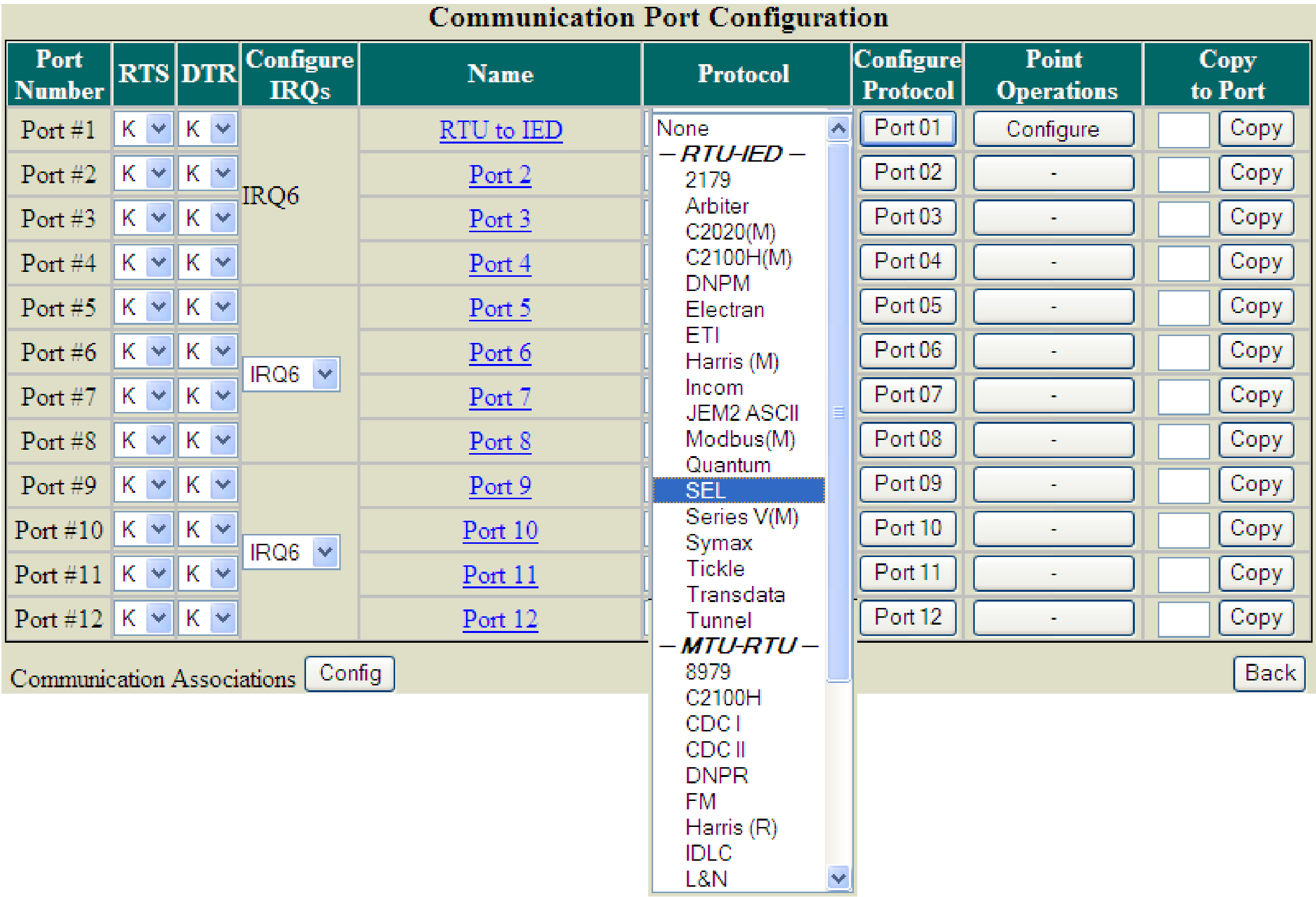
9.1.2 Tunnel Function

In addition to fast messaging, this interface allows you to tunnel directly through the RTU to a SEL port. You can use terminal messages to change relay configuration, check on relay health, and to get relay reports and files not normally associated with SCADA data. This tunneling function is independent of polling. That means you may query the SEL controller while the RTU performs its normal polling operations.

9.2 Communication Port Configuration

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click SEL from the Protocol drop-down menu as shown.

Figure 9-1 Communication Port Configuration



Port Number

Physical Port number of the RTU.

RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

> **Note:** This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

9.2.1.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

9.2.1.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

9.2.1.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

Name

Click on the "blue" name (see below) and rename the port, or accept the default name.

Protocol

From the drop-down list, select the protocol for this port.

Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

Point Operations

Click this button to assign points.

Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

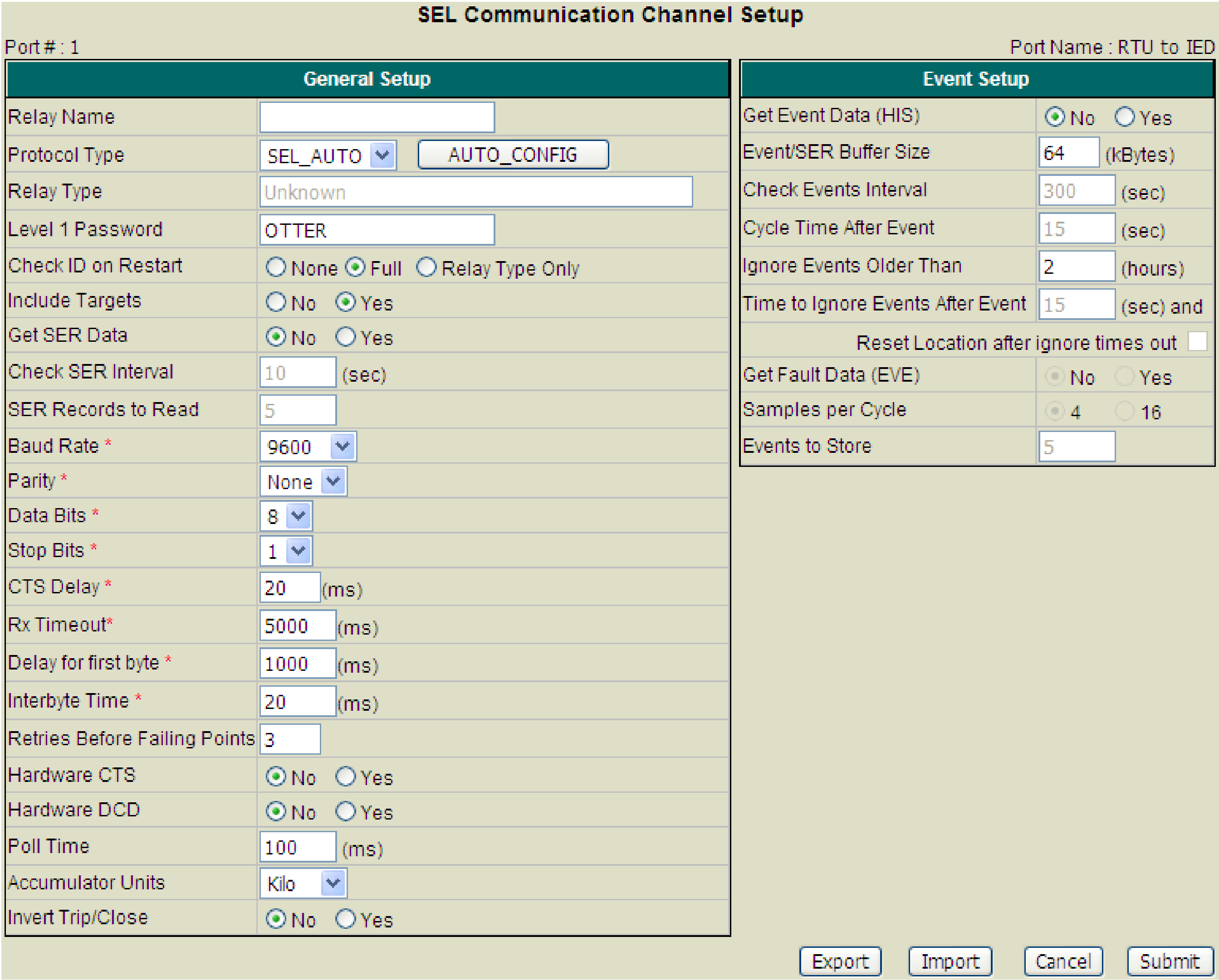
Navigation

Click the Back button to return to the previous screen.

9.3 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the SEL port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 9-2 SEL Communication Channel Configuration



Auto Configuration is a special feature explained in the next section.

Note: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

9.3.1 AUTO_CONFIG

For the AUTO_CONFIG to work, the SEL task must be running in the RTU. This means you must select "SEL" as a protocol, reset the RTU, then perform the AUTO_CONFIG steps. Follow the **Notes** steps to ensure proper functioning.

Notes:

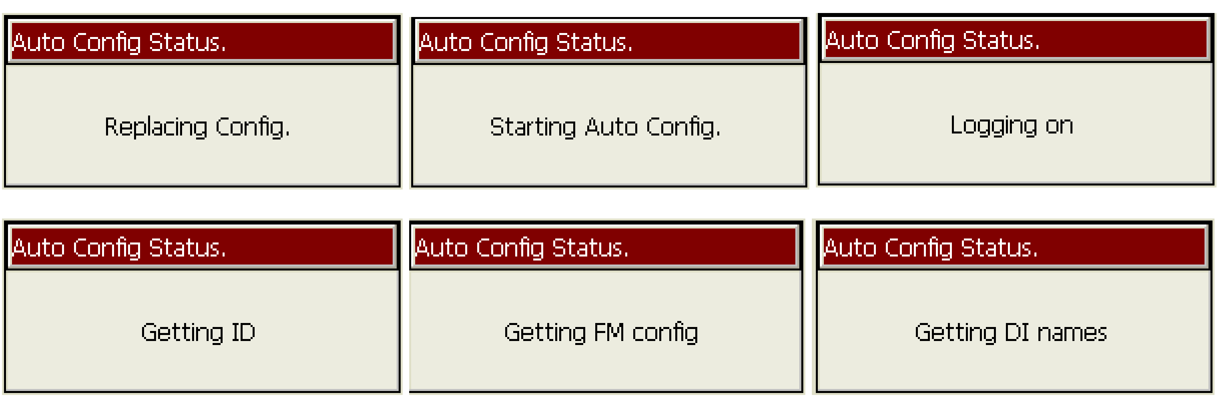
1) Select SEL for the protocol on the port of choice.
2) Set the communications parameters correctly (baud rate, etc.) for the particular SEL device.
3) Select "SEL_AUTO" for "Protocol Type" field beside the AUTO_CONFIG button.
4) Enter the correct Level1 Password for the SEL device.
5) Reboot the RTU. This allows the SEL task to start running.
6) Run AUTO_CONFIG as detailed below.
7) Select the data points to be stored in the RTU database.
8) Reboot the RTU. This allows the RTU to start scanning the IED for its configured I/O points.

9.3.1.1 Detailed Procedure

Note: If event data or Sequence of Events Report (SER) data are required, set the appropriate checkboxes, click "Submit" and return to the configuration page before clicking on AUTO_CONFIG. The RTU needs to send additional commands to the relay to acquire data on these inputs.

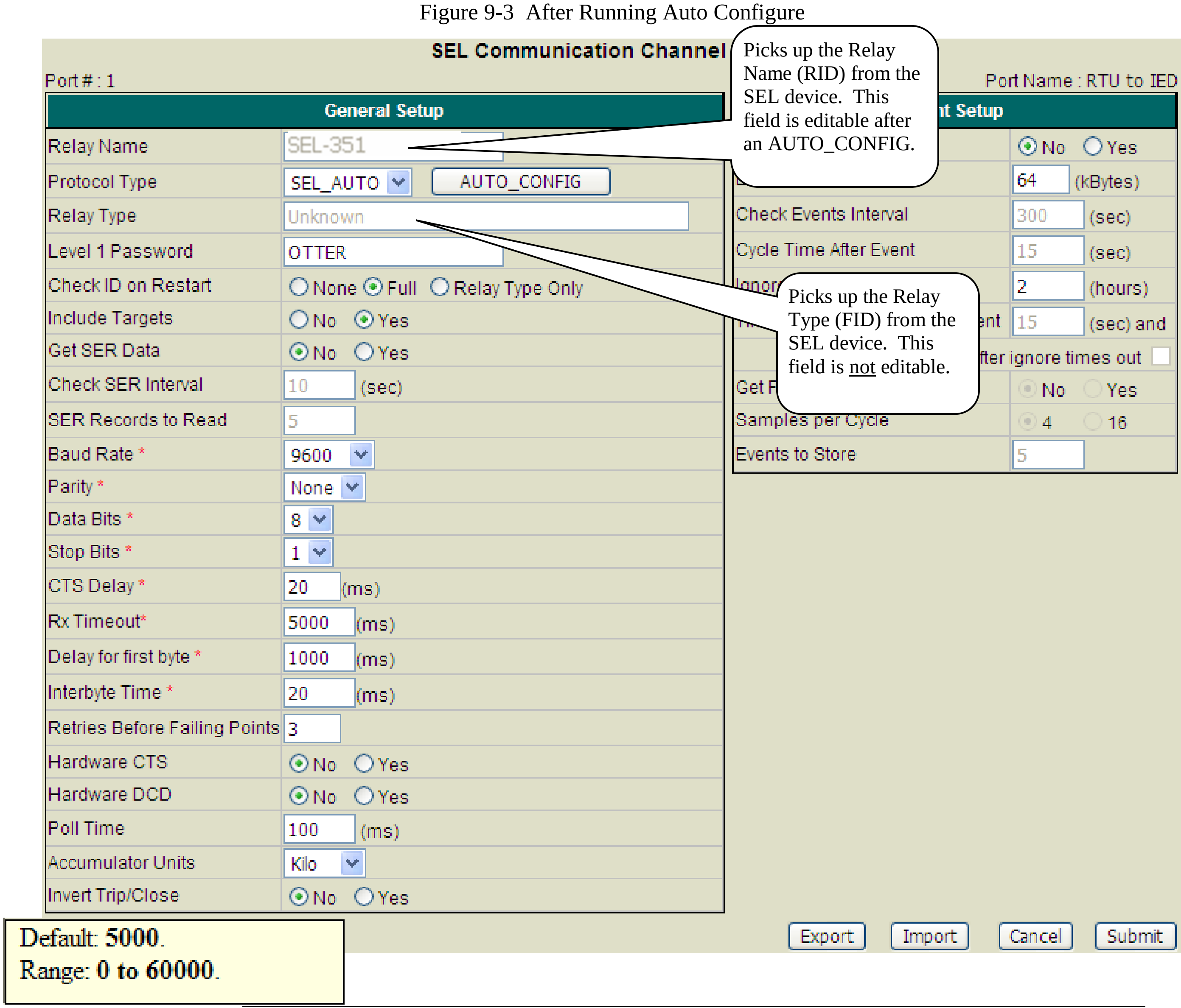
When you select SEL_AUTO as the Protocol Type, then click the AUTO_CONFIG button, the RTU queries the SEL device's database, then brings those points, including point names, back to the RTU. The process is shown in the series of Figures below.

Click OK in response to the above dialog box. You will get a sequence of messages on the progress of AUTO_CONFIG, as shown below. The final message should be "Auto Config completed successfully", as shown.



The end result of a successful Auto Config is shown in Figure 9-3. Notice the comments. Also shown is the result of clicking "Get Event Data." If Auto Config fails, Table 9-1 shows the meaning of failure messages.

Figure 9-3 After Running Auto Configure



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Rx Timeout.

If the auto configuration process detects an error, one of the following failure messages may be displayed.

Table 9-1 SEL Auto Config Failure Messages

Message	Meaning
Failed to log in	Unable to obtain Level 1 access to the relay. This most often occurs either because the baud rate or the password was incorrect.
Failed to get ID	Did not get a recognizable response to either the ID command or the SHOWSET command
Failed getting FM config	Unable to read the Fast Meter configuration message A5C1*
Failed to read BNA	Unable to read the binary names via the BNA command.
Failed to read DNA	Unable to read digital point names via the DNA command.
Failed Fast Operate cfg	Unable to read the Fast Operate configuration message A5CE*
Failed - no memory.	Unable to obtain temporary memory space in the RTU.
Failed to open IED file	Could not open the SEL IED configuration file iedspr.xml
Failed open template file	Could not open the protocol template configuration file ptemp.xml
Failed updating ANA tags	An error occurred wile updating the configuration file for SEL analog points.
Failed reading CAS	Could not read or parse the compressed ASCII (CAS) response needed for processing event data.
Failed reading HIS	Could not read or parse the uncompressed event history (HIS) response.
Failed reading CEV	Could not read or parse the compressed event (CEV) segment of the CAS response needed to process full (CEV) event reports.
Failed updating STS tags	An error occurred while updating the SEL status point configuration file.
Failed updating SBO tags	An error occurred wile updating the control output configuration file.
Failed to open port file	Could not open the port file (portxx.xml) for update.
Failed to update config	An error occurred in updating the IED configuration file iedspr.xml
Finished -- failed	Auto configururation failed for an unknown reason.

* Refer to SEL Application Guide AG95-10 for the formats of the auto configuration messages.

Relay Name

Type in the name of the relay. AUTO_CONFIG will pick up the name from the SEL (RID), but it will still be editable.

Protocol Type

Select a protocol type from the drop-down menu. The choices are as follows:

9.3.1.2 SEL_AUTO and AUTO_CONFIG

Select “SEL_AUTO” to perform auto configuration and follow steps above. This works with newer relays (300 and above). The AUTO_CONFIG button is not valid for any other “protocol types”. SEL_AUTO is the default.

9.3.1.3 X51

Select X51 for protocol type if the relay is a SEL 151 or 251. The RTU will automatically default to an appropriate configuration for this type of relay.

9.3.1.4 X21

Select X21 for protocol type if the relay is a SEL 121 or 221. The RTU will automatically default to an appropriate configuration for this type of relay.

9.3.1.5 XPG10

Select XPG10 for protocol type if the relay is a SEL 1PG10 or 2PG10. The RTU will automatically default to an appropriate configuration for this type of relay.

9.3.1.6 X21F

Select X21F for protocol type if the relay is a SEL 121F or 221F. The RTU will automatically default to an appropriate configuration for this type of relay.

Note: Some versions of X21F firmware may not work unless “Include Targets” is set to “No”.

9.3.1.7 X51C

Select X51C for protocol type if the relay is a SEL 151C or 251C. The RTU will automatically default to an appropriate configuration for this type of relay.

9.3.1.8 251-2

Select 251-2 for protocol type if the relay is a SEL 251-2. The RTU will automatically default to an appropriate configuration for this type of relay.

9.3.1.9 279H

Select 279H for protocol type if the relay is a SEL 279H. The RTU will automatically default to an appropriate configuration for this type of relay.

9.3.1.10 NO DATA

The "NO DATA" protocol type is used to allow only the tunnel function to the relay. When in this mode, the RTU will log on to the relay and send "ID" commands to verify the state of the communications link and update the communications status point associated with the relay.

Relay Type

Enter the type of relay. The default is Unknown. If the protocol type is SEL Auto, this field will be grayed out and non editable. AUTO_CONFIG will pick up the type (FID) from the SEL device during auto configuration.

Level 1 Password

Enter the Level 1 Password for the connected SEL device. This is required for the auto-configuration function. The default is OTTER.

Check ID on Restart

Note: This field doesn’t apply for relays that can’t be auto configured.

9.3.1.11 None

No check that the relay is the same as that autoconfigured.

9.3.1.12 Full

Check the entire ID string to see that the relay connected is the same model and firmware version as that auto configured.

9.3.1.13 Relay Type Only

Check only that the relay is the same model as that auto configured.

Include Targets

Some 100- and 200- series relays do not return targets. For them, Include Targets must be set to No so the RTU will send the correct fast meter command.

Get SER Data (No, Yes)

Select Yes or No to SER Data. The default is No. (Note: SER means Sequence of Events Recorder.)

Check SER Interval (10 – 86400 sec)

Enter the time in seconds to check for SER data. The default is every 10 sec.

SER Records to Read (1 – 50)

Enter the number of SER records to read. The default is 5.

Baud Rate (300 – 19200)

From the drop-down menu, select the baud rate. The default setting is 9600.

Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is None.

Data Bits (5,6,7,8)

Enter the data bits for the associated channel. The default setting is 8.

Stop Bits (0,1,2)

Enter the stop bits for the associated channel. The default setting is 1.

CTS Delay (0 to 250ms)

Enter the clear-to-send delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. Valid entries are in the range of 0-250 msec. The default setting is 20.

Rx Timeout (0 – 60,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 500.

Delay for First Byte (0 to 60,000ms)

Enter the delay time for the associated channel. This is the time allowed for a Slave Device to begin its response before the RTU assumes it is not going to reply and moves on to the next device. This parameter is typically set long because of delays in IED response. Valid entries are in the range of 0-60,000 ms. The default setting is 50 ms.

Note: This timer must be less than Rx Timeout (above).

Interbyte time (0 – 30000ms)

Enter the interbyte time for the associated channel. The interbyte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 20 msec.

Please note: No configuration changes take effect until the RTU is reset.

Retries Before Failing Points(0 – 10)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

Hardware CTS (No, Yes)

Click the radio button for Yes if you want the Hardware Clear-To-Send option selected. When this option is selected, the IEDs will not be polled unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. If no hardware CTS signal is present, the port aborts the transmission and tries again. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. The default setting is No.

Hardware DCD (No, Yes)

Click the radio button for Yes if you want the Hardware DCD selected. When this option is selected, the channel communications driver will accept requested message data bytes only if the carrier is detected by the modem. If the carrier is not detected, the data bytes are discarded. The default setting is No.

Poll Time(50 – 10000)

Enter the time (in milliseconds) that the RTU will take to poll this IED. The default is 100.

Accumulator Units(Kilo, Mega)

Select the units for the accumulators. The default is Kilo.

Invert Trip/Close (No.Yes)

Allows the logic of Trip/Close to be inverted.

9.3.2 Event Setup

Get Event Data (HIS) (No/Yes)

Extract event summary data (event type, location, etc.) from the event history command (HIS or CHIS). When set to Yes, Analog and Status points are created at the end of the ANA's and STS's to bring back events as shown below. Please see "Note" below illustration.

Event Analog Points

SEL Analog Inputs Configuration

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : FEEDER 1
<< Previous Page 3 of 4 GoTo Go Next >>

Pnt	Name	EGU Min	EGU Max	Add Points to Database
33	VBAT	0	300	Yes No
34	HIS-MONTH	0	100	Yes No
35	HIS-DAY	0	100	Yes No
36	HIS-YEAR	0	100	Yes No
37	HIS-HOUR	0	100	Yes No
38	HIS-MIN	0	100	Yes No
39	HIS-SEC	0	100	Yes No
40	HIS-MSEC	0	100	Yes No
41	HIS-EVENT	0	1000	Yes No
42	HIS-LOCATION	0	100	Yes No
43	HIS-CURR	0	100	Yes No
44	HIS-FREQ	55	65	Yes No
45	HIS-GROUP	0	100	Yes No
46	HIS-SHOT	0	100	Yes No
47	EVE-FREQ	55	65	Yes No
48	EVE-SAM/CYC_A	0	100	Yes No

Cancel Submit

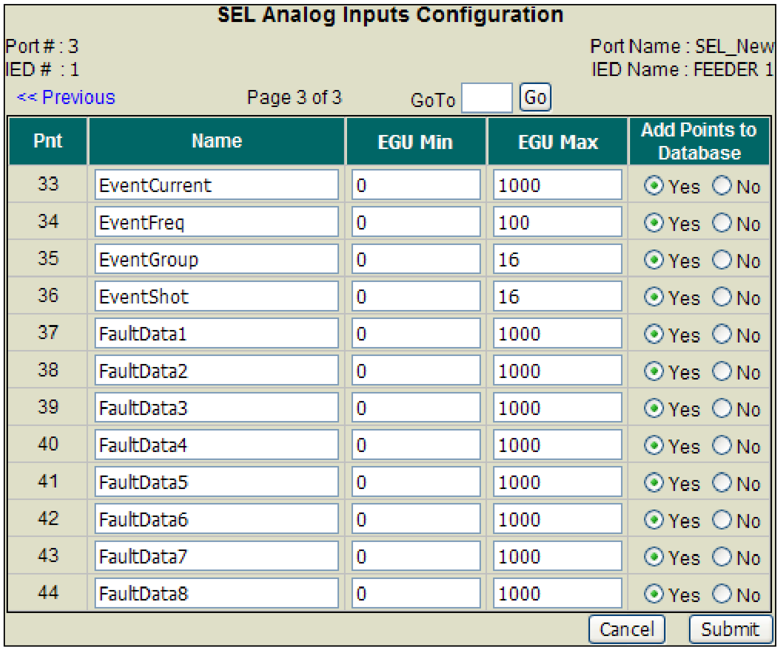
Event Status Points

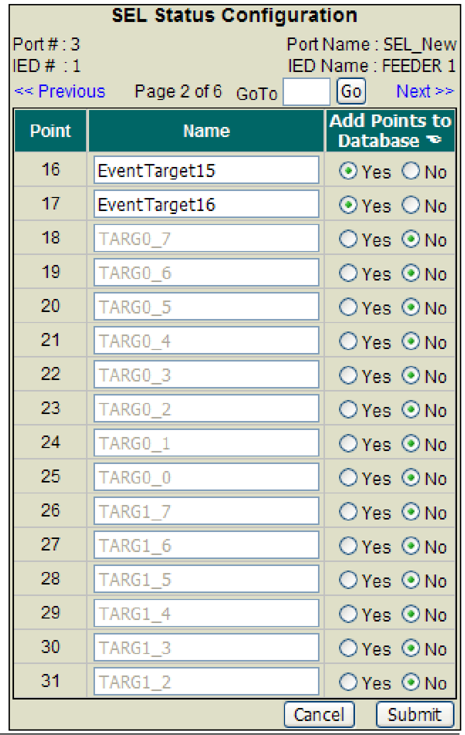
SEL Status Configuration

Port # : 3 Port Name : SEL_New
IED # : 1 IED Name : FEEDER 1
Page 1 of 6 GoTo Go Next >>

Point	Name	Add Points to Database
0	COMM_STS	
1	NewEvent	Yes No
2	EventTarget1	Yes No
3	EventTarget2	Yes No
4	EventTarget3	Yes No
5	EventTarget4	Yes No
6	EventTarget5	Yes No
7	EventTarget6	Yes No
8	EventTarget7	Yes No
9	EventTarget8	Yes No
10	EventTarget9	Yes No
11	EventTarget10	Yes No
12	EventTarget11	Yes No
13	EventTarget12	Yes No
14	EventTarget13	Yes No
15	EventTarget14	Yes No

Cancel Submit





Note 1: Points taken from the Event History are prefixed with “HIS-“ to distinguish them from similar data from other sources. Similarly, points taken from the Event Summary are prefixed with “EVE-“. These names may be edited if desired.

Note 2: You do not need to set “Get SER Data” to Yes for “Get Event Data (HIS)” to work properly.

Event/SER Buffer Size (8 – 128 kBytes)

Enter the kByte size to be used for Events. The default is 64 kBytes. (Note: SER means Sequence of Events Recorder.)

Check Events Interval (10 – 3600 sec)

Enter the interval in seconds in which to check for Events. The default is 300 sec.

Cycle Time After Event (0 – 60,000)

Enter the time in seconds for the RTU to listen for more Events after detecting a new one. The default is 15 seconds.

Ignore Events Older Than (-1 – 744 hours)

Enter the number of hours. This prevents old events from being reported again on restart. Enter -1 if all old event reports are desired. The default is 2 hours.

Time to Ignore Events After Event (0 – 60000 sec)

Enter the time in seconds to ignore events after the event of interest. The default is 15 sec.

Reset Location after ignore times out

If the fault location received from the relay needs to be set to zero after the "Time to Ignore Events After Event" (the initial event triggering the timer) expires, check this box. The time that the value is reset is approximate but will always be after the timer expires. The time that the location analog point is set to zero is affected by the communications timing with the relay. This function is enabled only if the "Time to Ignore Events After Event" is non zero.

Get Fault Data (EVE) (No/Yes)

Read the compressed event data (CEV) and extract data from the event summary line (per-phase currents, etc.).

> **Note:** The CEV command requires about one minute acquiring data, so use of this feature slows down data acquisition.

Samples per Cycle (4/16)

Choose either 4 samples per cycle or 16 samples per cycle.

Events to Store (0 – 30)

Enter the number of events you wish to store in Flash memory. The default is 10.

Xmit Events via FMS (No/Yes)

"Yes" allows Events to be returned through FMS. If the Feeder Monitor System (FMS) is configured either on a serial port or an Ethernet socket, the Feeder Monitor Master software can be used to upload event records to the PC on which the Feeder Monitor Master is running. This can be done either as a text copy of the event in the form returned by the compressed event (CEV) command to the relay, or in the form used by the FMS system. In FMS format, only the wave shape records of the three-phase currents and voltages are returned. SEL offers the option of getting four samples per cycle for 15 cycles or 16 samples per cycle for 16 cycles, as selected by the “Samples per Cycle” field above.

FMS Feeder No,

If "Yes" is selected to "Xmit Events via FMS", then you must select the appropriate Feeder Number to be used by the Feeder Monitor Master software. Note that if there are ACI boards configured for the RTU as well as SEL relays, the first feeder numbers are reserved for the ACI boards, and the “FMS Feeder No.” should be assigned to the next available records.

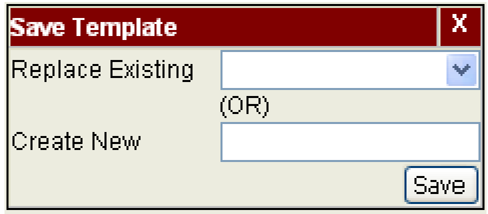
Event Data Format

If the “Xmit Events via FMS” option is selected, these options determine the format of the data to be returned. If SEL format is selected, the Feeder Monitor Master will store events in compressed event (CEV) format in a directory specified in the Feeder Monitor Master setup. If the FMS format is selected, the currents and voltages will be extracted from the event report as FMS wave shape records and sent to the Feeder Monitor Master in a format similar to that used for ACI data

Export

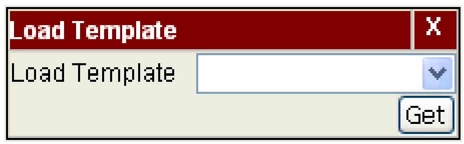
The Export function copies everything in the SEL configuration except the Name to an xml file. The Exp button exports a configuration in xml format from the SEL to the RTU as a template. The templates are protocol/IED specific. This template is stored in the RTU. When you choose Up/Download tab and click on “Get” (get files from RTU), you will transfer these templates to your PC.

Choose from one of the existing file types (if present), or create a new xml file type. Click Save after your selection.



Import

The Import button imports a configuration in xml format as shown below. Choose from one of the existing file types (if present) shown in the pull-down menu. If a new file type has been created under Export, that file type will also show up in the pull-down menu. When you set up another RTU, choose the Up/Download tab and click "Send" (send files to RTU), the template you save in the first RTU will be downloaded to the second RTU. Click Get after your selection below.



Navigation

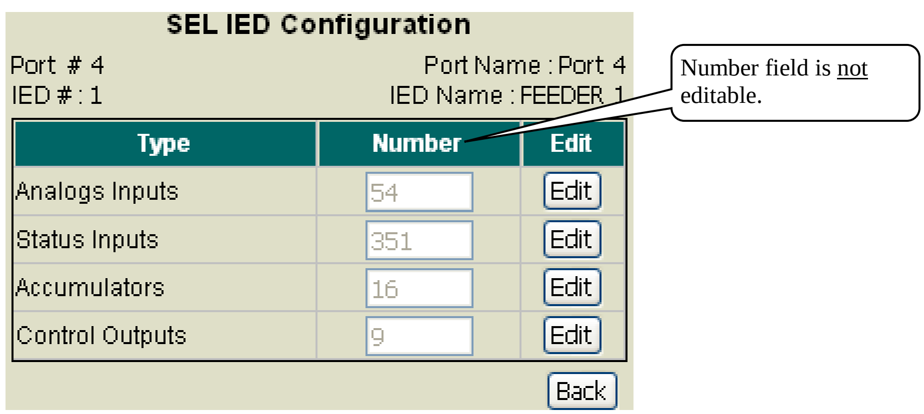
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

9.4 Point Operations

From the Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear.

Figure 9-4 SEL IED Configuration



Type

The type of point.

Number (This field is not editable)

Edit

Click the Edit button to edit points.

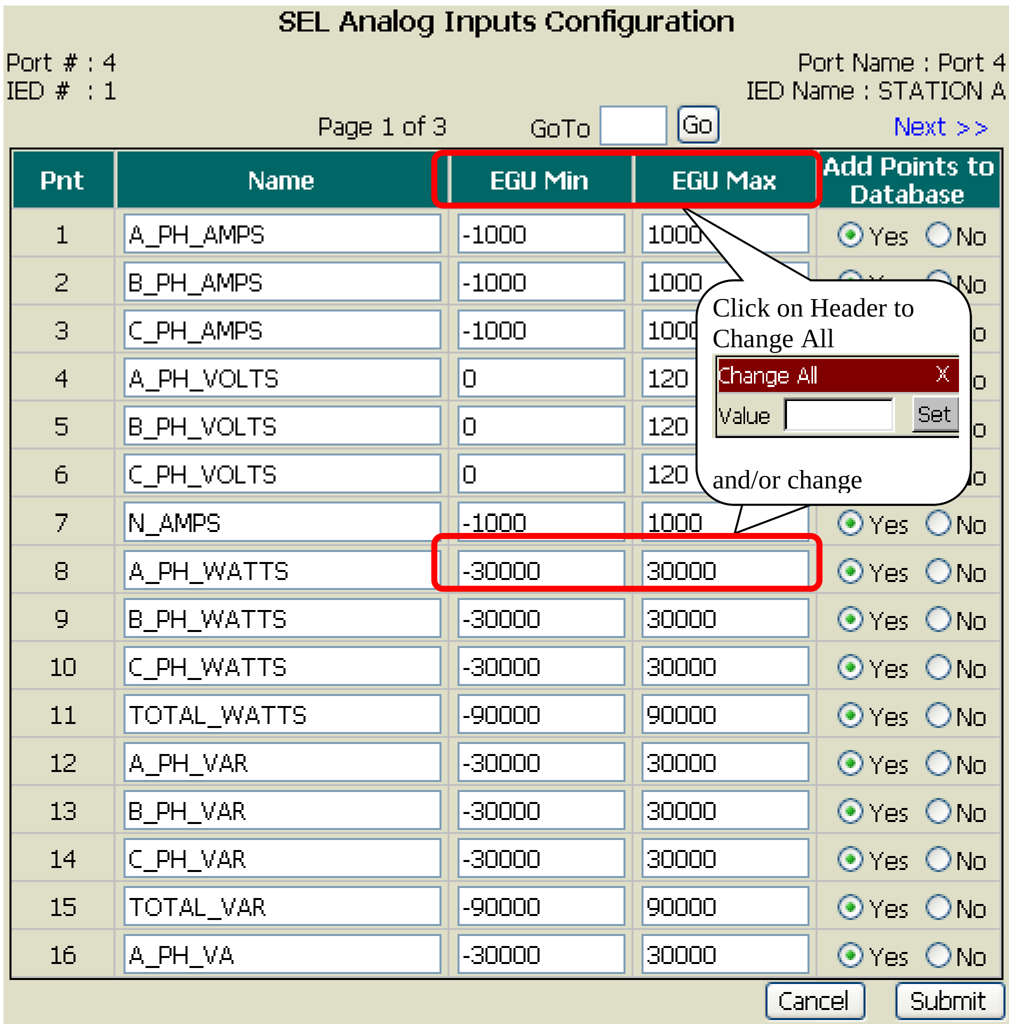
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

9.4.1 SEL Analog Input Configuration

From the SEL IED Configuration screen, click on Edit for Analogs. A screen similar to Figure 2-13 will appear.

Figure 9-5 SEL Analog Input Configuration



Pnt

Protocol logical point number. This number cannot be changed.

Name

Enter the name of the point (or accept the default name).

EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

Add Points to Database

Click "No" if you do not want a point added to the database. The default is Yes.

Navigation

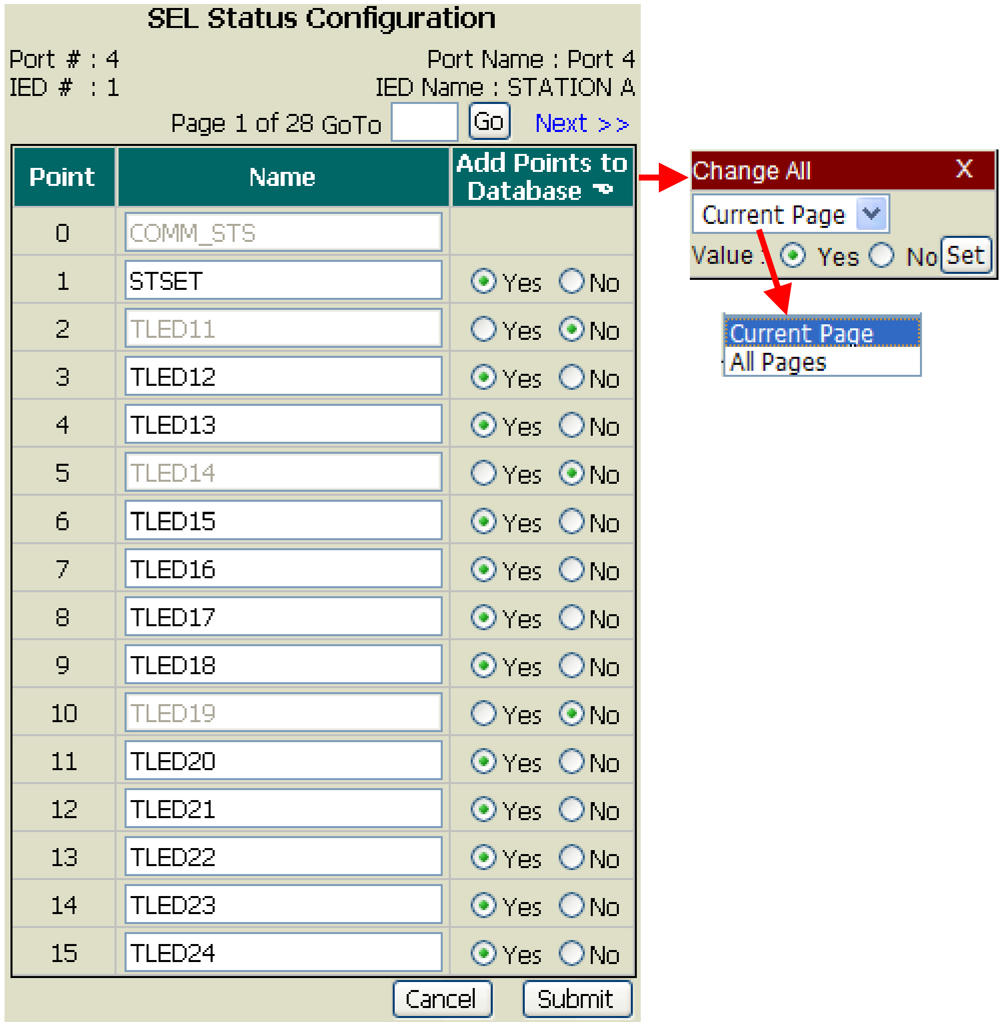
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

9.4.2 SEL Status Configuration

From the SEL IED Configuration screen, click on Edit for Status Inputs. A screen similar to Figure 8-5 will appear.

Figure 9-6 SEL Status Configuration



Point

Protocol logical point number. This number cannot be changed.

Name

Enter the name of the point (or accept the default name).

Add Points to Database

Click "Yes" if you want a point added to the database. By clicking on the header, all points displayed on this page may be turned ON or OFF with a single radio-button click. The default is No.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in

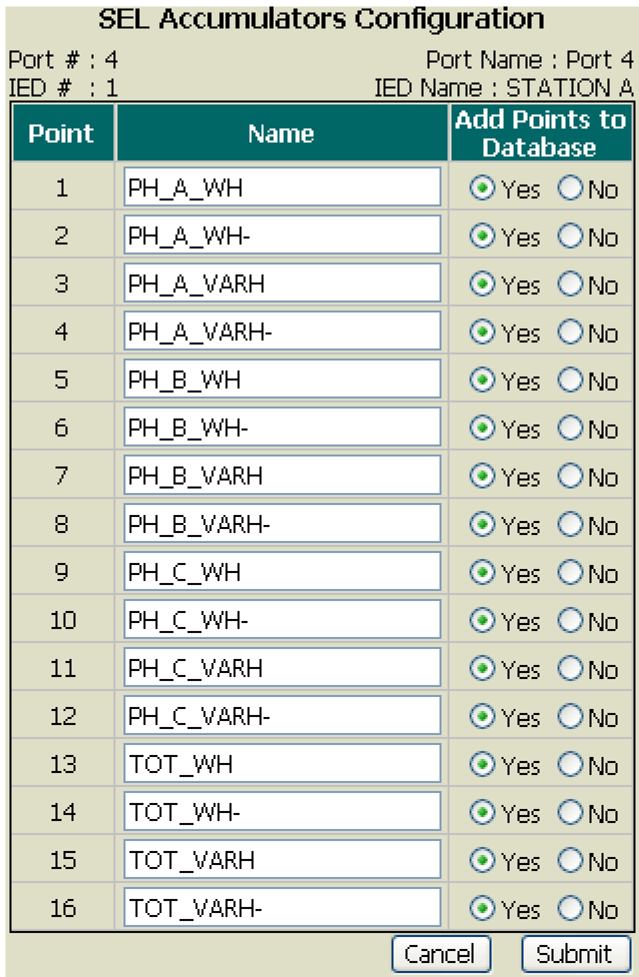
the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

9.4.3 SEL Accumulators Configuration

From the SEL IED Configuration screen, click on Edit for Accumulators Inputs. A screen similar to Figure 9-7 will appear.

Figure 9-7 SEL Accumulators Configuration



SEL Accumulators Configuration

Port # : 4 Port Name : Port 4
IED # : 1 IED Name : STATION A

Point	Name	Add Points to Database
1	PH_A_WH	Yes No
2	PH_A_WH-	Yes No
3	PH_A_VARH	Yes No
4	PH_A_VARH-	Yes No
5	PH_B_WH	Yes No
6	PH_B_WH-	Yes No
7	PH_B_VARH	Yes No
8	PH_B_VARH-	Yes No
9	PH_C_WH	Yes No
10	PH_C_WH-	Yes No
11	PH_C_VARH	Yes No
12	PH_C_VARH-	Yes No
13	TOT_WH	Yes No
14	TOT_WH-	Yes No
15	TOT_VARH	Yes No
16	TOT_VARH-	Yes No

Cancel Submit

Point

Protocol logical point number. This number cannot be changed.

Name

Enter the name of the point (or accept the default name).

Add Points to Database

Click "No" if you do not want a point added to the database. The default is Yes.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to

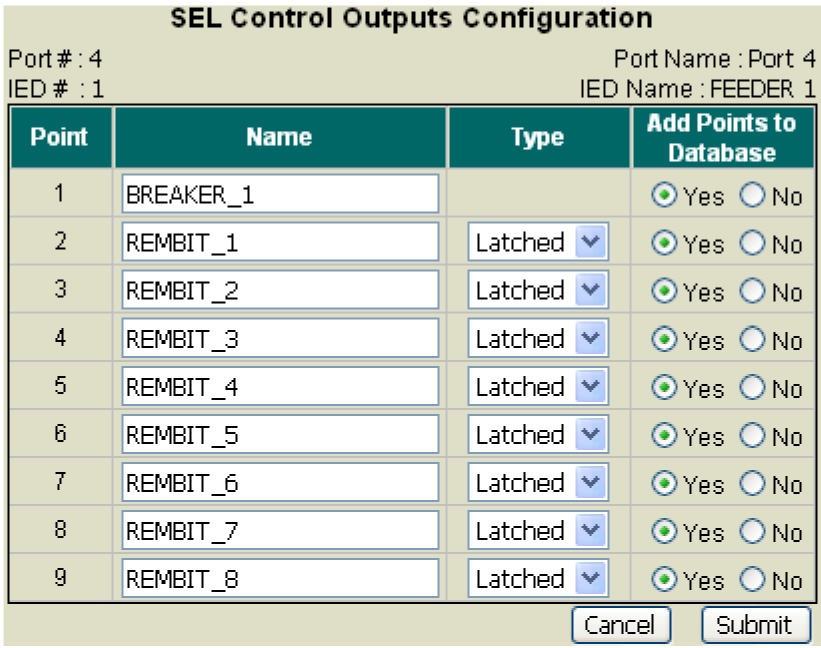
return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

9.4.4 SEL Control Outputs Configuration

From the SEL IED Configuration screen, click on Edit for Control Outputs. A screen similar to Figure 9-8 will appear.

Figure 9-8 SEL Control Outputs Configuration



Point

Protocol logical point number. This number cannot be changed.

Name

Enter the name of the point (or accept the default name).

Type

From the drop-down menu, select either Latched or Pulsed according to the SEL documentation for that point. If the point is Trip/Close only, such as Breaker Bits, a drop-down menu is not shown.

Add Points to Database

Click "No" if you do not want a point added to the database. The default is Yes.

Navigation

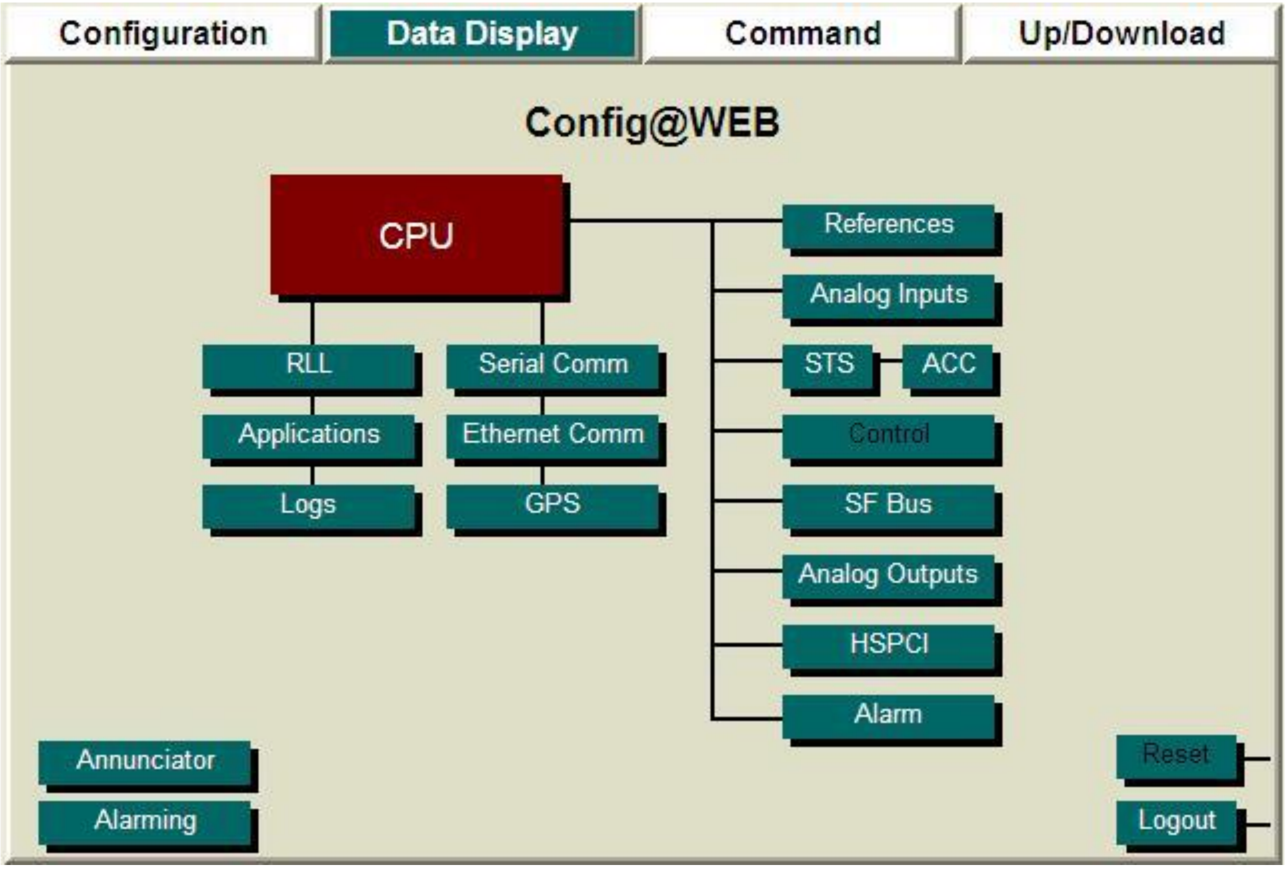
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

9.5 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 9-9 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 9-10 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Port 1	DNPR	View	Port Data
Port #2	K	K	Port 2	DNPM	View	Port Data
Port #3	K	K	Port 3	SEL	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

Port Number

Physical Port number of the RTU.

RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

9.5.1.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

9.5.1.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

9.5.1.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

Name

The port name given during configuration or default name accepted.

Protocol

The configured protocol for this port.

Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

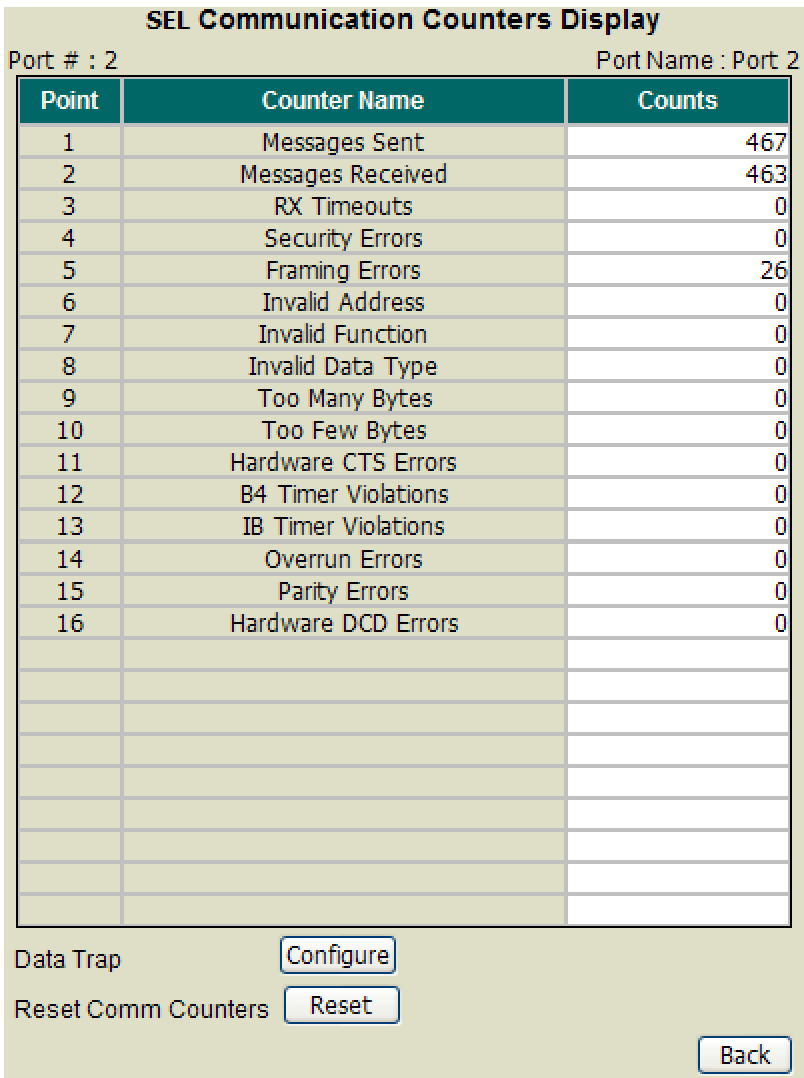
Navigation

Click the Back button to return to the previous screen.

9.5.2 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 9-11 SEL Communication Counters Display



Point	Counter Name	Counts
1	Messages Sent	467
2	Messages Received	463
3	RX Timeouts	0
4	Security Errors	0
5	Framing Errors	26
6	Invalid Address	0
7	Invalid Function	0
8	Invalid Data Type	0
9	Too Many Bytes	0
10	Too Few Bytes	0
11	Hardware CTS Errors	0
12	B4 Timer Violations	0
13	IB Timer Violations	0
14	Overrun Errors	0
15	Parity Errors	0
16	Hardware DCD Errors	0

Point

A logical point number for reference only.

Counter Name

The following counters are monitored:

9.5.2.1 Messages Sent

This indicates the cumulative number of valid sent messages since the last reset or power-up.

9.5.2.2 Messages Received

This indicates the cumulative number of valid received messages since the last reset or power-up.

9.5.2.3 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

9.5.2.4 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

9.5.2.5 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

9.5.2.6 Invalid Address

This indicates the cumulative number of messages received for which the system global group address was used by the RTU address was neither the broadcast address nor the RTU ID.

9.5.2.7 Invalid Function

This field is not used.

9.5.2.8 Invalid Data Type

This field is not used.

9.5.2.9 Too Many Bytes

This field is not used.

9.5.2.10 Too Few Bytes

This field is not used.

9.5.2.11 Hardware CTS Errors

This indicates the cumulative number of CTS errors since the last reset or power-up.

9.5.2.12 B4 Timer Violations

This indicates the cumulative number of B4 Timer Violations. This count can be affected by the setting of the Delay for first byte in configuration.

9.5.2.13 IB Timer Errors

This indicates the cumulative number of IB Timer Errors. This count can be affected by the setting of the Interbyte Time in configuration.

9.5.2.14 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

9.5.2.15 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

9.5.2.16 Hardware DCD Errors

This indicates the cumulative number of DCD errors since the last reset or power-up.

Counts

The counts for each type of Counter.

Data Trap

Please see the Config@WEB Secure Software Users Guide.

Reset Comm Counters

Click this button to reset all comm. counters.

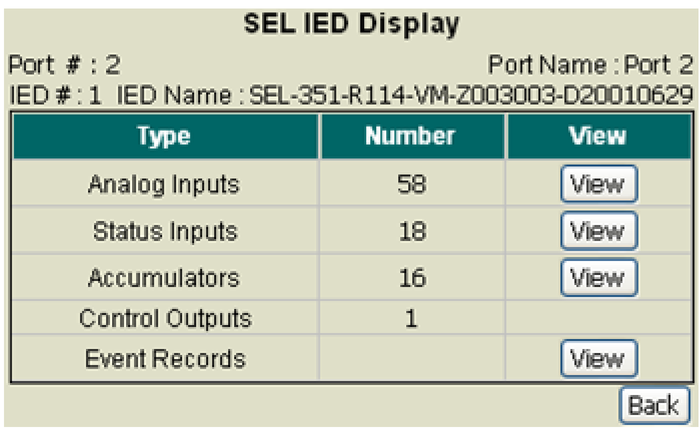
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

9.5.3 SEL IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 9-12 SEL IED Display



Type

The type of point.

Number

The number of points of each type configured for this logical RTU.

View

Click the View button to view points.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

9.5.3.1 Analog Inputs

From the SEL IED Display screen, click View for Analog Inputs. Notice that the three screen shots shown below include the Event data, which follows other ANA points.

Figure 9-13 SEL Analog Inputs Display

SEL Analog Inputs Display

Port # : 4 Port Name : Port 4
IED # : 1 IED Name : FEEDER 1

<<Prev Page2 of 4 Go To [Go] Next>>

Point	Point Name	Point Status	Point Value
17	B_PH_VA	F	-30000.000
18	C_PH_VA	F	-30000.000
19	TOTAL_VA	F	-90000.000
20	A_PH_PF	F	-1.000
21	B_PH_PF	F	-1.000
22	C_PH_PF	F	-1.000
23	TOTAL_PF	F	-1.000
24	EventMonth	F	0.000
25	EventDay	F	0.000
26	EventYear	F	0.000
27	EventHour	F	0.000
28	EventMinute	F	0.000
29	EventSecond	F	0.000
30	EventMsec	F	0.000
31	EventLocation	F	0.000
32	EventType	F	0.000

Back

See the Note under Point Value header.

Fig

SEL Analog Inputs Display

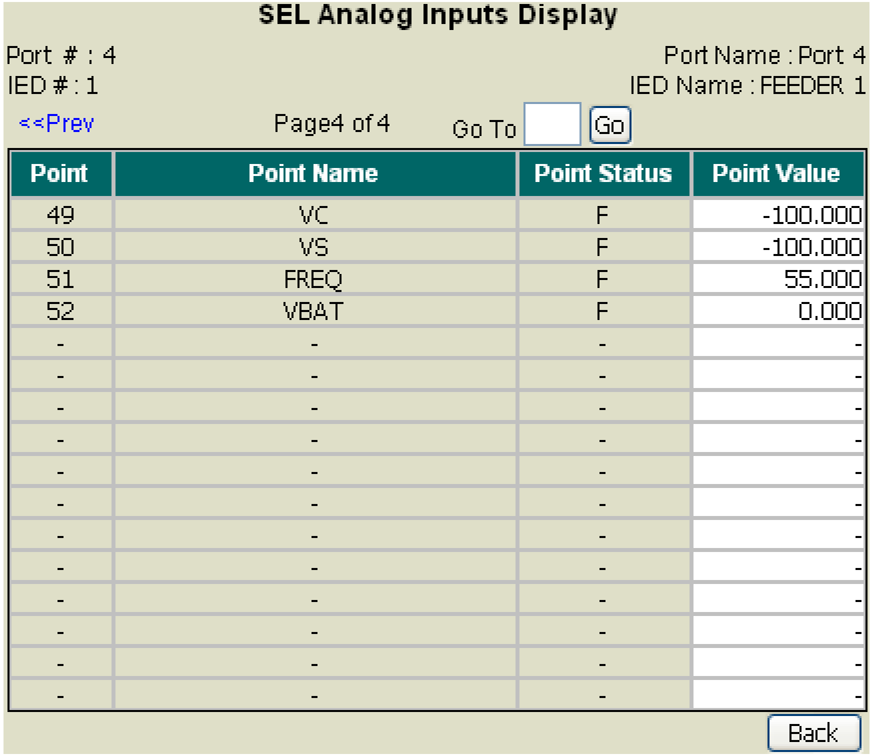
Port # : 4 Port Name : Port 4
IED # : 1 IED Name : FEEDER 1

<<Prev Page3 of 4 Go To [Go] Next>>

Point	Point Name	Point Status	Point Value
33	EventCurrent	F	0.000
34	EventFreq	F	0.000
35	EventGroup	F	0.000
36	EventShot	F	0.000
37	FaultData1	F	0.000
38	FaultData2	F	0.000
39	FaultData3	F	0.000
40	FaultData4	F	0.000
41	FaultData5	F	0.000
42	FaultData6	F	0.000
43	IA	F	-100.000
44	IB	F	-100.000
45	IC	F	-100.000
46	IN	F	-100.000
47	VA	F	-100.000
48	VB	F	-100.000

Back

Figure 9-15 SEL Analog Inputs Display



SEL Analog Inputs Display

Port # : 4 Port Name : Port 4

IED # : 1 IED Name : FEEDER 1

<<Prev Page4 of 4 Go To Go

Point	Point Name	Point Status	Point Value
49	VC	F	-100.000
50	VS	F	-100.000
51	FREQ	F	55.000
52	VBAT	F	0.000
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Back

Point

The logical number of the point.

Point Name

The point name. Only those points that were set to Yes under Add Points to Database will appear here.

Point State

Please see the Config@WEB Secure Software Users Guide.

Point Value

This is the engineering unit (EGU) value being calculated by the RTU based on the settings of the EGU min, EGU max, and the current binary value being returned by the meter.

Note: The Point Value of the Point Name "EventType" is detailed in Table 9-2, where the Point Value corresponds to the Code #. As an example, if the Point Value for EventType is "5", then the Event is "ER2", which means, "SELogic control of equation setting ER2". Notice that there is a Code # 0, which means, "Unknown event type".

Note: The SEL protocol supports the Tunnel Function and Event checking simultaneously.

Table 9-2 SEL Event Type Point Value

Event	Code #	Description
	0	Unknown event type
TRIG	1	Execution of TRI serial port command
PULSE	2	Execution of PUL serial port command
ER	3	SELogic control of equation setting ER
ER1	4	SELogic control of equation setting ER1
ER2	5	SELogic control of equation setting ER2
CLS3	6	Assertion of Relay Word bit CLS3
CLS2	7	Assertion of Relay Word bit CLS2
CLS1	8	Assertion of Relay Word bit CLS1
TRIP4	9	Assertion of Relay Word bit TRIP4
TRIP3	10	Assertion of Relay Word bit TRIP3
TRIP2	11	Assertion of Relay Word bit TRIP2
TRIP1	12	Assertion of Relay Word bit TRIP
TRIP	13	Assertion of Relay Word bit TRIP2
TRP1	14	TRP1 tripping element assertion
TRP2	15	TRP2 tripping element assertion
TRP3	16	TRP3 tripping element assertion
ABG	17	Two phase-to-ground fault
ABG T	18	Two phase-to-ground fault with trip
ACG	19	Two phase-to-ground fault
ACG T	20	Two phase-to-ground fault with trip
CAG	21	Two phase-to-ground fault
CAG T	22	Two phase-to-ground fault with trip
BCG	23	Two phase-to-ground fault
BCG T	24	Two phase-to-ground fault with trip
AB	25	Phase-to-phase fault
AB T	26	Phase-to-phase fault with trip
AC	27	Phase-to-phase fault
AC T	28	Phase-to-phase fault with trip
CA	29	Phase-to-phase fault
CA T	30	Phase-to-phase fault with trip
ABC	31	Three phase fault
ABC T	32	Three phase fault with trip
AG	33	Single phase-to-ground fault
AG T	34	Single phase-to-ground fault with trip
BG	35	Single phase-to-ground fault
BG T	36	Single phase-to-ground fault with trip
CG	37	Single phase-to-ground fault
CG T	38	Single phase-to-ground fault with trip
SBFTR	39	Rising edge of Relay Word Bit SBFTR, the OR combination of a breaker failure trip
87BTR	40	Rising edge of Relay Word Bit 87BTR, the OR combination of a busbar protection trip
A	41	Single Phase-to-ground fault (Peterson Coil and ungrounded/high-impedance grounded
A T	42	Single Phase-to-ground fault (Peterson Coil and ungrounded/high-impedance grounded
B	43	Single Phase-to-ground fault (Peterson Coil and ungrounded/high-impedance grounded
B T	44	Single Phase-to-ground fault (Peterson Coil and ungrounded/high-impedance grounded
C	45	Single Phase-to-ground fault (Peterson Coil and ungrounded/high-impedance grounded
C T	46	Single Phase-to-ground fault (Peterson Coil and ungrounded/high-impedance grounded
MER	47	Element assertion in the MER equation assertion
EXT	48	Report triggered by assertion of the EXT designated input
EXTC	49	Report triggered by the TRIGGER command
		Events Appends T if TRIP asserted (ABG T as an example)

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to

return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

9.5.3.2 Status Inputs

From the SEL IED Display screen, click View for Status Inputs. Notice that the two screen shots below contains Event Data.

Figure 9-16 SEL Digital Inputs Display

SEL Status Inputs Display

Port # : 4 Port Name : Port 4
IED # : 1 IED Name : FEEDER 1

Page1 of 2 Go To [Go] Next>>

Point	Point Name	Point Status	Point State	•
0	COMM_STS		CLOSE	•
1	NewEvent	F	OPEN	•
2	EventTarget1	F	OPEN	•
3	EventTarget2	F	OPEN	•
4	EventTarget3	F	OPEN	•
5	EventTarget4	F	OPEN	•
6	EventTarget5	F	OPEN	•
7	EventTarget6	F	OPEN	•
8	EventTarget7	F	OPEN	•
9	EventTarget8	F	OPEN	•
10	EventTarget9	F	OPEN	•
11	EventTarget10	F	OPEN	•
12	EventTarget11	F	OPEN	•
13	EventTarget12	F	OPEN	•
14	EventTarget13	F	OPEN	•
15	EventTarget14	F	OPEN	•

[Back]

Figure 9-17 SEL Digital Inputs Display

SEL Status Inputs Display

Port # : 4 Port Name : Port 4

IED # : 1 IED Name : FEEDER 1

<<Prev Page2 of 2 Go To [ ] Go

Point	Point Name	Point Status	Point State	•
16	EventTarget15	F	OPEN	•
17	EventTarget16	F	OPEN	•
18	STSET	F	OPEN	•
19	EN	F	OPEN	•
20	TRIP	F	OPEN	•
21	INST	F	OPEN	•
22	COMM	F	OPEN	•
23	SOTF	F	OPEN	•
24	PDEM	F	OPEN	•
25	NDEM	F	OPEN	•
26	GDEM	F	OPEN	•
27	QDEM	F	OPEN	•
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Back

Note: The COMM_STS point is automatically assigned to show whether the comm. channel is working or not. A CLOSED (red) point indicates that the comm. channel is failed. An OPEN (green) point indicates that the comm. channel is operational.

Note: The EventTarget points are shown only if event retrieval is enabled and these points are selected to be added to the database. The NewEvent point is toggled when a new event is detected. The state of this point is not significant, but a change of state indicates that new event data points are available.

Point

The logical number of the point.

Point Name

The point name.

Point State

Please see the Config@WEB Secure Software Users Guide.

Point State

Indicates that point is either OPEN or CLOSED.

●

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Navigation

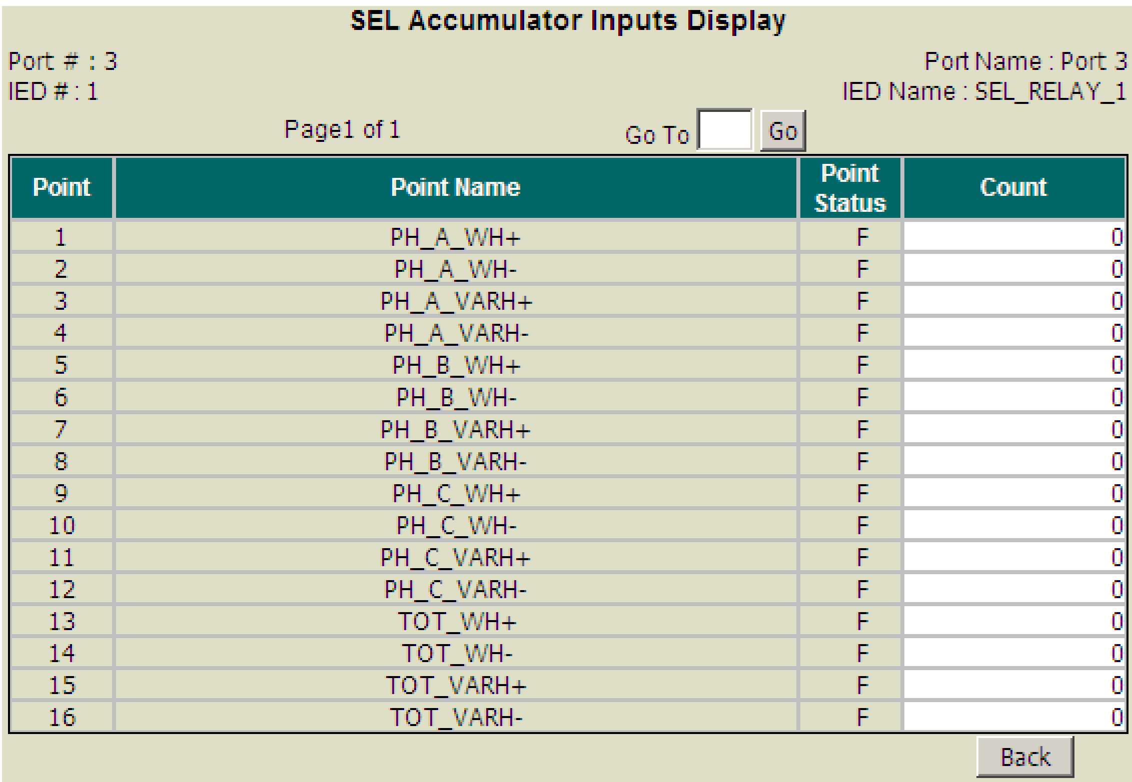
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

9.5.3.3 Accumulators

Accumulators are available only for those relay types that provide the analogs necessary to compute instantaneous power. They represent an integration of power into kilowatt hours or megawatt hours, according to the Accumulator Units field on Figure 9-2 above.

From the SEL IED Display screen, click View, then click Accumulators. Reference the screen shown in Figure 5-12.

Figure 9-18 SEL Accumulators Inputs Display



SEL Accumulator Inputs Display

Port # : 3 Port Name : Port 3
IED # : 1 IED Name : SEL_RELAY_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Count
1	PH_A_WH+	F	0
2	PH_A_WH-	F	0
3	PH_A_VARH+	F	0
4	PH_A_VARH-	F	0
5	PH_B_WH+	F	0
6	PH_B_WH-	F	0
7	PH_B_VARH+	F	0
8	PH_B_VARH-	F	0
9	PH_C_WH+	F	0
10	PH_C_WH-	F	0
11	PH_C_VARH+	F	0
12	PH_C_VARH-	F	0
13	TOT_WH+	F	0
14	TOT_WH-	F	0
15	TOT_VARH+	F	0
16	TOT_VARH-	F	0

Back

Point

Protocol logical point number.

Point Name

The point name. Only those points that were set to Yes under Add Points to Database will appear here.

Point State

Please see the Config@WEB Secure Software Users Guide.

Count

The counts as calculated.

Navigation

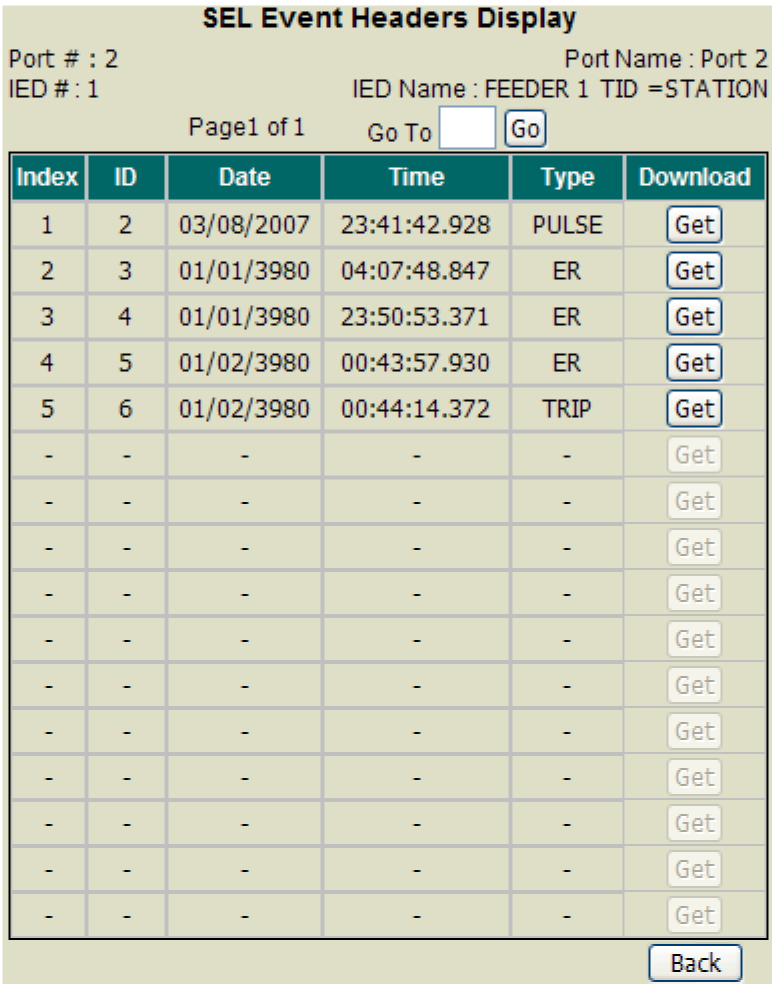
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

9.5.3.4 Event Records Display and Retrieval

If the option to capture and save full-format SEL events (CEV option) has been selected during configuration, clicking the View button for Event records will bring up a display giving the date, time and type of the most recent events captured.

Note: Be patient. Retrieving Event files takes a long time.

Figure 9-19 SEL Event Headers Display



SEL Event Headers Display

Port # : 2 Port Name : Port 2

IED # : 1 IED Name : FEEDER 1 TID =STATION

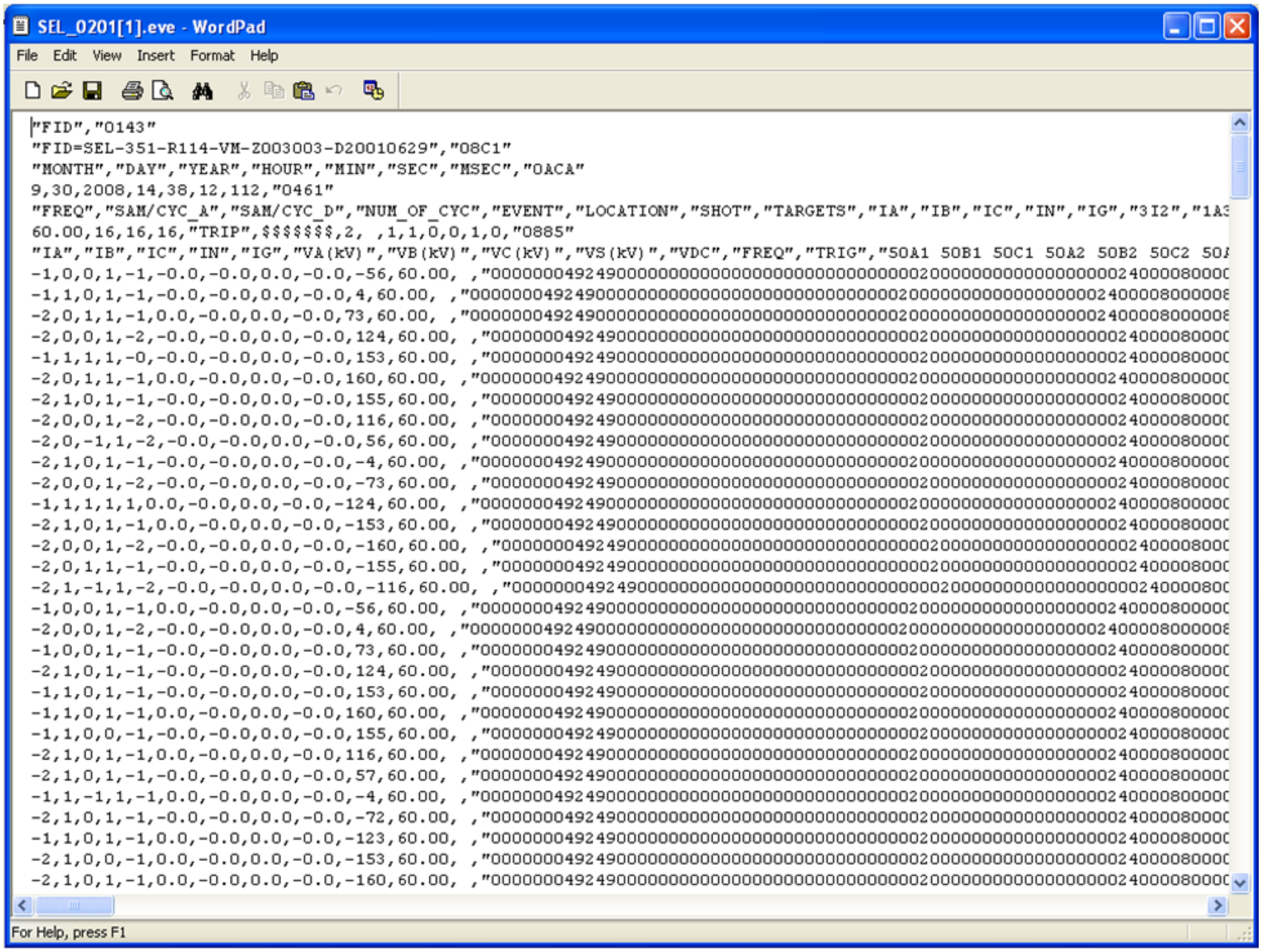
Page1 of 1 Go To Go

Index	ID	Date	Time	Type	Download
1	2	03/08/2007	23:41:42.928	PULSE	Get
2	3	01/01/3980	04:07:48.847	ER	Get
3	4	01/01/3980	23:50:53.371	ER	Get
4	5	01/02/3980	00:43:57.930	ER	Get
5	6	01/02/3980	00:44:14.372	TRIP	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get
-	-	-	-	-	Get

Back

Clicking the Get button for a given event record presents the option to save the event to a file or to view it on the screen.

