

config@WEB Software Users Guide

SAGE1-SFT-00001 V1.1

TELVENT is part of

Schneider GElectric

Telvent 10333 Southport Dr. S.W. Calgary, AB, Canada T2W 3X6

 Phone:
 +1 (403)253.8848

 Fax:
 +1 (403)259.2926

 E-mail:
 info.canada@telvent.com

Telvent 7000A Hollister Rd. Houston, TX 77040-5337

 Phone:
 +1 (713)939.9399

 Fax:
 +1 (713)939.0393

 E-mail:
 info.usa@telvent.com

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CHAPTER 1 Introduction

This user manual describes the software operation and features of the Telvent SAGE Remote Terminal Units (RTU).

SAGE Remote Terminal Units are designed to satisfy a wide range of Supervisory Control and Data Acquisition (SCADA) application requirements in harsh environmental conditions.

The SAGE Graphical User Interface guides the user through setup and operation while expanding the rich functionality you have come to expect from Telvent RTUs.

1.1 Legend

In this manual, the following designations apply:

SAGE 1X10 refers to SAGE 1210, SAGE 1310 and SAGE 1410 collectively.

SAGE 1X30 refers to SAGE 1230, SAGE 1330 and SAGE 1430 collectively.

SAGE 1X50 refers to SAGE 1250, SAGE 1350 and SAGE 1450 collectively.

SAGE 2X00 refers to SAGE 2200, SAGE 2300 and SAGE 2400 collectively.

SAGE 3030X refers to SAGE 3030 and SAGE 3030Magnum collectively.

1.2 Features

The SAGE RTU uses the latest electronic technology for reliability, speed and maintainability. It is intended for use in a variety of SCADA applications requiring maximum configuration flexibility. The design includes several state-of-the-art functional capabilities. For example, the AC Input (ACI) option provides an advanced transducer-less AC analog input capability.

The SAGE RTU has the following new features:

- Easy-to-use Graphical User Interface (GUI) via Microsoft Internet Explorer
- Embedded web server
- Built-in Ethernet with TCP/IP
- File Transfer Protocol (FTP)
- May be configured either locally or remotely
- Point naming (no more counting point numbers to find your point of interest!)
- Point mapping with simple click and drop
- Data concentration adds data from multiple IEDs to one database for fast polling

- Protocol conversion convert multiple protocols to a standard protocol
- Built on a widely adopted Real-Time Operating system (RTOS)
- Employs standard PC/104 bus interface for CPU and Communication upgrades
- Relay Ladder Logic capability that supports all five IEC 61131-3 Languages

1.3 Graphical User Interface (GUI)

The SAGE RTU is easily configured using the standard web browser, Internet Explorer version 6.0 or later. The physical connection may be made in one of four ways:

- Ethernet connection using an Ethernet crossover cable directly to the RTU
- Ethernet connection to a network , locally or remotely
- PPP connection using a null-modem cable to the UIF port
- Console this method commonly used to read and/or change IP address

The GUI is designed around the classical client/server model. A web browser is all you need for your client (PC) and you can browse any RTU product or any version of that product that supports our web interface. All configuration data is stored on the RTU in the form of Extensible Markup Language (XML). XML data is served up to the browser within HTML pages or transformed into HTML via Extensible Stylesheet Language (XSL). In either case data is presented to the user in an intuitive format using common design elements like forms, Radio Buttons, Spin Boxes, Alert Boxes, etc. for much of the data entry.

The GUI supports File Transfer Protocol (FTP) to transfer files to/from the RTU and the client. The file types include RTU applications, Web pages, Configuration files, and the operating system. In short, every file within one RTU can be transferred to another RTU or parts of the RTU file system can be upgraded as needed. This provides a powerful means of performing firmware upgrades or configuration changes.

General Operational Considerations

Note: See the Administration chapter for initial user name and password.

Note: With the release of firmware C0 and later, the initial TCP/IP address is now 172.18.150.50.

Note: For the latest manual, please see the appendix Accessing the Customer Website.

1.4 **Point Mapping**

The RTUs of today must interface to a wide Varity of I/O and industry standard IEDs. This creates within the RTU a large database of points that have been acquired by the RTU that must be transferred to one or more master stations.

The GUI supports an intuitive drag and drop point mapping scheme. Each point within the RTU is named and scaled with user definable names and values. Scaling is used for local data display as well as protocol count scaling for conversion of data from one protocol to another.

1.5 Communications

The SAGE RTU supports a large suite of communication protocols over many different types of communications media. Ethernet and RS232 come as standard hardware. However, installation of media converters allow for just about any physical communications media to be supported.

The UIF is a dedicated RS-232 port that supports a connection to the operating system using a terminal emulation program. It is used to configure the customer RTU IP and to change to safe mode operation. Diagnostic functions may also be performed using this port.

A second RS-232 port is available that supports the Point to Point Protocol (PPP). This port can perform all GUI functions, but at a 38.4kb.

Both ports can be used concurrently with the other serial and Ethernet ports.

All Telvent RTU products support multiple RTU and IED protocols. This allows for data to be mapped from IEDs to multiple masters via different RTU protocols. Example: If you were replacing your current master station software that talks Series V protocol with a system that supports DNP your RTU could talk to both the old master and the new master at the same time. This provides an excellent means of replacing legacy RTU/MTU equipment without interruption to data acquisition.

An emerging need for RTU products is SCADA protocols to communicate over Ethernet all the way down to the RTU. The SAGE RTU supports DNP over Ethernet.

1.6 Relay Ladder Logic (RLL)

The SAGE RTU supports a RLL Runtime Target that accepts applications that can be developed using any one of the five IEC 61131-3 languages plus flow Charting. Programs are developed on an application workbench that runs only on the client. Fully developed/debugged programs can be downloaded into the SAGE RTU and activated for execution.

RLL applications have access to all the data within the RTU and make use of the powerful mapping capabilities of the GUI. Output data from RLL applications can be viewed in real time data displays.

Configuration

This chapter tells you how to configure the RTU. Other chapters cover Data Display, Command, Upload/Download, and Administration. See the appendices for hardware User Interface connections.

A good user interface should be intuitive and easy to learn. This does not mean that no instruction is required, but that it is minimal and that users can "pick it up" quickly and easily. First-time users might not understand how to operate a scroll bar, or our drag and drop point mapping, but once it is explained they generally find it easy.

2.1 Client Server Application Principles

The client (your PC) can run many different types of applications. Usually the application program and all its data reside on your PC. In a Client Server application the relationship is somewhat different. All the unique features and specialized data can be stored on the remote system allowing the user to browse that data in a manner specific to that system. The GUI Interface is a Client Server application.

A thin client and a client server system avoid the version problems encountered when you have a thick Windows based application. Your browser will be able to talk to RTUs shipped today and years from now because all the content and configuration data will be stored on the RTU.

2.1.1 Client's Web Browser

The GUI Interface was designed to function with Microsoft Internet Explorer 6.0[™] or greater.

2.1.2 GUI Connection via Ethernet

In this case, your PC would use its network card to connect to RTUs that are connected either to your local Intranet or your PC could connect to your RTU via a crossover cable connected directly to your RTU. The latter would be the typical means of connection to field devices for installations without Ethernet all the way down to the RTU.

Please refer to the appendices for GUI Connection via Ethernet port.

2.1.3 GUI Connection via PPP

The RS232 User interface port is connected to the CPU card with one of two pigtail serial lines; either the Console connection or the PPP connection may be used. The Console pigtail is typically used only to view and modify the IP address of the Ethernet port. Once modified, the Ethernet port can be used for local and remote interfacing. If the PPP pigtail is used, the RTUs GUI is available at 38,400 baud.

Please refer to the appendices for GUI Connection via PPP ports.

2.2 Login

2.2.1 GUI Navigation Concepts

Launch Internet Explorer and type in the I.P. address of your RTU. The first screen that you encounter is the Login screen (see Figure 2-1). Enter your Username and Password.

Note: Username and Password and all security issues are explained in Chapter 6 Administration.

This screen will have the name of the substation RTU above the Username field. There is also a scratch pad to leave a message for the next user. The scratch pad is a scrollable box for larger messages (up to 500 characters).

The following is an example of how to use the scratch pad. Before you click Login, check the "Enable Post Message" box, as shown.

TELVENT			SAGE 2300
Username: Password: Enable Post N	C1 Update Admin ••••• Vlessage.	Login	
C1 Release C3413-500-0010 19-Jul-2005 Warning: This computer program is protected by cop this program or any portion of it, may result in seve	logout wright law and internatio	nalties; and will be prosed	

Figure 2-1 Login Screen

This action will bring you to the screen shown below. Type in your message, as shown below, then click "Post Message." At this point, you can click Continue to continue to Login, or you can click Logout, if your only purpose was to post a message.

Figure	2-2	Posting	а	Message

TELVENT	SAGE 2300		
C1 Update			
Username:			
Password: Continue			
Enable Post Message.			
This is a new message			
	-		
	<u>_</u>		
logout Post Message			
Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program or any portion of it, may result in severe civil and criminal penalties; and will be prosecuted to the maximum extent			
possible under the law.			

The following screen shows the result of clicking Logout. You first get a warning that you are about to logout..

Figure 2-3 Logo	jing Out After	Posting a	Message
-----------------	----------------	-----------	---------



After you logout, the new message is displayed, as shown.

Figure 2-4 Logging Out After Posting a Message

TELVENT	SAGE 2300	
C1 Update Username: Password: Login Enable Post Message.		
This is a new message logout Post Message		
Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program or any portion of it, may result in severe civil and criminal penalties; and will be prosecuted to the maximum extent possible under the law.		

Once you continue beyond the login screen, the next screen to appear depends upon your login privileges. In the example below, the configuration screen is shown. At the top of the configuration diagram you will find five tabs that allow you to jump between the Configuration page, Data Display page, Command page, Up/Download page, and Admin page. Grayed-out tabs indicate "no privilege" for that particular function. The example shown is for Admin privileges (meaning, no restrictions). In the event that some restrictions are in effect, the screen will default to the next unrestricted tab that is allowed, working from left to right.

The block diagrams as shown on the Configuration, Data Display, and Command pages are almost the same. However, the navigation will differ depending on which diagram you are on. Example: You can configure cards on the SF Bus from the Configuration diagram but to display live data you would navigate to the Data Display tab and then to the SF Bus tab to view live data from cards on the SF Bus.

In this and the following chapters you will find specific information devoted to each tab.

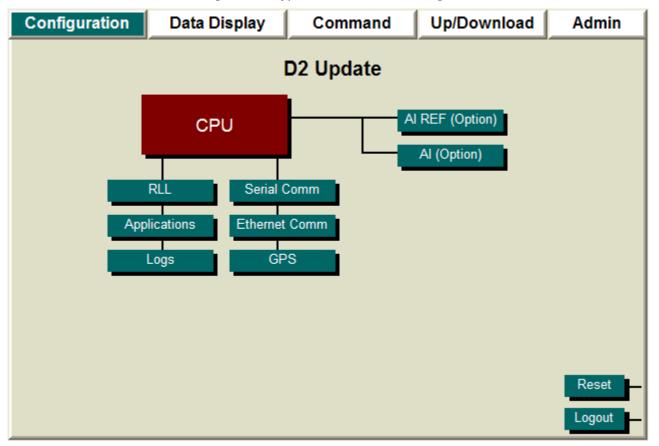


Figure 2-5 Typical SAGE 1X10 First Page

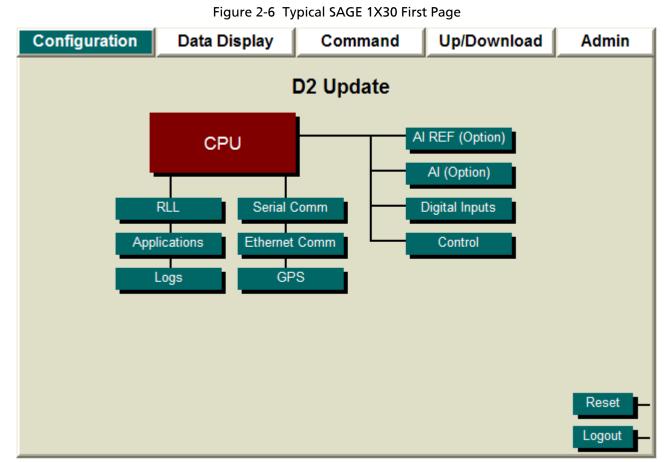
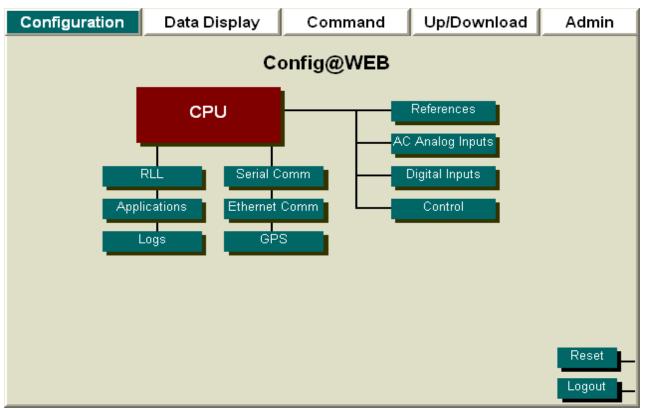


Figure 2-7 Typical SAGE 1X50 First Page



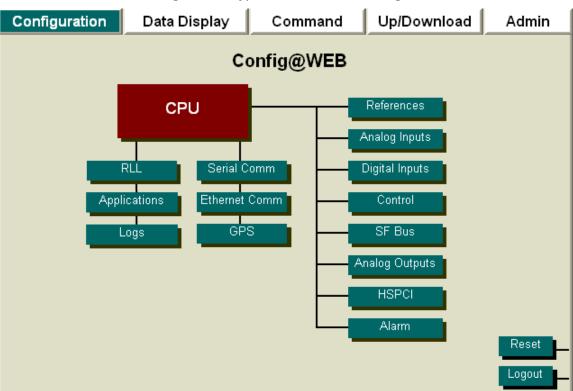
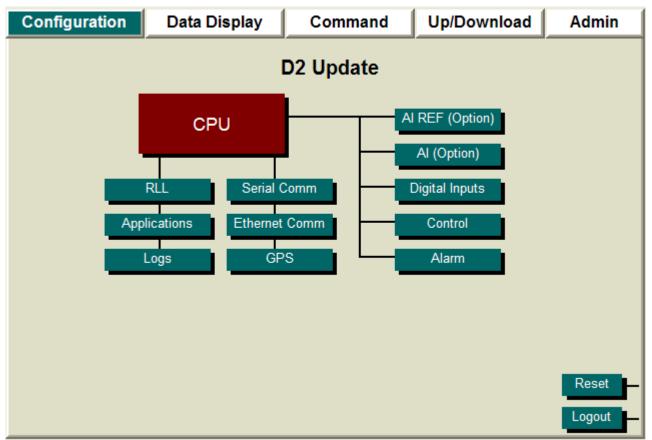
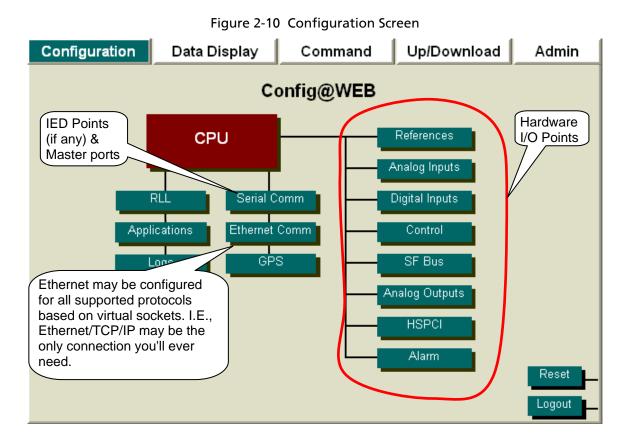


Figure 2-9 Typical SAGE 3030X First Page



Immediately after a successful login, you will see the Configuration screen (if the login is an unrestricted Admin login) as shown in Figure 2-10. On certain Configuration Screens you will see Hardware I/O Points to configure to the right of the CPU Block. Note that IED points are part of the Serial Comm configuration. Master ports are also part of the Serial Comm configuration. Configure all points, hardware & IED, then configure the Master ports. Simply place your cursor over the desired block and left-click to activate the function.



2.3 Multiple Window Technique

As you investigate the other tabs (Display, for instance, explained in the next chapter), you will find that having simultaneous multiple views into config@WEB is very useful. This is easy to do, no matter which version of IE you are using. Simply press Control N (New Window command) to bring up multiple instances of your session. Each window is separately navigable. See the following example.

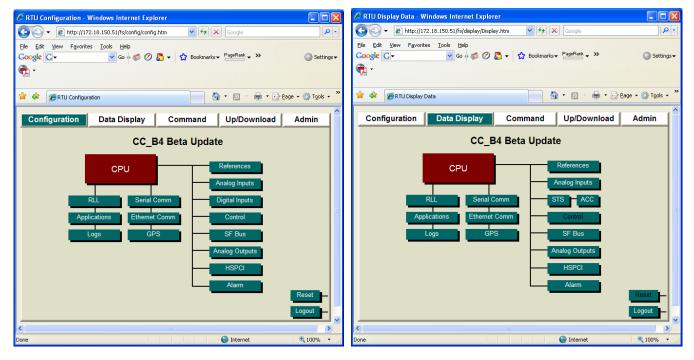


Figure 2-11 Multiple Views with Control N

Notice that this technique does not require multiple logins, which can present other issues. Multiple logins are limited to five, after which another login is impossible. If the windows opened with multiple logins are simply dismissed, the five logins will tie up the RTU until the sessions time out.

Multiple views using Control N (as shown above), rather than multiple logins, is a much better technique. If you reset or log out from one of the views, the other windows will be inactive and should be dismissed.

2.4 Navigation Shortcuts

Navigation shortcuts are now included on all screens below the tab level. No matter how far down you drill, you can always return to the top level, or any intermediate level. An example is shown below.

Config >> Serial Comm Setup >> Port 2 : DNPM IED List >> DNPM_IED_1 Config

2.5 CPU Configuration

From the Configuration screen, click the CPU block. You will get a screen similar to that shown in Figure 2-12. With the possible exception of adjusting the real-time clock, the CPU configuration may not ever have to be touched again.

CPU Configuration								
	RTU Information		C	crash Recovery	Configurat	ion	Ethernet Adapte	r Configuration
Part Number C Application Name C	Config@WEB C3414-500-001E0_B0 C3414-500-001E0_B0.ou	t	Number of Re			3 90	PPP Port * I.P. Address	PPP Port 90.0.0.50
	C3414-500-996E0 C3414-500-001E0_B0.gu	i		Global Freeze C	onfiguratio	on <u>Edit</u>	Primary Port (J3) I.P. Address	Ethernet Port 0
	DNP Profile			ACI Config	uration		Subnet Mask	255.255.248.0
Mfg. Hardware Ver	ChangeMe			ACI Type 🔘 AC	I 💿 FM	R	Default Gateway	172.18.1.1
ID Code	ChangeMe						Target Name	Telvent
Serial Num Prod Name & Mode	ChangeMe el SAGE 2400						Seconday Port (J2)	Ethernet Port 1
RTU	J Time Configuration						I.P. Address	
	Primary/Secondary <u>Edi</u> 03/25/2010 13:36:12 <u>Edi</u>						Subnet Mask Default Gateway	
		RTU Tim Date	e & Date mm/dd/yyyy	03 / 25 2010	X			
		Time Set	hh:mm:ss	13 : 36	: 12			Cancel Submit

Figure 2-12 CPU Configuration

Note: Ethernet Adapter Configuration may have one or two ports depending on the CPU card used.

2.5.1 RTU Information

The following fields in **bold** are meant for you, the user, to fill in (or accept the default):

RTU Name	Enter the name of this RTU
Part Number	Firmware Part Number assigned by Telvent (Var 242 – Device Mfg software ver – see below)
Application Name	File name of the firmware
VxWorks Ver	VxWorks Version number assigned by Telvent
GUI Version	Version number assigned by Telvent
Mfg. Hardware Ver	User define information These fields may be used to
ID Code	User define information \succ bring back any information
Serial Num	User define information coordinates for GIS, etc.

Support for DNP Object 0 was added for Level 1 and Level 2 compliance. The following information can now be returned to the DNPR Master by the Object 0 var X request.

R	TU Information		Crash Rec	overy Config	iration	TI Ef	hernet Adapter	Configuration
RTU Name C Part Number C: Application Name C: VxWorks Ver C: GUI Version C: Mfg. Hardware Ver ID Code Serial Num Prod Name & Model RTU Time Server Pi	onfig@WEB 3414-500-001E0_B0 3414-500-001E0_B0.ou 3414-500-996E0 3414-500-001E0_B0.gu DNP Profile ChangeMe ChangeMe ChangeMe	t Time Ser Primary Secondary Local Time Daylight S	Number of Restarts Time between Restarts Global Fre ACI Type Vices Source Real Time Clock	eeze Configu Configuration ○ ACI ○ Time Base Fr Sec ♥ 1! Sec ♥ 1! Time Coordin	3 90 ration FMR FMR X equency TimeOu 5 30 5 30	PPP Port * I.P. Address Primary Port I.P. Address Subnet Mash Default Gate Target Name Seconday P I.P. Address Subnet Mash Default Gate	(J3) k way cort (J2) k	PPP Port 90.0.0.50 Ethernet Port 0 172.18.150.51 255.255.248.0 172.18.1.1 Telvent Ethernet Port 1
B Primary PWR Fa Battery PWR Fail		nfigurat VDC VDC	ion	ECHO Dat	а	ort Configurat	es	
Battery Disconne		VDC		Long Cabl	e	⊙ No O Y	es	
			SAGE 1X50 on	nly				SAGE 1X10 only

Note: SAGE 1X10 and 1X50 have additional CPU Configuration.