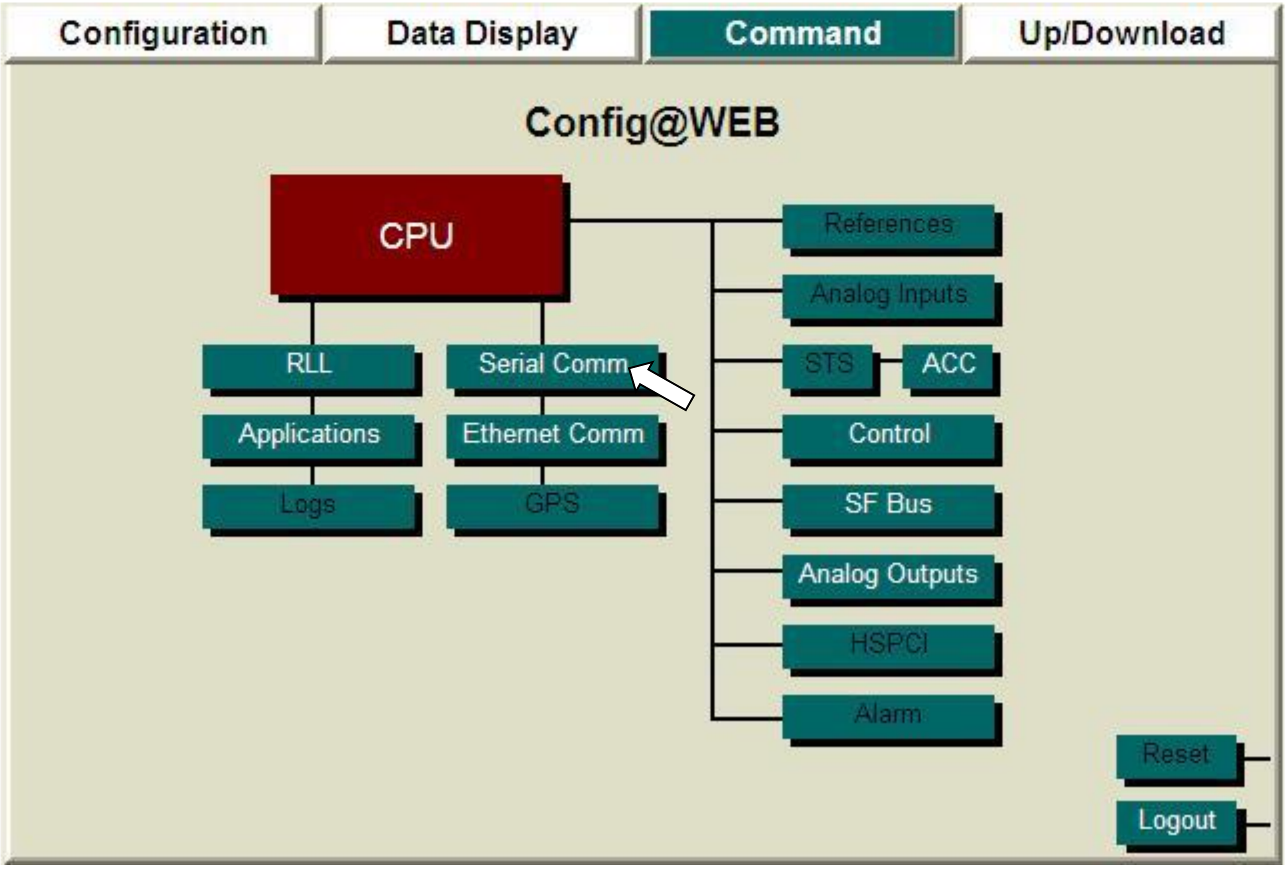
Figure 9-20 Records Display



9.6 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 9-21 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2300 manual. Under Command Port Data, click Port Data.

Figure 9-22 Serial Comm Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	DNPR	Port Data	Normal
Port #2	K	K	Port 2	DNPM	Port Data	Normal
Port #3	K	K	Port 3	CDC I	Port Data	Normal
Port #4	K	K	Port 4	SEL	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command Control Outputs.

Figure 9-23 SEL IED Command

SEL IED Command.

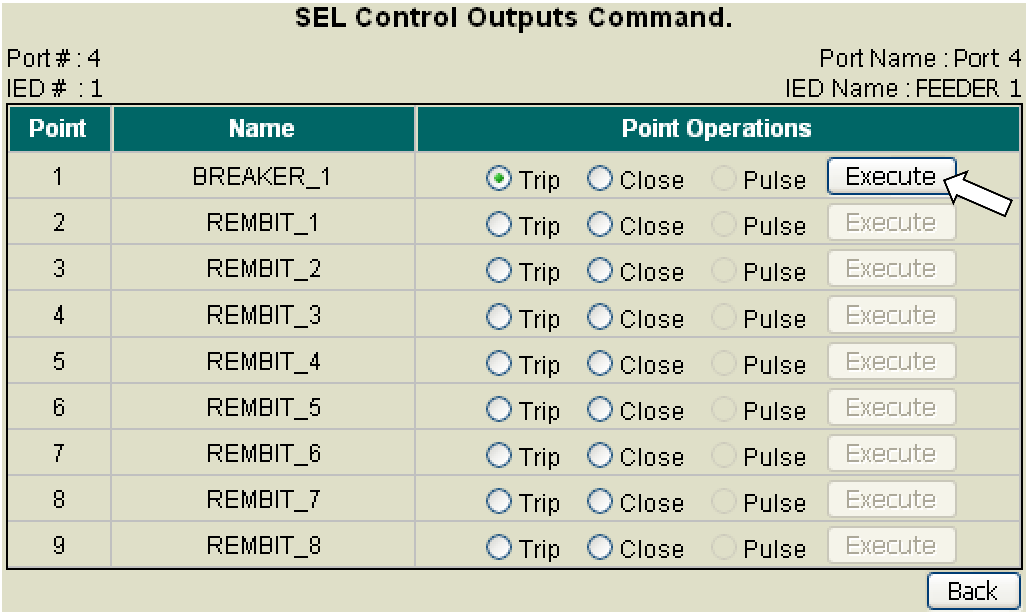
Port # : 4 Port Name : Port 4
IED # : 1 IED Name : FEEDER 1

Type	Number	Command
Analog Inputs	52	
Status Inputs	28	
Accumulators	16	
Control Outputs	9	Command

Back

The Control Outputs Command will give you a screen similar to Figure 2-34. The screen will display either Trip and Close only, or Pulse only, depending on the appropriateness for that particular point. After selecting an action, click the Execute button as shown in Figure 2-34.

Figure 9-24 SEL Control Outputs Command



9.7 Tunnel Function

The Tunnel Function is now accomplished through the SEL Emulation application. Please see the Config@WEB Applications Manual.

9.8 SEL Auto Configuration Theory

The software for auto-configuration does the following tasks:

RTU logs on to the SEL relay (Level 1 access needed to get some of the data)

1. Sends cancel sequence (0x11, 0x18) to stop any previous command.
2. Checks for a level 1 prompt ("=>")
3. Sends "Quit" to relay to start from a known state.
4. Checks for a level 1 prompt.
5. Sends "ACC" to relay.
6. Checks for Level 1 prompt (sent if relay has no defined Level 1 password).
7. Looks for password request ("Password ?")
8. If seen, sends the password from the configuration screen.
9. Checks for Level 1 prompt.
10. Returns an indication of success or failure to log on.

Get relay ID information

11. Send "ID".
12. Look for "FID=". Extracts following string and stores it in device type.
13. Send "SHOWSET" to get RID.
14. Look for "RID=". If found, extracts following string and stores it in device ID.
15. If no response to SHOWSET (some relays don't support it) copy device type into device ID.

16. Send 0x18, 0x0d to cancel any remaining SHOWSET response.

If configured to get Event History data (HIS), reads the relay.xml file to determine the capabilities of the relay.

17. If the RTU supports compressed event history (CHIS) for this relay, send "CAS" to the relay to retrieve the formats of compressed ASCII messages. Find the CHIS definition and the header line within that definition. Extract the names and positions of the time, date and analog data returned by the relay. Store the point names and their formats (integer, floating point, or string).
    1. If configured to get Event Summary data (EVE) and the RTU supports compressed events (CEV) for this relay, find the definition of the CEV definition. Count lines to the summary data line. Extract the names of analogs from the column headers and their formats.
    2. Otherwise, event summary data is not collected.
18. If the RTU supports only uncompressed event history data for this relay, send an “HIS 1” command to retrieve a sample of the event history. Find the line containing the column headings and extract the names and positions of the time, date and analog data returned by the relay. Store the names, formats and the offset from the beginning of the data line to one character past the end of the column name, which is used as a limit on the field width to detect when a data item is left blank in the event history. When HIS is used, no event summary data (EVE) is retrieved.
19. If the RTU supports neither compressed nor uncompressed event history for this relay, no event data can be reported for the relay. See Table 9-3 for a list of relays and the features that the RTU supports for them.

Read Fast Meter configuration

20. Send Faster Meter configuration request 0xA5C1.
21. If response, checks message checksum.
22. Extracts Fast Meter parameters from the response.
23. Repeat for three attempts if error or no reply.
24. Allocate database space for the number of analogs, digital inputs and controls indicated in the Fast meter response.
25. Extract analog names and scaling factors from Fast Meter config if present.
26. Extract number of defined calculations and extract parameters for each from the Fast Meter config.

Open the port configuration file and extract event enable, SER enable and event target format.

If SER data are to be retrieved, retrieve SER status point names.

27. Send "SHOWSET R" command.
28. Search response for "SER1=...", "SER2=...", "SER3=..." and "SER4=..." to get points the user has selected for inclusion in Sequence of Events Recorder reports. If present, each is followed by a list of target names, divided by commas. Extract all such names into storage, up to a maximum of 40.

Get relay status point names

29. Allocate storage for the number of status flags and status banks indicated in the Fast Meter config.
30. Check device type to see if the relay is a 421 which requires "DNA X" to retrieve digital point names.
31. Send "BNA" to get binary point names. Names come in sets of 8, separated by commas and followed by a checksum. Extract all names, skipping any "*" marking unused bit positions. BNA typically returns only one line, with one or two names defined.
32. Send "DNA" or "DNA X" to get digital point names. Extract point names as for BNA above. DNA or DNA X may return up to 400 or 500 point names in sets of eight.

33. If no names were returned by "DNA", send "DNA X" in case this is a 400-series relay like the 421 that requires the alternate command.

Get Fast Operate configuration

34. Send 0xA5CE to request fast-operate configuration.
35. If response, check the checksum.
36. Repeat up to 3 times on error or no reply.
37. Allocate storage for the number of breakers and "remote bits" defined in the Fast Operate config.
38. For each breaker, extract and store the 1-byte commands to perform a Trip or Close on that breaker.
39. For each remote bit, extract and store the 1-byte commands to perform an Open, Close or Pulse on that remote bit.

Update the configuration XML for this relay.

40. Open iedspr.xml. Find the IED for this serial port.
41. Open the protocol template file ptemp.xml. Find the template for SEL IEDs.
42. Update the device ID and instance number.
43. Replace the old IED with the IED template.
44. Update Analog XML section
    1. If there are no defined calculations, delete the "standard" 23 calculated analogs and the accumulators. Then correct point numbers and entity ID's for the event analog points.
    2. If there are calculations, set the entity ID's for the 16 power accumulators and the standard analogs.
    3. If there are any old analog tags following the event points, delete them.
    4. Create analog point XML for all "acquired" analogs from the Fast Meter configuration.
    5. For frequency analog, VBAT and VDC, insert analog scaling factors for those point types.
    6. If configured to get event data and the RTU supports either the compressed or uncompressed event history functions, insert analog points for the date, time, event type and other analogs returned in the event history, as identified in step 3.a above.
    7. If configured to get event history data and event summary data and the RTU supports the compressed event (CEV) function, insert analog points for the analog data returned in the event summary line of the CEV response.
    8. Replace the AI_LIST in iedspr.xml with the new AI_LIST just created.
45. Update the Status XML section
    1. Open a new XML string table and create the DI_LIST tag.
    2. Initialize the comm status point, always the first point.
    3. Copy the event target status points from the IED template XML. Set entity ID's for targets.
    4. If the event targets are ASCII names (as opposed to binary strings), assume that the first 16 status points are the event targets. Rename the event targets with the names obtained from DNA with a prefix "EVT-" to distinguish them from the same points received as ordinary status points.
    5. If Sequence of Events reports are enabled and SER target names were obtained with "SER1", etc., create SER target XML. Create two special points for "Relay newly powered up" and "Settings changed", as these must be handled differently (no target names to look up, and always "Asserted"). Create SER point XML for all names retrieved with "SER1", etc.
    6. Create XML for all status point names acquired with "BNA" or DNA".

7. Replace the DI_LIST tag from the IED template with the DI_LIST just created.

46. Update the Digital Output XML section
    1. Create XML tags for all breakers defined in the Fast Operate configuration.
    2. Create XML tags for all remote bit points defined in the Fast Operate configuration.
    3. Replace the template DO_LIST with the DO_LIST just created.
47. Update the SCAN XML section with number of points, etc., retrieved with the Fast Meter configuration.
48. Update the number of defined calculations. This tag is used by the GUI to know whether to expect the "standard" 23 calculated analogs to be present, or not.
49. For all defined calculations, create XML for all calculation parameters (line configuration, calculation type, current analog offsets, voltage analog offsets, skew, RS and XS correction offsets if present.
50. Update the iedspr.xml file.
51. Open and update the port file for device type and device ID retrieved above.

Table 9-3 SEL Relays Supported Features

Relay Model	Compressed History (CHIS) Support	Compressed Event (CEV) Support	Uncompressed History (HIS) Support
300G	Yes	Yes	No
311A	Yes	Yes	No
311B	Yes	Yes	No
311C	Yes	Yes	No
311L	No	No	No
321	Yes	Yes	No
351	Yes	Yes	No
351A	Yes	Yes	No
351R	Yes	Yes	No
351S	Yes	Yes	No
387	Yes	Yes	No
387A	Yes	Yes	No
387E	Yes	Yes	No
387L	No	No	No
421	No	No	Yes
451	No	No	Yes
487B	Yes	No	No
501	No	No	No
547	Yes	Yes	No
551	Yes	No	No
551C	Yes	No	No
587	Yes	No	No
587Z	Yes	Yes	No
651R	No	No	Yes
701	No	No	No
710	No	No	No
734	No	No	Yes
749M	Yes	No	No

10 Series V Master

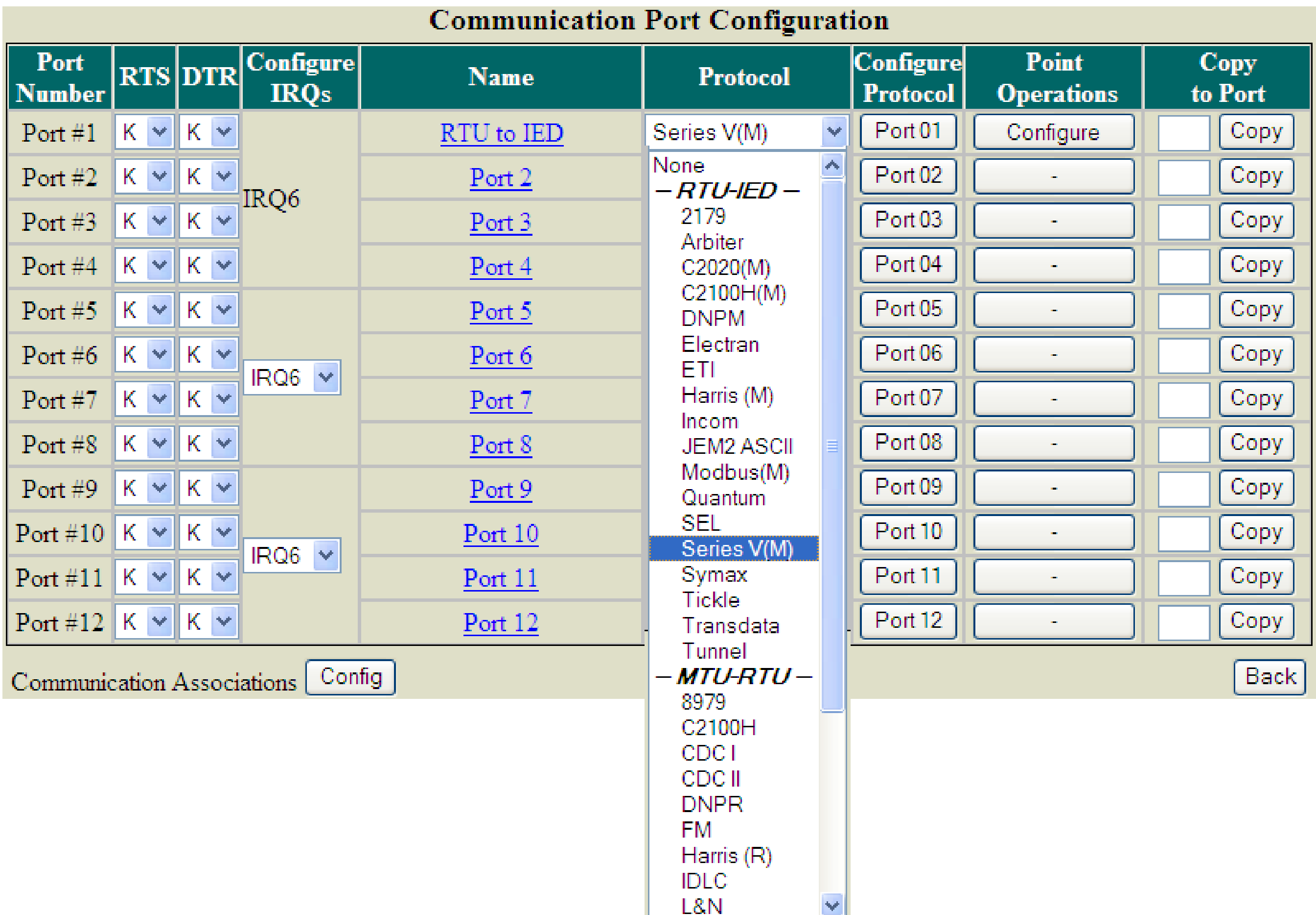
10.1 Serial Comm Port Configuration

Series V Master is a protocol that communicates between the RTU and an IED. It can be used to front-end an existing RTU in order to add new communication functionality within the substation while preserving the existing hardware I/O.

The Series V Master protocol running on an RTU can also be used at the master station as a front-end processor scanning multiple RTUs and converting the data to a different protocol.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Series V Master from the Protocol drop-down menu as shown.

Figure 10-1 Series V Master Communication Port Configuration



10.1.1 Port Number

Physical Port number of the RTU.

10.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

10.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

10.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

10.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

10.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.

10.1.4 Protocol

From the drop-down list, select the protocol for this port.

10.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

10.1.6 Point Operations

Click this button to assign points.

10.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

10.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

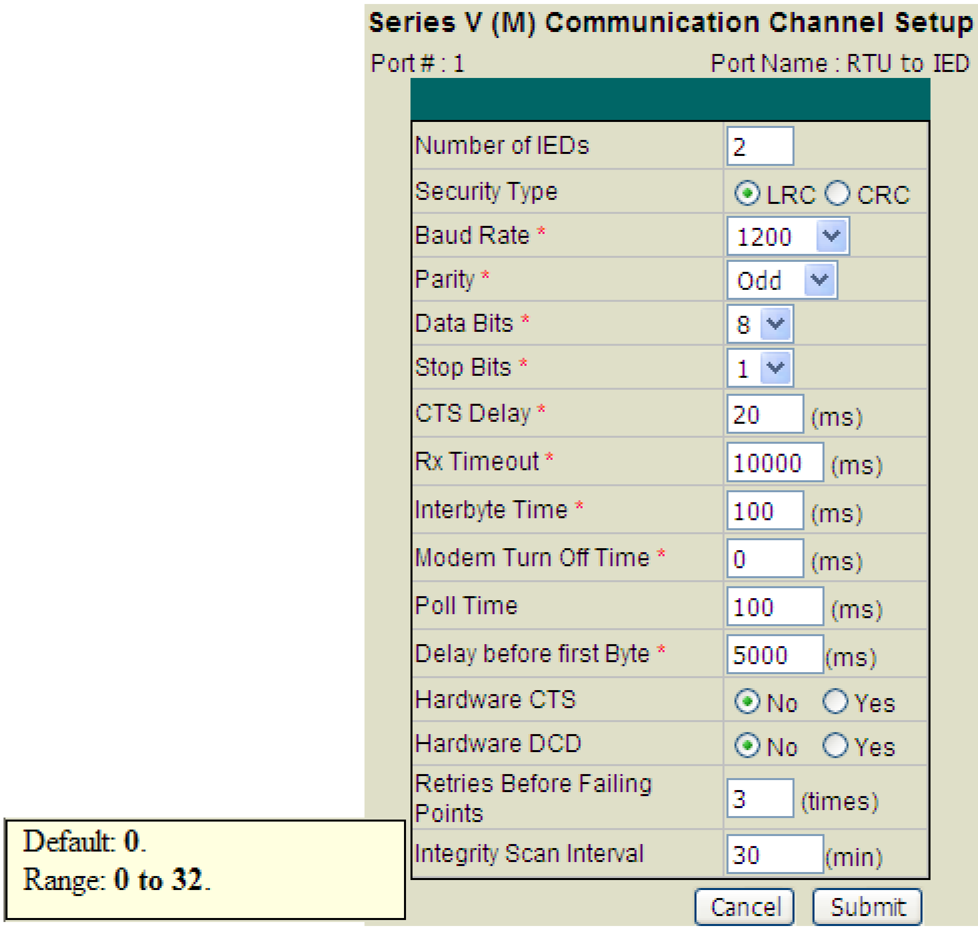
Navigation

Click the Back button to return to the previous screen.

10.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n* to configure the Series V Master port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 10-2 Series V Master Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

10.2.1 Number of IEDs (0-32)

Enter the number of IEDs on the port. The default setting is 0.

10.2.2 Security Type (LRC-CRC)

Click the security type. The Series V Communication Protocol uses two types of error detection techniques: Longitudinal Redundancy Check (LRC) or Cyclic Redundancy Check (CRC). Both security codes are described in the Series V Protocol Manual, B8300-AAA-00005. The default setting is LRC.

10.2.3 Baud Rate (300-19200)

From the drop-down menu, select the baud rate. The default setting is 1200.

10.2.4 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is Odd.

10.2.5 Data Bits (5,6,7,8)

From the drop-down menu, select the data bits for the associated channel. The default setting is 8.

10.2.6 Stop Bits (0,1,2)

From the drop-down menu, select the stop bits for the associated channel. The default setting is 1.

10.2.7 CTS Delay (0 – 250ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 20.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

10.2.8 Rx Timeout (0 – 60,000 msec)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 10000 msec.

Note: This timer must be greater than Delay for First Byte timer (below).

10.2.9 Interbyte Time (0 – 250ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 100 msec.

10.2.10 Modem Turn Off Time (0 – 250ms)

Enter the delay time that the modem will maintain the carrier after the last data byte has been transmitted. Default setting is 0.

10.2.11 Poll Time (0 – 10,000ms)

Enter the time to delay between a sequence of polling all the devices connected to this communications port. Default setting is 100.

10.2.12 Delay before First Byte (0 to 10,000ms)

Enter the delay time for the associated channel. This is the time allowed for a Slave Device to begin its response before the MTU assumes it is not going to reply and moves on to the next device. This parameter is typically set long because of delays in IED response. The default setting is 5000ms.

Note: This timer must be less than Rx Timeout (above).

10.2.13 Hardware CTS (No, Yes)

If the hardware Clear-To-Send option is selected for a channel, then data bytes will not be transmitted unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. Default setting is No.

10.2.14 Hardware DCD (No, Yes)

If the hardware data carrier detect option is selected for a channel, then the channel communications driver will accept message data bytes only if carrier is detected. If carrier is not detected, the data bytes are discarded. Default setting is No.

10.2.15 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

10.2.16 Integrity Scan Interval (0 – 10000 min)

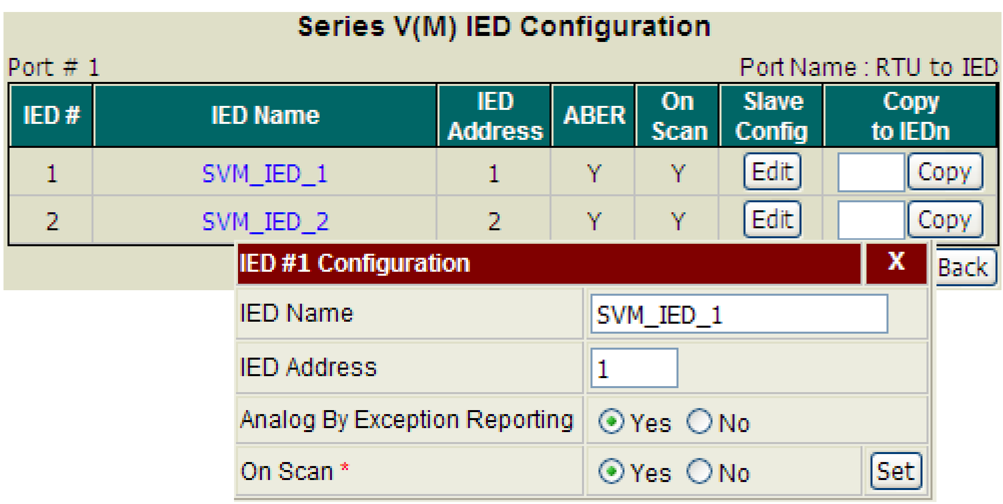
Enter the time interval in minutes for integrity scans. The default is 30.

Please note: No configuration changes take effect until the RTU is reset.

10.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 10-3 IED Configuration



10.3.1 IED

The logical number of the IED on this communication channel.

10.3.2 IED Name

Click on the IED Name. A pop-up window called **IED Configuration** will appear, as shown above.

10.3.2.1 IED Name

The name of the IED. Type in a name, or accept the default.

10.3.2.2 IED Address

The address of the IED. Type in an address, or accept the default.

10.3.2.3 Analog By Exception Reporting (ABER)

Reports analogs that exceed the Deadband (DB). Click No to disable ABER, or accept the default (Yes).

10.3.2.4 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled.

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

10.3.2.5 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

10.3.3 IED Address

Reflects the entry in the pop-up menu. See above.

10.3.4 ABER (Analog By Exception Reporting)

Y means the Analog By Exception function is ON. N means this function is OFF. See above.

10.3.5 On Scan

Reflects the entry in the pop-up menu. See above.

10.3.6 Slave Config

Click the Edit button to edit the IED points.

10.3.7 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

Navigation

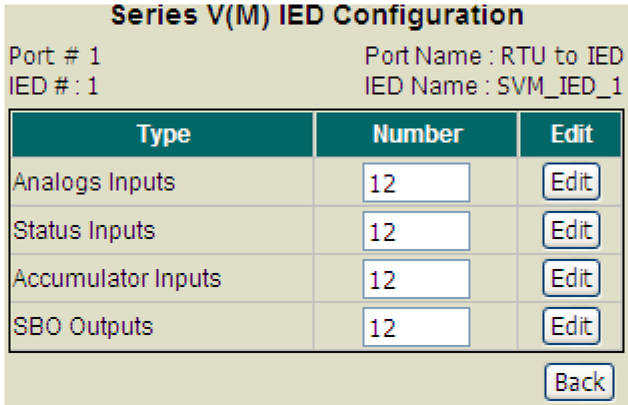
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

10.3.7.1 Slave Configuration Edit

10.3.8 Slave Config

Click Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 10-4 IED Configuration



10.3.9 Type

The type of point.

10.3.10 Number

Enter the number of points from your IED.

10.3.11 Edit

Click the Edit button to edit points.

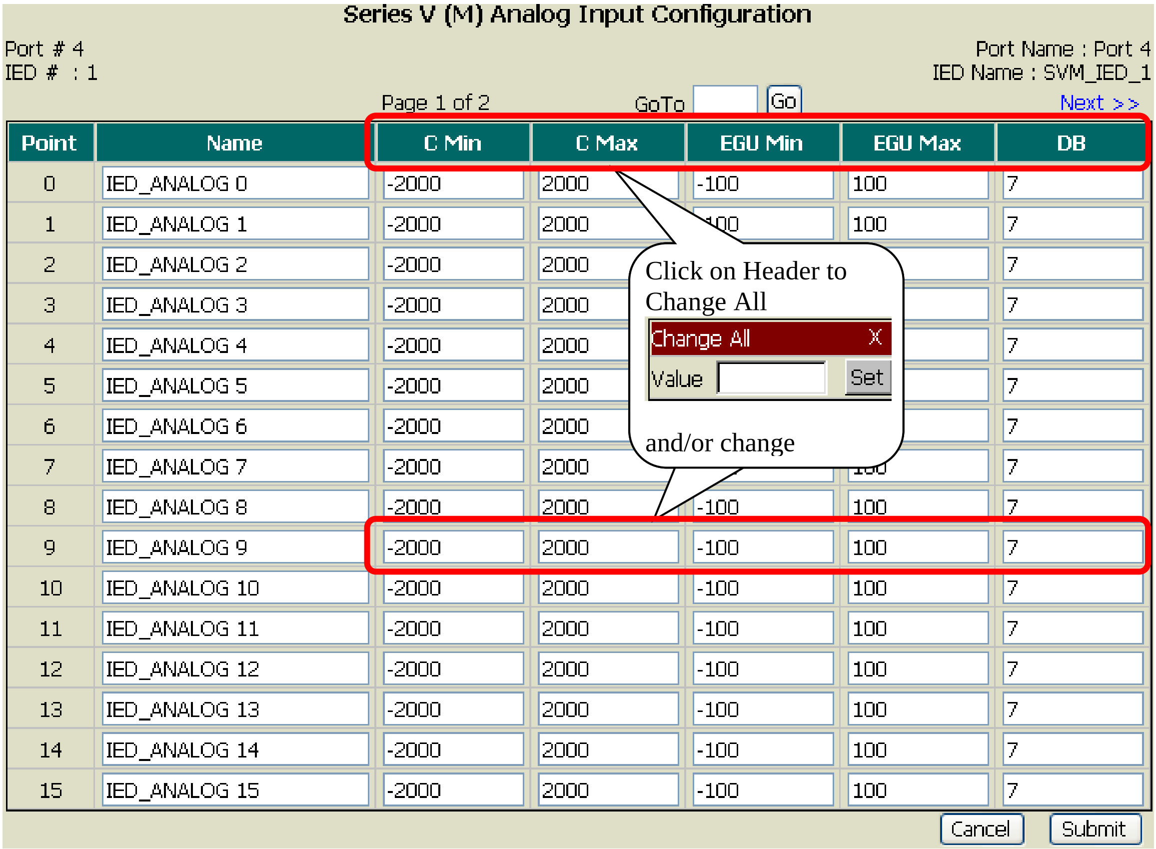
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

10.3.12 IED Analog Configuration

From the Series V Master IED Configuration screen, click on Edit for Analog Inputs. A screen similar to Figure 2-13 will appear.

Figure 10-5 Series V Master Analog Input Configuration


Series V (M) Analog Input Configuration

Port # 4
IED # : 1

Port Name : Port 4
IED Name : SVM_IED_1

Page 1 of 2 GoTo Go Next >>

Point	Name	C Min	C Max	EGU Min	EGU Max	DB
0	IED_ANALOG 0	-2000	2000	-100	100	7
1	IED_ANALOG 1	-2000	2000	100	100	7
2	IED_ANALOG 2	-2000	2000			7
3	IED_ANALOG 3	-2000	2000			7
4	IED_ANALOG 4	-2000	2000			7
5	IED_ANALOG 5	-2000	2000			7
6	IED_ANALOG 6	-2000	2000			7
7	IED_ANALOG 7	-2000	2000		100	7
8	IED_ANALOG 8	-2000	2000	-100	100	7
9	IED_ANALOG 9	-2000	2000	-100	100	7
10	IED_ANALOG 10	-2000	2000	-100	100	7
11	IED_ANALOG 11	-2000	2000	-100	100	7
12	IED_ANALOG 12	-2000	2000	-100	100	7
13	IED_ANALOG 13	-2000	2000	-100	100	7
14	IED_ANALOG 14	-2000	2000	-100	100	7
15	IED_ANALOG 15	-2000	2000	-100	100	7

Cancel Submit

10.3.13 Point

Protocol logical point number. This number cannot be changed.

10.3.14 Name

Enter the name of the point (or accept the default name).

10.3.15 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

10.3.16 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

10.3.17 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

10.3.18 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

10.3.19 DB (Deadband)

Instructs the slave device to set the analog by exception deadband for a specified point, or for all points. The deadband value sent to the IED slave device is in raw counts. Downloading a deadband count of zero would effectively tell the IED to report all analogs. The default deadband count to be downloaded to the IED is 7.

Navigation

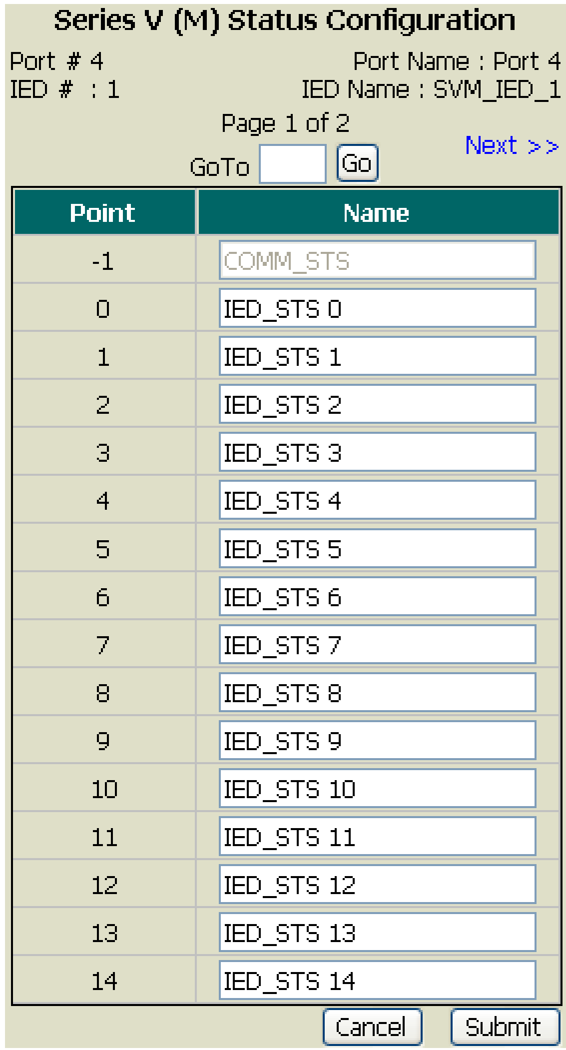
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

10.3.20 IED Status Configuration

From the Series V Master IED Configuration screen, click on Edit for Status. A screen similar to Figure 2-14 will appear.

Figure 10-6 Series V Master Status Input Configuration



10.3.21 Point

Protocol logical point number. This number cannot be changed. The COMM_STS point is automatically assigned to show whether this IED has valid connections.

10.3.22 Name

Enter the name of the point (except for COMM_STS which can not be changed) or accept the default name.

Navigation

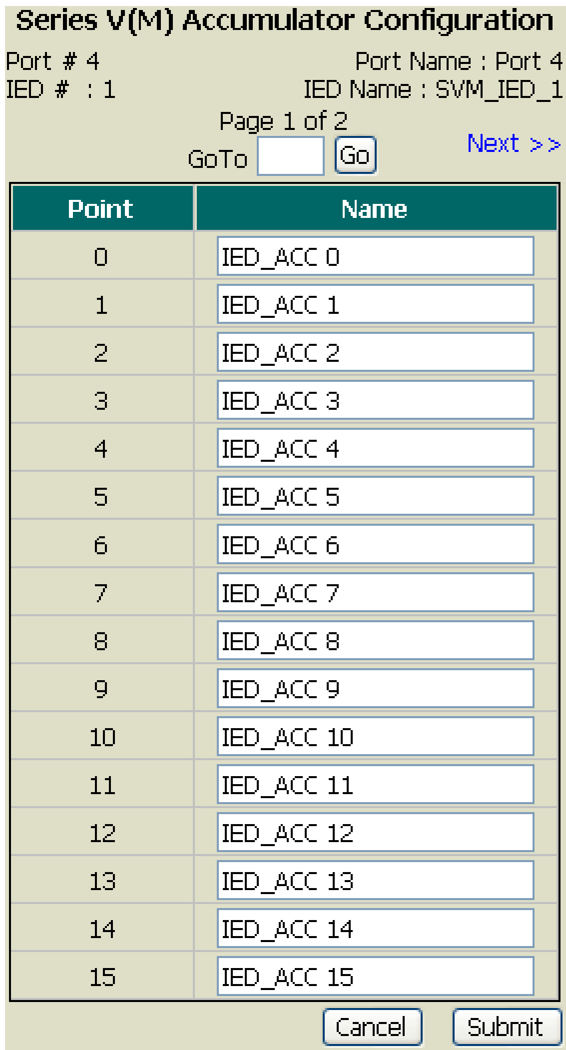
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

10.3.23 IED Accumulators Configuration

From the Series V Master IED Configuration screen, click on Edit for Accumulator Inputs. A screen similar to Figure 2-15 will appear.

Figure 10-7 Series V Master Accumulators Configuration



10.3.24 Point

Protocol logical point number. This number cannot be changed.

10.3.25 Name

Enter the name of the point or accept the default name.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in

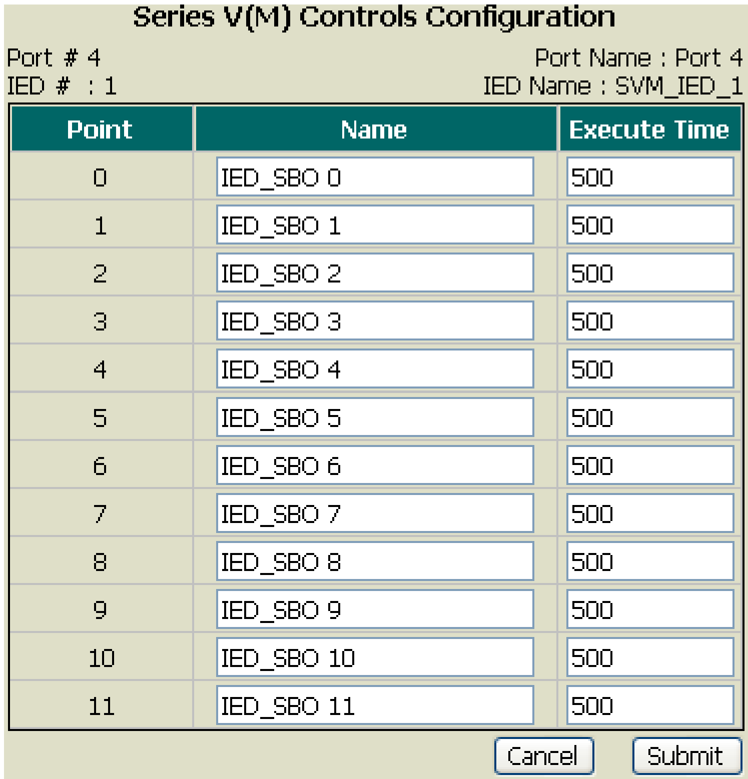
the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

10.3.26 IED Controls Configuration

Click on Edit for SBO Outputs. A screen similar to Figure 2-17 will appear.

Figure 10-8 Series V Master Binary Outputs Configuration



Series V(M) Controls Configuration

Port # 4 Port Name : Port 4
IED # : 1 IED Name : SVM_IED_1

Point	Name	Execute Time
0	IED_SBO 0	500
1	IED_SBO 1	500
2	IED_SBO 2	500
3	IED_SBO 3	500
4	IED_SBO 4	500
5	IED_SBO 5	500
6	IED_SBO 6	500
7	IED_SBO 7	500
8	IED_SBO 8	500
9	IED_SBO 9	500
10	IED_SBO 10	500
11	IED_SBO 11	500

Cancel Submit

10.3.27 Point

Protocol logical point number. This number cannot be changed

10.3.28 Point Name

Enter the name of the point (or accept the default name)

10.3.29 Execute Time

Enter the default Execute Time (or accept the default)

Navigation

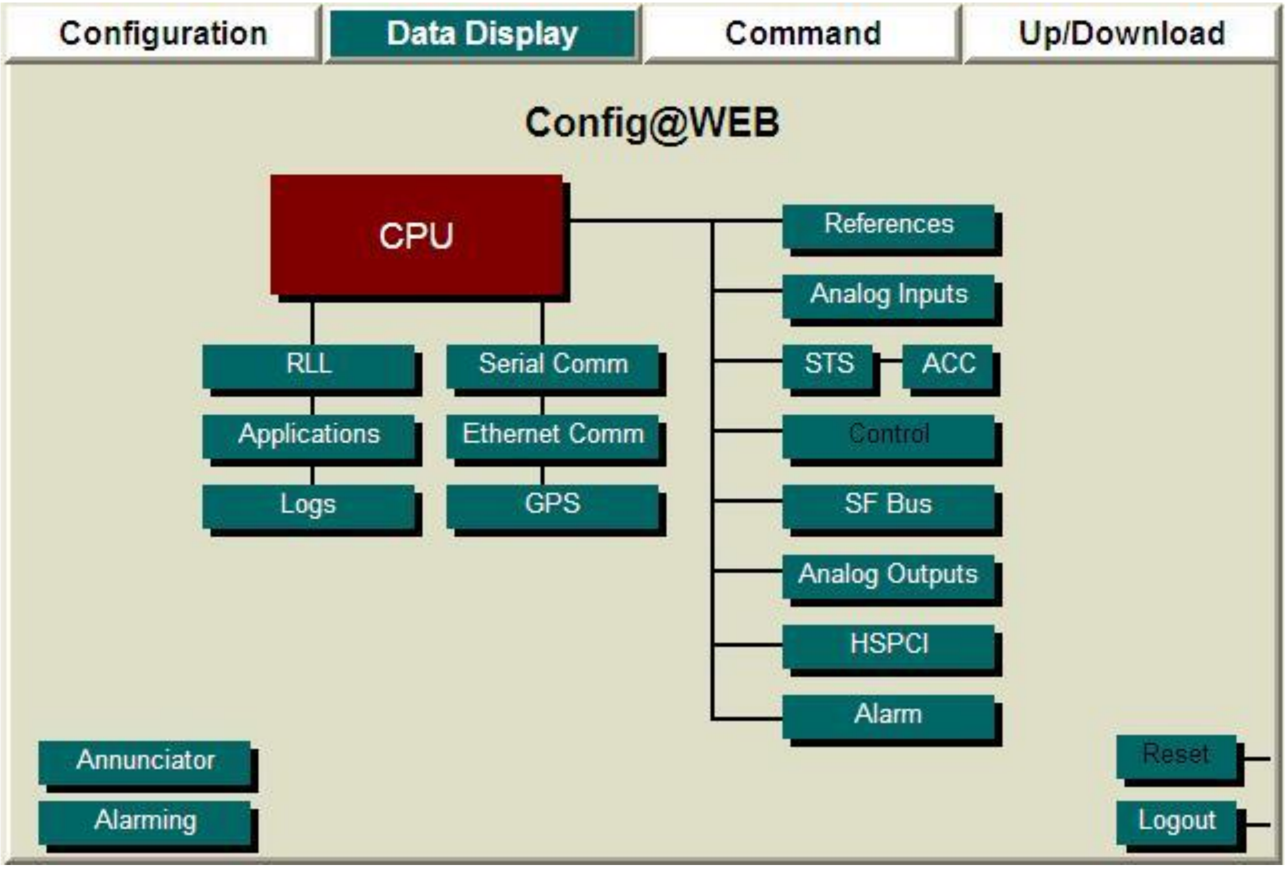
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

10.4 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 10-9 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 10-10 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	RTU to IED	Series V(M)	View	Port Data
Port #2	K	K	Port 2	None	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

10.4.1 Port Number

Physical Port number of the RTU.

10.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

10.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

10.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

10.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

10.4.3 Name

The port name given during configuration or default name accepted.

10.4.4 Protocol

The configured protocol for this port.

10.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

10.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

10.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

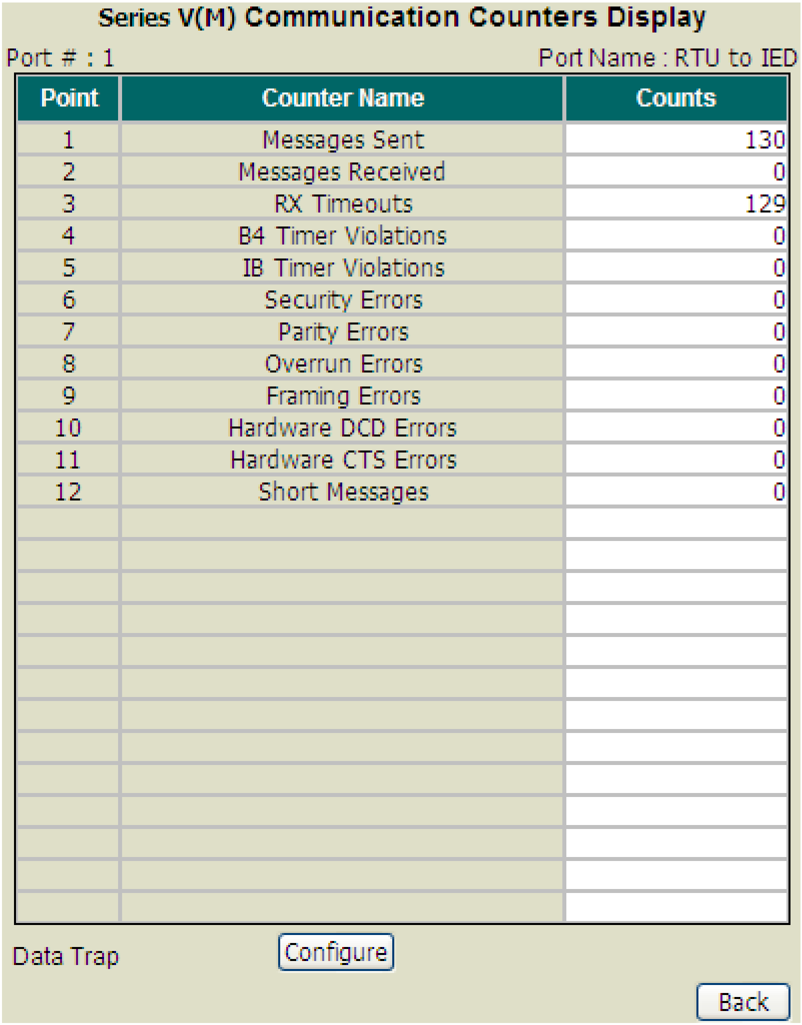
Navigation

Click the Back button to return to the previous screen.

10.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 10-11 Series V Master Communication Counters Display



Point	Counter Name	Counts
1	Messages Sent	130
2	Messages Received	0
3	RX Timeouts	129
4	B4 Timer Violations	0
5	IB Timer Violations	0
6	Security Errors	0
7	Parity Errors	0
8	Overrun Errors	0
9	Framing Errors	0
10	Hardware DCD Errors	0
11	Hardware CTS Errors	0
12	Short Messages	0

10.4.9 Point Number

A logical point number for reference only.

10.4.10 Counter Name

The following counters are monitored:

10.4.10.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

10.4.10.2 Messages Received

This indicates the cumulative number of received messages since the last reset or power-up.

10.4.10.3 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

10.4.10.4 B4 Timer Violations

This indicates the cumulative number of B4 Timer violations. This count can be affected by the setting of the B4 Time in configuration.

10.4.10.5 IB Timer Violations

This indicates the cumulative number of Interbyte timer violations since the last reset or power-up. This count can be affected by the setting of the Interbyte Time in configuration.

10.4.10.6 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

10.4.10.7 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

10.4.10.8 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

10.4.10.9 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

10.4.10.10 Hardware DCD Errors

This indicates the cumulative number of DCD errors since the last reset or power-up.

10.4.10.11 Hardware CTS Errors

This indicates the cumulative number of CTS errors since the last reset or power-up.

10.4.10.12 Short Messages

This indicates the cumulative number of times the IED being scanned returns a “Short Message” or error response since the last reset or power-up.

10.4.11 Counts

The counts for each type of Counter.

10.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

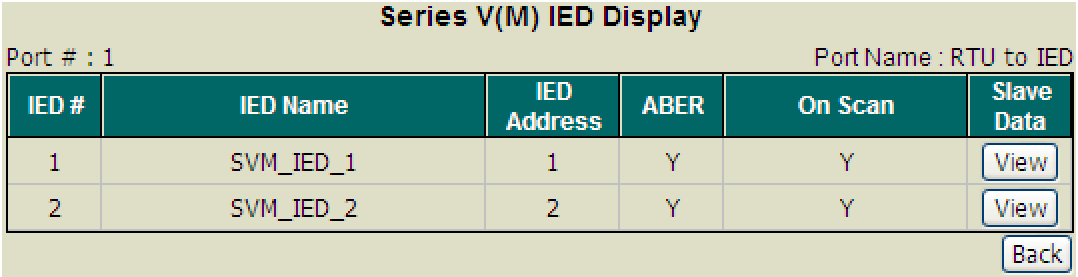
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

10.4.13 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 10-12 Series V Master IED Display


Series V(M) IED Display

Port # : 1 Port Name : RTU to IED

IED #	IED Name	IED Address	ABER	On Scan	Slave Data
1	SVM_IED_1	1	Y	Y	View
2	SVM_IED_2	2	Y	Y	View

Back

10.4.14 IED

The logical number of the IED on this communication channel.

10.4.15 IED Name

The name that was chosen, or accepted as default, during configuration.

10.4.16 IED Address

The IED Address chosen during configuration.

10.4.17 ABER (Analog By Exception Reporting)

Y (Yes) means the Analog By Exception function is ON. N (No) means this function is OFF.

10.4.18 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

10.4.19 Slave Data

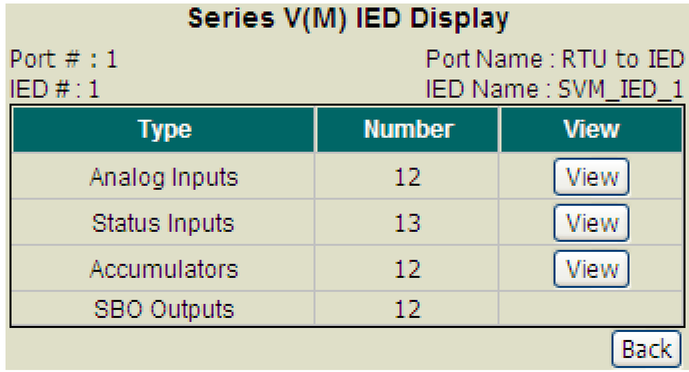
Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 10-13 Series V Master IED Display



10.4.20 Type

The type of point.

10.4.21 Number

The number of points from your IED.

10.4.22 View

Click the View button to view points.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the previous screen.

10.4.22.1 Analog Inputs

From the Series V Master IED Display screen, click View for Analog Inputs to get the screen shown in Figure 2-24.

Figure 10-14 Series V Master Analog Inputs Display

Series V(M) Analog Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : SVM_IED_1

Page1 of 1 Go To [ ] Go

Point	Point Name	Point Status	Point Value	Point Counts
0	IED_ANALOG 0	F	-100.000	0
1	IED_ANALOG 1	F	-100.000	0
2	IED_ANALOG 2	F	-100.000	0
3	IED_ANALOG 3	F	-100.000	0
4	IED_ANALOG 4	F	-100.000	0
5	IED_ANALOG 5	F	-100.000	0
6	IED_ANALOG 6	F	-100.000	0
7	IED_ANALOG 7	F	-100.000	0
8	IED_ANALOG 8	F	-100.000	0
9	IED_ANALOG 9	F	-100.000	0
10	IED_ANALOG 10	F	-100.000	0
11	IED_ANALOG 11	F	-100.000	0
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Back

10.4.23 Point

Protocol logical point number.

10.4.24 Point Name

The name of the point assigned during configuration.

10.4.25 Point Status

Please see the Config@WEB Secure Software Users Guide.

10.4.26 Point Value

The engineering unit (EGU) value.

10.4.27 Point Counts

The counts from the IED.

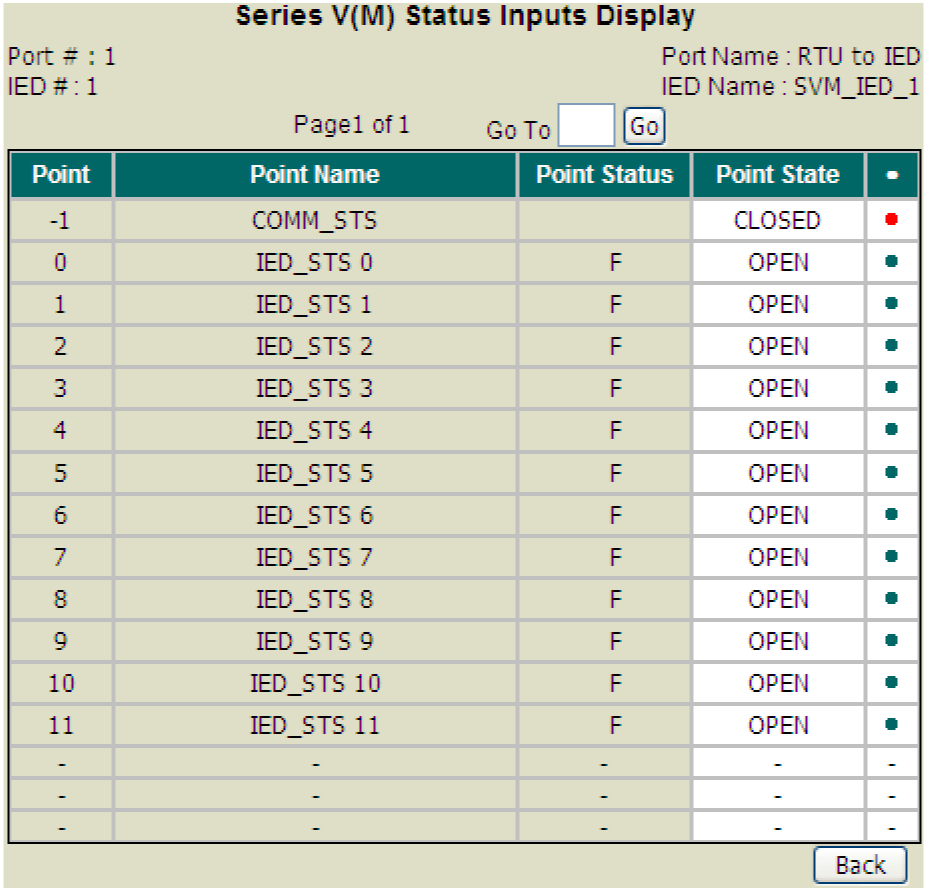
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

10.4.27.1 Status Inputs

From the Series V Master IED Display screen, click View for Status Inputs to get the screen shown in Figure 2-25.

Figure 10-15 Series V Master Status Inputs Display



Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not this IED is in good communications. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

10.4.28 Point

Protocol logical point number.

10.4.29 Point Name

The name of the point assigned during configuration.

10.4.30 Point Status

Please see the Config@WEB Secure Software Users Guide.

10.4.31 Point State

Indicates that point is either OPEN or CLOSED.

10.4.32 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

10.4.32.1 Accumulator Inputs

From the Series V Master IED Display screen, click View for Accumulators to get the screen shown in Figure 2-26.

Figure 10-16 Series V Master Counter Inputs Display

Series V(M) Accumulator Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : SVM_IED_1

Page1 of 1 Go To [ ] Go

Point	Point Name	Point Status	Count
0	IED_ACC 0	F	0
1	IED_ACC 1	F	0
2	IED_ACC 2	F	0
3	IED_ACC 3	F	0
4	IED_ACC 4	F	0
5	IED_ACC 5	F	0
6	IED_ACC 6	F	0
7	IED_ACC 7	F	0
8	IED_ACC 8	F	0
9	IED_ACC 9	F	0
10	IED_ACC 10	F	0
11	IED_ACC 11	F	0
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Back

10.4.33 Point

Protocol logical point number.

10.4.34 Point Name

The name of the point assigned during configuration.

10.4.35 Point Status

Please see the Config@WEB Secure Software Users Guide.

10.4.36 Count

The accumulated count.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

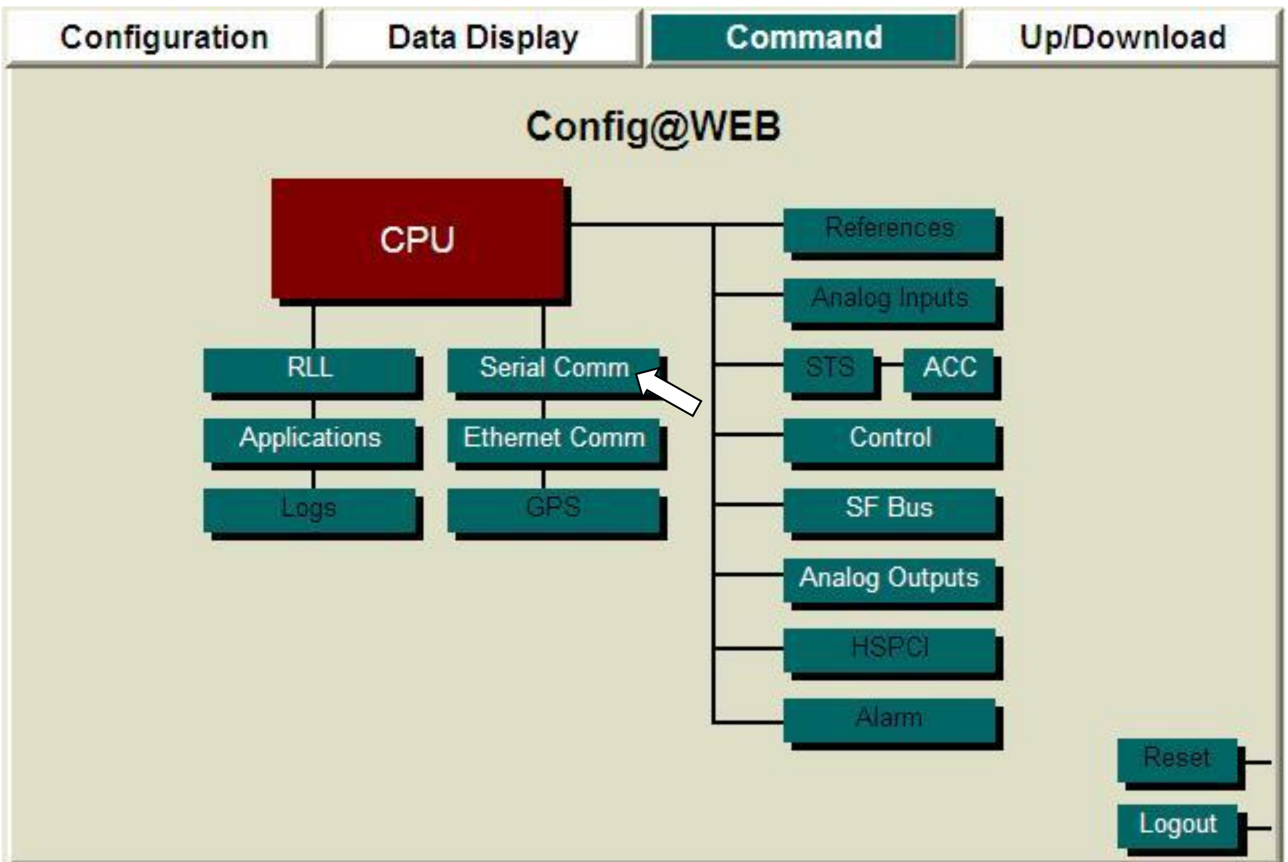
10.4.36.1 SBO Outputs

There is no display for SBO Outputs.

10.5 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 10-17 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2200 manual. Under Command Port Data, click Port Data.

Figure 10-18 Serial Comm Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	RTU to IED	Series V(M)	Port Data	Normal
Port #2	K	K	Port 2	None	Port Data	Normal
Port #3	K	K	Port 3	None	Port Data	Normal
Port #4	K	K	Port 4	None	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button as shown.

Figure 10-19 Series V Master IED Command

Series V(M) IED Command

Port # : 1 Port Name : RTU to IED

IED #	IED Name	IED Address	ABER	On Scan	Slave Data
1	SVM_IED_1	1	Y	Y	Command
2	SVM_IED_2	2	Y	Y	Command

Back

The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command SBO Outputs.

Figure 10-20 Series V Master IED Command

Series V(M) IED Command

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : SVM_IED_1

Type	Number	Command
Analog Inputs	12	
Status Inputs	13	
Accumulators	12	
SBO Outputs	12	Command

Back

Click on the Command button. The resulting screen will look like Figure 10-21 after either a Trip or Close has been selected, then click the Execute button.

Figure 10-21 Series V SBO Outputs Command

Series V(M) SBO Outputs Command

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : SVM_IED_1

Page 1 of 1 GoTo Go

Point	Name	Execute Time (ms)	Point Operations		
0	IED_SBO 0	500	Trip	Close	Execute
1	IED_SBO 1	500	Trip	Close	Execute
2	IED_SBO 2	500	Trip	Close	Execute
3	IED_SBO 3	500	Trip	Close	Execute
4	IED_SBO 4	500	Trip	Close	Execute
5	IED_SBO 5	500	Trip	Close	Execute
6	IED_SBO 6	500	Trip	Close	Execute
7	IED_SBO 7	500	Trip	Close	Execute
8	IED_SBO 8	500	Trip	Close	Execute
9	IED_SBO 9	500	Trip	Close	Execute
10	IED_SBO 10	500	Trip	Close	Execute
11	IED_SBO 11	500	Trip	Close	Execute

Back

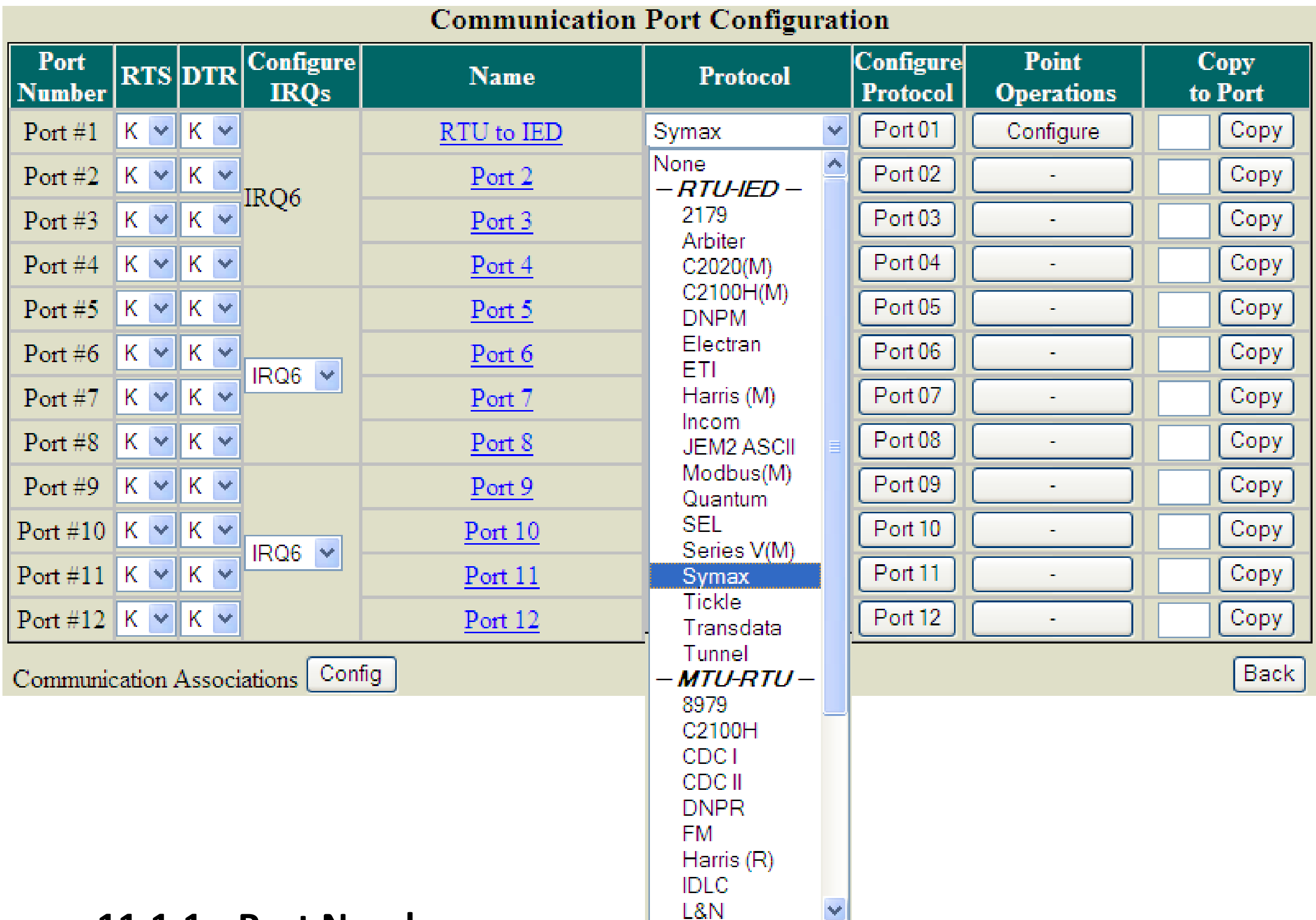
11 Symax

11.1 Serial Comm Port Configuration

Symax is a protocol that communicates between the RTU and an IED.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Symax from the Protocol drop-down menu as shown.

Figure 11-1 Symax Communication Port Configuration



11.1.1 Port Number

Physical Port number of the RTU.

11.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

11.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

11.1.2.2 "H" represents Positive RS232 Voltage.

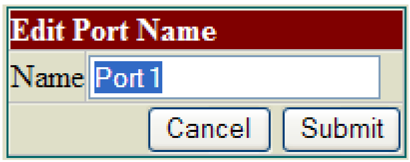
When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

11.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

11.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.



11.1.4 Protocol

From the drop-down list, select the protocol for this port.

11.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

11.1.6 Point Operations

Click this button to assign points.

11.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

11.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

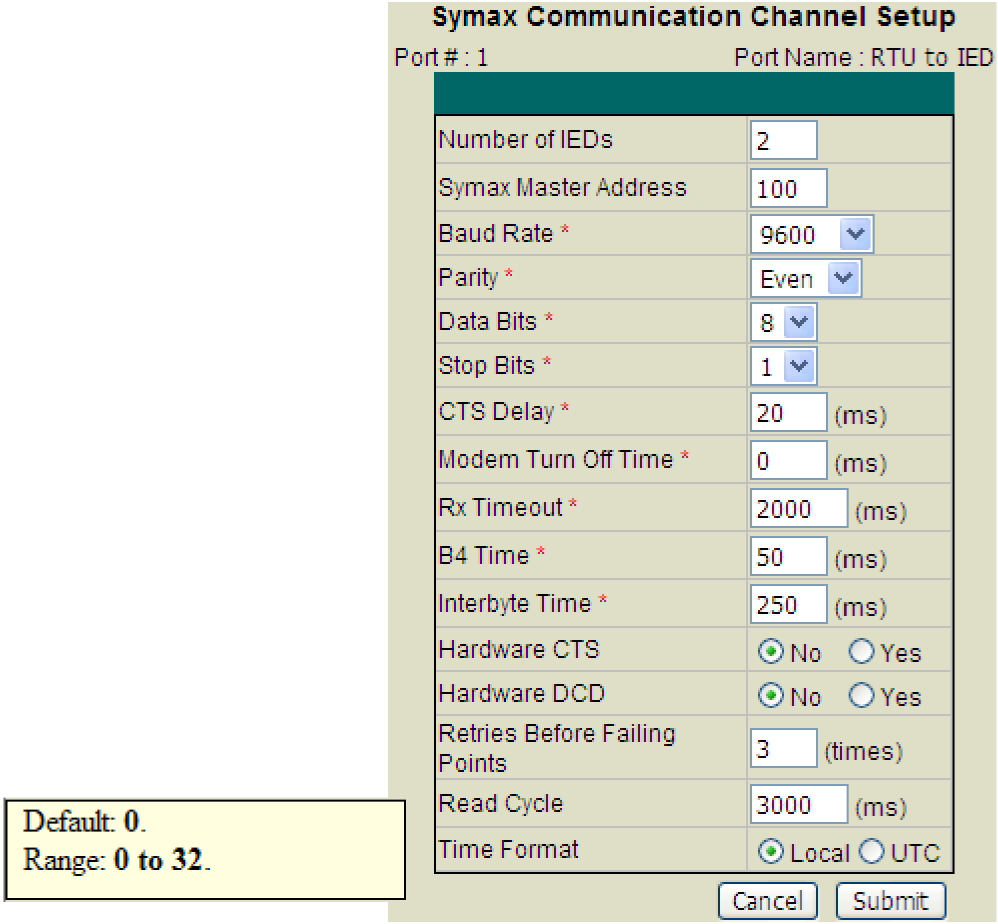
Navigation

Click the Back button to return to the previous screen.

11.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n* to configure the Symax port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 11-2 Symax Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

11.2.1 Number of IEDs (0-32)

Enter the number of IEDs on the port. The default setting is 0.

11.2.2 Symax Master Address (0 - 199)

Enter the Symax Master address. Since Symax is designed for network communications, multiple masters are allowed in the same network. The default is 100.

11.2.3 Baud Rate (300-19200)

From the drop-down menu, select the baud rate. The default setting is 9600.

11.2.4 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is Even.

11.2.5 Data Bits (5,6,7,8)

From the drop-down menu, select the data bits for the associated channel. The default setting is 8.

11.2.6 Stop Bits (0,1,2)

From the drop-down menu, select the stop bits for the associated channel. The default setting is 1.

11.2.7 CTS Delay (0 – 1000ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 20.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

11.2.8 Modem Turn Off Time (0 – 250ms)

Enter the delay time that the modem will maintain the carrier after the last data byte has been transmitted. Default setting is 0.

11.2.9 Rx Timeout (0 – 30,000 msec)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 2000 msec.

11.2.10 B4 Time (0 – 250ms)

Enter the B4 time for the associated channel. The B4 time is the length of quiet time required on the channel following a transmission from the RTU prior to turning on the RTU's receive interrupts. Default setting 50.

11.2.11 Interbyte Time (0 – 250ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 250 msec.

11.2.12 Hardware CTS (No, Yes)

If the hardware Clear-To-Send option is selected for a channel, then data bytes will not be transmitted unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. Default setting is No.

11.2.13 Hardware DCD (No, Yes)

If the hardware data carrier detect option is selected for a channel, then the channel communications driver will accept message data bytes only if carrier is detected. If carrier is not detected, the data bytes are discarded. Default setting is No.

11.2.14 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

11.2.15 Read Cycle (0 – 90,000ms)

This is the base time at which data scanning from Symax IEDs takes place. All data scanning will be in multiples of this value. Analogs and Accumulators are set up in multiples of cycles on a per point basis to be scanned. The default is 3000.

Please note: No configuration changes take effect until the RTU is reset.

11.2.16 Time Format (Local, UTC)

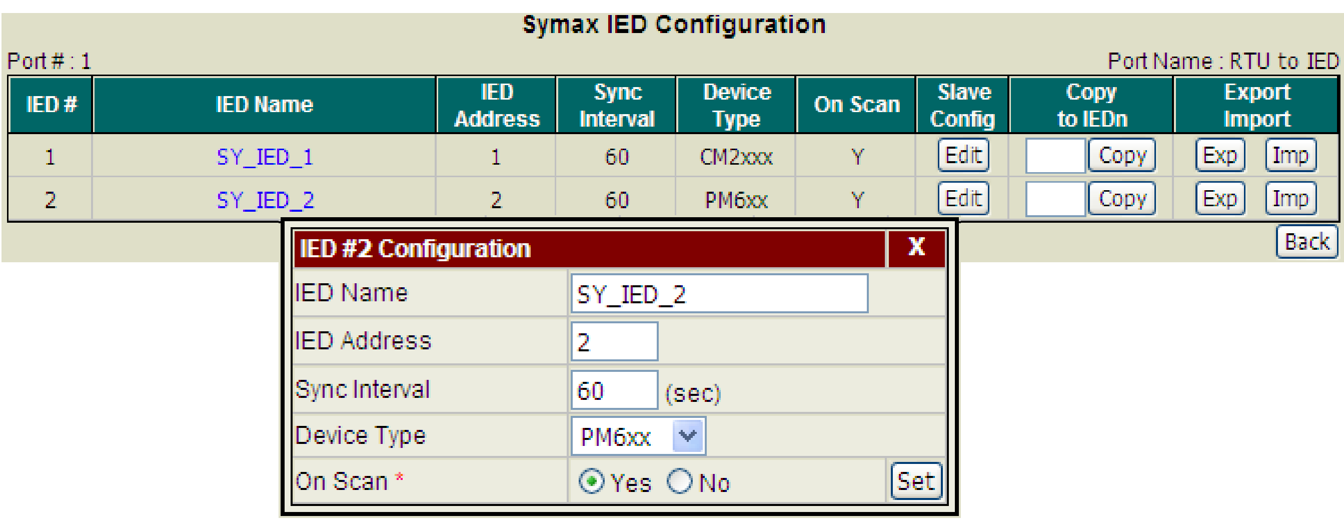
Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regards to time syncs, set Time Format to Local Time. See Time Configuration Settings in the Configuration chapter of the hardware manual for time settings under the CPU block.

If you want to send time synchronization to this device, you must know whether the device will accept Local time or UTC time, then set this radio button to match.

11.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 11-3 IED Configuration



IED #	IED Name	IED Address	Sync Interval	Device Type	On Scan	Slave Config	Copy to IEDn	Export Import
1	SY_IED_1	1	60	CM2xxx	Y	Edit	Copy	Exp Imp
2	SY_IED_2	2	60	PM6xx	Y	Edit	Copy	Exp Imp

11.3.1 IED

The logical number of the IED on this communication channel.

11.3.2 IED Name

Click on the IED Name. A pop-up window called **IED Configuration** will appear, as shown above.

11.3.2.1 IED Name

The name of the IED. Type in a name, or accept the default.

11.3.2.2 IED Address

The address of the IED. Type in an address, or accept the default.

11.3.2.3 Sync Interval

The time interval in seconds at which the RTU will sync the Symax IEDs. Accept the default time or enter a new time.

11.3.2.4 Device Type

Select either CM2xxx or PM6xx as the Symax Device Type. Since there are protocol differences between these two Symax devices, it is necessary to define to the RTU which device it is scanning.

11.3.2.5 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled.

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

11.3.2.6 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

11.3.3 IED Address

Reflects the entry in the pop-up menu. See above.

11.3.4 Sync Interval

The time interval at which the RTU will sync the Symax IED. See above.

11.3.5 Device Type

Reflects either CM2xxx or PM6xx. See above.

11.3.6 On Scan

Reflects the entry in the pop-up menu. See above.

11.3.7 Slave Config

Click the Edit button to edit the IED points.

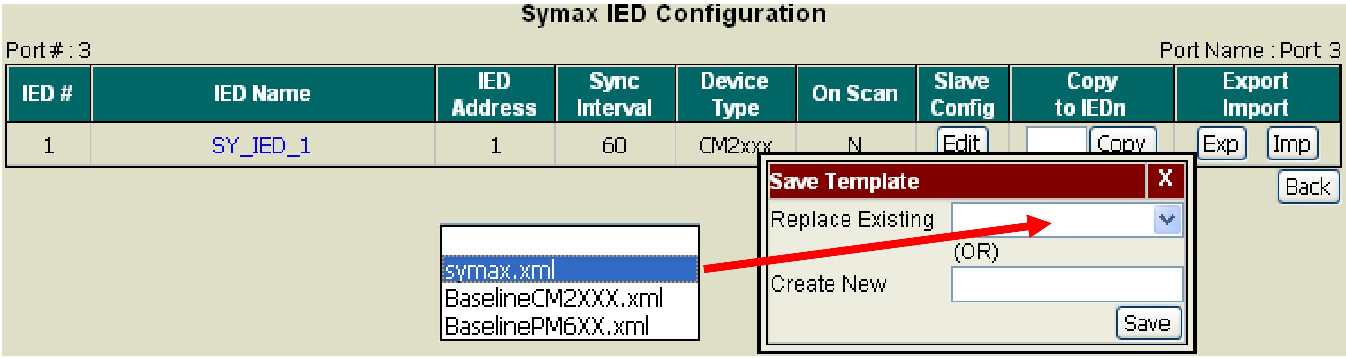
11.3.8 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

11.3.9 Export

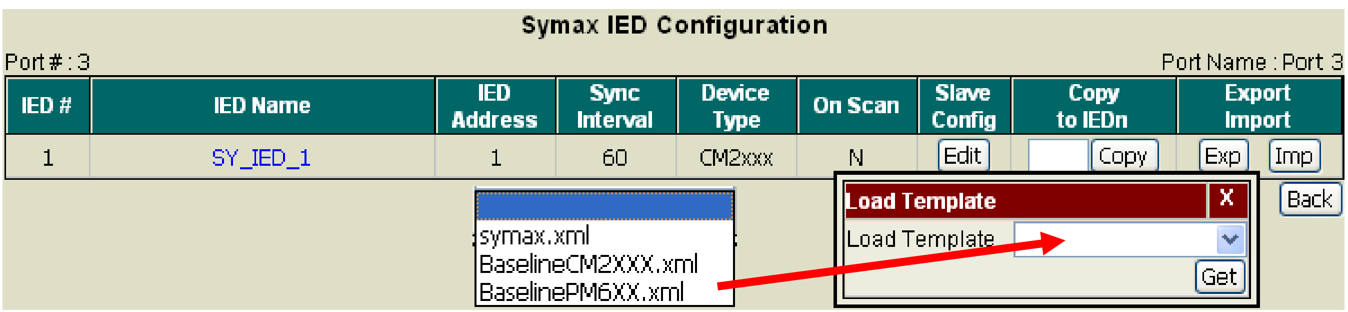
The Exp button exports a configuration in xml format from the IED to the RTU as a template. The templates are protocol/IED specific. This template is stored in the RTU. When you choose Up/Download tab and click on "Get" (get files from RTU), you will transfer these templates to your PC.