2.5.2 RTU Time Configuration

Time Server	Click on the <u>Edit</u> link. For each <i>Source</i> , enter the <i>Time</i> <i>Base</i> (Sec, Min, Hrs), and the <i>Frequency</i> you want the RTU to request time syncs, and the <i>TimeOut</i> you want before the RTU stops requesting syncs from an unresponsive <i>Source</i> . After the <i>TimeOut</i> , the RTU will request time syncs from the <i>Secondary Source</i> . If the <i>Secondary Source</i> fails to provide times syncs, the RTU will not be synced.
	Note: If you assign and configure both a primary and a secondary time source, the RTU will fail over to the secondary source if the primary source fails. Note: Time sources must be configured before they become available in the drop-down list (for instance, time serve from a protocol, GPS available, IRIG-B), except for Real Time Clock, which is inherently available in the RTU.
RTU Time & Date	Click on the <u>Edit</u> link. Enter time and date as indicated for the RTU real-time clock. The entered values will take effect when you click on Set. Click X to cancel.
	The RTU Time and Date are always entered in local time regardless of the settings for Local and UTC time in the section following.

Note: You must set the real-time clock to the correct date for proper operation (i.e., to prevent crashes).

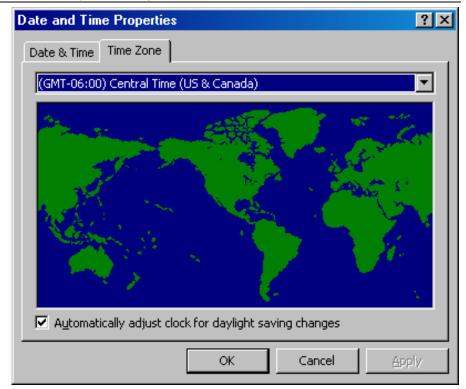
Note: The coordination between UTC and local time is a feature that may be ignored. If you want your RTU to act as it always has in regard to time syncs, set Local Time Offset from Universal Time Coordinated to 0, Daylight Saving Time Enabled to No, and IRIG-B Signal Format to None.

Local Time Offset from Universal Time Coordinated If you use UTC for time syncs, and you want to use local time-stamps within the RTU, or to pass local time coordinated with UTC to an IED, you must enter an offset of your local time from UTC.

Values to enter for the hourly Local Time Offset follow:

Atlantic Time zone = -4. Eastern Time Zone = -5 Central Time Zone = -6 Mountain Time Zone = -7 Pacific Time Zone = -8 Alaska Time Zone = -9

Other offsets can be determined by examination of the time zone settings on your PC. If the local time is correct on your PC, the UTC offset is in the configuration of the time zone.



The offset to use is the numeric part of the "(GMT-06:00)" displayed with the description of the time zone. Include the "-" (minus sign) if it is displayed.

Daylight Saving Time En	abled Click Yes if you want your local time to account for Daylight Saving Time. If this feature is enabled, one hour will be subtracted from the local time used in the RTU. Daylight Saving Time is defined (as this document is written) as beginning on the 2nd Sunday in March at 2:00AM, ending on the 1st Sunday in November at 02:00AM. Time at the beginning goes from 1:59:59:999AM Standard Time to 3:00AM Daylight Time. Time at the ending goes from 1:59:59:999AM Daylight Time to 1:00:00:000AM Standard Time. Note that the one hour of identical numeric Standard and Daylight Time at the end of Daylight Saving Time is indistinguishable in RTU communications protocols that use the Local time feature.
IRIG-B Signal Format	Note: IRIG-B function is standard on SAGE 3030X and is available as an option on the other RTU models.
	Select from the drop-down list from the following:
	None – no C3831 IRIG-B card attached to the PC/104 bus Local – C3831 IRIG-B signal is Local Time UTC – C3831 IRIG-B signal is Universal Time Coordinated
	The IRIG-B signal can be provided to the RTU or driven as an output by the RTU depending on the configuration of the IRIG-B signal.

If the IRIG-B signal is used as a Time Server, the IRIG-B signal is used as an input and an IRIG-B source must be connected to the IRIG BNC connector.

Otherwise, the IRIG-B signal will be an output unless configured as none.

It is suggested that you configure the Time Services, set the RTU Time & Date and then reset the RTU and then complete the configuration of the RTU.

If you use the Local/UTC function of the RTU, the clock of the RTU is always set in UTC. Bootup/Reset times on the console and timetags on files stored on the Compact Flash will be displayed in UTC.

2.5.3 Battery Backup Configuration (SAGE 1X50 only)

Primary PWR Fail	The voltage at which the Primary Power is considered to be failed (12.0 volts is the default), forcing automatic switch-over to Battery. This event is available as a status Source Point (under AC Analog Inputs), which can be mapped to the Master.
Battery PWR Fail	The voltage at which the Battery will be considered failed (11.2 volts is the default). This event is available as a status Source Point (under AC Analog Inputs), which can be mapped to the Master.
Battery Disconnect	The voltage at which the Battery is disconnected (10.8 volts is the default). The disconnect prevents the battery from completely discharging.

Note: Once the battery is disconnected, the Primary Power must be restored before the RTU will reconnect the battery.

2.5.4 Fiber Port Configuration (SAGE 1X10 only)

ECHO Data	Press No if this RTU is the master on a fiber optic loop or the only slave on a fiber optic connection. Press Yes if this RTU is a slave on a fiber optic loop. Default is No.
Long Cable	Press No if this RTU is driving the fiber optic transmitter less than 1 mile. Press Yes if this RTU is transmitting to a device located more than 1 mile away. Default is No.

2.5.5 Crash Recovery Configuration

(See the appendices for detailed information)

Crash Recovery is a state of the RTU that allows you to back out of a bad configuration gracefully. The recovery process is based on the premise that you can have a way to boot VxWorks without running any applications. This allows you to reconfigure the RTU without actually having to run the last configuration.

Number of Restarts The number of restarts before the RTU starts VxWorks without applications (for troubleshooting purposes).

	Works best under normal conditions if the user accepts the default value.
Time between Restarts	If crash happens in shorter time, it is logged as a restart. Works best under normal conditions if the user accepts the default value.

Example: If the RTU crashes within 90 seconds after the beginning of bootup, that counts as one restart. If this happens three times in a row, the RTU goes into Crash Recovery mode.

Notice that the default Time between Restarts is 90 seconds. Because the RTU takes about 60 seconds to reboot, 30 seconds is allowed for a crash. If you have reason to believe that the configuration problem takes longer to crash the RTU, enter a longer Time between Restarts.

2.5.6 Ethernet Adapter Configuration

PPP Port Address Primary Port I.P. Address	Address assigned by Telvent. See Appendix E. Name of the primary Ethernet port Primary I.P. Address of this RTU
Subnet Mask	Primary Subnet Mask of this RTU
Default Gateway	I.P. Address of the device connected to multiple physical TCP/IP networks capable of routing or delivering IP packets between them. A gateway translates between different transport protocols or data formats (for example, IPX and IP) and is generally added to a network primarily for its translation ability.
Target Name	Network server name of the RTU (the network server that resolves this name to the I.P. address is the DNS server)
Secondary Port	Name of the secondary Ethernet port
I.P. Address	Secondary I.P. Address of this RTU
Subnet Mask	Secondary Subnet Mask of this RTU
Default Gateway	I.P. Address of the secondary default gateway. This default gateway should not be set unless you are utilizing two networks in which case the secondary default gateway must be different from the primary.

2.5.7 Global Freeze Configuration

The Global Freeze application gives every port (meaning every master) the ability to read the exact same accumulator values as every other port for any given instant of time. Additionally, the ports may be set so that any master can initiate the freeze. There is a configurable lockout period whenever a freeze is initiated. The driving idea behind the Global Freeze function is synchronization of power data between ports.

Lockout Period (1–3600)	After any freeze that takes place which is triggered by any one of the options mentioned below there will be a period where any other freeze that is sent to the remote during this period will be ignored. This time period is in seconds and is entered by the user and is known as a 'lock-out period'. This value should not be greater than the freeze interval if the RTU clock is enabled. The default is 60 seconds.
Freeze triggers	Any combination of the five options listed can be selected:

Enable Freeze on Startup
Enable Freeze by Port
Enable Freeze by Status point
Enable Freeze by RTU clock
Enable Freeze After the Hour

The freeze triggers are further explained below.

- Enable Freeze on Startup Upon a RTU startup the Global Freeze task will immediately send a freeze.
- **Enable Freeze by Port** Select the port(s) that can read and initiate the Global Freeze. Ports may be selected to participate in the Global Freeze but not initiate a freeze by simply selecting 'Read' for the particular port. If you want the port to be a freeze initiator, the 'Trigger' option should be selected. Only those ports that are configured which have protocols that are capable of sending a freeze will be in the choice list.
- Enable Freeze by Status Point Select a status point (hardware or software) that can initiate the freeze. The global freeze occurs on a 'CLOSE' on the selected point.
- Enable Freeze by RTU clock By enabling this option the user must enter the freeze interval and the freeze delay in seconds.

Freeze Interval (1 – 3600)

The user has the option to do freezes based on an interval by setting the number of seconds between freezes. For example, 900 to freeze every 15 minutes based on top of the hour; 3600 to freeze every hour on the hour. Default is 3600.

Freeze Delay (0 – [1 minus the Freeze Interval]) The freeze delay can be used as an alternative or

'backup' freeze in the case where the master station or status point fails to send the freeze. The delay time must be less than the freeze interval. Based on the delay, the RTU clock freeze initiates at the specified time but will execute only after the delay period has expired. If another freeze trigger is sent by a port or by the COS point during the delay period, it will cancel the RTU clock freeze and immediately execute the global freeze. Default is 0.

Enable Freeze After the Hour – By enabling this option the user must enter the seconds after the hour and the interval within the hour when the freeze is to occur.
 Seconds After Hour (0 – 3599)

 The user has the option to cause a global accumulator freeze a specified number of seconds after the hour. Default is 0.
 Interval Within Hour (sec) (0 – 3600)

 The user has the option to freeze at subsequent

intervals, in seconds, afterwards Default is 0.

Global Freeze Notes:

1. If the RTU clock is enabled then the Freeze Delay plus the Lockout Period must be less than the freeze interval (Freeze Delay + Lockout Period < Freeze Interval).

2. If none of the options are selected the Global Freeze task will suspend.

2.5.7.1 Global Freeze Status Points

There are two internal status points associated with Global Freeze. They exist only if Global Freeze has been configured. The example below shows how the points might be mapped to a Master.

ort # : 1						Port Name	e : Port
Point	Device Name	Point Name	Inve	ert 🤏		Source Points	
2	Hardware DI	DI_PNT_3	(€ Yes	🕑 No	^	Global Freeze	
3	Hardware DI	DI_PNT_4	O Yes	💿 No		SPARE	
4	Hardware DI	DI_PNT_5	∕ Yes	💿 No		Select All points	
5	Hardware DI	DI_PNT_6	O Yes	💿 No		Gibl Frz Lockout	
6	Hardware DI	DI_PNT_7	O Yes	💿 No		Glbl Frz Event	
7	Hardware DI	DI_PNT_8	O Yes	📀 No			
8	Hardware DI	DI_PNT_9	O Yes	📀 No			
9	Hardware DI	DI_PNT_10	O Yes	📀 No			
10	Hardware DI	DI_PNT_11	O Yes	📀 No	=		
11	Hardware DI	DI_PNT_12	O Yes	📀 No			
12	Hardware DI	DI_PNT_13	_ O Yes	💿 No			
13	Hardware DI	DI_PNT_14	O Yes	💿 No			
14	Global Freeze	Glbl Frz Lockout	_ OYes	📀 No			
15	Global Freeze	Gibi Frz Event	O Yes	No	-		

Figure 2-13 Global Freeze Status Points Mapping

Glbl Frz Lockout

The "Glbl Frz Lockout" closes when the freeze occurs and opens when the defined lockout period expires.

Glbl Frz Event

The "Glbl Frz Event" closes when the freeze occurs and opens approximately 500 milliseconds later. This point can be mapped to an alarm point to provide a contact closure at the RTU to enable other substation devices to receive a pulse when the freeze occurs. The closure time is fixed.

Figure 2-14 Mapping Global Freeze Status Points to Alarms

Alarm Output Point Mapping

Point	Device Name	Point Name	Invert		Source Points		
1	Global Freeze	Gibi Frz Lockout	○ Yes	💿 No		Global Freeze	
2	Global Freeze	Glbl Frz Event	○ Yes	′es 💿 No		SPARE	
L						Select All points	
					Gibi Frz Lockout		
						Gibi Frz Event	
						Cancel Subr	nit

2.5.8 ACI Type

Use the radio button to choose either ACI or FMR. Please see section "2.12.1 ACI Type" on page 2-36 for further information.

Navigation

Click the Submit button to accept the changes or the Cancel button to cancel changes.

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

2.5.9 Internal Status Points

The firmware automatically generates internal status points that are useful for monitoring important functions within the RTU. The Internal Status Points appear as source points for mapping, as shown in the example below.

Note: Internal status points are visible only when mapped to a master or any other function that is capable of mapping points. The example below happens to be a slave protocol.

	internal Status		Invert 🔊	Source Points
1 -	incontar o cacao	PRM TIME SRC FAIL	OYes ⊙No	💁 Internal Status
- I	internal Status	SEC TIME SRC FAIL	OYes ⊙No	Search
2 II	internal Status	RUN	OYes ⊙No	SPARE
3 II	internal Status	TIME SRC FAIL	OYes ⊙No	Select All points PRM TIME SRC FAIL
4 II	internal Status	IED FAIL	OYes ⊙No	SEC TIME SRC FAIL
5 II	internal Status	LOCAL	OYes ⊙No	RUN
	internal Status	LOGGED IN	OYes ⊙No	TIME SRC FAIL
-	internal Status	CONFIG CHG	OYes ⊙No	IED FAIL LOCAL
	internal Status	RLL RUN	OYes ⊙No	LOGGED IN
0	internal Status	ETHERNET LINK	O Yes ⊙ No	CONFIG CHG
1			O Yes ONO	RLL RUN ETHERNET LINK

Figure 2-15 Mapping Internal Status Points

Note: See the Data Display chapter for the results of this configuration.

PRM TIME SRC FAIL

Indicates the health of the Primary Time Source. Close means the primary time source has failed. Open means the primary time source is operational.

SEC TIME SRC FAIL

Indicates the health of the Secondary Time Source. Close means the secondary time source has failed. Open means the secondary time source is operational.

RUN

Indicates whether or not the CPU is running. In Display mode, look for the signature "heartbeat"; that is, a one-second change of status similar to the blink-rate of the Power/Run LED on the CPU card (although they won't necessarily be in sync). Normally blinking.

TIME SRC FAIL

Indicates the health of either Time Source. If two time sources are configured (primary and secondary), Close means one of the time sources has failed. Open means both sources are operational.

IED FAIL

Indicates the status of the IED. Close means an IED (or communications with it) has failed. Open means the IED is operational. Normally Open.

LOCAL

Indicates the status of the Remote/Local switch. Close means the switch is in the Local position (no power to controls). Open means the switch is in the Remote position (controls have power). Normally Open.

LOGGED IN

Indicates whether or not someone is logged into the device. Close means that one or more persons are logged in. Open means that no one is logged in.

CONFIG CHG

Indicates whether or not the configuration has been changed since the last reset. Closed means there has been a configuration change since the last reset. Open means there has been no configuration change since the last reset. Normally Open.

RLL RUN

Indicates whether or not an RLL program is running. Closed means there is an RLL (ISaGRAF) program running in the RTU. Open means there is no RLL program running.

ETHERNET LINK

Indicates whether or not there is a valid Ethernet link circuit connected to the Ethernet connector. Closed means there is a valid Ethernet connection to the RTU. Open means there is not.

Note: If the optional C3463 Switched Ethernet PC/104 card is installed, the Ethernet Link indication will always show a valid Ethernet connection.

2.6 Naming Points

As mentioned previously, and as described throughout this manual, you may name source points as you configure them. There is a forty five character limit to the name of a point. The interface will not allow you to input more than forty five characters. However, some

customers have created macros of various types in which the macro automatically reads a column of a spreadsheet and places those names into the appropriate XML file. The problem with this technique is that the XML file doesn't have a character limit on the name or a filter for the type of character. The problem will show up when the RTU tries to run a long character-count name, or an inappropriate special character.

The following characters (shown below) may be used when typing into the GUI, but will present problems when placed directly into the XML file. When the character is typed into the GUI, it is replaced by the string on the right in the table. The string is retranslated into the original character for display. If any of these special characters are entered directly into the XML file, the program will use them just as they are and will cause problems.

Special Character	Name	Replaced by
&	Ampersand	&
<	Less Than	<
>	Greater Than	>
u u	Double Quote	"
'	Apostrophe	'

Figure 2-16	Special Characters
-------------	--------------------

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Warning: The lesson is that, if you write a macro to place point names in an XML file, be sure you limit names to forty five characters and that you replace special characters with the "Replace by" string listed above.

2.7 Copying Multiple Point Names From a Spreadsheet

Point names may be copied from an Excel column of names as shown below. Select and copy the range to your clipboard.

Note: Not all configurations or protocols support this feature.

2-17 Jpr	eausneet column of t	
Point	Name	De
COMM	1_STS	FEE
STSET		EEĘ
T LE 👗	Cu <u>t</u>	
T LE 🗈	⊆ору	
T LE 选	<u>P</u> aste	
TLE	Paste <u>S</u> pecial	
TLE	Insert Copied C <u>e</u> lls	
TLE	<u>D</u> elete	
TLE	Clear Co <u>n</u> tents	
	Insert Comment	
	Format Cells	
	Pick From Drop-down List.	
TLE	<u>Create List</u>	· [
TLE 🧕	<u>Hyperlink</u>	
TLE 📆	Look Up	
TLEDZ	-	FEE
TLED2	6	FEE
50A1		FEE
50B1		FEE
50C1		FEE
50A2		FEE
50B2		FEE
50C2		FEE

Figure 2-17 Spreadsheet Column of Point Names

Then paste into the point name source (such as IED point names) as shown below.

	DNPM Status Configuration	
Port # 3	P	ort Name : Port 3
IED # : 1		ne : DNPM_IED_1
	Page 1 of 2 GoTo Go	Next >>
Point	Name	IED Point
-1	COMM_STS	-1
0 Past	Place cursor over	0

point number

where you wish

names to starts, then right click 1

2

3

4

5

6

7

8

9

10

11

12

13

14

Submit

Cancel

Figure 2-18 Pasting Point Names Into Hardware Status Source Names

Click on Allow Access to paste the names into the Configuration.

Note 2: This feature is not widely implemented. If you don't see the "Paste" message as shown above, then the particular screen has not been upgraded yet.

Figure 2-19 Dialog Message



2

3

4

5

6

7

8

9

10

11

12

13

14

IED_STS 2

IED_STS 3

IED_STS 4

IED_STS 5

IED_STS 6

IED_STS 7

IED_STS 8

IED_STS 9

IED_STS 10

IED_STS 11

IED_STS 12

IED_STS 13

IED_STS 14

	Figure 2-20 Results of Paste DNPM Status Configuration			
Port # 3 IED # : 1	F	°ort Name : Port 3 me : DNPM_IED_1		
	Page 1 of 2 GoTo Go	Next >>		
Point	Name	IED Point		
-1	COMM_STS	-1		
0	STSET	0		
1	TLED11	1		
2	TLED12	2		
3	TLED13	3		
4	TLED14	4		
5	TLED15	5		
6	TLED16	6		
7	TLED17	7		
8	TLED18	8		
9	TLED19	9		
10	TLED20	10		
11	TLED21	11		
12	TLED22	12		
13	TLED23	13		
14	TLED24	14		
	Can	cel Submit		

Notice that the Paste operation will encompass as many pages as required to accommodate the number of names you have selected, as long as you've assigned enough point names.

	Figure 2-21 Second Page			
	DNPM Status Configuration			
Port # 3 IED # : 1		Port Name : Port 3 me : DNPM_IED_1		
<< Previo	us Page 2 of 2 GoTo Go			
Point	Name	IED Point		
15	TLED25	15		
16	TLED26	16		
17	50A1	17		
18	50B1	18		
19	50C1	19		
20	50A2	20		
21	50B2	21		
22	50C2	22		
	Cancel Submit			

Note 1: This technique for pasting names works with columns of names from other application sources besides a spreadsheet, such as Notepad.

2.8 References Configuration

The References Configuration screen allows you to name the references or accept the default names. You may also set the temperature units (°F or °C) and correct the temperature reading (enter the current correct temperature at the RTU). See Figure 2-22. Click Submit when you are satisfied with the configuration, or Cancel to back out of the function without saving.

	References Configuration				
Point	Point Name	Units	Temperature		
1	bb_gnd_ref				
2	bb_+5.0V_REF				
3	bb_+4.5V_ref				
4	bb4.5V_ref				
5	bb_temp_ref	°F ▼	74		
6	bb_dc_in				
		Cano	el Submit		

Figure 2-22	References	Configuration
rigule z-zz	Nererences	Configuration

The following table defines the EGU Min and EGU Max values for the references.

Note: The SAGE 2000 baseboard sets the type for the bb_+5.0V_REF, temperature reference, and DC Input voltage to be unipolar. However, for flexibility, the default for the points when mapping to a master is bipolar. There are two ways to handle this: 1) Change the C Min and C Max in the RTU to be unipolar for those references (for instance, for Series V protocol, 0 to 2000 counts instead of -2000 to 2000 counts. 2) Change the master station analog scaling for these two points to use the -2000 to 2000 count range.

Ref #	Reference	Reference Name	Туре	EGU Min	EGU Max	EGU
1	Ground	bb_gnd_ref	Bipolar	-5	+5	VDC
2	Full Scale	bb_+5.0V_REF	Unipolar	0	+5	VDC
3	Positive	bb_+4.5V_ref	Bipolar	-5	+5	VDC
4	Negative	bb4.5V_ref	Bipolar	-5	+5	VDC
5	Temperature	bb_temp_ref	Unipolar	-58	+842	DEG F
5	Temperature	bb_temp_ref	Unipolar	-50	+450	DEG C
6	DC Input	bb_dc_in	Unipolar	0	+39	VDC

Table 2-1 SAGE 2X00 Reference Points

Table 2-2	SAGE	1X50	Reference Points	
-----------	------	------	-------------------------	--

Ref #	Reference	Reference Name	Туре	EGU Min	EGU Max	EGU
1	Ground	bb_gnd_ref	Bipolar	-3	+3	VDC
2	Positive 2.5	bb_+2.5V_ref	Bipolar	-3	+3	VDC
3	Negative 2.5	bb2.5V_ref	Bipolar	-3	+3	VDC
4	Temperature	bb_temp_ref	Bipolar	-58	+185	DEG F
4	Temperature	bb_temp_ref	Bipolar	-50	+85	DEG C
5	Battery Power	bb_bat_in_ref	Bipolar	-33	+33	VDC
6	Primary Power	bb_pwr_in_ref	Bipolar	-33	+33	VDC

Table 2-3	C3830	Reference	Points
-----------	-------	-----------	--------

Ref #	Reference	Reference	Туре	EGU Min	EGU Max	EGU
		Name				
1	Ground	bb_gnd_ref	Bipolar	-5	+5	VDC
2	Full Scale	bb_+5.0V_ref	Unipolar	-5	+5	VDC
3	Positive	bb_+4.5V_ref	Bipolar	-5	+5	VDC
4	Negative	bb4.5V_ref	Bipolar	-5	+5	VDC
5	Temperature	bb_temp_ref	Bipolar	-58	+185	DEG F
5	Temperature	bb_temp_ref	Bipolar	-50	+85	DEG C
6	C3830 Ground	C3830_gnd_ref	Bipolar	-5	+5	VDC
7	C3830 Ground	C3830_gnd_ref	Bipolar	-5	+5	VDC
8	C3830 Aux	C3830_aux_in	Bipolar	-5	+5	VDC

2.9 Analog Inputs Configuration

Click on the Analog Inputs button to enter the total number of DC hardware analog points. See Figure 2-23. Click Continue to configure the points, or Cancel to back out of the function without saving.

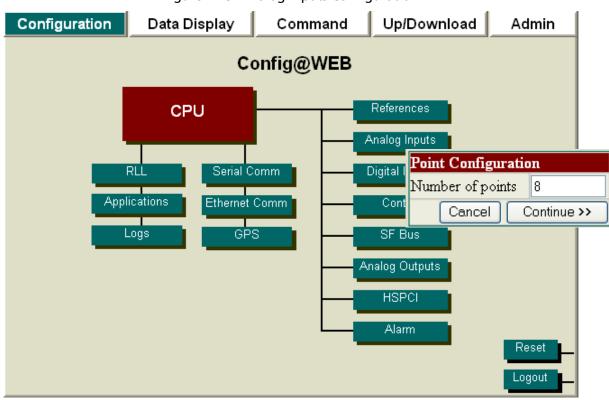
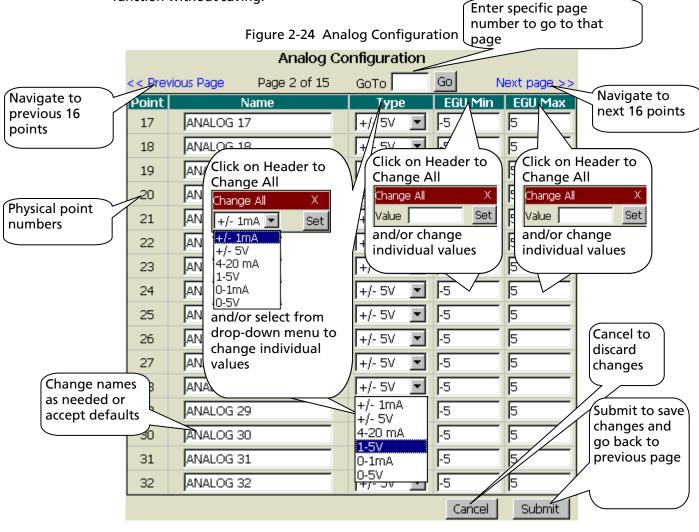


Figure 2-23 Analog Inputs Configuration

The Analog Configuration screen (Figure 2-24) allows you to name each analog point, select the type of input from a drop-down menu, and set the engineering scaling.

You are not required to set the EGU Min and EGU Max because these values are used only on the RTU Data Display (the Engineering Unit values are not sent to the Master). However, for troubleshooting purposes, it is good practice to set the EGU Min and EGU Max to the same values used on the Master station.

Click Submit when you are satisfied with the configuration, or Cancel to back out of the function without saving.



2.10 Digital Inputs Configuration

Click Digital Inputs button to enter the total number of hardware digital points.

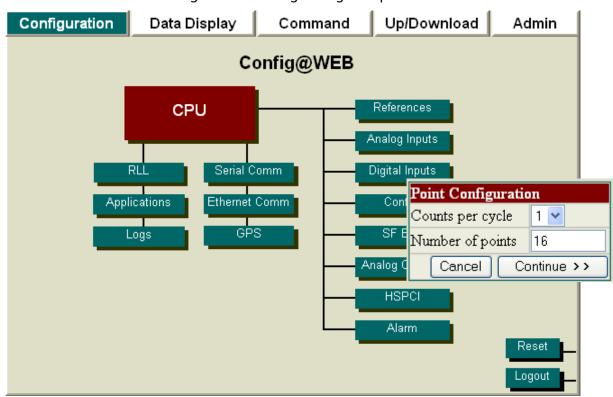


Figure 2-25 Configure Digital Inputs

Counts per cycle

If some DI points will be configured as accumulator points, select either 1 or 2 counts per cycle for accumulators from the dropdown menu. The number of counts is calculated by rising and falling edges as follows:

Counts per cycle = 1

Form A: 1 is added to the accumulator on the debounced rising edge (closed state) of the digital input point assigned to the accumulator point.

Form C: 1 is added to the accumulator when the debounced transitions on the two digital input points assigned to the accumulator point have been received and validated, 0(Open) 1(Closed) state to 10 state to 01 state adds 1 count.

Counts per cycle = 2

Form A: 1 is added to the accumulator for each debounced rising or falling edge of the digital input point assigned to the accumulator point.

Form C: 2 is added to the accumulator when the debounced transitions on the two digital input points assigned to the accumulator point have been received and validated, 01 state adds 1 count and 10 state adds 1 count.

Number of points

Enter the total number of DI points. This includes both status points and accumulator points.

Click Continue to configure the points, or Cancel to back out of the function without saving.

On the Digital Input Configuration screen, type in a name for each point or accept the default names. Select whether the point is to be Spare, Status, Form A Accumulator, or Form C Accumulator.

Note: When selecting a digital input point to be a Form C accumulator, the digital input point immediately following must first be set to Spare. When defining a point to be Form C, the next point will be grayed out and not allow further entry.

Click Submit when you are satisfied with the configuration, or Cancel to back out of the function without saving.

		-
	Page 1 of 2	GoTo Go Next page >>
Point	Point Name	Point Type
1	DOOR	C Spare © Status C Form A C Form C
2	DI_PNT_2	C Spare © Status C Form A C Form C
3	DI_PNT_3	C Spare C Status C Form A C Form C
4	DI_PNT_4	C Spare C Status C Form A C Form C
5	DI_PNT_5	C Spare C Status C Form A C Form C
6	DI_PNT_6	C Spare C Status C Form A C Form C
7	DI_PNT_7	C Spare C Status C Form A C Form C
8	DI_PNT_8	C Spare © Status C Form A C Form C
9	DI_PNT_9	C Spare © Status C Form A C Form C
10	DI_PNT_10	C Spare C Status C Form A C Form C
11	DI_PNT_11	C Spare © Status C Form A C Form C
12	DI_PNT_12	C Spare © Status C Form A C Form C
13	DI_PNT_13	C Spare C Status C Form A C Form C
14	DI_PNT_14	C Spare C Status C Form A C Form C
15	DI_PNT_15	C Spare C Status C Form A C Form C
16	DI_PNT_16	C Spare C Status C Form A C Form C
		Cancel Submit

Figure 2-26 Digital Input Configuration Digital Input Configuration

Navigation

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.

2.11 Control Configuration

Click on Control button, then type in the number of control points. Select either SBO, Skip BB SBO, or BB DO (BB means baseboard). Skipping baseboard SBOs would be a good option if the baseboard SBOs were not suitable for the application. Baseboard SBOs *must* be skipped to use the full compliment of 128 SBO XTs. Only 124 SBOs may be configured if the baseboard SBOs are not skipped.

Note: If you intend to use SFB DOs without using BB DOs, or BB SBOs, be sure to check "Skip BB SBO".

Note: The SBO options do not apply to the SAGE 1X50 or the SAGE 3030X. You can only enter the number of control points ,then Cancel or Continue

Click Continue to configure the points or Cancel to back out of the function without saving.

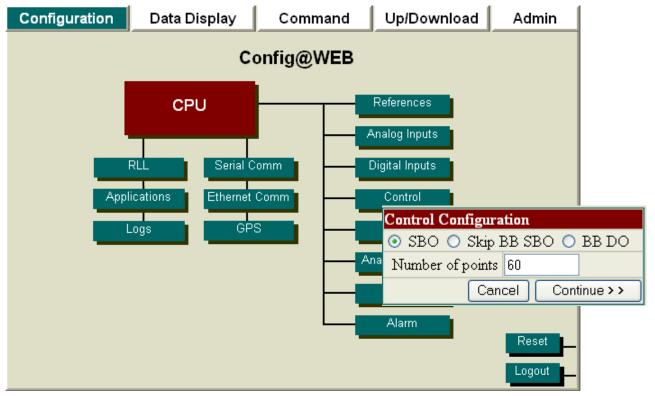


Figure 2-27 Control Configuration

Enter the name of the SBO point and the Execute Time for each SBO, or accept the defaults. You may click on the header Execute Time to set a time for all SBOs. You may also change the individual Execute Time for selected SBOs. The Execute Time entered will be used as the default when operating controls through the UIF and also for protocols that do not have the ability to send the control execute time in an MTU-to-RTU message.

Click Submit when you are satisfied with the configuration, or Cancel to back out of the function without saving.

	SBO Configuratio	
	Page 1 of 4 GoTo Go	Next Page >>
Point	Name	Execute Time
1	SBO 1	100
2	SBO 2	200 Click on Header to
3	SBO 3	300 Change All
4	SBO 4	400 Change All X Value Set
5	SB0 5	500 and/or change
6	SBO 6	500 individual values
7	SB0 7	500
8	SBO 8	500 (ms)
9	SBO 9	500 (ms)
10	SBO 10	500 (ms)
11	SB011	500 (ms)
12	SBO 12	500 (ms)
13	SBO 13	500 (ms)
14	SBO14	500 (ms)
15	SBO 15	500 (ms)
16	SBO 16	500 (ms)
	С	ancel Submit

Figure 2-28 SBO Configuration

Navigation

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.

If the BB DO radio button selection is made, the relays on the baseboard will operate as general purpose digital outputs and the screen shown in Figure 2-29 will come up when the continue button is depressed.

DO BB Configuration				
Point	t Name Momentary Rel Duration			
1	DO_PNT 1	500 (ms)		
2	DO_PNT 2	500 (ms)		
3	DO_PNT 3	500 (ms)		
4	DO_PNT 4	500 (ms)		
5	DO_PNT 5	500 (ms)		
6	DO_PNT 6	500 (ms)		
7	DO_PNT 7	500 (ms)		
8	DO_PNT 8	500 (ms)		
		Cancel Submit		

Figure 2-29	DO BB Configuration
-------------	---------------------

Navigation

Click the Cancel button to discard changes. Click the Submit button to accept the changes.

2.12 SF Bus Configuration (SAGE 2X00 Only)

Click on SF Bus button to configure the Special Function Bus (SFB), as shown in Figure 2-30. Configuring the SFB is required for ACI cards, 1MSSOE cards, some Analog Output cards, High Speed Pulse Counter Input cards, and Digital Output cards.

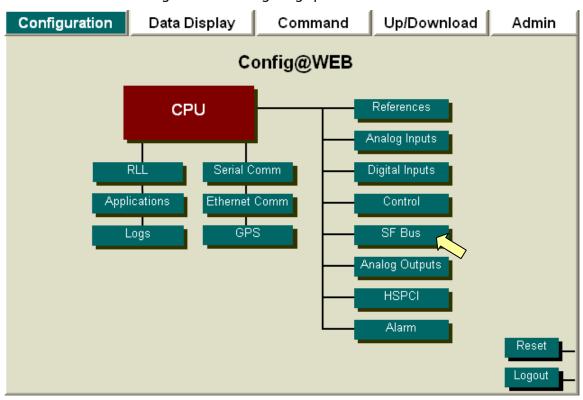


Figure 2-30 Configuring Special Function Bus

Select from the drop-down menu the SFB Card Types cabled to the SFB. Start at the RTU and follow the ribbon cable to the last XT on the cable chain. See Figure 2-31.

This data is required for correct operation of the RTU because the XTs placed on the SFB are position dependent. If a designated SFB XT fails, operation of that type of data is disabled, rather than operating the wrong digital output or reporting the status of an input incorrectly.

Note: The ACI notation for the SFB refers to the AC Analog inputs. Additional ACI theory information is to be found in the manual: C3244 AC Analog Input Option, Manual Number C3244-AAA-00011.

As an example of how the SFB might be configured with two 1MSSOE cards and two ACI cards, begin with Figure 2-31.

Spec		and comignitation		
SFB Card Location	SFB Card type	Configure each XT	Copy to Card	
Select 1	1MSSOE	Configure SFB XT# 0	Сору	
Select 2	1MSSOE	Configure SFB XT# 1	Сору	
Select 3	ACI	Configure SFB XT# 2	Сору	
Select 4	ACI	Configure SFB XT# 3	Сору	
Select 5	None	-	Сору	
Select 6	None	-	Сору	
Select 7	None	-	Сору	
Select 8	None	-	Сору	
			Back	

Figure 2-31 Example SFB Configuration

Navigation

Click the Back button to go back to the Configuration screen.

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

After you select the SFB Card Type, "Configure SFB XT#" will appear under "Configure each XT". The underlined blue legend means it is a clickable link. Click on the link to configure the 1MSSOE card.

Note: If the configuration for a particular card is nearly the same for the next card of the same type, you can save some time by copying the configuration as shown in Figure 2-32.

Figure 2-32 Copying an SFB Configuration

Special Function Bus Card configuration					
SFB Card Location	SFB Card type	Configure each XT	Copy to Card		
Select 1	1MSSOE	Configure SFB XT# 0	2 Copy		
Select 2	None	-	Сору		
Select 3	None	-	Сору		
Select 4	None	-	Сору		
Select 5	None	-	Сору		
Select 6	None	-	Сору		
Select 7	None	-	Сору		
Select 8	None	-	Сору		
			Back		

Navigation

Click the Back button to go back to the Configuration screen.

ACI Type (SAGE 2X00 and SAGE 1X50 Only) 2.12.1

Warning: The applications Energy Calculation, Timing, and the ACI function all use the same BB ram memory space; therefore only one of these applications may be run at any given time.

From the CPU Configuration screen, you have a choice of two types of AC Analog Inputs: Either ACI or FMR. See the following sections for an explanation of each type.

2.12.2 FMR Type AC Analog Inputs Configuration

From the CPU Configuration screen, click the radio button for FMR.

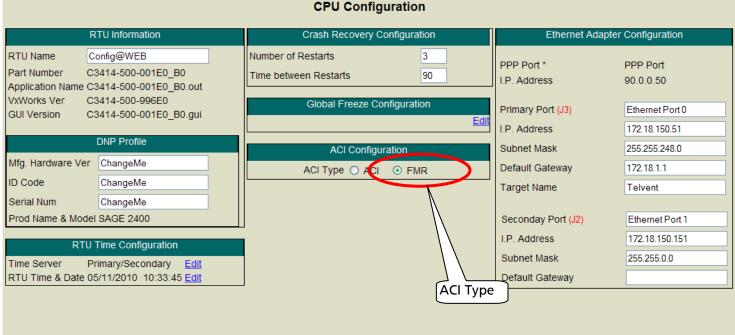


Figure 2-33 Choosing Between FMR or ACI

CPU Configuration

Cancel Submit

Navigation

Click the Submit button to accept the changes or the Cancel button to cancel changes.

The ACI Card Configuration screen is used to configure a database record for the ACI subsystem. This menu allows you to enter information about the circuit that you are monitoring and the data to be returned via the ACI subsystem.

Figure 2-34	FMR Type ACI Card Setup
· · · · · · · · · · · · · · · · · · ·	

1	ACI Card	Configuration		
	ACI Car	d Setup		
Card Name	ACLO	n BUS 0	69V_PT 120V_PT	
Card is Currently	Enab	iled 💌		S&C
Sensor Type	69_	PT 🗾 Edit	: Sensor Data	LINDSEY SQUARE_D
Metering Type	Туре	3	Edit ACI Data	
Nominal EGU for Current	600.0			Type_2.5
Nominal EGU for Voltage	7200.	0		Type_3 Type_2
Low Current Cutoff Point 1		%FS		
Low Voltage Cutoff Point	1	%FS		Unity Kilo
Demand Scale Factor	Kilo	•		Mega
Eve	nt Detec	tion Parameters		[
Phase Current Threshold	600.0	Event monitoring	C Yes ⊙No	1
Neutral Current Threshold	100.0	Report sag/swells	CYes €No	
Voltage swell Threshold	7560.0	Report outages	C Yes ⊙ No	Drop-down
Voltage sag Threshold	6840.0	Use voltages in outage	C Yes ⊙ No	menus
Current outage Threshold	10.0	Validation time 1 (cycle:		
Voltage outage Threshold	10.0			
		Ca	ncel Submit	

Card Name

Type in a card name or accept the default. This entry usually corresponds to the circuit or the device the ACI card is monitoring. The card name corresponds to the source point name in the data mapping routine.

Card is Currently (Enabled, Disabled)

This field must be set to Enabled before the ACI will perform any analog measurements.

Navigation

Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Sensor Type

From the drop-down menu, select the Input type from 69V_PT, 120V_PT, S&C, LINDSEY, or SQUARE_D, as shown in Figure 2-35. For each sensor type you may click the

Edit Sensor Data button to edit sensor data as required. The configuration required by hitting this button is further described in section 2.12.4.

ACT Clark Configuration - Sensor Type					
ACI Card Configuration					
ACI Card Setup					
Card Name	ACI or	n BUS 1			
Card is Currently	Enab	led 🔽			
Sensor Type	120	_PT 🔫		EditS	Sensor Data
Metering Type	69V_F			E	dit ACI Data
Nominal EGU for Current	S&C				、
Nominal EGU for Voltage		SEY ARE_D		Drop- menu	down
Low Current Cutoff Point	1		%FS		r Types
Low Voltage Cutoff Point	1	ç	%FS		
Demand Scale Factor	Kilo	~			
Eve	nt Detect	tion Para	neters		
Phase Current Threshold	600.0	Event mo	onitoring		🔾 Yes 💿 No
Neutral Current Threshold	100.0	Report s	ag/swells		🔾 Yes 💿 No
Voltage swell Threshold	7560.0	Report o	utages		⊙Yes ⊙No
Voltage sag Threshold	6840.0	Use volta	ages in out	tage	🔿 Yes 💿 No
Current outage Threshold	10.0	Validatio	n time		1 (cycles)
Voltage outage Threshold	10.0				
				Can	cel Submit

Figure 2-35 FMR Type ACI Card Configuration – Sensor Type

Navigation

Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Metering Type

From the drop-down menu, select 3 for 3 element metering, 2.5 for 2 1/2 element metering, and 2 for 2 element metering. The calculated values for the different metering types are shown in Table 2-4, Table 2-5, and Table 2-6. Please refer to the C3244 ACI Analog Input Option manual (C3244-AAA-00011) for termination requirements.

Table 2-4 Calculated Values for 3-Element Metering

Phase and Total Watts
Phase and Total VARs
Phase and Total PF
Phase and Total VA
Phase frequency, voltage derived
Phase RMS Current
Phase RMS Voltage
Harmonic content (2nd through 7th) of ABC voltage and ABC
current
RMS Neutral current

Table 2-5 Calculated Values for 2 1/2-Element Metering

Phase and Total Watts
Phase and Total VARs
Phase A & C and Total PF
Phase A & C and Total VA
Phase A and C frequency, voltage derived
Phase RMS current
Phase A and C RMS voltage
Harmonic Content (2nd through 7th) of A&C voltage and ABC
current
RMS Neutral current

Table 2-6 Calculated Values for 2-Element Metering

Total Watts
Total VARs
Total PF
Total VA
Phase AB and BC frequency, voltage derived
Phase A and C RMS current
Harmonic Content (2nd through 7th) of AB & BC volts and A & C current

Nominal EGU for Current

Enter the 100% nominal value for the current. This value is used to scale analog data for display and calculation of other analog data. See Table 2-7. The RTU will report 150% of this parameter to the master allowing measurement and reporting of 50% over-range. For example, if it is set to 600 amps, the maximum reported value would be 900 amps.

Nominal EGU for Voltage

Enter the 100% nominal value for the voltage. For 3 and 2 1/2 element metering, this value must be line-to-neutral voltage. For 2 element metering, this value is line-to-line voltage, This value is used to scale analog data for display and calculation of other analog data. See Table 2-7. The RTU will report 125% of this parameter to the master allowing measurement

and reporting of 25% over-range. For example, if it is set to 7200 volts, the maximum reportable value will be 9000 volts.

Note: Remember, the voltages you enter for 3-element and 2 1/2-element metering are measured from line to neutral. Voltages for 2-element metering are measured line to line.

Calculated	Туре	Scaling Source	EGU Min	EGU Max	Multiplier	Engineering Unit (EU)
Current	Unipolar	AC Analog	0.0	Х	1.50	Amps
Voltage		Configuration	0.0	Х	1.25	Volts

Note: X designates operator-entered values.