Choose from one of the existing file types (if present), or create a new xml file type. Click Save after your selection.



11.3.10 Import

The Imp button imports a configuration in xml format as shown below. Choose from one of the existing file types (if present) shown in the pull-down menu. If a new file type has been created under Export, that file type will also show up in the pull-down menu. When you set up another RTU, choose the Up/Download tab and click "Send" (send files to RTU), the template you save in the first RTU will be downloaded to the second RTU. Click Get after your selection below.



Navigation

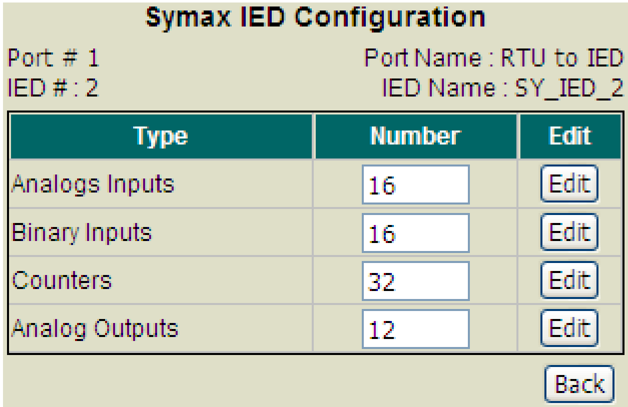
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

11.3.10.1 Slave Configuration Edit

11.3.11 Slave Config

Click Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 11-4 IED Configuration



11.3.12 Type

The type of point.

11.3.13 Number

Enter the number of points from your IED.

11.3.14 Edit

Click the Edit button to edit points.

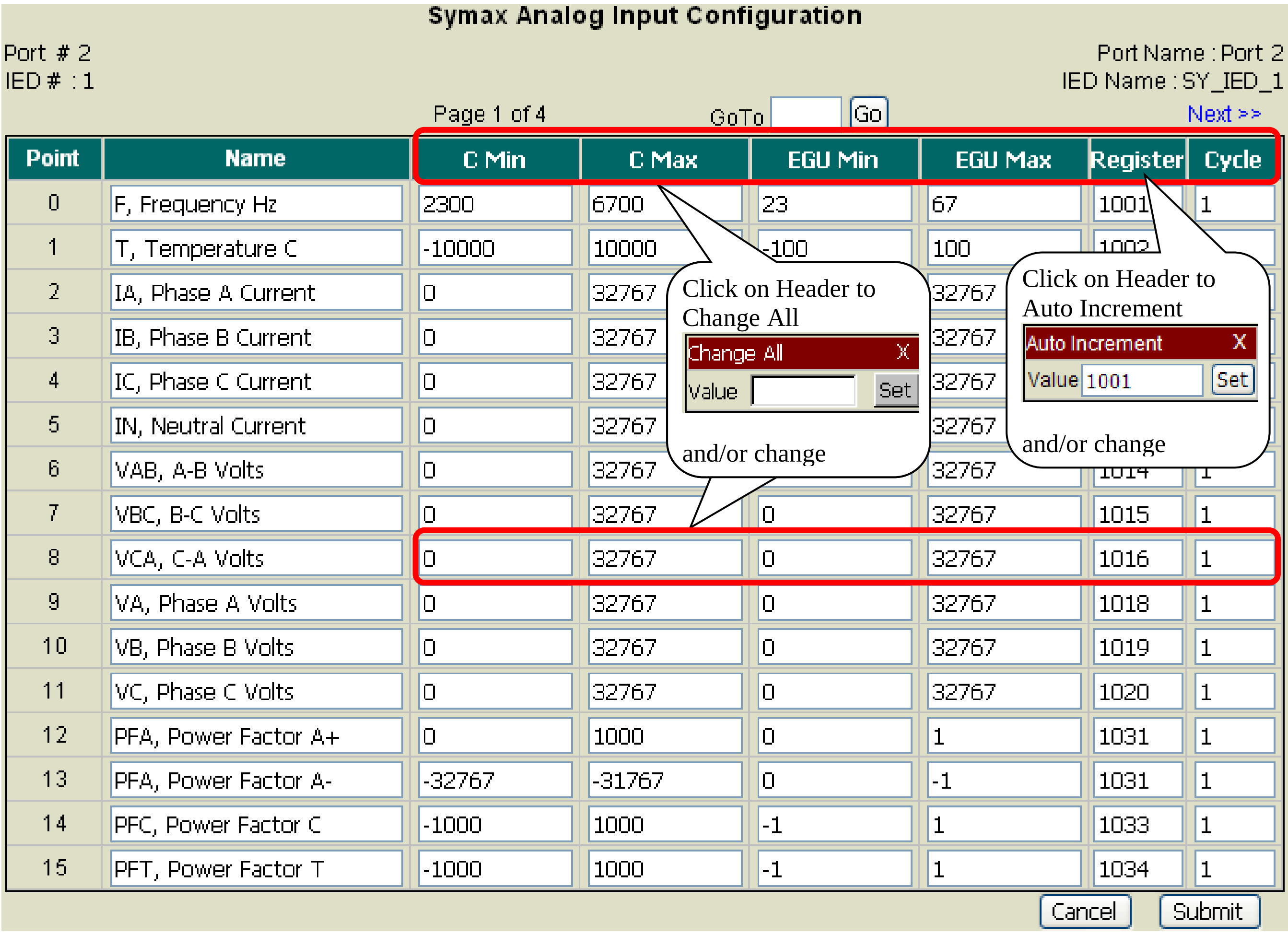
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

11.3.15 IED Analog Configuration

From the Symax IED Configuration screen, click on Edit for Analog Inputs. A screen similar to Figure 2-13 will appear.

Figure 11-5 Symax Analog Input Configuration



Point	Name	C Min	C Max	EGU Min	EGU Max	Register	Cycle
0	F, Frequency Hz	2300	6700	23	67	1001	1
1	T, Temperature C	-10000	10000	-100	100	1002	
2	IA, Phase A Current	0	32767		32767		
3	IB, Phase B Current	0	32767		32767		
4	IC, Phase C Current	0	32767		32767		
5	IN, Neutral Current	0	32767		32767		
6	VAB, A-B Volts	0	32767		32767	1014	1
7	VBC, B-C Volts	0	32767	0	32767	1015	1
8	VCA, C-A Volts	0	32767	0	32767	1016	1
9	VA, Phase A Volts	0	32767	0	32767	1018	1
10	VB, Phase B Volts	0	32767	0	32767	1019	1
11	VC, Phase C Volts	0	32767	0	32767	1020	1
12	PFA, Power Factor A+	0	1000	0	1	1031	1
13	PFA, Power Factor A-	-32767	-31767	0	-1	1031	1
14	PFC, Power Factor C	-1000	1000	-1	1	1033	1
15	PFT, Power Factor T	-1000	1000	-1	1	1034	1

11.3.16 Point

Protocol logical point number. This number cannot be changed.

11.3.17 Name

Enter the name of the point (or accept the default name).

11.3.18 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

11.3.19 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

11.3.20 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

11.3.21 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

11.3.22 Register

Enter the Symax register number associated with the point to be scanned as defined in the IEDs' users manual.

11.3.23 Cycle

Enter the value to be multiplied by the Read cycle to define how often each point is to be scanned.

Navigation

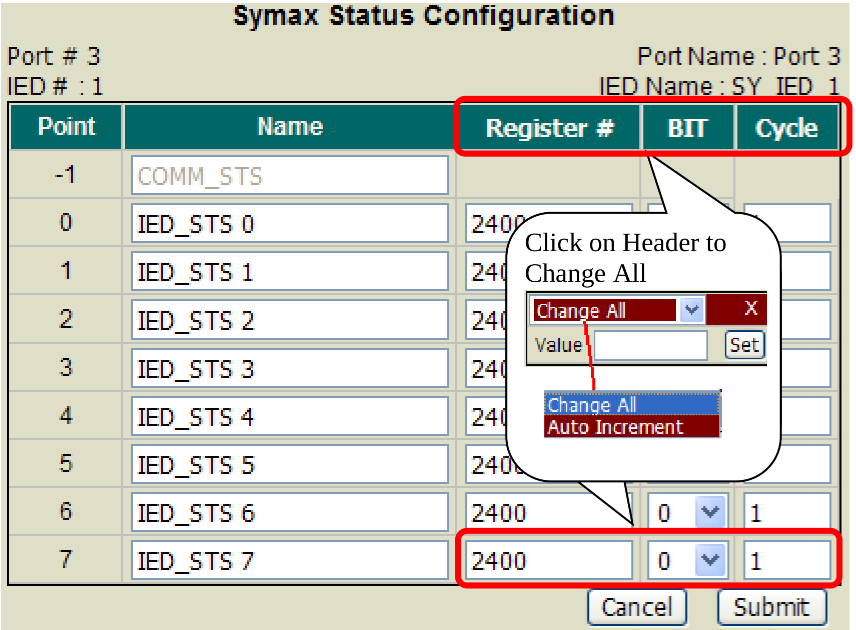
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

11.3.24 IED Status Configuration

From the Symax IED Configuration screen, click on Edit for Status Inputs. A screen similar to the one below will appear

Figure 11-6 Symax Status Input Configuration



11.3.25 Point

Protocol logical point number. This number cannot be changed. The COMM_STS point is automatically assigned to show whether this IED has valid connections.

11.3.26 Name

Enter the name of the point (except for COMM_STS which can not be changed) or accept the default name.

11.3.27 Register

Enter the Symax register number associated with the point to be scanned as defined in the IEDs' users manual.

11.3.28 BIT

Select the BIT (0-15) from the defined register to be read into the RTU as a status point.

11.3.29 Cycle

Enter the value to be multiplied by the Read cycle to define how often each point is to be scanned.

Navigation

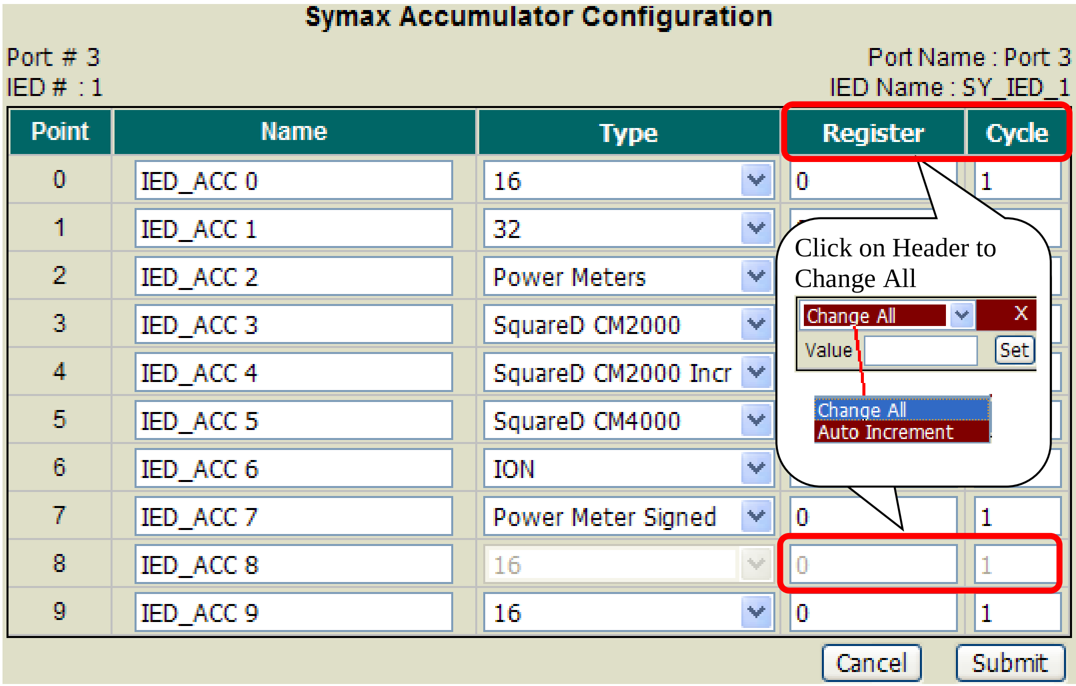
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

11.3.30 IED Accumulators Configuration

From the Symax IED Configuration screen, click on Edit for Accumulator Inputs. A screen similar to Figure 2-15 will appear.

Figure 11-7 Symax Accumulators Configuration



11.3.31 Point

Protocol logical point number. This number cannot be changed.

11.3.32 Name

Enter the name of the point or accept the default name.

11.3.33 Type

Select the accumulator type from the drop–down menu. Examples of the types are shown above. All entries in this column may be changed at once by clicking on the header.

11.3.33.1 16

16-bit binary counter in one Modbus register

11.3.33.2 32

32-bit binary counter in two successive ModBus registers, first register treated as containing the high-order 16 bits. Selecting 32 bits will cause the protocol to combine the value from the next logical register with that of the current register value. I.e., If you configure point 1 to be a 32 bit point, the RTU will poll the IED for registers 1 and 2 and combine their values to create 1 32 bit number. Point 2 then should be configured to get register number 3 instead of register 2.

11.3.33.3 Power Meters, Square D CM2000, Square D CM2000 Incr., Square D CM4000

All counters are treated as three 16-bit registers. The two bytes of each register are reversed. First register is divided by 1000 to convert from watts to kilowatts. The second register is multiplied by

1000 and added to the first. The third register is multiplied by 100,000 and added to the previous result. The resulting value runs from 0 to 999,999,999 kilowatts.

11.3.33.4 ION

ABB ION meter accumulators are received in two registers. The first register is multiplied by 10,000 and added to the second register. Counters run from 0 to 99,999,999.

11.3.33.5 Power Meter Signed

By setting for this Type, the protocol will accept signed counters. That is, In signed mode, the power meter IED considers the direction of power flow, allowing the accumulated energy magnitude to both increase and decrease.

11.3.34 Register

Enter the Symax register number associated with the point to be scanned as defined in the IEDs' users manual.

11.3.35 Cycle

Enter the value to be multiplied by the Read cycle to define how often each point is to be scanned.

Navigation

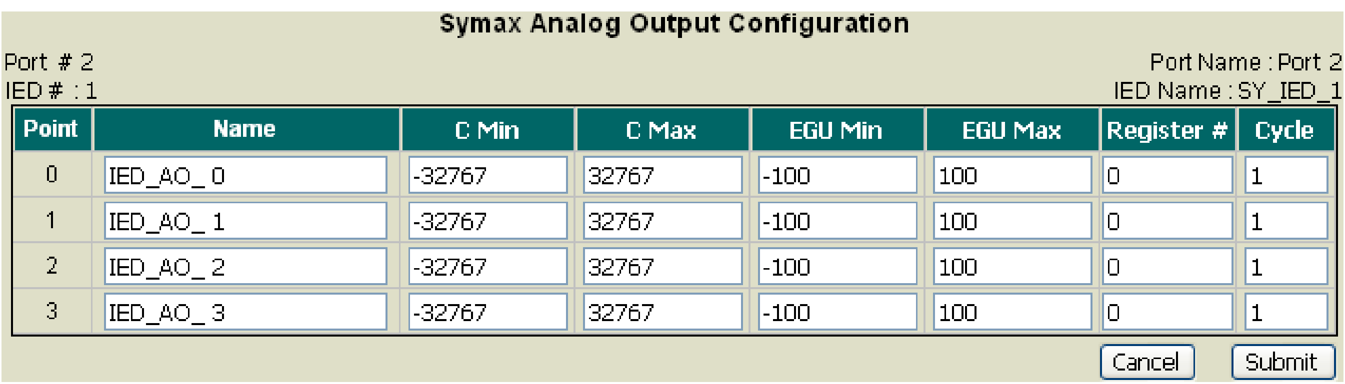
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

11.3.36 Analog Outputs

From the Symax IED Configuration screen, click on Edit for Analog Outputs. A screen similar to the one below will appear.

Figure 11-8 Symax Analog Output Configuration



Symax Analog Output Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : SY_IED_1

Point	Name	C Min	C Max	EGU Min	EGU Max	Register #	Cycle
0	IED_AO_ 0	-32767	32767	-100	100	0	1
1	IED_AO_ 1	-32767	32767	-100	100	0	1
2	IED_AO_ 2	-32767	32767	-100	100	0	1
3	IED_AO_ 3	-32767	32767	-100	100	0	1

Cancel Submit

11.3.37 Point

Protocol logical point number. This number cannot be changed

11.3.38 Name

Enter the name of the point (or accept the default name)

11.3.39 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header

11.3.40 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header

11.3.41 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header

11.3.42 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header

11.3.43 Register

Enter the Symax register number associated with the point to be scanned as defined in the IEDs' users manual.

11.3.44 Cycle

Enter the value to be multiplied by the Read cycle to define how often each point is to be scanned.

Navigation

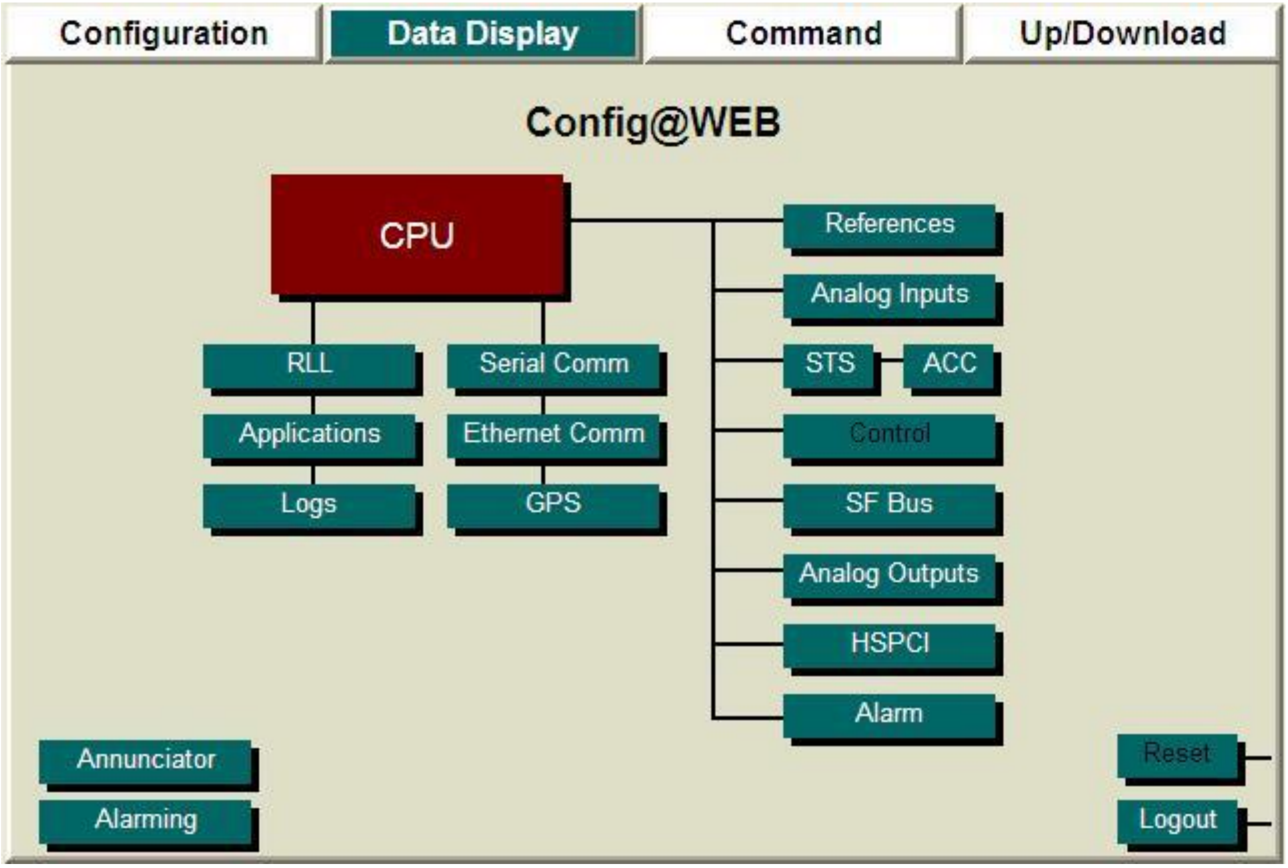
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

11.4 Data Display

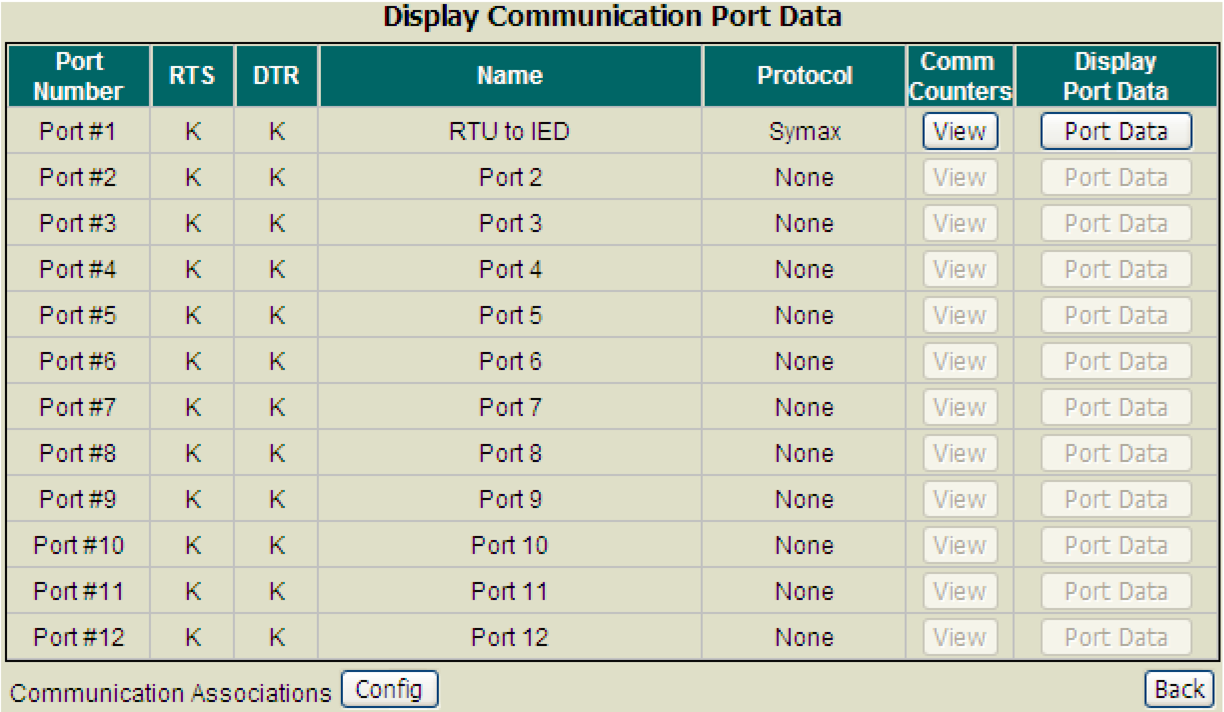
Click the Data Display tab as shown in Figure 2-18.

Figure 11-9 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 11-10 Display Communication Port Data



Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	RTU to IED	Symax	View	Port Data
Port #2	K	K	Port 2	None	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

11.4.1 Port Number

Physical Port number of the RTU.

11.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

11.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

11.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

11.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

11.4.3 Name

The port name given during configuration or default name accepted.

11.4.4 Protocol

The configured protocol for this port.

11.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

11.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

11.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

11.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 11-11 Symax Communication Counters Display

Symax Communication Counters Display

Port # : 4 Port Name : Port 4

Point	Counter Name	Counts
1	Messages Sent	0
2	Good Replies	0
3	No Reply/Timeout	0
4	Checksum Errors	0
5	Framing Errors	0
6	Overrun Errors	0
7	Parity Errors	0
8	Bad Replies	0
9	Write Failures	0
10	IB Timer Violations	0
11	Device Busy	0
12	Hardware DCD Errors	0
13	Hardware CTS Errors	0

Data Trap [Configure]

IED Comm Counters [View]

Reset Comm Counters [Reset]

[Back]

11.4.9 Point Number

A logical point number for reference only.

11.4.10 Counter Name

The following counters are monitored:

11.4.10.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

11.4.10.2 Good Replies

This indicates the cumulative number of good replies since the last reset or power-up.

11.4.10.3 No Replies/Timeout

This indicates the cumulative number of no replies or timeouts since the last reset or power-up.

11.4.10.4 Checksum Errors

This indicates the cumulative number of Checksum Errors since the last reset or power-up.

11.4.10.5 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

11.4.10.6 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

11.4.10.7 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

11.4.10.8 Bad Replies

This indicates the cumulative number of Bad Replies since the last reset or power-up.

11.4.10.9 Write Failures

This indicates the cumulative number of Write Failures since the last reset or power-up.

11.4.10.10 IB Timer Violations

This indicates the cumulative number of Interbyte timer violations since the last reset or power-up. This count can be affected by the setting of the Interbyte Time in configuration.

11.4.10.11 Device Busy

This indicates the cumulative number of times the IED was too busy to reply since the last reset or power-up.

11.4.10.12 Hardware DCD Errors

This indicates the cumulative number of DCD errors since the last reset or power-up.

11.4.10.13 Hardware CTS Errors

This indicates the cumulative number of CTS errors since the last reset or power-up.

11.4.11 Counts

The counts for each type of Counter.

11.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

11.4.13 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

Symax IED Comm Counters Display

Port # : 1 Port Name : Port 1

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts	Security Errors	Framing Errors	Overrun Errors	Parity Errors
1	SY_IED_1	0	0	0	0	0	0	0	0
2	SY_IED_2	0	0	0	0	0	0	0	0

Done

11.4.13.1 IED
The number of the IED

11.4.13.2 IED Name
The name of the IED

11.4.13.3 Messages Sent
Messages sent to this IED since the last reset or since the last time the counters were cleared.

11.4.13.4 Valid Replies
Valid messages received from this IED since the last reset or since the last time the counters were cleared.

11.4.13.5 No Replies
The number of no replies from this IED since the last reset or since the last time the counters were cleared.

11.4.13.6 Timeouts
The number of timeouts from this IED since the last reset or since the last time the counters were cleared.

11.4.13.7 Security Errors
The number of security errors from this IED since the last reset or since the last time the counters were cleared.

11.4.13.8 Framing Errors
The number of framing errors from this IED since the last reset or since the last time the counters were cleared.

11.4.13.9 Overrun Errors
The number of overrun errors from this IED since the last reset or since the last time the counters were cleared.

11.4.13.10 Parity Errors
The number of parity errors from this IED since the last reset or since the last time the counters were cleared.

11.4.14 Reset Comm Counters
Click this button to reset all comm. counters.

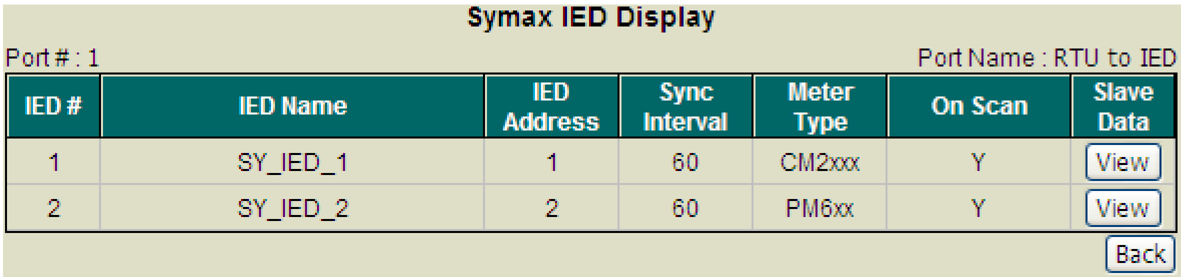
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

11.4.15 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 11-12 Symax IED Display



11.4.16 IED

The logical number of the IED on this communication channel.

11.4.17 IED Name

The name that was chosen, or accepted as default, during configuration.

11.4.18 IED Address

The IED Address chosen during configuration.

11.4.19 Sync Interval

The time interval in seconds at which the RTU will time-sync the Symax IED.

11.4.20 Meter Type

Reflects either CM2xxx or PM6xx.

11.4.21 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

11.4.22 Slave Data

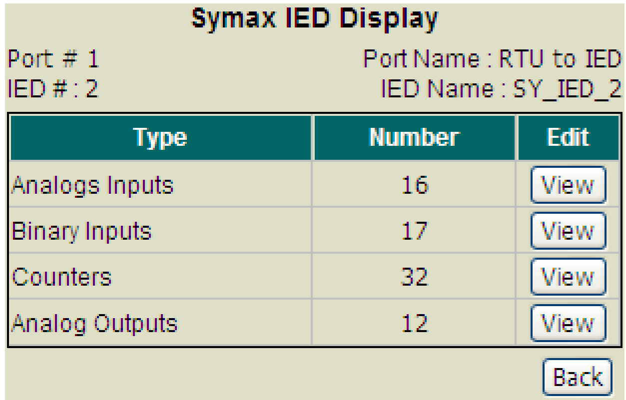
Click View to examine the data being returned from this device.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 11-13 Symax IED Display



11.4.23 Type

The type of point.

11.4.24 Number

The number of points from your IED.

11.4.25 View

Click the View button to view points.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the previous screen.

11.4.25.1 Analog Inputs

From the Symax IED Display screen, click View for Analog Inputs to get the screen shown in Figure 2-24.

Figure 11-14 Symax Analog Inputs Display

Symax Analog Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : SY_IED_1

Page1 of 1 Go To [ ] Go

Point	Reg	Point Name	Point Status	Point Value	Point Counts
0	1	IED_ANALOG 0	F	-100.000	-32767
1	2	IED_ANALOG 1	F	-100.000	-32767
2	3	IED_ANALOG 2	F	-100.000	-32767
3	4	IED_ANALOG 3	F	-100.000	-32767
4	5	IED_ANALOG 4	F	-100.000	-32767
5	6	IED_ANALOG 5	F	-100.000	-32767
6	7	IED_ANALOG 6	F	-100.000	-32767
7	8	IED_ANALOG 7	F	-100.000	-32767
8	9	IED_ANALOG 8	F	-100.000	-32767
9	10	IED_ANALOG 9	F	-100.000	-32767
10	11	IED_ANALOG 10	F	-100.000	-32767
11	12	IED_ANALOG 11	F	-100.000	-32767
12	13	IED_ANALOG 12	F	-100.000	-32767
13	14	IED_ANALOG 13	F	-100.000	-32767
14	15	IED_ANALOG 14	F	-100.000	-32767
15	16	IED_ANALOG 15	F	-100.000	-32767

Back

11.4.26 Point

Protocol logical point number.

11.4.27 Reg

Reflects the register chosen during Configuration.

11.4.28 Point Name

The name of the point assigned during configuration.

11.4.29 Point State

Please see the Config@WEB Secure Software Users Guide.

11.4.30 Point Value

The engineering unit (EGU) value.

11.4.31 Point Counts

The counts from the IED.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are

on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

11.4.31.1 Status Inputs

From the Symax IED Display screen, click View for Status Inputs to get the screen shown in Figure 2-25.

Figure 11-15 Symax Status Inputs Display

Symax Status Inputs Display

Port # : 1 — Port Name : RTU to IED
IED # : 1 — IED Name : SY_IED_1

Page1 of 2 Go To [ ] Go Next>>

Point	Reg	Bit	Point Name	Point Status	Point State	
-1	-1	0	COMM_STS		CLOSE	
0	2400	1	IED_STS 0	F	OPEN	
1	2400	6	IED_STS 1	F	OPEN	
2	2400	2	IED_STS 2	F	OPEN	
3	2400	1	IED_STS 3	F	OPEN	
4	2400	0	IED_STS 4	F	OPEN	
5	2400	0	IED_STS 5	F	OPEN	
6	2400	0	IED_STS 6	F	OPEN	
7	2400	0	IED_STS 7	F	OPEN	
8	2400	0	IED_STS 8	F	OPEN	
9	2400	0	IED_STS 9	F	OPEN	
10	2400	0	IED_STS 10	F	OPEN	
11	2400	0	IED_STS 11	F	OPEN	
12	2400	0	IED_STS 12	F	OPEN	
13	2400	0	IED_STS 13	F	OPEN	
14	2400	0	IED_STS 14	F	OPEN	

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not this IED is in good communications. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

11.4.32 Point

Protocol logical point number.

11.4.33 Reg

Reflects the register chosen during Configuration.

11.4.34 Bit

Reflects the Bit chosen during Configuration.

11.4.35 Point Name

The name of the point assigned during configuration.

11.4.36 Point State

Please see the Config@WEB Secure Software Users Guide.

11.4.37 Point State

Indicates that point is either OPEN or CLOSED.

11.4.38 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

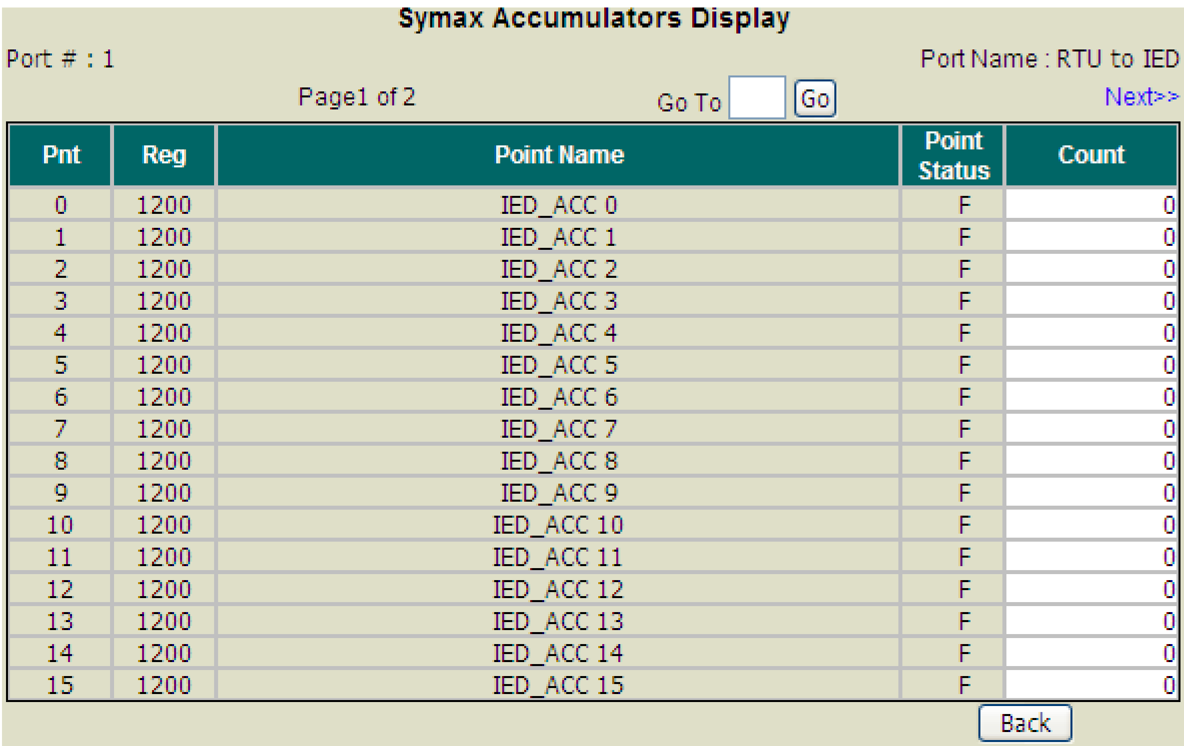
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

11.4.38.1 Accumulator Inputs

From the Symax IED Display screen, click View for Accumulators to get the screen shown in Figure 2-26.

Figure 11-16 Symax Counter Inputs Display



Symax Accumulators Display

Port # : 1 Port Name : RTU to IED

Page1 of 2 Go To Go Next>>

Pnt	Reg	Point Name	Point Status	Count
0	1200	IED_ACC 0	F	0
1	1200	IED_ACC 1	F	0
2	1200	IED_ACC 2	F	0
3	1200	IED_ACC 3	F	0
4	1200	IED_ACC 4	F	0
5	1200	IED_ACC 5	F	0
6	1200	IED_ACC 6	F	0
7	1200	IED_ACC 7	F	0
8	1200	IED_ACC 8	F	0
9	1200	IED_ACC 9	F	0
10	1200	IED_ACC 10	F	0
11	1200	IED_ACC 11	F	0
12	1200	IED_ACC 12	F	0
13	1200	IED_ACC 13	F	0
14	1200	IED_ACC 14	F	0
15	1200	IED_ACC 15	F	0

Back

11.4.39 Pnt

Protocol logical point number.

11.4.40 Reg

Reflects the register chosen during Configuration.

11.4.41 Point Name

The name of the point assigned during configuration.

11.4.42 Point State

Please see the Config@WEB Secure Software Users Guide.

11.4.43 Count

The accumulated count.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

11.4.43.1 Analog Outputs

From the Symax IED Display screen, click View for Analog Outputs to get the screen shown below.

Symax Analog Outputs Display

Port # : 1 Port Name : RTU to IED

Page1 of 1 Go To [ ] Go

Pnt	Reg	Point Name	Point Status	Point Value	Point Counts
0	1800	IED_AO_ 0		-100.000	0
1	1801	IED_AO_ 1		-100.000	0
2	1802	IED_AO_ 2		-100.000	0
3	1803	IED_AO_ 3		-100.000	0
4	1804	IED_AO_ 4		-100.000	0
5	1805	IED_AO_ 5		-100.000	0
6	1806	IED_AO_ 6		-100.000	0
7	1807	IED_AO_ 7		-100.000	0
8	1808	IED_AO_ 8		-100.000	0
9	1809	IED_AO_ 9		-100.000	0
10	1810	IED_AO_ 10		-100.000	0
11	1811	IED_AO_ 11		-100.000	0
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Back

11.4.44 Point

Protocol logical point number.

11.4.45 Reg

Reflects the register chosen during Configuration.

11.4.46 Point Name

The name of the point assigned during configuration.

11.4.47 Point State

Please see the Config@WEB Secure Software Users Guide.

11.4.48 Point Value

The engineering unit (EGU) value.

11.4.49 Point Counts

The number of counts.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

12 L&N C2100H Master

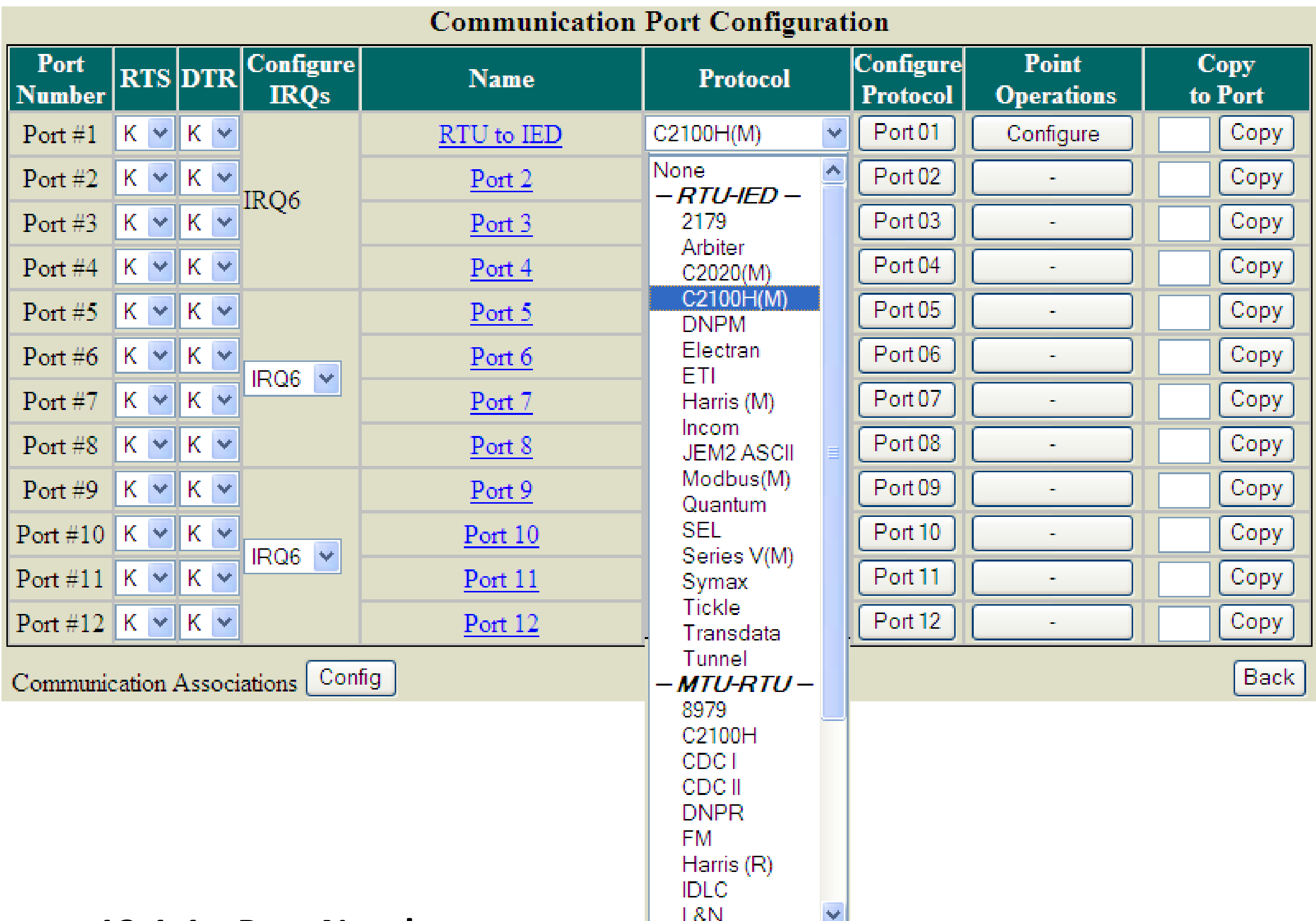
12.1 Serial Comm Port Configuration

is a protocol that communicates between the RTU and an IED. It can be used to front-end an existing RTU in order to add new communication functionality within the substation while preserving the existing hardware I/O.

The protocol running on an RTU can also be used at the master station as a front-end processor scanning multiple RTUs and converting the data to a different protocol.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click from the Protocol drop-down menu as shown.

Figure 12-1 Communication Port Configuration



12.1.1 Port Number

Physical Port number of the RTU.

12.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

12.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

12.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

12.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

12.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.

12.1.4 Protocol

From the drop-down list, select the protocol for this port.

12.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

12.1.6 Point Operations

Click this button to assign points.

12.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

12.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

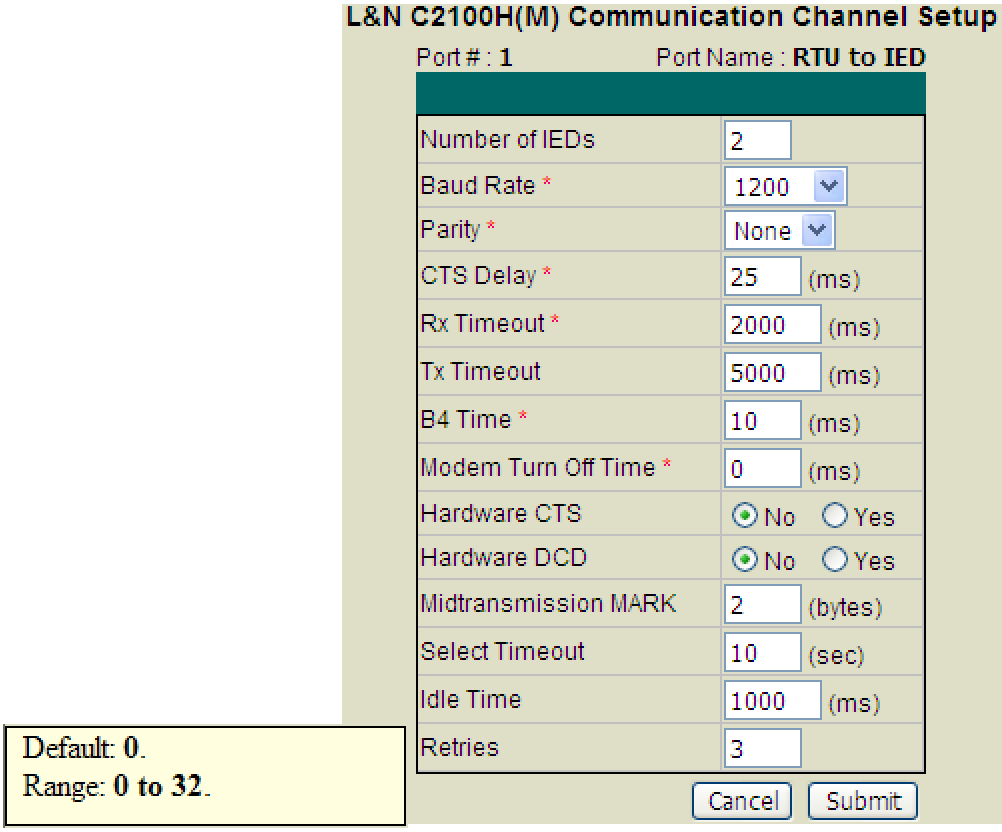
Navigation

Click the Back button to return to the previous screen.

12.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n*. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 12-2 Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

12.2.1 Number of IEDs (0-32)

Enter the number of IEDs on the port. The default setting is 0.

12.2.2 Baud Rate (300 – 19200)

Select the communications speed for the associated channel. Default setting is 1200.

12.2.3 Parity (None, Odd, Even)

From the drop-down menu, select the parity for the associated channel. The default setting is None.

12.2.4 CTS Delay (0 – 1000ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 25.

12.2.5 Rx Timeout (0 – 30,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. Default setting is 2000 (2 seconds).

12.2.6 Tx Timeout (0 – 30,000ms)

Enter the transmit timeout for the associated channel. This value limits the maximum transmission time from the RTU to the master. Default setting is 5000 (5 seconds).

12.2.7 B4 Time (0 – 250ms)

Enter the B4 time for the associated channel. The B4 time is the length of quiet time required on the channel following a transmission from the RTU prior to turning on the RTUs receive interrupts. Default setting is 10.

12.2.8 Modem Turn Off Time (0 – 250ms)

Enter the time delay after the last transmitted byte before turning off the modem. Default setting is 0.

12.2.9 Hardware CTS (No, Yes)

If the hardware Clear-To-Send option is selected for a channel, then reply data bytes will not be transmitted unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. Default setting is No.

12.2.10 Hardware DCD (No, Yes)

If the hardware data carrier detect option is selected for a channel, then the channel communications driver will accept requested message data frames only if carrier is detected by the modem. If carrier is not detected, the data frames are discarded. Default setting is No.

12.2.11 Midtransmission MARK (0 – 255 bytes)

Enter the number of 8 bit marks to be transmitted between data blocks 8 and 9 of transmissions longer than 8 blocks. Default is 2.

12.2.12 Select Timeout (1 – 25 sec)

Enter the time in seconds that an SBO Select will be armed. Default is 10.

12.2.13 Idle Time (1 – 25,000 ms)

Enter the number of milliseconds to delay between polling messages to IEDs. Default is 1000.

12.2.14 Retries (1-25)

Enter the number of retries on poll messages before marking the data from that IED as failed. Default is 3.

Navigation

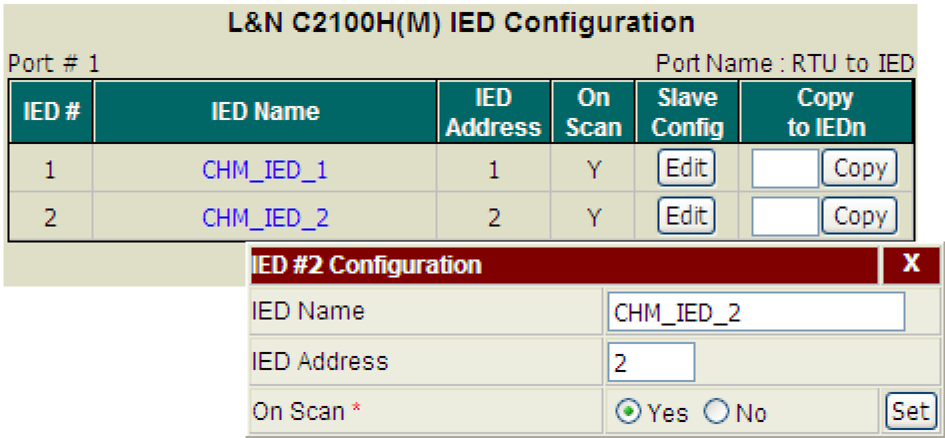
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

12.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 12-3 IED Configuration



12.3.1 IED

The logical number of the IED on this communication channel.

12.3.2 IED Name

Click on the IED Name. A pop-up window called **IED Configuration** will appear, as shown above.

12.3.2.1 IED Name

The name of the IED. Type in a name, or accept the default.

12.3.2.2 IED Address

The address of the IED. Type in an address, or accept the default.

12.3.2.3 On Scan

Determines whether or not the IED is being scanned. Click No to disable the scan, or accept the default (Yes).

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

12.3.2.4 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

12.3.3 IED Address

Reflects the entry in the pop-up menu. See above.

12.3.4 On Scan

Reflects the entry in the pop-up menu. See above.

12.3.5 Slave Config

Click the Edit button to edit the IED points.

12.3.6 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

Navigation

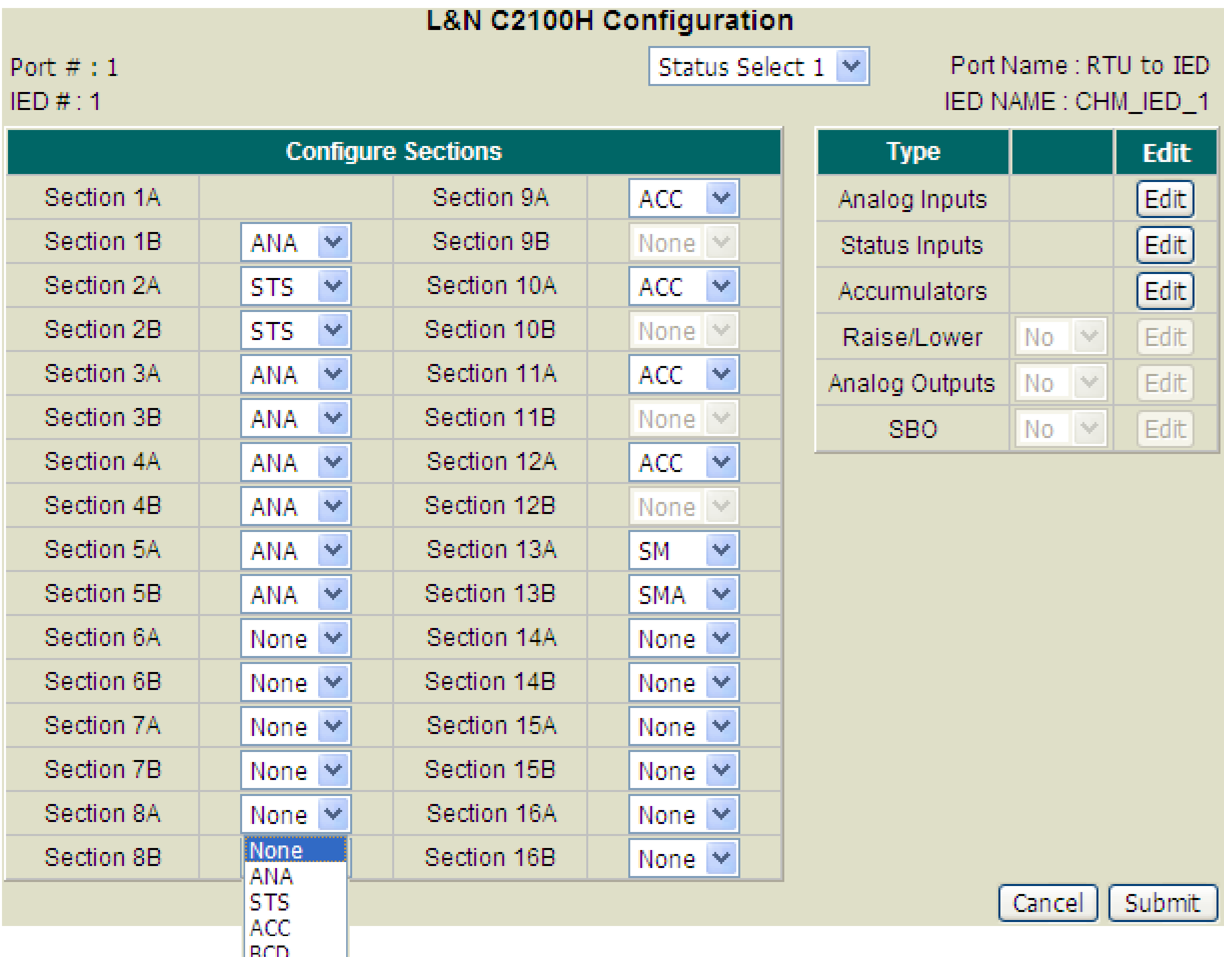
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

12.3.6.1 Slave Configuration Edit

12.3.7 Slave Config

Click Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 12-4 IED Configuration



12.3.8 Status Select, Pass/Group, or Pass

12.3.8.1 Status Select 1 or 2

Select Status Select 1 or 2 to edit what types of points are to be included in the response message.

12.3.8.2 Pass/Group 1 through 4

Select Pass/Group 1 through 4 to edit what types of points are to be included in the response message. Raise/Lower, Analog outputs, and SBO points may be mapped only in groups 1-4.

12.3.8.3 Pass 5 through 12

Select Pass 5 through 12 to edit what types of points are to be included in the response message.

12.3.9 Configure Sections

12.3.9.1 ANA

Analog Inputs, 12-bit. Uses one section. See Analog Inputs MAP function.

12.3.9.2 STS

Status, 1-bit. Twelve status points will fit in one section. See Status Inputs MAP function.

12.3.9.3 ACC

Block is an accumulator. This is valid only in the 1st data block as required by the protocol. It uses both the 1st and 2nd data blocks to return a 24 bit value in binary format. The 1st data block contains the most significant 12 bits and the 2nd data block contains the least significant 12 bits.

12.3.9.4 BCD

Block is an accumulator. This is valid only in the 1st data block as required by the protocol. It uses both the 1st and 2nd data blocks to return 6 BCD digits. The 1st data block contains the most significant 3 BCD digits and the 2nd data block contains the least significant 3 BCD digits.

12.3.10 Type

The different types of I/O points supported by this protocol.

12.3.11 Edit

Click the Edit button to configure the point types for this group.

Please note: No configuration changes take effect until the RTU is reset.

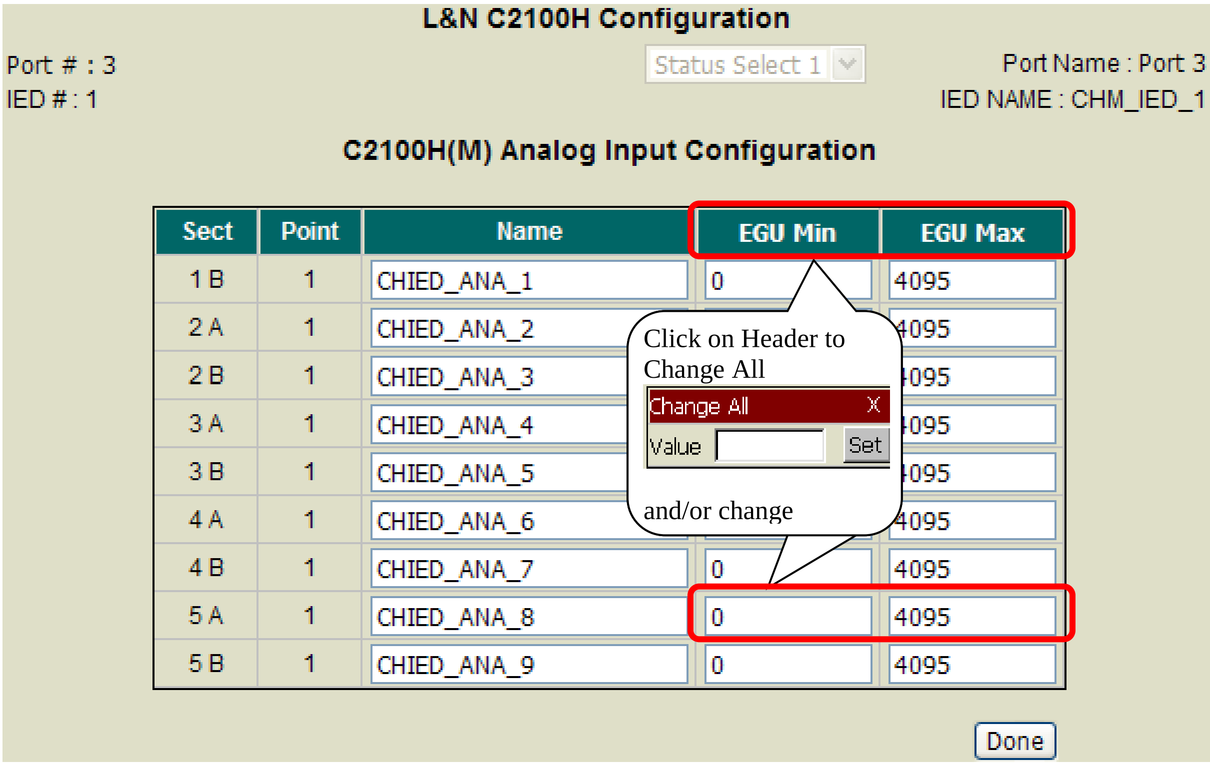
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

12.3.12 IED Analog Configuration

From the IED Configuration screen, click on Edit for Analog Inputs. A screen similar to Figure 2-13 will appear.

Figure 12-5 Analog Input Configuration



12.3.13 Sect

Protocol logical section number. This number cannot be changed.

12.3.14 Point

Protocol logical point number. This number cannot be changed.

12.3.15 Name

Enter the name of the point (or accept the default name).

12.3.16 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

12.3.17 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable.

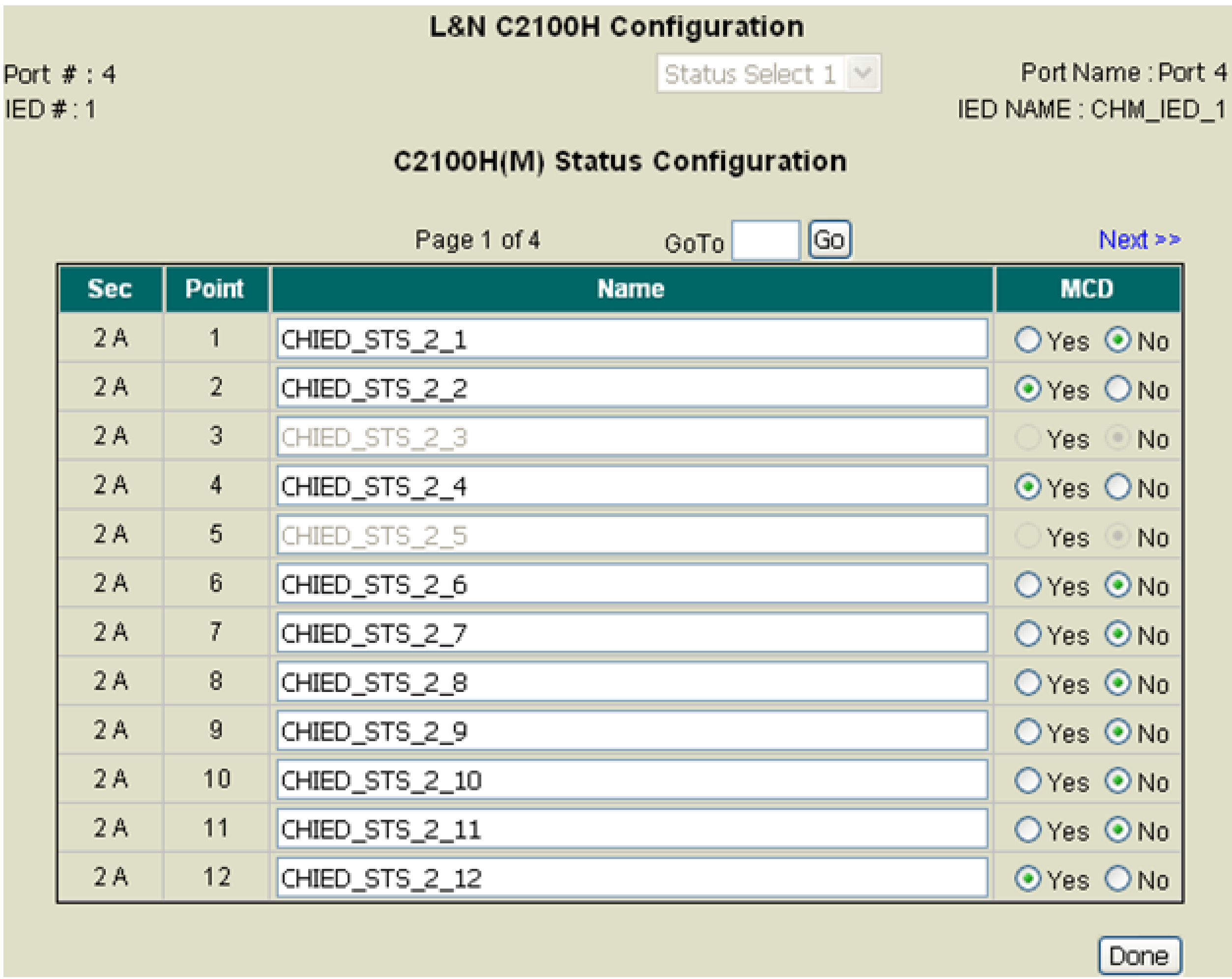
Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

12.3.18 IED Status Configuration

From the IED Configuration screen, click on Edit for Status. A screen similar to Figure 2-14 will appear.

Figure 12-6 Status Input Configuration (Section A)



12.3.19 Sec

Protocol logical section number. This number cannot be changed.

12.3.20 Point

Protocol logical point number. This number cannot be changed.

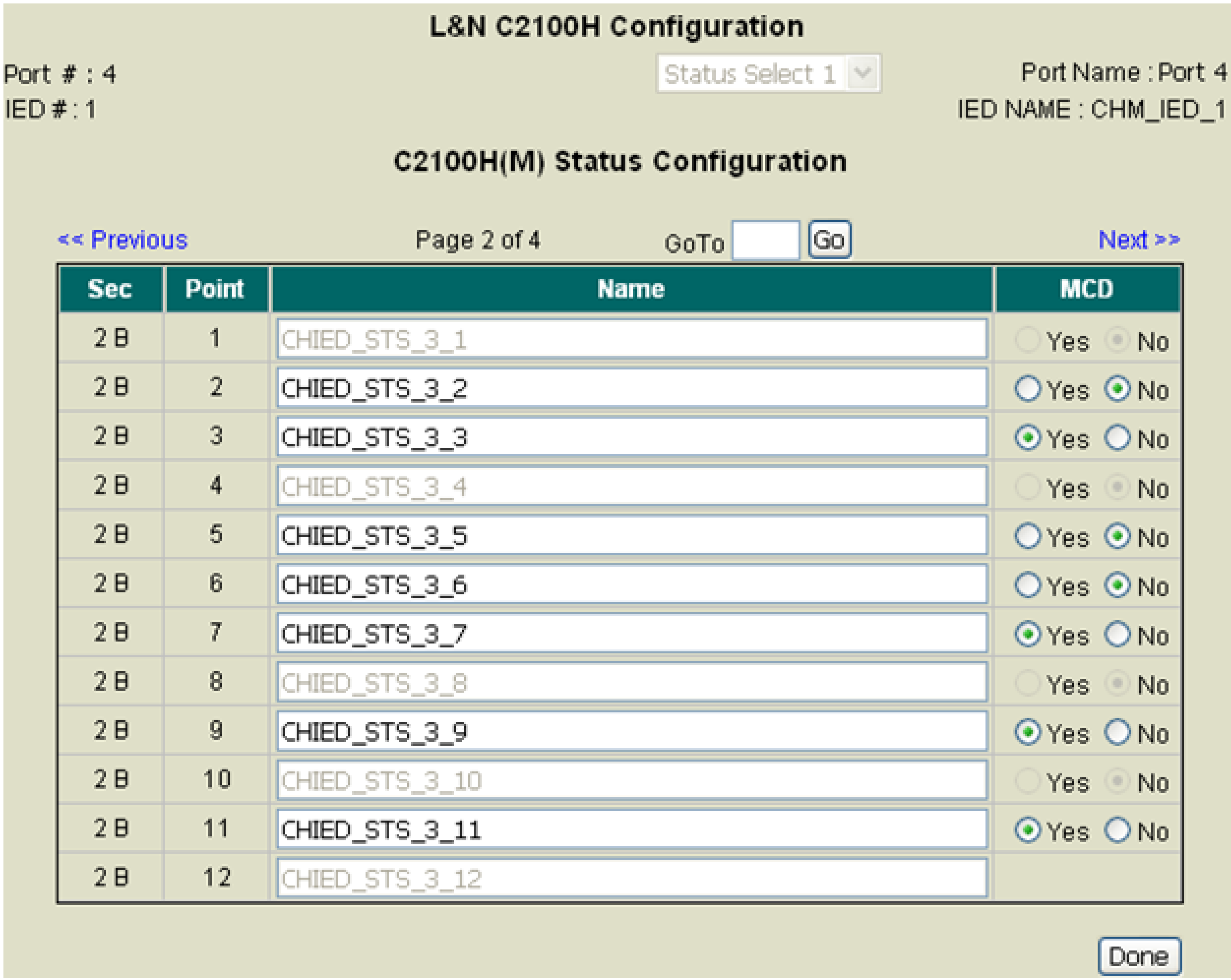
12.3.21 Name

Enter the name of the point (except for COMM_STS which can not be changed) or accept the default name.

12.3.22 MCD (Multiple Change Detect)

Click Yes to make any point a status-with-memory point. The point following then becomes the memory bit and is disabled. The last point in section A can be an MCD point, and its corresponding memory bit becomes the first element of the following B section. But as shown below, the last point in a B section cannot be defined as a status-with-memory point.

Figure 12-7 Status Input Configuration (Section B)



Navigation

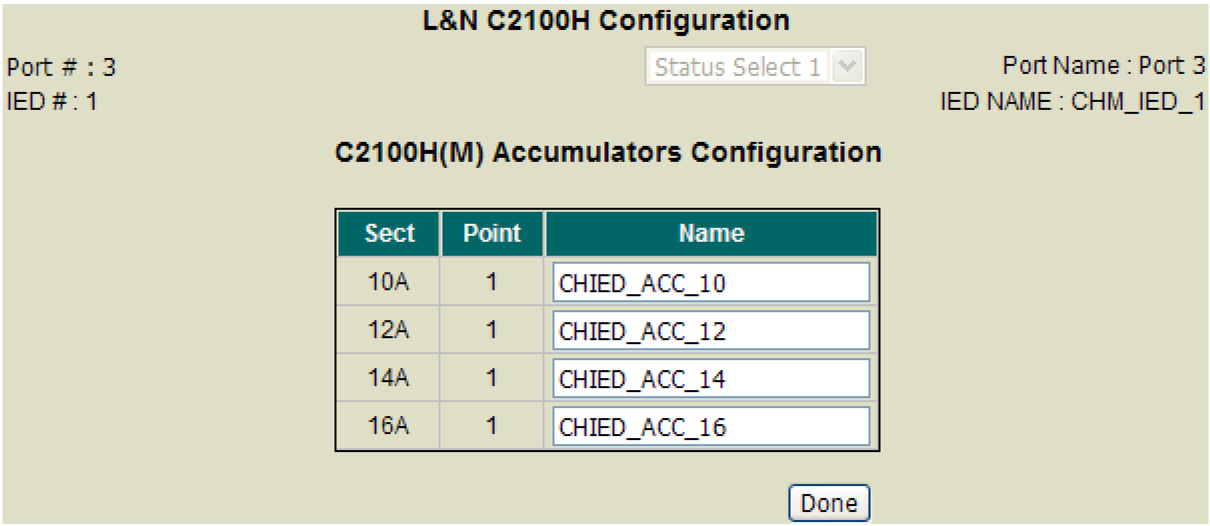
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

12.3.23 IED Accumulators Configuration

From the IED Configuration screen, click on Edit for Accumulator Inputs. A screen similar to Figure 2-15 will appear.

Figure 12-8 Accumulators Configuration



12.3.24 Sect

Protocol logical section number. This number cannot be changed.

12.3.25 Point

Protocol logical point number. This number cannot be changed.

12.3.26 Name

Enter the name of the point or accept the default name.

Navigation

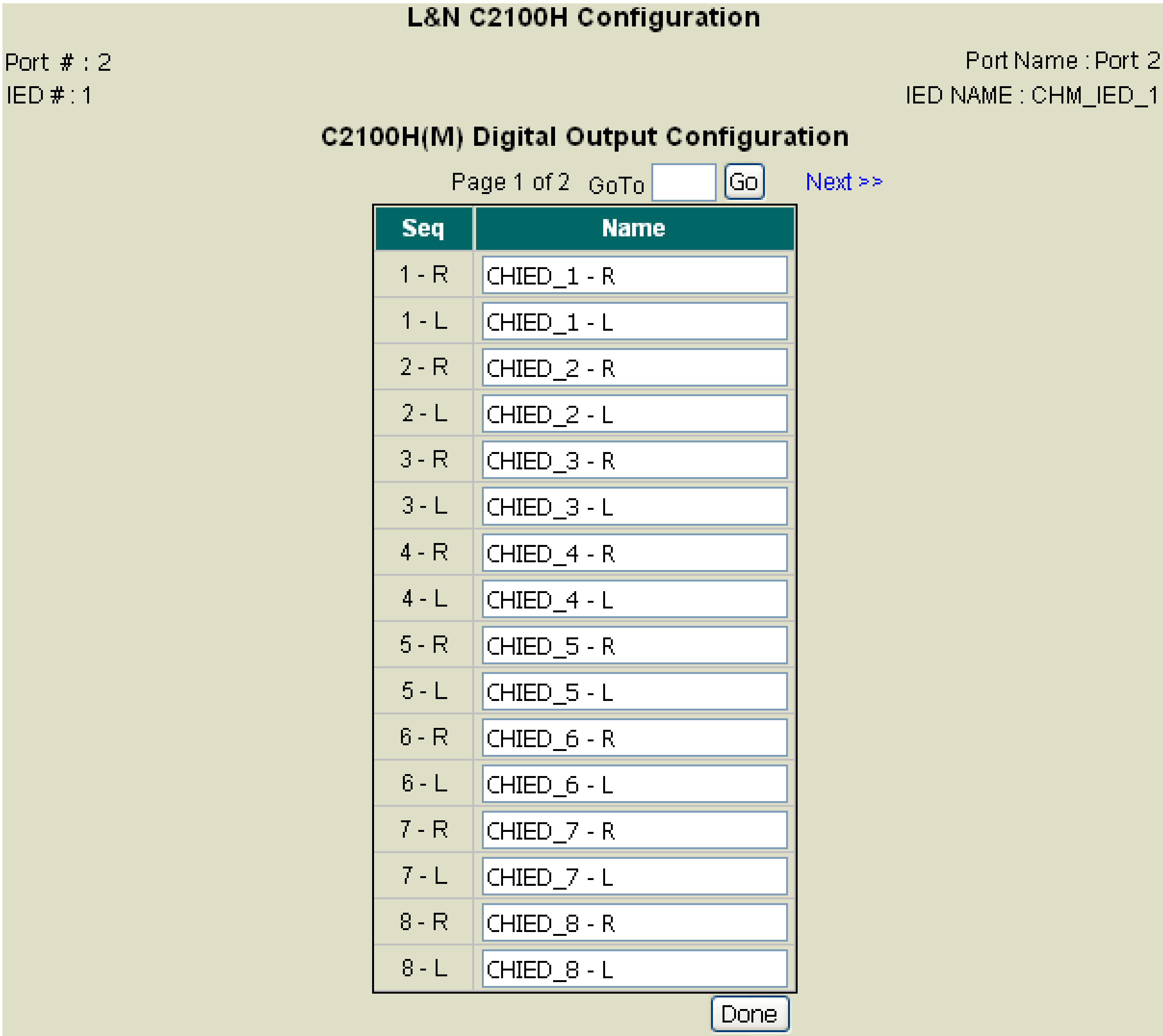
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

12.3.27 IED Raise/Lower Configuration

Click on Edit for Raise/Lower. A screen similar to Figure 2-17 will appear.

Figure 12-9 Digital Outputs Configuration



12.3.28 Seq

Protocol logical sequence number. This number cannot be changed

12.3.29 Name

Enter the name of the point (or accept the default name)

Navigation

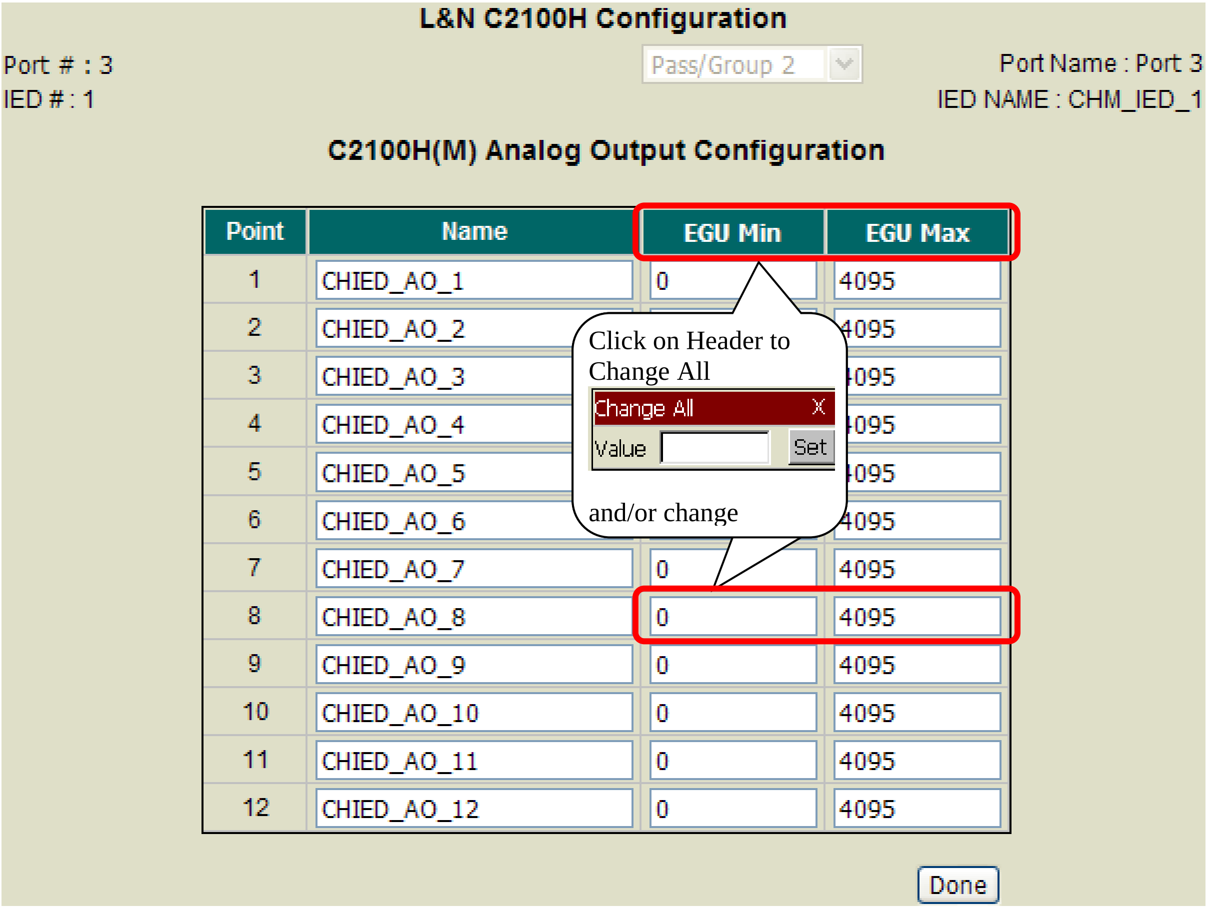
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

12.3.30 IED Analog Outputs Configuration

Click on Edit for Analog Outputs. A screen similar to the one below will appear.

Figure 12-10 Analog Outputs Configuration



Point	Name	EGU Min	EGU Max
1	CHIED_AO_1	0	4095
2	CHIED_AO_2		4095
3	CHIED_AO_3		4095
4	CHIED_AO_4		4095
5	CHIED_AO_5		4095
6	CHIED_AO_6		4095
7	CHIED_AO_7	0	4095
8	CHIED_AO_8	0	4095
9	CHIED_AO_9	0	4095
10	CHIED_AO_10	0	4095
11	CHIED_AO_11	0	4095
12	CHIED_AO_12	0	4095

12.3.31 Point

Protocol logical point number. This number cannot be changed

12.3.32 Name

Enter the name of the point (or accept the default name)

12.3.33 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

12.3.34 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

Navigation

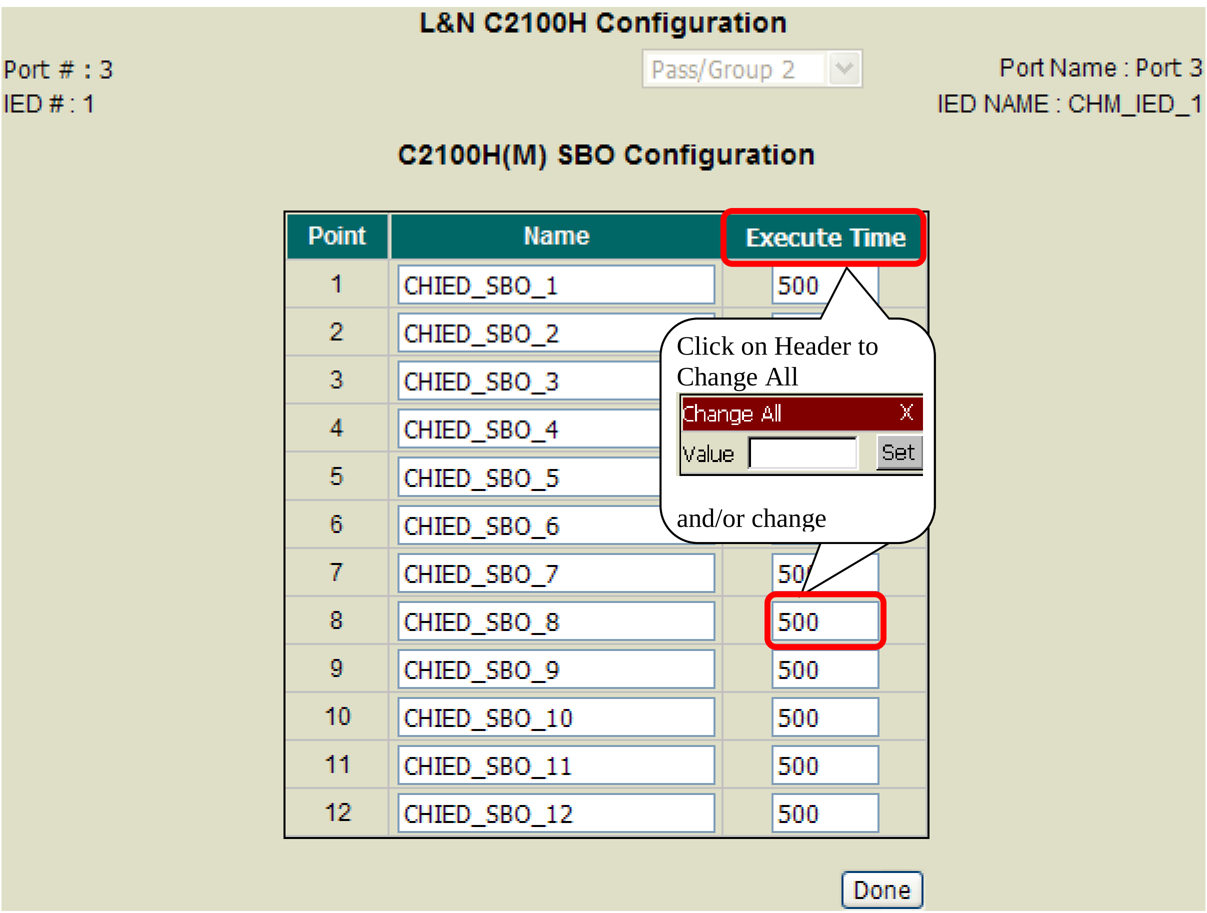
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

12.3.35 IED SBO Configuration

Click on Edit for SBO. A screen similar to the one below will appear.

Figure 12-11 SBO Configuration



12.3.36 Point

Protocol logical point number. This number cannot be changed

12.3.37 Name

Enter the name of the point (or accept the default name)

12.3.38 Execute Time

Enter the Execute Time (or accept the default)

Navigation

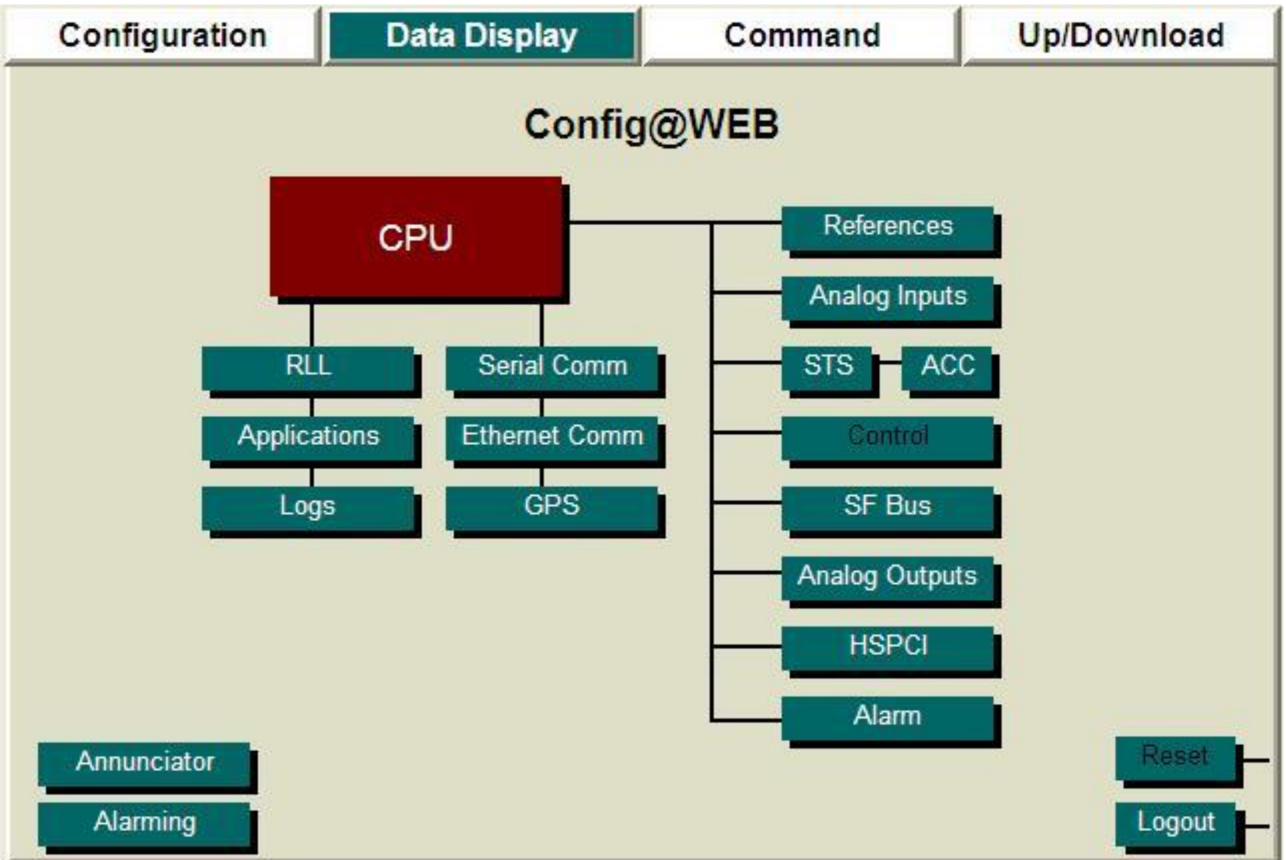
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

12.4 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 12-12 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 12-13 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	RTU to IED	C2100H(M)	View	Port Data
Port #2	K	K	Port 2	None	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

12.4.1 Port Number

Physical Port number of the RTU.

12.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

12.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

12.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

12.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

12.4.3 Name

The port name given during configuration or default name accepted.

12.4.4 Protocol

The configured protocol for this port.

12.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

12.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

12.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

12.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 12-14 Communication Counters Display

C2100H(M) Communication Counters Display

Port # : 1 Port Name : Port 1

Point	Counter Name	Counts
1	Messages Received	0
2	Messages Sent	0
3	B4 Timer Violations	0
4	BCH Security Errors	0
5	Overrun Errors	0
6	Framing Errors	0
7	Hardware DCD Errors	0
8	Hardware CTS Errors	0

Data Trap Configure

Back

12.4.9 Point

A logical point number for reference only.

12.4.10 Counter Name

The following counters are monitored:

12.4.10.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

12.4.10.2 Messages Received

This indicates the cumulative number of received messages since the last reset or power-up.

12.4.10.3 B4 Timer Violations

This indicates the cumulative number of B4 Timer violations. This count can be affected by the setting of the B4 Time in configuration.

12.4.10.4 BCH Security Errors

This indicates the cumulative number of BCH security errors since the last reset or power-up.

12.4.10.5 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

12.4.10.6 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

12.4.10.7 Hardware DCD Errors

This indicates the cumulative number of DCD errors since the last reset or power-up.

12.4.10.8 Hardware CTS Errors

This indicates the cumulative number of CTS errors since the last reset or power-up.

12.4.11 Counts

The counts for each type of Counter.

12.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

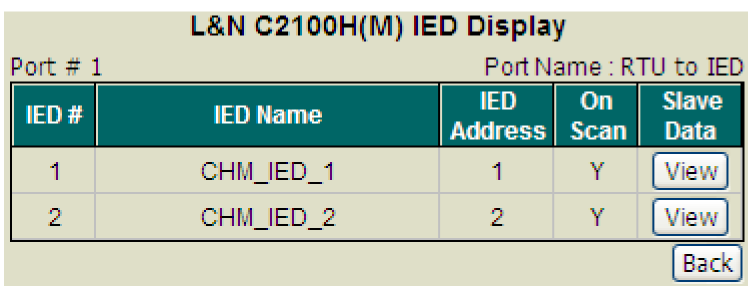
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

12.4.13 Display Port Data

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 12-15 IED Display


L&N C2100H(M) IED Display

Port # 1 Port Name : RTU to IED

IED #	IED Name	IED Address	On Scan	Slave Data
1	CHM_IED_1	1	Y	View
2	CHM_IED_2	2	Y	View

Back

12.4.14 IED

The logical number of the IED on this communication channel.

12.4.15 IED Name

The name that was chosen, or accepted as default, during configuration.

12.4.16 IED Address

The IED Address chosen during configuration.

12.4.17 On Scan

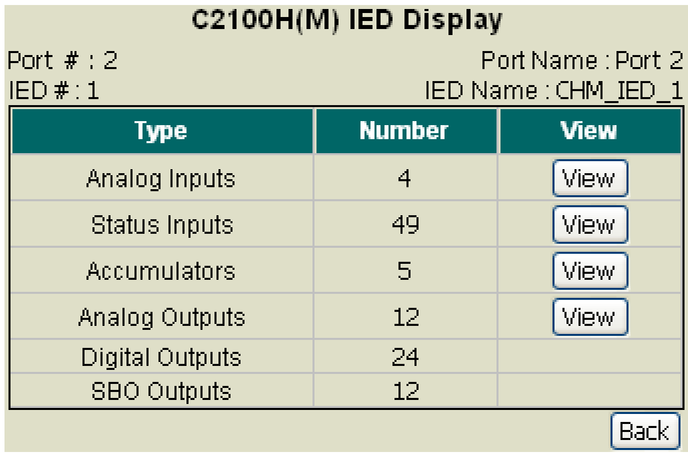
Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

12.5 Slave Data

Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

From the IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 12-16 IED Display



12.5.1 Type

The type of point.

12.5.2 Number

The number of points from your IED.

12.5.3 View

Click the View button to view points.

12.6 Analog Inputs

From the IED Display screen, click View for Analog Inputs to get the screen shown in Figure 2-24.

Figure 12-17 Analog Inputs Display

C2100H(M) Analog Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : CHM_IED_1

Page1 of 1 Go To [ ] Go

Pass	Sect	Point Name	Point Status	Point Value	Point Counts
SS1	1B	CHIED_ANA_1	F	0.000	0
SS1	3A	CHIED_ANA_4	F	0.000	0
SS1	3B	CHIED_ANA_5	F	0.000	0
SS1	4A	CHIED_ANA_6	F	0.000	0
SS1	4B	CHIED_ANA_7	F	0.000	0
SS1	5A	CHIED_ANA_8	F	0.000	0
SS1	5B	CHIED_ANA_9	F	0.000	0
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Back

12.6.1 Pass

Protocol logical Pass/Group number:

SS1-2 Status Select 1 and 2
P1-12 Pass/Group 1 thru 4 and Pass 5 thru 12

12.6.2 Sect

Protocol logical section number.

12.6.3 Point Name

The name of the point assigned during configuration.

12.6.4 Point State

Please see the Config@WEB Secure Software Users Guide.

12.6.5 Point Value

The engineering unit (EGU) value.

12.6.6 Point Counts

The counts from the IED.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

12.7 Status Inputs

From the IED Display screen, click View for Status Inputs to get the screen shown in Figure 2-25.

Figure 12-18 Status Inputs Display

C2100H(M) Status Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : CHM_IED_1

Page1 of 2 Go To [ ] Go Next>>

Pass	Sect	Point	Point Name	Point Status	Point State	•
		0	CHM_COMM_STS		CLOSE	•
SS1	2A	1	CHIED_STS_2_1	F	OPEN	•
SS1	2A	2	CHIED_STS_2_2	F	OPEN	•
SS1	2A	3	CHIED_STS_2_3	F	OPEN	•
SS1	2A	4	CHIED_STS_2_4	F	OPEN	•
SS1	2A	5	CHIED_STS_2_5	F	OPEN	•
SS1	2A	6	CHIED_STS_2_6	F	OPEN	•
SS1	2A	7	CHIED_STS_2_7	F	OPEN	•
SS1	2A	8	CHIED_STS_2_8	F	OPEN	•
SS1	2A	9	CHIED_STS_2_9	F	OPEN	•
SS1	2A	10	CHIED_STS_2_10	F	OPEN	•
SS1	2A	11	CHIED_STS_2_11	F	OPEN	•
SS1	2A	12	CHIED_STS_2_12	F	OPEN	•
SS1	2B	1	CHIED_STS_3_1	F	OPEN	•
SS1	2B	2	CHIED_STS_3_2	F	OPEN	•
SS1	2B	3	CHIED_STS_3_3	F	OPEN	•

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not this IED is in good communications. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

12.7.1 Pass

Protocol logical Pass/Group number:

SS1-2 Status Select 1 and 2
P1-12 Pass/Group 1 thru 4 and Pass 5 thru 12

12.7.2 Sect

Protocol logical section number.

12.7.3 Point

Protocol logical point number.

12.7.4 Point Name

The name of the point assigned during configuration.

12.7.5 Point State

Please see the Config@WEB Secure Software Users Guide.

12.7.6 Point State

Indicates that point is either OPEN or CLOSED.

12.7.7 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

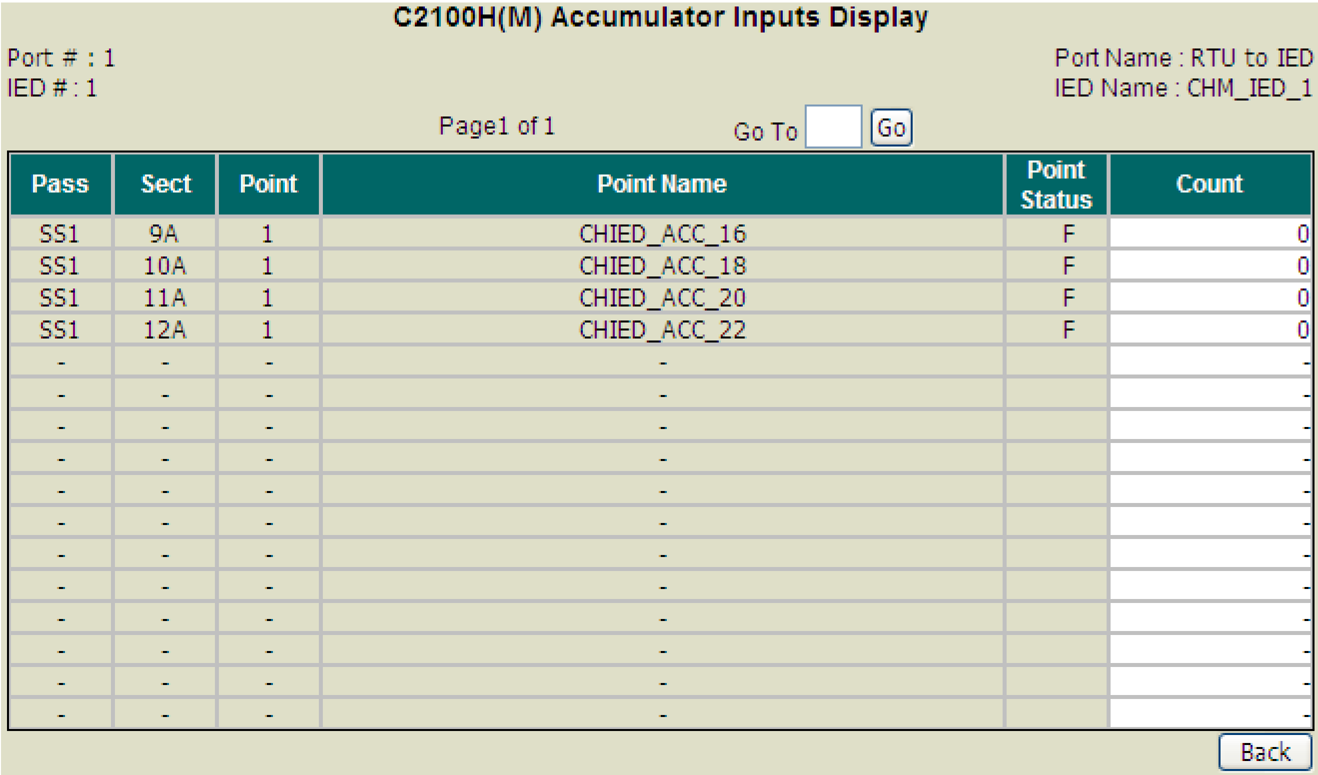
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

12.8 Accumulator Inputs

From the IED Display screen, click View for Accumulators to get the screen shown in Figure 2-26.

Figure 12-19 Counter Inputs Display



C2100H(M) Accumulator Inputs Display

Port # : 1 Port Name : RTU to IED
IED # : 1 IED Name : CHM_IED_1

Page1 of 1 Go To [ ] Go

Pass	Sect	Point	Point Name	Point Status	Count
SS1	9A	1	CHIED_ACC_16	F	0
SS1	10A	1	CHIED_ACC_18	F	0
SS1	11A	1	CHIED_ACC_20	F	0
SS1	12A	1	CHIED_ACC_22	F	0
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-

Back

12.8.1 Pass

Protocol logical Pass/Group number:

SS1-2	Status Select 1 and 2
P1-12	Pass/Group 1 thru 4 and Pass 5 thru 12

12.8.2 Sect

Protocol logical section number.

12.8.3 Point

Protocol logical point number.

12.8.4 Point Name

The name of the point assigned during configuration.

12.8.5 Point State

Please see the Config@WEB Secure Software Users Guide.

12.8.6 Count

The accumulated count.

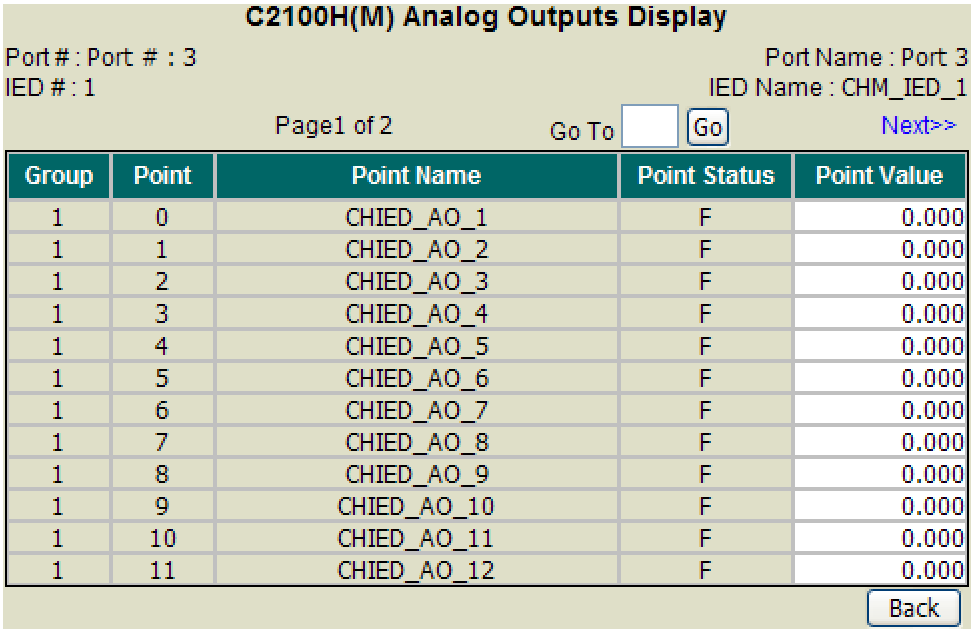
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

12.9 Analog Outputs

From the IED Display screen, click View for Analog Outputs to get the screen shown below.

Figure 12-20 Analog Outputs Display



12.9.1 Group

Protocol logical Group number:

12.9.2 Point

Protocol logical point number.

12.9.3 Point Name

The name of the point assigned during configuration.

12.9.4 Point State

Please see the Config@WEB Secure Software Users Guide.

12.9.5 Point Value

The engineering unit (EGU) value.

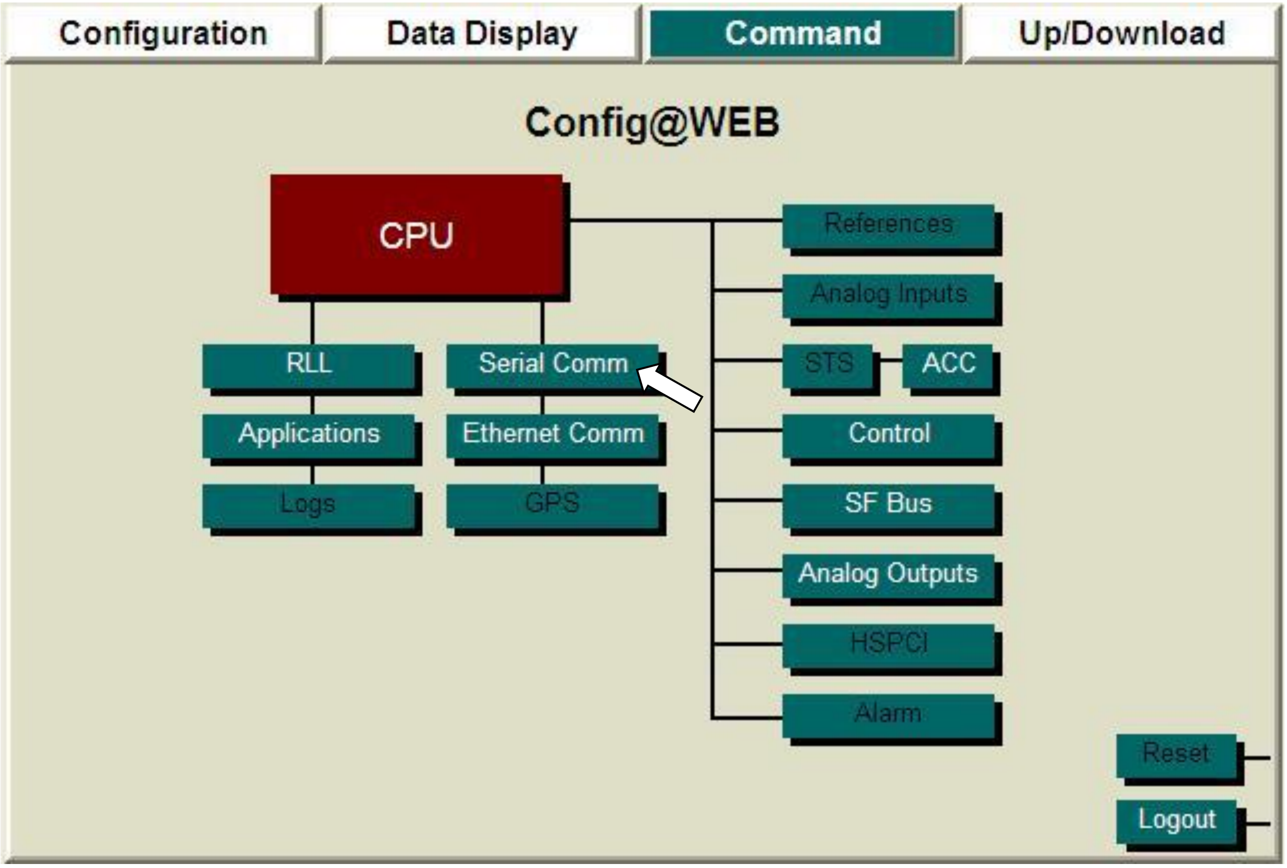
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

12.10 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 12-21 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2300 manual. Under Command Port Data, click Port Data.

Figure 12-22 Serial Comm Command Communications Port Data

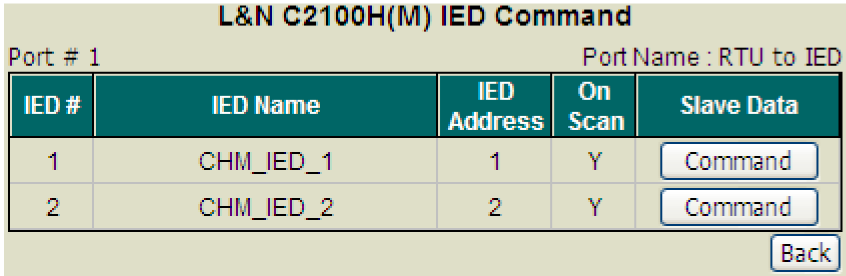
Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	RTU to IED	C2100H(M)	Port Data	Normal
Port #2	K	K	Port 2	None	Port Data	Normal
Port #3	K	K	Port 3	None	Port Data	Normal
Port #4	K	K	Port 4	None	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button.

Figure 12-23 IED Command



L&N C2100H(M) IED Command

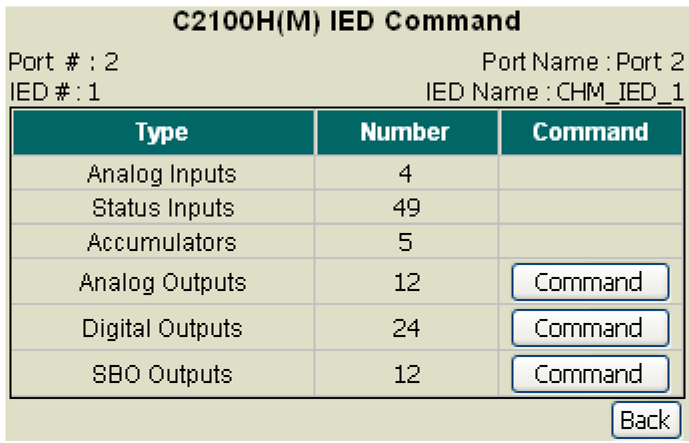
Port # 1 Port Name : RTU to IED

IED #	IED Name	IED Address	On Scan	Slave Data
1	CHM_IED_1	1	Y	Command
2	CHM_IED_2	2	Y	Command

Back

The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command various outputs.

Figure 12-24 IED Command



C2100H(M) IED Command

Port # : 2 Port Name : Port 2

IED # : 1 IED Name : CHM_IED_1

Type	Number	Command
Analog Inputs	4	
Status Inputs	49	
Accumulators	5	
Analog Outputs	12	Command
Digital Outputs	24	Command
SBO Outputs	12	Command

Back

Click on the Analog Outputs Command button. The resulting screen will look like Figure 10-21. Type in a value for the chosen AO channel, then click the Execute button. The output channel will be driven to that value.

Figure 12-25 Analog Outputs Command

C2100H(M) Analog Outputs Command

Port # : 3 Port Name : Port 3
IED # : 2 IED Name : CHM_IED_2

Page 1 of 1 Go To Go

Group	Point	Name	Range	Value	Operation
1	0	CHIED_AO_1	0.000 to 4095.000	2000.000	Execute
1	1	CHIED_AO_2	0.000 to 4095.000	0.000	Execute
1	2	CHIED_AO_3	0.000 to 4095.000	0.000	Execute
1	3	CHIED_AO_4	0.000 to 4095.000	0.000	Execute
1	4	CHIED_AO_5	0.000 to 4095.000	0.000	Execute
1	5	CHIED_AO_6	0.000 to 4095.000	0.000	Execute
1	6	CHIED_AO_7	0.000 to 4095.000	0.000	Execute
1	7	CHIED_AO_8	0.000 to 4095.000	0.000	Execute
1	8	CHIED_AO_9	0.000 to 4095.000	0.000	Execute
1	9	CHIED_AO_10	0.000 to 4095.000	0.000	Execute
1	10	CHIED_AO_11	0.000 to 4095.000	0.000	Execute
1	11	CHIED_AO_12	0.000 to 4095.000	0.000	Execute

CHIED_AO_1 : Success Back

Click on the Command button for Digital Outputs. The resulting screen will look like the figure below. Type in an execute time, then click the Execute button.

Figure 12-26 Digital Outputs Command

C2100H(M) Digital Outputs Command

Port # : 3 — Port Name : Port 3
IED # : 2 — IED Name : CHM_IED_2

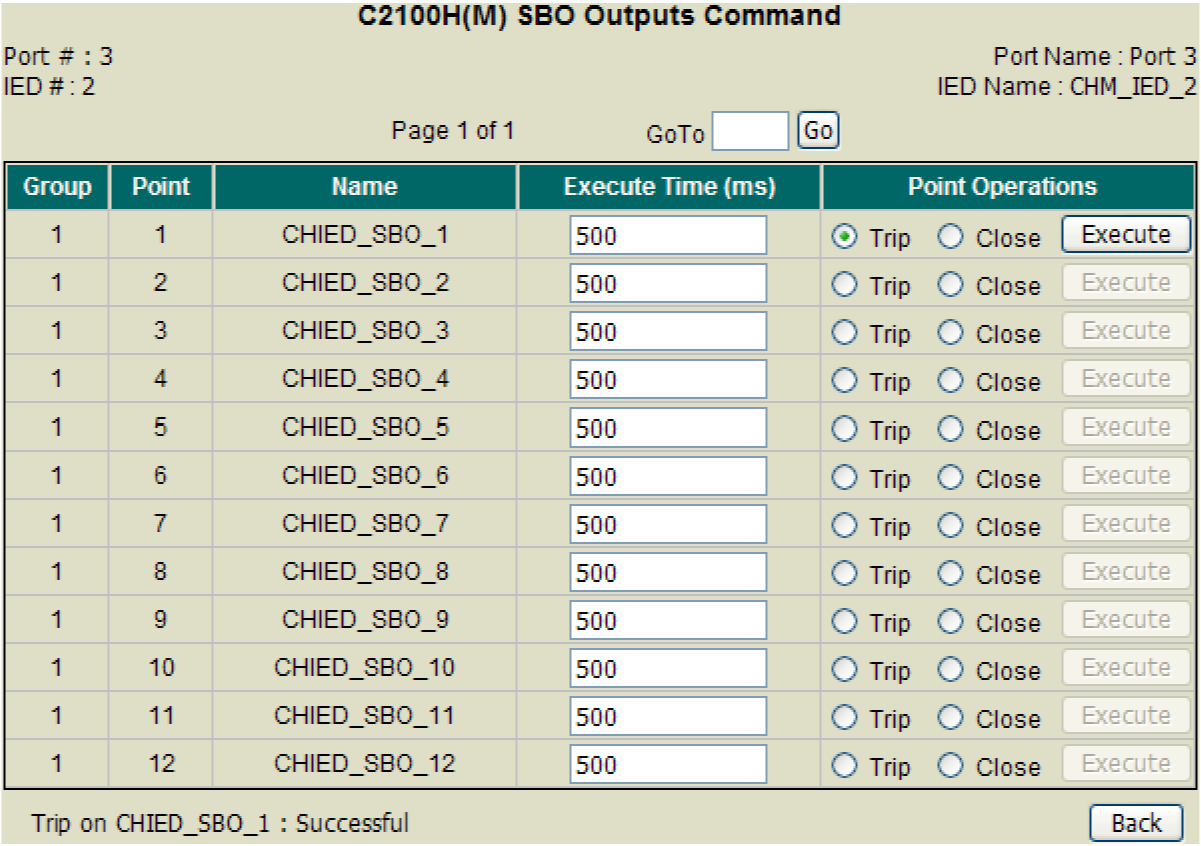
Page 1 of 1 GoTo [ ] Go

Group	Point	Name	Execute Time (ms)	Point Operations
1	1	CHIED_1 - R	500	Execute
1	2	CHIED_1 - L	0	Execute
1	3	CHIED_2 - R	0	Execute
1	4	CHIED_2 - L	0	Execute
1	5	CHIED_3 - R	0	Execute
1	6	CHIED_3 - L	0	Execute
1	7	CHIED_4 - R	0	Execute
1	8	CHIED_4 - L	0	Execute
1	9	CHIED_5 - R	0	Execute
1	10	CHIED_5 - L	0	Execute
1	11	CHIED_6 - R	0	Execute
1	12	CHIED_6 - L	0	Execute
1	13	CHIED_7 - R	0	Execute
1	14	CHIED_7 - L	0	Execute
1	15	CHIED_8 - R	0	Execute
1	16	CHIED_8 - L	0	Execute
1	17	CHIED_9 - R	0	Execute
1	18	CHIED_9 - L	0	Execute
1	19	CHIED_10 - R	0	Execute
1	20	CHIED_10 - L	0	Execute
1	21	CHIED_11 - R	0	Execute
1	22	CHIED_11 - L	0	Execute
1	23	CHIED_12 - R	0	Execute
1	24	CHIED_12 - L	0	Execute

Open on CHIED_1 - R : Successful — Back

Click on the Command button for SBO Outputs. The resulting screen will look like the one below after either a Trip or Close has been selected, then Executed with the Execute button.

Figure 12-27 SBO Outputs Command



C2100H(M) SBO Outputs Command

Port # : 3 Port Name : Port 3
IED # : 2 IED Name : CHM_IED_2

Page 1 of 1 GoTo Go

Group	Point	Name	Execute Time (ms)	Point Operations
1	1	CHIED_SBO_1	500	Trip Close Execute
1	2	CHIED_SBO_2	500	Trip Close Execute
1	3	CHIED_SBO_3	500	Trip Close Execute
1	4	CHIED_SBO_4	500	Trip Close Execute
1	5	CHIED_SBO_5	500	Trip Close Execute
1	6	CHIED_SBO_6	500	Trip Close Execute
1	7	CHIED_SBO_7	500	Trip Close Execute
1	8	CHIED_SBO_8	500	Trip Close Execute
1	9	CHIED_SBO_9	500	Trip Close Execute
1	10	CHIED_SBO_10	500	Trip Close Execute
1	11	CHIED_SBO_11	500	Trip Close Execute
1	12	CHIED_SBO_12	500	Trip Close Execute

Trip on CHIED_SBO_1 : Successful Back

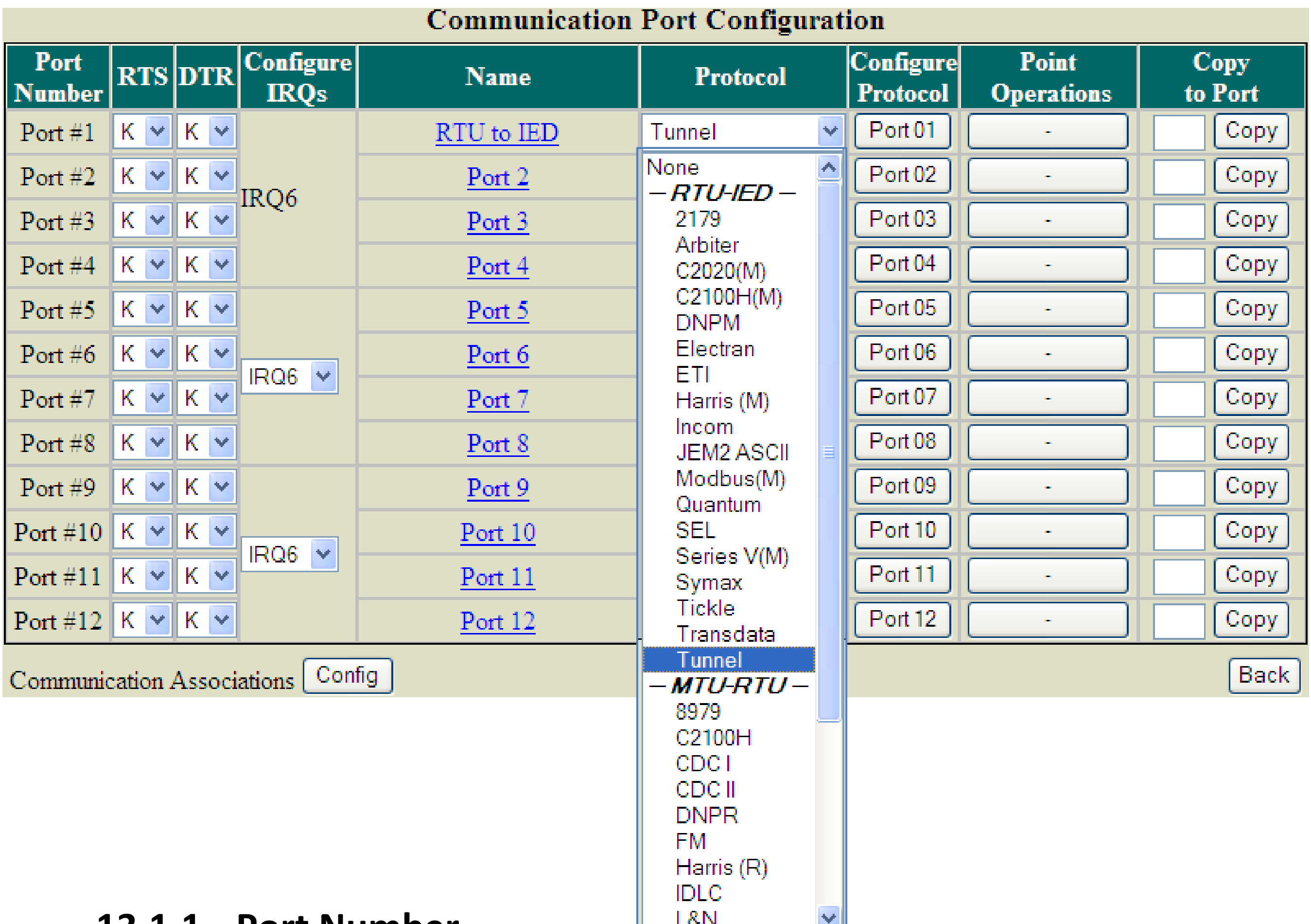
13 Tunnel Function

13.1 Serial Comm Port Configuration

 is a protocol that allows the user to set up a terminal emulation program on the Ethernet side of the RTU and talk directly to many devices, including Beckwith. Because this "protocol" handles only simple communications, there is no point configuration.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. From this screen, click Tunnel from the Protocol drop-down menu as shown.

Figure 13-1 Communication Port Configuration



13.1.1 Port Number

Physical Port number of the RTU.

13.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

13.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

13.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

13.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

13.1.3 Name

Click on the "blue" name (see below) and rename the port, or accept the default name.

13.1.4 Protocol

From the drop-down list, select the protocol for this port.

13.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

13.1.6 Point Operations

Click this button to assign points.

13.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

13.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

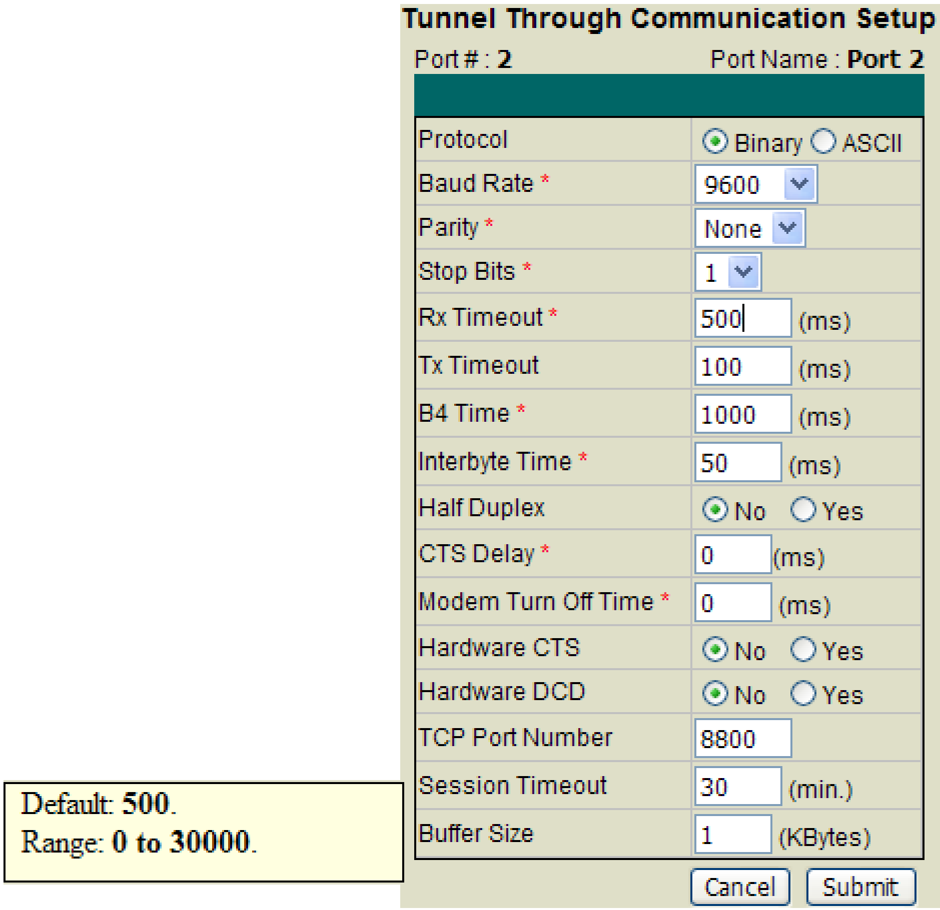
Navigation

Click the Back button to return to the previous screen.

13.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n*. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 13-2 Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Rx Timeout.

13.2.1 Protocol (Binary – ASCII)

Select the format of information that is to be tunneled. The default is Binary.

13.2.2 Baud Rate (300 – 19200)

Select the communications speed for the associated channel. Default setting is 9600.

13.2.3 Parity (None, Odd, Even)

From the drop-down menu, select the parity for the associated channel. The default setting is None.

13.2.4 Stop Bits (0, 1, 2)

Enter the Stop Bits for the associated channel. The default is 1.

13.2.5 Rx Timeout (0 – 30,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. Default setting is 500 (0.5 seconds).

13.2.6 Tx Timeout (0 – 3,000ms)

Enter the transmit timeout for the associated channel. This value limits the maximum transmission time from the RTU to the master. Default setting is 100 ms.

13.2.7 B4 Time (0 – 10,000ms)

Enter the B4 time for the associated channel. The B4 time is the length of quiet time required on the channel following a transmission from the RTU prior to turning on the RTU's receive interrupts. Default setting 1000 msec.

13.2.8 Interbyte Time (10 – 5000ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 50 msec.

13.2.9 Half Duplex (No, Yes)

Click the radio button for Yes if you want half duplex operation. This function enables the RTU to properly condition the RS-232 control lines. The CTS delay is used for carrier conditioning. In full duplex operation, the CTS signal is used for collision avoidance. In Half duplex operation, the DCD signal is used for collision avoidance and to enable the receiver. The default setting is No.

13.2.10 CTS Delay (0 – 250ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 0.

13.2.11 Modem Turn Off Time (0 – 250ms)

Enter the time delay after the last transmitted byte before turning off the modem. Default setting is 0.

13.2.12 Hardware CTS (No, Yes)

If the hardware Clear-To-Send option is selected for a channel, then reply data bytes will not be transmitted unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. Default setting is No.

13.2.13 Hardware DCD (No, Yes)

If the hardware data carrier detect option is selected for a channel, then the channel communications driver will accept requested message data frames only if carrier is detected by the modem. If carrier is not detected, the data frames are discarded. Default setting is No.

13.2.14 TCP Port Number

This is the port number for the TCP socket connection. The default setting is 8800. Each additional port must be uniquely numbered. If you configure more than one serial Tunnel port, use a unique TCP Port Numbers for each.

Note: For each Telnet session, the TCP port number in the Tunnel protocol setup and the Telnet session must match.

13.2.15 Session Timeout (1 – 1000 min.)

Enter the time delay before your Tunnel session times out. Default setting is 30 minutes.

13.2.16 Buffer Size (1 – 20 kBytes)

Enter the required buffer size. Default setting is 1 kByte.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

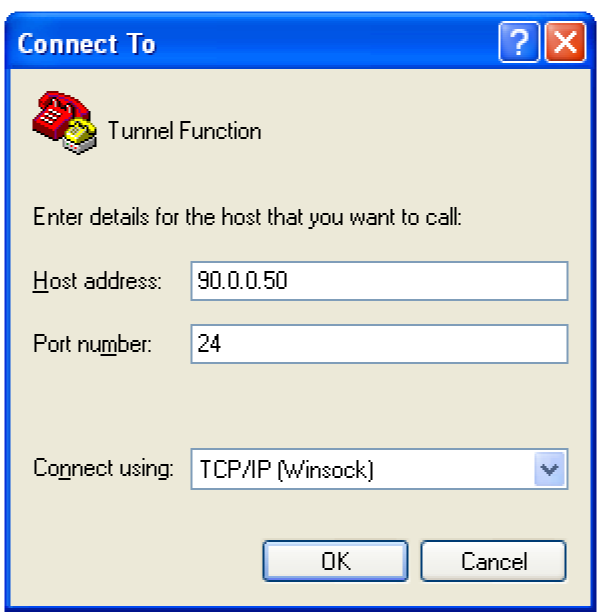
13.2.17 Telnet Session Host Address

There is a variation in the host address depending on whether your connection method is PPP or TCP/IP. See the following sections.

13.2.17.1 PPP Host Address

Select Winsock as the Connection method. Set the Port number to 24. If you are using PPP, enter the PPP host address of the RTU as shown below.

Figure 13-3 Connect Using Winsock & PPP Host Address

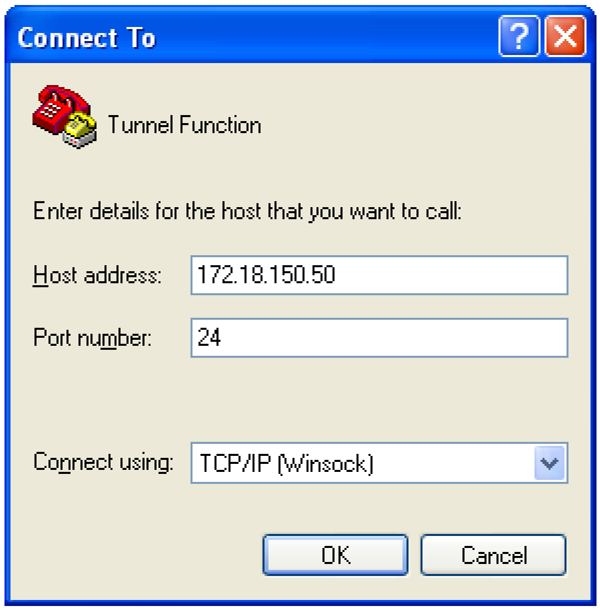


Note: For each Telnet session, the TCP port number in the Tunnel protocol setup and the Telnet session must match.

13.2.17.2 TCP/IP Host Address

Select Winsock as the Connection method. Set the Port number to 24. If you are using TCP/IP, enter the TCP/IP host address of the RTU as shown below.

Figure 13-4 Connect Using Winsock & TCP/IP Host Address



Note: For each Telnet session, the TCP port number in the Tunnel protocol setup and the Telnet session must match.

14 Incom

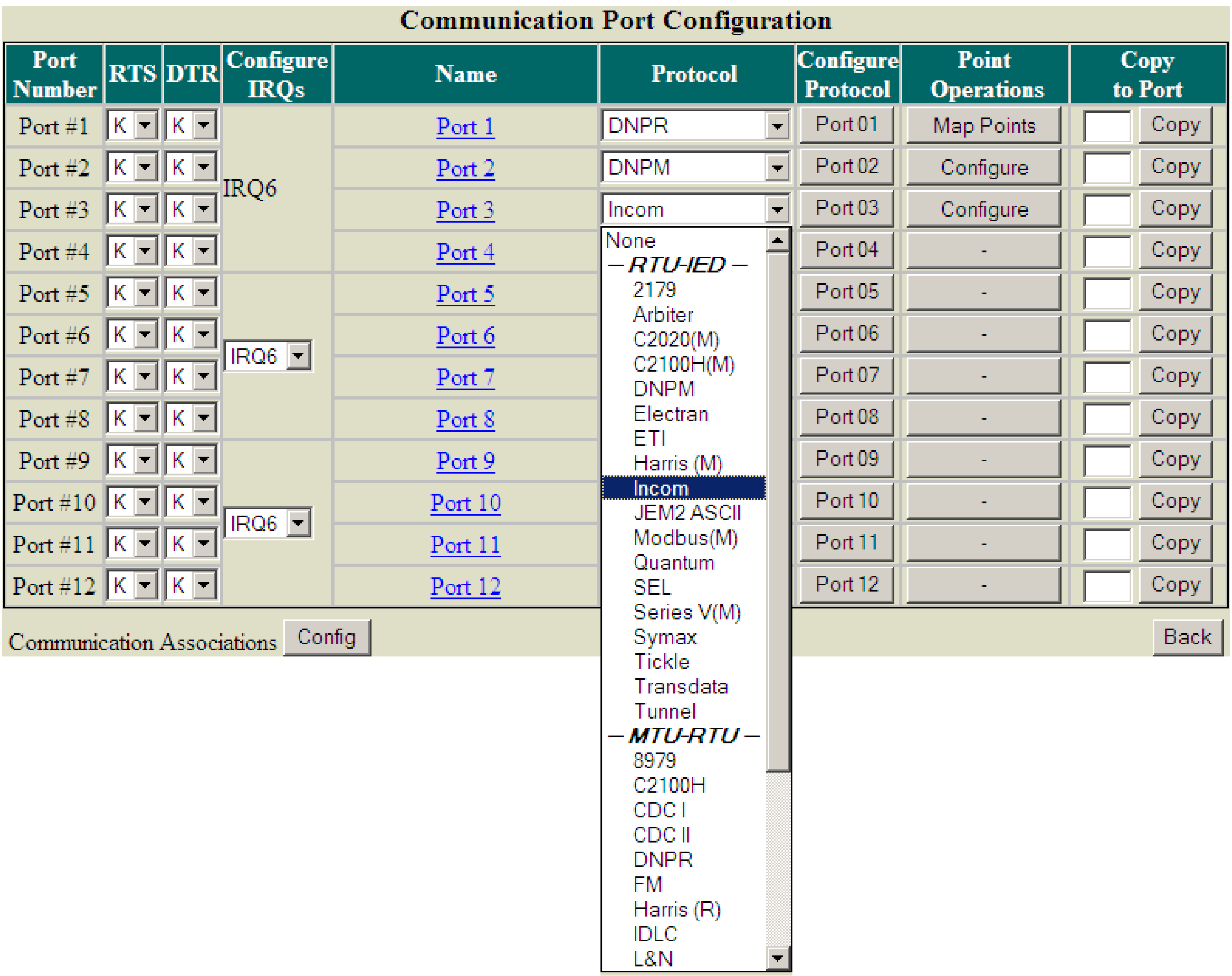
14.1 Serial Comm Port Configuration

Incom is a protocol that communicates between the RTU and an IED. It can be used to front-end an existing RTU in order to add new communication functionality within the substation while preserving the existing hardware I/O.

The Incom protocol running on an RTU can also be used at the master station as a front-end processor scanning multiple RTUs and converting the data to a different protocol.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click Incom from the Protocol drop-down menu as shown.

Figure 14-1 Communication Port Configuration



14.1.1 Port Number

Physical Port number of the RTU.

14.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

14.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

14.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

14.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

14.1.3 Name

Click on the "blue" name (see below) and rename the port, or accept the default name.

14.1.4 Protocol

From the drop-down list, select the protocol for this port.

14.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

14.1.6 Point Operations

Click this button to assign points.

14.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

14.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

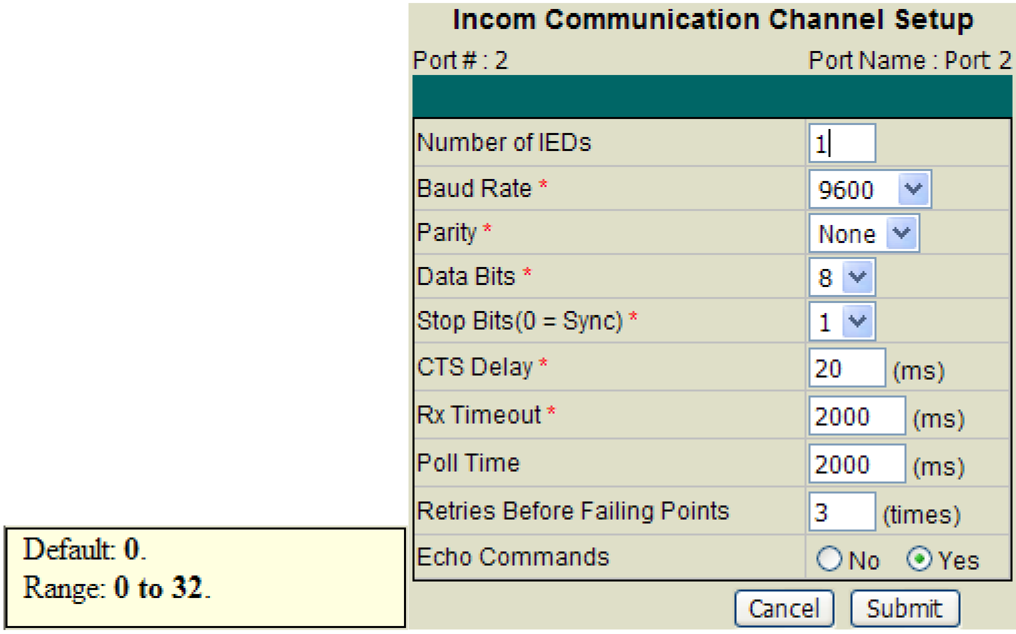
Navigation

Click the Back button to return to the previous screen.

14.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n* to configure the Incom port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 14-2 Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

14.2.1 Number of IEDs (0-32)

Enter the number of IEDs on the port. The default setting is 0.

14.2.2 Baud Rate (300-19200)

From the drop-down menu, select the baud rate. The default setting is 9600.

14.2.3 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is None.

14.2.4 Data Bits (5,6,7,8)

From the drop-down menu, select the data bits for the associated channel. The default setting is 8.

14.2.5 Stop Bits (0,1,2)

From the drop-down menu, select the stop bits for the associated channel. The default setting is 1.

14.2.6 CTS Delay (0 – 250ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 20.

> **Note:** For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

14.2.7 Rx Timeout (0 – 30,000 msec)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 2000 msec.

14.2.8 Poll Time (0 – 10,000ms)

Enter the time to delay between a sequence of polling all the devices connected to this communications port. Default setting is 2000.

14.2.9 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

14.2.10 Echo Commands (No, Yes)

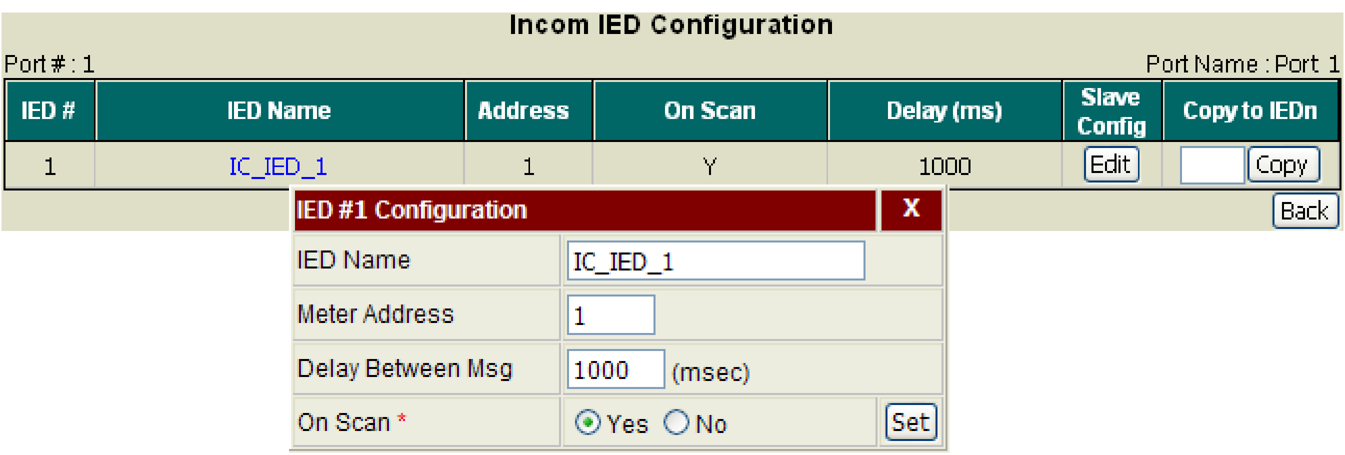
Select Yes or No to echo commands back to the RTU. The default is Yes.

> **Please note:** No configuration changes take effect until the RTU is reset.

14.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 14-3 IED Configuration



14.3.1 IED

The logical number of the IED on this communication channel.

14.3.2 IED Name

Click on the IED Name. A pop-up window called **IED Configuration** will appear, as shown above.

14.3.2.1 IED Name

The name of the IED. Type in a name, or accept the default.

14.3.2.2 Meter Address

The address of the Meter. Type in an address, or accept the default.

14.3.2.3 Delay Between Msg (1 – 32767 msec.)

Type in the delay between messages or accept the default. Default is 1000 msec.

14.3.2.4 On Scan

Determines whether or not the Meter is being scanned. Click No to disable the scan, or accept the default (Yes).

14.3.2.5 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

14.3.3 IED Address

Reflects the entry in the pop-up menu. See above.

14.3.4 On Scan

Reflects the entry in the pop-up menu. See above.

14.3.5 Delay (ms)

Reflects the entry in the pop-up menu. See above.

14.3.6 Slave Config

Click the Edit button to edit the IED points.

14.3.7 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

Navigation

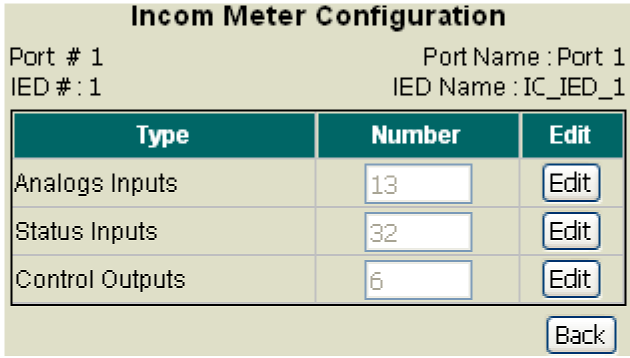
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

14.3.7.1 Slave Configuration Edit

14.3.8 Slave Config

Click Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 14-4 IED Configuration



14.3.9 Type

The type of point.

14.3.10 Number

Reflects a fixed number of various types of points from your IED.

14.3.11 Edit

Click the Edit button to edit points.

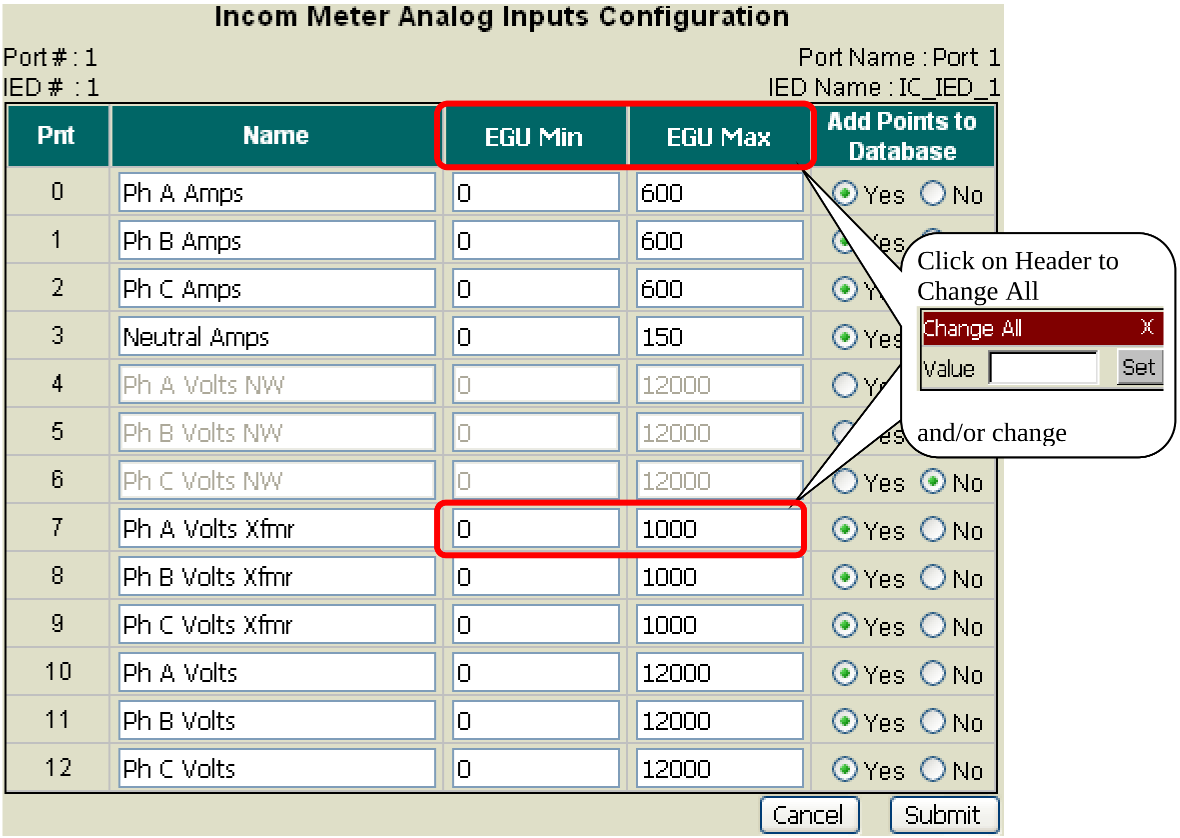
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

14.3.12 IED Analog Configuration

From the IED Configuration screen, click on Edit for Analog Inputs. A screen similar to Figure 2-13 will appear.

Figure 14-5 Analog Input Configuration



14.3.13 Point

Protocol logical point number. This number cannot be changed.

14.3.14 Name

Enter the name of the point (or accept the default name).

14.3.15 EGU Min

Accept the default or enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

14.3.16 EGU Max

Accept the default or enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

14.3.17 Add Points to Database (Yes, No)

Accept the default or click either Yes to add a point to the database or no to exclude a point from the database.

Navigation

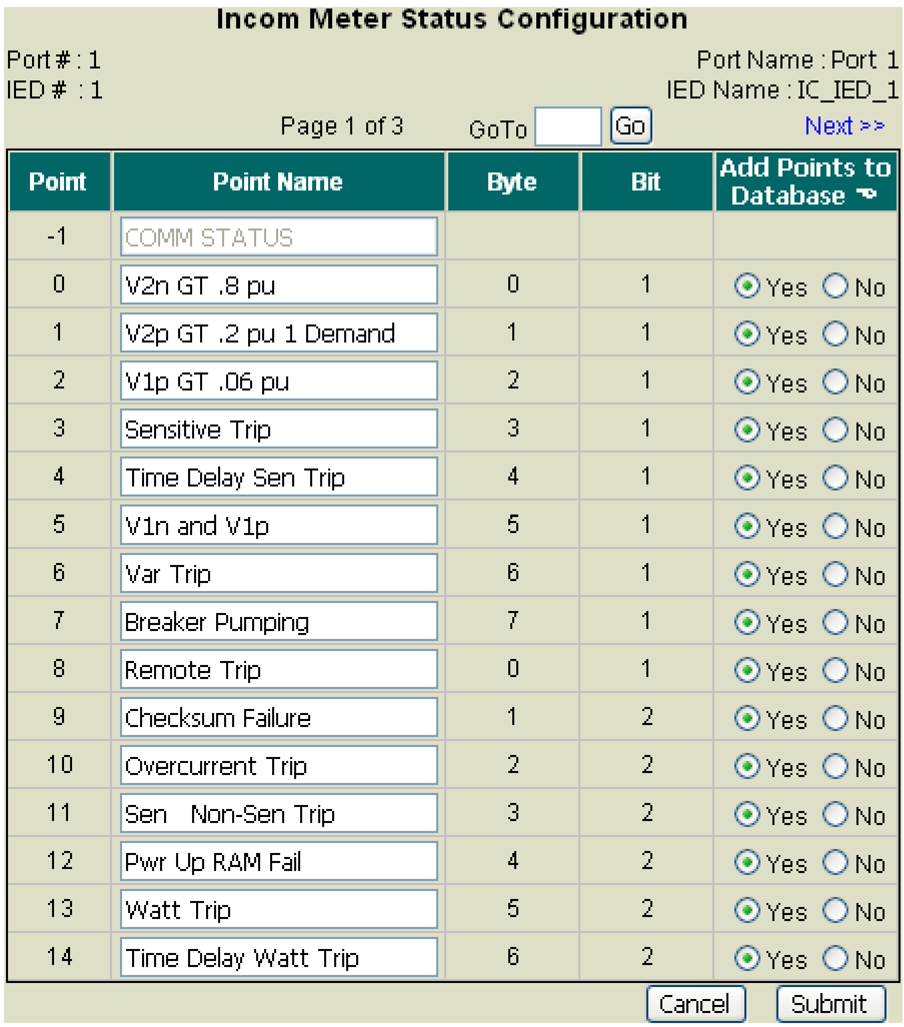
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

14.3.18 IED Status Configuration

From the IED Configuration screen, click on Edit for Status. A screen similar to Figure 2-14 will appear.

Figure 14-6 Status Input Configuration



14.3.19 Point

Protocol logical point number. This number cannot be changed. The COMM_STS point is automatically assigned to show whether this IED has valid connections.

14.3.20 Point Name

Enter the name of the point (except for COMM_STS which can not be changed) or accept the default name.

14.3.21 Byte

Reflects which byte the status point has been assigned to.

14.3.22 Bit

Reflects which bit the status point has been assigned to.

14.3.23 Add Points to Database (Yes, No)

Accept the default or click either Yes to add a point to the database or no to exclude a point from the database. All selections in this column may be changed at once by clicking on the header.

Navigation

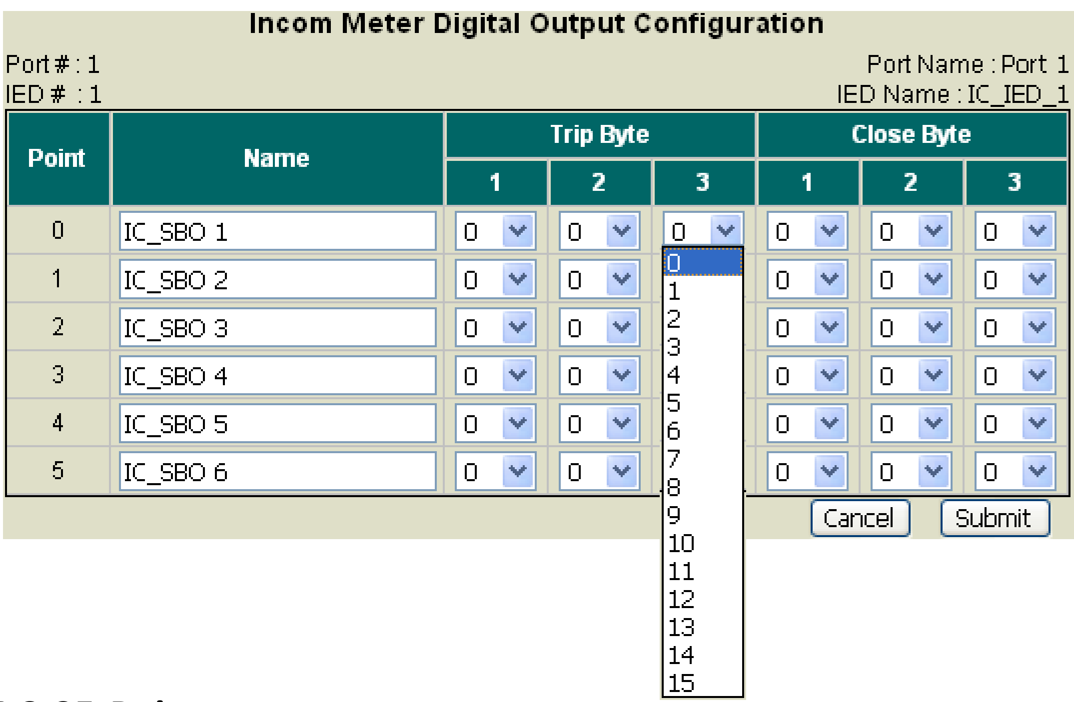
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

14.3.24 IED Controls Configuration

Click on Edit for Control Outputs. A screen similar to Figure 2-17 will appear.

Figure 14-7 Digital Output Configuration



14.3.25 Point

Protocol logical point number. This number cannot be changed

14.3.26 Name

Enter the name of the point (or accept the default name)

14.3.27 Trip Byte

From the pull-down menu, select the bit within the three bytes for Trip (or accept the default).

14.3.28 Close Byte

From the pull-down menu, select the bit within the three bytes for Close (or accept the default).

Navigation

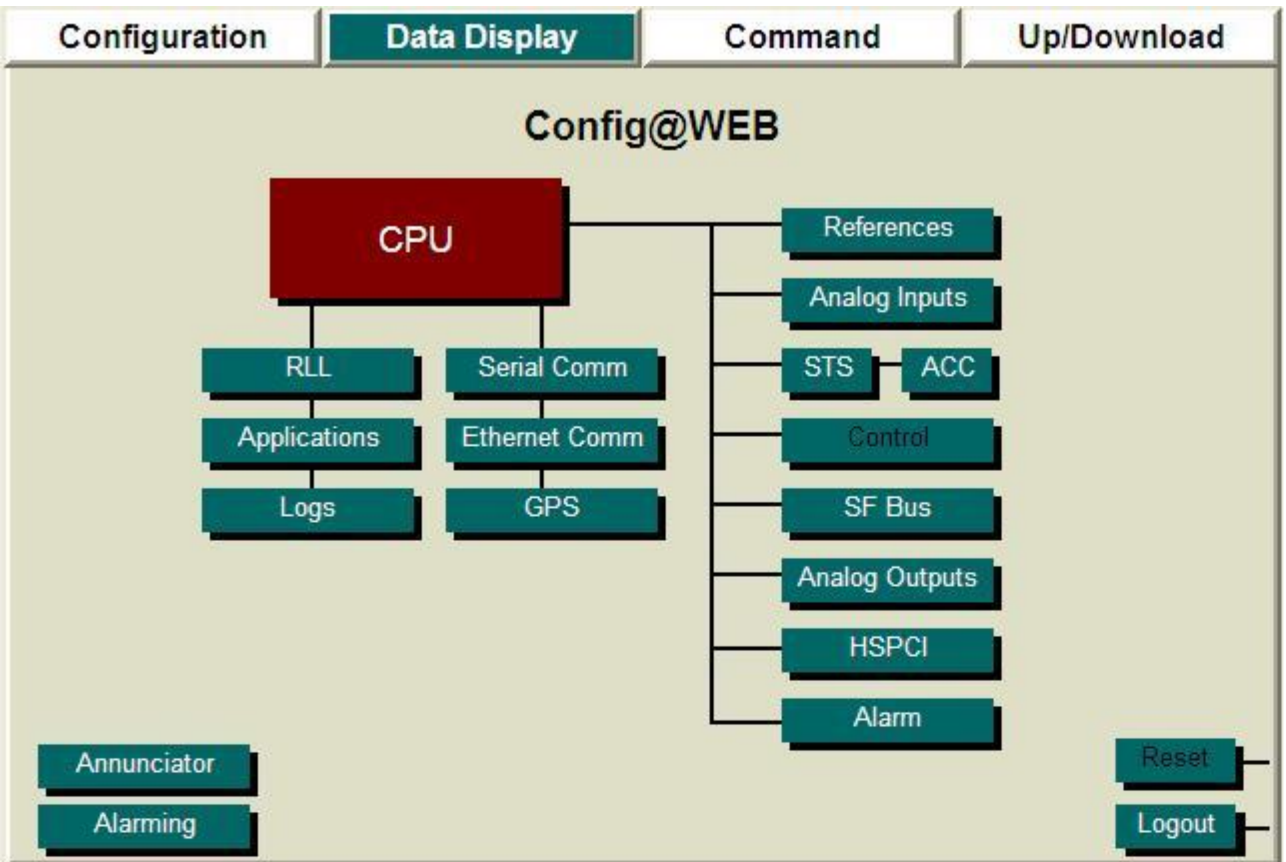
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

14.4 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 14-8 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 14-9 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Port 1	DNPR	View	Port Data
Port #2	K	K	Port 2	DNPM	View	Port Data
Port #3	K	K	Port 3	Incom	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

14.4.1 Port Number

Physical Port number of the RTU.

14.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

14.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

14.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

14.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at power up and always be the negative RS232 voltage.

14.4.3 Name

The port name given during configuration or default name accepted.

14.4.4 Protocol

The configured protocol for this port.

14.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

14.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

14.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

14.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 14-10 Communication Counters Display

14.4.9 Point

A logical point number for reference only.

14.4.10 Counter Name

The following counters are monitored:

14.4.10.1 Attempts

This indicates the cumulative number of transmitted messages since the last reset or power-up.

14.4.10.2 Valid Replies

This indicates the cumulative number of received messages since the last reset or power-up.

14.4.10.3 No Replies

This indicates the cumulative number of no replies since the last reset or power-up.

14.4.10.4 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

14.4.10.5 CRC Errors

This indicates the cumulative number of CRC Errors since the last reset or power-up.

14.4.10.6 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

14.4.10.7 Overruns

This indicates the cumulative number of overrun errors since the last reset or power-up.

14.4.10.8 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

14.4.11 Counts

The counts for each type of Counter.

14.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

14.4.13 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

Incom IED Comm Counters Display

Port # : 1 Port Name : Port 1

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts	Security Errors	Framing Errors	Overrun Errors	Parity Errors
1	IC_IED_1	6	0	6	0	0	0	0	0
2	IC_IED_2	4	0	4	0	0	0	0	0

Done

14.4.13.1 IED

The number of the IED

14.4.13.2 IED Name

The name of the IED

14.4.13.3 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

14.4.13.4 Valid Replies

This indicates the cumulative number of received messages since the last reset or power-up.

14.4.13.5 No Replies

This indicates the cumulative number of no replies since the last reset or power-up.

14.4.13.6 Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

14.4.13.7 Security Errors

This indicates the cumulative number of CRC Errors since the last reset or power-up.

14.4.13.8 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

14.4.13.9 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

14.4.13.10 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

14.4.14 Reset Comm Counters

Click this button to reset all comm. counters.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

14.4.15 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 14-11 IED Display

Incom IED Data

Port # : 1 Port Name : Port 1

IED #	IED Name	Address	On Scan	Delay (ms)	Slave Data
1	IC_IED_1	1	Y	1000	View
2	IC_IED_2	2	Y	1000	View

Back

14.4.16 IED

The logical number of the IED on this communication channel.

14.4.17 IED Name

The name that was chosen, or accepted as default, during configuration.

14.4.18 IED Address

The IED Address chosen during configuration.

14.4.19 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

14.4.20 Delay (ms)

This is the delay between messages in miliseconds.

14.4.21 Slave Data

Click View to examine the data being returned from this device, then click either Analog or Status to view as shown below.