Low Current Cutoff Point

Enter the percentage of the full-scale value for the ACI subsystem to utilize in determining a low current. Current readings below this threshold will be treated as 0 when computing power and harmonics. For example, if it is set at 1% and nominal feeder current is 600 amps, the ACI subsystem will consider any current below 6 amps as zero and will not waste time computing power and harmonics because it may be meaningless.

Low Voltage Cutoff Point

Enter the percentage of the full-scale value for the ACI subsystem to utilize in determining a low voltage. Voltage readings below this threshold will be treated as 0 when computing power and harmonics.

Demand Scale Factor

From the drop-down menu, select Unity, Kilo or Mega for scaling Watts, VARs, VA, Watthours and VAR-hours. This field selects the units for scaling real and reactive power and accumulated real and reactive power.

Unity - Watts, VARs, VA, Wh, VARh Kilo - kW, kVAR, kVA, kWh, kVARh Mega - MW, MVAR, MVA, MWh, MVARh

Phase Current Threshold

Enter the RMS current threshold for identifying an event on a phase current.

Neutral Current Threshold

Enter the RMS current threshold for identifying an event on the neutral current. Set the threshold to a high value to disable neutral event detection.

Voltage swell Threshold

Enter the RMS voltage threshold for identifying a voltage swell event on a phase voltage.

Voltage sag Threshold

Enter the RMS voltage threshold for identifying a voltage sag event on a phase voltage.

Current outage Threshold

Enter the RMS current threshold for identifying a current outage event on a phase current.

Voltage outage Threshold

Enter the RMS voltage threshold for identifying a voltage outage event on a phase voltage.

Event monitoring

Click the radio button for "Yes" to enable event monitoring. This flag must be set to Y to enable any event monitoring (must be true for any event activity to occur).

Report sag/swells

Click the radio button for "Yes" to enable reporting of phase over and phase under voltage events.

Report outages

Click the radio button for "Yes" to enable current outage event reporting.

Use voltages in outage

Click the radio button for "Yes" to enable voltage outage monitoring.

Validation time

Enter the number of cycles that an event must be present to qualify as a valid event. A value of 1 will cause an immediate validation of the event. If some other value is entered, the trigger event must be maintained for this number of cycles before the event will be validated.

2.12.2.1 Edit FMR Type ACI Data

Press the button Edit ACI Data to go to the screen for ACI Data Configuration (see Figure 2-36). Use the scroll bar as necessary to access all functions on this screen.

ACI Data Configuration							
Point Names	EGU Min	EGU Max	Add Points to Database				
Volts							
Volts Phase A	0	9000	OYes ⊙No				
Volts Phase B	0	9000	OYes ⊙No				
Volts Phase C	0	9000	🔾 Yes 💿 No				
Volts Phase A RMS	0	9000	🔾 Yes 💿 No				
Volts Phase B RMS	0	9000	OYes ⊙No				
Volts Phase C RMS	0	9000	OYes ⊙No				
	An	ap s					
Amps Phase A	0	900	🔿 Yes 💿 No				
Amps Phase B	0	900	🔾 Yes 💿 No				
Amps Phase C	0	900	🔿 Yes 💿 No				
Amps Neutral	0	900	🔾 Yes 💿 No				
Amps Phase A RMS	0	900	🔾 Yes 💿 No				
Amps Phase B RMS	0	900	OYes ⊙No				
Amps Phase C RMS	0	900	OYes ⊙No				
Amps RMS Neutral	0	900	🔿 Yes 💿 No 🗸				
			Done				

Figure 2-36 FMR Type ACI Data Configuration

Table 2-8 explains the way EGU Min and EGU Max are determined for ACI Data Configuration screen.

	Calculated Per Phase	Туре	Scaling Source	EGU Min	EGU Max	Multiplier	Engineering Unit (EU)
	Watts		EGU Min &	Х	Х	1.00	Watts
	VARS	Either	Max	Х	Х	1.00	VARS
Calandatad	VA		(Note 1)	Х	Х	1.00	VA
Calculated	Frequency (60Hz)			55.0	65.0	1.00	Hz
	Frequency (50Hz)	Unipolar	RTU	45.0	55.0	1.00	Hz
	Power Factor	•	Configuration	0.0	1.0	1.00	
	Power Factor	Bipolar	-	-1.0	1.0	1.00	
DC Analogs	Ground	Bipolar	Fixed	-3.0	3.0	1.00	VDC
_	+ REF			-3.0	3.0	1.00	VDC

Note 1: If EGU Min & Max is 0, no value will be calculated for the field.

Note 2: X designates operator-entered values.

Note 3: The Point Names (Volts Phase A, Amps Phase A, etc.) are editable. You may change the name as needed. The following definitions use the default names for convenience.

Volts Phase (A, B, C)

Click the radio button for "Yes" to report voltage information on the indicated phase fundamental component of the voltage.

Volts Phase (A, B, C) RMS

Click the radio button for "Yes" to report RMS voltage for each phase.

Amps Phase (A, B, C)

Click the radio button for "Yes" to report information on the current of the indicated phase.

Amps Neutral

Click the radio button for "Yes" to report the neutral phasor amperage.

Amps Phase (A, B, C) RMS

Click the radio button for "Yes" to report RMS current for each phase.

Amps Neutral RMS

Click the radio button for "Yes" to report the neutral RMS amperage.

Watts Phase (A, B, C)

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report watts information on the indicated phase.

Watts Total

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report total wattage information.

VAR Phase (A, B, C)

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report VAR information on the indicated phase.

VAR Total

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report total VAR information.

VA Phase (A, B, C)

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report VA information on the indicated phase.

VA Total

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report total VA information.

Freq Phase (A, B, C)

Click the radio button for "Yes" to report the frequency information on the indicated phase.

PF Phase (A, B, C)

Click the radio button for "Yes" to report power factor information on the indicated phase.

PF Total

Click the radio button for "Yes" to report total power factor information.

2nd Through 7th Voltage Harmonic 0 to 100%

Click the radio button for "Yes" to report voltage harmonics for three phases. Values are reported as a percentage of the fundamental frequency component.

2nd Through 7th Current Harmonic 0 to 100%

Click the radio button for "Yes" to report current harmonics for three phases. Values are reported as a percentage of the fundamental frequency component.

DC Inputs

AGND

Click the radio button for "Yes" to report the value of the analog ground reference point.

+2.500 Ref

Click the radio button for "Yes" to report the value of the +2.5 volt analog reference point.

Phase (A, B, C) Accumulators

+WH Phase A,B,C

Click the radio button for "Yes" to report the accumulated positive Watt-hours.

–WH Phase A,B,C

Click the radio button for "Yes" to report the accumulated negative Watt-hours.

+VARH Phase A,B,C

Click the radio button for "Yes" to report the accumulated positive VAR-hours.

-VARH Phase A,B,C

Click the radio button for "Yes" to report the accumulated negative VAR-hours.

Total Accumulators

+WH Total

Click the radio button for "Yes" to report the accumulated total positive Watthours.

–WH Total

Click the radio button for "Yes" to report the accumulated total negative Watthours.

+VARH Total

Click the radio button for "Yes" to report the accumulated total positive VAR-hours.

-VARH Total

Click the radio button for "Yes" to report the accumulated total negative VAR-hours.

Status Points

Fault Phase (A, B, C)

Click the radio button for "Yes" to report the fault for each phase.

Fault Neutral

Click the radio button for "Yes" to report the fault for neutral.

Navigation

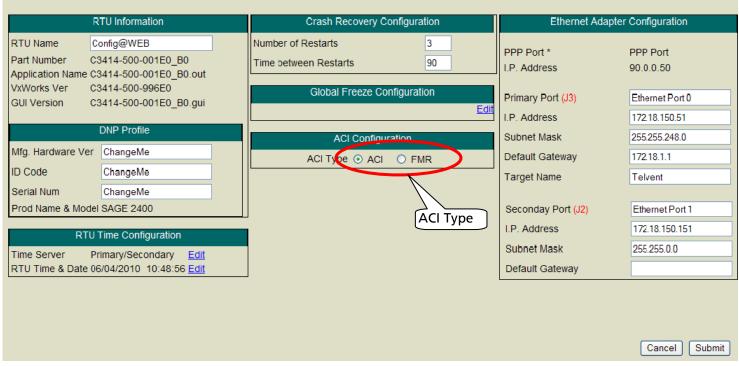
Click the Done button to accept the changes.

2.12.3 ACI Type AC Analog Inputs Configuration

From the CPU Configuration screen, click the radio button for ACI.

Figure 2-37 Choosing ACI

CPU Configuration



Navigation

Click the Submit button to accept the changes or the Cancel button to cancel changes.

The ACI Card Configuration screen is used to configure a database record for the ACI subsystem. This menu allows you to enter information about the circuit that you are monitoring and the data to be returned via the ACI subsystem.

A	CI Car	d Config	uration				
	AC	I Card Setu	р				
Card Name	AC	l on BUS 1	69V_PT 120V PT				
Card is Currently	Di	sabled 💌	S&C				
Sensor Type		120V_PT Edit Sensor Data					LINDSEY SQUARE_D
Metering Type		pe_3 💌 🖡			Edit ACI D	ata	
Nominal EGU for Current).0					Type_2.5 Type_3
Nominal EGU for Voltage		7200.0					Type_2
Low Current Cutoff Point		1 %FS					Unity
Low Voltage Cutoff Point		1 %FS					Kilo
Demand Scale Factor	Kil	o 🖌 🔶					Mega
Fault Detection Paran	ieters	Volta	age Sag/Swe	ll Pa	arameters	s	N
Phase Current Threshold 600.		Sag Volta	Sag Voltage]	
Neutral Current Threshold	100.0	Swell Volt	age		7560]	
Alarm Time (cycles)	1	Minimum I	Duration(cycl	es)	6]	Drop-down
Delay Time (cycles)	1	Use Bipola	ar Power Fac	tor	⊖Yes 🤄	No	menus
Signal integrity (cycles)	5	Line Impe	dance		0.001]	
Deadline Voltage	1000.0						
			[Car	ncel Si	ıbmit	

Card Name

Type in a card name or accept the default. This entry usually corresponds to the circuit or the device the ACI card is monitoring. The card name corresponds to the source point name in the data mapping routine.

Card is Currently (Enabled, Disabled)

This field must be set to Enabled before the ACI will perform any analog measurements.

Navigation

Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Sensor Type

From the drop-down menu, select the Input type from 69V_PT, 120V_PT, S&C, LINDSEY, or SQUARE_D, as shown below. For each sensor type you may click the

Edit Sensor Data button to edit sensor data as required. The configuration required by hitting this button is further described in section 2.12.4.

rigure 2-55 ACI					matio		, iype	
A				0				
		ACI	Card	Setu	ւթ			
Card Name		ACI o	on BU	S1				
Card is Currently		Ena	bled	*				
Sensor Type			/_PT	~	·	Edit	Sensor Data	
Metering Type			e_3	*			Edit ACI D)ata
Nominal EGU for Current		600.0)					
Nominal EGU for Voltage		7200.0]		Drop-down		
Low Current Cutoff Point		02.65			menu Senso	i for or Types		
Low Voltage Cutoff Point		1 %FS			7 1 1 1			
Demand Scale Factor		Kilo	*					
Fault Detection Param	s		Volta	age Sag	/Swell Pa	arameter	s	
Phase Current Threshold	600.0)	Sag 1	Volta	ge		6840.0	
Neutral Current Threshold	100.0		Swell Voltage				7560	
Alarm Time (cycles)	1		Minimum Duration(cycles)			6		
Delay Time (cycles)	1		Use Bipolar Power Factor			OYes 🤇	N₀	
Signal integrity (cycles)	5							
Deadline Voltage	1000	.0						
						Ca	ncel S	ubmit

Figure 2-39 ACI Type ACI Card Configuration – Sensor Type

Navigation

Click the Cancel button to discard changes. Click the Submit button to accept the changes.

Metering Type

From the drop-down menu, select 3 for 3 element metering, 2.5 for 2 1/2 element metering, and 2 for 2 element metering. The calculated values for the different metering types are shown in Table 2-9, Table 2-10, and Table 2-11. Please refer to the C3244 ACI Analog Input Option manual (C3244-AAA-00011) for termination requirements.

Table 2-9 Calculated Values for 3-Element Metering

Phase and Total Watts
Phase and Total VARs
Phase and Total PF
Phase and Total VA
Phase frequency, voltage derived
Phase RMS Current
Phase RMS Voltage
Harmonic content (2nd through 7th) of ABC voltage and ABC
current
RMS Neutral current

Table 2-10 Calculated Values for 2 1/2-Element Metering

Phase and Total Watts
Phase and Total VARs
Phase A & C and Total PF
Phase A & C and Total VA
Phase A and C frequency, voltage derived
Phase RMS current
Phase A and C RMS voltage
Harmonic Content (2nd through 7th) of A&C voltage and ABC
current
RMS Neutral current

Table 2-11 Calculated Values for 2-Element Metering

Total Watts
Total VARs
Total PF
Total VA
Phase AB and BC frequency, voltage derived
Phase A and C RMS current
Harmonic Content (2nd through 7th) of AB & BC volts and A & C current

Nominal EGU for Current

Enter the 100% nominal value for the current. This value is used to scale analog data for display and calculation of other analog data. The RTU will report 150% of this parameter to the master allowing measurement and reporting of 50% over-range. For example, if it is set to 600 amps, the maximum reported value would be 900 amps.

Nominal EGU for Voltage

Enter the 100% nominal value for the voltage. For 3 and 2 1/2 element metering, this value must be line-to-neutral voltage. For 2 element metering, this value is line-to-line voltage. This value is used to scale analog data for display and calculation of other analog data. The RTU will report 125% of this parameter to the master allowing measurement and reporting

of 25% over-range. For example, if it is set to 7200 volts, the maximum reportable value will be 9000 volts.

Note: Remember, the voltages you enter for 3-element and 2 1/2-element metering are measured from line to neutral. Voltages for 2-element metering are measured line to line.

Calculated	Туре	Scaling Source	EGU Min	EGU Max	Multiplier	Engineering Unit (EU)
Current	Unipolar	AC Analog	0.0	Х	1.50	Amps
Voltage		Configuration	0.0	Х	1.25	Volts

Table 2-12 Current & Voltage Scaling for Pa	age 1
---	-------

Note: X designates operator-entered values.

Low Current Cutoff Point

Enter the percentage of the full-scale value for the ACI subsystem to utilize in determining a low current. Current readings below this threshold will be treated as 0 when computing power and harmonics. For example, if it is set at 1% and nominal feeder current is 600 amps, the ACI subsystem will consider any current below 6 amps as zero and will not waste time computing power and harmonics because it may be meaningless.

Low Voltage Cutoff Point

Enter the percentage of the full-scale value for the ACI subsystem to utilize in determining a low voltage. Voltage readings below this threshold will be treated as 0 when computing power and harmonics.

Demand Scale Factor

From the drop-down menu, select Unity, Kilo or Mega for scaling Watts, VARs, VA, Watthours and VAR-hours. This field selects the units for scaling real and reactive power and accumulated real and reactive power.

Unity - Watts, VARs, VA, Wh, VARh Kilo - kW, kVAR, kVA, kWh, kVARh Mega - MW, MVAR, MVA, MWh, MVARh

2.12.3.1 Fault Detection Parameters

Phase Current Threshold

Enter the RMS current threshold for identifying an event on a phase current.

Neutral Current Threshold

Enter the RMS current threshold for identifying an event on the neutral current. Set the threshold to a high value to disable neutral event detection.

Alarm Time (cycles)

Enter the number of cycles an over-current must persist in order for an alarm event to be validated. This debounce delay can be disabled by entering 1. For example, if it is set to 5

cycles and current goes beyond the threshold, the ACI subsystem will wait for 5 cycles after over-current before the fault will be considered.

Delay Time (cycles)

Enter the time delay to pass to allow the upstream interrupting device to detect and clear the fault. The fault detection algorithm will wait this many cycles after the current levels return to normal before computing the average voltage after the fault. The units of this parameter are cycles with a range of 0 to 65535 cycles. Set the time to 1 if the voltage monitoring is disabled.

Signal Integrity (cycles)

Enter the number of cycles over which the ACI will average the RMS voltage values to determine the validity of a detected fault. Set the number to 1 if the voltage monitoring is disabled.

Deadline Voltage

Enter the RMS phase voltage below which the voltage must drop to qualify the fault. If the average voltage calculated during the fault is not below this threshold, the event is discarded. To disable this voltage monitoring, enter 1.25 times the value used for the "AC Input Nominal EGU Range" Voltage for this parameter and 1 for Signal Integrity and Delay Times.

2.12.3.2 Voltage Sag/Swell Parameters

Sag Voltage

Enter the voltage threshold below which the phase voltage must fall to activate the sag detection subsystem. For example, if it is set to 6840 volts (5% below a nominal voltage of 7200 volts), then the sag counter will increment once for every time the voltage goes below 6840 volts and stays for the "minimum duration" defined.

Swell Voltage

Enter the voltage threshold above which the phase voltage must rise to activate the swell detection subsystem. For example, if it is set to 7560 volts (5% above a nominal voltage of 7200 volts), then the swell counter will increment once for every time the voltage goes above 7560 volts and stays for the "minimum duration" defined.

Minimum Duration (Cycles)

Enter the minimum number of cycles the phase voltage must remain below the Sag Voltage threshold or remain above Swell Voltage threshold as a requirement for incrementing the sag counter or swell counter when the phase voltage returns to a normal level.

Use bipolar power factor

Set this flag to Yes to force the sign of the power factor to follow the sign of the VARs. If set to No, the power factor will always be positive. This should be set to Yes if VARs are also bipolar.

Line Impedance

Enter the line impedance per unit of length of the line. This unit of length will be used in the display for Fault Distance.

2.12.3.3 Edit ACI Type ACI Data

Press the button Edit ACI Data to go to the screen for ACI Data Configuration. Use the scroll bar as necessary to access all functions on this screen.

Figure 2-40 ACI Type ACI Data Configuration

ACI Data Configuration								
Point Names	EGU Min	EGU Max	Add Points to Databas	е				
	Vo	olts		_				
Volts Phase A	0	9000	🔾 Yes 💿 No	Ξ				
Volts Phase B	0	9000	🔾 Yes 💿 No					
Volts Phase C	0	9000	🔾 Yes 💿 No					
Volts Phase A RMS	0	9000	🔾 Yes 💿 No					
Volts Phase B RMS	0	9000	🔾 Yes 💿 No					
Volts Phase C RMS	0	9000	🔾 Yes 💿 No					
	An	aps						
Amps Phase A	0	900	🔾 Yes 💿 No					
Amps Phase B	0	900	🔾 Yes 💿 No					
Amps Phase C	0	900	🔾 Yes 💿 No					
Amps Neutral	0	900	🔾 Yes 💿 No					
Amps Phase A RMS	0	900	🔾 Yes 💿 No					
Amps Phase B RMS	0	900	🔾 Yes 💿 No					
Amps Phase C RMS	0	900	🔾 Yes 💿 No					
Amps RMS Neutral	0	900	⊙Yes ⊙No					

	Calculated Per Phase	Туре	Scaling Source	EGU Min	EGU Max	Multiplier	Engineering Unit (EU)
	Watts		EGU Min &	Х	Х	1.00	Watts
	VARS	Either	Max	Х	Х	1.00	VARS
	VA		(Note 1)	Х	Х	1.00	VA
Calculated	Frequency (60Hz)			55.0	65.0	1.00	Hz
	Frequency (50Hz)	Unipolar	RTU	45.0	55.0	1.00	Hz
	Power Factor	I	Configuration	0.0	1.0	1.00	
	Power Factor	Bipolar	5	-1.0	1.0	1.00	
DC Analogs	Ground	Bipolar	Fixed	-3.0	3.0	1.00	VDC
	+ REF			-3.0	3.0	1.00	VDC

Note 1: If EGU Min & Max is 0, no value will be calculated for the field.

Note 2: X designates operator-entered values.

Note 3: The Point Names (Volts Phase A, Amps Phase A, etc.) are editable. You may change the name as needed. The following definitions use the default names for convenience.

Volts Phase (A, B, C)

Click the radio button for "Yes" to report voltage information on the indicated phase fundamental component of the voltage.

Volts Phase (A, B, C) RMS

Click the radio button for "Yes" to report RMS voltage for each phase.

Amps Phase (A, B, C)

Click the radio button for "Yes" to report information on the current of the indicated phase.

Amps Neutral

Click the radio button for "Yes" to report the neutral phasor amperage.

Amps Phase (A, B, C) RMS

Click the radio button for "Yes" to report RMS current for each phase.

Amps Neutral RMS

Click the radio button for "Yes" to report the neutral RMS amperage.

Watts Phase (A, B, C)

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report watts information on the indicated phase.

2-53

Watts Total

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report total wattage information.

VAR Phase (A, B, C)

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report VAR information on the indicated phase.

VAR Total

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report total VAR information.

VA Phase (A, B, C)

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report VA information on the indicated phase.

VA Total

Enter the EGU Min and EGU Max (or accept the defaults) and click the radio button for "Yes" to report total VA information.

Freq Phase (A, B, C)

Click the radio button for "Yes" to report the frequency information on the indicated phase.

PF Phase (A, B, C)

Click the radio button for "Yes" to report power factor information on the indicated phase.

PF Total

Click the radio button for "Yes" to report total power factor information.

2nd Through 7th Voltage Harmonic 0 to 100%

Click the radio button for "Yes" to report voltage harmonics for three phases. Values are reported as a percentage of the fundamental frequency component.

2nd Through 7th Current Harmonic 0 to 100%

Click the radio button for "Yes" to report current harmonics for three phases. Values are reported as a percentage of the fundamental frequency component.

DC Inputs

AGND

Click the radio button for "Yes" to report the value of the analog ground reference point.

+2.500 Ref

Click the radio button for "Yes" to report the value of the +2.5 volt analog reference point.

Fault

Fault Start Time

Click the radio button for "Yes" to report the fault start time.

Fault Duration in Cycles

Click the radio button for "Yes" to report the fault duration in cycles.

Fault RMS I, Phases A, B, C

Click the radio button for "Yes" to report the fault RMS current for phases A, B, and C.

Fault RMS I Neutral

Click the radio button for "Yes" to report the fault RMS current for Neutral.

Fault RMS V, Phases A,B,C

Click the radio button for "Yes" to report the fault RMS voltage for phases A, B, and C.

Fault MAG I, Phases A,B,C

Click the radio button for "Yes" to report the fault current magnitude for phases A, B, and C.

Fault MAG V, Phases A,B,C

Click the radio button for "Yes" to report the fault voltage magnitude for phases A, B, and C.

Fault Distance

Enter the minimum and maximum fault distance. The minimum should logically be zero.

Phase (A, B, C) Accumulators

+WH Phase A,B,C

Click the radio button for "Yes" to report the accumulated positive Watt-hours.

–WH Phase A,B,C

Click the radio button for "Yes" to report the accumulated negative Watt-hours.

+VARH Phase A,B,C

Click the radio button for "Yes" to report the accumulated positive VAR-hours.

-VARH Phase A,B,C

Click the radio button for "Yes" to report the accumulated negative VAR-hours.

Total Accumulators

+WH Total

Click the radio button for "Yes" to report the accumulated total positive Watthours.

-WH Total

Click the radio button for "Yes" to report the accumulated total negative Watthours.

+VARH Total

Click the radio button for "Yes" to report the accumulated total positive VAR-hours.

-VARH Total

Click the radio button for "Yes" to report the accumulated total negative VAR-hours.

Sag/Swell

Click the radio button for "Yes" to report the Sags and Swells for all three phases.

Status Points

Fault Phase (A, B, C)

Click the radio button for "Yes" to report the fault for each phase.

Fault Neutral, Fault Forward, Fault Reverse

Click the radio button for "Yes" to report these fault status points.

Navigation

Click the Done button to accept the changes.

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

2.12.4 Edit Sensor Data for FMR & ACI

69 Volt & 120 Volt PT Configuration

Figure 2-41 Edit AC Analog Setup for 69 Volt PT

69V_PT Sensor Configuration

RTU H	hase A	RTUI	Phase B	RTU Phase C		
Current		Current		Current		
Magnitude	Phase Angle	Magnitude	Phase Angle	Magnitude	Phase Angle	
1.000639	0.0	1.000639	0.0	1.000639	0.0	
Ve	olts	Volts		Volts		
Magnitude	Phase Angle	Magnitude	Phase Angle	Magnitude	Phase Angle	
0.984178	0.0	0.984178	0.0	0.984178	0.0	
					Done	

Navigation

Click the Done button to accept the changes.

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

120V_PT Sensor Configuration								
RTU I	Phase A	RTU	Phase B	RTU	Phase C			
Current		Cu	rrent	Cu	urent			
Magnitude	Phase Angle	Magnitude	Phase Angle	Magnitude	Phase Angle			
1.00064	0.0	1.00064	0.0	1.00064	0.0			
V	olts	Volts		Volts				
Magnitude	Phase Angle	Magnitude	Phase Angle	Magnitude	Phase Angle			
0.980854	0.0	0.980854	0.0	0.980854	0.0			
					Done			

Figure 2-42 Edit AC Analog Setup for 120 Volt PT

The following field descriptions apply to all phases of the 69 and 120 Volt inputs:

RTU Current Sensor Magnitude

The values entered in these fields are correction values applied to the current measured by the secondary CT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

RTU Current Sensor Phase Angle

The values entered in these fields are correction values applied to the current phase angle measured by the secondary CT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

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RTU Voltage Sensor Magnitude

The values entered in these fields are correction values applied to the voltage measured by the secondary PT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

RTU Voltage Sensor Phase Angle

The values entered in these fields are correction values applied to the voltage phase angle measured by the secondary PT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

Navigation

Click the Done button to accept the changes.

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

Figure 2-43 LINDSEY Sensor Configuration

LINDSEY Sensor Configuration								
	1		2	3				
Cur	rent	Cu	rent	Current				
Magnitude	Phase Angle	Magnitude Phase Angle		Magnitude	Phase Angle			
1.0	0.0	1.0	0.0	1.0	0.0			
Ve	olts	V	olts	I.	/olts			
Magnitude	Phase Angle	Magnitude	Phase Angle	Magnitude	Phase Angle			
1.0	0.0	1.0	0.0	1.0	0.0			
RTU F	hase A	RTUI	Phase B	RTU Phase C				
		Current		Current				
Cur	rent	Cu	rent	Cu	urent			
Cur Magnitude	rent Phase Angle	Cu Magnitude	rent Phase Angle	Cu Magnitude	urrent Phase Angle			
Magnitude 0.9914	Phase Angle	Magnitude 0.9914	Phase Angle	Magnitude 0.9914	Phase Angle			
Magnitude 0.9914	Phase Angle 0.0	Magnitude 0.9914	Phase Angle 0.0	Magnitude 0.9914	Phase Angle 0.0			
Magnitude 0.9914 Vo	Phase Angle 0.0 Dits	Magnitude 0.9914	Phase Angle 0.0 Dits	Magnitude 0.9914	Phase Angle 0.0 Volts			
Magnitude 0.9914 Vo Magnitude	Phase Angle 0.0 Dits Phase Angle	Magnitude 0.9914 Ve Magnitude 0.9908	Phase Angle 0.0 Dlts Phase Angle	Magnitude 0.9914 Magnitude	Phase Angle 0.0 Volts Phase Angle			
Magnitude 0.9914 Vo Magnitude	Phase Angle 0.0 Dits Phase Angle	Magnitude 0.9914 Ve Magnitude 0.9908	Phase Angle 0.0 Dits Phase Angle 0.0	Magnitude 0.9914 Magnitude	Phase Angle 0.0 Volts Phase Angle			

The following entries apply to the Lindsey CVMI Input Type.

LINDSEY Current Sensor Magnitude

Enter the scaling factor as given in the accompanying documentation.

LINDSEY Current Sensor Phase Angle

Enter the scaling factor as given in the accompanying documentation.

LINDSEY Voltage Sensor Magnitude

Enter the scaling factor as given in the accompanying documentation.

LINDSEY Voltage Sensor Phase Angle

Enter the scaling factor as given in the accompanying documentation.

RTU Current Sensor Magnitude Factor

The values entered in these fields are correction values applied to the current measured by the secondary CT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

RTU Current Sensor Phase Angle

The values entered in these fields are correction values applied to the current phase angle measured by the secondary CT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

RTU Voltage Sensor Magnitude Factor

The values entered in these fields are correction values applied to the voltage measured by the secondary PT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

RTU Voltage Sensor Phase Angle

The values entered in these fields are correction values applied to the voltage phase angle measured by the secondary PT on the indicated phase. These values are stored in the software as defaults and will not need to be modified.

Line to Line Voltage (kvLL)

From the drop-down menu, enter the value 14.4, 25.0 or 34.5 in kV, of the line to line voltage.

Navigation

Click the Done button to accept the changes.

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

2.12.5 SFB 1MSSOE XTs Configuration (SAGE 2X00 Only)

Click on "Configure SFB XT# 1" (in this example, 1MSSOE). Enter the number of points that are attached to this 1MSSOE card. Click Continue to accept your entry, or Cancel to back out without saving.

Figure 2-44 Special Function Bus Card Configuration

Special Function Bus Card configuration

-		-	
SFB Card Location	SFB Card type	Configure each XT	Copy to Card
Select 1	1MSSOE	Configure SFB XT# 0	Copy
Select 2	1MSSOE	Configure SF Point Co	onfiguration
Select 3	ACI	Configure SF Number	of points 128
Select 4	ACI	Configure SF	cel Continue >>
Select 5	None	-	Сору
Select 6	None	-	Сору
Select 7	None	-	Сору
Select 8	None	-	Сору
			Back

The 1MSSOE Configuration screen allows you to name the point, type in a Debounce Time, a Valid Event time, and a Dead Time or accept the defaults for all values.

	Page 1 of 9	GoTo	Go	Next Page >>				
Point	Name	Debounc Time(ms		nt Dead Time (ms)				
-1	Comm Status	0	0	0				
1	MSSOE_PNT1	25	5		ck on Header to			
2	MSSOE_PNT2	25	5		ange All ange All X			
3	MSSOE_PNT3	25	5		ue Set			
4	MSSOE_PNT4	25	5	0 and	d/or change lividual values			
5	MSSOE_PNT5	25	5	0				
6	MSSOE_PNT6	25	5	0				
7	MSSOE_PNT7	25	5	0				
8	MSSOE_PNT8	25	5	U				
9	MSSOE_PNT9	25	5	0				
10	MSSOE_PNT10	25	5	0				
11	MSSOE_PNT11	25	5	0				
12	MSSOE_PNT12	25	5	0				
13	MSSOE_PNT13	25	5	0				
14	MSSOE_PNT14	25	5	0				
15	MSSOE_PNT15	25	5	0				
Cancel Submit								

Figure 2-45 1MSSOE Configuration

Note: Point -1 is a Comm Status point for the SOE channel.

Debounce time (ms) 1-255

Enter the debounce time in milliseconds to filter an event before it is logged as a valid event. The debounce time must be an odd number of 1/2 cycles. For 60 Hz systems, the optimum debounce time is 25 msec. The event time-tag will be that of the initial excursion that triggered the debounce timer. Default is 25 msec.

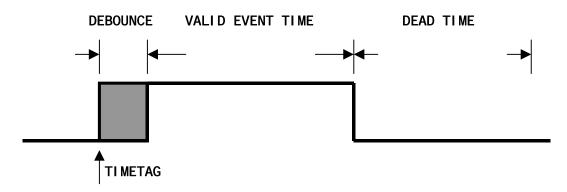
Valid event times (ms) 1-255

Enter the minimum event time required to validate an event. Default is 5 msec.

Dead time between events (ms) 0-255

Enter the minimum dead time required between events to validate that a new event has occurred. Default is 0.

Figure 2-46 1MS SOE Event Parameters



Navigation

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.

2.12.6 SFB DO XTs Configuration (SAGE 2X00 Only)

You may select up to two DO cards, one at a time. When you click on Configure SFB XT# n, you will get a screen similar to the one below..

Note: If you intend to use SFB DOs without using BB DOs, or BB SBOs, be sure to check "Skip BB SBO" under Control Configuration.

Doint	Nama	Momentary Relay
Point	Name	Duration
1	DO_PNT 1	500 (ms)
2	DO_PNT 2	500 (ms)
3	DO_PNT 3	500 (ms)
4	DO_PNT 4	500 (ms)
5	DO_PNT 5	500 (ms)
6	DO_PNT 6	500 (ms)
7	DO_PNT 7	500 (ms)
8	DO_PNT 8	500 (ms)
9	DO_PNT 9	500 (ms)
10	DO_PNT 10	500 (ms)
11	DO_PNT 11	500 (ms)
12	DO_PNT 12	500 (ms)
13	DO_PNT 13	500 (ms)
14	DO_PNT 14	500 (ms)
15	DO_PNT 15	500 (ms)
16	DO_PNT 16	500 (ms)

Figure 2-47 SFB Digital Output Configuration SFB Digital Output Configuration.

Point

This is the physical point number on the DO XT.

Name

This is the point name. You may change it, or accept the default.

Momentary Relay Duration

You may change the momentary relay pull-in time, or accept the default.

2.12.7 SFB Analog Outputs Configuration

(SFB AO CONFIGURATION NOT CURRENTLY IMPLEMENTED)

2.12.8 SFB HSPCI Configuration

(SFB HSPCI CONFIGURATION NOT CURRENTLY IMPLEMENTED)

2.13 Analog Outputs Configuration (SAGE 2X00 Only)

Click Analog Outputs. Type the number of points. Click Continue to configure the points.

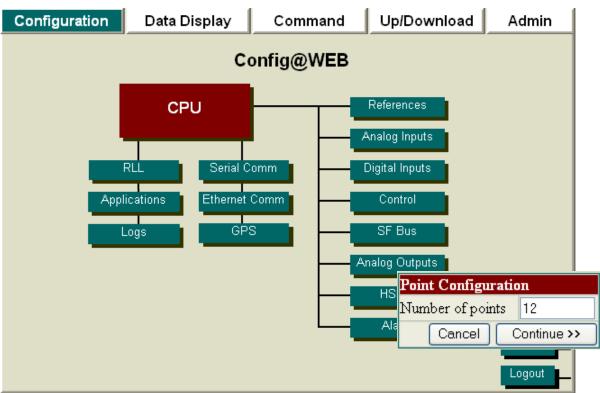


Figure 2-48 Analog Outputs Configuration

Type a name for the point (or accept the default), select the point Type from the drop-down menu, type in the EGU Min and EGU Max (or accept the defaults).

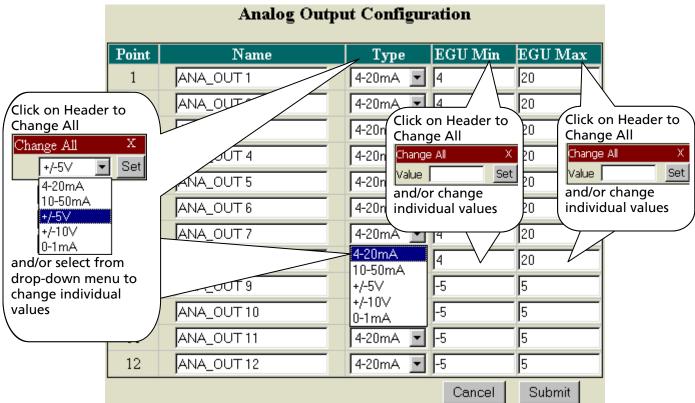


Figure 2-49 Analog Output Configuration

Navigation

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.

2.14 HSPCI Configuration

Note: This feature not implemented at this time.



Microso	ft Internet Explorer 🛛 🛛 🔀
⚠	Feature Not supported by this RTU
	ОК

2.15 Alarm Configuration

The two baseboard alarms may be sourced (triggered) by any DI, as shown below.

Alarm Output Point Mapping								
Point	Device Name	Point Name	Inv	ert	Source Points			
1	Hardware DI	DI_PNT_7	◯ Yes	⊙ No	Hardware DI 🛛			
2	Hardware DI	DI_PNT_11	⊖ Yes	⊙ No	Select Source Hardware DI			
					Common Time Data Transfer Port 1			
					DI_PNT_3			
					DI_PNT_4			
					DI_PNT_5			
					DI_PNT_6			
					DI_PNT_7			
					DI_PNT_8			
					DI_PNT_9			
					DI_PNT_10			
					DI_PNT_11			
					DI_PNT_12			
					DI_PNT_13			
					Cancel Submit			

Figure 2-51 Baseboard Alarm Output Configuration

Point

This is the physical point number of the alarm.

Device Name

This is the source of the point.

Point Name

This is the point name.

Invert

This allows you to invert the manner in which the DI triggers the alarm. The default is NO inversion.

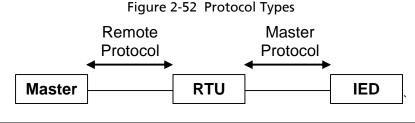
Source Points

Select the DIs to trigger the alarms from the list of sources.

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

2.16 Serial Comm Configuration

There are two types of protocols that the RTU deals with: Remote and Master. Master protocol means that the RTU is gathering data from an IED. Remote protocol means that the RTU is talking to a Master Station. Both types are shown in Figure 2-52.



Note: An IED could be another RTU.

The SAGE configuration utility has 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 configuration should follow this sequence:

- Configure Hardware I/O
- Configure IEDs
- Configure Master Station interface ports

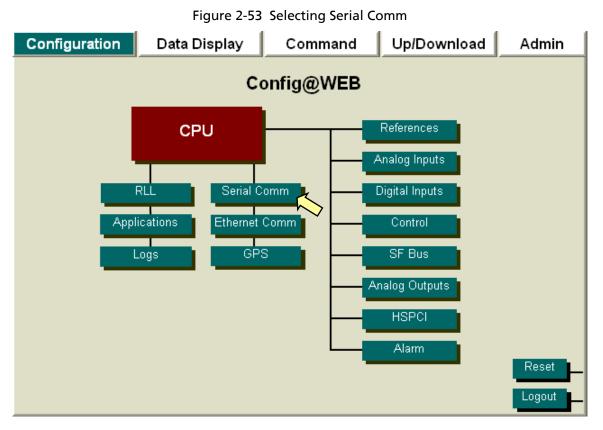
Caution: Configure only ports that physically exist. For instance, if the RTU does not have comm. expansion cards for ports 5 through 12, do not configure any protocols for these ports. If a non-existing port were to be configured, the RTU would use all its resources looking for that port. That is, it would "hang." To recover from such a loop, boot-up would have to be halted from the console when you see this message:

Press the SPACE bar to run the GUI only . . .

This will allow you to correct the configuration.

Notice: Do not configure a port without configuring points for that port.

To begin serial communications configuration, select Serial Comm as shown in Figure 2-53.



The Communication Port Configuration screen has a number of features that are explained below.

Communication Port Configuration									
Port Number	RTS	DTR	Configure IRQs	Name	Protoco	1	Configure Protocol	Point Operations	Copy to Port
Port #1	К 💌	К 💌		Series V to Master	Series V	*	Port 01	Map Points	Сору
Port #2	K H	К 💌	IRQ6	Port 2	None	*	Port 02	-	Сору
Port #3	Ľ	К 💌	шQQ	Port 3	None	*	Port 03	-	Сору
Port #4	К 💌	К 💌		Port 4	None	*	Port 04	-	Сору
Port #5	К 💌	К 🕶		Port 5	None	*	Port 05	-	Сору
Port #6	К 💌	К 💌		<u>Port 6</u>	None	*	Port 06	-	Сору
Port #7	К 💌	К 💌	IRQ6 🔽	<u>Port 7</u>	None	*	Port 07	-	Сору
Port #8	К 💌	К 💌		Port 8	None	*	Port 08	-	Сору
Port #9	К 💌	К 💌		Port 9	None	*	Port 09	-	Сору
Port #10	К 💌	К 💌		<u>Port 10</u>	None	*	Port 10	-	Сору
Port #11	К 💌	К 💌	IRQ6 🔽	<u>Port 11</u>	None	*	Port 11	-	Сору
Port #12	К 💌	К 💌		<u>Port 12</u>	None	*	Port 12	-	Сору
									Back

Figure 2-54 Communication Port Configuration
--

Port Number

This is the physical port number. **Note:** The SAGE 3030X has 16 ports

RTS and DTR

Note: This option is not available on baseboard RS-485 or on fiber optic serial ports. In these instances, the option is grayed out and cannot be selected.

Request To Send and Data Terminal Ready. Using the drop-down list, set to K, H, or L.

"K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. See Figure 2-55. Typically used as a Radio/Modem key output (Default Setting).

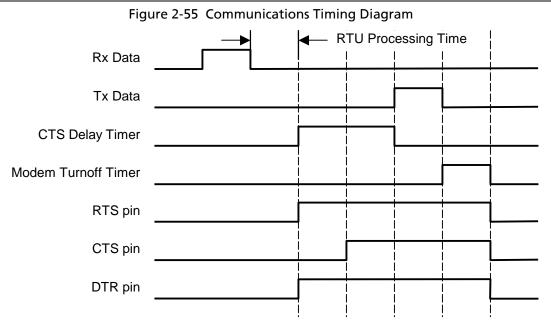
"H" represents Positive RS232 Voltage.

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.

Note: Setting RTS to "H" (High) provides approximately +12V to pin 7 of the RS232 port. Setting DTR to "H" (High) provides +12V to pin 4 of the RS232 port.

"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

Port name. Click the default port under Name to name the port (or accept the default). Click Submit to accept the name, as shown in Figure 2-56.

Protocol

Select the desired protocol from the drop-down list. See Figure 2-57.

Configure Protocol

See section 2.16.2.1

Point Operations

See section 2.16.2.7

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. See Figure 2-59.

Communication Port Configuration								
Port Number	RTS	DTR	Configure IRQs	Name	Protocol	Configure Protocol	Point Operations	Copy to Port
Port #1	К 💌	К 💌		Series V to Master	:	Port 01	Map Points	Сору
Port #2	К 💌	К 💌	IRQ6	Port 2 Ed	it Port Name	ort O2	-	Сору
Port #3	К 💌	К 💌	тсбо	Port 3 Na	me Series V to Master	ort 03	-	Сору
Port #4	К 💌	К 💌		Port 4	Cancel Subr	nit ort 04	-	Сору
Port #5	К 💌	К 💌		Port 5	None 💌	Port 05	-	Сору
Port #6	К 💌	К 💌	IRQ6 🗸	<u>Port 6</u>	None 💌	Port 06	-	Сору
Port #7	К 💌	К 💌	IRQ8	<u>Port 7</u>	None 💌	Port 07	-	Сору
Port #8	К 💌	К 💌		<u>Port 8</u>	None 💌	Port 08	-	Сору
Port #9	К 💌	К 💌		<u>Port 9</u>	None 💌	Port 09	-	Сору
Port #10	К 💌	К 💌		<u>Port 10</u>	None 💌	Port 10	-	Сору
Port #11	К 💌	К 💌	IRQ6 🔽	<u>Port 11</u>	None 💌	Port 11	-	Сору
Port #12	К 💌	К 💌		<u>Port 12</u>	None	Port 12	-	Сору
								Back

Figure 2-56 Communication Port Configuration: Port Name

From the drop-down menu, select a protocol (see Figure 2-57). If the selected protocol is for IEDs, the Point Operations button will say "Configure". If the selected protocol is to talk to a Master, the Point Operations button will say "Map Points" (see Figure 2-58).