Figure 14-12 IED Display

Incom IED Data

Port # : 1 Port Name : Port 1

IED #	IED Name	Address	On Scan	Delay (ms)	Slave Data
1	IC_IED_1	1	Y	1000	View
2	IC_IED_2	2	Y	1000	View

IDE # 1 X
Analogs
Status

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

14.4.21.1 Analog Inputs

From the IED Data Display screen, click Analog to get the screen shown below.

Figure 14-13 Analog Inputs Display

Incom Analog Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : IC_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point Value	Point Counts
1	Ph A Amps	F	0.000	0
2	Ph B Amps	F	0.000	0
3	Ph C Amps	F	0.000	0
4	Neutral Amps	F	0.000	0
5	Ph A Volts Xfmr	F	0.000	0
6	Ph B Volts Xfmr	F	0.000	0
7	Ph C Volts Xfmr	F	0.000	0
8	Ph A Volts	F	0.000	0
9	Ph B Volts	F	0.000	0
10	Ph C Volts	F	0.000	0
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Back

14.4.22 Point

Protocol logical point number.

14.4.23 Point Name

The name of the point assigned during configuration.

14.4.24 Point State

Please see the Config@WEB Secure Software Users Guide.

14.4.25 Point Value

The engineering unit (EGU) value.

14.4.26 Point Counts

The counts from the IED.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

14.4.26.1 Status Inputs

From the IED Data Display screen, click Status to get the screen shown below.

Figure 14-14 Status Inputs Display

Incom Status Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : IC_IED_1

Page1 of2 Go To [ ] Go Next>>

Point	Point Name	Point Status	Point State	•
0	COMM STATUS		CLOSED	•
1	V2n GT .8 pu	F	OPEN	•
2	V2p GT .2 pu 1 Demand	F	OPEN	•
3	V1p GT .06 pu	F	OPEN	•
4	Sensitive Trip	F	OPEN	•
5	Time Delay Sen Trip	F	OPEN	•
6	V1n and V1p	F	OPEN	•
7	Var Trip	F	OPEN	•
8	Breaker Pumping	F	OPEN	•
9	Remote Trip	F	OPEN	•
10	Checksum Failure	F	OPEN	•
11	Overcurrent Trip	F	OPEN	•
12	Sen Non-Sen Trip	F	OPEN	•
13	Pwr Up RAM Fail	F	OPEN	•
14	Watt Trip	F	OPEN	•
15	Time Delay Watt Trip	F	OPEN	•

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not this IED is in good communications. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

14.4.27 Point

Protocol logical point number.

14.4.28 Point Name

The name of the point assigned during configuration.

14.4.29 Point State

Please see the Config@WEB Secure Software Users Guide.

14.4.30 Point State

Indicates that point is either OPEN or CLOSED.

14.4.31 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

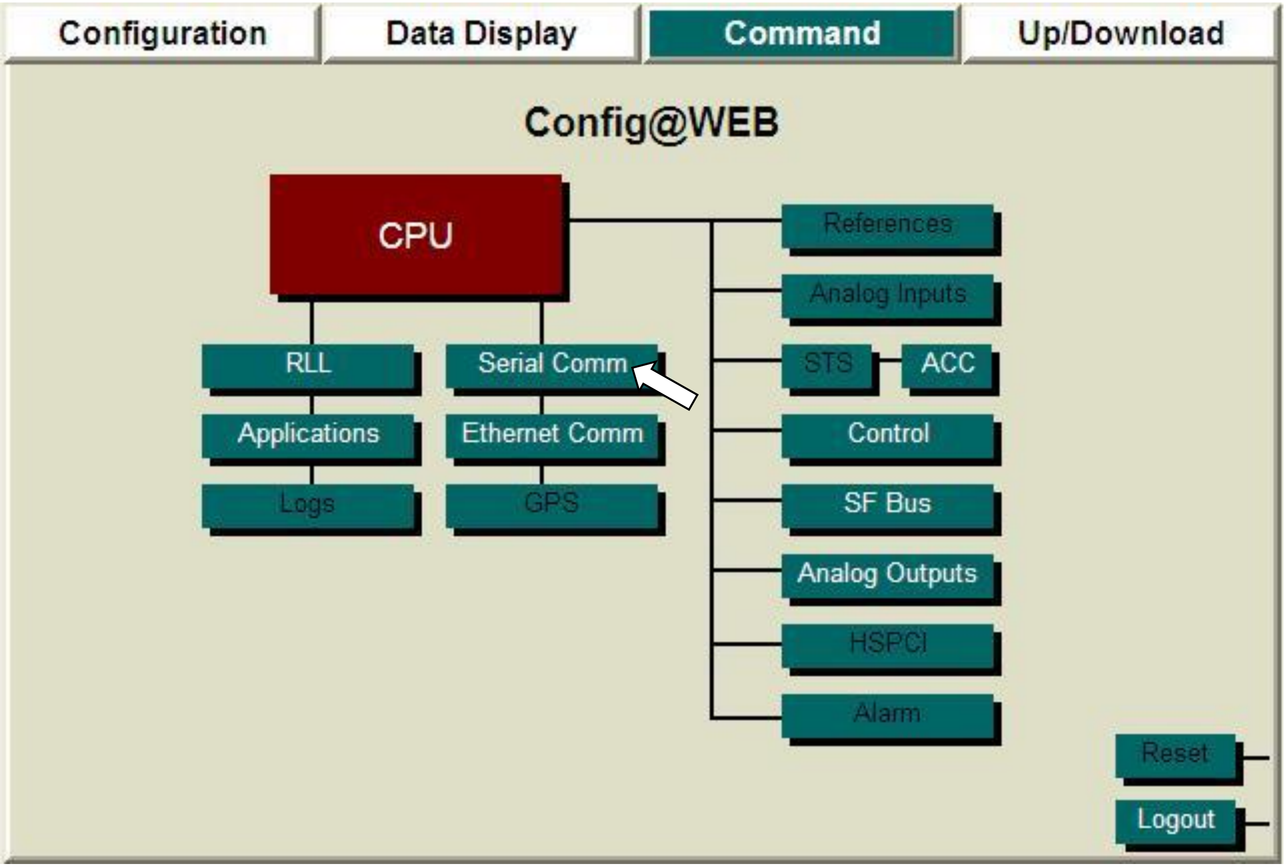
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

14.5 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 14-15 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2400 manual. Under Command Port Data, click Port Data.

Figure 14-16 Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	Incom	Port Data	Normal
Port #2	K	K	Port 2	DNPR	Port Data	Normal
Port #3	K	K	Port 3	DNPM	Port Data	Normal
Port #4	K	K	Port 4	ETI	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button as shown.

Figure 14-17 IED Command

Incom IED Command

Port # 1 Port Name : Port 1

IED #	IED Name	IED Address	On Scan	Slave Data
1	IC_IED_1	1	Y	Command
2	IC_IED_2	2	Y	Command

Back

The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command SBO Outputs.

Figure 14-18 IED Command

Incom IED Command

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : IC_IED_1

Type	Number	Command
Analog Inputs	13	
Status Inputs	33	
SBO Outputs	6	Command

Back

Click on the Command button. The resulting screen will look like Figure 10-21 after either a Trip or Close has been selected, then Executed with the Execute button.

Figure 14-19 Incom SBO Outputs Command

Incom SBO Outputs Command

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : IC_IED_1

Page 1 of 1 GoTo Go

Point	Name	Trip Byte			Close Byte			Point Operations
		1	2	3	1	2	3	
0	IC_SBO 1	0	0	0	0	0	0	Trip Close Execute
1	IC_SBO 2	0	0	0	0	0	0	Trip Close Execute
2	IC_SBO 3	0	0	0	0	0	0	Trip Close Execute
3	IC_SBO 4	0	0	0	0	0	0	Trip Close Execute
4	IC_SBO 5	0	0	0	0	0	0	Trip Close Execute
5	IC_SBO 6	0	0	0	0	0	0	Trip Close Execute

Back

15 ETI

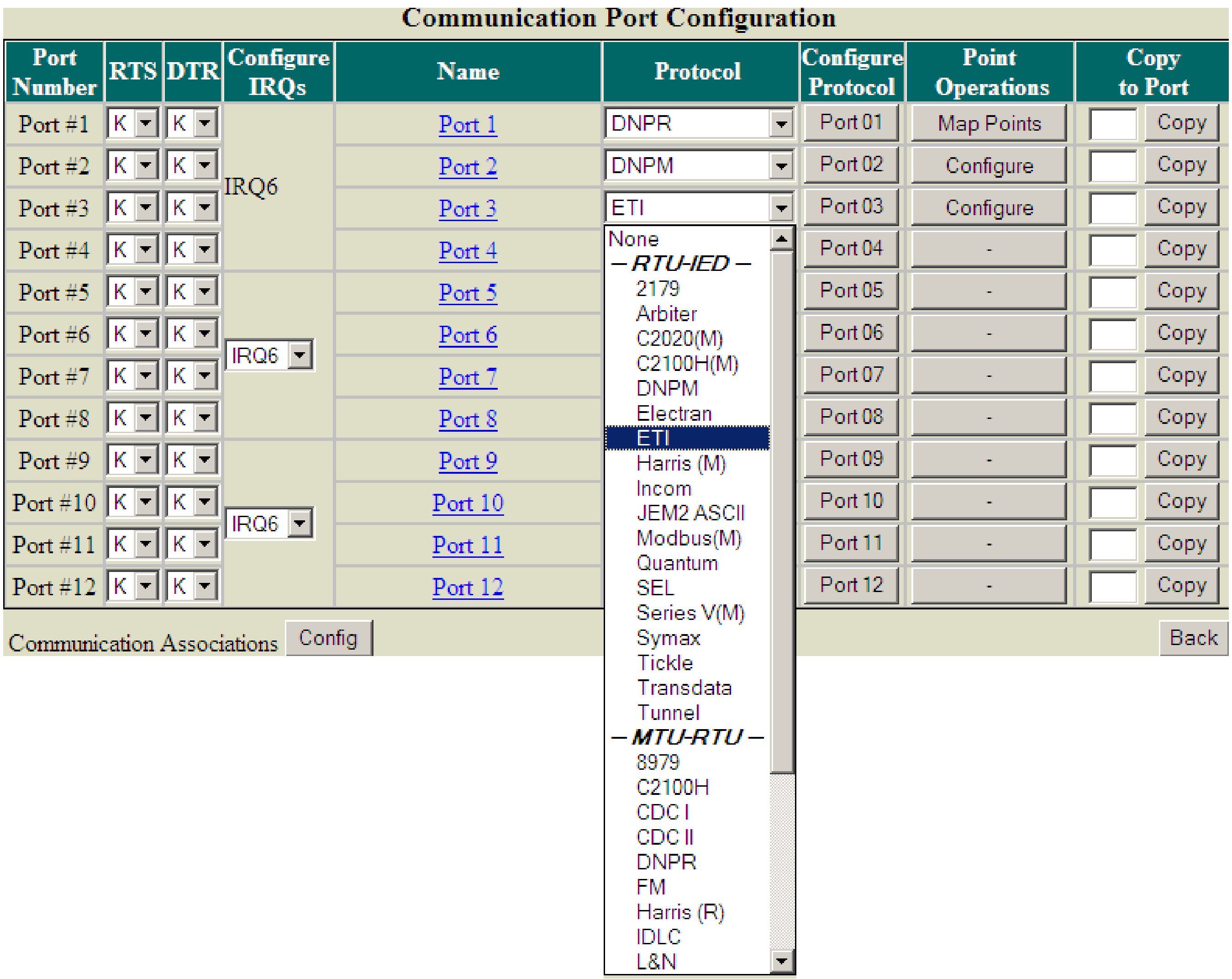
15.1 Serial Comm Port Configuration

is a protocol that communicates between the RTU and an IED. It can be used to front-end an existing RTU in order to add new communication functionality within the substation while preserving the existing hardware I/O.

The protocol running on an RTU can also be used at the master station as a front-end processor scanning multiple RTUs and converting the data to a different protocol.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click from the Protocol drop-down menu as shown.

Figure 15-1 ETI Communication Port Configuration



15.1.1 Port Number

Physical Port number of the RTU.

15.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

15.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

15.1.2.2 "H" represents Positive RS232 Voltage.

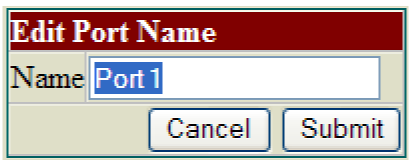
When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

15.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

15.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.



15.1.4 Protocol

From the drop-down list, select the protocol for this port.

15.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

15.1.6 Point Operations

Click this button to assign points.

15.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

15.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

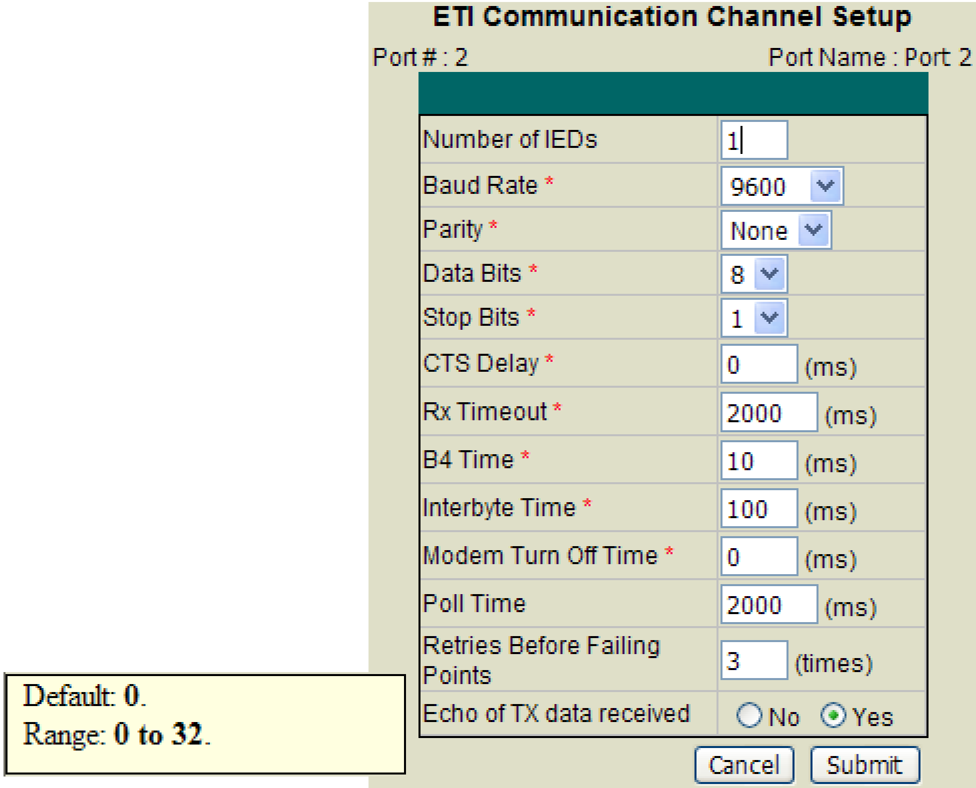
Navigation

Click the Back button to return to the previous screen.

15.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n* to configure the port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 15-2 ETI Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

15.2.1 Number of IEDs (0-32)

Enter the number of IEDs on the port. The default setting is 0.

15.2.2 Baud Rate (300-19200)

From the drop-down menu, select the baud rate. The default setting is 9600.

15.2.3 Parity (None, Odd, Even)

Enter the parity for the associated channel. The default setting is None.

15.2.4 Data Bits (5,6,7,8)

From the drop-down menu, select the data bits for the associated channel. The default setting is 8.

15.2.5 Stop Bits (0,1,2)

From the drop-down menu, select the stop bits for the associated channel. The default setting is 1.

15.2.6 CTS Delay (0 – 250ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 0.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

15.2.7 Rx Timeout (0 – 30,000 msec)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 2,000 msec.

15.2.8 B4 Time (0 – 250 msec)

Enter the B4 time for the associated channel. The B4 time is the length of quiet time required on the channel following a transmission from the RTU prior to turning on the RTU's receive interrupts. Default setting 10 msec.

15.2.9 Interbyte Time (0 – 250ms)

Enter the inter-byte time for the associated channel. The inter-byte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 100 msec.

15.2.10 Modem Turn Off Time (0 – 250ms)

Enter the delay time that the modem will maintain the carrier after the last data byte has been transmitted. Default setting is 0.

15.2.11 Poll Time (0 – 10,000ms)

Enter the time to delay between a sequence of polling all the devices connected to this communications port. Default setting is 2000.

15.2.12 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

15.2.13 Echo of TX Data received (No, Yes)

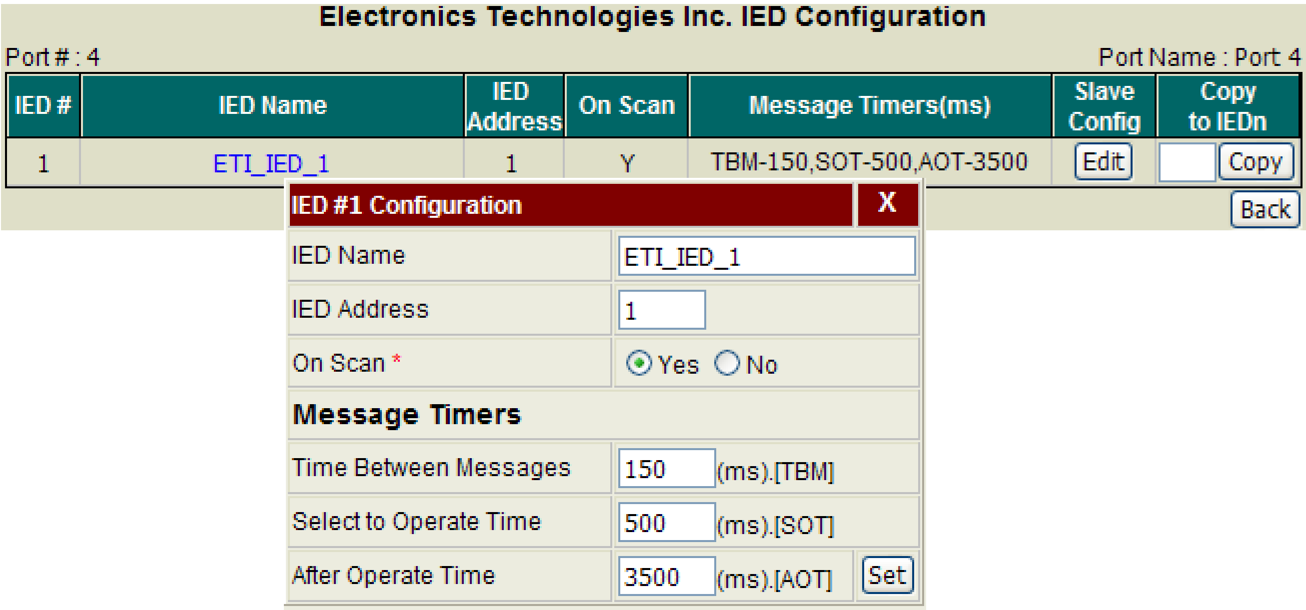
Select Yes or No to echo commands back to the RTU. The default is Yes.

Please note: No configuration changes take effect until the RTU is reset.

15.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 15-3 IED Configuration



15.3.1 IED

The logical number of the IED on this communication channel.

15.3.2 IED Name

Click on the IED Name. A pop-up window called **IED Configuration** will appear, as shown above.

15.3.2.1 IED Name

The name of the IED. Type in a name, or accept the default.

15.3.2.2 IED Address

The address of the IED. Type in an address, or accept the default.

15.3.2.3 On Scan

Determines whether or not the IED is being scanned. Click No to disable the scan, or accept the default (Yes).

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

15.3.2.4 Message Timers

15.3.2.5 Time Between Msg (0 – 12750 msec.)

Type in the delay between messages or accept the default. Default is 150 msec.

15.3.2.6 Select to Operate Time (0 – 12750 msec.)

Type in the delay between a Select command and an Operate command or accept the default. Default is 500 msec.

15.3.2.7 After Operate Time (0 – 12750 msec.)

Type in the delay between separate SBO commands or accept the default. Default is 3500 msec.

15.3.2.8 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

15.3.3 IED Address

Reflects the entry in the pop-up menu. See above.

15.3.4 On Scan

Reflects the entry in the pop-up menu. See above.

15.3.5 Message Timers (ms)

Reflects the entry in the pop-up menu. See above. (TBM = Time Between Messages, SOT = Select to Operate Time, AOT = After Operate Time)

15.3.6 Slave Config

Click the Edit button to edit the IED points.

15.3.7 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

Navigation

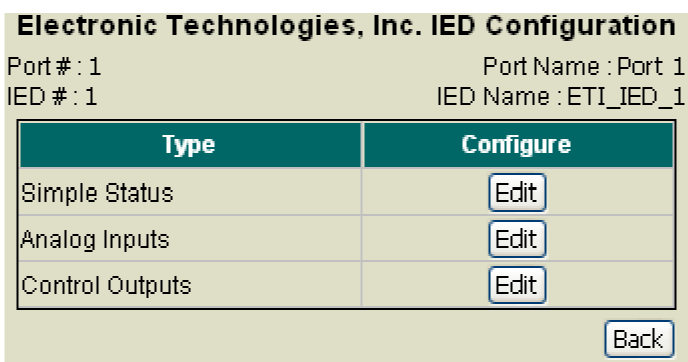
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

15.3.7.1 Slave Configuration Edit

15.3.8 Slave Config

Click Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 15-4 IED Configuration



15.3.9 Type

The type of point.

15.3.10 Configure

Click the Edit button to edit points.

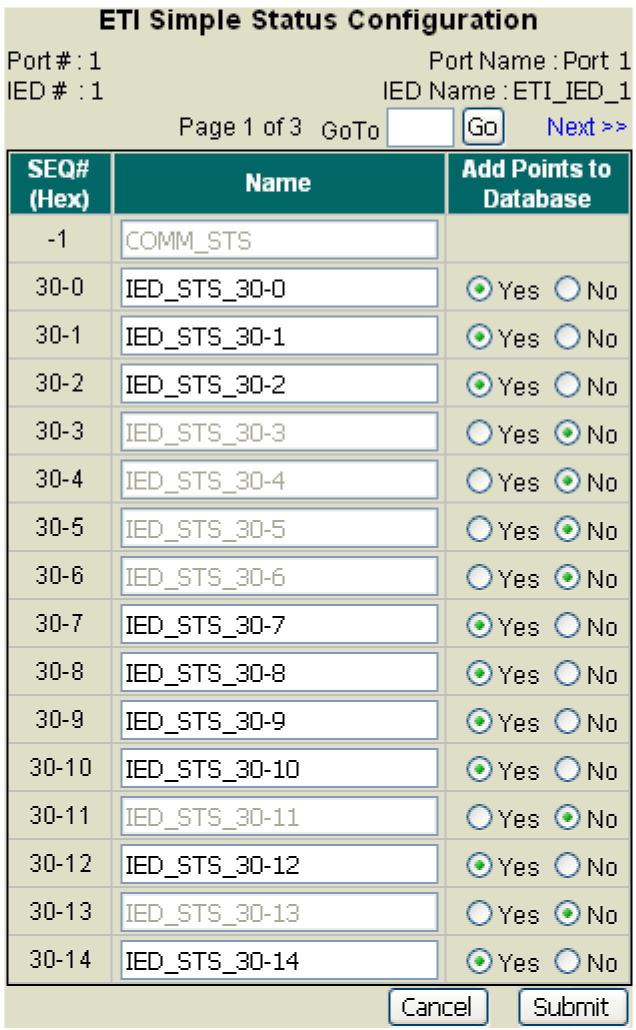
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

15.3.11 IED Simple Status Configuration

From the IED Configuration screen, click on Edit for Simple Status. A screen similar to Figure 2-14 will appear.

Figure 15-5 Simple Status Configuration



15.3.12 SEQ# (Hex)

This is the Status sequence in Hex.

15.3.13 Point Name

This is the name of the point. If the point is added to the database, you may change the name of the point or accept the default name.

15.3.14 Add Points to Database (Yes, No)

Click Yes to add a point to the database.

Navigation

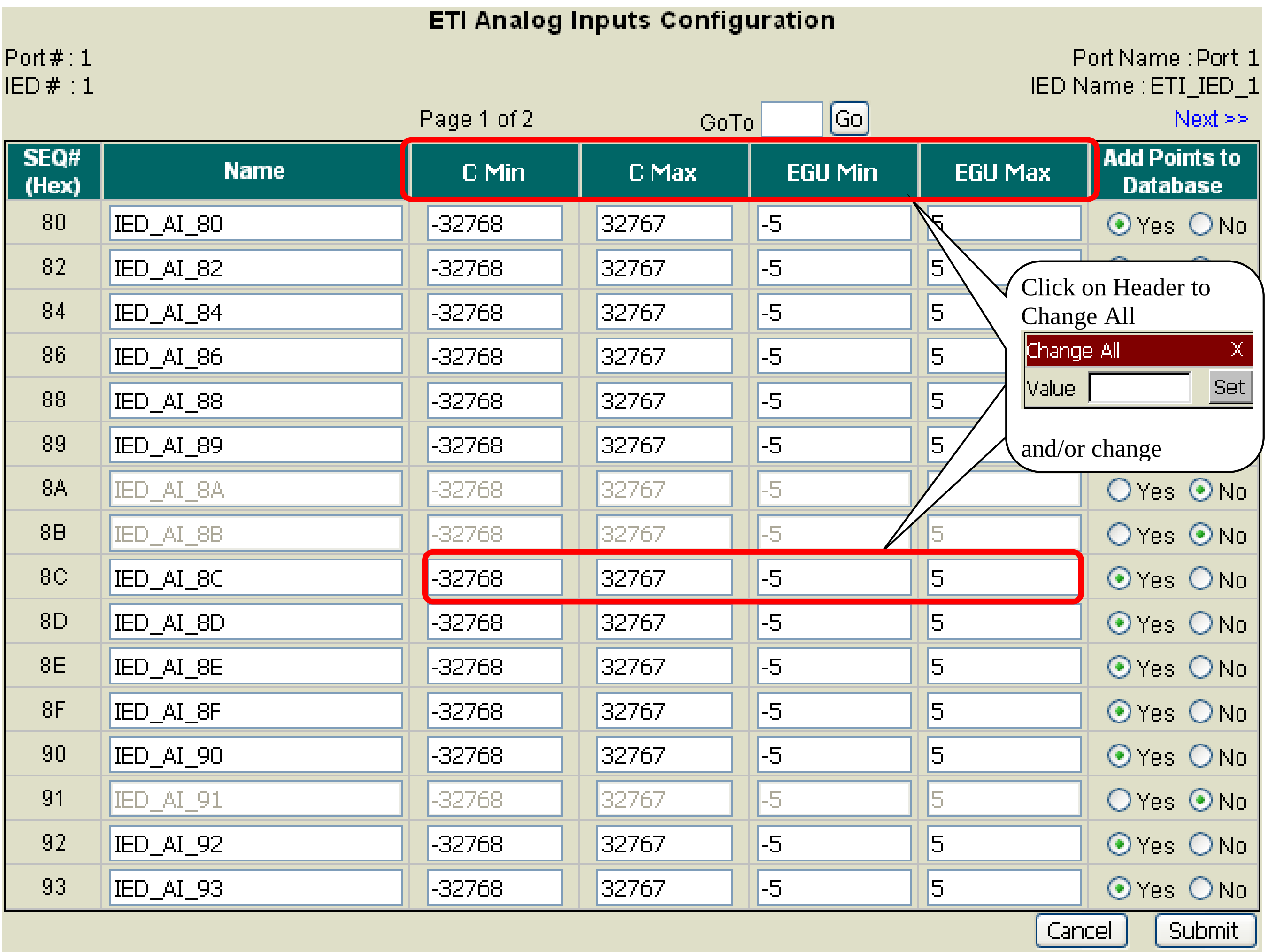
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

15.3.15 IED Analog Configuration

From the IED Configuration screen, click on Edit for Analog Inputs. A screen similar to Figure 2-13 will appear.

Figure 15-6 Analog Input Configuration



SEQ# (Hex)	Name	C Min	C Max	EGU Min	EGU Max	Add Points to Database
80	IED_AI_80	-32768	32767	-5	5	Yes (selected) / No
82	IED_AI_82	-32768	32767	-5	5	
84	IED_AI_84	-32768	32767	-5	5	
86	IED_AI_86	-32768	32767	-5	5	
88	IED_AI_88	-32768	32767	-5	5	
89	IED_AI_89	-32768	32767	-5	5	
8A	IED_AI_8A	-32768	32767	-5		Yes / No (selected)
8B	IED_AI_8B	-32768	32767	-5	5	Yes / No (selected)
8C	IED_AI_8C	-32768	32767	-5	5	Yes (selected) / No
8D	IED_AI_8D	-32768	32767	-5	5	Yes (selected) / No
8E	IED_AI_8E	-32768	32767	-5	5	Yes (selected) / No
8F	IED_AI_8F	-32768	32767	-5	5	Yes (selected) / No
90	IED_AI_90	-32768	32767	-5	5	Yes (selected) / No
91	IED_AI_91	-32768	32767	-5	5	Yes / No (selected)
92	IED_AI_92	-32768	32767	-5	5	Yes (selected) / No
93	IED_AI_93	-32768	32767	-5	5	Yes (selected) / No

15.3.16 SEQ# (Hex)

This is the Analog sequence in Hex.

15.3.17 Name

If the point has been added to the database, enter the name of the point (or accept the default name).

15.3.18 C Min

If the point has been added to the database, accept the default or enter a minimum count for the point. All entries in this column may be changed at once by clicking on the header.

15.3.19 C Max

If the point has been added to the database, accept the default or enter a maximum count for the point. All entries in this column may be changed at once by clicking on the header.

15.3.20 EGU Min

If the point has been added to the database, accept the default or enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

15.3.21 EGU Max

If the point has been added to the database, accept the default or enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

15.3.22 Add Points to Database (Yes, No)

Click Yes to add a point to the database.

Navigation

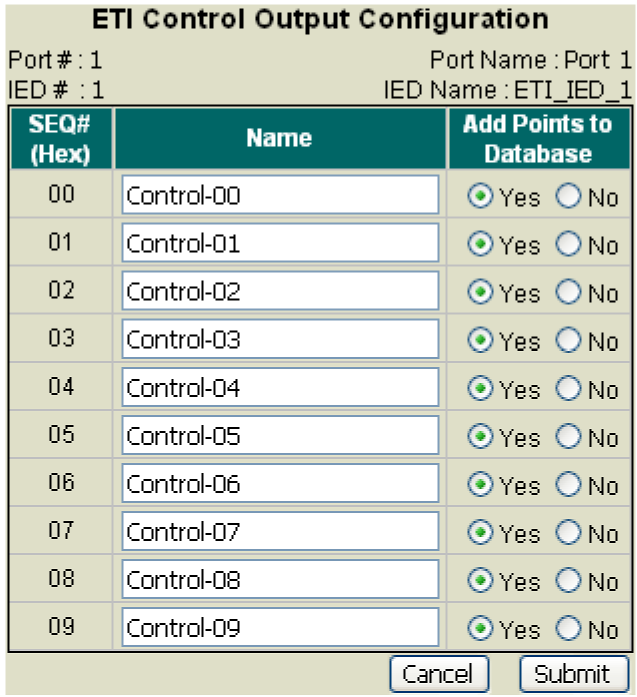
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

15.3.23 IED Controls Configuration

Click on Edit for Control Outputs. A screen similar to Figure 2-17 will appear.

Figure 15-7 Digital Output Configuration



15.3.24 SEQ# (Hex)

This is the Control sequence in Hex.

15.3.25 Name

If the point has been added to the database, enter the name of the point (or accept the default name)

15.3.26 Add Points to Database (Yes, No)

Click Yes to add a point to the database.

Navigation

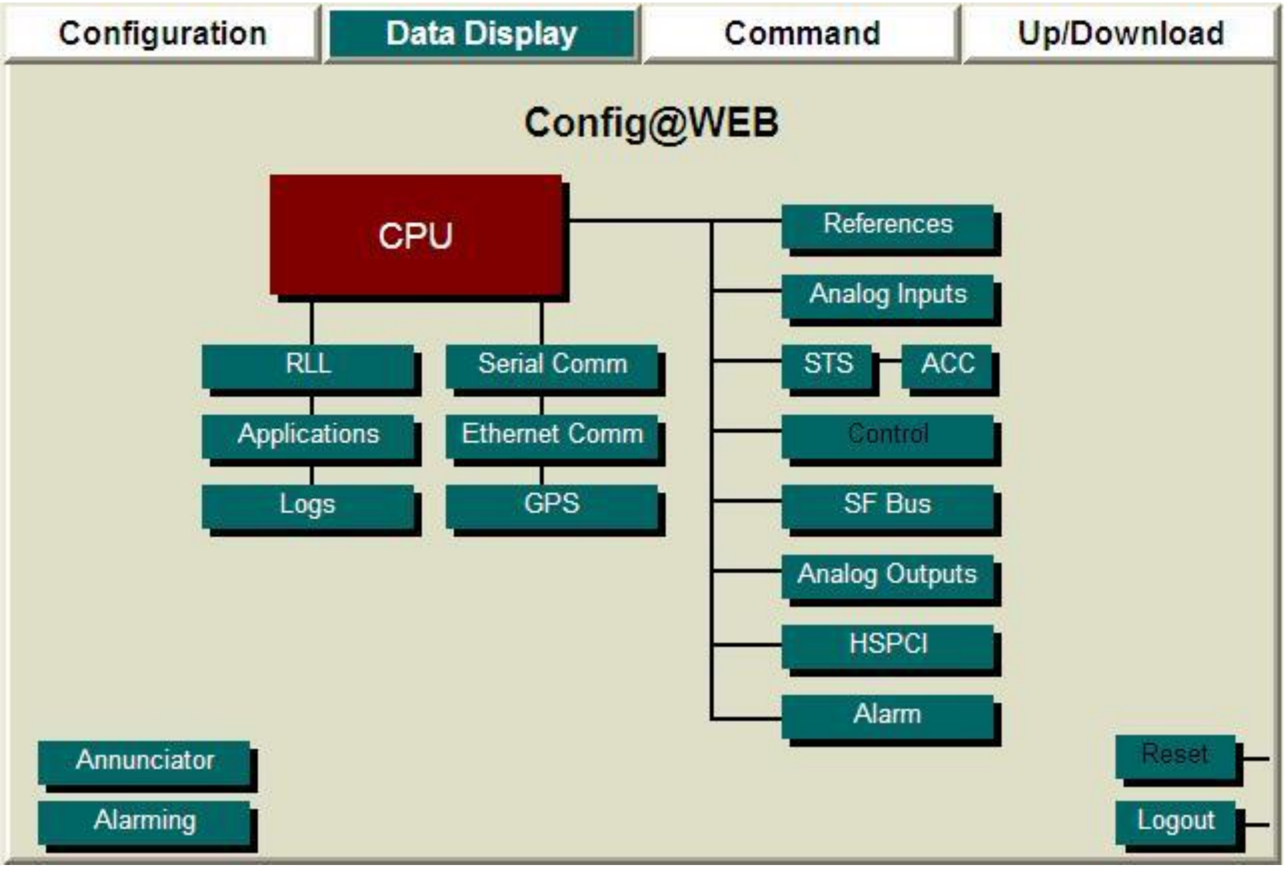
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

15.4 Data Display

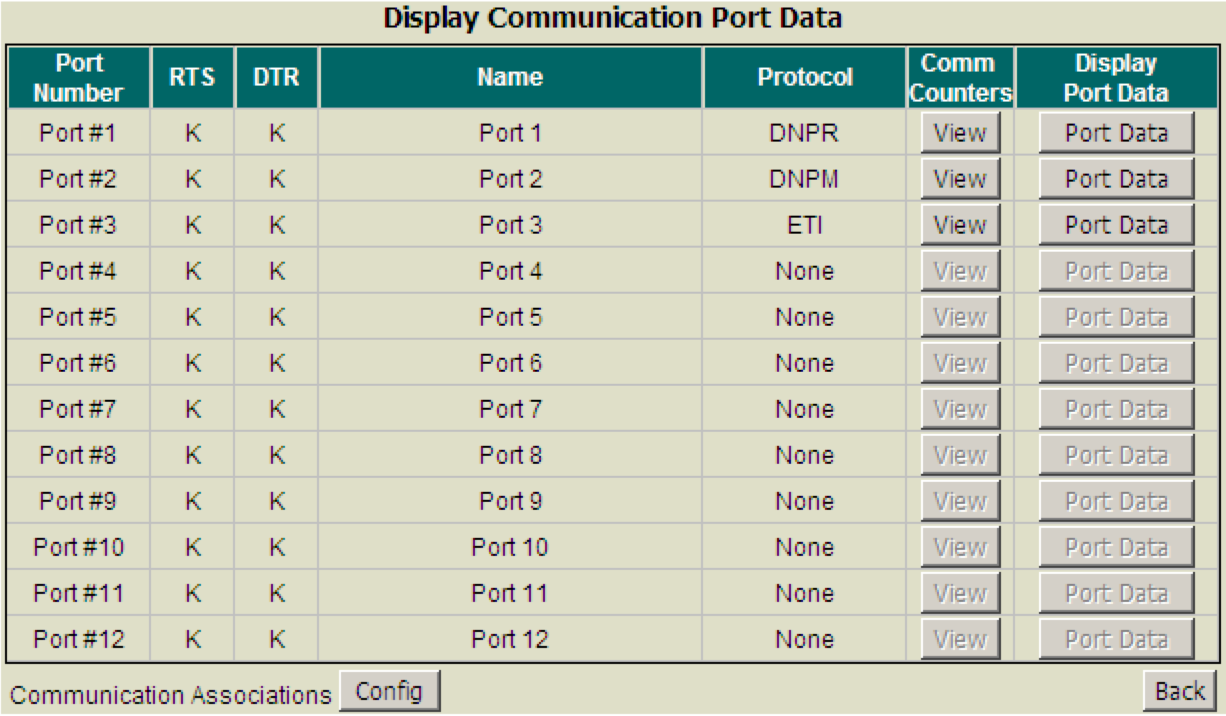
Click the Data Display tab as shown in Figure 2-18.

Figure 15-8 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 15-9 Display Communication Port Data



Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Port 1	DNPR	View	Port Data
Port #2	K	K	Port 2	DNPM	View	Port Data
Port #3	K	K	Port 3	ETI	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

15.4.1 Port Number

Physical Port number of the RTU.

15.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

15.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

15.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

15.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

15.4.3 Name

The port name given during configuration or default name accepted.

15.4.4 Protocol

The configured protocol for this port.

15.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

15.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

15.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

15.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 15-10 Communication Counters Display

15.4.9 Point

A logical point number for reference only.

15.4.10 Counter Name

The following counters are monitored:

15.4.10.1 Attempts

This indicates the cumulative number of transmitted messages since the last reset or power-up.

15.4.10.2 Valid Replies

This indicates the cumulative number of received messages since the last reset or power-up.

15.4.10.3 No Replies

This indicates the cumulative number of no replies since the last reset or power-up.

15.4.10.4 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

15.4.10.5 CRC Errors

This indicates the cumulative number of CRC Errors since the last reset or power-up.

15.4.10.6 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

15.4.10.7 Overruns

This indicates the cumulative number of overrun errors since the last reset or power-up.

15.4.10.8 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

15.4.11 Counts

The counts for each type of Counter.

15.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

15.4.13 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

ETI IED Comm Counters Display

Port # : 1 Port Name : Port 1

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts	Security Errors	Framing Errors	Overrun Errors	Parity Errors
1	ETI_IED_1	68	0	68	0	0	0	0	0
2	ETI_IED_2	0	0	0	0	0	0	0	0

Done

15.4.13.1 IED

The number of the IED

15.4.13.2 IED Name

The name of the IED

15.4.13.3 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

15.4.13.4 Valid Replies

This indicates the cumulative number of received messages since the last reset or power-up.

15.4.13.5 No Replies

This indicates the cumulative number of no replies since the last reset or power-up.

15.4.13.6 Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

15.4.13.7 Security Errors

This indicates the cumulative number of CRC Errors since the last reset or power-up.

15.4.13.8 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

15.4.13.9 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

15.4.13.10 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

15.4.14 Reset Comm Counters

Click this button to reset all comm. counters.

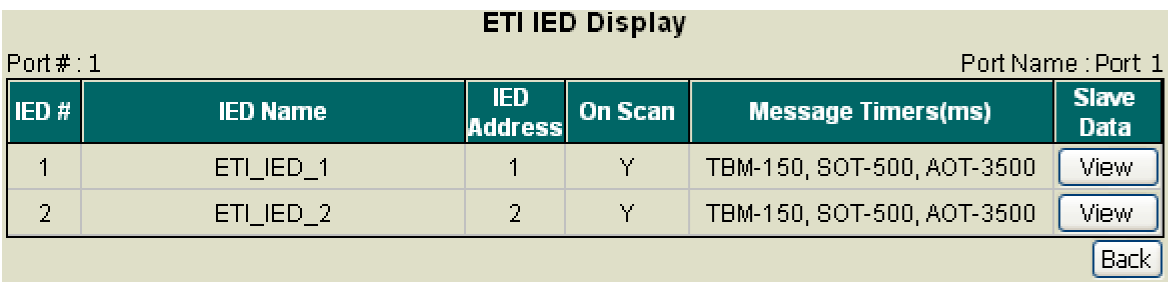
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

15.4.15 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 15-11 IED Display



ETI IED Display

Port # : 1 Port Name : Port 1

IED #	IED Name	IED Address	On Scan	Message Timers(ms)	Slave Data
1	ETI_IED_1	1	Y	TBM-150, SOT-500, AOT-3500	View
2	ETI_IED_2	2	Y	TBM-150, SOT-500, AOT-3500	View

Back

15.4.16 IED

The logical number of the IED on this communication channel.

15.4.17 IED Name

The name that was chosen, or accepted as default, during configuration.

15.4.18 IED Address

The IED Address chosen during configuration.

15.4.19 Message Timers (ms)

TBM (Time Between Messages in milliseconds)

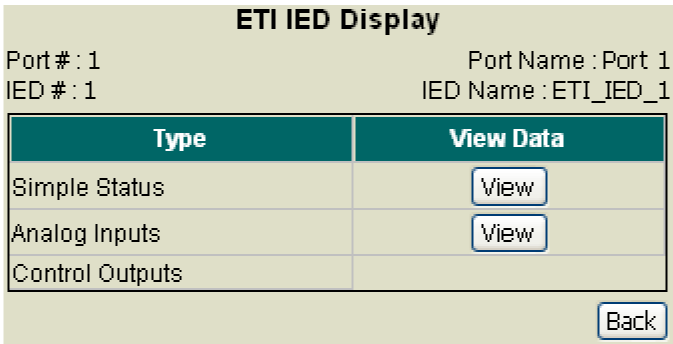
SOT (Select to Operate Time in milliseconds)

AOT (After Operate Time in milliseconds)

15.4.20 Slave Data

Click View to examine the data being returned from this device, then click either Analog or Status to view as shown below.

Figure 15-12 IED Display



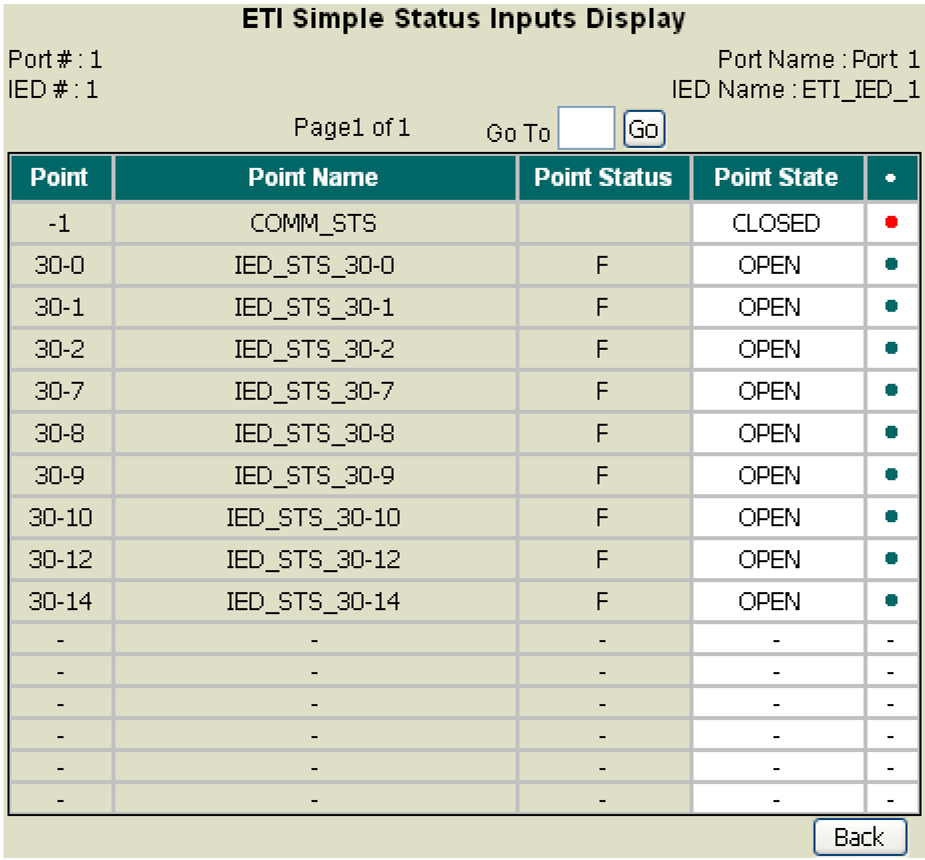
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

15.4.20.1 Simple Status Inputs

From the IED Data Display screen, click Status to get the screen shown below.

Figure 15-13 Status Inputs Display


ETI Simple Status Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : ETI_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point State	•
-1	COMM_STS		CLOSED	•
30-0	IED_STS_30-0	F	OPEN	•
30-1	IED_STS_30-1	F	OPEN	•
30-2	IED_STS_30-2	F	OPEN	•
30-7	IED_STS_30-7	F	OPEN	•
30-8	IED_STS_30-8	F	OPEN	•
30-9	IED_STS_30-9	F	OPEN	•
30-10	IED_STS_30-10	F	OPEN	•
30-12	IED_STS_30-12	F	OPEN	•
30-14	IED_STS_30-14	F	OPEN	•
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not this IED is in good communications. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

15.4.21 Point

Protocol logical point number.

15.4.22 Point Name

The name of the point assigned during configuration.

15.4.23 Point Status

Please see the Config@WEB Secure Software Users Guide.

15.4.24 Point State

Indicates that point is either OPEN or CLOSED.

15.4.25 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

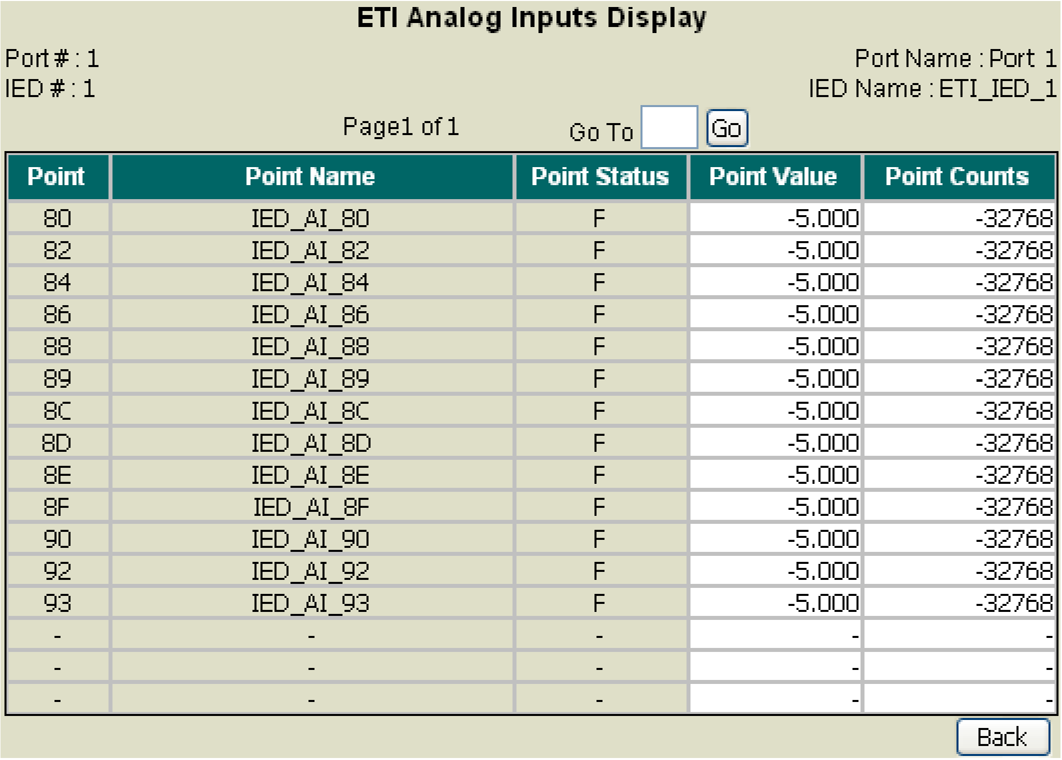
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

15.5 Analog Inputs

From the IED Data Display screen, click Analog to get the screen shown below.

Figure 15-14 Analog Inputs Display



ETI Analog Inputs Display

Port # : 1 Port Name : Port 1

IED # : 1 IED Name : ETI_IED_1

Page1 of 1 Go To Go

Point	Point Name	Point Status	Point Value	Point Counts
80	IED_AI_80	F	-5.000	-32768
82	IED_AI_82	F	-5.000	-32768
84	IED_AI_84	F	-5.000	-32768
86	IED_AI_86	F	-5.000	-32768
88	IED_AI_88	F	-5.000	-32768
89	IED_AI_89	F	-5.000	-32768
8C	IED_AI_8C	F	-5.000	-32768
8D	IED_AI_8D	F	-5.000	-32768
8E	IED_AI_8E	F	-5.000	-32768
8F	IED_AI_8F	F	-5.000	-32768
90	IED_AI_90	F	-5.000	-32768
92	IED_AI_92	F	-5.000	-32768
93	IED_AI_93	F	-5.000	-32768
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Back

15.5.1 Point

Protocol logical point number.

15.5.2 Point Name

The name of the point assigned during configuration.

15.5.3 Point Status

Please see the Config@WEB Secure Software Users Guide.

15.5.4 Point Value

The engineering unit (EGU) value.

15.5.5 Point Counts

The counts from the IED.

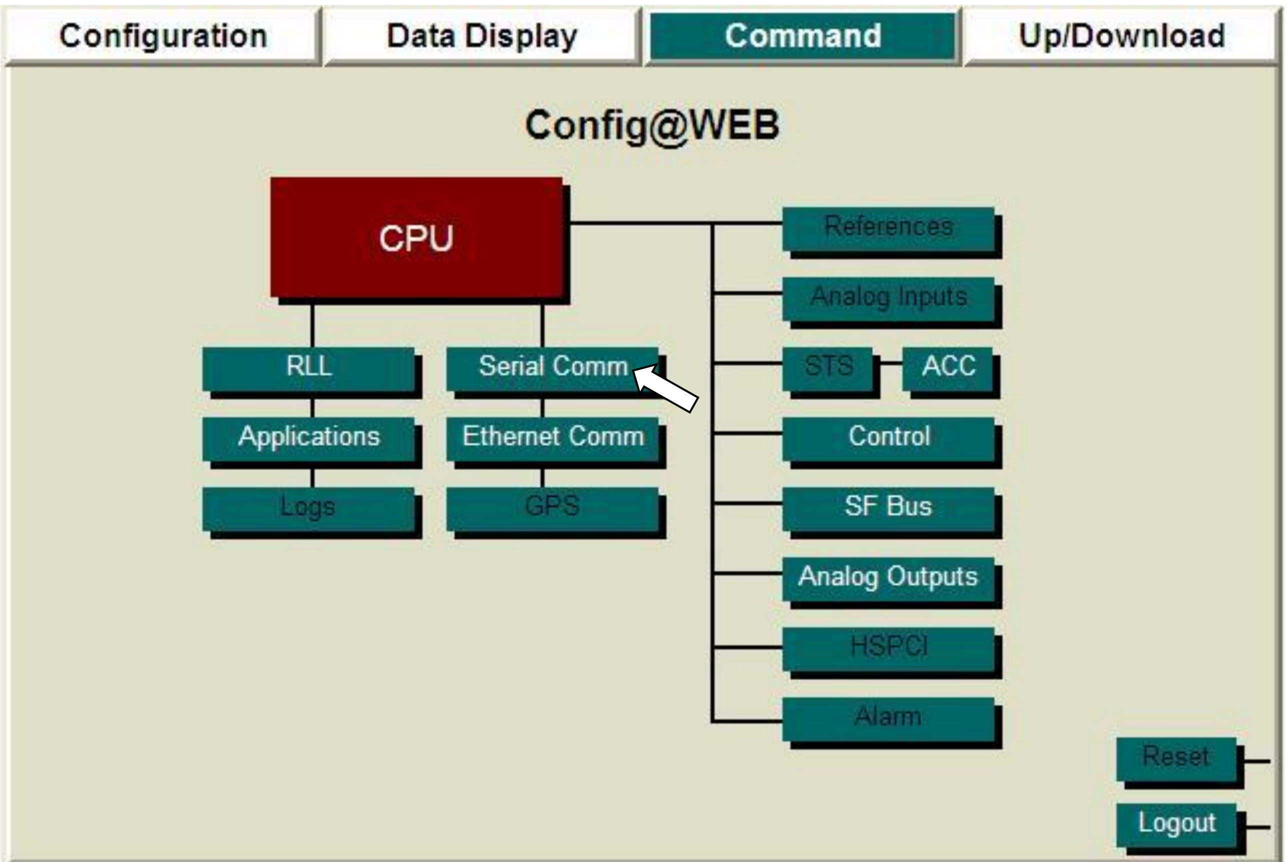
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

15.6 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 15-15 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2300 manual. Under Command Port Data, click Port Data.

Figure 15-16 ETI Serial Comm Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	ETI	Port Data	Normal
Port #2	K	K	Port 2	DNPR	Port Data	Normal
Port #3	K	K	Port 3	DNPM	Port Data	Normal
Port #4	K	K	Port 4	None	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button as shown.

Figure 15-17 ETI IED Command

ETI IED Command

Port # 1 Port Name : Port 1

IED #	IED Name	IED Address	On Scan	Slave Data
1	ETI_IED_1	1	Y	Command
2	ETI_IED_2	2	Y	Command

Back

The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command SBO Outputs.

Figure 15-18 ETI IED Command Details

ETI IED Command

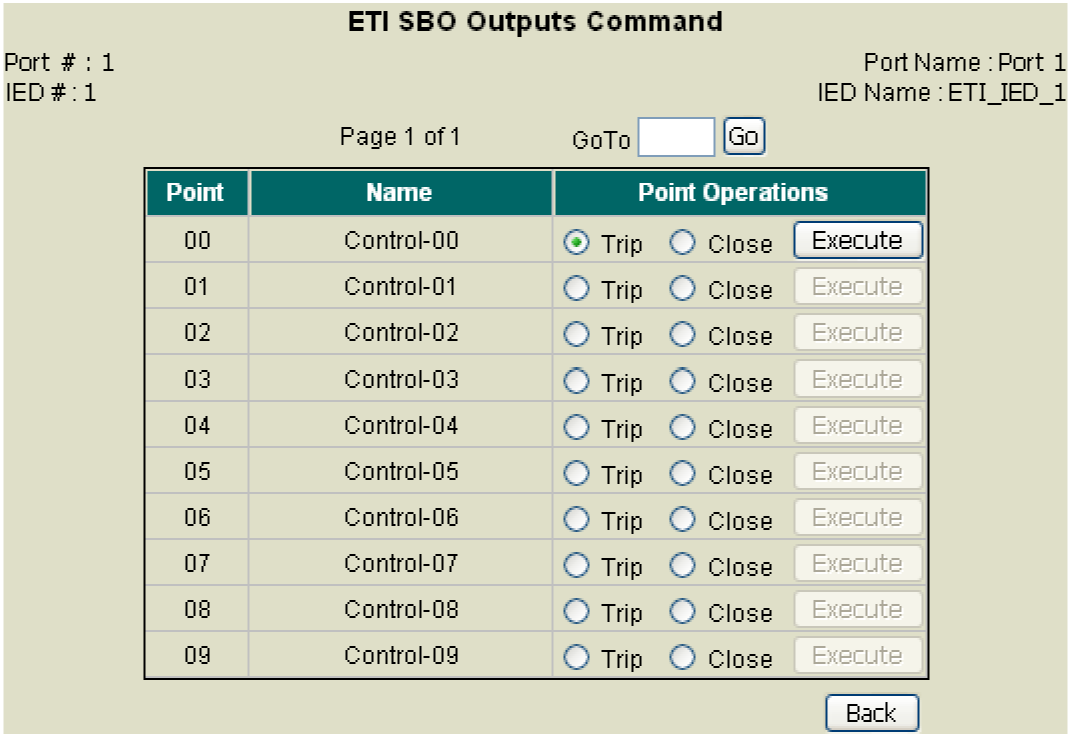
Port # : 1 Port Name : Port 1
IED # : 1 IED Name : ETI_IED_1

Type	Number	Command
Analog Inputs	13	
Status Inputs	10	
SBO Outputs	10	Command

Back

Click on the Command button. The resulting screen will look like Figure 10-21 after either a Trip or Close has been selected, then Executed with the Execute button.

Figure 15-19 ETI SBO Outputs Command



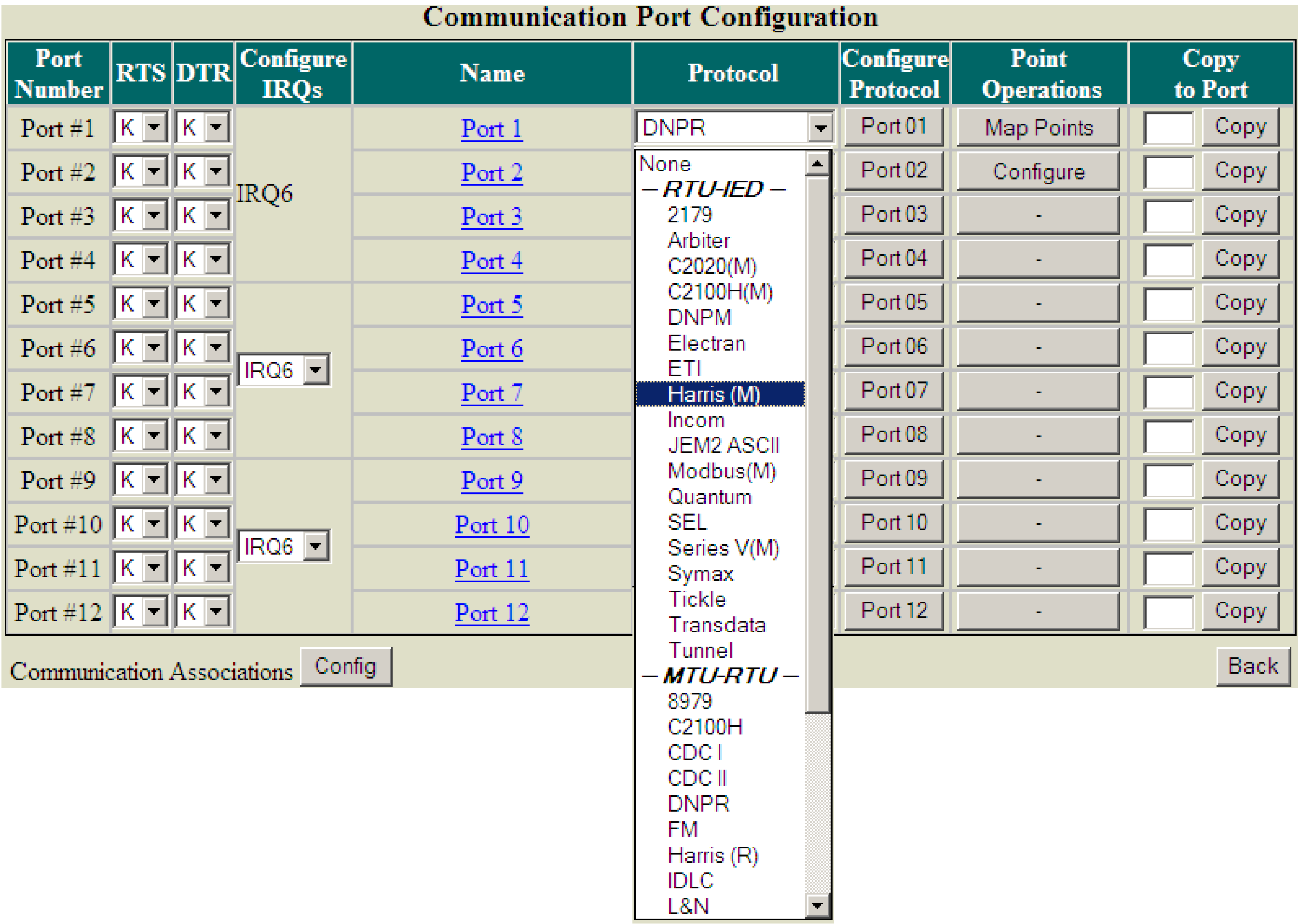
16 Harris(M)

16.1 Communication Port Configuration

Harris(M) is a protocol that communicates between the SAGE RTU and one or more (up to 32) RTUs or IEDs per port using the Harris 5000, 5500, or 6000 protocols.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. From this screen, click Harris(M) from the Protocol drop-down menu as shown.

Figure 16-1 Harris(M) Communication Port Configuration



16.1.1 Port Number

Physical Port number of the RTU.

16.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

16.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

16.1.2.2 "H" represents Positive RS232 Voltage.

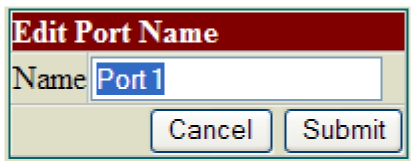
When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

16.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

16.1.3 Name

Click on the "blue" name (see below) and rename the port, or accept the default name.



16.1.4 Protocol

From the drop-down list, select the protocol for this port.

16.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

16.1.6 Point Operations

Click this button to assign points.

16.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

16.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

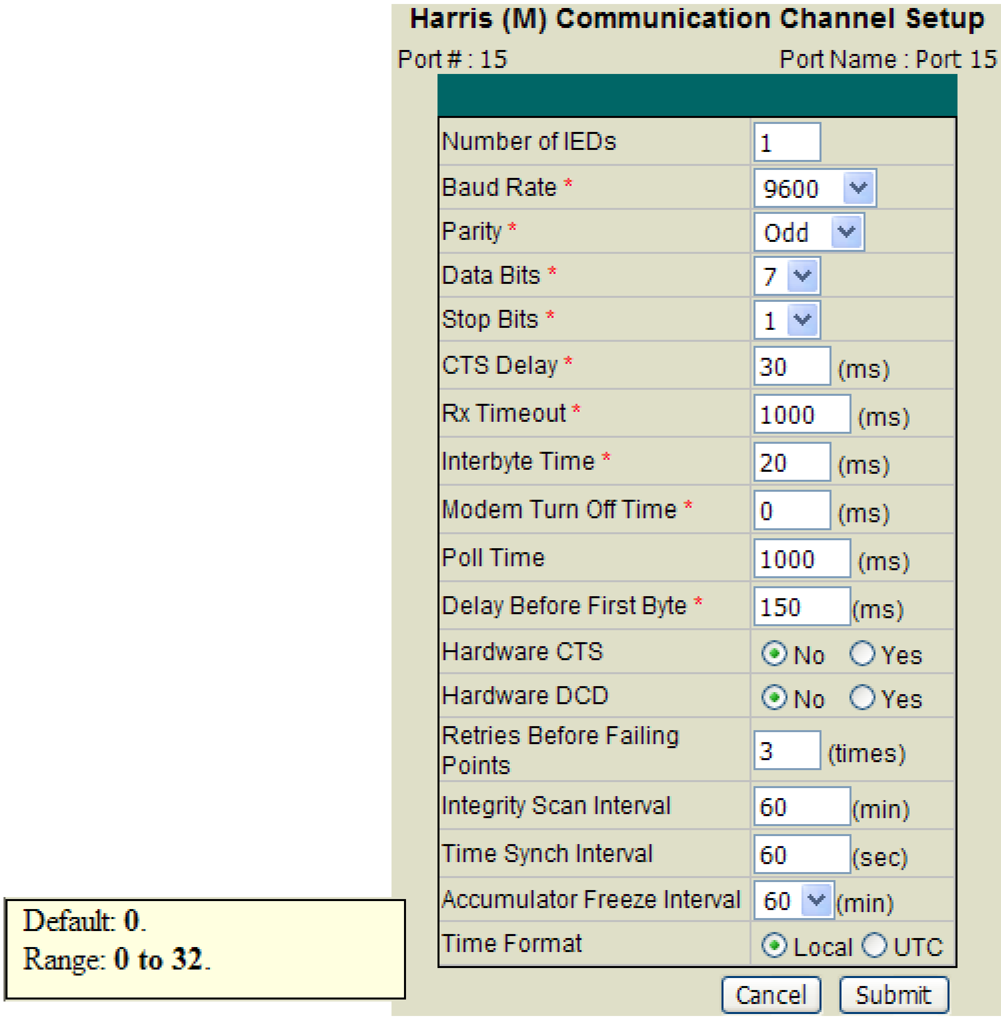
Navigation

Click the Back button to return to the previous screen.

16.2 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the Harris(M) port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 16-2 Harris(M) Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of RTUs.

16.2.1 Number of IEDs (0-32)

Enter the number of IEDs on the port. The default setting is 0.

16.2.2 Baud Rate (300 – 19200)

Select the communications speed for the associated channel. Default setting is 9600.

16.2.3 Parity (None, Odd, Even)

Select the parity for the associated channel. The default setting is Odd.

16.2.4 Data Bits (5,6,7,8)

From the drop-down menu, select the data bits for the associated channel. The default setting is 7.

16.2.5 Stop Bits (0,1,2)

From the drop-down menu, select the stop bits for the associated channel. The default setting is 1.

16.2.6 CTS Delay (0 – 250ms)

Enter the Clear-To-Send delay in milliseconds for the associated channel. This is the time delay the channel will wait to start transmitting following Request-To-Send signal being asserted. Default setting is 30.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

16.2.7 Rx Timeout (0 – 60,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. Default setting is 1000 (1 second).

Note: This timer must be greater than Delay Before First Byte timer (below).

16.2.8 Interbyte Time (0 – 250ms)

Enter the interbyte time allowed before the received message is terminated. Default setting is 20.

16.2.9 Modem Turn Off Time (0 – 250ms)

Enter the delay time that the modem will maintain the carrier after the last data byte has been transmitted. Default setting is 0.

16.2.10 Poll Time (0 – 10,000ms)

Enter the time to delay between a sequence of polling all the devices connected to this communications port. The default is 1000 msec.

16.2.11 Delay Before First Byte (100 to 10,000ms)

Enter the delay time for the associated channel. This is the time allowed for a Slave Device to begin its response before the MTU assumes it is not going to reply and moves on to the next device. This parameter is typically set long because of delays in IED response. The default setting is 150ms.

Note: This timer must be less than Rx Timeout (above).

16.2.12 Hardware CTS (No, Yes)

If the hardware Clear-To-Send option is selected for a channel, then reply data bytes will not be transmitted unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. Default setting is No.

16.2.13 Hardware DCD (No, Yes)

If the hardware data carrier detect option is selected for a channel, then the channel communications driver will accept requested message data bytes only if carrier is detected by the modem. If carrier is not detected, the data bytes are discarded. Default setting is No.

16.2.14 Retries Before Failing Points (0 – 99)

Enter the number of times the RTU will attempt communications before marking all points attached to the device as failed. The default is 3.

16.2.15 Integrity scan interval (0 to 10000 min)

Enter the number of minutes for the execution of an Integrity Scan. An integrity scan is a full refresh of all data from every IED on scan. The default is 60.

16.2.16 Time sync interval (0 to 10000 sec)

Enter the time for synchronizing the Slave Devices from the DNPM real-time clock. This is the time in seconds between time sync messages from the DNPM to the IEDs. The default is 60.

16.2.17 Accumulator Freeze Interval (0 to 63 min)

Enter the number of minutes between accumulator freezes. The default is 60.

16.2.18 Time Format (Local, UTC)

Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regards to time syncs, set Time Format to Local Time. See Time Configuration Settings in the Configuration chapter of the hardware manual for time settings under the CPU block.

If you want to send time synchronization to this device, you must know whether the device will accept Local time or UTC time, then set this radio button to match.

Navigation

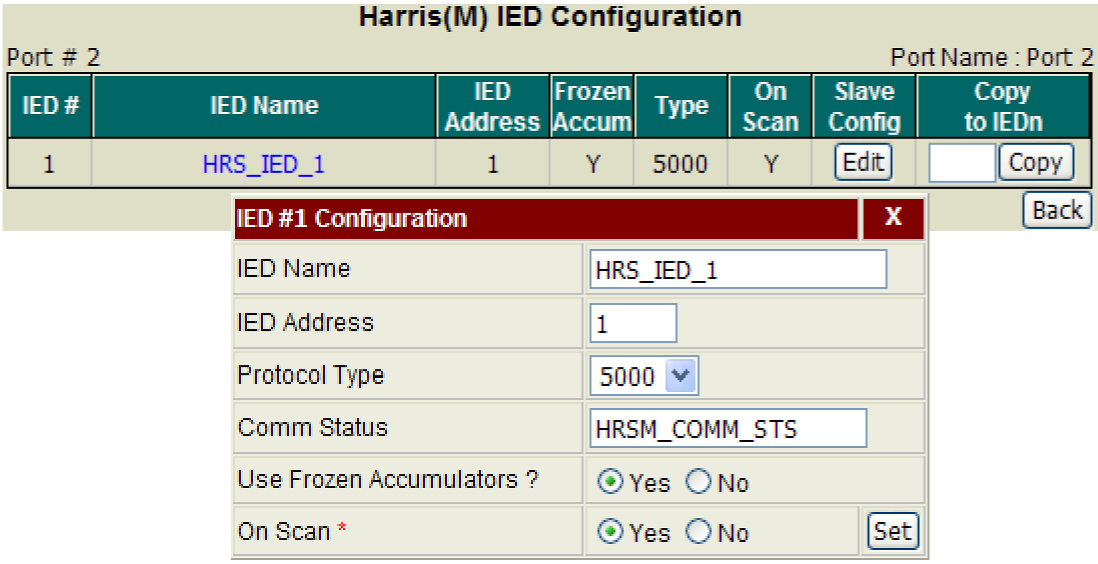
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 16-3 IED Configuration



16.3.1 IED

The logical number of the IED on this communication channel.

16.3.2 IED Name

Click on the IED Name. A pop-up window called **IED Configuration** will appear, as shown above.

16.3.2.1 IED Name

The name of the IED. Type in a name, or accept the default.

16.3.2.2 IED Address

The address of the IED. Type in an address, or accept the default.

16.3.2.3 Protocol Type (5000, 5500, 6000)

From the drop-down list, select the type of RTU emulation to be performed: 5000, 5500 or 6000. This field is used to determine which protocol Op Codes will be valid along with defining specific header information used in RTU to IED responses. This field is also used by the Automatic Configuration function to determine valid port types. Default setting is 5000.

16.3.2.4 Comm Status

Accept the default name for the Comm Status bit or type in a new name.

16.3.2.5 Use Frozen Accumulators? (Yes, No)

Determines whether or not to send accumulator freezes to the IED. The default is Yes.

16.3.2.6 On Scan

Determines whether or not the IED is being scanned. Click No to disable the scan, or accept the default (Yes).

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

16.3.2.7 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

16.3.3 IED Address

Reflects the entry in the pop-up menu. See above.

16.3.4 Frozen Accum

Y means the RTU is sending accumulator freezes to the IED. N means this function is OFF. See above.

16.3.5 Type

Reflects the type of Harris protocol selected above (5000, 5500, or 6000).

16.3.6 On Scan

Reflects the entry in the pop-up menu. See above.

16.3.7 Slave Config

Click the Edit button to edit the IED points.

16.3.8 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

16.3.9 Slave Configuration Edit, Type 5000

From the Harris(M) IED Configuration screen, click Slave Config Edit. You will get the following screens.

Figure 16-4 Harris(M) IED Setup for 5000, First Seven Types

Harris IED Setup

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Type	Edit Inputs	Edit Outputs
1	32 Pt Control & Ind	Edit	Edit
2	32 Pt Analog In	Edit	Edit
3	8 Pt 12 bit ACC In	Edit	Edit
4	4 Pt 24 bit ACC In	Edit	Edit
5	4 Pt 32 bit ACC In	Edit	Edit
6	6 Pt Raise/Lower Out	Edit	Edit
7	4 Pt Analog Out	Edit	Edit

Back

Figure 16-5 Harris(M) IED Setup for 5000, Eighth Type

Harris IED Setup

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Type	Edit Inputs	Edit Outputs
1	16 Pt Digital Out	Edit	Edit
2	None	Edit	Edit
3	None	Edit	Edit
4	None	Edit	Edit
5	None	Edit	Edit
6	None	Edit	Edit
7	None	Edit	Edit

Back

16.3.10 Port

The physical port number which will be associated with the point type.

16.3.11 Type

The type of point as shown above.

16.3.12 Edit Inputs

If the Harris(M) port has an input map, this button will be active.

16.3.13 Edit Outputs

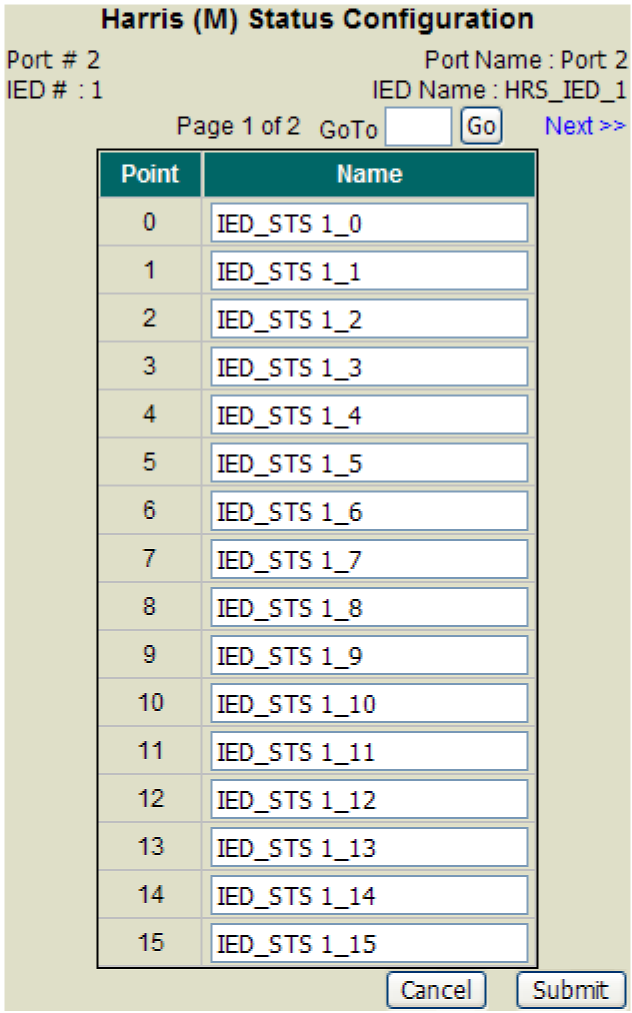
If the Harris(M) port has an Output map, this button will be active.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

16.3.13.1 32 Pt. Control & Ind, Edit Inputs

Figure 16-6 Harris(M) Status Configuration for 5000



16.3.14 Point

The protocol point number.

16.3.15 Name

Enter the name of the point or accept the default.