	Communication Port Configuration									
Port Number	RTS	DTR	Configure IRQs	Name	Protocol		Configure Protocol	Point Operations		Copy o Port
Port #1	К 🛩	К 🛩		Series V to Master	Series V	~	Port 01	Map Points		Сору
Port #2	К 🛩	К 🛩	IRQ6	Port 2	Electran ETI	^	Port 02	-		Сору
Port #3	К 🛩	К 🛩	IKQ0	Port 3	Harris (M)		Port 03	-		Сору
Port #4	К 🛩	К 🛩		Port 4	Incom Modbus(M)		Port 04	· ·		Сору
Port #5	К 🛩	К 🛩		Port 5	Quantum SEL		Port 05	· ·		Сору
Port #6	К 🛩	К 🛩		Port 6	Series V(M)		Port 06	-		Сору
Port #7	К 🛩	К 🛩	IRQ6 💌	Port 7	Symax Transdata		Port 07	· ·		Сору
Port #8	К 🛩	К 🛩		Port 8	Tunnel MTU-RTU		Port 08	-		Сору
Port #9	К 🛩	К 🛩		Port 9	8979 C2100H		Port 09	-		Сору
Port #10	К 🛩	К 🛩		<u>Port 10</u>	CDCI		Port 10	· ·		Сору
Port #11	К 🛩	К 🛩	IRQ6 💌	<u>Port 11</u>	DNPR		Port 11	-		Сору
Port #12	К 🛩	К 🛩		<u>Port 12</u>	FM Harris (R)	Ξ	Port 12	-		Сору
					IDLC 1					Back
					L&N M9000					
					Modbus(R)					
					PG&E					
					PMS 80					
					Series V					
					SES 92					
					SVGP					
					SVNC					
					VanComm	~				

Figure 2-57 Communication Port Configuration: Assigning Protocol

Communication Port Configuration

Communication 1 of Comiguration									
Port Number	RTS	DTR	Configure IRQs	Name	Protocol		Configure Protocol	Point Operations	Copy to Port
Port #1	К 💌	К 💌		Series V to Master	Series V 🔹	•	Port 01	Map Points	Сору
Port #2	К 💌	К 💌	тоr	Port 2	None	•	Port 02	-	Сору
Port #3	К 💌	К 💌	IRQ6	Port 3	None	•	Port 03	-	Сору
Port #4	К 💌	К 💌		Port 4	None	•	Port 04	-	Сору
Port #5	К 💌	К 💌		Port 5	None	•	Port 05	-	Сору
Port #6	К 💌	К 💌	IRQ6 🔽	Port 6	None	•	Port 06	-	Сору
Port #7	К 💌	К 💌	IRQ6 🚩	<u>Port 7</u>	None	•	Port 07	-	Сору
Port #8	К 💌	К 💌		Port 8	None	•	Port 08	-	Сору
Port #9	К 💌	К 💌		<u>Port 9</u>	None	•	Port 09	-	Сору
Port #10	К 💌	К 💌		<u>Port 10</u>	None	•	Port 10	-	Сору
Port #11	К 💌	К 💌	IRQ6 💌	<u>Port 11</u>	None	•	Port 11	-	Сору
Port #12	К 💌	К 💌		<u>Port 12</u>	None	•	Port 12	-	Сору
									Back

Communication Port Configuration

If you have several ports with nearly the same configuration, you may want to copy configuration from one port to another. Enter the target port number under Copy to Port and click Copy. See Figure 2-59.

	Communication Port Configuration									
Port Number	RTS	DTR	Configure IRQs	Name	Protocol		Configure Protocol	Point Operations		Copy Port
Port #1	К 💌	К 💌		Series V to Master	Series V	*	Port 01	Map Points	3	Сору
Port #2	К 💌	К 💌	IRQ6	Port 2	None	*	Port 02	-		Сору
Port #3	К 💌	К 💌	тсбо	Port 3	None	*	Port 03	-		Сору
Port #4	К 💌	К 💌		Port 4	None	~	Port 04	-		Сору
Port #5	К 💌	К 💌		Port 5	None	*	Port 05	-		Сору
Port #6	К 💌	К 💌		<u>Port 6</u>	None	*	Port 06	-		Сору
Port #7	К 💌	К 💌	IRQ6 🔽	<u>Port 7</u>	None	*	Port 07	-		Сору
Port #8	К 💌	К 💌		Port 8	None	*	Port 08	-		Сору
Port #9	К 💌	К 💌		<u>Port 9</u>	None	~	Port 09	-		Сору
Port #10	К 💌	К 💌		<u>Port 10</u>	None	*	Port 10	-		Сору
Port #11	К 💌	К 💌	IRQ6 🔽	<u>Port 11</u>	None	*	Port 11	-		Сору
Port #12	К 💌	К 💌		<u>Port 12</u>	None	~	Port 12	-		Сору
										Back

Figure 2-59	Copying Ports
-------------	---------------

The result of the Copy to Port is shown in Figure 2-60. You may assign a name to the new port as was shown in Figure 2-56.

	Communication Port Configuration								
Port Number	RTS	DTR	Configure IRQs	Name	Protocol		Configure Protocol	Point Operations	Copy to Port
Port #1	К 💌	К 💌		Series V to Master	Series V	*	Port 01	Map Points	3 Copy
Port #2	К 💌	К 💌	IRQ6	Port 2	None	~	Port 02	-	Сору
Port #3	К 💌	К 💌	тсбо	Port 3	Series V	~	Port 03	Map Points	Сору
Port #4	К 💌	К 💌		<u>Port 4</u>	None	~	Port 04	-	Сору
Port #5	К 💌	К 💌		Port 5	None	*	Port 05	-	Сору
Port #6	К 💌	К 💌		Port 6	None	~	Port 06	-	Сору
Port #7	К 💌	К 💌	IRQ6 🔽	<u>Port 7</u>	None	*	Port 07	-	Сору
Port #8	К 💌	К 💌		Port 8	None	*	Port 08	-	Сору
Port #9	К 💌	К 💌		Port 9	None	~	Port 09	-	Сору
Port #10	К 💌	К 💌		<u>Port 10</u>	None	*	Port 10	-	Сору
Port #11	К 💌	К 💌	IRQ6 💌	<u>Port 11</u>	None	*	Port 11	-	Сору
Port #12	К 💌	К 💌		<u>Port 12</u>	None	~	Port 12	-	Сору
									Back

Figure 2-60 Result of Copying to Port

The following sections cover examples of 2179 protocol configuration and Series 5 protocol configuration. Each protocol has two distinct parts to configure: "Configure Protocol" and "Point Operations." Remember, you must configure all the points on the input to the RTU before you configure an output port. Protocol 2179 is an input. Protocol Series 5 is an output port. First, configure the RTU hardware points, then configure the 2179 IED (input port) points, then configure the Series 5 output port.

2.16.1 Internal COMM Status Points

COMM Status applies to any port. Shown below are two examples; one for DNPM, then another for DNPR.

	DNPM Status Configura	ation	
Port # 2 ED # : 1		ort Name : Port 2 ne : DNPM_IED_1	
Point	Name	IED Point	
-1	COMM_STS	-1	Automatically generated Internal
0	IED_STS 0	0	Status Point
1	IED_STS 1	1	
2	IED_STS 2	2	
3	IED_STS 3	3	
4	IED_STS 4	4	
5	IED_STS 5	5	
6	IED_STS 6	6	
7	IED_STS 7	7	
	Can	cel Submit	

Figure 2-61 DNPM COMM Status Point

In the mapping example below, note that we are mapping both the COMM Status for the DNPM port and the COMM Status for the DNPR port back to the Master on DNPR.

Point	Device Name	Point Name	Inv	ert 🤏		Source Points	
0	Port 1	Port 1 COMM Status	OYes	: 💿 No	^	DNPM_IED_1	•
1	DNPM_IED_1	COMM_STS	O Yes	: 💿 No		Select Source DNPM IED 1	
2		SPARE	OYes	i 💿 No		Internal Status Port 1	
3		SPARE	O Yes	: 💿 No		IED_STS 0	
4		SPARE	O Yes	: 💿 No		IED_STS 1	
5		SPARE	OYes	: 💿 No		IED_STS 2	
6		SPARE	OYes			IED_STS 3	
						IED_STS 4	
7		SPARE	_ OYes	: 💿 No		IED_STS 5	
8		SPARE	O Yes	No 💿		IED_STS 6	
9		SPARE	OYes	: 💿 No		IED_STS 7	
10		SPARE	O Yes	 No 			
11		SPARE	∕ Yes	: 💿 No			
12		SPARE	OYes	i 💿 No			
13		SPARE		No.	~		

Figure 2-62 DNPR COMM Status Point DNPR Binary Input Point Mapping

COMM Status points will be open when the comm. channel is operational, and closed when the comm. channel is failed.

2.16.2 Serial Comm Configuration Examples

2.16.2.1 DNPM 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 2-63. 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.

Communication Fort Configuration									
DTR	Configure IRQs	Name	Protocol	Configure Protocol	Point Operations	Copy to Port			
К 💌		Port 1		Port 01	Configure	Сору			
К 💌	ТОS	Port 2	None —Master—	Port 02	-	Сору			
К 💌	тСо	Port 3	2179 C2100H(M)	Port 03	-	Сору			
К 💌		Port 4	DNPM	Port 04	-	Сору			
К 💌		Port 5	Modbus(M)	Port 05	-	Сору			
К 💌		<u>Port 6</u>		Port 06	-	Сору			
К 💌	IRQ6 🚩	<u>Port 7</u>	Series V(M)	Port 07	-	Сору			
К 💌		Port 8	Transdata	Port 08	-	Сору			
К 💌		Port 9		Port 09	-	Сору			
К 💌		<u>Port 10</u>	Arbiter C2100H CDC1	Port 10	-	Сору			
К 💌	IRQ6 Y	<u>Port 11</u>		Port 11	-	Сору			
К 💌		<u>Port 12</u>	DNPR	Port 12	-	Сору			
			FM Harris			Back			
			Modbus(R)						
			Series V						
			SES 92						
			VanComm						
	K • • K • * K • • K • * K * *	K V K V K V K V K V K V K V HRQ6 V K V HRQ6 V	Configure IRQsNameK • K •Port 1K • RQ6Port 2K • Port 3Port 3K • Port 4Port 4K • Port 5Port 5K • RQ6 •Port 6K • Port 7Port 8K • Port 9Port 10K • Port 10Port 11	DTR Configure IRQs Name Protocol K Port 1 DNPM None K Port 2 None K Port 3 2179 K Port 4 DNPM K Port 4 DNPM K Port 5 Modbus(M) K Port 6 SEL K Port 7 Series V(M) Symax Transdata Slave- B979 Port 10 C2100H K Port 9 8979 K Port 11 CDC I K Port 12 DNPR	DTR Configure IRQs Name Protocol Configure Protocol K ♥ Port 1 DNPM ♥ Port 01 Port 02 K ♥ Port 2 Master Port 02 K ♥ Port 3 2179 Port 03 K ♥ Port 4 DNPM Port 03 K ♥ Port 5 Modbus(M) Port 05 K ♥ Port 6 Selication Port 05 K ♥ Port 6 Series V(M) Port 07 K ♥ Port 9 8979 Port 08 K ♥ Port 9 8979 Port 10 K ♥ Port 10 Arbiter Port 10 K ♥ Port 11 CDC I Port 10 K ♥ Port 12 DNPR Port 12 FM Harris <ii< td=""> IDLC L&N Modbus(R) PG&E PMS 80 Series V SES 92 SVNC SVNC SVNC</ii<>	DTR Configure IRQs Name Protocol Configure Protocol Point Operations K ♥ Port 1 DNPM ♥ Port 01 Configure K ♥ Port 2			

Figure 2-63 DNPM Communication Port Configuration

Port Number

Physical Port number of the RTU.

RTS and DTR

Request To Send and Data Terminal Ready. 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.

"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).

"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.

"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

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

Navigation

Click the Back button to return to the previous screen.

2.16.2.2 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 2-64.

Figure 2-64 DNPM Communication Channel Configuration

DNPM RTU Communication Channel Configuration

Port # : 16			Port Name : Port 16			
Data Link Para	meters	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 S	etup	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			
Default: 0.		Ca	ncel Submit			
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.

2.16.2.3 Data Link Parameters

Baud Rate (300-38400)

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.

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.

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.

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 <u>greater</u> than Delay for First Byte timer (below).

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).

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.

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.

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.

2.16.2.4 Message Setup

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.

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.

Number of Frame Retries (0 to 9)

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

2.16.2.5 Scanner Application Parameters

Number of IEDs (0 to 40)

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

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.

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.

Scanner application retries (0 to 10)

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

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.

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.

Accumulator freeze time 1 (-1 to 3600 sec) Accumulator freeze time 2 (-1 to 3600 sec) Accumulator freeze time 3 (-1 to 3600 sec) 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.

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.

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.

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.

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.

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.

2.16.2.6 Series 5, Configure Protocol

On the Communication Port Configuration, under the heading Configure Protocol, click Port *n* to configure the Series 5 port as shown in Figure 2-65.

Communication Port Configuration									
Port Number	RTS	DTR	Configure IRQs	Name	Protocol		Configure Protocol	Point Operations	Copy to Port
Port #1	К 💌	К 💌	IRQ6	Series V to Master	Series V	*	Port 01	Map Points	Сору
Port #2	К 💌	К 💌		<u>Port 2</u>	None	*	Port 02	-	Сору
Port #3	К 💌	К 💌		Port 3	None	*	Port 03	-	Сору
Port #4	К 💌	К 💌		<u>Port 4</u>	None	*	Port 04	-	Сору
Port #5	К 💌	К 💌	IRQ6 💌	Port 5	None	*	Port 05	-	Сору
Port #6	К 💌	К 💌		<u>Port 6</u>	None	*	Port 06	-	Сору
Port #7	К 💌	К 💌		<u>Port 7</u>	None	*	Port 07	-	Сору
Port #8	К 💌	К 💌		Port 8	None	*	Port 08	-	Сору
Port #9	К 💌	К 💌	IRQ6 💌	<u>Port 9</u>	None	*	Port 09	-	Сору
Port #10	К 💌	К 💌		<u>Port 10</u>	None	*	Port 10	-	Сору
Port #11	К 💌	К 💌		<u>Port 11</u>	None	*	Port 11	-	Сору
Port #12	К 💌	К 💌		<u>Port 12</u>	None	~	Port 12	-	Сору
									Back

Figure 2-65 Communication Port Configuration: Assigning Protocol Results

Navigation

Click the Back button to go back to the Configuration screen.

You may accept all defaults or fill in the form according to the information following Figure 2-66.

Figure 2-66 Communication Channel Setup for Series 3/5

SERIES V COMMUNICATION CHANNEL SETUP

Port # : 2	Port Name : Port 2
	· · ·
RTU I.D.	1
Series Type	OIII ⊙V
Security Type	⊙ LRC ○ CRC
Baud Rate *	1200 💌
Parity *	Odd 💌
Stop Bits *	1 💌
CTS Delay *	20 (ms)
Rx Timeout *	5000 (ms)
Tx Timeout	5000 (ms)
B4 Time *	1 (ms)
Interbyte Time *	10 (ms)
Modem Turn Off Time *	0 (ms)
Communications Timeout	10 (sec.)
Half Duplex	⊙No ○Yes
Hardware CTS	⊙No ○Yes
Hardware DCD	⊙No ⊖Yes
	Cancel Submit

Default: 1. Range: 1 to 127.

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 RTU I.D.

RTU I.D. (1 – 127)

Enter the RTU I.D. number. This number is used to allow an RTU to respond to the master when it is received in a message. Default setting is 1.

Series Type

Identifies the communications protocol used between the MTU and RTU. The default is Series V.

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. Default setting is LRC.

Baud Rate (300 - 19200)

Select the communications speed for the associated channel. Default setting is 1200.

Parity (None, Odd, Even)

Select the parity for the associated channel. The default setting is Odd.

Stop Bits (0,1,2)

Select the stop bits from the pull-down menu. The default is 1.

CTS Delay (0 – 1000ms)

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 20.

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 5000 (5 seconds).

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).

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 1.

Interbyte Time (0 – 250ms)

Enter the interbyte time allowed before the received message is terminated. Default setting is 10.

Modem Turn Off Time (0 – 250ms)

Enter the time delay after the last transmitted byte before turning off the modem. Default setting is 0.

Communications Timeout (1 to 86,400 sec.)

Enter the communications timeout for the associated channel. The communications 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 10 sec.

Half Duplex (No, Yes)

Enter Yes for half duplex or No for full duplex. This field 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.

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.

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.

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.

2.16.2.7 Series 5, Point Operations, Point Mapping

The act of mapping points within the RTU creates a few interesting concepts that need to be understood.

- 1. Each Source Point (I/O type or IED) has its own database in the RTU. This database can be exposed to other parts of the system to accomplish data display or point mapping.
- 2. Each RTU protocol that connects to say, a master station, has its own database. This database can also be displayed once it is created. However, the act of creating this database is accomplished through the task of point mapping.

From the configuration diagram select the box Serial Comm. The following screen will appear. For the sake of illustrations the following example uses the Series 5 protocol to explain Point Mapping.

Click Map Points for the SV protocol from the following screen.

Port	RTS	DTR	Configure	Name	Protocol	-	Configure	Point	Сору
Number	III S		IRQs	1141110	1100000		Protocol	Operations	to Port
Port #1	К 💌	К 💌		Series V to Master	Series V	*	Port 01	Map Points	Сору
Port #2	К 💌	К 💌	IRQ6	Port 2	None	*	Port 02	-	Сору
Port #3	К 💌	К 💌	шQQ	<u>Port 3</u>	None	*	Port 03	-	Сору
Port #4	К 💌	К 💌		<u>Port 4</u>	None	*	Port 04	-	Сору
Port #5	К 💌	К 💌		Port 5	None	*	Port 05	-	Сору
Port #6	К 💌	К 💌		Port 6	None	*	Port 06	-	Сору
Port #7	К 💌	К 💌	IRQ6 💌	<u>Port 7</u>	None	*	Port 07	-	Сору
Port #8	К 💌	К 💌		Port 8	None	*	Port 08	-	Сору
Port #9	К 💌	К 💌		Port 9	None	*	Port 09	-	Сору
Port #10	К 💌	К 💌	IRQ6 🔽	<u>Port 10</u>	None	*	Port 10	-	Сору
Port #11	К 💌	К 💌	IRQ6 Y	<u>Port 11</u>	None	*	Port 11	-	Сору
Port #12	К 💌	К 💌		<u>Port 12</u>	None	~	Port 12	-	Сору
									Back

Figure 2-67 Communication Port Configuration

Commu	• .•	T	~ ~	
('O 110 110 111	100100		0.000	DOTION.
				

Enter the number of points for the type of interest. Remember to include the total number of analog points (if you want them all to be sent to the Master), including References, hardware analogs, ACI analogs, IED analogs, etc.

Series V Communication Mapping					
Port # : 3 Port Name : Port 3					
Type	Number	Map			
Analog Inputs	34	MAP			
Status Inputs	24	MAP			
Accumulators	8	MAP			
Digital Outputs	0	MAP			
Analog Outputs	0	MAP			
SBO	12	MAP			
		Back			

Figure 2-68	Series	5	Communication	Manning
rigule 2-00	Jenes	2	Communication	wapping

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 go back to the Communication Port Configuration.

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

Click MAP for the point-type of interest. A screen similar to Figure 2-69 will appear. You may select all points, a single point, or compile a list of points by using "Shift Click" and/or "Ctrl Click". Shift Click includes all in-between points. Ctrl Click selects individual points.

- From drop-down menu under Source Points, select type of points (e.g., for analogs, References, then Hardware, etc.)
- Individual source points may be dragged and dropped into the desired order.
- Select All points may be dragged and dropped at once.
- Select points in a customized list with "Shift Click" and/or "Ctrl Click". See Figure 2-70.
- SPAREs may be clicked and dropped where desired.
- There must be no "Missing Point Info". If a Point Name is unused, mark it as SPARE.
- Specific points or groups of points may be searched from the point database
- After mapping, points may be inserted (above or below) or deleted from the mapped list without having to remap all points.

Point	Device Name	Point Name	C Min 🔊	C Max 🔊		Sour -oints	
0		SPARE	-2000	2000		DNPM_IED_1	
1		SP E	-2000	2000		Search	
2	/	ARE	-2000	2000		SPARE	
3	4. Click second ti		-2000	2000		Select All points IED_ANALOG 0	
4	"drop" points (not		-2000	2000			
5	yellow highlight f			2000 2. Clic	k on	IED_ANALOG 2	
6	selection)	3. Move por	inter	2000		IED_ANALOG 3	
7			-2000			IED_ANALOG 4	
		SPARE	-2000	2000		IED_ANALOG 5	
8		SPARE	-2000	2000		IED_ANALOG 6	
9		SPARE	-2000	2000		IED_ANALOG 7	
10		SPARE	-2000	2000		IED_ANALOG 8 IED_ANALOG 9	
11				1		IED_ANALOG 9	
		SPARE	-2000	2000		IED_ANALOG 11	
12		SPARE	-2000	2000		IED_ANALOG 12	
13		SPARE	-2000	2000		IED_ANALOG 13	
14		SPARE	-2000	2000		IED_ANALOG 14	
15		SPARE	-2000	2000	~	IED_ANALOG 15	
		or rule	2000	2000	\mathbf{M}		

Figure 2-69 Analog Source Point Mapping Series V Analog Input Point Mapping

Figure 2-70 Point Mapping – Compiling a List

Series V Analog Input Point Mapping

rt # : 1						Port Name : Port 1
Point	Device Name	Point Name	C Min 🔊	C Max 🔊		Source Points
0	DNPM_IED_1	IED_ANALOG	-2000	2000		DNPM_IED_1
1	DNPM_IED_1	IED_ANA JG 3	-2000	2000		Search 1. Ctrl Click
2	DNPM_IED_1	IED ALOG 6	-2000	2000		SPARE once
3		E	-2000	2000		Select All points IED_ANALOG 0
4	5. Click to "c	lrop"	-2000	2000		IED_ANALOG 1
5	the non-cont		-2000	2000 3. Ct	rl C	Lick IED_ANALOG 2
6	list of points		-2000	2000 third	tim	IED_ANALOG 3 2. Ctrl Cl IED_ANALOG 4 twice
7		4. Move pointer	-2800	2000		IED_ANALOG 5
8		SPARE	-2000	2000	1	IED_ANALOG 6
9		SPARE	-2000	2000	1	IED_ANALOG IED_ANALOG 0
10		SPARE	-2000	2000	1	IED_ANALOG IED_ANALOG IED_ANALOG IED_ANALOG 6
11		SPARE	-2000	2000		IED_ANALOG 10
12		SPARE	-2000	2000	1	IED_ANALOG Compiles a
13		SPARE	-2000	2000	1	IED_ANALOG IED_ANALOG list of points
14		SPARE	-2000	2000	1	IED_ANALOG 1+
15		SPARE	-2000	2000		IED_ANALOG 15

After your Source Points have been dropped as shown in Figure 2-71, you will notice that the Point name field and the Device Name field have been updated.