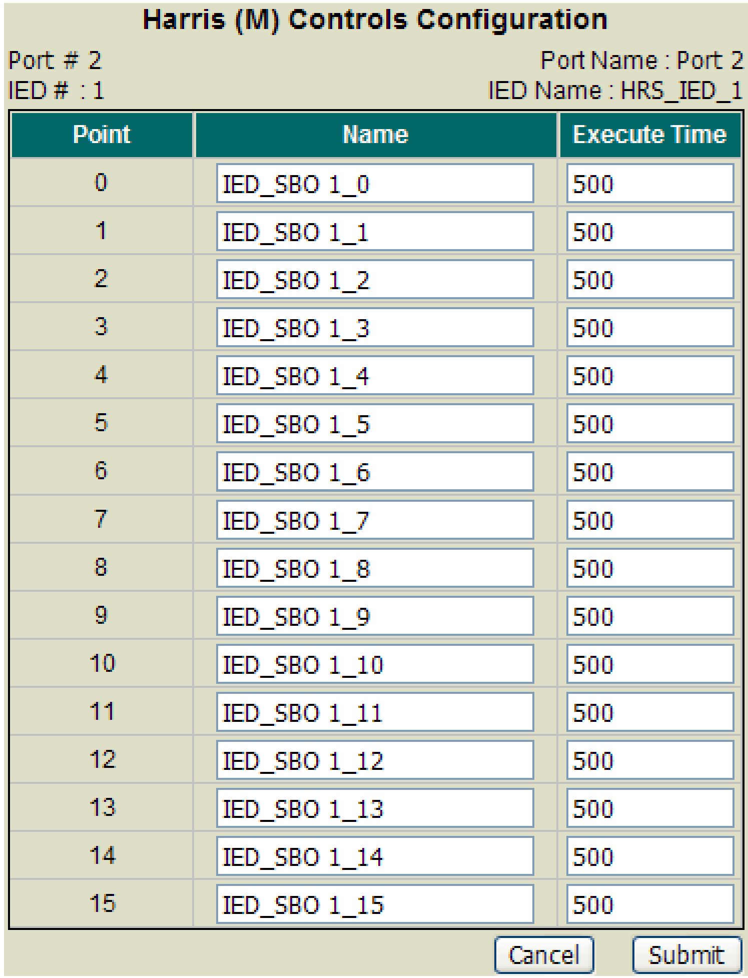
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.15.1 32 Pt. Control & Ind, Edit Outputs

Figure 16-7 Harris(M) Controls Configuration for 5000



Harris (M) Controls Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Point	Name	Execute Time
0	IED_SBO 1_0	500
1	IED_SBO 1_1	500
2	IED_SBO 1_2	500
3	IED_SBO 1_3	500
4	IED_SBO 1_4	500
5	IED_SBO 1_5	500
6	IED_SBO 1_6	500
7	IED_SBO 1_7	500
8	IED_SBO 1_8	500
9	IED_SBO 1_9	500
10	IED_SBO 1_10	500
11	IED_SBO 1_11	500
12	IED_SBO 1_12	500
13	IED_SBO 1_13	500
14	IED_SBO 1_14	500
15	IED_SBO 1_15	500

Cancel Submit

16.3.16 Point

The protocol point number.

16.3.17 Name

Enter the name of the point or accept the default.

16.3.18 Execute Time

Enter the hold-in time for the control, or accept the default.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.18.1 32 Pt. Analog In, Edit Inputs

Figure 16-8 Harris(M) Analog Input Configuration for 5000

Harris (M) Analog Input Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Page 1 of 2 GoTo Go Next >>

Point	Name	C Min	C Max	EGU Min	EGU Max
0	IED_ANALOG 1_0	-2000	2000	-100	100
1	IED_ANALOG 1_1	-2000	2000	-100	100
2	IED_ANALOG 1_2	-2000	2000	-100	100
3	IED_ANALOG 1_3	-2000	2000	-100	100
4	IED_ANALOG 1_4	-2000	2000	-100	100
5	IED_ANALOG 1_5	-2000	2000	-100	100
6	IED_ANALOG 1_6	-2000	2000	-100	100
7	IED_ANALOG 1_7	-2000	2000	-100	100
8	IED_ANALOG 1_8	-2000	2000	-100	100
9	IED_ANALOG 1_9	-2000	2000	-100	100
10	IED_ANALOG 1_10	-2000	2000	-100	100
11	IED_ANALOG 1_11	-2000	2000	-100	100
12	IED_ANALOG 1_12	-2000	2000	-100	100
13	IED_ANALOG 1_13	-2000	2000	-100	100
14	IED_ANALOG 1_14	-2000	2000	-100	100
15	IED_ANALOG 1_15	-2000	2000	-100	100

Cancel Submit

16.3.19 Point

The protocol point number.

16.3.20 Name

Enter the name of the point or accept the default.

16.3.21 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.22 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.23 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

16.3.24 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

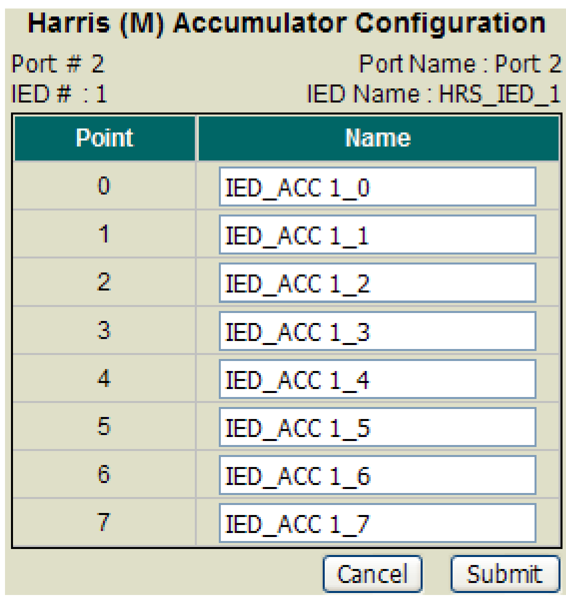
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.24.1 8 Pt. 12 bit ACC In, Edit Inputs

Figure 16-9 Harris(M) Accumulator Configuration for 5000



16.3.25 Point

The protocol point number.

16.3.26 Name

Enter the name of the point or accept the default.

Navigation

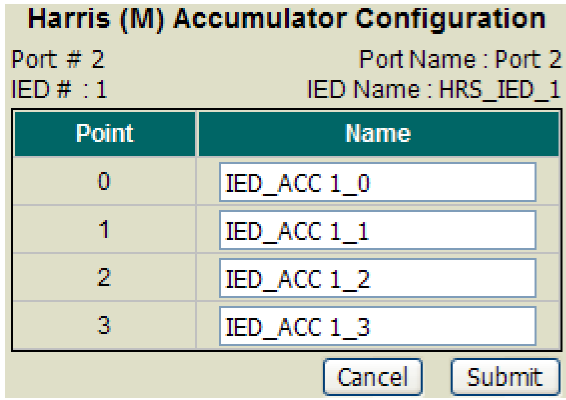
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in

the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.26.1 4 Pt. 24 bit ACC In, Edit Inputs

Figure 16-10 Harris(M) Accumulator Configuration for 5000



16.3.27 Point

The protocol point number.

16.3.28 Name

Enter the name of the point or accept the default.

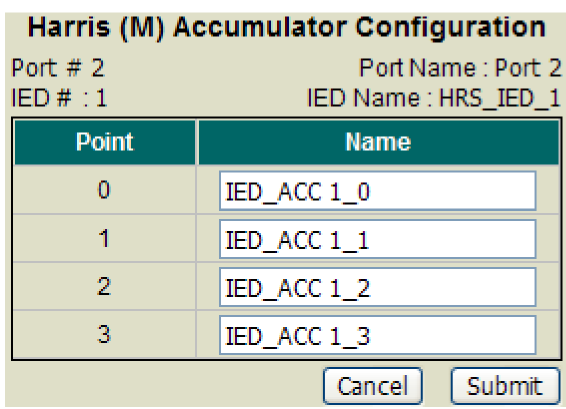
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.28.1 4 Pt. 32 bit ACC In, Edit Inputs

Figure 16-11 Harris(M) Accumulator Configuration for 5000



16.3.29 Point

The protocol point number.

16.3.30 Name

Enter the name of the point or accept the default.

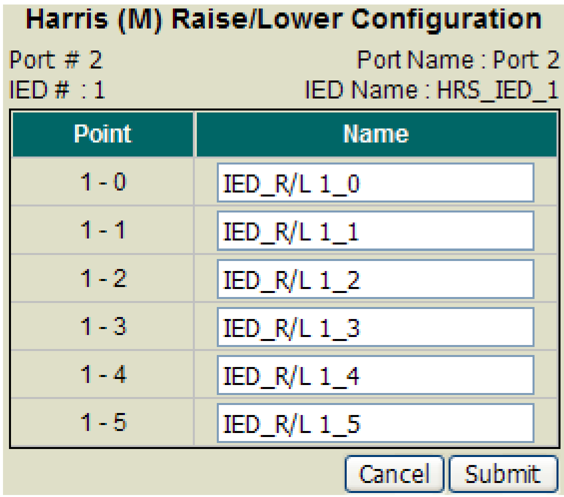
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.30.1 6 Pt. Raise/Lower Out, Edit Outputs

Figure 16-12 Harris(M) Raise/Lower Configuration for 5000



16.3.31 Point

The protocol point number.

16.3.32 Name

Enter the name of the point or accept the default.

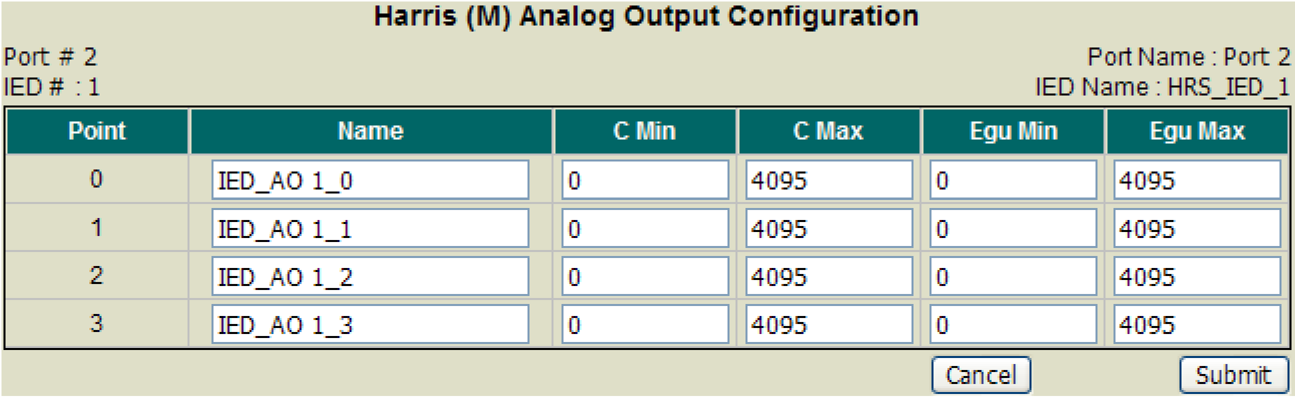
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.32.1 4 Pt. Analog Out, Edit Outputs

Figure 16-13 Harris(M) Analog Output Configuration for 5000


Harris (M) Analog Output Configuration

Port # 2 | Port Name : Port 2
IED # : 1 | IED Name : HRS_IED_1

Point	Name	C Min	C Max	Egu Min	Egu Max
0	IED_AO 1_0	0	4095	0	4095
1	IED_AO 1_1	0	4095	0	4095
2	IED_AO 1_2	0	4095	0	4095
3	IED_AO 1_3	0	4095	0	4095

Cancel Submit

16.3.33 Point

The protocol point number.

16.3.34 Name

Enter the name of the point or accept the default.

16.3.35 C Min

Enter the Min count number from the IED vendor's documentation.

16.3.36 C Max

Enter the Max count number from the IED vendor's documentation.

16.3.37 EGU Min

Enter a minimum engineering unit value for the point.

16.3.38 EGU Max

Enter a maximum engineering unit value for the point.

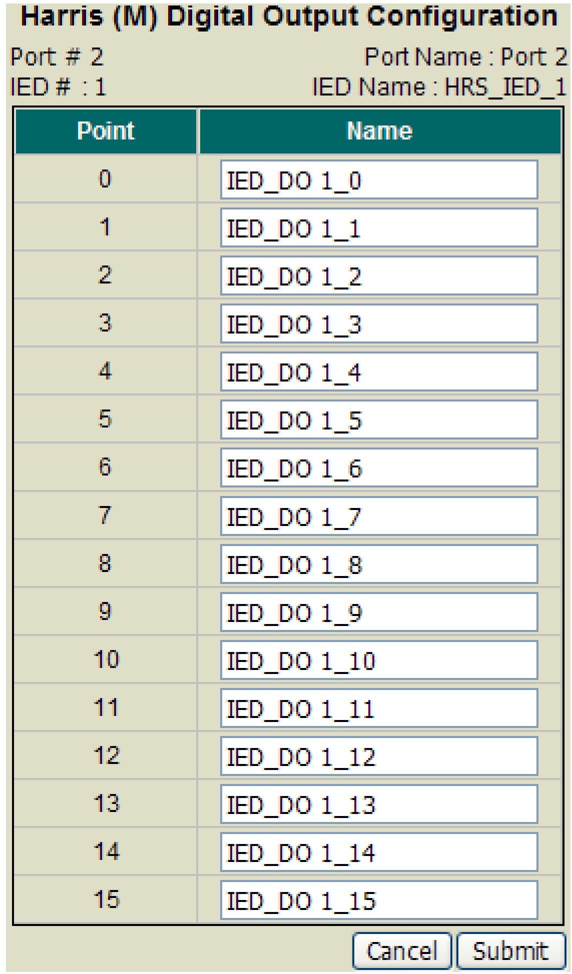
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.38.1 16 Pt. Digital Out, Edit Outputs

Figure 16-14 Harris(M) Digital Output Configuration for 5000



Harris (M) Digital Output Configuration

Port # 2 Port Name : Port 2

IED # : 1 IED Name : HRS_IED_1

Point	Name
0	IED_DO 1_0
1	IED_DO 1_1
2	IED_DO 1_2
3	IED_DO 1_3
4	IED_DO 1_4
5	IED_DO 1_5
6	IED_DO 1_6
7	IED_DO 1_7
8	IED_DO 1_8
9	IED_DO 1_9
10	IED_DO 1_10
11	IED_DO 1_11
12	IED_DO 1_12
13	IED_DO 1_13
14	IED_DO 1_14
15	IED_DO 1_15

Cancel Submit

16.3.39 Point

The protocol point number.

16.3.40 Name

Enter the name of the point or accept the default.

Navigation

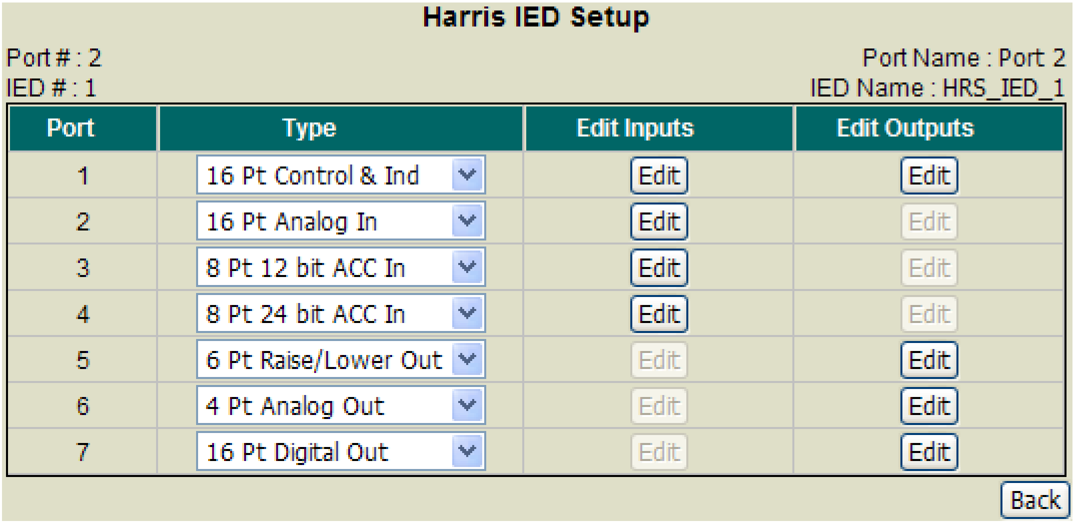
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.41 Slave Configuration Edit, Type 5500

From the Harris(M) IED Configuration screen, click Slave Config Edit. You will get the following screen.

Figure 16-15 Harris(M) IED Setup for 5500



16.3.42 Port

The physical port number.

16.3.43 Type

The type of point as shown above.

16.3.44 Edit Inputs

If the Harris(M) port has an input map, this button will be active.

16.3.45 Edit Outputs

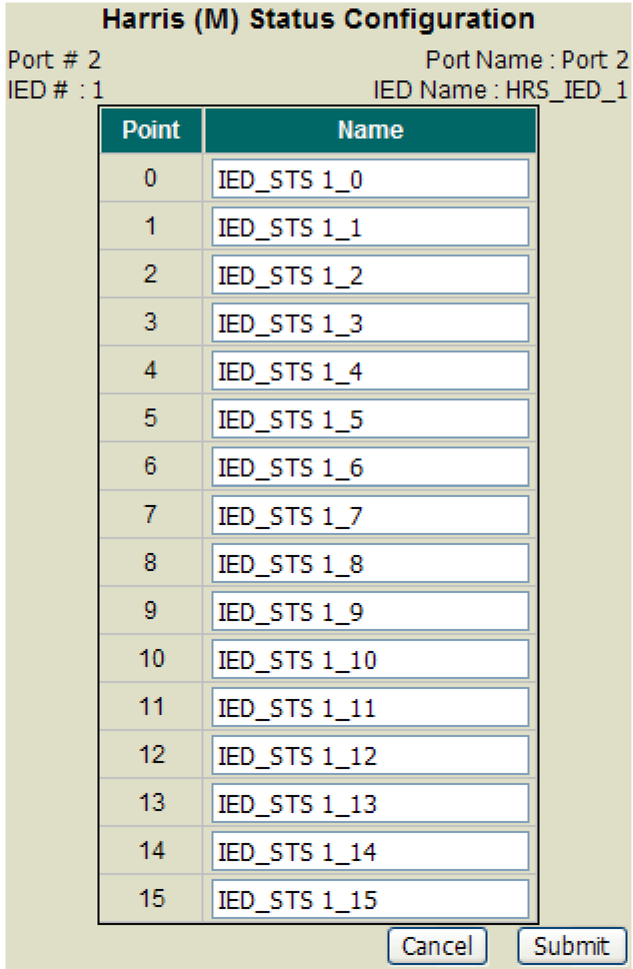
If the Harris(M) port has an Output map, this button will be active.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

16.3.45.1 16 Pt. Control & Ind, Edit Inputs

Figure 16-16 Harris(M) Status Configuration for 5500



16.3.46 Point

The protocol point number.

16.3.47 Name

Enter the name of the point or accept the default.

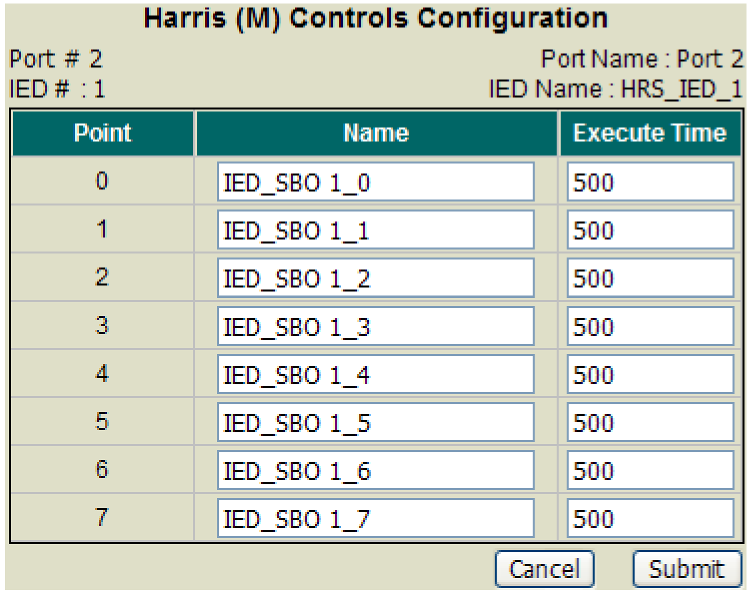
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.47.1 16 Pt. Control & Ind, Edit Outputs

Figure 16-17 Harris(M) Controls Configuration for 5500



16.3.48 Point

The protocol point number.

16.3.49 Name

Enter the name of the point or accept the default.

16.3.50 Execute Time

Enter the hold-in time for the control, or accept the default.

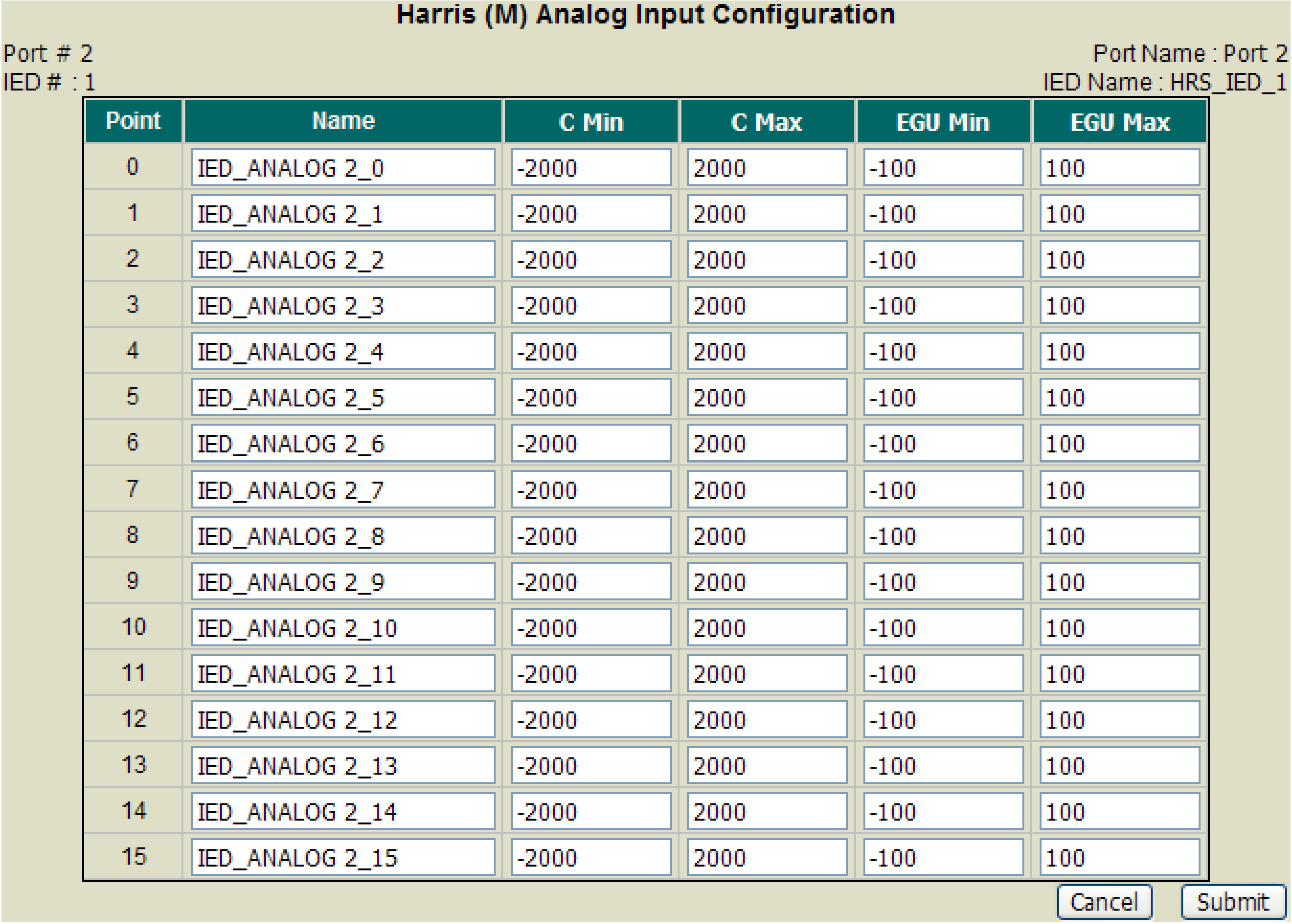
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.50.1 16 Pt. Analog In, Edit Inputs

Figure 16-18 Harris(M) Analog Input Configuration for 5500



Harris (M) Analog Input Configuration

Port # 2 Port Name : Port 2

IED # : 1 IED Name : HRS_IED_1

Point	Name	C Min	C Max	EGU Min	EGU Max
0	IED_ANALOG 2_0	-2000	2000	-100	100
1	IED_ANALOG 2_1	-2000	2000	-100	100
2	IED_ANALOG 2_2	-2000	2000	-100	100
3	IED_ANALOG 2_3	-2000	2000	-100	100
4	IED_ANALOG 2_4	-2000	2000	-100	100
5	IED_ANALOG 2_5	-2000	2000	-100	100
6	IED_ANALOG 2_6	-2000	2000	-100	100
7	IED_ANALOG 2_7	-2000	2000	-100	100
8	IED_ANALOG 2_8	-2000	2000	-100	100
9	IED_ANALOG 2_9	-2000	2000	-100	100
10	IED_ANALOG 2_10	-2000	2000	-100	100
11	IED_ANALOG 2_11	-2000	2000	-100	100
12	IED_ANALOG 2_12	-2000	2000	-100	100
13	IED_ANALOG 2_13	-2000	2000	-100	100
14	IED_ANALOG 2_14	-2000	2000	-100	100
15	IED_ANALOG 2_15	-2000	2000	-100	100

Cancel Submit

16.3.51 Point

The protocol point number.

16.3.52 Name

Enter the name of the point or accept the default.

16.3.53 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.54 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.55 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

16.3.56 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

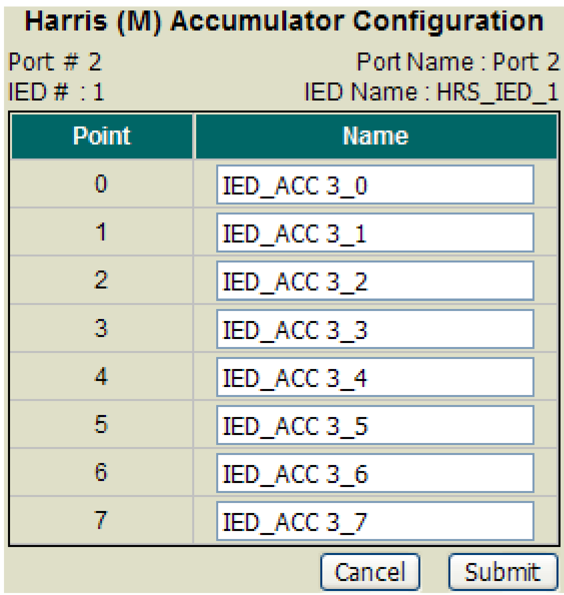
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.56.1 8 Pt. 12 bit ACC In, Edit Inputs

Figure 16-19 Harris(M) Accumulator Configuration for 5500



16.3.57 Point

The protocol point number.

16.3.58 Name

Enter the name of the point or accept the default.

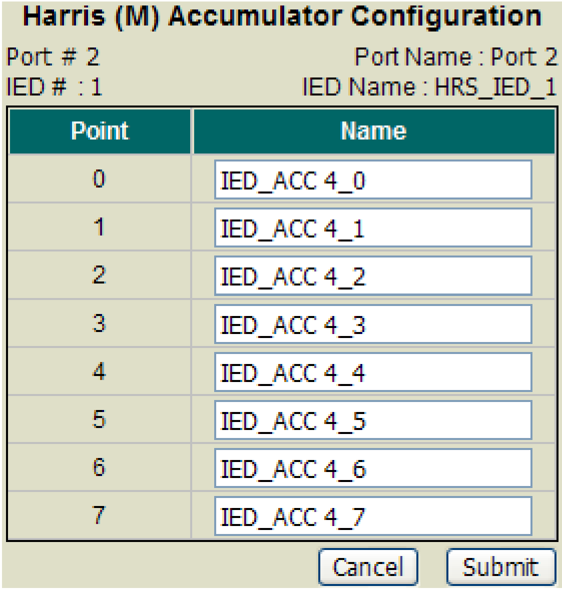
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.58.1 8 Pt. 24 bit ACC In, Edit Inputs

Figure 16-20 Harris(M) Accumulator Configuration for 5500



16.3.59 Point

The protocol point number.

16.3.60 Name

Enter the name of the point or accept the default.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.60.1 6 Pt. Raise/Lower Out, Edit Outputs

Figure 16-21 Harris(M) Raise/Lower Configuration for 5500

Harris (M) Raise/Lower Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Point	Name
5 - 0	IED_R/L 5_0
5 - 1	IED_R/L 5_1
5 - 2	IED_R/L 5_2
5 - 3	IED_R/L 5_3
5 - 4	IED_R/L 5_4
5 - 5	IED_R/L 5_5

Cancel Submit

16.3.61 Point

The protocol point number.

16.3.62 Name

Enter the name of the point or accept the default.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.62.1 4 Pt. Analog Out, Edit Outputs

Figure 16-22 Harris(M) Analog Output Configuration for 5500

Harris (M) Analog Output Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Point	Name	C Min	C Max	Egu Min	Egu Max
0	IED_AO 6_0	0	4095	0	4095
1	IED_AO 6_1	0	4095	0	4095
2	IED_AO 6_2	0	4095	0	4095
3	IED_AO 6_3	0	4095	0	4095

Cancel Submit

16.3.63 Point

The protocol point number.

16.3.64 Name

Enter the name of the point or accept the default.

16.3.65 C Min

Enter the Min count number from the IED vendor's documentation.

16.3.66 C Max

Enter the Max count number from the IED vendor's documentation.

16.3.67 EGU Min

Enter a minimum engineering unit value for the point.

16.3.68 EGU Max

Enter a maximum engineering unit value for the point.

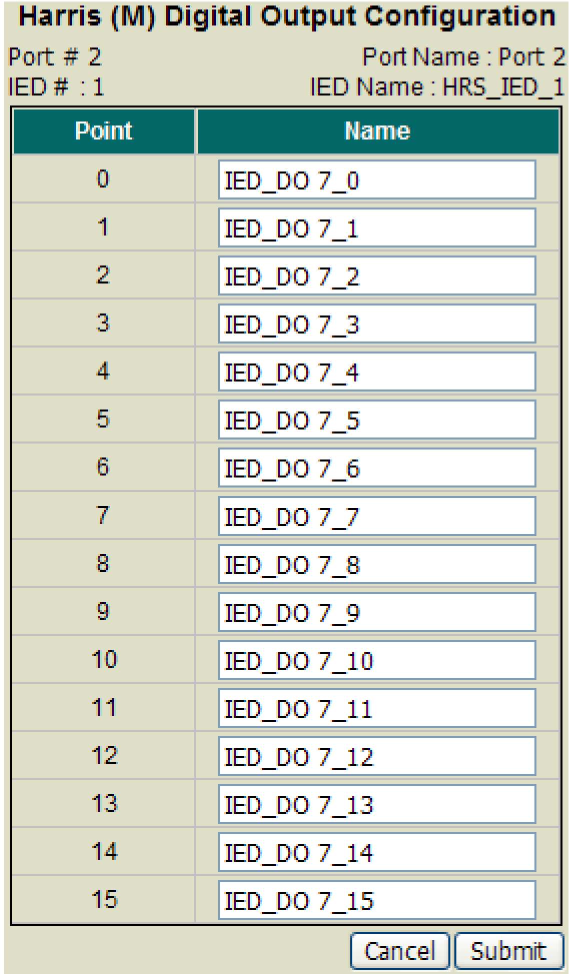
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.68.1 16 Pt. Digital Out, Edit Outputs

Figure 16-23 Harris(M) Raise/Lower Configuration for 5500



16.3.69 Point

The protocol point number.

16.3.70 Name

Enter the name of the point or accept the default.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.71 Slave Configuration Edit, Type 6000

From the Harris(M) IED Configuration screen, click Slave Config Edit. You will get the following screens.

Figure 16-24 Harris(M) IED Setup for 6000, First Eight

Harris IED Setup

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Type	Edit Inputs	Edit Outputs
1	32 Pt Control & Ind	Edit	Edit
2	63 Pt Control & Ind	Edit	Edit
3	63 Pt Control & SOE	Edit	Edit
4	32 Pt Analog In	Edit	Edit
5	63 Pt Analog In	Edit	Edit
6	8 Pt 12 bit ACC In	Edit	Edit
7	8 Pt 24 bit ACC In	Edit	Edit

Back

Figure 16-25 Harris(M) IED Setup for 6000, Last Three

Harris IED Setup

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Type	Edit Inputs	Edit Outputs
1	6 Pt Raise/Lower Out	Edit	Edit
2	4 Pt Analog Out	Edit	Edit
3	16 Pt Digital Out	Edit	Edit
4	None	Edit	Edit
5	None	Edit	Edit
6	None	Edit	Edit
7	None	Edit	Edit

Back

16.3.72 Port

The physical port number.

16.3.73 Type

The type of point as shown above.

16.3.74 Edit Inputs

If the Harris(M) port has an input map, this button will be active.

16.3.75 Edit Outputs

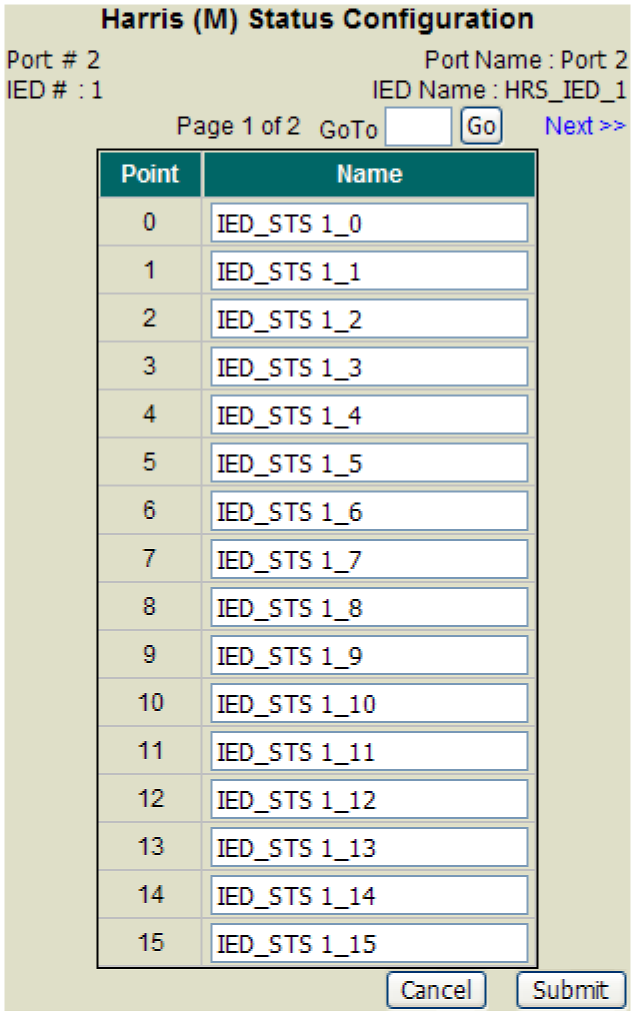
If the Harris(M) port has an Output map, this button will be active.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

16.3.75.1 32 Pt. Control & Ind, Edit Inputs

Figure 16-26 Harris(M) Status Configuration for 6000



16.3.76 Point

The protocol point number.

16.3.77 Name

Enter the name of the point or accept the default.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.77.1 32 Pt. Control & Ind, Edit Outputs

Figure 16-27 Harris(M) Controls Configuration for 6000

Harris (M) Controls Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Point	Name	Execute Time
0	IED_SBO 1_0	500
1	IED_SBO 1_1	500
2	IED_SBO 1_2	500
3	IED_SBO 1_3	500
4	IED_SBO 1_4	500
5	IED_SBO 1_5	500
6	IED_SBO 1_6	500
7	IED_SBO 1_7	500
8	IED_SBO 1_8	500
9	IED_SBO 1_9	500
10	IED_SBO 1_10	500
11	IED_SBO 1_11	500
12	IED_SBO 1_12	500
13	IED_SBO 1_13	500
14	IED_SBO 1_14	500
15	IED_SBO 1_15	500

Cancel Submit

16.3.78 Point

The protocol point number.

16.3.79 Name

Enter the name of the point or accept the default.

16.3.80 Execute Time

Enter the hold-in time for the control, or accept the default.

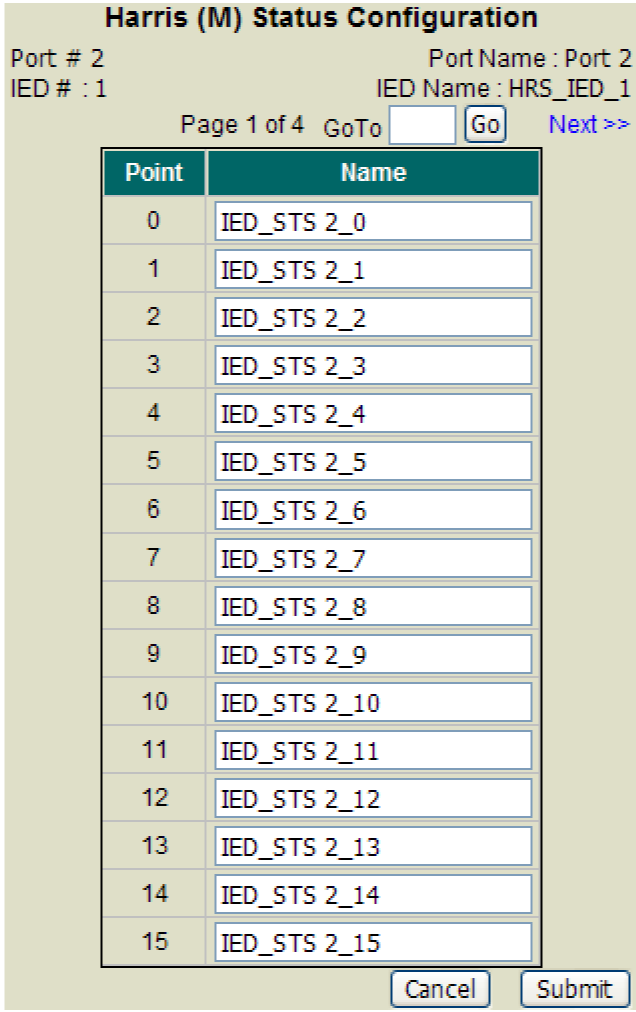
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.80.1 63 Pt. Control & Ind, Edit Inputs

Figure 16-28 Harris(M) Status Configuration for 6000



16.3.81 Point

The protocol point number.

16.3.82 Name

Enter the name of the point or accept the default.

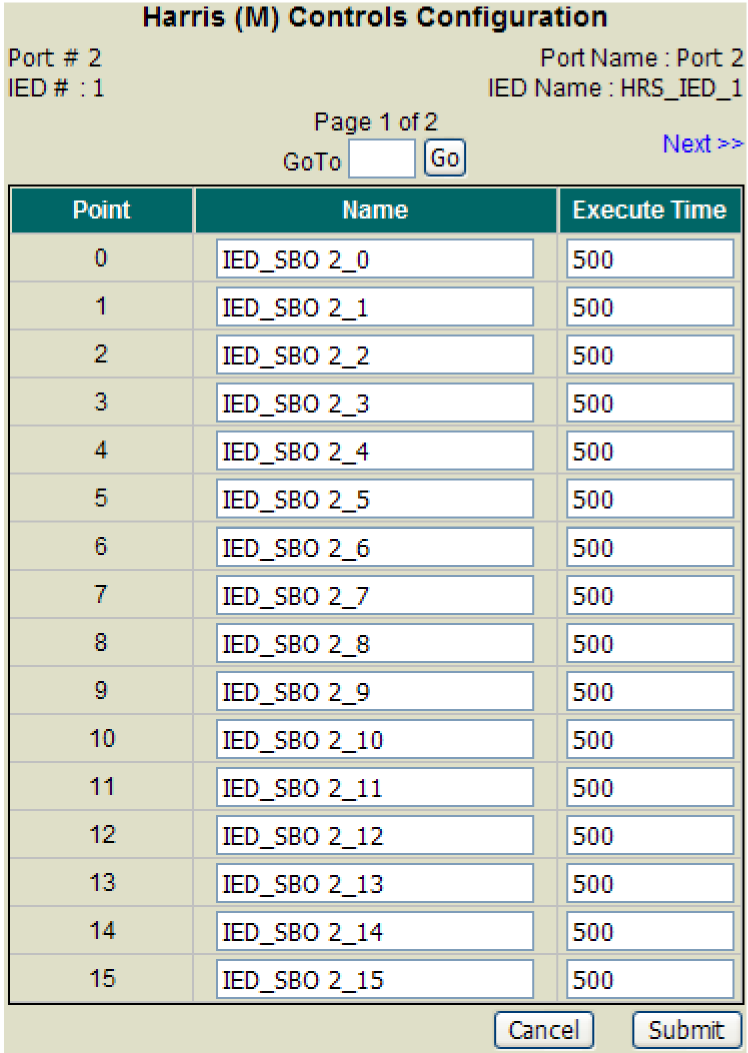
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.82.1 63 Pt. Control & Ind, Edit Outputs

Figure 16-29 Harris(M) Controls Configuration for 6000



Point	Name	Execute Time
0	IED_SBO 2_0	500
1	IED_SBO 2_1	500
2	IED_SBO 2_2	500
3	IED_SBO 2_3	500
4	IED_SBO 2_4	500
5	IED_SBO 2_5	500
6	IED_SBO 2_6	500
7	IED_SBO 2_7	500
8	IED_SBO 2_8	500
9	IED_SBO 2_9	500
10	IED_SBO 2_10	500
11	IED_SBO 2_11	500
12	IED_SBO 2_12	500
13	IED_SBO 2_13	500
14	IED_SBO 2_14	500
15	IED_SBO 2_15	500

16.3.83 Point

The protocol point number.

16.3.84 Name

Enter the name of the point or accept the default.

16.3.85 Execute Time

Enter the hold-in time for the control, or accept the default.

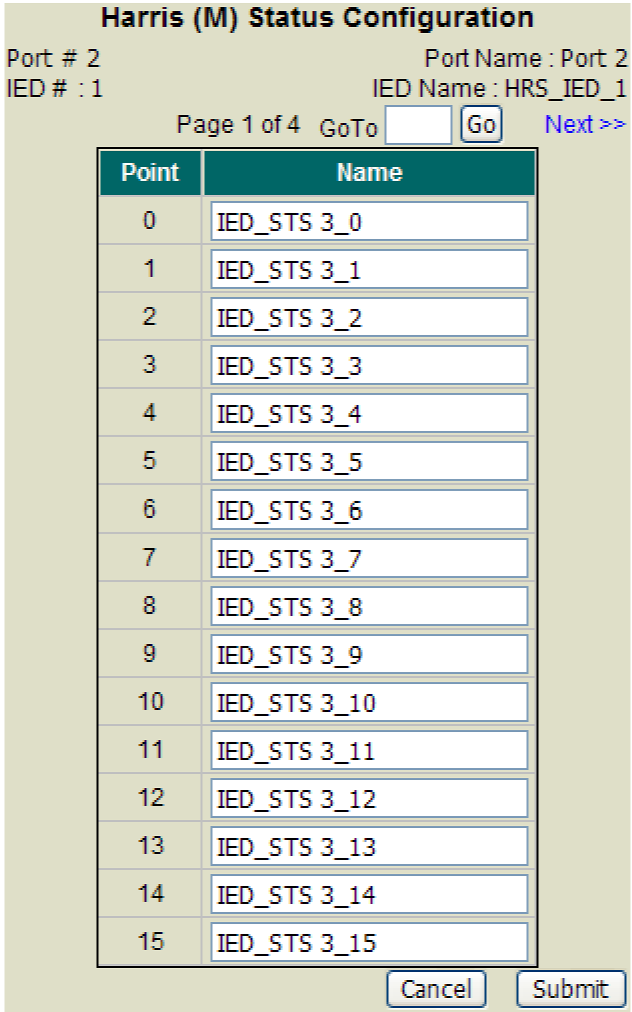
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.85.1 63 Pt. Control & SOE, Edit Inputs

Figure 16-30 Harris(M) Status Configuration for 6000



16.3.86 Point

The protocol point number.

16.3.87 Name

Enter the name of the point or accept the default.

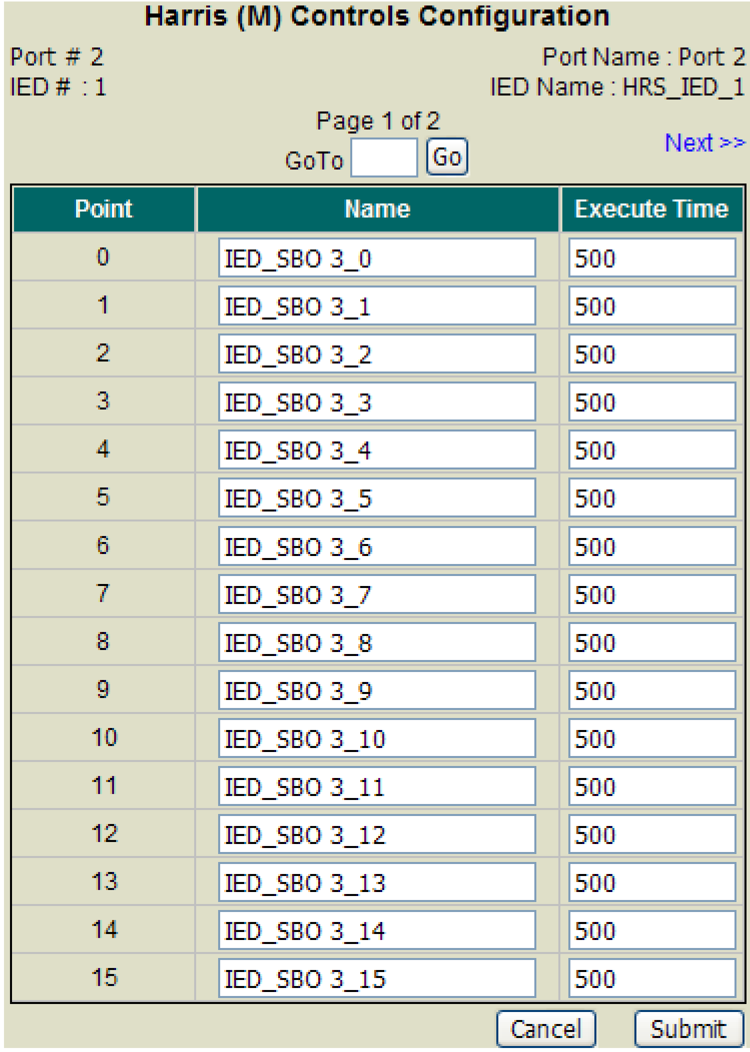
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.87.1 63 Pt. Control & SOE, Edit Outputs

Figure 16-31 Harris(M) Controls Configuration for 6000


Harris (M) Controls Configuration

Port # 2 Port Name : Port 2

IED # : 1 IED Name : HRS_IED_1

Page 1 of 2

GoTo Go Next >>

Point	Name	Execute Time
0	IED_SBO 3_0	500
1	IED_SBO 3_1	500
2	IED_SBO 3_2	500
3	IED_SBO 3_3	500
4	IED_SBO 3_4	500
5	IED_SBO 3_5	500
6	IED_SBO 3_6	500
7	IED_SBO 3_7	500
8	IED_SBO 3_8	500
9	IED_SBO 3_9	500
10	IED_SBO 3_10	500
11	IED_SBO 3_11	500
12	IED_SBO 3_12	500
13	IED_SBO 3_13	500
14	IED_SBO 3_14	500
15	IED_SBO 3_15	500

Cancel Submit

16.3.88 Point

The protocol point number.

16.3.89 Name

Enter the name of the point or accept the default.

16.3.90 Execute Time

Enter the hold-in time for the control, or accept the default.

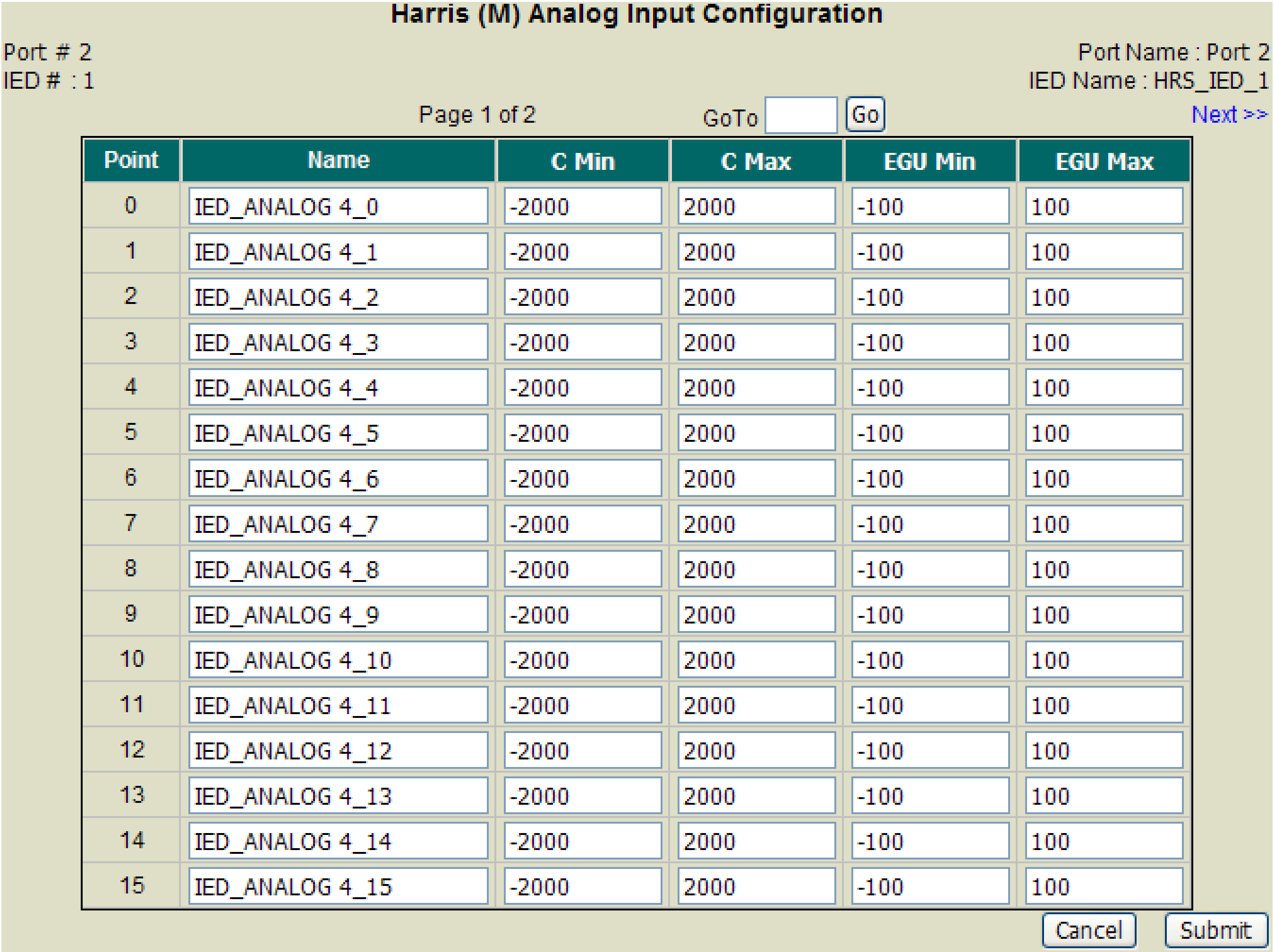
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.90.1 32 Pt. Analog In, Edit Inputs

Figure 16-32 Harris(M) Analog Input Configuration for 6000



Harris (M) Analog Input Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Page 1 of 2 GoTo Go Next >>

Point	Name	C Min	C Max	EGU Min	EGU Max
0	IED_ANALOG 4_0	-2000	2000	-100	100
1	IED_ANALOG 4_1	-2000	2000	-100	100
2	IED_ANALOG 4_2	-2000	2000	-100	100
3	IED_ANALOG 4_3	-2000	2000	-100	100
4	IED_ANALOG 4_4	-2000	2000	-100	100
5	IED_ANALOG 4_5	-2000	2000	-100	100
6	IED_ANALOG 4_6	-2000	2000	-100	100
7	IED_ANALOG 4_7	-2000	2000	-100	100
8	IED_ANALOG 4_8	-2000	2000	-100	100
9	IED_ANALOG 4_9	-2000	2000	-100	100
10	IED_ANALOG 4_10	-2000	2000	-100	100
11	IED_ANALOG 4_11	-2000	2000	-100	100
12	IED_ANALOG 4_12	-2000	2000	-100	100
13	IED_ANALOG 4_13	-2000	2000	-100	100
14	IED_ANALOG 4_14	-2000	2000	-100	100
15	IED_ANALOG 4_15	-2000	2000	-100	100

Cancel Submit

16.3.91 Point

The protocol point number.

16.3.92 Name

Enter the name of the point or accept the default.

16.3.93 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.94 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.95 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

16.3.96 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

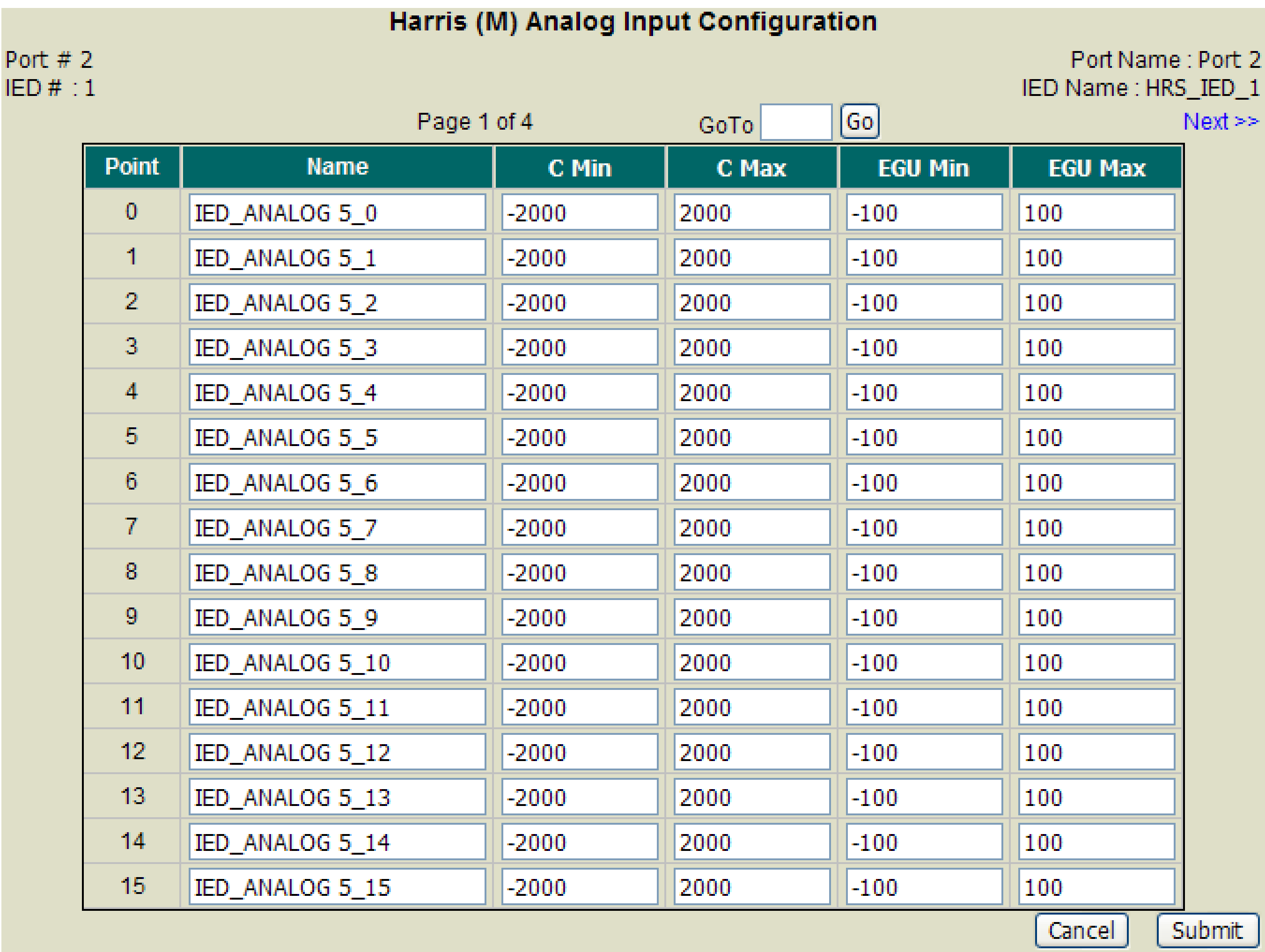
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.96.1 63 Pt. Analog In, Edit Inputs

Figure 16-33 Harris(M) Analog Input Configuration for 6000



Harris (M) Analog Input Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Page 1 of 4 GoTo [ ] Go Next >>

Point	Name	C Min	C Max	EGU Min	EGU Max
0	IED_ANALOG 5_0	-2000	2000	-100	100
1	IED_ANALOG 5_1	-2000	2000	-100	100
2	IED_ANALOG 5_2	-2000	2000	-100	100
3	IED_ANALOG 5_3	-2000	2000	-100	100
4	IED_ANALOG 5_4	-2000	2000	-100	100
5	IED_ANALOG 5_5	-2000	2000	-100	100
6	IED_ANALOG 5_6	-2000	2000	-100	100
7	IED_ANALOG 5_7	-2000	2000	-100	100
8	IED_ANALOG 5_8	-2000	2000	-100	100
9	IED_ANALOG 5_9	-2000	2000	-100	100
10	IED_ANALOG 5_10	-2000	2000	-100	100
11	IED_ANALOG 5_11	-2000	2000	-100	100
12	IED_ANALOG 5_12	-2000	2000	-100	100
13	IED_ANALOG 5_13	-2000	2000	-100	100
14	IED_ANALOG 5_14	-2000	2000	-100	100
15	IED_ANALOG 5_15	-2000	2000	-100	100

Cancel Submit

16.3.97 Point

The protocol point number.

16.3.98 Name

Enter the name of the point or accept the default.

16.3.99 C Min

Enter the Min count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.100 C Max

Enter the Max count number from the IED vendor's documentation. All entries in this column may be changed at once by clicking on the header.

16.3.101 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

16.3.102 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

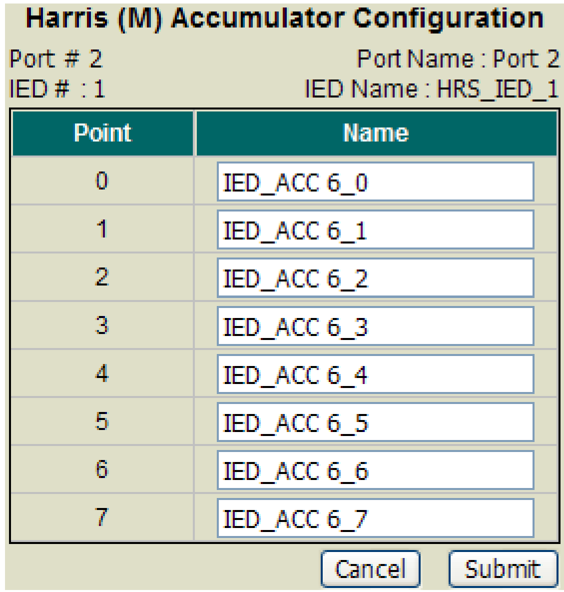
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.102.1 8 Pt. 12 bit ACC In, Edit Inputs

Figure 16-34 Harris(M) Accumulator Configuration for 6000



16.3.103 Point

The protocol point number.

16.3.104 Name

Enter the name of the point or accept the default.

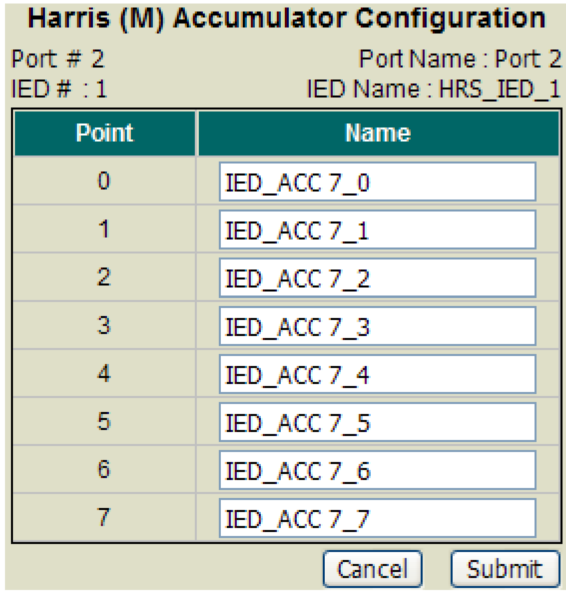
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.104.1 8 Pt. 24 bit ACC In, Edit Inputs

Figure 16-35 Harris(M) Accumulator Configuration for 6000



16.3.105 Point

The protocol point number.

16.3.106 Name

Enter the name of the point or accept the default.

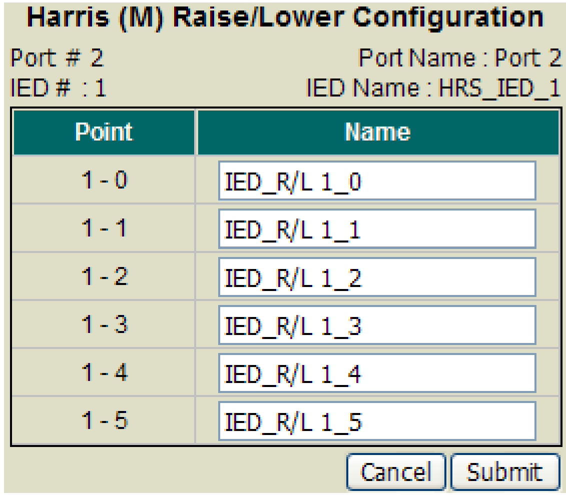
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.106.1 6 Pt. Raise/Lower Out, Edit Outputs

Figure 16-36 Harris(M) Raise/Lower Configuration for 6000


Harris (M) Raise/Lower Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Point	Name
1 - 0	IED_R/L 1_0
1 - 1	IED_R/L 1_1
1 - 2	IED_R/L 1_2
1 - 3	IED_R/L 1_3
1 - 4	IED_R/L 1_4
1 - 5	IED_R/L 1_5

Cancel Submit

16.3.107 Point

The protocol point number.

16.3.108 Name

Enter the name of the point or accept the default.

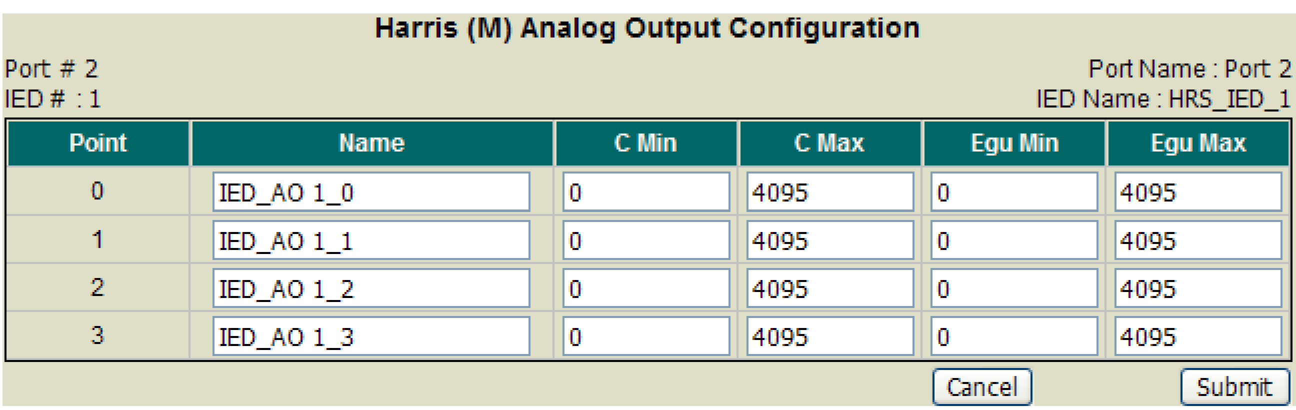
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.108.1 4 Pt. Analog Out, Edit Outputs

Figure 16-37 Harris(M) Analog Output Configuration for 6000


Harris (M) Analog Output Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Point	Name	C Min	C Max	Egu Min	Egu Max
0	IED_AO 1_0	0	4095	0	4095
1	IED_AO 1_1	0	4095	0	4095
2	IED_AO 1_2	0	4095	0	4095
3	IED_AO 1_3	0	4095	0	4095

Cancel Submit

16.3.109 Point

The protocol point number.

16.3.110 Name

Enter the name of the point or accept the default.

16.3.111 C Min

Enter the Min count number from the IED vendor's documentation.

16.3.112 C Max

Enter the Max count number from the IED vendor's documentation.

16.3.113 EGU Min

Enter a minimum engineering unit value for the point.

16.3.114 EGU Max

Enter a maximum engineering unit value for the point.

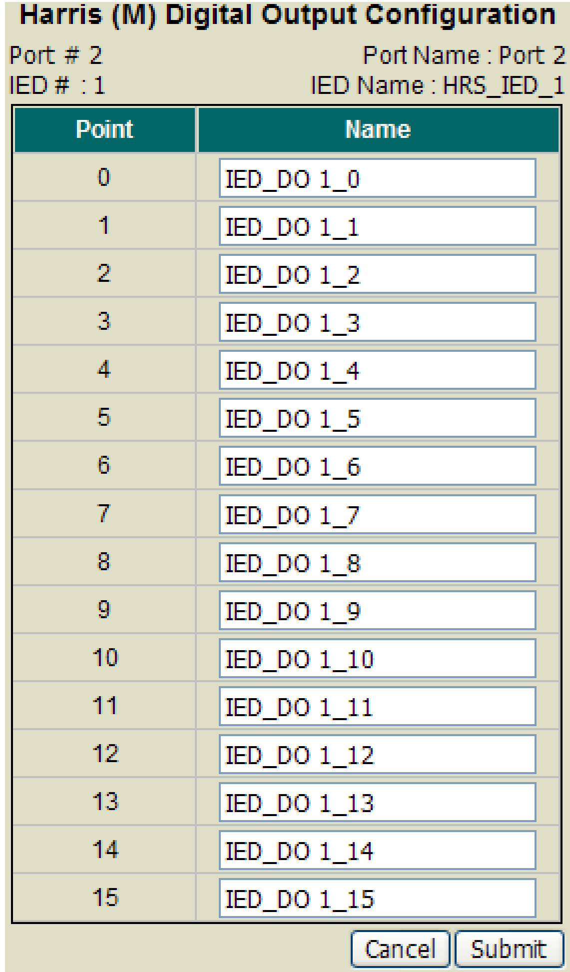
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.3.114.1 16 Pt. Digital Out, Edit Outputs

Figure 16-38 Harris(M) Raise/Lower Configuration for 6000



Harris (M) Digital Output Configuration

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Point	Name
0	IED_DO 1_0
1	IED_DO 1_1
2	IED_DO 1_2
3	IED_DO 1_3
4	IED_DO 1_4
5	IED_DO 1_5
6	IED_DO 1_6
7	IED_DO 1_7
8	IED_DO 1_8
9	IED_DO 1_9
10	IED_DO 1_10
11	IED_DO 1_11
12	IED_DO 1_12
13	IED_DO 1_13
14	IED_DO 1_14
15	IED_DO 1_15

Cancel Submit

16.3.115 Point

The protocol point number.

16.3.116 Name

Enter the name of the point or accept the default.

Navigation

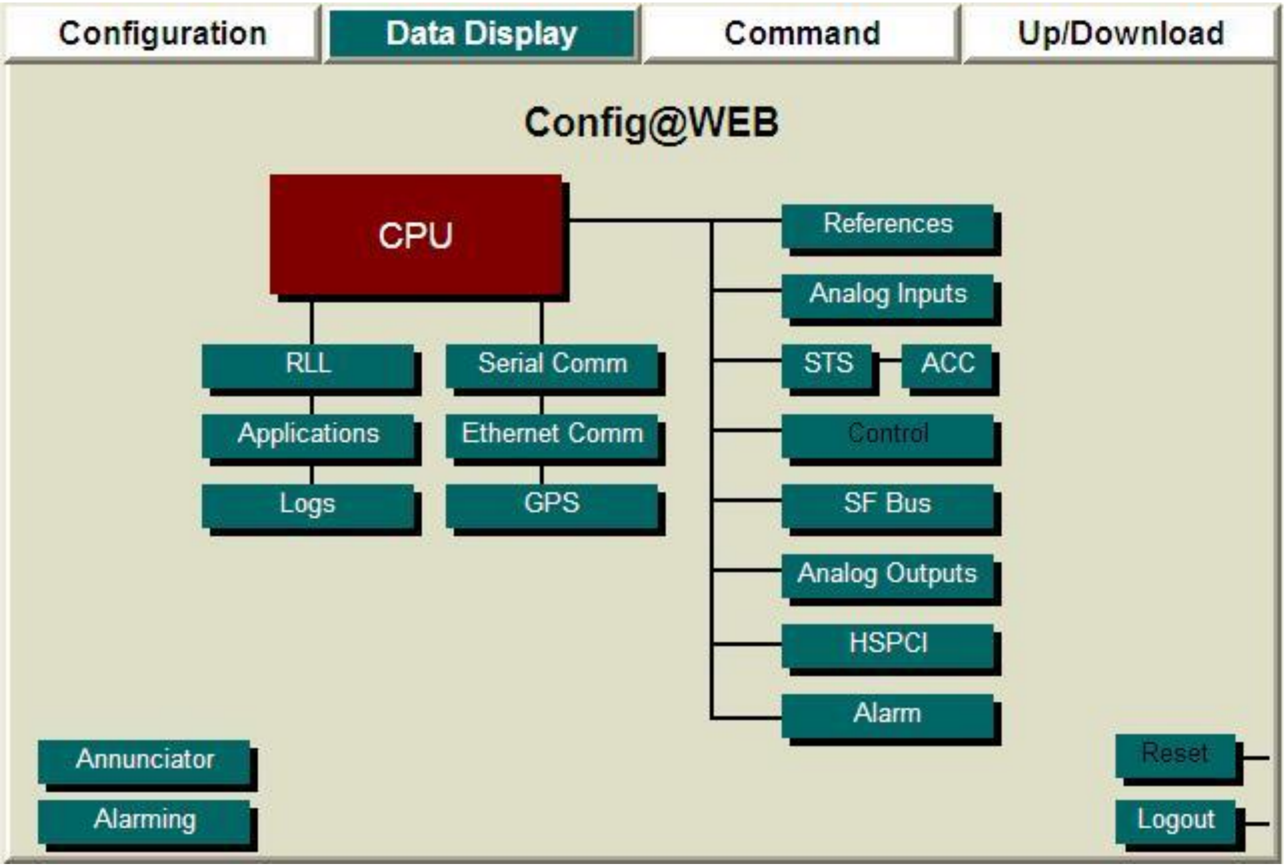
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

16.4 Data Display

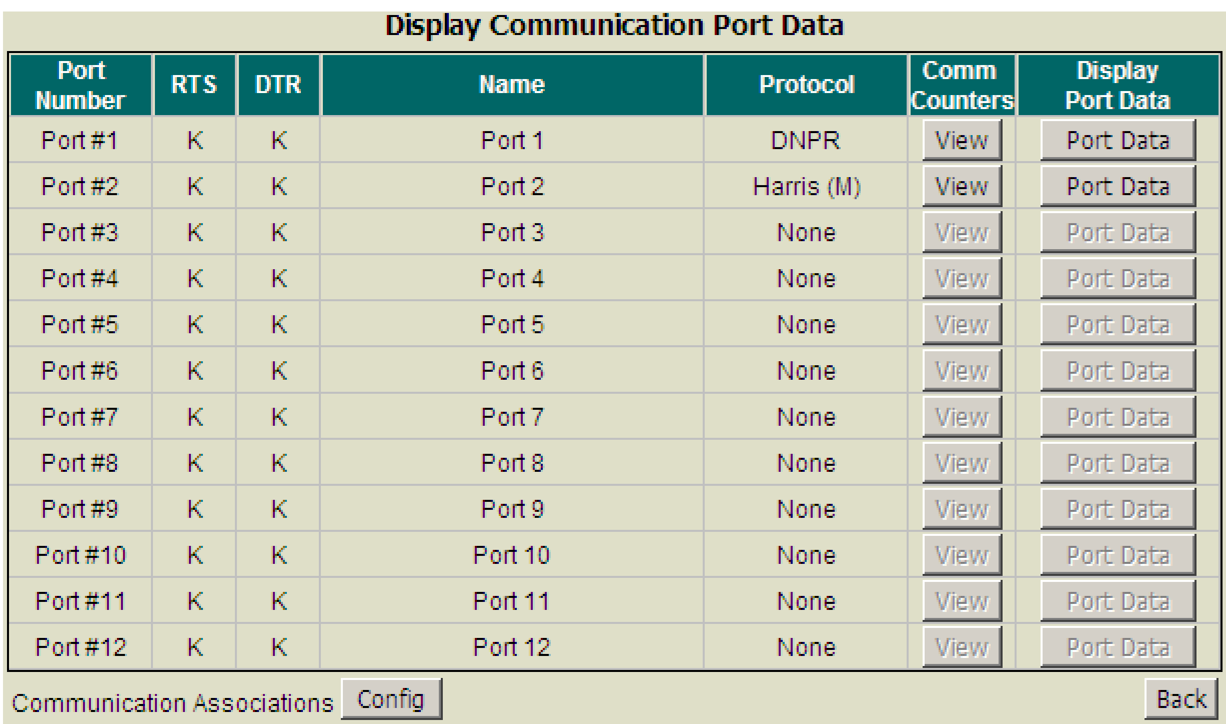
Click the Data Display tab as shown in Figure 2-18.

Figure 16-39 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 16-40 Display Communication Port Data



Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Port 1	DNPR	View	Port Data
Port #2	K	K	Port 2	Harris (M)	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

16.4.1 Port Number

Physical Port number of the RTU.

16.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

16.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

16.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

16.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

16.4.3 Name

The port name given during configuration or default name accepted.

16.4.4 Protocol

The configured protocol for this port.

16.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

16.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

16.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

Navigation

Click the Back button to return to the previous screen.

16.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20. The Comm Counters are the same for all three types of protocol.

Figure 16-41 Harris(M) Communication Counters Display

Harris (M) Communication Counters Display

Port # : 2 Port Name : Port 2

Point	Counter Name	Counts
1	Messages Sent	1452
2	Messages Received	0
3	No Response	1451
4	B4 Timer Violations	0
5	IB Timer Violations	0
6	Multiple ID Byte detections	0
7	Security Errors	0
8	Parity Errors	0
9	Overrun Errors	0
10	Framing Errors	0
11	Hardware DCD Errors	0
12	Hardware CTS Errors	0

Data Trap [Configure]

IED Comm Counters [View]

Reset Comm Counters [Reset]

[Back]

16.4.9 Point Number

A logical point number for reference only.

16.4.10 Counter Name

The following counters are monitored:

16.4.10.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

16.4.10.2 Messages Received

This indicates the cumulative number of received messages since the last reset or power-up.

16.4.10.3 No Response

This indicates the cumulative number of sent messages that were not responded to since the last reset or power-up.

16.4.10.4 B4 Timer Violations

This indicates the cumulative number of B4 Timer violations. This count can be affected by the setting of the B4 Time in configuration.

16.4.10.5 IB Timer Violations

This indicates the cumulative number of Interbyte timer violations since the last reset or power-up. This count can be affected by the setting of the Interbyte Time in configuration.

16.4.10.6 Multiple ID Byte detections

This indicates the cumulative number of Multiple ID Byte detections since the last reset or power-up.

16.4.10.7 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

16.4.10.8 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

16.4.10.9 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

16.4.10.10 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

16.4.10.11 Hardware DCD Errors

This indicates the cumulative number of DCD errors since the last reset or power-up.

16.4.10.12 Hardware CTS Errors

This indicates the cumulative number of CTS errors since the last reset or power-up.

16.4.11 Counts

The counts for each type of Counter.

16.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

16.4.13 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

Harris (M) IED Comm Counters Display

Port # : 2 Port Name : Port 2

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Security Errors	Framing Errors	Overrun Errors	Parity Errors	Message Errors	Last Err Opcode
1	HRS_IED_1	2725	0	2724	0	0	0	0	0	12

PortStatus Done

16.4.13.1 IED

The number of the IED

16.4.13.2 IED Name

The name of the IED

16.4.13.3 Messages Sent

Messages sent to this IED since the last reset or since the last time the counters were cleared.

16.4.13.4 Valid Replies

Valid messages received from this IED since the last reset or since the last time the counters were cleared.

16.4.13.5 No Replies

This indicates the cumulative number of sent messages that were not responded to since the last reset or power-up.

16.4.13.6 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

16.4.13.7 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

16.4.13.8 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

16.4.13.9 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

16.4.13.10 Message Errors

This indicates the cumulative number of message errors since the last reset or power-up.

16.4.13.11 Last Err Opcode

The "Last Err Opcode" field on IED error counters display contains the Harris Operation Code for the last message that failed to get a response. The operation codes (in decimal) are as follows

0 Data Dump (analogs and accumulators)
3 Status Change Check
4 Status Change Dump
5 Status Dump (used for integrity check and when there is a change overflow)
6 Control Point Arm
7 Control Point Operate
8 Raise/Lower
9 Set Point Arm (Digital output or analog output)
10 Set Point Operate
11 Power Fail Reset
12 Port Status Scan
17 SOE Time Synchronization
18 SOE Change Dump
19 SOE Time Sync Adjust
23 Time Synchronization (non-SOE)
24 Set Freeze Interval

16.4.14 Port Status

On the Port Status display (shown below), the possible error codes are as follows

P/F Power Fail

O/L	Off line (port not configured)
M/F	Message Fail (previous message was invalid)
SOE	SOE change available for download

Harris (M) Harris Port Status

Port # : 2 Port Name : Port 2

IED #	IED Name	Changes	OverAll	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7
1	HRS_IED_1	0								

CommCounters ResetStatus Done

16.4.15 Reset Status Button

Click this button to reset the status of all Harris ports.

16.4.16 Comm Counters Button

Click this button to return to the individual Comm Counters view.

16.4.17 Done

Click this button to return to the overall Comm Counters view.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

16.4.18 Display Port Data

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 16-42 Harris(M) IED Display

Harris Master IED Display

Port # : 2 Port Name : Port 2

IED #	IED Name	IED Address	Frozen Accum	Type	On Scan	Slave Data
1	HRS_IED_1	1	Y	6000	Y	View

Back

16.4.19 IED

The logical number of the IED on this communication channel.

16.4.20 IED Name

The name that was chosen, or accepted as default, during configuration.

16.4.21 IED Address

The IED Address chosen during configuration.

16.4.22 Frozen Accum

Y (Yes) means the frozen accumulators will be displayed.

16.4.23 Type

The Harris protocol type.

16.4.24 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

16.4.25 Slave Data

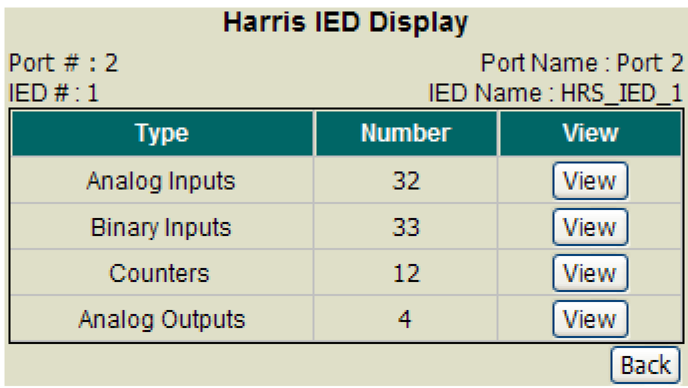
Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 16-43 Harris(M) IED Display



16.4.26 Type

The type of point.

16.4.27 Number

The number of points from your IED.

16.4.28 View

Click the View button to view points.

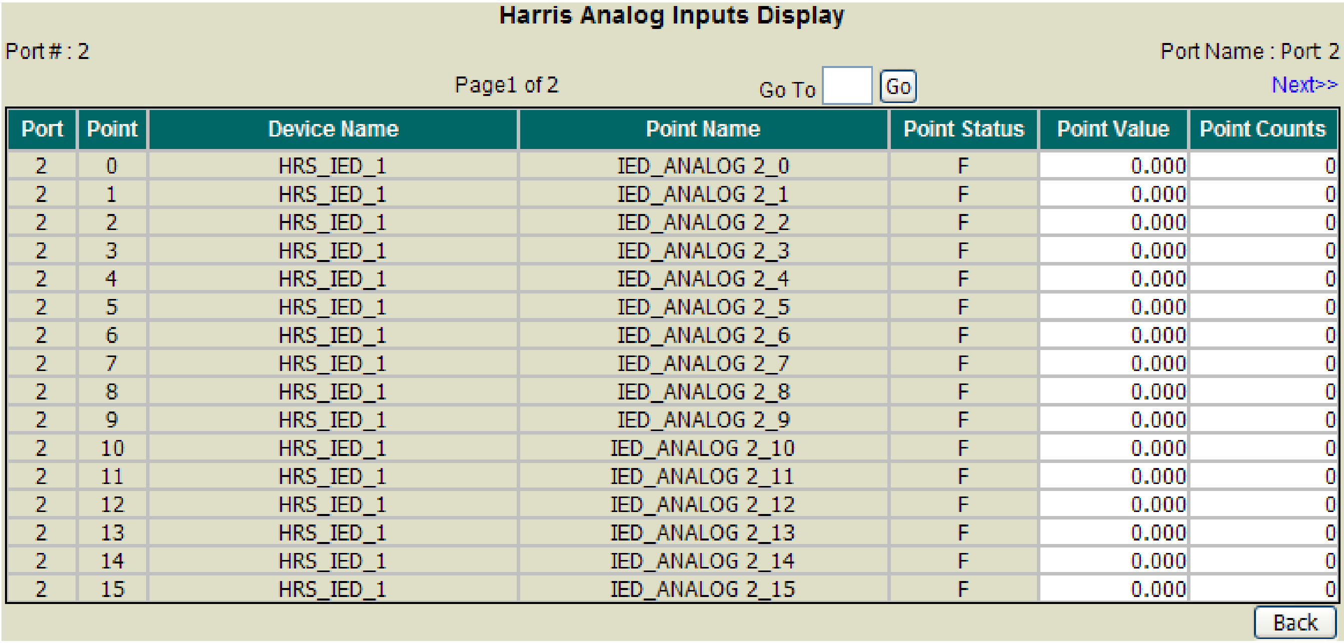
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the previous screen.

16.5 Analog Inputs

From the Harris(M) IED Display screen, click View for Analog Inputs to get the screen shown below.

Figure 16-44 Harris(M) Analog Inputs Display


Harris Analog Inputs Display

Port # : 2 Port Name : Port 2

Page1 of 2 Go To [ ] Go Next>>

Port	Point	Device Name	Point Name	Point Status	Point Value	Point Counts
2	0	HRS_IED_1	IED_ANALOG 2_0	F	0.000	0
2	1	HRS_IED_1	IED_ANALOG 2_1	F	0.000	0
2	2	HRS_IED_1	IED_ANALOG 2_2	F	0.000	0
2	3	HRS_IED_1	IED_ANALOG 2_3	F	0.000	0
2	4	HRS_IED_1	IED_ANALOG 2_4	F	0.000	0
2	5	HRS_IED_1	IED_ANALOG 2_5	F	0.000	0
2	6	HRS_IED_1	IED_ANALOG 2_6	F	0.000	0
2	7	HRS_IED_1	IED_ANALOG 2_7	F	0.000	0
2	8	HRS_IED_1	IED_ANALOG 2_8	F	0.000	0
2	9	HRS_IED_1	IED_ANALOG 2_9	F	0.000	0
2	10	HRS_IED_1	IED_ANALOG 2_10	F	0.000	0
2	11	HRS_IED_1	IED_ANALOG 2_11	F	0.000	0
2	12	HRS_IED_1	IED_ANALOG 2_12	F	0.000	0
2	13	HRS_IED_1	IED_ANALOG 2_13	F	0.000	0
2	14	HRS_IED_1	IED_ANALOG 2_14	F	0.000	0
2	15	HRS_IED_1	IED_ANALOG 2_15	F	0.000	0

Back

16.5.1 Port

Port corresponds to the type of point assigned to this port number during configuration.

16.5.2 Point

Protocol logical point number.

16.5.3 Device Name

The name of the device from which the point originates.

16.5.4 Point Name

The name of the point assigned during configuration.

16.5.5 Point Status

Please see the Config@WEB Secure Software Users Guide.

16.5.6 Point Value

The engineering unit (EGU) value.

16.5.7 Point Counts

The counts from the IED.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to

the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

16.6 Status Inputs

From the Harris(M) IED Display screen, click View for Binary Inputs to get the screen shown below.

Figure 16-45 Harris(M) Status Inputs Display

Harris Status Inputs Display

Port # : 2 Port Name : Port 2

Page 1of 3 Go To [ ] Go Next>>

Port	Point	Device Name	Point Name	Point Status	Point State	●
0	-1	HRS_IED_1	HRSM_COMM_STS		CLOSE	●
1	0	HRS_IED_1	IED_STS 1_0	F	OPEN	●
1	1	HRS_IED_1	IED_STS 1_1	F	OPEN	●
1	2	HRS_IED_1	IED_STS 1_2	F	OPEN	●
1	3	HRS_IED_1	IED_STS 1_3	F	OPEN	●
1	4	HRS_IED_1	IED_STS 1_4	F	OPEN	●
1	5	HRS_IED_1	IED_STS 1_5	F	OPEN	●
1	6	HRS_IED_1	IED_STS 1_6	F	OPEN	●
1	7	HRS_IED_1	IED_STS 1_7	F	OPEN	●
1	8	HRS_IED_1	IED_STS 1_8	F	OPEN	●
1	9	HRS_IED_1	IED_STS 1_9	F	OPEN	●
1	10	HRS_IED_1	IED_STS 1_10	F	OPEN	●
1	11	HRS_IED_1	IED_STS 1_11	F	OPEN	●
1	12	HRS_IED_1	IED_STS 1_12	F	OPEN	●
1	13	HRS_IED_1	IED_STS 1_13	F	OPEN	●
1	14	HRS_IED_1	IED_STS 1_14	F	OPEN	●

Back

Note: The first point is reserved for Communication Status. HRSM_COMM_STS indicates whether or not this IED is in good communications. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

16.6.1 Port

Port corresponds to the type of point assigned to this port number during configuration.

16.6.2 Point

Protocol logical point number.

16.6.3 Device Name

The name of the device from which the point originates.

16.6.4 Point Name

The name of the point assigned during configuration.

16.6.5 Point Status

Please see the Config@WEB Secure Software Users Guide.

16.6.6 Point State

Indicates that point is either OPEN or CLOSED.

16.6.7 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

16.7 Accumulator Inputs

From the Harris(M) IED Display screen, click View for Counters to get the screen shown below.

Figure 16-46 Harris(M) Counter Inputs Display

Harris Accumulators Display

Port # : 2 Port Name : Port 2

Page1 of 1 Go To Go

Port	Point	Device Name	Point Name	Point Status	Count
3	0	HRS_IED_1	IED_ACC 3_0	F	0
3	1	HRS_IED_1	IED_ACC 3_1	F	0
3	2	HRS_IED_1	IED_ACC 3_2	F	0
3	3	HRS_IED_1	IED_ACC 3_3	F	0
3	4	HRS_IED_1	IED_ACC 3_4	F	0
3	5	HRS_IED_1	IED_ACC 3_5	F	0
3	6	HRS_IED_1	IED_ACC 3_6	F	0
3	7	HRS_IED_1	IED_ACC 3_7	F	0
4	0	HRS_IED_1	IED_ACC 4_0	F	0
4	1	HRS_IED_1	IED_ACC 4_1	F	0
4	2	HRS_IED_1	IED_ACC 4_2	F	0
4	3	HRS_IED_1	IED_ACC 4_3	F	0
5	0	HRS_IED_1	IED_ACC 5_0	F	0
5	1	HRS_IED_1	IED_ACC 5_1	F	0
5	2	HRS_IED_1	IED_ACC 5_2	F	0
5	3	HRS_IED_1	IED_ACC 5_3	F	0

Back

16.7.1 Port

Port corresponds to the type of point assigned to this port number during configuration.

16.7.2 Point

Protocol logical point number.

16.7.3 Device Name

The name of the device from which the point originates.

16.7.4 Point Name

The name of the point assigned during configuration.

16.7.5 Point Status

Please see the Config@WEB Secure Software Users Guide.

16.7.6 Count

The accumulated count.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

16.8 Analog Outputs

From the Harris(M) IED Display screen, click View for Analog Outputs to get the screen shown below.

Figure 16-47 Harris(M) Analog Outputs Display

Harris Analog Outputs Display

Port # : 2 Port Name : Port 2

Page1 of 1 Go To [ ] Go

Port	Point	Device Name	Point Name	Point Status	Point Value	Point Counts
6	0	HRS_IED_1	IED_AO 6_0	F	0	0.000
6	1	HRS_IED_1	IED_AO 6_1	F	0	0.000
6	2	HRS_IED_1	IED_AO 6_2	F	0	0.000
6	3	HRS_IED_1	IED_AO 6_3	F	0	0.000
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Back

16.8.1 Port

Port corresponds to the type of point assigned to this port number during configuration.

16.8.2 Point

Protocol logical point number.

16.8.3 Device Name

The name of the device from which the point originates.

16.8.4 Point Name

The name of the point assigned during configuration.

16.8.5 Point Status

Please see the Config@WEB Secure Software Users Guide.

16.8.6 Point Value

The engineering unit (EGU) value.

16.8.7 Point Counts

The counts from the IED.

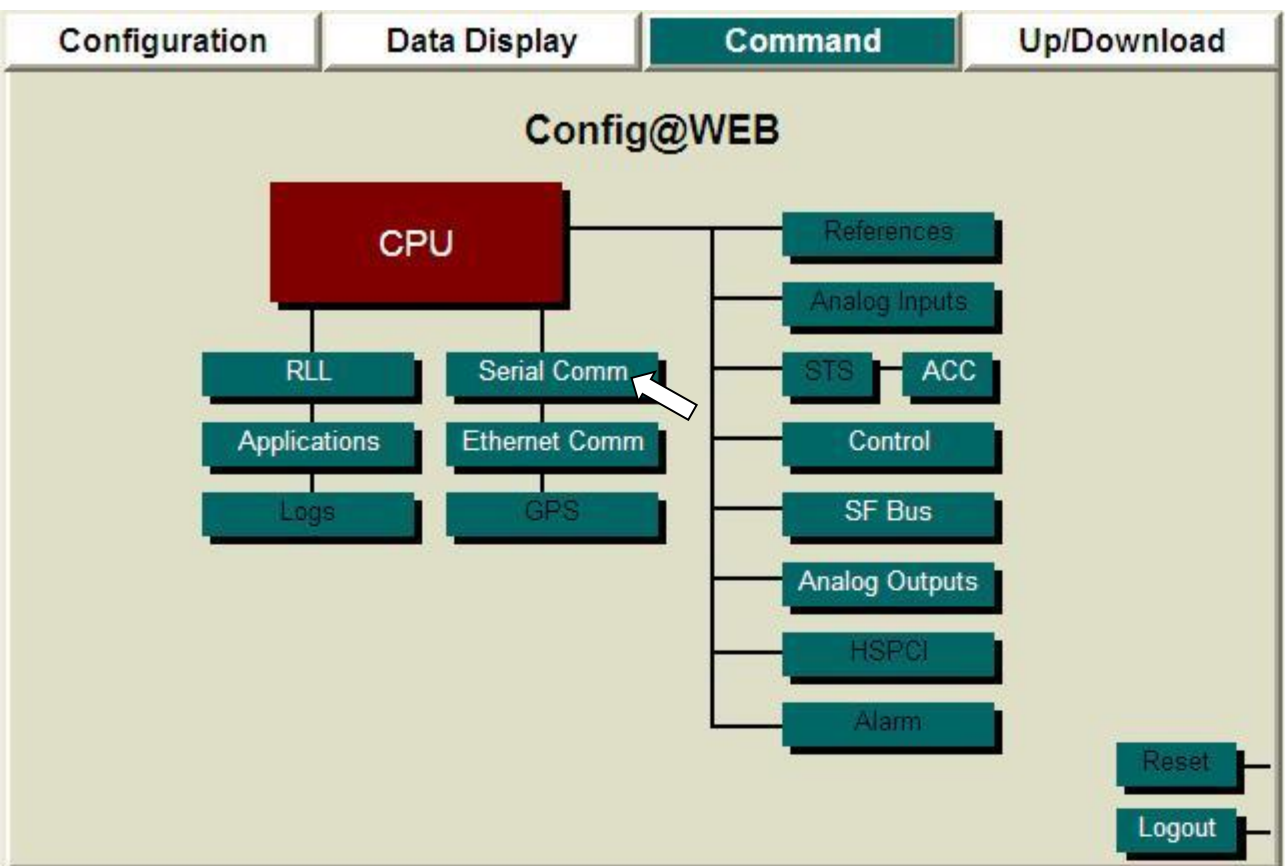
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

16.9 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 16-48 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2200 manual. Under Command Port Data, click Port Data.

Figure 16-49 Serial Comm Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	Harris (R)	Port Data	Normal
Port #2	K	K	Port 2	Harris (M)	Port Data	Normal
Port #3	K	K	Port 3	None	Port Data	Normal
Port #4	K	K	Port 4	None	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

Back

The resultant screen will be similar to Figure 2-31. Click on the Command button as shown.

Figure 16-50 Harris(M) IED Command

Harris (M) IED Command

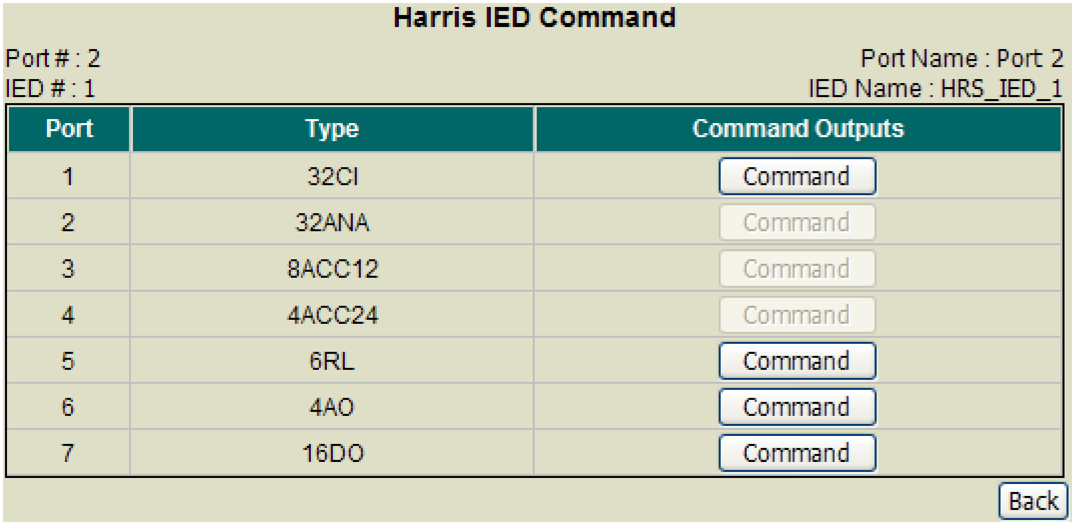
Port # : 2 Port Name : Port 2

IED #	IED Name	IED Address	On Scan	Slave Data
1	HRS_IED_1	1	Y	Command

Back

The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command various Outputs.

Figure 16-51 Harris(M) IED Command


Harris IED Command

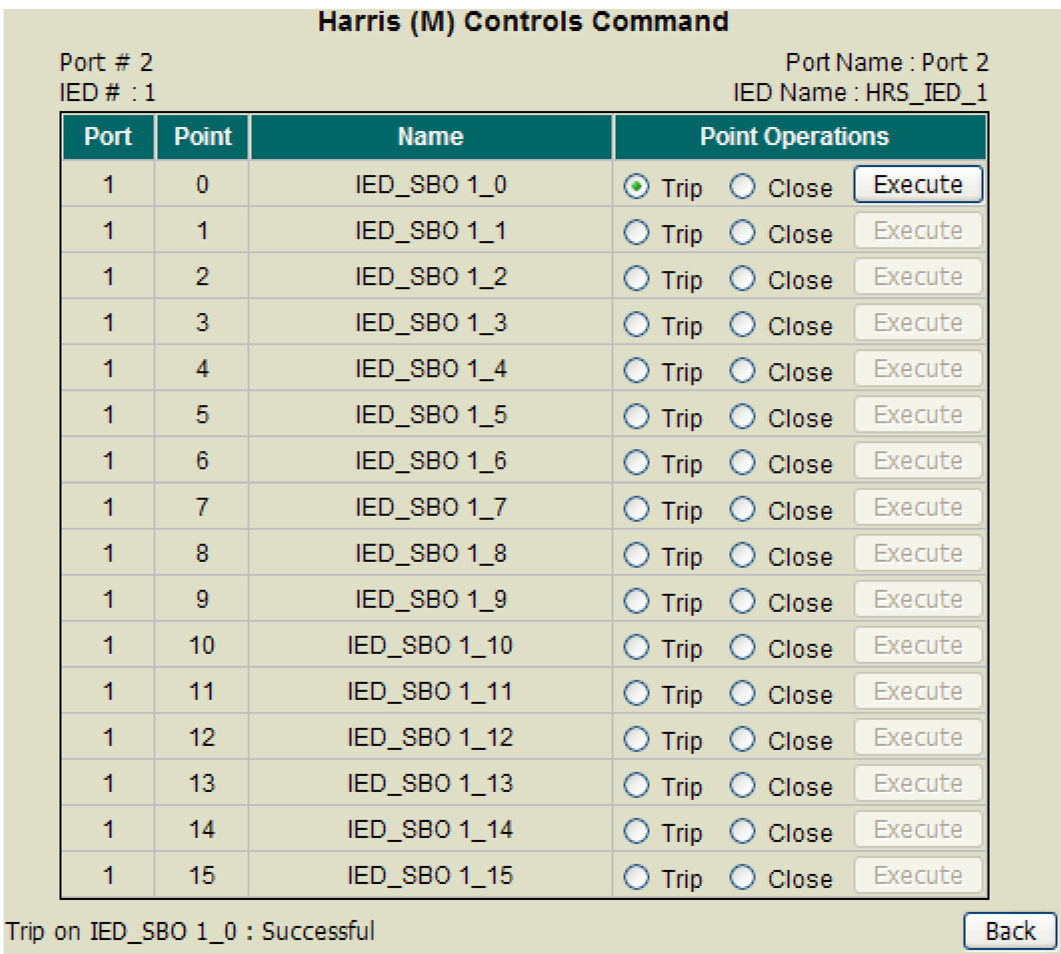
Port # : 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Type	Command Outputs
1	32CI	Command
2	32ANA	Command
3	8ACC12	Command
4	4ACC24	Command
5	6RL	Command
6	4AO	Command
7	16DO	Command

Back

Click on the Command button for the type of point. The first screen below is the 32 Pt Control & Indication after either a Trip or Close has been selected, then Executed with the Execute button.

Figure 16-52 Harris(M) 32 Pt Controls Command


Harris (M) Controls Command

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Point	Name	Point Operations
1	0	IED_SBO 1_0	Trip Close Execute
1	1	IED_SBO 1_1	Trip Close Execute
1	2	IED_SBO 1_2	Trip Close Execute
1	3	IED_SBO 1_3	Trip Close Execute
1	4	IED_SBO 1_4	Trip Close Execute
1	5	IED_SBO 1_5	Trip Close Execute
1	6	IED_SBO 1_6	Trip Close Execute
1	7	IED_SBO 1_7	Trip Close Execute
1	8	IED_SBO 1_8	Trip Close Execute
1	9	IED_SBO 1_9	Trip Close Execute
1	10	IED_SBO 1_10	Trip Close Execute
1	11	IED_SBO 1_11	Trip Close Execute
1	12	IED_SBO 1_12	Trip Close Execute
1	13	IED_SBO 1_13	Trip Close Execute
1	14	IED_SBO 1_14	Trip Close Execute
1	15	IED_SBO 1_15	Trip Close Execute

Trip on IED_SBO 1_0 : Successful Back

The next screen is the 6 Pt Raise/Lower after either a Raise or Lower has been selected, then Executed with the Execute button. Notice that the pulse time is adjustable.

Figure 16-53 Harris(M) 6 Pt Raise/Lower Controls Command

Harris (M) Raise/Lower Output Command

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Point	Name	Point Operations	Pulse Time (sec/10)	Operate
5	0	IED_R/L 5_0	Raise Lower	10	Execute
5	1	IED_R/L 5_1	Raise Lower	10	Execute
5	2	IED_R/L 5_2	Raise Lower	10	Execute
5	3	IED_R/L 5_3	Raise Lower	10	Execute
5	4	IED_R/L 5_4	Raise Lower	10	Execute
5	5	IED_R/L 5_5	Raise Lower	10	Execute

Raise on IED_R/L 5_0 : Successful Back

The next screen is the 4 Pt AO after a Value has been entered, then Executed with the Execute button.

Figure 16-54 Harris(M) 4 Pt Analog Outputs Command

Harris (M) Analog Outputs Command

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Page 1 of 1 Go To Go

Port	Point	Name	Range	Value	Operation
6	0	IED_AO 6_0	0.000 to 4095.000	2000.000	Execute
6	1	IED_AO 6_1	0.000 to 4095.000	0.000	Execute
6	2	IED_AO 6_2	0.000 to 4095.000	0.000	Execute
6	3	IED_AO 6_3	0.000 to 4095.000	0.000	Execute

IED_AO 6_0 : Success Back

The next screen is the 16 Pt DO after either an Open or a Close has been entered, then Executed with the Execute button.

Figure 16-55 Harris(M) 16 Pt Digital Output Command

Harris (M) Digital Output Command

Port # 2 Port Name : Port 2
IED # : 1 IED Name : HRS_IED_1

Port	Point	Name	Point Operations
7	0	IED_DO 7_0	Open Close Execute
7	1	IED_DO 7_1	Open Close Execute
7	2	IED_DO 7_2	Open Close Execute
7	3	IED_DO 7_3	Open Close Execute
7	4	IED_DO 7_4	Open Close Execute
7	5	IED_DO 7_5	Open Close Execute
7	6	IED_DO 7_6	Open Close Execute
7	7	IED_DO 7_7	Open Close Execute
7	8	IED_DO 7_8	Open Close Execute
7	9	IED_DO 7_9	Open Close Execute
7	10	IED_DO 7_10	Open Close Execute
7	11	IED_DO 7_11	Open Close Execute
7	12	IED_DO 7_12	Open Close Execute
7	13	IED_DO 7_13	Open Close Execute
7	14	IED_DO 7_14	Open Close Execute
7	15	IED_DO 7_15	Open Close Execute

Open on IED_DO 7_0 : Successful Back

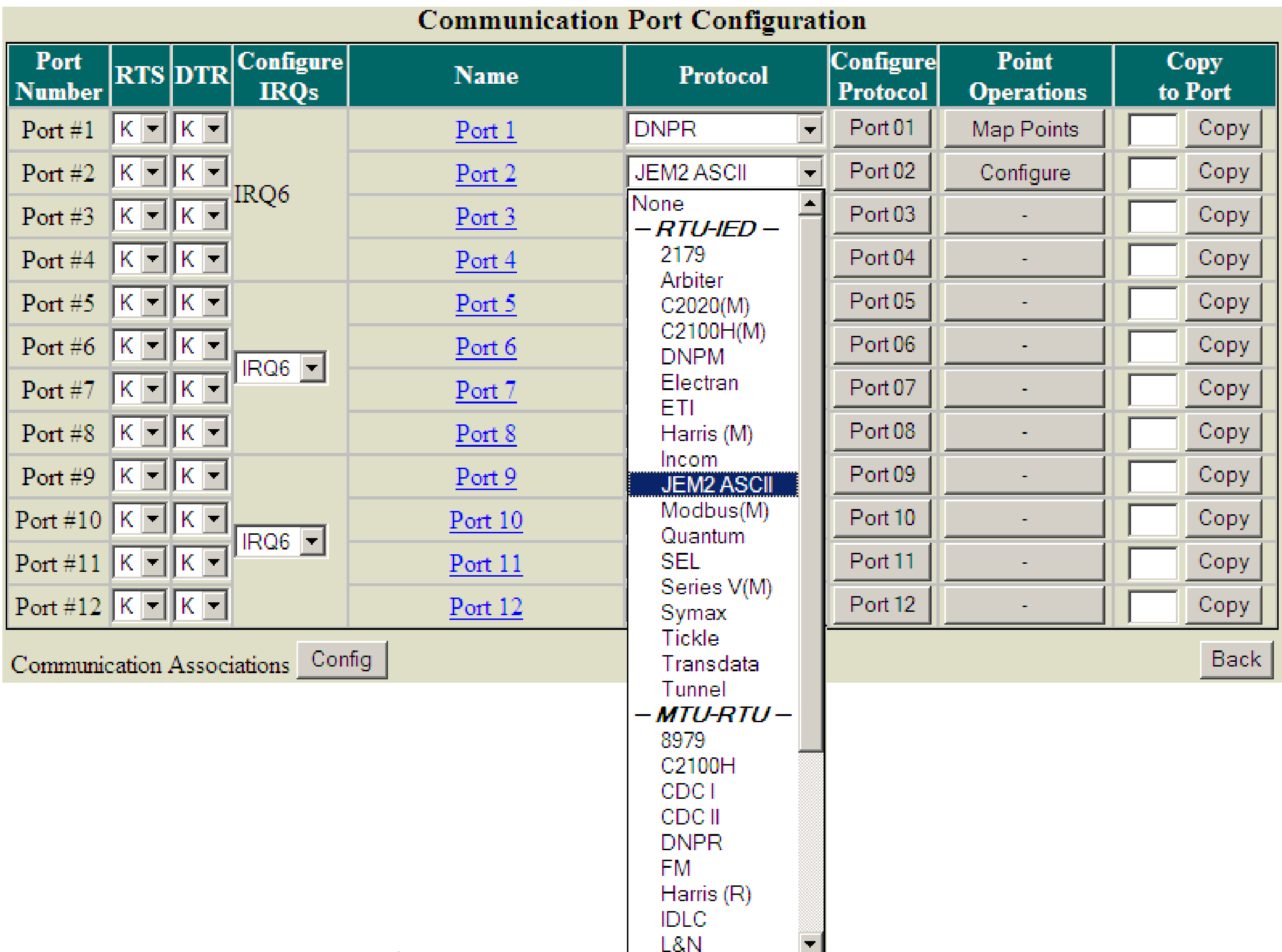
17 JEM2 ASCII

17.1 Communication Port Configuration

The JEM2 ASCII protocol is a protocol that communicates between the RTU and a JEM2 ASCII meter. The RTU may be configured to periodically poll one or more JEM2 ASCII meters.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click JEM2 ASCII from the Protocol drop-down menu as shown.

Figure 17-1 JEM2 ASCII Communication Port Configuration



17.1.1 Port Number

Physical Port number of the RTU.

17.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

17.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

17.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

17.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

17.1.3 Name

Click on the "blue" name (see below) and rename the port, or accept the default name.

17.1.4 Protocol

From the drop-down list, select the protocol for this port.

17.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

17.1.6 Point Operations

Click this button to assign points.

17.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

17.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

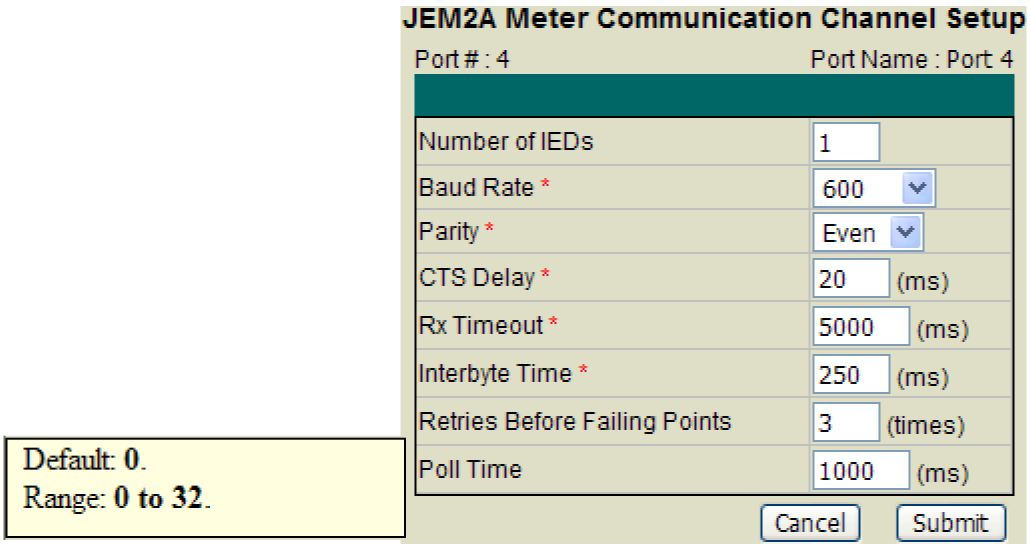
Navigation

Click the Back button to return to the previous screen.

17.2 Configure Protocol

Under the heading Configure Protocol, click Port *n* to configure the JEM2 ASCII port. As a minimum, you must enter the "Number of IEDs" this port will be connected to. You may accept all other defaults or fill in the form according to the information following Figure 2-2.

Figure 17-2 JEM2 ASCII Communication Channel Configuration



Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

17.2.1 Number of IEDs (0 – 32)

Enter the number of IEDs connected to this port. The default setting is 0.

17.2.2 Baud Rate (300 – 19200)

From the drop-down menu, select the baud rate. The default setting is 600.

17.2.3 Parity (None, Odd, Even)

From the drop-down menu, select the parity for the associated channel. The default setting is Even.

17.2.4 CTS Delay (0 – 250ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 20.

Note: For the RS485 ports on any Telvent RTU, the RTS (Request To Send) signal will stay ON unless a non-zero value is entered for CTS (Clear To Send) in the communication interface. This means the RTU will send, but not receive. Always enter a non-zero value for CTS in the RS485 port communications user interface.

17.2.5 Rx Timeout (0 – 30,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. The default setting is 5000ms.

17.2.6 Interbyte time (0 – 250ms)

Enter the interbyte time for the associated channel. The interbyte time is the time allowed for the next byte of a message to be received after a byte has been accepted before the RTU discards the partial message and begins looking for the first byte of a new message. It is recommended that you increase the delay when using frequency-hopping radios. The default setting is 250 msec.

17.2.7 Retries Before Failing Points (0-99)

Enter the number of times the RTU will attempt communications with a device before marking all points attached to the device as failed. The default setting is 3.

17.2.8 Poll Time (0 – 10000ms)

Enter the desired length of time between polls. The default is 1000ms.

Navigation

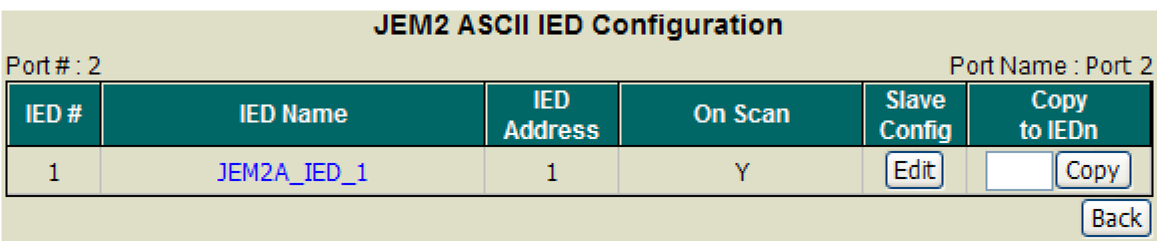
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

17.3 Point Operations

From the Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 17-3 IED Configuration



17.3.1 IED

The logical number of the IED on this communication channel.

17.3.2 IED Name

Click on the IED Name. A pop-up window will appear. See section 6.3.6.1 above.

17.3.3 IED Address

Reflects the entry in the pop-up menu. See section 6.3.6.1 above.

17.3.4 On Scan

Reflects the entry in the pop-up menu. See section 6.3.6.1 above.

17.3.5 Slave Config

Click the Edit to edit the IED points. See section "4.5.16.1 Slave Configuration Edit" on page 115.

17.3.6 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

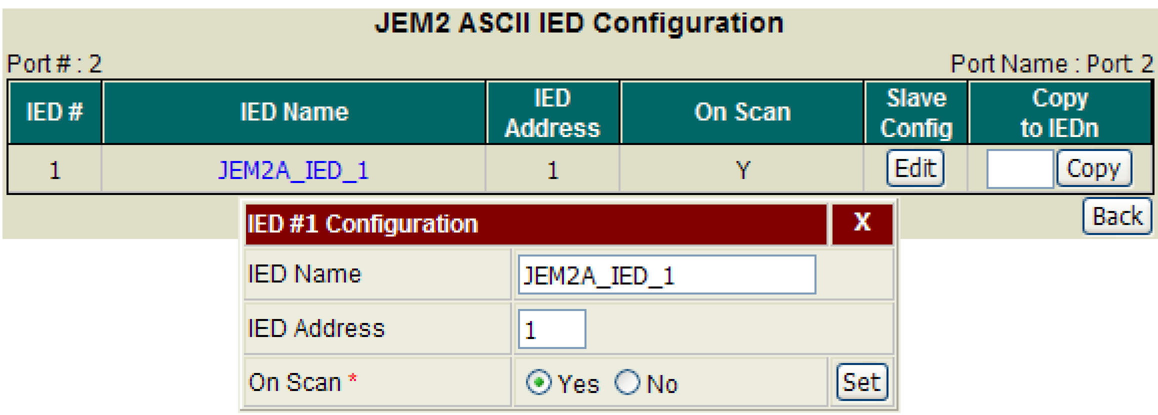
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

17.3.6.1 IED Name & Address Configuration

When you click the name of the IED (in blue characters), a pop-up menu will appear, as shown in Figure 2-6. Edit this pop-up window according to the directions below. After editing, your choices are reflected as explained under Figure 2-5.

Figure 17-4 IED Configuration



17.3.7 IED Name

Accept the default name or type a name of your choosing.

17.3.8 IED Address (1 – 99)

Enter the IED address. The default is 1.

17.3.9 On Scan

Accept the default (Yes) to place the IED on Scan. If you click No, the IED will not be polled.

Note: The IED may be switched On Scan to Off Scan and vice versa without the need to reboot.

17.3.10 Set / X

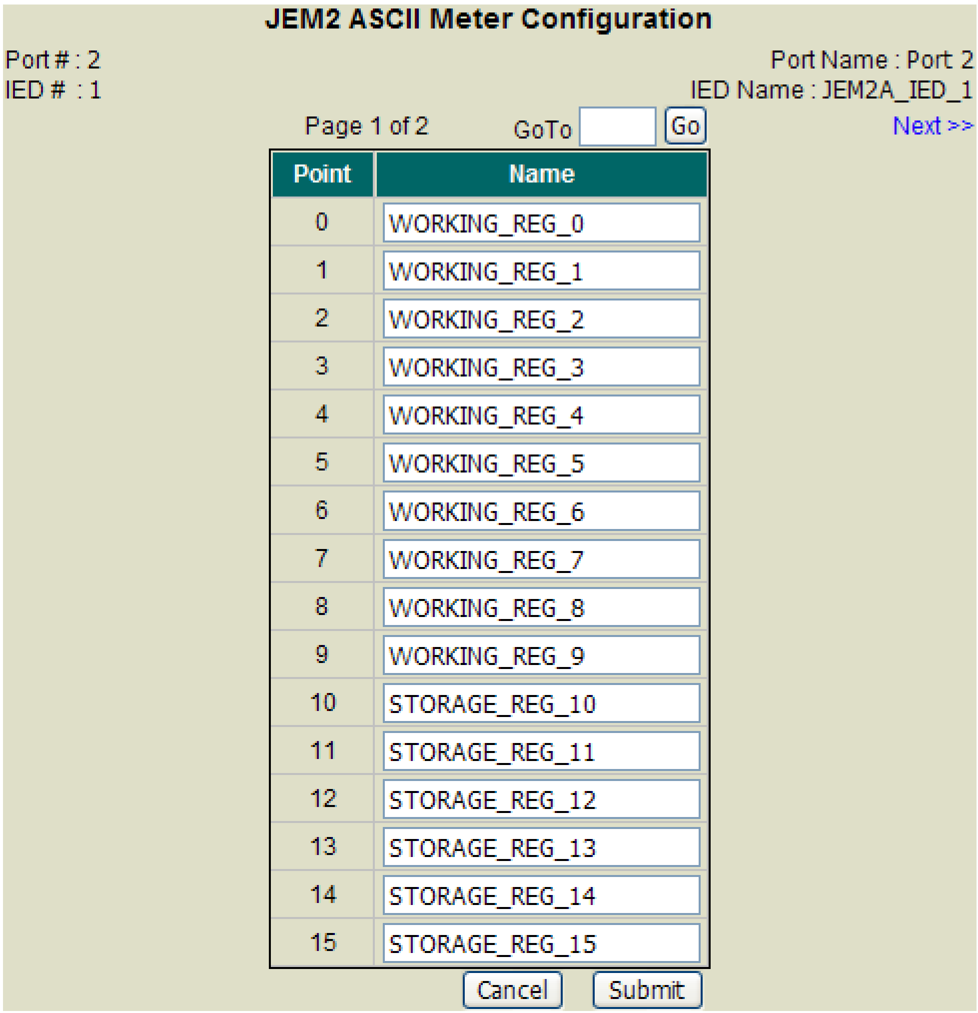
Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

17.3.10.1 Slave Configuration Edit

17.3.11 Slave Config

Click the Edit button to continue. A screen similar to Figure 2-10 will appear. The JEM2 ASCII meter has 20 working registers. All twenty are automatically assigned.

Figure 17-5 IED Configuration



17.3.12 Point

Protocol logical point number. This number cannot be changed.

17.3.13 Name

Enter the name of the point (or accept the default name).

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click Next>> to go to the next 16 points, if applicable. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click the Cancel button to discard changes and return to the IED

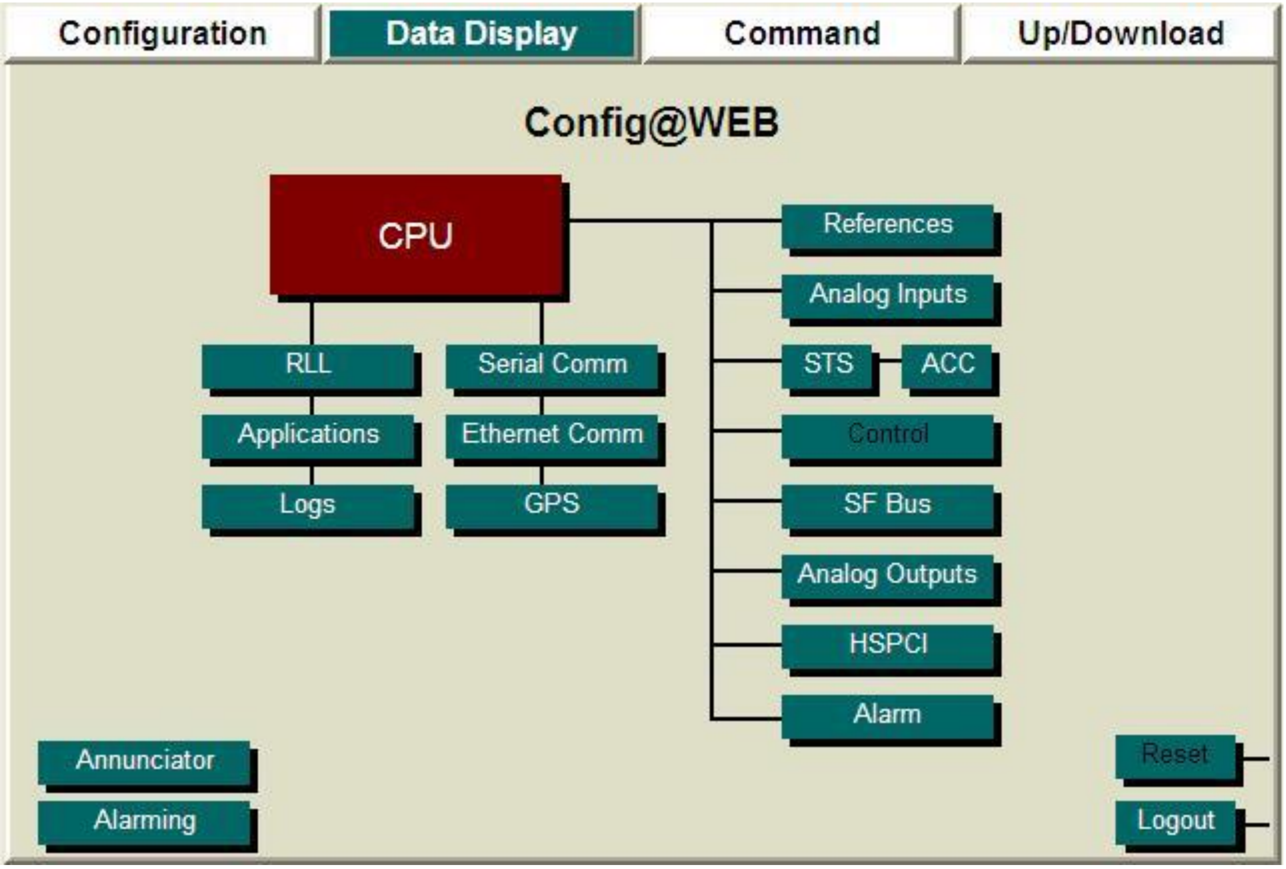
Configuration screen. Click the Submit button to accept the changes and return to the IED Configuration screen.

Please note: No configuration changes take effect until the RTU is reset.

17.4 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 17-6 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 17-7 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Port 1	DNPR	View	Port Data
Port #2	K	K	Port 2	JEM2 ASCII	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

17.4.1 Port Number

Physical Port number of the RTU.

17.4.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

17.4.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

17.4.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

17.4.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

17.4.3 Name

The port name given during configuration or default name accepted.

17.4.4 Protocol

The configured protocol for this port.

17.4.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

17.4.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

17.4.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

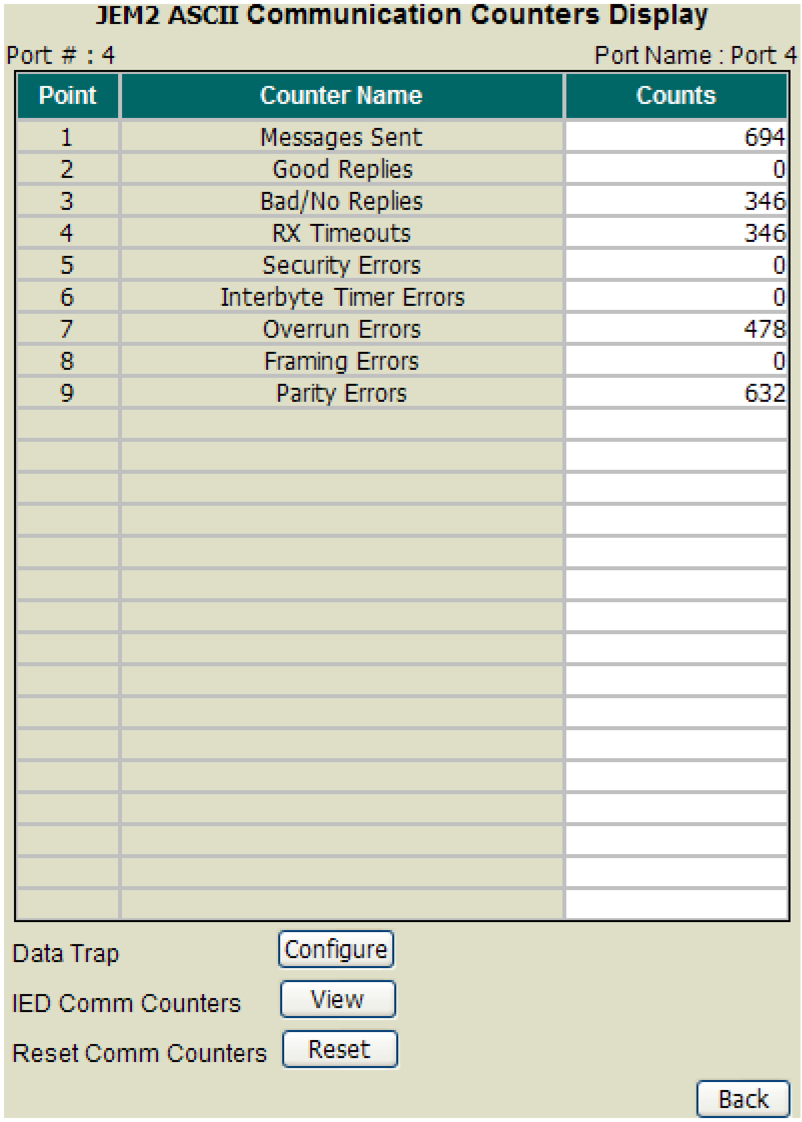
Navigation

Click the Back button to return to the previous screen.

17.4.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 17-8 JEM2 ASCII Communication Counters Display



Point	Counter Name	Counts
1	Messages Sent	694
2	Good Replies	0
3	Bad/No Replies	346
4	RX Timeouts	346
5	Security Errors	0
6	Interbyte Timer Errors	0
7	Overrun Errors	478
8	Framing Errors	0
9	Parity Errors	632

17.4.9 Point Number

A logical point number for reference only.

17.4.10 Counter Name

The following counters are monitored:

17.4.10.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

17.4.10.2 Good Replies

This indicates the cumulative number of good replies since the last reset or power-up.

17.4.10.3 Bad/No Replies

This indicates the cumulative number of transmitted messages that did not receive a response, or were incorrect, since the last reset or power-up. This count can be affected by the Rx timeout delay value.

17.4.10.4 RX Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

17.4.10.5 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

17.4.10.6 Interbyte Timer Errors

This indicates the cumulative number of Interbyte timer errors since the last reset or power-up. This count can be affected by the setting of the Interbyte Time in configuration.

17.4.10.7 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

17.4.10.8 Framing Errors

This indicates the cumulative number of framing errors since the last reset or power-up. This can be affected by parity.

17.4.10.9 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

17.4.11 Counts

The counts for each type of Counter.

17.4.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

17.4.13 IED Comm Counters

Click this button to see individual comm. counters for each IED as shown below.

JEM2 ASCII IED Comm Counters Display

Port # : 4 Port Name : Port 4

IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts	Security Errors	Framing Errors	Overrun Errors	Parity Errors
1	JEM2A_IED_1	4	0	3	3	0	0	0	0
2	JEM2A_IED_2	3	0	3	3	0	0	0	0

Done

17.4.13.1 IED

The number of the IED

17.4.13.2 IED Name

The name of the IED

17.4.13.3 Messages Sent

Messages sent to this IED since the last reset or since the last time the counters were cleared.

17.4.13.4 Valid Replies

Valid messages received from this IED since the last reset or since the last time the counters were cleared.

17.4.13.5 No Replies

The number of no replies from this IED since the last reset or since the last time the counters were cleared.

17.4.13.6 Timeouts

This indicates the cumulative number of times that no response was received since the last reset or power-up. This count can be affected by the setting of the Rx Timeout in configuration.

17.4.13.7 Security Errors

This indicates the cumulative number of security errors since the last reset or power-up.

17.4.13.8 Framing Errors

This indicates the cumulative number of framing errors since the last reset or power-up. This can be affected by parity.

17.4.13.9 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

17.4.13.10 Parity Errors

This indicates the cumulative number of parity errors since the last reset or power-up.

17.4.14 Reset Comm Counters

Click this button to reset all comm. counters.

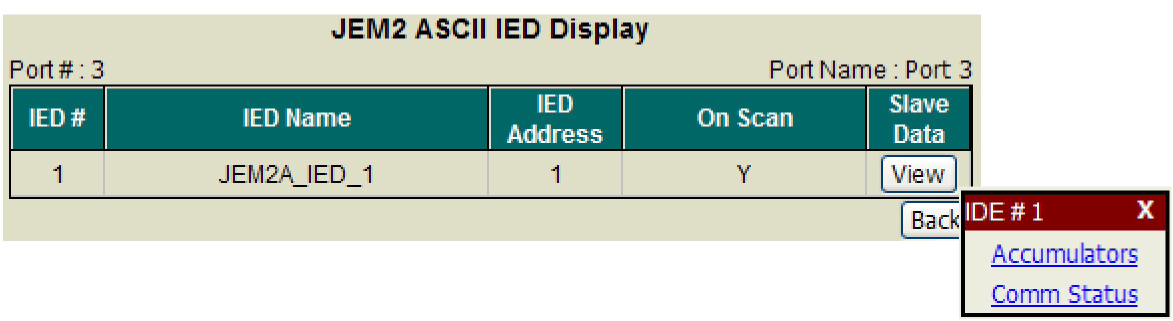
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

17.4.15 IED Displays

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 17-9 JEM2 ASCII IED Display



17.4.16 IED

The logical number of the IED on this communication channel.

17.4.17 IED Name

The name that was chosen, or accepted as default, during configuration.

17.4.18 IED Address

The IED Address chosen during configuration.

17.4.19 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

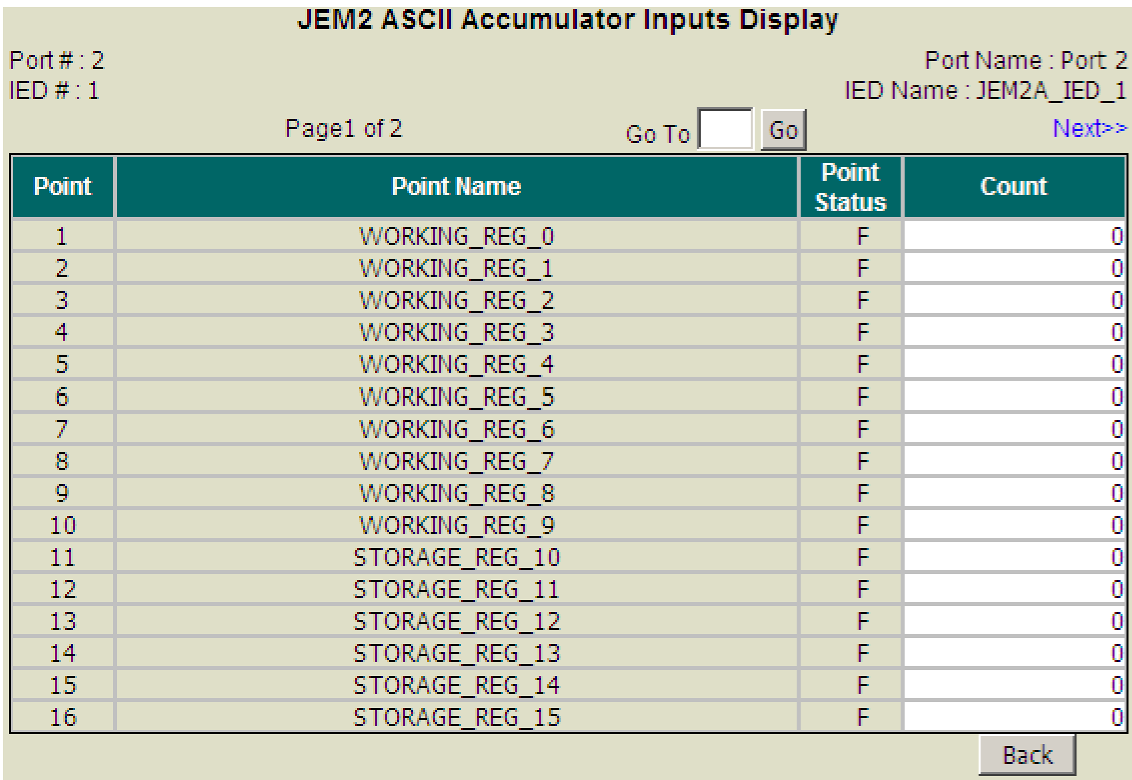
17.5 Slave Data

Click View to bring up a popup that gives you the choice of viewing Accumulators or Comm Status.

17.5.1 Accumulators

The accumulator counts are displayed as shown below.

Figure 17-10 JEM2 ASCII Accumulator Display



JEM2 ASCII Accumulator Inputs Display

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : JEM2A_IED_1

Page1 of 2 Go To Go Next>>

Point	Point Name	Point Status	Count
1	WORKING_REG_0	F	0
2	WORKING_REG_1	F	0
3	WORKING_REG_2	F	0
4	WORKING_REG_3	F	0
5	WORKING_REG_4	F	0
6	WORKING_REG_5	F	0
7	WORKING_REG_6	F	0
8	WORKING_REG_7	F	0
9	WORKING_REG_8	F	0
10	WORKING_REG_9	F	0
11	STORAGE_REG_10	F	0
12	STORAGE_REG_11	F	0
13	STORAGE_REG_12	F	0
14	STORAGE_REG_13	F	0
15	STORAGE_REG_14	F	0
16	STORAGE_REG_15	F	0

Back

17.5.1.1 Point

The logical point number.

17.5.1.2 Point Name

The name that was chosen, or accepted as default, during configuration.

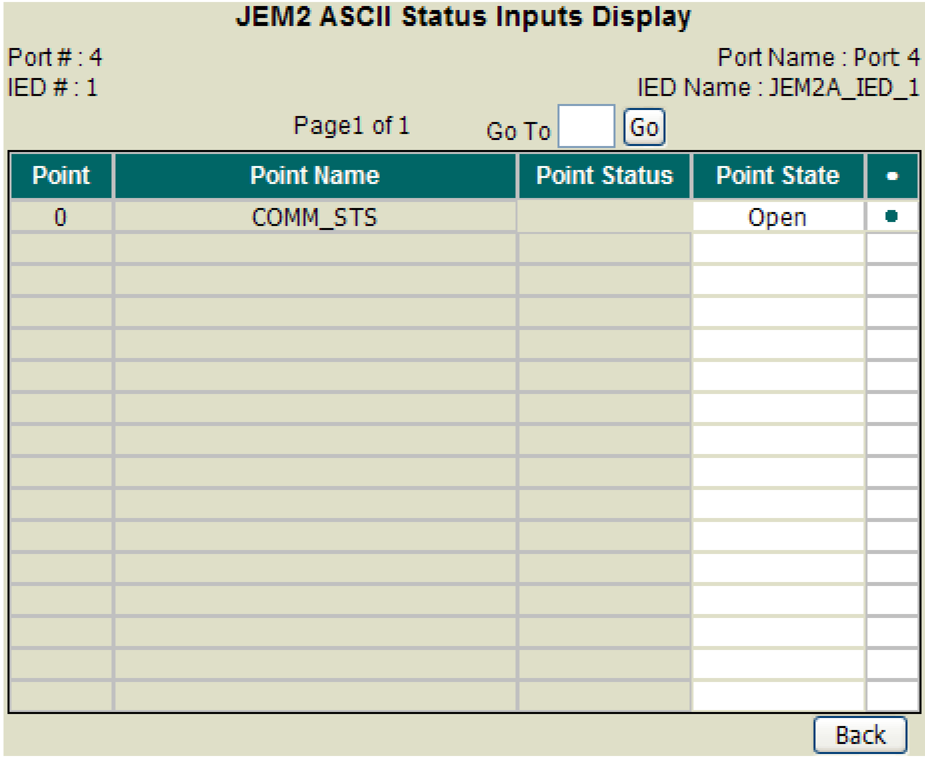
17.5.1.3 Point Status

Please see the Config@WEB Secure Software Users Guide.

17.5.1.4 Count

The accumulated count of the point.

Figure 17-11 JEM2 ASCII Comm Status Display



17.5.2 Comm Status

17.5.2.1 Point

The logical number of the point.

17.5.2.2 Point Name

The point name. The only Digital Input point available is the COMM_STS.

17.5.2.3 Point Status

Please see the Config@WEB Secure Software Users Guide.

17.5.2.4 Point State

Indicates that point is either OPEN or CLOSED.

17.5.2.5 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Note: A CLOSED (red) point indicates that the comm. channel is failed. An OPEN (green) point indicates that the comm. channel is operational.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

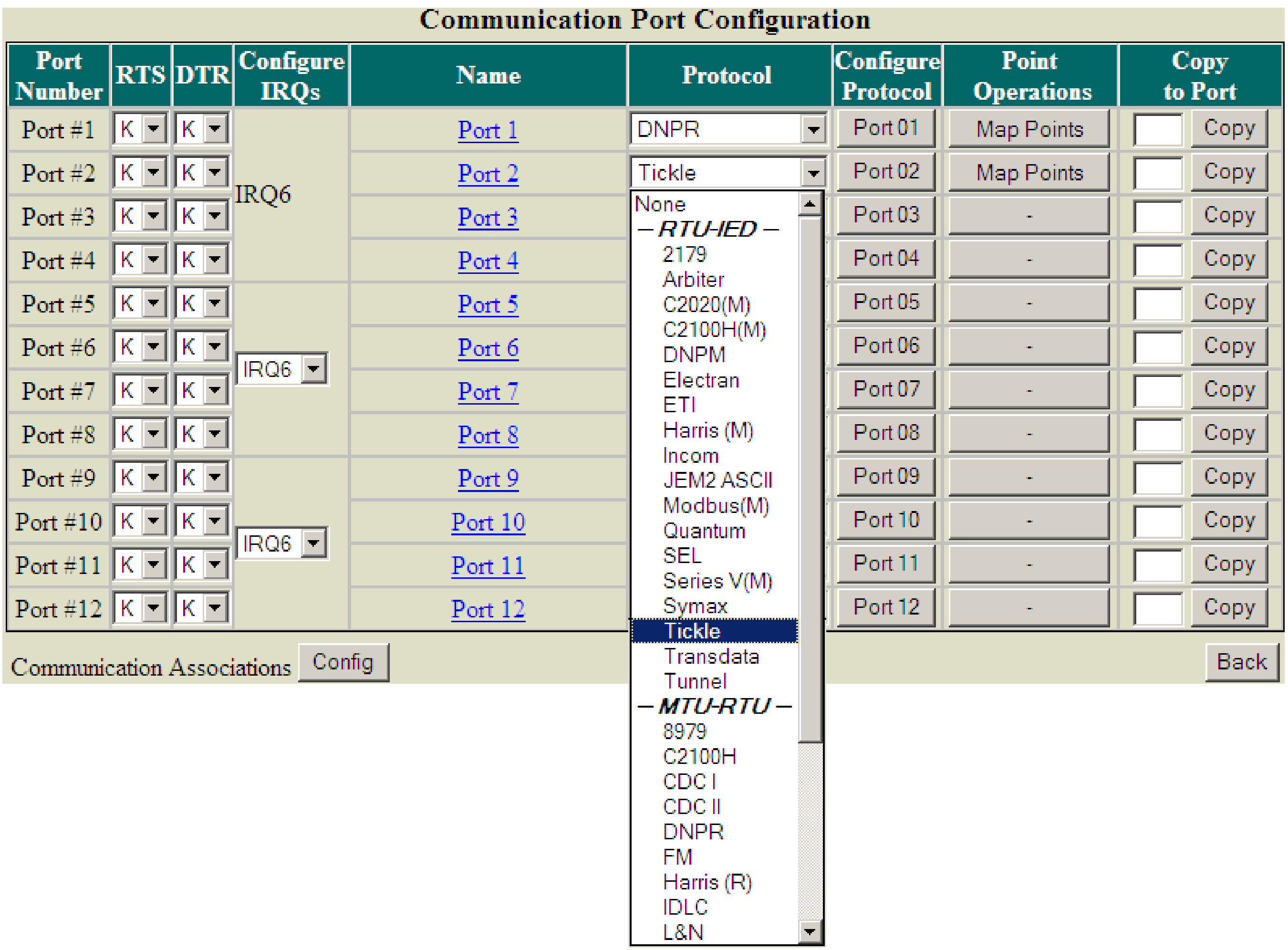
18 Tickle

18.1 Serial Comm Port Configuration

Tickle Task is not a protocol in the usual sense; it is simply a mechanism to toggle the RTS pin of the chosen port for use by an external alarm or watch dog timer. Additionally, RTS toggling is controlled (enabled or disabled) by any mapped status point.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. From this screen, click Tickle Task from the Protocol drop-down menu as shown.

Figure 18-1 Tickle Task Communication Port Configuration



18.1.1 Port Number

Physical Port number of the RTU.

18.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

18.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

Note: The port on which you assign the Tickle Task must be keyed (K) for the Tickle Task to work.

18.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

18.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

18.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.

18.1.4 Protocol

From the drop-down list, select the protocol for this port.

18.1.5 Configure Protocol

Click the button under Configure Protocol to set up operational parameters for the Tickle Task.

18.1.6 Point Operations

Click this button to assign which status points will be used to enable/disable the toggling of the RTS signal.

18.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

18.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

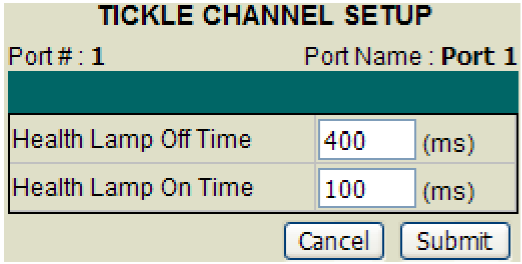
Navigation

Click the Back button to return to the previous screen.

18.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n* to configure the Tickle Task port. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 18-2 Tickle Task Communication Channel Configuration



18.2.1 Health Lamp Off Time (ms)

Enter the time (in milliseconds) for the RTS to be low (off). The default setting is 400.

18.2.2 Health Lamp On Time (ms)

Enter the time (in milliseconds) for the RTS to be High (on). The default setting is 100.

Navigation

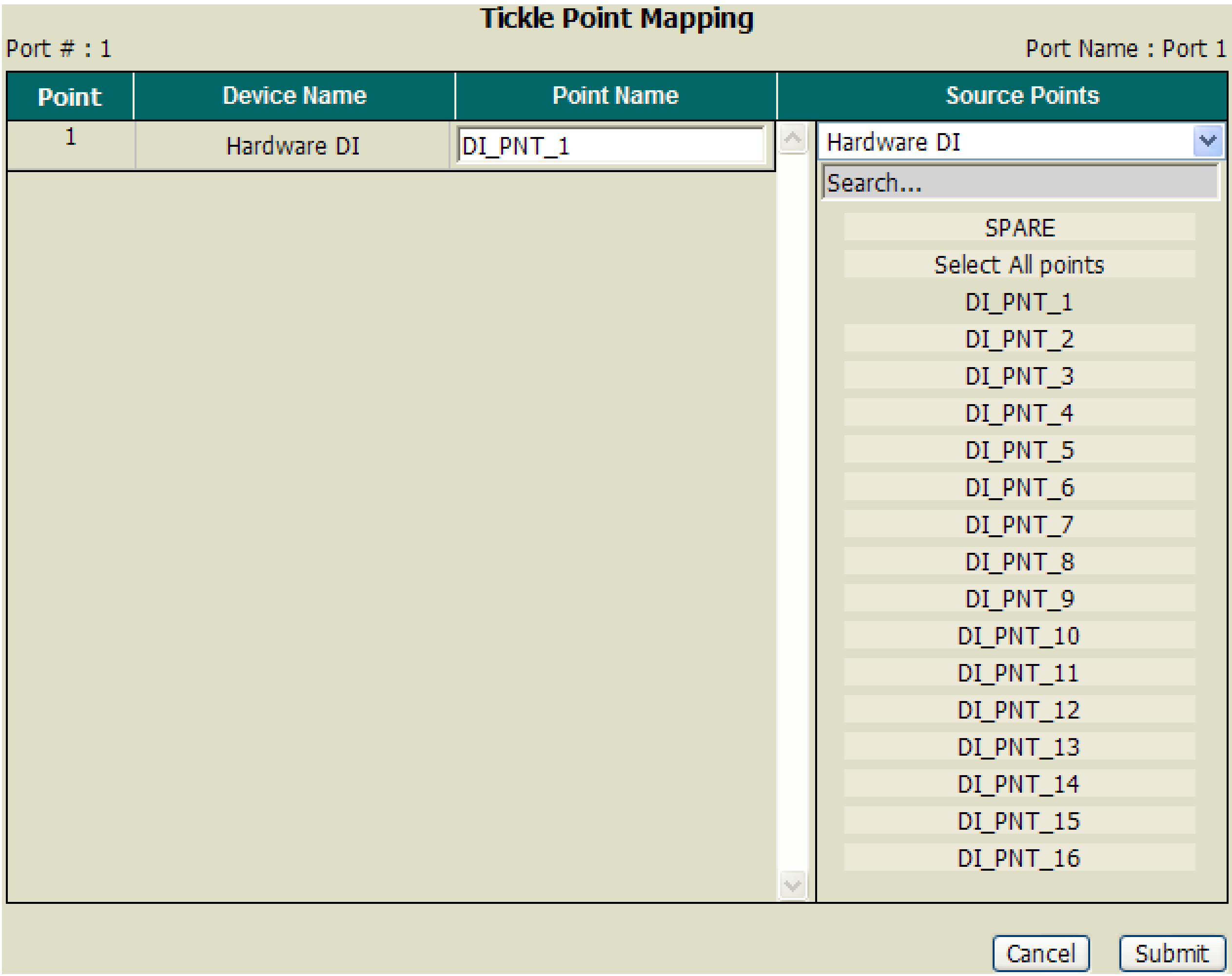
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

18.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Map Points button under Point Operations. A screen similar to Figure 2-5 will appear. Select a staus point from any source. This status point will enable toggling of the RTS line if the point is closed, or disable the toggling of the RTS line if the point is open.

Figure 18-3 Tickle Task IED Configuration



Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click Submit button to save changes.

18.4 Data Display

There is no Data Display. You may confirm operation by observing the RTS light for the port in question.

19 L&N C2020(M)

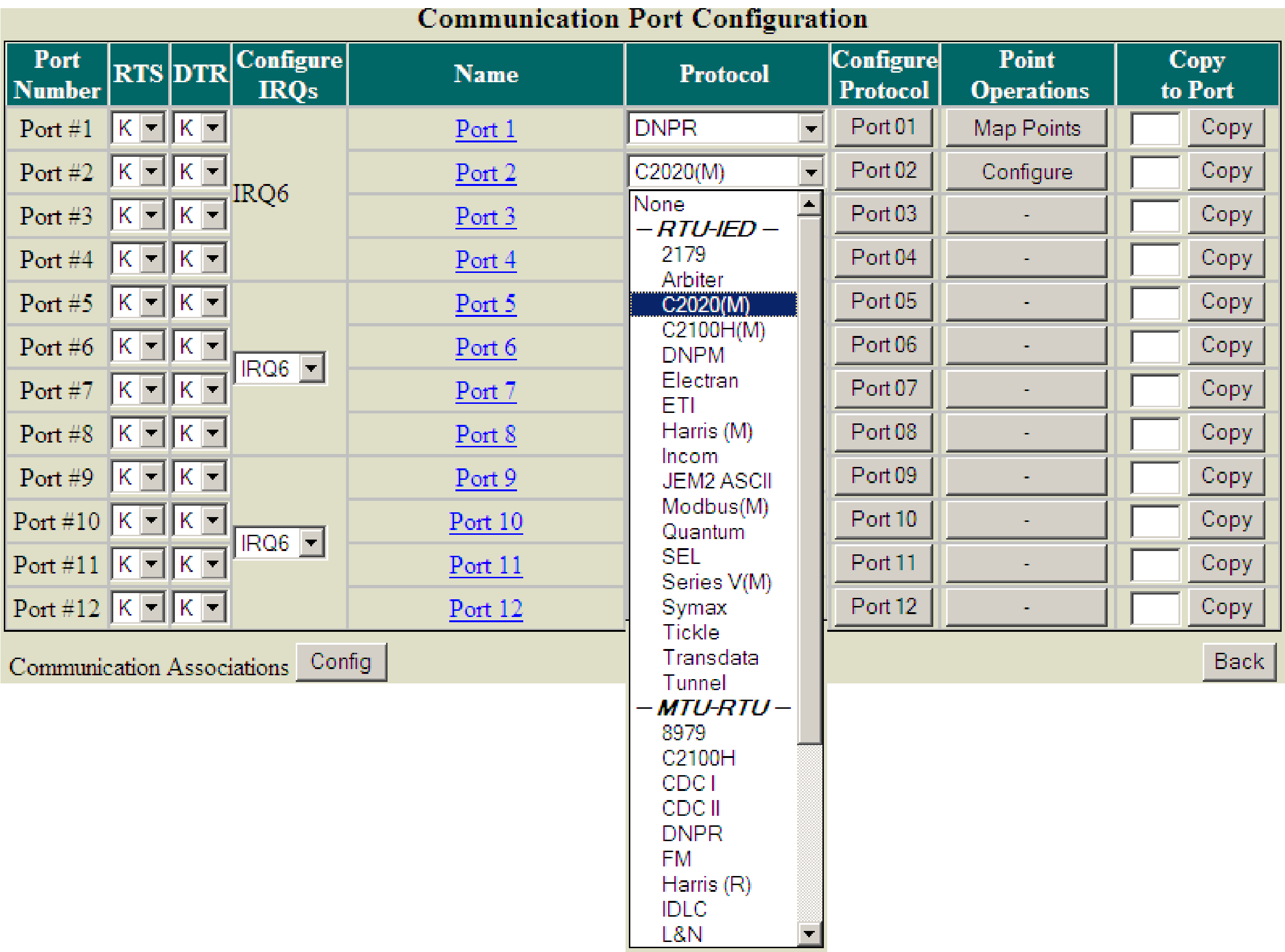
19.1 Serial Comm Port Configuration

is a protocol that communicates between the RTU and an IED. It can be used to front-end an existing RTU in order to add new communication functionality within the substation while preserving the existing hardware I/O.

The protocol running on an RTU can also be used at the master station as a front-end processor scanning multiple RTUs and converting the data to a different protocol.

From the Configuration screen, click Serial Comm. You will get a screen similar to Figure 2-1. See Chapter 1 for a complete explanation of the Communication Port Configuration screen. From this screen, click from the Protocol drop-down menu as shown.

Figure 19-1 Communication Port Configuration



19.1.1 Port Number

Physical Port number of the RTU.

19.1.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Using the drop-down list, set to K, H, or L.

Note: This example applies to the SAGE 2300. Refer to the hardware manual for your particular RTU for variations.

19.1.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

19.1.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

19.1.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

19.1.3 Name

Click on the “blue” name (see below) and rename the port, or accept the default name.

19.1.4 Protocol

From the drop-down list, select the protocol for this port.

19.1.5 Configure Protocol

Click the button under Configure Protocol to set up communication parameters for this port.

19.1.6 Point Operations

Click this button to assign points.

19.1.7 Copy to Port

This function copies everything in the port configuration except the port name to the target port. Enter a port number to copy to, then click the Copy button.

19.1.8 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

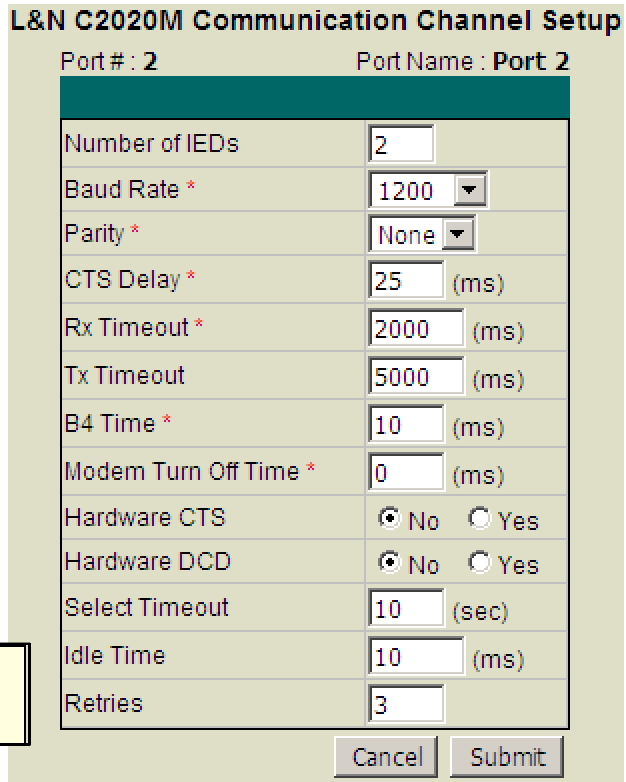
Navigation

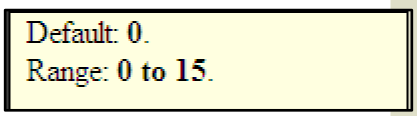
Click the Back button to return to the previous screen.

19.2 Configure Protocol, Serial Comm

Under the heading Configure Protocol, click Port *n*. You may accept all defaults or fill in the form according to the information following Figure 2-2.

Figure 19-2 Communication Channel Configuration





Note 1: All communication parameters with an asterisk * beside their names can be changed on the fly. That is, the change will take effect after Submit without having to reset.

Note 2: The default value and range of acceptable entries for a field where your cursor is placed is shown at the bottom-left of your screen. The example shown is for Number of IEDs.

19.2.1 Number of IEDs (0-15)

Enter the number of IEDs on the port. The default setting is 0.

19.2.2 Baud Rate (300 – 19200)

Select the communications speed for the associated channel. Default setting is 1200.

19.2.3 Parity (None, Odd, Even)

From the drop-down menu, select the parity for the associated channel. The default setting is None.

19.2.4 CTS Delay (0 – 1000ms)

Enter the Clear-To-Send (CTS) Delay in milliseconds for the associated channel. This is the delay of time the channel will wait to start transmitting following Request-To-Send being asserted. The default setting is 25.

19.2.5 Rx Timeout (0 – 30,000ms)

Enter the receive timeout for the associated channel. The receive timeout is the length of time the channel will wait for valid communications prior to declaring the channel in communications error and resetting the channel. Default setting is 2000 (2 seconds).

19.2.6 Tx Timeout (0 – 30,000ms)

Enter the transmit timeout for the associated channel. This value limits the maximum transmission time from the RTU to the master. Default setting is 5000 (5 seconds).

19.2.7 B4 Time (0 – 250ms)

Enter the B4 time for the associated channel. The B4 time is the length of quiet time required on the channel following a transmission from the RTU prior to turning on the RTUs receive interrupts. Default setting is 10.

19.2.8 Modem Turn Off Time (0 – 250ms)

Enter the time delay after the last transmitted byte before turning off the modem. Default setting is 0.