Next Enter the counts expected by the master.

Figure 2-71 Results of "Click-Drag-Click"

Series V Analog Input Point Mapping

Point	Device Name	Point Name	C Min 🄊	C Max 🔊		Source Points	
0	DNPM_IED_1	IED_ANALOG 0	-2000	2000		DNPM_IED_1	
1	DNPM_IED_1	IED_ANALOG 3	-2000	\sum		Search	
2	DNPM_IED_1	IED_ANALOG 6	-2000	Click on Header	to	SPARE	
3		SPARE	-2000	Change All		Select All points IED ANALOG 0	
4		SPARE	-2000	Change All	1		
5		SPARE	-2000	Value		Get IED_ANALOG 1 IED_ANALOG 2	
6	Source			and/or change individual values	~	IED_ANALOG 3	
-		SPARE	_	individual values	5	IED_ANALOG 4	
7		SPARE	-2000		-1	IED_ANALOG 5	
8	Poi	int names from	-2000	2000		IED_ANALOG 6	
9	poi	nt configuration	-2000	2000		IED_ANALOG 7 IED_ANALOG 8	
10		SPARE	-2000	2000		IED_ANALOG 9	
11		SPARE	-2000	2000		IED_ANALOG 10	
12		SPARE	-2000	2000		IED_ANALOG 11	
13						IED_ANALOG 12	
14		SPARE	-2000	2000		IED_ANALOG 13	
		SPARE	-2000	2000		IED_ANALOG 14 IED_ANALOG 15	
15		SPARE	-2000	2000	~	TED_VINCEO0.12	

The Search function makes it easy to find and map specific points from any source. Put your cursor in the gray field below Sources and click once. Type in any combination of numbers or letters. If there is a match, those points will be displayed, as shown.

Point	Device Name	Point Name	C Min 🔊	C Max 🔊		Source Points	
0	DNPM_IED_1	IED_ANALOG 0	-2000	2000		DNPM_IED_1	
1	DNPM_IED_1	IED_ANALOG 3	-2000	2000		Search	
2	DNPM_IED_1	IED_ANALOG 6	-2000	2000		SPARE	
3		SPARE	-2000	2000	1	Select All points IED ANALOG 0	
4		SPARE	-2000	2000		IED_ANALOG 0	
5		SPARE	-2000	2000		IED_ANALOG 2	
6		SPARE	-2000	2000		IED_ANALOG 3	
7				2000		IED_ANALOG 4	
8		SPARE	-2000			IED_ANALOG 5 IED_ANALOG 6	
9		SPARE	-2000	2000		IED_ANALOG 7	
		SPARE	-2000	2000		IED_ANALOG 8	
10		SPARE	-2000	2000		IED_ANALOG 9	
11		SPARE	-2000	2000		IED_ANALOG 10	
12		SPARE	-2000	2000		IED_ANALOG 11 IED_ANALOG 12	
13		SPARE	-2000	2000		IED_ANALOG 13	
14		SPARE	-2000	2000	1	IED_ANALOG 14	
15		SPARE	-2000	2000		IED_ANALOG 15	

Figure 2-72 Before Search
Series V Analog Input Point Mapping

SAGE1-SFT-00001

Figure 2-73 After Search

Series V Analog Input Point Mapping

ort # : 1						Port Name : Por
Point	Device Name	Point Name	C Min 👓	C Max 🔊		Source Points
0	DNPM_IED_1	IED_ANALOG 0	-2000	2000	_	DNPM_IED_1
1	DNPM_IED_1	IED_ANALOG 3	-2000	2000		23
2	DNPM_IED_1	IED_ANALOG 6	-2000	2000		SPARE
3		SPARE	-2000	2000		Select All points IED ANALOG 23
4		SPARE	-2000	20 "23" is er	y nter	
5		SPARE	-2000	2000		IED_ANALOG 223
6		SPARE	-2000	2000		IED_ANALOG 230
7		SPARE	-2000	2000		IED_ANALOG 231 IED_ANALOG 232
8		SPARE	-2000	2000		IED_ANALOG 233
9		SPARE	-2000	2000		IED_ANALOG 234
10			_			IED_ANALOG 235
		SPARE	-2000	2000		IED_ANALOG 236
11		SPARE	-2000	2000		IED_ANALOG 237
12		SPARE	-2000	2000		IED_ANALOG 238 IED_ANALOG 239
13		SPARE	-2000	2000		IED_ANALOG 239
14		SPARE	-2000	2000		Search returns only those
15		SPARE	-2000	2000	~	points that have"23" as part of their names
						Cancel Subm

To Insert Above, place your cursor on a Point number (in this example, Point #6) and <u>right</u> click the mouse. The message box shown below appears. Select Insert above and <u>left</u> click.

Port # : 1 Port Name : Port							
Point	Device N	Name	Point Name	C Min 🔊	C Max 🔊		Source Points
0	DNPM_I	ED_1	IED_ANALOG 0	-2000	2000	^	Select Source 💌
1	DNPM_I	ED_1	IED_ANALOG 1	-2000	2000		Search
2	DNPM_I	ED_1	IED_ANALOG 2	-2000	2000		
3	DNPM_I	ED_1	IED_ANALOG 3	-2000	2000		
4	DNPM_I	ED_1	IED_ANALOG 4	-2000	2000		
5	DNPM_I	ED_1	IED_ANALOG 5	-2000	2000		
6 Inser	t above	ED_1	IED_ANALOG 6	-2000	2000		
	below IPM_II	ED_1	IED_ANALOG 7	-2000	2000		
Delete	e IPM_I	ED_1	IED_ANALOG 8	-2000	2000		
9	DNPM_I	ED_1	IED_ANALOG 9	-2000	2000		
10	DNPM_I	ED_1	IED_ANALOG 10	-2000	2000		
11	DNPM_I	ED_1	IED_ANALOG 11	-2000	2000		
12	DNPM_I	ED_1	IED_ANALOG 12	-2000	2000		
13	DNPM_I	ED_1	IED_ANALOG 13	-2000	2000		
14	DNPM_I	ED_1	IED_ANALOG 14	-2000	2000		
15	DNPM_I	ED_1	IED_ANALOG 15	-2000	2000	~	
							Cancel Submit

Figure 2-74	Insert Above
-------------	--------------

The results of Insert above is shown in the next Figure. Notice that the old Point #6, IED_ANALOG 6, is now pushed down. A Spare takes its place. Also notice that the Point numbers remain contiguous.

Insert below works the same way, only the Spare is created below the designated point.

The usefulness of this procedure is that any desired point can now be mapped to the Spare point.

Figure 2-75 Results of Insert Above

Series V Analog Input Point Mapping

Port # : 1						Port Name : Port 1
Point	Device Name	Point Name	C Min 🔊	C Max 🔊		Source Points
0	DNPM_IED_1	IED_ANALOG 0	-2000	2000	<u>^</u>	Select Source
1	DNPM_IED_1	IED_ANALOG 1	-2000	2000		Search
2	DNPM_IED_1	IED_ANALOG 2	-2000	2000		
3	DNPM_IED_1	IED_ANALOG 3	-2000	2000		
4	DNPM_IED_1	IED_ANALOG 4	-2000	2000		
5	DNPM_IED_1	IED_ANALOG 5	-2000	2000		
6		SPARE	-2000	2000		
7	DNPM_IED_1	IED_ANALOG 6	-2000	2000		
8	DNPM_IED_1	IED_ANALOG 7	-2000	2000		
9	DNPM_IED_1	IED_ANALOG 8	-2000	2000		
10	DNPM_IED_1	IED_ANALOG 9	-2000	2000		
11	DNPM_IED_1	IED_ANALOG 10	-2000	2000		
12	DNPM_IED_1	IED_ANALOG 11	-2000	2000		
13	DNPM_IED_1	IED_ANALOG 12	-2000	2000		
14	DNPM_IED_1	IED_ANALOG 13	-2000	2000		
15	DNPM_IED_1	IED_ANALOG 14	-2000	2000	~	

Cancel Submit

The Spare point can also be deleted. The following example shows the results of deleting the Spare, then also deleting Point#6, IED_ANALOG 6.

Point	Device Name	Point Name	C Min 🔊	C Max 🔊		Source Points	
0	DNPM_IED_1	IED_ANALOG 0	-2000	2000		Select Source	
1	DNPM_IED_1	IED_ANALOG 1	-2000	2000		Search	
2	DNPM_IED_1	IED_ANALOG 2	-2000	2000			
3	DNPM_IED_1	IED_ANALOG 3	-2000	2000			
4	DNPM_IED_1	IED_ANALOG 4	-2000	2000			
5	DNPM_IED_1	IED_ANALOG 5	-2000	2000			
6	DNPM_IED_1	IED_ANALOG 7	-2000	2000			
7	DNPM_IED_1	IED_ANALOG 8	-2000	2000			
8	DNPM_IED_1	IED_ANALOG 9	-2000	2000			
9	DNPM_IED_1	IED_ANALOG 10	-2000	2000			
10	DNPM_IED_1	IED_ANALOG 11	-2000	2000			
11	DNPM_IED_1	IED_ANALOG 12	-2000	2000			
12	DNPM_IED_1	IED_ANALOG 13	-2000	2000			
13	DNPM_IED_1	IED_ANALOG 14	-2000	2000			
14	DNPM_IED_1	IED_ANALOG 15	-2000	2000			
15	DNPM_IED_1	IED_ANALOG 16	-2000	2000	~		

Figure 2-76 Results of Deleting a Point Series V Analog Input Point Mapping

Notice that IED_ANALOG 6 is now missing, although Point numbers remain contiguous.

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.

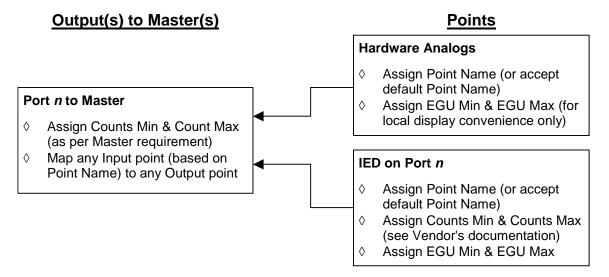
Perhaps the ease of mapping can best be shown with the analog input example as described in Figure 2-77. For the sake of illustration, consider that points have an input to the RTU and an output from the RTU. We use analog points in Figure 2-77 because analog scaling from an IED is usually a tricky task.

Notice in Figure 2-77 that you only have to do a few things to untangle the complex problem of getting a usable IED analog from the IED to the Master:

(Points)	Assign a unique point name (or accept the default name)
(Points)	Assign Engineering Unit minimum and maximum values
(Points)	Assign minimum and maximum counts (taken from the vendor's manual)
(Output)	Assign minimum and maximum counts to match what is expected at the
	Master

(Output) Map any Input point to any Output point

Figure 2-77 Analog Inputs & Outputs



2.16.2.8 Point Scaling Principles & Examples

The configuration utility simplifies all analog scaling to a few fundamental principles that are easy to follow. For the sake of discussion, we will say that analog outputs are also Source Points because they are scaled the same as other analogs.

Point scaling is accomplished using a concept called the Full Range Factor (FRF). This factor is calculated using properties associated with the point we are scaling. For any one point only one property will be used to calculate the FRF:

- •Hardware Analogs are scaled when the proper Point Type is entered.
- •IED Analogs are scaled by entering the proper Counts Min (C Min) and Counts Max (C Max). C Min and C Max for an IED Analog point are obtained from the IED vendor's manual.

Hardware Analog Example

The database in the RTU stores a number called FRF (Full Range Factor). This number is typically a fraction from 0 to 1 of the full range of the analog input. The FRF is derived as follows:

FRF = <u>Measured Value – Data Min</u> Data Max – Data Min This formula is generalized to apply to any step along the way, where:

Measure value is the actual value at a given time, whether it is counts, current, voltage, temperature, etc.

Data Max is either Data Maximum, or EGU Max, or C Max Data Min is either Data Minimum, or EGU Min, or C Min

Obviously, you must stick to one set of units for every step. Let's do the FRFs for temperature and Sensor Type based on Figure 2-78:

Temperature FRF = $\frac{175 - (-50)}{250 - (-50)} = \frac{225}{300} = 0.75$

Now that we know the FRF, we can solve for current at the Sensor Type by transposing the formula:

Sensor Type Data Value = FRF (Data Max – Data Min) + Data Min Sensor Type Data Value = 0.75 (20 - 4) + 4Sensor Type Data Value = 16

Conversely, knowing the FRF and the minimum and maximum counts required by the Master, we can solve for the number of counts that will be sent to the Master (see Figure 2-78):

Counts to Master = FRF (C Max – C Min) + C Min Counts to Master = 0.75 (2000 - (-2000)) + (-2000)Counts to Master = 1000

Figure 2-78 shows the path of an analog hardware point from measurement to Master.

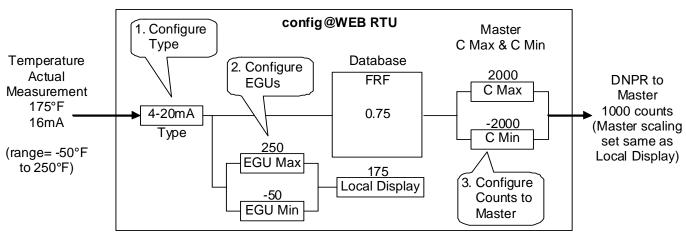


Figure 2-78 Analog Scaling for Hardware Point

We learn from the sensor vendor's manual that the sensor covers a real-world range of – 50°F to 250°F. It converts this temperature range to a current range of 4-20mA.

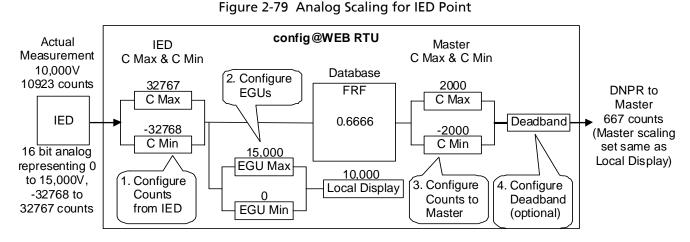
- Set Type to 4-20mA.
- Set EGU Min and Max to –50 and 250.

We learn from the Master Station vendor's manual that the Master Station's DNPR protocol expects a count range of –2000 to 2000.

• Set C Min and C Max to –2000 and 2000.

IED Analog Example

Scaling for IEDs is just as easy, as shown in Figure 2-79. The formula for calculating FRF is the same as it was for the hardware analog.



We learn from the IED vendor's manual that the IED covers a real-world range of 0V to 15,000V. It converts this voltage range to a 16-bit count range of -32768 to 32767.

- Set C Min and Max to -32768 and 32767.
- Set EGU Min and Max to 0 and 15,000.

We learn from the Master Station vendor's manual that the Master Station's DNPR protocol expects a count range of –2000 to 2000.

• Set C Min and C Max to -2000 and 2000.

Handy Binary to Decimal Converter

Type of Binary Word	Counts
Bipolar 12 bit	+2047
	-2048
Bipolar 16 bit	+32,767
	-32,768
Bipolar 32 bit	+2,147,483,647
	-2,147,483,648

2.17 Ethernet Comm Configuration

From the Configuration screen, click on Ethernet Comm as shown in Figure 2-80.

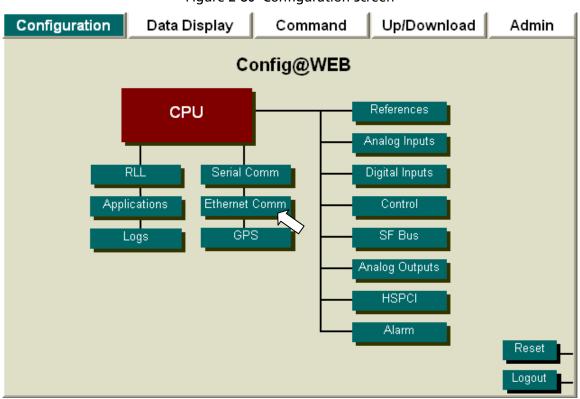


Figure 2-80 Configuration Screen

2-99

As shown below, the Ethernet Comm port has sockets that are independent channels within Ethernet. You may configure the available protocols for any or all of the sockets. The Configure Protocol for each socket is explained in the config@WEB Protocols Manuals. Point Operations are identical to the Point Operations for Serial Comm Configuration.

Figure 2-81 Ethernet Comm Port Configuration

Socket Number	Name	Protocol	Configure Protocol	Point Operations	Copy to Port
Socket #1	Socket 1	None 💌	Socket 1	· ·	Сору
Socket #2	Socket 2	None 🖌	Socket 2	-	Сору
Socket #3	Socket 3	None 💌	Socket 3	-	Сору
Socket #4	Socket 4	None 💌	Socket 4	-	Сору
Socket #5	Socket 5	None 💌	Socket 5	-	Сору
Socket #6	Socket 6	None 💌	Socket 6	-	Сору
Socket #7	Socket 7	None 💌	Socket 7	-	Сору
Socket #8	Socket 8	None 💌	Socket 8	-	Сору
					Ba

Communication Port Configuration

Socket Number

The physical socket number.

Name

The name of the socket. You may change the name. The default name is the same as the physical socket number.

Protocol

The protocol to be used for the socket. Multiple protocols are available.

Configure Protocol

Click this button to set up the communication and other basic parameters of the protocol.

Point Operations

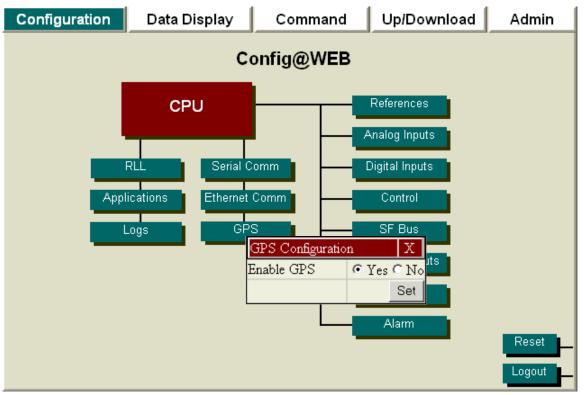
If an RTU protocol (DNPR) has been selected, the legend on the button will be "Map Points". If a Master protocol (DNPM) has been selected, the legend on the button will be "Configure". Point Operations are identical to the Point Operations for Serial Comm Configuration.

Copy to Port

A socket configuration may be copied to another socket by entering the number of the target socket.

2.18 GPS Configuration

If your RTU has a GPS, you may set the GPS as either the Primary or Secondary Time Server Source under the CPU Configuration (see Figure 2-12). Then, from the Configuration main screen, click GPS to get a screen as shown in Figure 2-82. Click Yes, then Set to enable GPS.



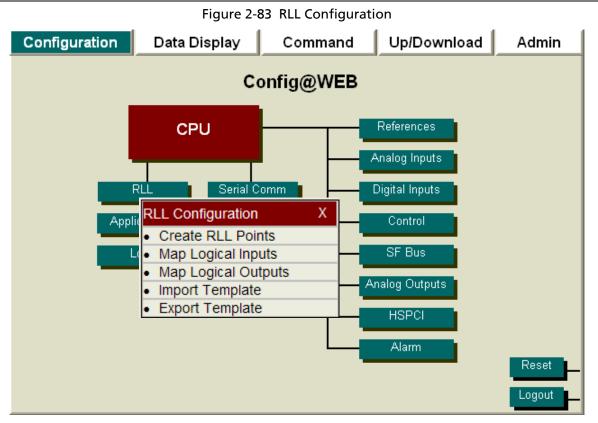


See the Data Display chapter for GPS Display information.

2.19 RLL Configuration

ISaGRAF PRO is a program for Telvent RTUs with the config@WEB gui interface that supports IEC 61131-3 programming languages. Four of the six languages supported are easy-to-use graphical languages. Please see the following manual for further information:

config@WEB Relay Ladder Logic Manual



2.20 Applications Configuration

Please refer to the config@WEB Applications manual.

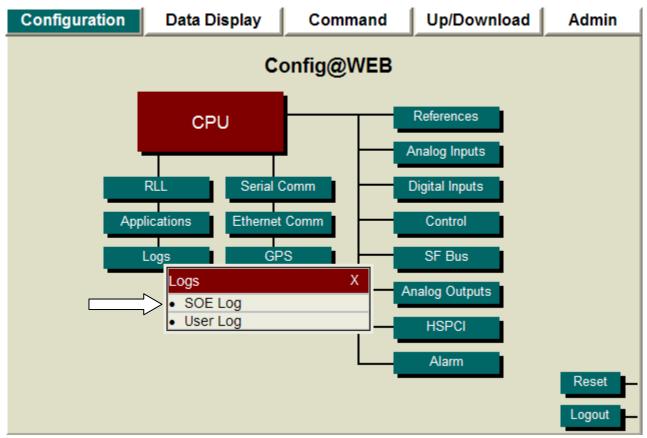
2.21 Logs

2.21.1 SOE Log

SOE Log is a function that allows you to configure the collection and storage of timestamped event data.

Click on Logs, then click on SOE Log as shown below.