19.2.9 Hardware CTS (No, Yes)

If the hardware Clear-To-Send option is selected for a channel, then reply data bytes will not be transmitted unless the CTS signal is detected by the communications controller chip. This signal is examined after the user programmed CTS delay time has timed out. At the point where the RTU starts its CTS timer, the RTS signal is asserted to the modem. The CTS signal is asserted by the modem to the RTU after the programmed CTS delay. Configuring a CTS delay in the RTU along with the hardware CTS will insure a minimum CTS delay of the configured time. Default setting is No.

19.2.10 Hardware DCD (No, Yes)

If the hardware data carrier detect option is selected for a channel, then the channel communications driver will accept requested message data frames only if carrier is detected by the modem. If carrier is not detected, the data frames are discarded. Default setting is No.

19.2.11 Select Timeout (1 – 25 sec)

Enter the time in seconds that an SBO Select will be armed. Default is 10.

19.2.12 Idle Time (1 – 25,000 ms)

Enter the number of milliseconds to delay between polling messages to IEDs. Default is 1000.

19.2.13 Retries (1-25)

Enter the number of retries on poll messages before marking the data from that IED as failed. Default is 3.

Navigation

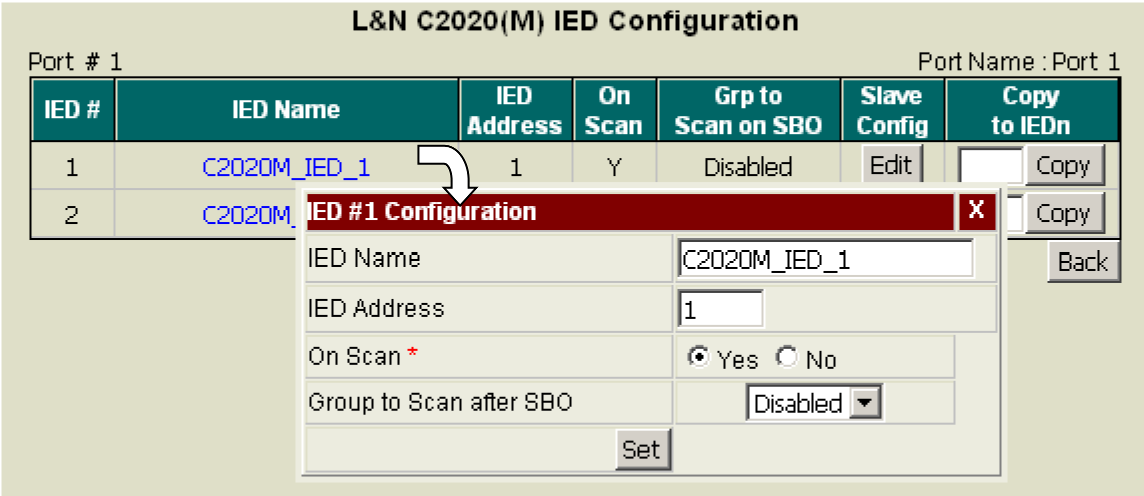
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

19.3 Point Operations

From the Serial Comm Communication Port Configuration screen, click the Configure button under Point Operations. A screen similar to Figure 2-5 will appear. Click on the default IED Name to set up basic information about the IED as shown below.

Figure 19-3 IED Configuration



19.3.1 IED

The logical number of the IED on this communication channel.

19.3.2 IED Name

Click on the IED Name. A pop-up window called **IED Configuration** will appear, as shown above.

19.3.2.1 IED Name

The name of the IED. Type in a name, or accept the default.

19.3.2.2 IED Address

The address of the IED. Type in an address, or accept the default. Range is 1 – 15.

19.3.2.3 On Scan

Determines whether or not the IED is being scanned. Click No to disable the scan, or accept the default (Yes).

19.3.2.4 Group to Scan after SBO

Sets the group to scan after a control is performed. Default is Disabled.

19.3.2.5 Set / X

Click the Set button to keep your changes. Click the X at the top right of this dialog box to discard changes.

19.3.3 IED Address

Reflects the entry in the pop-up menu. See above.

19.3.4 On Scan

Reflects the entry in the pop-up menu. See above.

19.3.5 Group to Scan after SBO

Reflects the entry in the pop-up menu. See above.

19.3.6 Slave Config

Click the Edit button to edit the IED points.

19.3.7 Copy to IEDn

To copy the entire IED configuration to another IED, enter the number of the target IED and click Copy.

Navigation

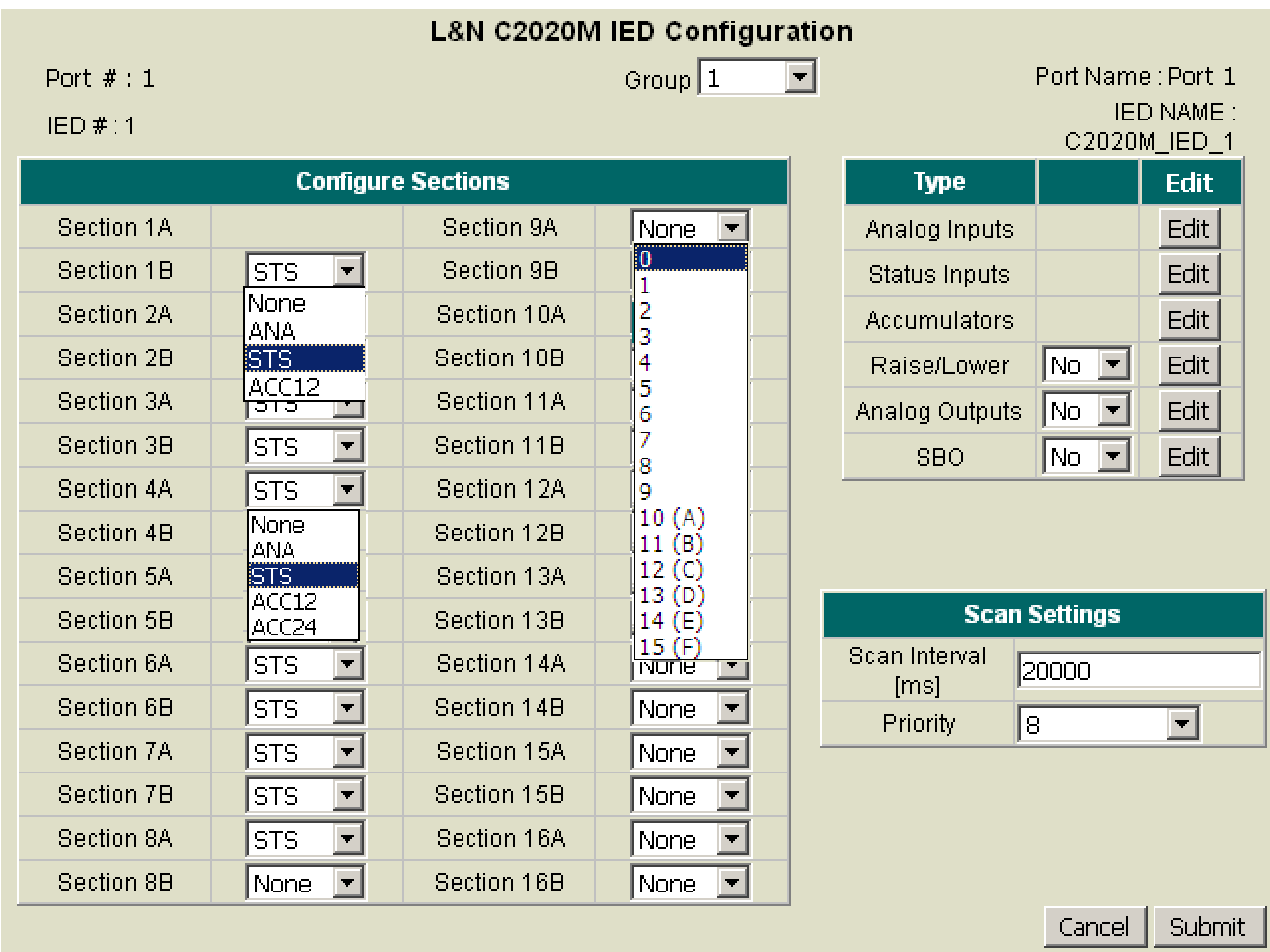
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the Communication Port Configuration screen. Click Edit to Edit the Slave Configuration

19.4 Slave Configuration Edit

19.4.1 Slave Config

Click Edit to continue. A screen similar to Figure 2-10 will appear.

Figure 19-4 IED Configuration



19.4.2 Group

19.4.2.1 Group

Select Status Select 0 through 15 to edit what types of points are to be included in the response message for the corresponding group.

19.4.3 Configure Sections

19.4.3.1 ANA

Analog Inputs, 12-bit. Uses one section. See Analog Inputs MAP function.

19.4.3.2 STS

Status Inputs, 1-bit or 2-bit. Up to twelve status points will fit in one section. See Status Inputs MAP function.

19.4.3.3 ACC12

One section is an accumulator. It uses all 12 bits of the section for a maximum value of 4095.

19.4.3.4 ACC24

Block is an accumulator (2 sections). This is valid only in the 1st data block as required by the protocol. It uses both the 1st and 2nd data blocks to return a 24 bit value in binary format. The 1st data block contains the most significant 12 bits and the 2nd data block contains the least significant 12 bits.

19.4.4 Type

The different types of I/O points supported by this protocol.

19.4.5 Edit

Click the Edit button to configure the point types for this group.

19.4.6 Scan Settings

The different types of I/O points supported by this protocol.

19.4.6.1 Scan Interval [ms]

The time in milliseconds between scans of this group.

19.4.6.2 Priority

Selects the priority of the group. Zero is the highest priority and will preempt the scans of all lower priority scan groups when the Scan Interval expires.

Please note: No configuration changes take effect until the RTU is reset.

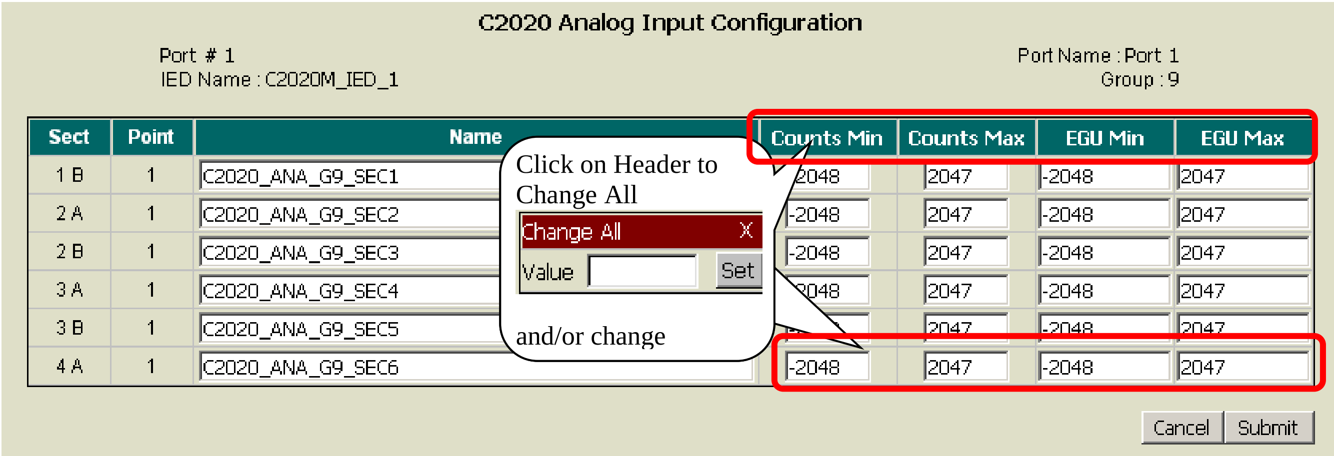
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen.

19.5 IED Analog Configuration

From the IED Configuration screen, click on Edit for Analog Inputs. A screen similar to Figure 2-13 will appear.

Figure 19-5 Analog Input Configuration



19.5.1 Sect

Protocol logical section number. This number cannot be changed.

19.5.2 Point

Protocol logical point number. This number cannot be changed.

19.5.3 Name

Enter the name of the point (or accept the default name).

19.5.4 Counts Min

Enter a minimum counts value for the point. All entries in this column may be changed at once by clicking on the header. The maximum range is -2047 thru 2047

19.5.5 Counts Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header. The maximum range is -2047 thru 2047

19.5.6 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

19.5.7 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable.

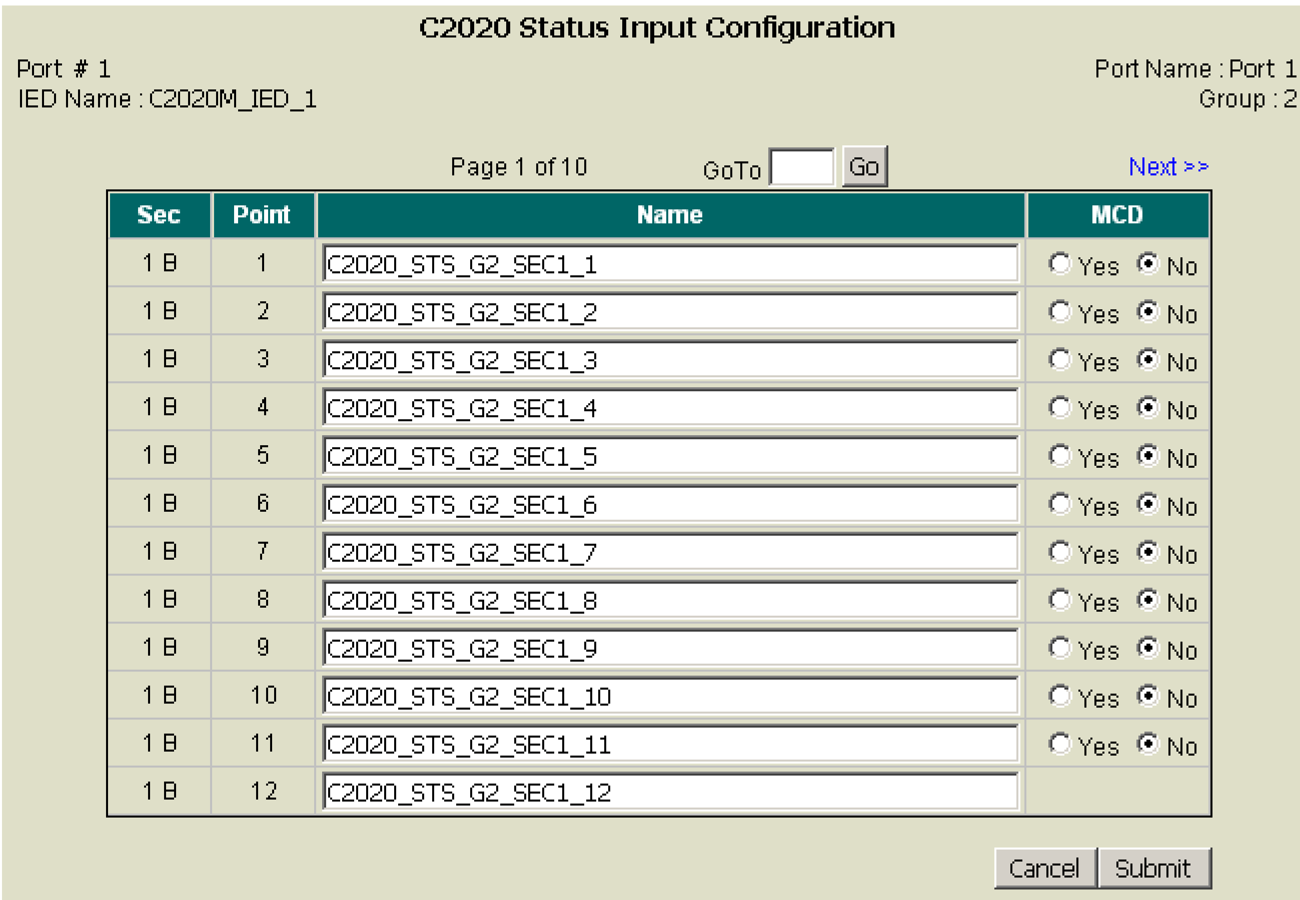
Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

19.6 IED Status Configuration

From the IED Configuration screen, click on Edit for Status. A screen similar to Figure 2-14 will appear.

Figure 19-6 Status Input Configuration


C2020 Status Input Configuration

Port # 1
IED Name : C2020M_IED_1

Port Name : Port 1
Group : 2

Page 1 of 10 GoTo Go Next >>

Sec	Point	Name	MCD
1 B	1	C2020_STS_G2_SEC1_1	Yes No
1 B	2	C2020_STS_G2_SEC1_2	Yes No
1 B	3	C2020_STS_G2_SEC1_3	Yes No
1 B	4	C2020_STS_G2_SEC1_4	Yes No
1 B	5	C2020_STS_G2_SEC1_5	Yes No
1 B	6	C2020_STS_G2_SEC1_6	Yes No
1 B	7	C2020_STS_G2_SEC1_7	Yes No
1 B	8	C2020_STS_G2_SEC1_8	Yes No
1 B	9	C2020_STS_G2_SEC1_9	Yes No
1 B	10	C2020_STS_G2_SEC1_10	Yes No
1 B	11	C2020_STS_G2_SEC1_11	Yes No
1 B	12	C2020_STS_G2_SEC1_12	

Cancel Submit

19.6.1 Sec

Protocol logical section number. This number cannot be changed.

19.6.2 Point

Protocol logical point number. This number cannot be changed.

19.6.3 Name

Enter the name of the point (except for COMM_STS which can not be changed) or accept the default name.

19.6.4 MCD

Sets this point and the next point as a 2-bit Momentary Change Detect point.

The RTU IED database may then be configured to cause the RTU to scan the IED status points to acquire the change bits from the IED. The following parameters apply to the 2 bit status change data acquisition: Table 4-1

Table 19-1 Two Bit Status

RTU Current State	2020 Current State	2020 Change Bit	RTU Events Queued
1	1	0	none
0	0	0	none
1	0	0	change to 0
0	1	0	change to 1
1	1	1	change to 0, change to 1
0	0	1	change to 1, change to 0
1	0	1	change to 0, change to 1, change to 0
0	1	1	change to 1, change to 0, change to 1

Navigation

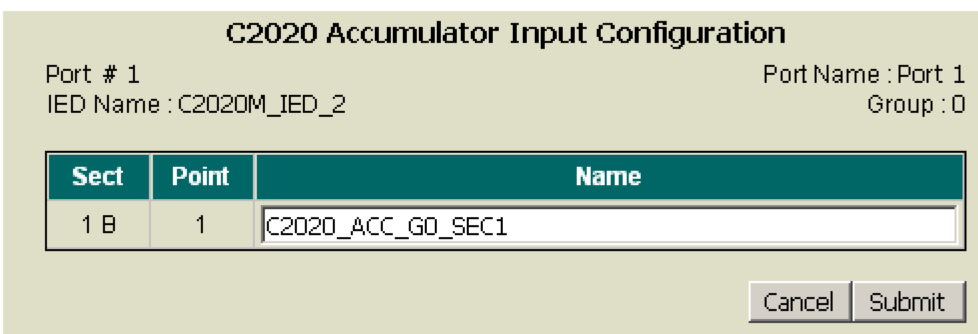
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

19.7 IED Accumulators Configuration

From the IED Configuration screen, click on Edit for Accumulator Inputs. A screen similar to Figure 2-15 will appear.

Figure 19-7 Accumulators Configuration



19.7.1 Sect

Protocol logical section number. This number cannot be changed.

19.7.2 Point

Protocol logical point number. This number cannot be changed.

19.7.3 Name

Enter the name of the point or accept the default name.

Navigation

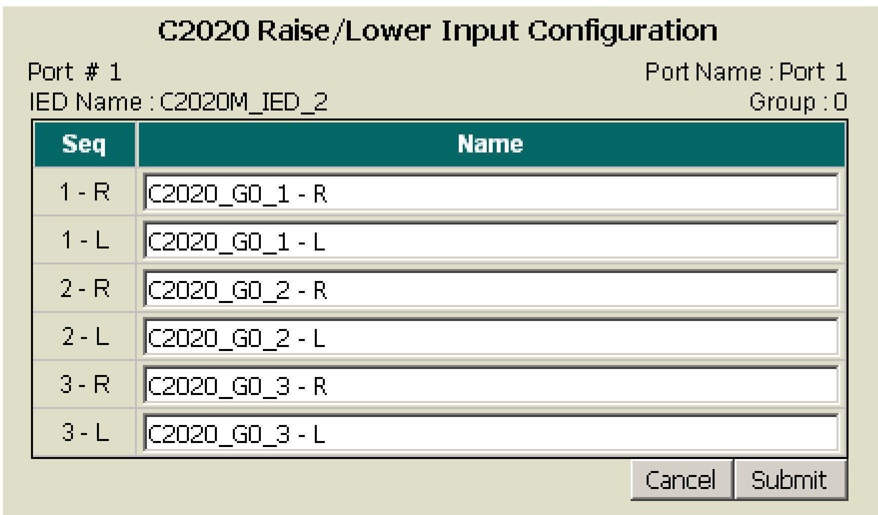
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

19.8 IED Raise/Lower Configuration

Click on Edit for Raise/Lower. A screen similar to Figure 2-17 will appear.

Figure 19-8 Digital Outputs Configuration



19.8.1 Seq

Protocol logical sequence number. This number cannot be changed

19.8.2 Name

Enter the name of the point (or accept the default name)

Navigation

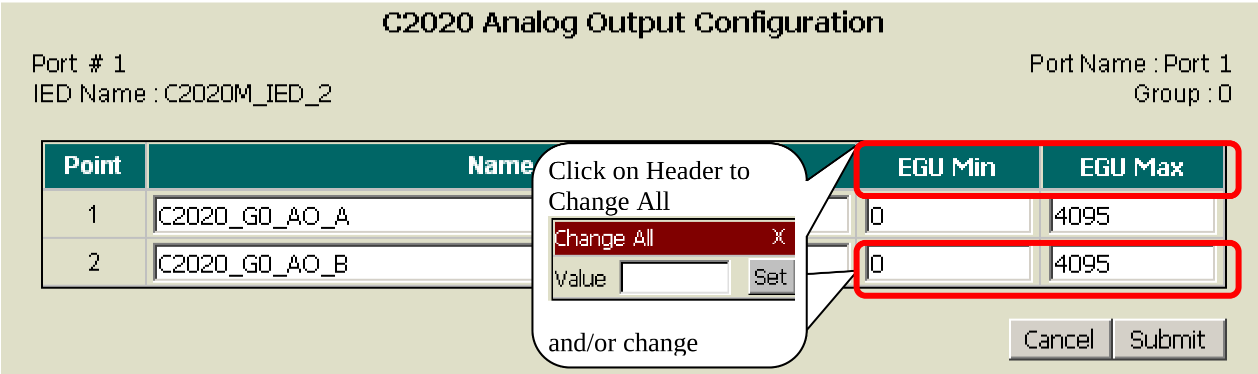
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

19.9 IED Analog Outputs Configuration

Click on Edit for Analog Outputs. A screen similar to the one below will appear.

Figure 19-9 Analog Outputs Configuration



19.9.1 Point

Protocol logical point number. This number cannot be changed

19.9.2 Name

Enter the name of the point (or accept the default name)

19.9.3 EGU Min

Enter a minimum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

19.9.4 EGU Max

Enter a maximum engineering unit value for the point. All entries in this column may be changed at once by clicking on the header.

Navigation

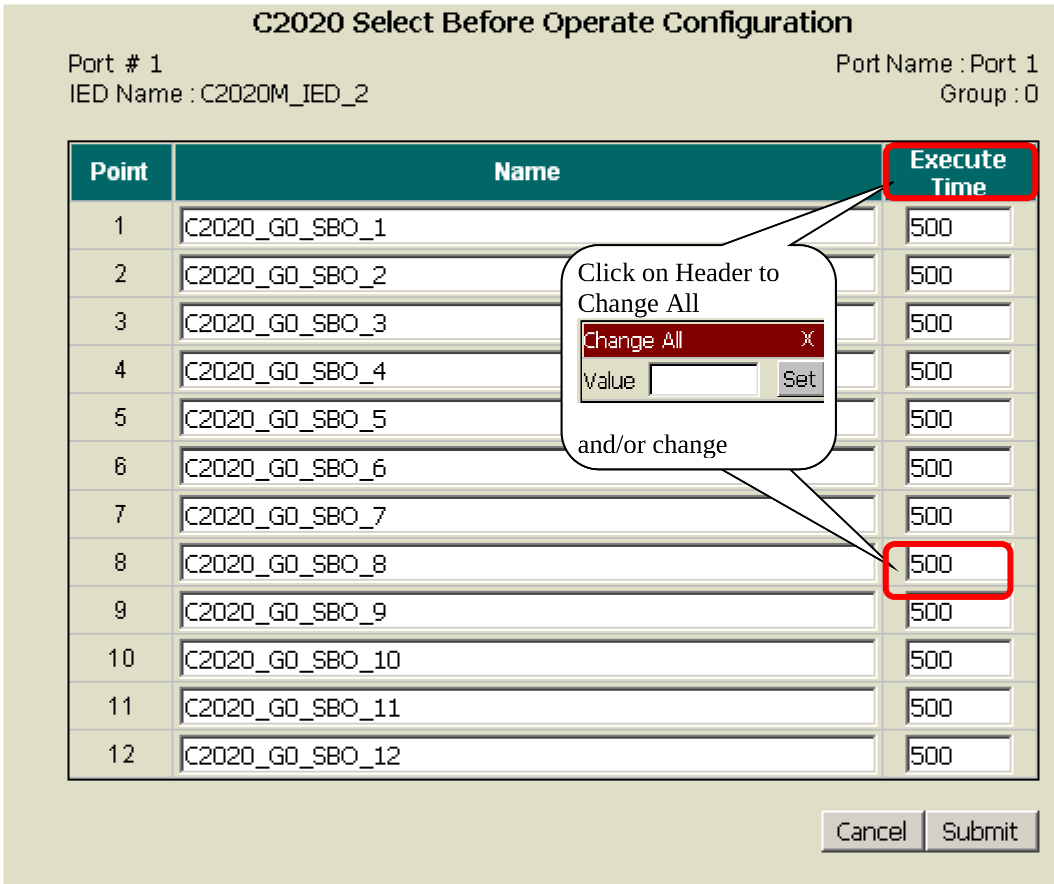
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

19.10 IED SBO Configuration

Click on Edit for SBO. A screen similar to the one below will appear.

Figure 19-10 SBO Configuration



19.10.1 Point

Protocol logical point number. This number cannot be changed

19.10.2 Name

Enter the name of the point (or accept the default name)

19.10.3 Execute Time

Enter the Execute Time (or accept the default)

Navigation

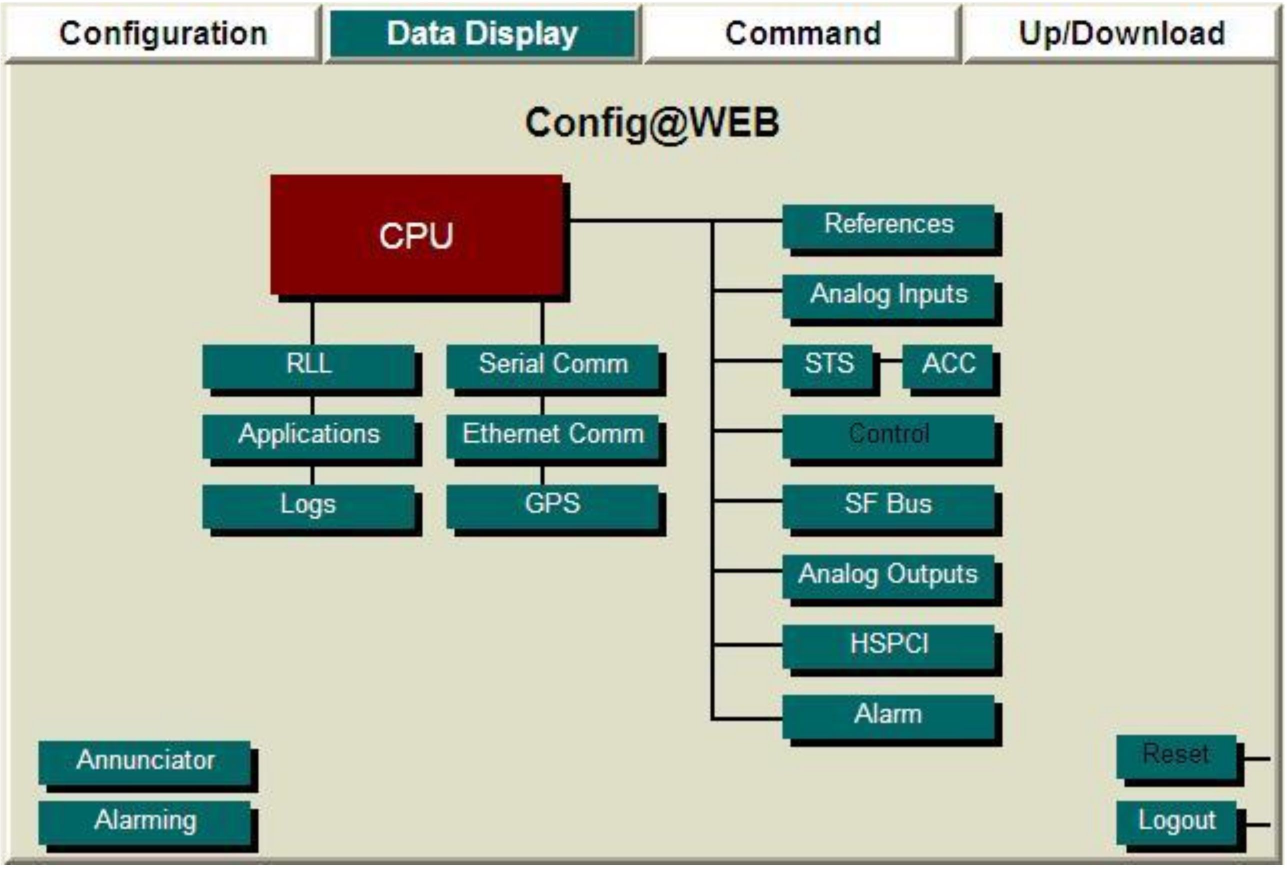
Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the IED Configuration screen. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Please note: No configuration changes take effect until the RTU is reset.

19.11 Data Display

Click the Data Display tab as shown in Figure 2-18.

Figure 19-11 Data Display Screen



Click Serial Comm to get the screen shown in Figure 2-19.

Figure 19-12 Display Communication Port Data

Display Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	K	K	Port 1	DNPR	View	Port Data
Port #2	K	K	Port 2	C2020(M)	View	Port Data
Port #3	K	K	Port 3	None	View	Port Data
Port #4	K	K	Port 4	None	View	Port Data
Port #5	K	K	Port 5	None	View	Port Data
Port #6	K	K	Port 6	None	View	Port Data
Port #7	K	K	Port 7	None	View	Port Data
Port #8	K	K	Port 8	None	View	Port Data
Port #9	K	K	Port 9	None	View	Port Data
Port #10	K	K	Port 10	None	View	Port Data
Port #11	K	K	Port 11	None	View	Port Data
Port #12	K	K	Port 12	None	View	Port Data

Communication Associations Config Back

19.11.1 Port Number

Physical Port number of the RTU.

19.11.2 RTS and DTR

Request **T**o **S**end and **D**ata **T**erminal **R**eady. Selected during configuration, this value can be K, H, or L.

19.11.2.1 "K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. Typically used as a Radio/Modem key output (Default Setting).

19.11.2.2 "H" represents Positive RS232 Voltage.

When the RTU firmware is active, the output will be driven to the positive RS232 voltage except when the Z85230 (Communications Controller chip) channel driving the output is being reset. While the reset is occurring, the output will drop to the negative RS232 voltage. When the reset is complete, the output will rise to the Positive RS232 Voltage. This setting can be used to power RS232 to RS485 converters, RS232 to Fiber Optic converters, or any other device requiring the Positive RS232 Voltage.

19.11.2.3 "L" represents Negative RS232 Voltage.

The output will be driven to the negative RS232 voltage at powerup and always be the negative RS232 voltage.

19.11.3 Name

The port name given during configuration or default name accepted.

19.11.4 Protocol

The configured protocol for this port.

19.11.5 Comm Counters

Click the View button under Comm Counters to display a set of Communication Counters for this port.

19.11.6 Display Port Data

Click the Port Data button under Display Port Data to display an IED listing to select the data to be displayed.

19.11.7 Communication Associations

Please see the DNPR chapter of the Config@WEB MTU to RTU Protocols Manual.

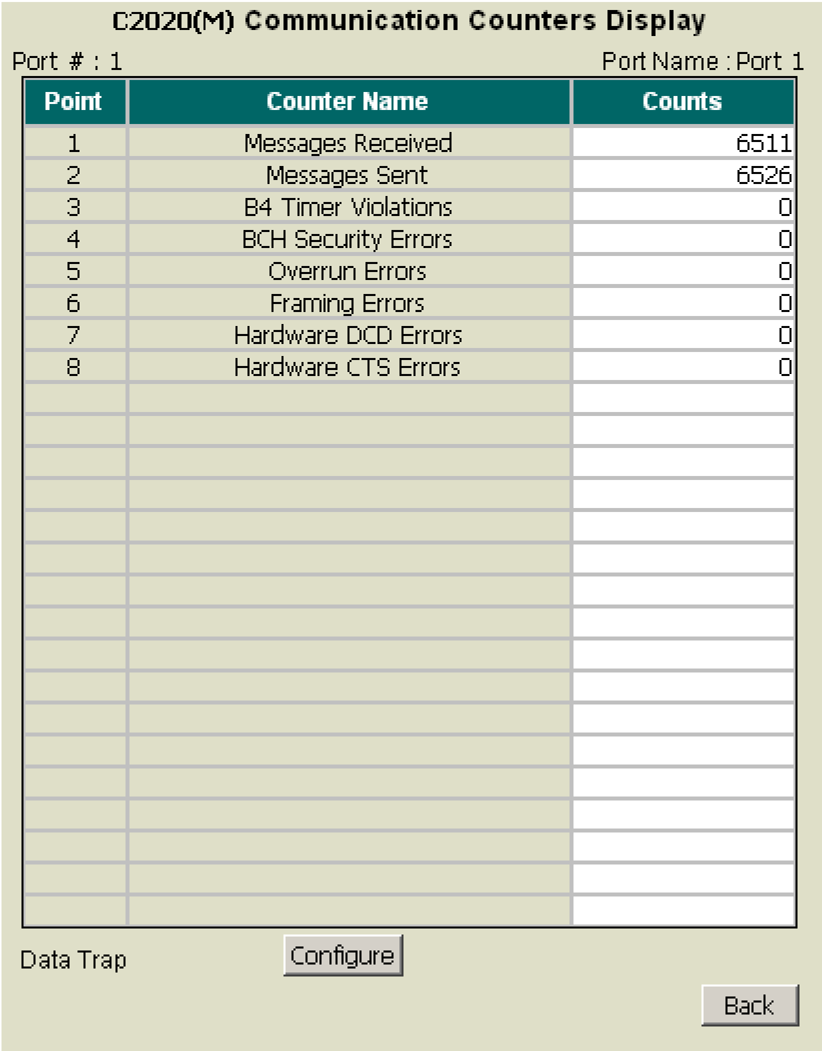
Navigation

Click the Back button to return to the previous screen.

19.11.8 Communication Counters

Under Comm Counters, click View to get the screen shown in Figure 2-20.

Figure 19-13 Communication Counters Display



19.11.9 Point

A logical point number for reference only.

19.11.10 Counter Name

The following counters are monitored:

19.11.10.1 Messages Sent

This indicates the cumulative number of transmitted messages since the last reset or power-up.

19.11.10.2 Messages Received

This indicates the cumulative number of received messages since the last reset or power-up.

19.11.10.3 B4 Timer Violations

This indicates the cumulative number of B4 Timer violations. This count can be affected by the setting of the B4 Time in configuration.

19.11.10.4 BCH Security Errors

This indicates the cumulative number of BCH security errors since the last reset or power-up.

19.11.10.5 Overrun Errors

This indicates the cumulative number of overrun errors since the last reset or power-up.

19.11.10.6 Framing Errors

This indicates the cumulative number of received bytes with framing errors since the last reset or power-up. This can be affected by parity and MTO.

19.11.10.7 Hardware DCD Errors

This indicates the cumulative number of DCD errors since the last reset or power-up.

19.11.10.8 Hardware CTS Errors

This indicates the cumulative number of CTS errors since the last reset or power-up.

19.11.11 Counts

The counts for each type of Counter.

19.11.12 Data Trap

Please see the Config@WEB Secure Software Users Guide.

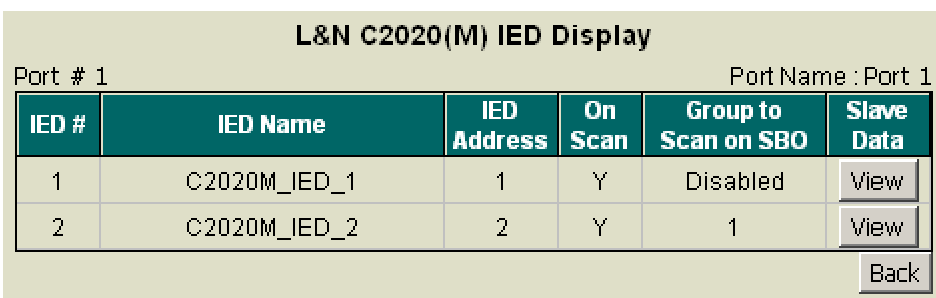
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

19.11.13 Display Port Data

From the Display Communication Port Data Screen, click Port Data to get the screen shown in Figure 2-22.

Figure 19-14 IED Display


L&N C2020(M) IED Display

Port # 1 Port Name : Port 1

IED #	IED Name	IED Address	On Scan	Group to Scan on SBO	Slave Data
1	C2020M_IED_1	1	Y	Disabled	View
2	C2020M_IED_2	2	Y	1	View

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19.11.14 IED

The logical number of the IED on this communication channel.

19.11.15 IED Name

The name that was chosen, or accepted as default, during configuration.

19.11.16 IED Address

The IED Address chosen during configuration.

19.11.17 On Scan

Y (Yes) means that the IED is on scan. An N (No) means the IED will not be polled.

19.11.18 Slave Data

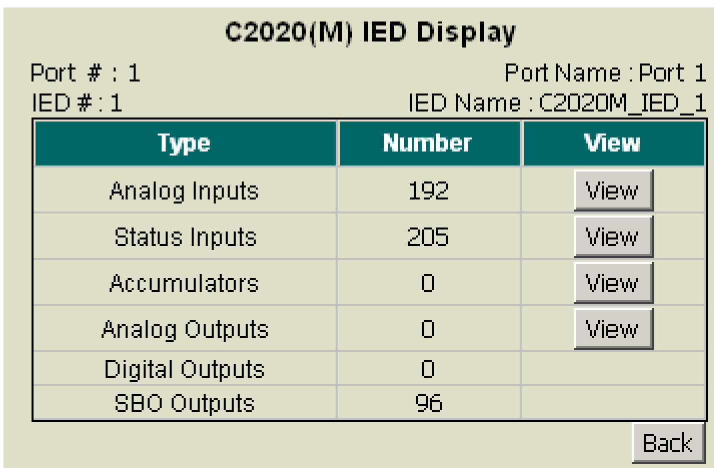
Click View to examine the data being returned from this device. A screen similar to Figure 2-23 will appear.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. Click the Back button to return to the previous screen.

From the IED Display screen, click View under Slave Data to get the screen shown in Figure 2-23.

Figure 19-15 IED Display



19.11.19 Type

The type of point.

19.11.20 Number

The number of points from your IED.

19.11.21 View

Click the View button to view points.

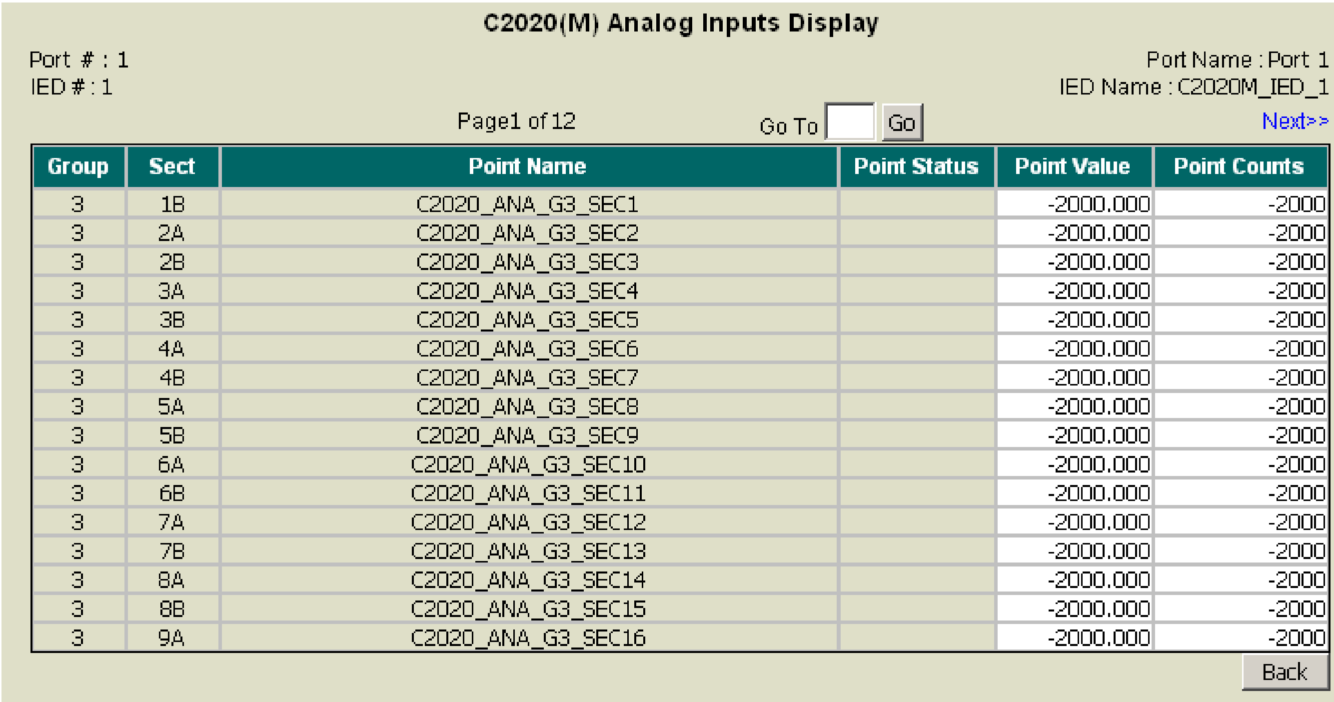
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click the Back button to return to the previous screen.

19.12 Analog Inputs

From the IED Display screen, click View for Analog Inputs to get the screen shown in Figure 2-24.

Figure 19-16 Analog Inputs Display



C2020(M) Analog Inputs Display

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : C2020M_IED_1

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Group	Sect	Point Name	Point Status	Point Value	Point Counts
3	1B	C2020_ANA_G3_SEC1		-2000.000	-2000
3	2A	C2020_ANA_G3_SEC2		-2000.000	-2000
3	2B	C2020_ANA_G3_SEC3		-2000.000	-2000
3	3A	C2020_ANA_G3_SEC4		-2000.000	-2000
3	3B	C2020_ANA_G3_SEC5		-2000.000	-2000
3	4A	C2020_ANA_G3_SEC6		-2000.000	-2000
3	4B	C2020_ANA_G3_SEC7		-2000.000	-2000
3	5A	C2020_ANA_G3_SEC8		-2000.000	-2000
3	5B	C2020_ANA_G3_SEC9		-2000.000	-2000
3	6A	C2020_ANA_G3_SEC10		-2000.000	-2000
3	6B	C2020_ANA_G3_SEC11		-2000.000	-2000
3	7A	C2020_ANA_G3_SEC12		-2000.000	-2000
3	7B	C2020_ANA_G3_SEC13		-2000.000	-2000
3	8A	C2020_ANA_G3_SEC14		-2000.000	-2000
3	8B	C2020_ANA_G3_SEC15		-2000.000	-2000
3	9A	C2020_ANA_G3_SEC16		-2000.000	-2000

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19.12.1 Group

Protocol logical Group number.

19.12.2 Sect

Protocol logical section number.

19.12.3 Point

Protocol logical point number.

19.12.4 Point Name

The name of the point assigned during configuration.

19.12.5 Point Status

Please see the Config@WEB Secure Software Users Guide.

19.12.6 Point Value

The engineering unit (EGU) value.

19.12.7 Point Counts

The counts from the IED.

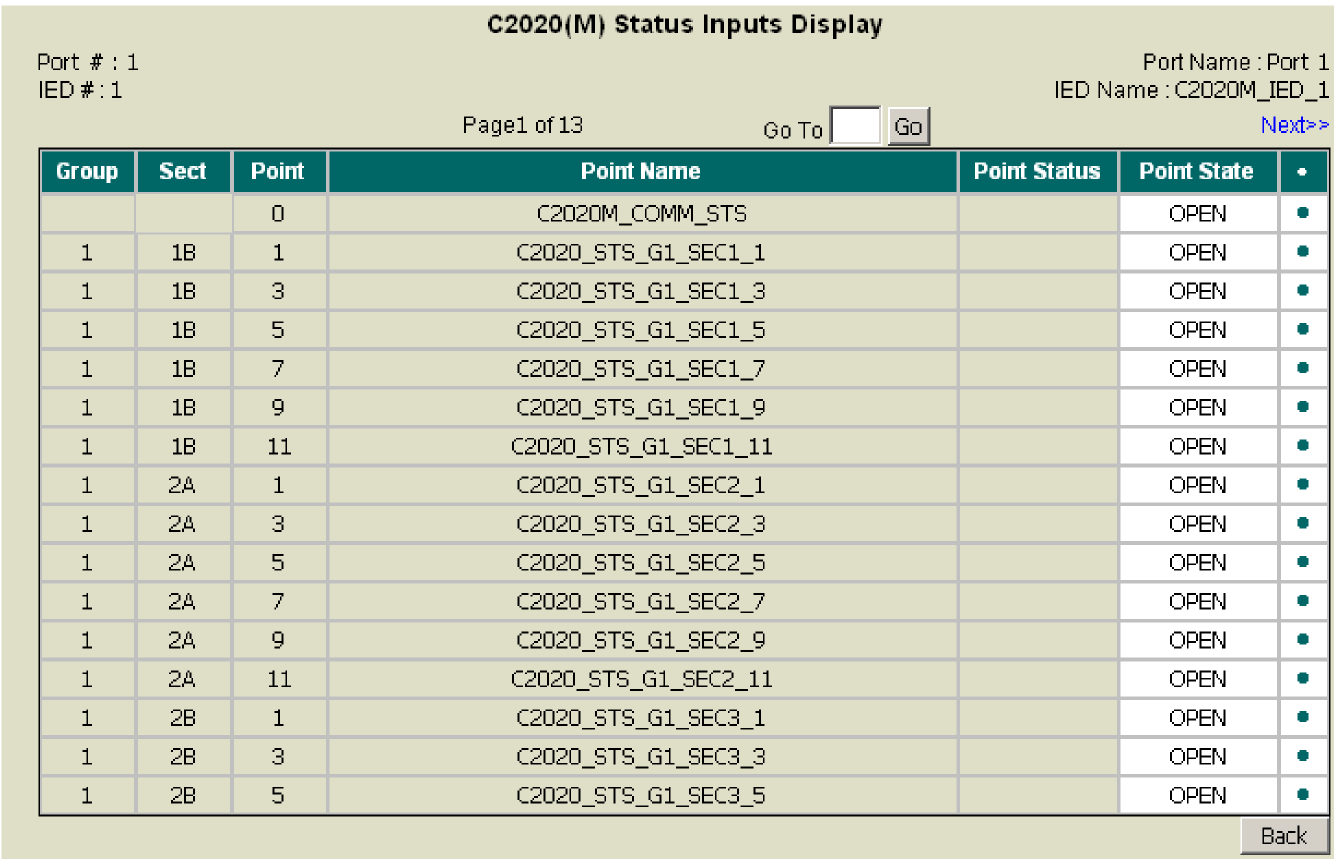
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

19.13 Status Inputs

From the IED Display screen, click View for Status Inputs to get the screen shown in Figure 2-25.

Figure 19-17 Status Inputs Display



C2020(M) Status Inputs Display

Port # : 1 Port Name : Port 1

IED # : 1 IED Name : C2020M_IED_1

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Group	Sect	Point	Point Name	Point Status	Point State	•
		0	C2020M_COMM_STS		OPEN	•
1	1B	1	C2020_STS_G1_SEC1_1		OPEN	•
1	1B	3	C2020_STS_G1_SEC1_3		OPEN	•
1	1B	5	C2020_STS_G1_SEC1_5		OPEN	•
1	1B	7	C2020_STS_G1_SEC1_7		OPEN	•
1	1B	9	C2020_STS_G1_SEC1_9		OPEN	•
1	1B	11	C2020_STS_G1_SEC1_11		OPEN	•
1	2A	1	C2020_STS_G1_SEC2_1		OPEN	•
1	2A	3	C2020_STS_G1_SEC2_3		OPEN	•
1	2A	5	C2020_STS_G1_SEC2_5		OPEN	•
1	2A	7	C2020_STS_G1_SEC2_7		OPEN	•
1	2A	9	C2020_STS_G1_SEC2_9		OPEN	•
1	2A	11	C2020_STS_G1_SEC2_11		OPEN	•
1	2B	1	C2020_STS_G1_SEC3_1		OPEN	•
1	2B	3	C2020_STS_G1_SEC3_3		OPEN	•
1	2B	5	C2020_STS_G1_SEC3_5		OPEN	•

Back

Note: The first point is reserved for Communication Status. COMM_STS indicates whether or not this IED is in good communications. CLOSED indicates a failed comm. channel. OPEN indicates an operational comm. channel.

19.13.1 Group

Protocol logical Group number.

19.13.2 Sect

Protocol logical section number.

19.13.3 Point

Protocol logical point number.

19.13.4 Point Name

The name of the point assigned during configuration.

19.13.5 Point Status

Please see the Config@WEB Secure Software Users Guide.

19.13.6 Point State

Indicates that point is either OPEN or CLOSED.

19.13.7 •

A red dot indicates the point is CLOSED; a green dot indicates the point is OPEN.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

19.14 Accumulator Inputs

From the IED Display screen, click View for Accumulators to get the screen shown in Figure 2-26.

Figure 19-18 Counter Inputs Display

C2020(M) Accumulator Inputs Display

Port # : 2 Port Name : Port 2
IED # : 1 IED Name : C2020M_IED_1

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Group	Sect	Point	Point Name	Point Status	Count
0	5B	1	C2020_ACC_G0_5B	F	0
0	6A	1	C2020_ACC_G0_6A	F	0
0	7A	1	C2020_ACC24_G0_7A	F	0
0	8A	1	C2020_ACC24_G0_8A	F	0
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-
-	-	-	-		-

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19.14.1 Group

Protocol logical Group number:

19.14.2 Sect

Protocol logical section number.

19.14.3 Point

Protocol logical point number.

19.14.4 Point Name

The name of the point assigned during configuration.

19.14.5 Point Status

Please see the Config@WEB Secure Software Users Guide.

19.14.6 Count

The accumulated count.

Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

19.15 Analog Outputs

From the IED Display screen, click View for Analog Outputs to get the screen shown below.

Figure 19-19 Analog Outputs Display

C2100H(M) Analog Outputs Display

Port # : Port # : 3 Port Name : Port 3
IED # : 1 IED Name : CHM_IED_1
Page1 of 2 Go To [ ] Go Next>>

Group	Point	Point Name	Point Status	Point Value
1	0	CHIED_AO_1	F	0.000
1	1	CHIED_AO_2	F	0.000
1	2	CHIED_AO_3	F	0.000
1	3	CHIED_AO_4	F	0.000
1	4	CHIED_AO_5	F	0.000
1	5	CHIED_AO_6	F	0.000
1	6	CHIED_AO_7	F	0.000
1	7	CHIED_AO_8	F	0.000
1	8	CHIED_AO_9	F	0.000
1	9	CHIED_AO_10	F	0.000
1	10	CHIED_AO_11	F	0.000
1	11	CHIED_AO_12	F	0.000

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19.15.1 Group

Protocol logical Group number:

19.15.2 Point

Protocol logical point number.

19.15.3 Point Name

The name of the point assigned during configuration.

19.15.4 Point Status

Please see the Config@WEB Secure Software Users Guide.

19.15.5 Point Value

The engineering unit (EGU) value.

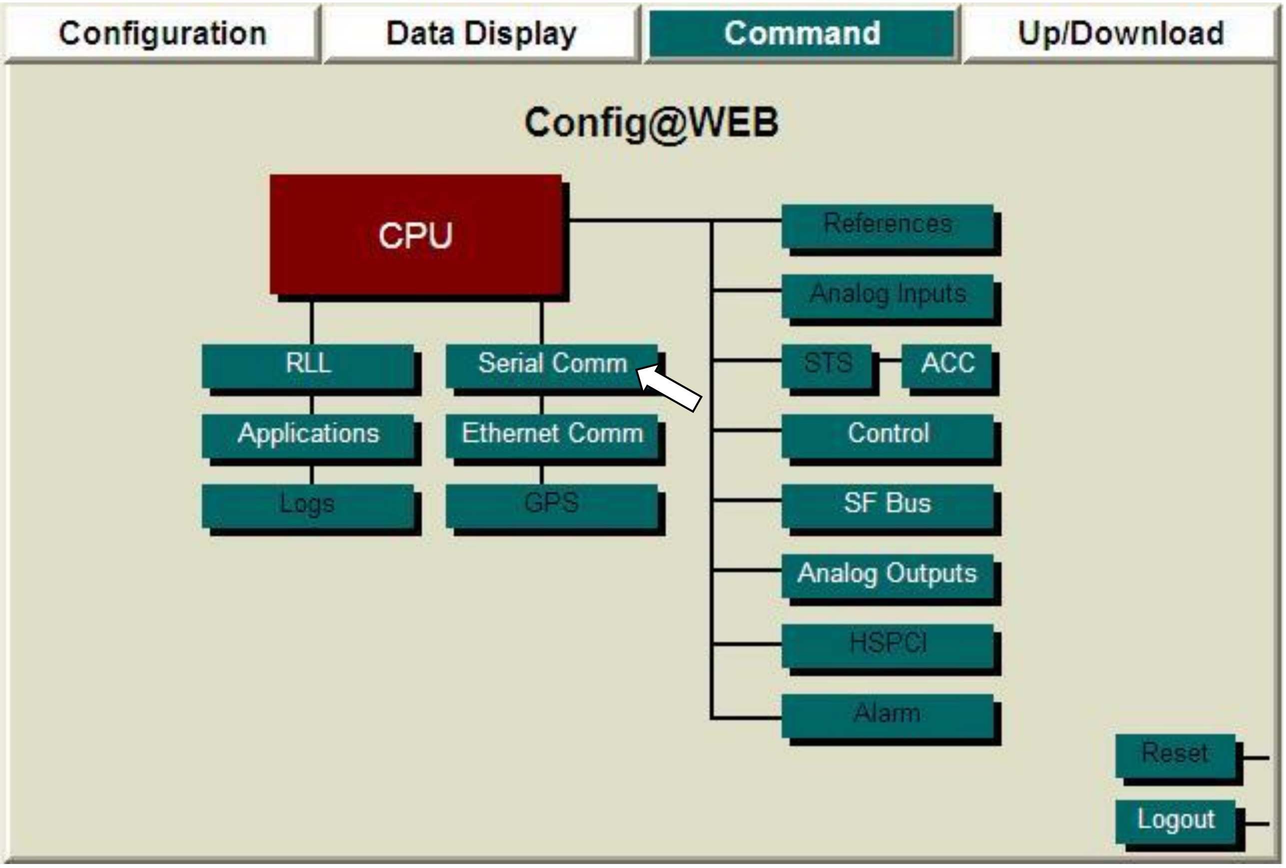
Navigation

Port # : *n* tells you which port you are on. Port Name : *name* tells you the name of the port. IED # : *n* tells you which IED you are on. IED Name : *name* tells you the name of the IED. Click <<Prev to navigate to the previous 16 points, if applicable. Page *n* of *n* tells you which page (of a total number of pages) you are on. Go to a specific page by typing in the page number, then click the Go button. Click Next>> to go to the next 16 points, if applicable. Click the Back button to return to the previous screen.

19.16 Command Serial Comm

Devices on the Serial Comm ports may be commanded, if they are capable of controls. From the main menu page, click the Command tab, then the Serial Comm button as shown in Figure 2-29.

Figure 19-20 Command Tab Page



The resultant screen will be similar to Figure 2-30. Test Mode is explained in the SAGE 2300 manual. Under Command Port Data, click Port Data.

Figure 19-21 Serial Comm Command Communications Port Data

Command Communication Port Data

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port #1	K	K	Port 1	C2020(M)	Port Data	Normal
Port #2	K	K	Port 2	None	Port Data	Normal
Port #3	K	K	Port 3	L&N	Port Data	Normal
Port #4	K	K	Port 4	L&N	Port Data	Normal
Port #5	K	K	Port 5	None	Port Data	Normal
Port #6	K	K	Port 6	None	Port Data	Normal
Port #7	K	K	Port 7	None	Port Data	Normal
Port #8	K	K	Port 8	None	Port Data	Normal
Port #9	K	K	Port 9	None	Port Data	Normal
Port #10	K	K	Port 10	None	Port Data	Normal
Port #11	K	K	Port 11	None	Port Data	Normal
Port #12	K	K	Port 12	None	Port Data	Normal

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The resultant screen will be similar to Figure 2-31. Click on the Command button.

Figure 19-22 IED Command

C2020M IED Command

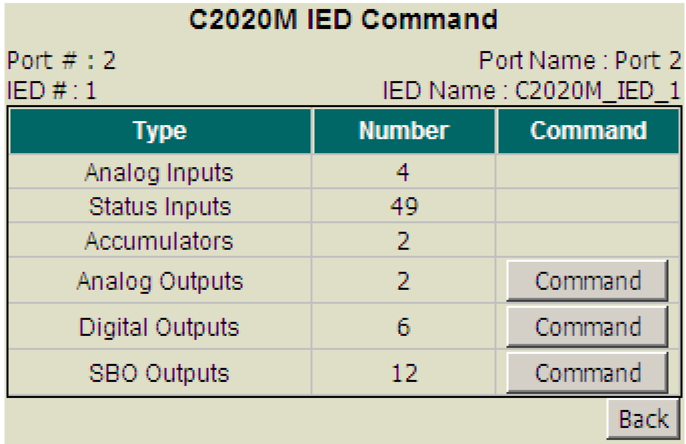
Port # 1 Port Name : Port 1

IED #	IED Name	IED Address	On Scan	Slave Data
1	C2020M_IED_1	1	Y	Command
2	C2020M_IED_2	2	Y	Command

Back

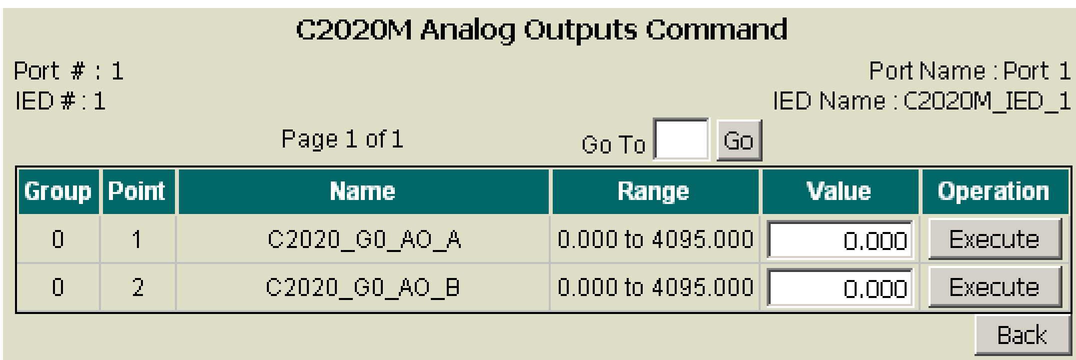
The resultant screen will be similar to Figure 2-32. If the devices exist on the IED, and if you have them configured as in this example, you will be able to command various outputs.

Figure 19-23 IED Command



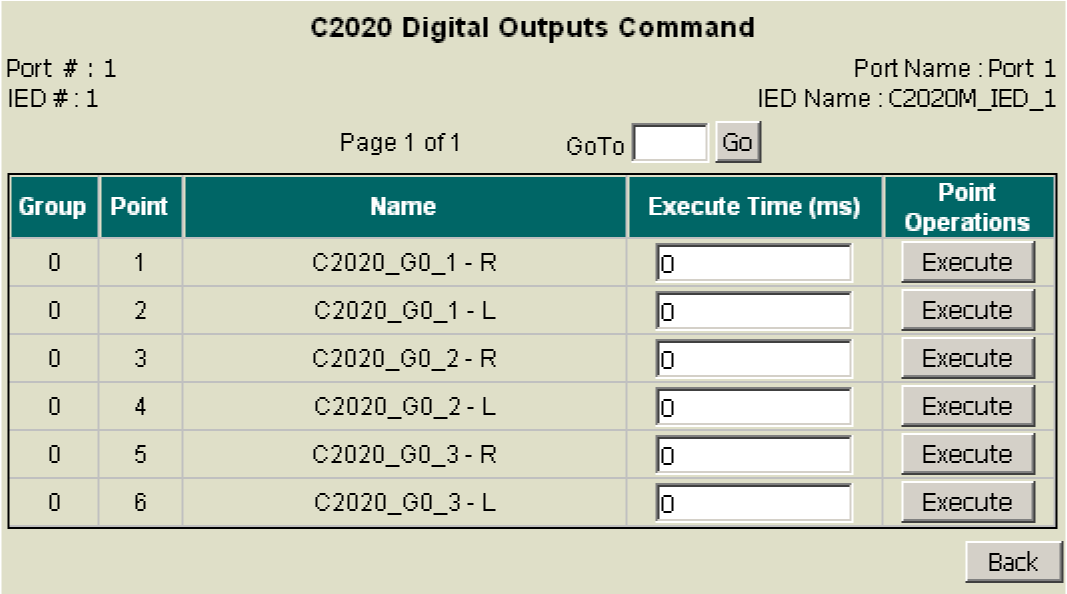
Click on the Analog Outputs Command button. The resulting screen will look like Figure 10-21. Type in a value for the chosen AO channel, then click the Execute button. The output channel will be driven to that value.

Figure 19-24 Analog Outputs Command



Click on the Command button for Digital Outputs. The resulting screen will look like the figure below. Type in an execute time, then click the Execute button.

Figure 19-25 Digital Outputs Command



C2020 Digital Outputs Command

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : C2020M_IED_1

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Group	Point	Name	Execute Time (ms)	Point Operations
0	1	C2020_G0_1 - R	0	Execute
0	2	C2020_G0_1 - L	0	Execute
0	3	C2020_G0_2 - R	0	Execute
0	4	C2020_G0_2 - L	0	Execute
0	5	C2020_G0_3 - R	0	Execute
0	6	C2020_G0_3 - L	0	Execute

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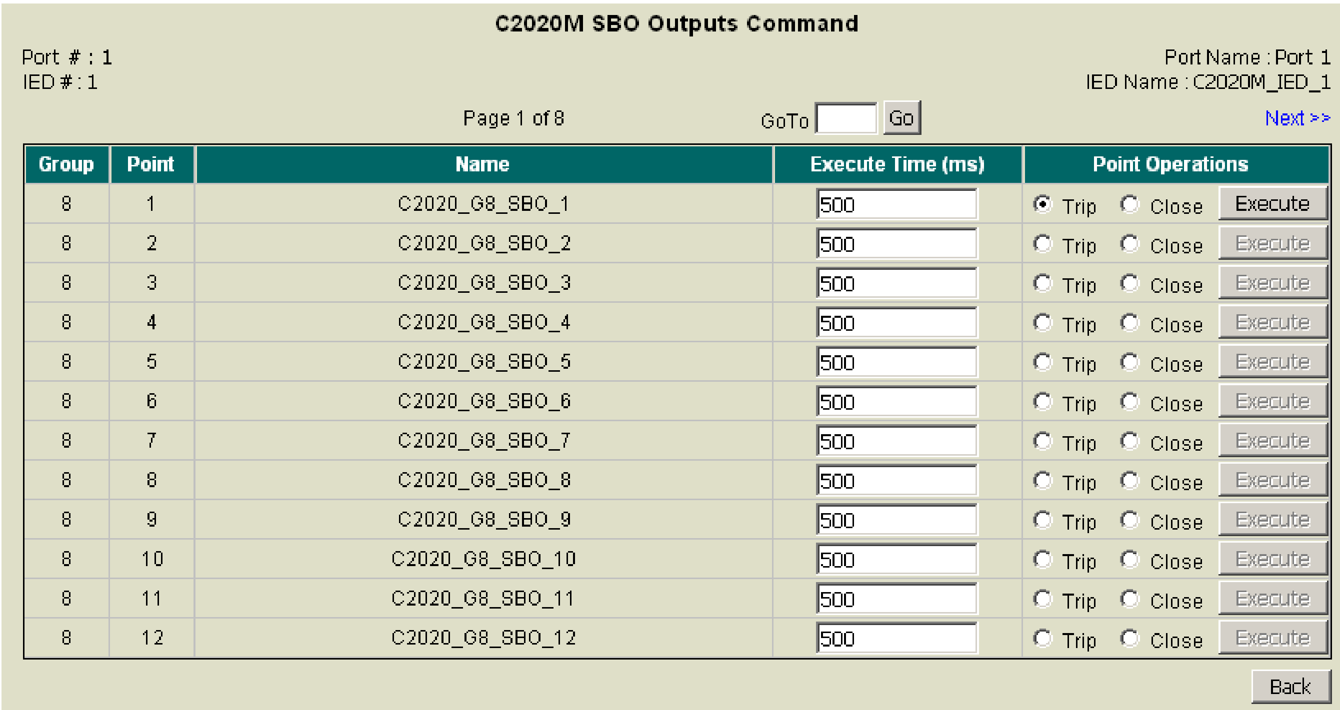
Click on the Command button. The resulting screen will look like the one below after either a Trip or Close has been selected, then Executed with the Execute button.

Figure 19-26 SBO Outputs Command



C2020M SBO Outputs Command

Port # : 1 Port Name : Port 1
IED # : 1 IED Name : C2020M_IED_1

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Group	Point	Name	Execute Time (ms)	Point Operations
8	1	C2020_G8_SBO_1	500	Trip Close Execute
8	2	C2020_G8_SBO_2	500	Trip Close Execute
8	3	C2020_G8_SBO_3	500	Trip Close Execute
8	4	C2020_G8_SBO_4	500	Trip Close Execute
8	5	C2020_G8_SBO_5	500	Trip Close Execute
8	6	C2020_G8_SBO_6	500	Trip Close Execute
8	7	C2020_G8_SBO_7	500	Trip Close Execute
8	8	C2020_G8_SBO_8	500	Trip Close Execute
8	9	C2020_G8_SBO_9	500	Trip Close Execute
8	10	C2020_G8_SBO_10	500	Trip Close Execute
8	11	C2020_G8_SBO_11	500	Trip Close Execute
8	12	C2020_G8_SBO_12	500	Trip Close Execute

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20 Glossary

A/D	Analog to Digital
AC	Alternating Current
ACI	AC Input
ADC	Analog to Digital Converter
AI	Analog Input, also AIN
ANSI	American National Standards Institute
AO	Analog Output, also AOUT
ARP	Address Resolution Protocol (ARP) is a telecommunications protocol used for resolution of network layer addresses into link layer addresses, a critical function in multiple-access networks. ARP was defined by RFC 826 in 1982. It is Internet Standard STD 37. It is also the name of the program for manipulating these addresses in most operating systems.
ASCI	Asynchronous Serial Communications Interface
ASCII	American Standard Code for Information Interchange
ASIC	Application Specific Integrated Circuit
AWG	American Wire Gauge
baud	Modem speed in Bits Per Second
bps	Bits Per Second
bridge	A network device capable of connecting networks that use similar protocols
C	Celsius or the programming language C
CA	Certificate Authority - an entity that issues digital certificates. The digital certificate certifies the ownership of a public key by the named subject of the certificate.
CEB	Communication Expansion Board
check-back	Hardware/Software method of control output protection
CCITT	Comité Consultatif Internationale de Télégraphique et Téléphonique
CIP	Critical Infrastructure Protection – The CIP Cyber Security Standards maintained by NERC are intended to ensure the protection of the Critical Cyber Assets that control or effect the reliability of North America's bulk electric systems. In 2006, the Federal Energy Regulatory Commission (FERC) approved the Security and Reliability standards

	proposed by NERC, making the CIP Cyber Security Standards mandatory and enforceable across all users, owners and operators of the bulk-power system.
CMOS	Complementary Metal Oxide Semiconductor
COMM	Communication, also COM
COS	Change of State
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check; a method for error checking that detects randomly occurring single and multiple bit errors and is widely accepted for the detection of "burst" errors encountered in communication networks.
CTS	Clear To Send
DAC	Digital to Analog Converter
dBm	Decibels relative to 1mW
DC	Direct Current
debounce	Filtering of contact closure noise
DHCP	Dynamic Host Configuration Protocol – often used to refer to the network server that performs this function
DI	Digital Input
DFT	Discreet Fourier Transform
DMA	Direct Memory Access
DMM	Digital Multimeter
DNS	Domain Naming Service – often used to refer to the network server that performs this function
DO	Digital Output
DSA	Digital Signature Algorithm - An algorithm for public/private-key cryptography
DSP	Digital Signal Processor
DTR	Data Terminal Ready
DVM	Digital Volt Meter
EIA	Electronic Industries Association
EEPROM	Electrically Erasable Programmable Read Only Memory
EPLD	Electrically Programmable Logic Device

EPROM	Erasable Programmable Read Only Memory
Ethernet	A broadcast networking technology that can use several different physical media, including twisted pair cable and coaxial cable. TCP/IP is commonly used with Ethernet networks.
FB	Function Block – an element is the Function Block Diagram graphical language
FBD	Function Block Diagram graphical language – one of the IEC 61131-3 programming languages
FC	Flow Chart graphical language – one of the IEC 61131-3 programming languages
FF	Flip-Flop
FIFO	First In First Out
FIP	Fieldbus implementation based on French standard
firmware	Program held in ROM or Flash memory
Flash Memory	A type of non-volatile storage device similar to EEPROM
FMR	Feeder Management Remote
FMS	Feeder Management System
form A	Relay contact, single throw, normally open
form C	Relay contact, double throw
FRF	Full Range Factor; a method used for analog scaling; $FRF = \frac{\text{Data Value} - \text{Data Min}}{\text{Data Max} - \text{Data Min}}$
FS	Full Scale
FTP	File Transfer Protocol – A TCP/IP application used for transferring files from one system to another
GPS	Global Positioning System
GUI	Graphical User Interface
H	Hexadecimal (base 16), as in XXXXh
HEX	Hexadecimal (base 16), as in XXXXh
HDLC	High-level Data Link Control
HSPCI	High Speed Pulse Counter Input
HTTP	The Hypertext Transfer Protocol (HTTP) is an application protocol for distributed, collaborative, hypermedia information systems.[1] HTTP is the foundation of data communication for the World Wide Web.

HTTPS	Hypertext Transfer Protocol Secure (HTTPS) is a widely used communications protocol for secure communication over a computer network, with especially wide deployment on the Internet. Technically, it is not a protocol in itself; rather, it is the result of simply layering the Hypertext Transfer Protocol (HTTP) on top of the SSL/TLS protocol, thus adding the security capabilities of SSL/TLS to standard HTTP communications.
Hz	Hertz, frequency in cycles per second
I/O	Input/Output
ID	Identification
IEC	International Electro-technical Commission
IED	Intelligent Electronic Device
IEEE	Institute of Electrical and Electronic Engineers
IKE	Internet Key Exchange - the protocol used to set up a security association (SA) in the IPsec protocol suite
IL	Instruction List language – one of the IEC 61131-3 programming languages
IPsec	Internet Protocol Security is a protocol suite for securing IP communications by authenticating and encrypting each IP packet of a communication session. IPsec also includes protocols for establishing mutual authentication between agents at the beginning of the session and negotiation of cryptographic keys to be used during the session.
ISA	Instrument Society of America
ISO	International Standards Organization
ISP	Integrated Software Project – Fieldbus implementation using existing IEC standards
ITU	Intelligent Terminal Unit
JEDEC	Joint Electronic Device Engineering Council
k	Kilo - kB is kilobytes, kV is kilovolts, etc.
KHz	Kilo Hertz
LAN	Local Area Network
LCD	Liquid Crystal Display
LD	Ladder Diagram graphical language – one of the IEC 61131-3 programming languages
LED	Light Emitting Diode

LRC	Longitudinal Redundancy Check; uses both "horizontal" and "vertical" parity bits to detect errors in the messages between the Master and the RTUs. This technique is also known as Geometric Coding.
LSB	Least Significant Bit
mA	Milliampere
MAP	Manufacturing Automation Protocol
MEB	Memory Expansion Bus (also, Memory Expansion Board)
MHz	Megahertz
MMI	Man Machine Interface
MMS	Manufacturing Message Specification
MSB	Most Significant Bit
msec	Millisecond
MTU	Master Terminal Unit, also Master Station
MUX	Multiplexer
NC contact	Normally Closed relay contact
NEMA	National Electrical Manufacturers Association
NERC	The North American Electric Reliability Corporation is the electric reliability organization (ERO) certified by the Federal Energy Regulatory Commission to establish and enforce reliability standards for the bulk power system.
NO contact	Normally Open relay contact
OpenSSH	A set of computer programs providing encrypted communication sessions over a computer network using the SSH protocol. It was created as an open source alternative to the proprietary Secure Shell software suite offered by SSH Communications Security.
O/S or OS	Operating System
OSI	Open Systems Interconnection
oz	Ounce
PC	Power Converter, also Personal Computer
PCI	Pulse Counter Input
PF	Power Factor
PID	Three term controller, proportional, integral, derivative closed-loop control algorithm
PLD	Programmable Logic Device

PLC	Programmable Logic Controller
POU	Program Organization Unit
PPP	Point-to-Point Protocol – A TCP/IP protocol that provides host-to-host network and router-to-router connections. Can be used to provide a serial line connection between two machines.
pps	Pulses Per Second
Public/Private Key	Secure data encryption scheme
PuTTY	A free and open source terminal emulator application which can act as a client for the SSH, Telnet, rlogin, and raw TCP computing protocols and as a serial console client.
PWR	Power
RAM	Random Access Memory
RLL	Relay Ladder Logic
ROM	Read Only Memory
router	A device that connects LANs into an internetwork and routes traffic between them
RS232C	EIA Serial data communications standard
RSA	An algorithm for public/private-key cryptography.
RST	Reset
RTOS	Real Time Operating System
RTS	Request To Send
RTU	Remote Terminal Unit
Rx	Receive
SAP	Substation Automation Platform
SBO	Select Before Operate
SCC	Serial Communications Controller
SCADA	Supervisory Control And Data Acquisition
SCTO	Soft Carrier Turn Off
SDLC	Synchronous Data Link Control
SEB	Surge Protection Expansion Board
SFB	Sequential Function Block – one of the IEC 61131-3 programming languages
SFB	Special Function Bus

SFC	Sequential Function Chart graphical language
SOE	Sequence of Events
SSH	Secure Shell - A method to obtain secure data communication using public/private RSA or DSA keys
SSL	Secure Socket Layer - The standard security technology for establishing an encrypted link between a web server and a browser; when installed in conjunction with a certificate, displays HTPPS connection; green for valid certificate, red for invalid certificate
ST	Structured Text language – one of the IEC 61131-3 programming languages
STS	Status
SWC	Surge Withstand Capability, IEEE C37.90a 1978
TCP/IP	Transmission Control Protocol/Internet Protocol
TLS	Transport Layer Security (TLS) and its predecessor, Secure Sockets Layer (SSL), are cryptographic protocols that provide communication security over the Internet. TLS and SSL encrypt the segments of network connections at the Application Layer for the Transport Layer, using asymmetric cryptography for key exchange, symmetric encryption for confidentiality, and message authentication codes for message integrity.
Tx	Transmit
UART	Universal Asynchronous Receiver Transmitter
UIF	User Interface Function
USART	Universal Synchronous Asynchronous Receiver Transmitter
msec	Microsecond
UVPROM	Ultraviolet erasable Programmable Read Only Memory
VAC	Volts Alternating Current
VAR	Volt-Amperes Reactive
VARH	VAR Hours
VDC	Volts Direct Current
VxWorks	Real Time Operating System made by Wind River for embedded computer systems
W	Watt
Watchdog Timer	Circuit that resets CPU if it fails to execute program
WH	Watt Hours

XB	Expansion Board
XML	Extensible Markup Language – The method used by Schneider Electric for the storing and retrieval of Config@WEB RTU data. The data is stored in the form of a series of XML files (files with an XML extension).
XT	External Termination (panel, module or assembly)