Figure 2-84 Selecting SOE Log



The default settings are to Enable the SOE Log, and to set the initial Number of Events at 100. The Number of Events may be set in a range of 100 to 300. The Events are stored in the RTU.

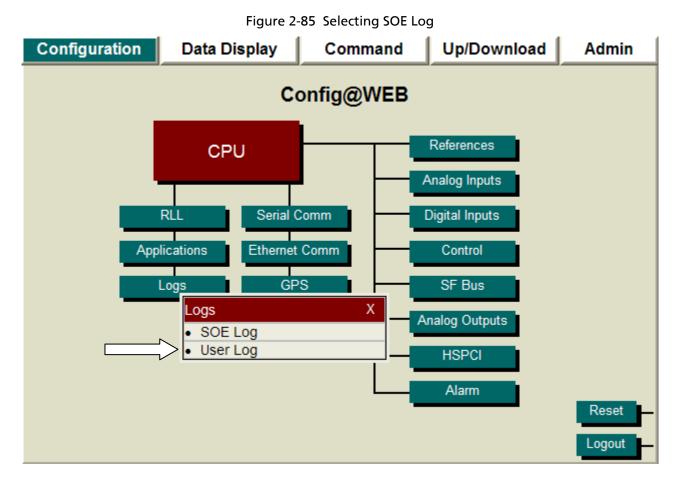
Click "Set" to submit the new setting; Click "X" to dismiss the SOE Log Configuration.

SOE Log Configuration		
Enable SOE Log	⊙Yes ○No	
Number of Events	100	
	Set	

2.21.2 User Log

User Log is a function that allows you to configure the collection and storage of timestamped event data.

Click on Logs, then click on User Log as shown below.



The default settings are to Enable the User Log, and to set the initial Number of Events at 10. The Number of Events may be set in a range of 10 to 300. The Events are stored in the RTU.

Click "Set" to submit the new setting; Click "X" to dismiss the User Log Configuration.

User Log Configuration	
Enable User Log	⊙Yes ⊖No
Number of Events	10
	Set

Click Reset to reset the system. Click Yes on the Warning dialog box.

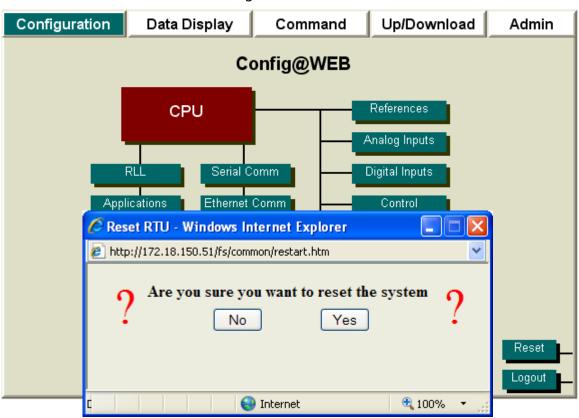


Figure 2-86 Reset

You must allow approximately 60 seconds for the system to reset. The reset function logs you out and will ultimately take you back to the login page.

Figure 2-87 Reset



2.23 Logout

Click Logout to complete your session. You will get a small dialog box before you log out, as shown below. Logging out will take you to the Login screen. From there, you may close Internet Explorer. You should always log out instead of just closing the browser in order to avoid having open sessions on your RTU.





CHAPTER 3 Data Display

The SAGE RTU has a unique approach to data display. In fact if you have become familiar with the Configuration of the SAGE RTU you will find Data Display straight forward and very user friendly.

Immediately after a successful login, you will see the Configuration screen (if the login is an unrestricted Admin login). You will now need to press the Data Display Tab located at the top of the Configuration screen. One of the few noticeable differences between the Data Display screen and the other (tab) screens is that the Data Display screen digital inputs are divided into Status (STS) and Accumulator (ACC) points. Note that the newly configured points will not appear in Data Display until the RTU has been RESET and allowed to add all new points to the Database.

Navigation to data to be displayed is the same as navigation used during configuration and again the same for Command output.

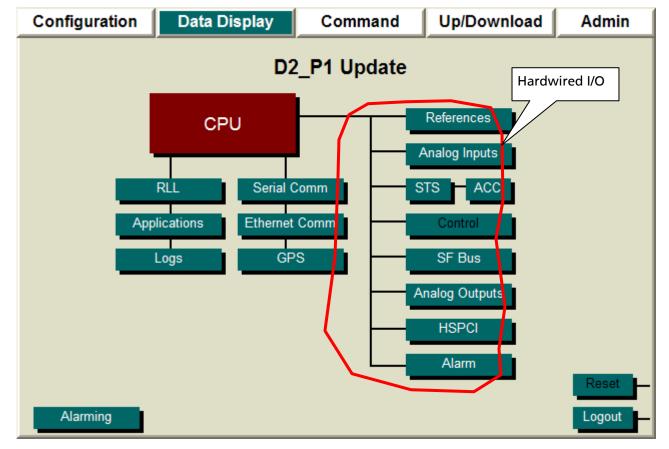


Figure 3-1 Data Display

3.1 CPU Data Display

From the Data Display screen, click CPU. The CPU Data Display screen reflects the CPU Configuration as shown in Figure 3-2.

CPU Display						
	RTU Information			Crash Recovery Configuration		
RTU Name	(Config@WEB	Number of Restarts	;	3	
Part Number	(C3414-500-001E0_B0	Time Between Res	tarts	90	
ApplicationNa	me (C3414-500-001E0_B0.out		GUI Add	ress (Configuration
VxWorks Ver	(C3414-500-996E0	PPP Port Address		90.0	0.0.50
GUI Version	(C3414-500-001E0_B0.gui	Primary I.P Address	3	172	.18.150.51
Mfg Hardware	Ver (ChangeMe	Subnet Mask		255	.255.248.0
User ID Descr	ription	ChangeMe	Default Gateway		172	.18.1.1
Serial Num	(ChangeMe	Target Name		Teh	rent
Product Name	e & Model S	SAGE 2400				
	RTU Time	Configuration	Secondary IP Addre	SS	172	.18.150.151
Time Server	F	Primary/Secondary	Subnet Mask		255	.255.0.0
RTU Time & D	Date (05/11/2010 16:18:36	/11/2010 16:18:36 Default Gateway			
Back						
Туре	Source	Point Name		Point State	•	
Primary	RTC	PRM TIME SRC FAIL		OPEN	•	
Secondary	-	-		-	-	

Figure 3-2	CPU Data	Display

RTU Information	
RTU Name	The name of this RTU as selected in Configuration
Part Number	Firmware Part Number assigned by Telvent (for DNP, Var 242 – Device Mfg software ver))
Application Name	File name of the firmware
VxWorks Ver	VxWorks Version number assigned by Telvent
GUI Version	Version number assigned by Telvent
Mfg. Hardware Ver	User defined information (for DNP, Var 243 – Device Mfg hardware ver)
ID Code	User defined information (for DNP, Var 246 - User assigned ID code / num)
Serial Num	User defined information (for DNP, Var 248 – Device serial number)
Product Name & Model	The RTU hardware (for DNP, Var 250 – Device mfg prod name & model)
RTU Time Configuration	
Time Server	This RTU has a Primary and a Secondary Time Server.
RTU Time & Date	Reflects the Date and Time as derived from the common time. Common time is initially synced from the real time clock on startup; thereafter, the

3-2

connyevv	
	common time is synced by the Primary Time Server and, if the Primary fails, by the Secondary Time Server.
Туре	The Type of Time Server.
Source	The source of the Time Server as determined during Configuration.
Point Name	The name of the point from which the Time Sync is derived.
Point State	The status of the Time Sync for that particular source. CLOSE means the Time Sync is failed; OPEN means the Time Sync is operational.
•	A red dot indicates the point is CLOSED (failed); a green dot indicates the point is OPEN (operational).

Crash Recovery Configuration (See the appendices for detailed information)

Crash Recovery is a state of the RTU that allows you to back out of a bad configuration gracefully. The recovery process is based on the premise that you can have a way to boot VxWorks without running any applications. This allows you to reconfigure the RTU without actually having to run the last configuration.

Number of Restarts	The number of restarts before the RTU starts VxWorks without applications (for troubleshooting purposes). Works best under normal conditions if the user accepts the default value.
Time between Restarts	If crash happens in shorter time, it is logged as a restart. Works best under normal conditions if the user accepts the default value.

Example: If the RTU crashes within 90 seconds after the beginning of bootup, that counts as one restart. If this happens three times in a row, the RTU goes into Crash Recovery mode.

Notice that the default Time between Restarts is 90 seconds. Because the RTU takes about 60 seconds to reboot, 30 seconds is allowed for a crash. If you have reason to believe that the configuration problem takes longer to crash the RTU, enter a longer Time between Restarts.

GUI Address Configuration

PPP Port Address	Address assigned by Telvent. See the appendices.
Primary I.P. Address	Primary I.P. Address of this RTU
Subnet Mask	Subnet Mask of this RTU
Default Gateway	I.P. Address of the device connected to multiple physical TCP/IP networks capable of routing or delivering IP packets between them. A gateway translates between different transport protocols or data formats (for example, IPX and IP) and is generally added to a network primarily for its translation ability.
Target Name	Network server name of the RTU (the network server that resolves this name to the I.P. address is the DNS server)
Secondary I.P. Address	I.P. Address used by the secondary Ethernet port

Subnet Mask Default Gateway Subnet Mask used by the secondary Ethernet port Default Gateway used by the secondary Ethernet port

Navigation

Click the Back button to go back to the Data Display screen.

3.1.1 Internal Status Points

Internal Status Points can be seen in any display that has mapping capabilities. The example shown below happens to be mapped to a DNP Master.

Figure 3-3	Internal Status Points Mapped to a DNPR Master	r
inguic 3 3	internal status i ontes mappea to a biti n maste	

		Page1 of 1 Go To	Go			
Point	Device Name	Point Name	Assigned Class	Point Status	Point State	
0	RTU Internal Status	PRM TIME SRC FAIL	1		OPEN	Γ
1	RTU Internal Status	SEC TIME SRC FAIL	1		CLOSE	Τ
2	RTU Internal Status	RUN	1		CLOSE	Ι
3	RTU Internal Status	TIME SRC FAIL	1		OPEN	Τ
4	RTU Internal Status	IED FAIL	1		CLOSE	Τ
5	RTU Internal Status	LOCAL	1		OPEN	Τ
6	RTU Internal Status	LOGGED IN	1		CLOSE	Τ
7	RTU Internal Status	CONFIG CHG	1		OPEN	Τ
8	RTU Internal Status	RLL RUN	1		OPEN	T
9	RTU Internal Status	ETHERNET LINK	1		CLOSE	Т
-	-	-	-	-	-	I
-	-	-	-	-	-	+
-	-	-	-	-	-	╇
-				-	-	+
					-	t

DNPR Binary Inputs Display

PRM TIME SRC FAIL

Indicates the health of the Primary Time Source. Open (green) means the time source is operational. Closed (red) indicates a failure.

SEC TIME SRC FAIL

Indicates the health of the Secondary Time Source. Open (green) means the time source is operational. Closed (red) indicates a failure.

RUN

Indicates whether or not the CPU is running. Look for the signature "heartbeat"; that is, blinking at an approximately one-second rate. A "steady ON" light means the CPU is in either Safe mode or Crash Recovery mode. No light means the CPU is not running. Normally blinking.

Indicates the health of the either Time Source. Open (green) means both the time sources are operational. Closed (red) indicates a failure in one of the time sources.

IED FAIL

Indicates the status of the IED. Open (green) means the IED is responding. Closed (red) means the IED is not responding. Note that the IED may not be responding because a comm. channel has failed.

LOCAL

Indicates the status of the Remote/Local switch. Open (green) means the switch is in the Remote position. Closed (red) means the switch is in the Local position.

LOGGED IN

Indicates whether or not someone is logged into the device. Closed (red) means that one or more logins are active. Open (green) means that there are no active logins.

CONFIG CHG

Indicates whether or not the configuration has been changed since the last reset. Open (green) means no configuration changes have been submitted. Closed (red) means that at least one configuration change has been submitted.

RLL RUN

Indicates whether or not an RLL program is running. Open (green) means there is no RLL program running. Closed (red) mean there is an RLL program running.

ETHERNET LINK

Indicates whether or not there is a valid Ethernet link circuit connected to the Ethernet connector. Closed (red) means there is a valid connection to the Ethernet connector. Open (green) means there is no valid connection to the Ethernet connector.

Note: If the optional Switched Ethernet PC/104 card is installed, the Ethernet Link indication will always show a valid Ethernet connection.

3.2 Point Status Codes

Point Status (quality) codes depend upon the data type for which it is being displayed.

Up to four codes (flags) may or may not be displayed in the Point Status field at the same time. A code will only be displayed if it is valid for a particular data type under the proper status condition.

The possible values depend on the data type, as follows.

- Status Points
 - 'F' indicates the point is Failed (stale). Its source is not responding to polls.
 - 'm' indicates that at least some of the quality code flags are manually-entered.
 - 'f ' indicates that the value of the point has been manually-entered ("forced").
 - 'C' indicates that the point has been manually disabled because its value is changing for no valid reason ("Chattering").
 - 'A' indicates that the point is in its alarm state.
 - 'u' indicates that the point is in an unacknowledged alarm state.

Note: 'A' and 'u' are alarm flags and only apply to points that have been configured as alarm points.

Analog Inputs

- 'F' indicates the point is Failed (stale). Its source is not responding to polls.
- 'm' indicates that at least some of the quality code flags are manually-entered.
- 'f' indicates that the value of the point has been manually-entered ("forced").
- 'L' indicates that the point is below its Low instrument rating.
- 'H' indicates that the point is above its High instrument rating.
- 'O' indicates that the point is Over-range.
- 'A' indicates that the point has exceeded its high alarm limit.
- 'a' indicates that the point is below its low alarm limit.
- 'u' indicates that the point is in an unacknowledged alarm state.

Note: 'A', 'a' and 'u' are alarm flags and only apply to points that have been configured as alarm points.

Accumulators

- 'F' indicates the point is Failed (stale). Its source is not responding to polls.
- 'm' indicates that at least some of the quality code flags are manually-entered.
- 'f ' indicates that the value of the point has been manually-entered ("forced").
- 'O' indicates that the counter has Overflowed.

Analog Outputs

- 'F' indicates the point is marked Failed (point is offline).
- 'L' indicates Logic power failure.
- 'P' indicates field Power failure.

Floating Points

- 'F' indicates the point is Failed (stale). Its source is not responding to polls.
- 'm' indicates that at least some of the quality code flags are manually-entered.
- 'f' indicates that the value of the point has been manually-entered ("forced").
- 'N' indicates an invalid value (not valid floating point format).

Digital Outputs and SBO Controls

- 'F' indicates the point is marked Failed (point is offline).
- 'U' indicates that the open/closed state of this point is Unknown because it has not been commanded to any state since the RTU last started.

3.3 References Data Display

From the Data Display screen, click References. The References will display with the name you assigned under Configuration. Point Status uses the same code used for other analog inputs. See the next section. Voltage reference Point Values are in Volts, except for temperature, which will display in either °F or °C, depending on which was chosen during Configuration.

References Display				
Point	Point Name	Point Status	Point Value	
1	bb_gnd_ref		0.000	
2	bb_+5.0V_REF		5.000	
3	bb_+4.5V_ref		4.500	
4	bb4.5V_ref		-4.498	
5	bb_temp_ref		73.212	
6	bb_dc_in		25.154	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
			Back	

References Display				
Point	Point Name	Point Status	Point Value	
1	bb_gnd_ref		0.001	
2	bb_+2.5V_ref		2.503	
3	bb2.5V_ref		-2.503	
4	bb_temp_ref		60.970	
5	bb_bat_in_ref		13.624	
6	bb_pwr_in_ref		15.660	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
			Back	

Figure 3-5 References Display for SAGE 1X50

Figure 3-6 References Display for SAGE C3830

References Display

Point	Point Name	Point Status	Point Value				
1	bb_gnd_ref		0.004				
2	bb_+5.0V_ref		5.000				
2 3	bb_+4.5V_ref		4.342				
	bb4.5V_ref		-4.343				
4 5 6	bb_temp_ref		134.446				
6	C3830_gnd_ref		0.000				
7	C3830_gnd_ref		0.000				
8	C3830_aux_in		2.493				
-	-	-	-				
-	-	-	-				
-	-	-	-				
-	-	-	-				
-	-	-	-				
-	-	-	-				
-	-	-	-				
-	-	-	-				
	Back						

Point

The physical point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

Not used for References.

Point Value

The engineering unit value based on internal scaling for references.

Navigation

Click the Back button to go back to the Data Display screen.

3.4 Analog Inputs Data Display

From the Data Display screen, click Analog Inputs to view the DC analog inputs. The inputs are shown in Figure 3-7 and are in the following order:

- Baseboard inputs
- Analog expansion bus inputs.

Figure 3-7 Analog Inputs (AI) Display

	Analog Inputs (AI) Display					
< <prev< th=""><th>Page2 of 7</th><th>Go To</th><th>Go</th><th>Next>></th></prev<>	Page2 of 7	Go To	Go	Next>>		
Point	Point Name		Point Sta	tus Point Value		
17	ANALOG 17			0.042		
18	ANALOG 18			0.048		
19	ANALOG 19			0.038		
20	ANALOG 20			0.047		
21	ANALOG 21			0.039		
22	ANALOG 22			0.048		
23	ANALOG 23			0.037		
24	ANALOG 24			0.047		
25	ANALOG 25			0.039		
26	ANALOG 26			0.048		
27	ANALOG 27			0.038		
28	ANALOG 28			0.047		
29	ANALOG 29			0.039		
30	ANALOG 30			0.047		
31	ANALOG 31			0.038		
32	ANALOG 32			0.046		
				Back		

Point

The physical point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

An **H** or **L** will appear in the Point Status column when the point's input is outside the range of the configured point as follows:

Input Range	H	L
±5VDC/±1mA	>+5.0 VDC	<-5.0 VDC
0-5VDC/0-1mA	>+5.0 VDC	< 0.0 VDC
1-5VDC/4-20mA	>+5.0 VDC	<+1.0 VDC

See section 3.2

Point Value

The engineering unit value based on the Min and Max scaling assigned during Configuration

Navigation

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 go back to the Data Display screen.

3.5 STS Data Display

From the Data Display screen, click the STS button to go to the Hardware Status Display. This display shows only inputs from the baseboard and XTs, not including the SOE status points. The SOE status points have their own display. In addition to showing the point number and name assigned during Configuration, this display shows both a text message (OPEN/CLOSED) and a green dot for OPEN and a red dot for CLOSED.

Figure 3-8	Hardw	are Stat	tus Disp	lay

CL / TN

Hardware Status Display				
< <prev< th=""><th>Page2 of 6 Go To</th><th>Go</th><th>Next</th><th>>></th></prev<>	Page2 of 6 Go To	Go	Next	>>
Point	Point Name	Point S	tate	•
17	DI_PNT_22	CLOS	ED	•
18	DI_PNT_23	CLOS	ED	•
19	DI_PNT_24	CLOS	ED	•
20	DI_PNT_25	CLOS	ED	•
21	DI_PNT_26	CLOS	ED	•
22	DI_PNT_27	CLOS	ED	•
23	DI_PNT_28	CLOS	ED	•
24	DI_PNT_29	CLOS	ED	•
25	DI_PNT_30	CLOS	ED	•
26	DI_PNT_31	CLOS	ED	•
27	DI_PNT_32	CLOS	ED	•
28	DI_PNT_33	CLOS	ED	•
29	DI_PNT_34	CLOS	ED	•
30	DI_PNT_35	CLOS	ED	•
31	DI_PNT_36	CLOS	ED	•
32	DI_PNT_37	CLOS	ED	•
			Ba	ck

Point

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point State

This will be either CLOSED or OPENED.

•

Displays a green dot for OPEN and a red dot for CLOSED.

Navigation

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 go back to the Data Display screen.

3.6 ACC Data Display

From the Data Display screen, click the ACC button to go to the Hardware Accumulator Display. This screen shows Digital Inputs used as accumulators: Each accumulator register has a 32-bit unsigned field. The maximum value is 4,294,967,295. The next count will force a rollover to zero. Up to 32 bits are returned to the MTU depending on the protocol being used.

	Hardware Accumulator Display				
< <prev< th=""><th>Page2 of 3</th><th>Go To</th><th>Go Next>></th></prev<>	Page2 of 3	Go To	Go Next>>		
Point	Point Na	ume	Count		
17	DI_PNT	_45	0		
18	DI_PNT	_46	0		
19	DI_PNT	_47	0		
20	DI_PNT	_48	0		
21	DI_PNT	_49	0		
22	DI_PNT	_50	0		
23	DI_PNT	_51	0		
24	DI_PNT	_52	0		
25	DI_PNT	_53	0		
26	DI_PNT	_54	0		
27	DI_PNT	_55	0		
28	DI_PNT	_56	0		
29	DI_PNT	_57	0		
30	DI_PNT	_58	0		
31	DI_PNT	_59	0		
32	DI_PNT	_60	0		
			Back		

Figure 3-9 Hardware Accumulator Display

Point

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Count

The maximum value is 4,294,967,295. The next count will force a rollover to zero.

Navigation

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 go back to the Data Display screen.

3.7 Control Data Display

There is no Data Display for Control.

3.8 SF Bus Data Display

From the Data Display screen, click the SF Bus. The Special Function Bus Data Display allows you to break out all the data from the Special Function Bus by type of card, then type of point. Two examples are given below: 1MSSOE and ACI.

Figure 3-10 Special Function Bus Data Display

Special Function Bus Data Display

Card Location	Card Type	Card Name	Display XT Data
Gard Location	Gard Type	Card Name	DISPINYAT Data
Select 1	1MSSOE	1MSSOE on BUS 1	<u>Display</u>
Select 2	ACI	ACI on BUS 2	<u>Display</u>
Select 3	NONE	NONE on BUS 3	-
Select 4	NONE	NONE on BUS 4	-
Select 5	NONE	-	-
Select 6	NONE	-	-
Select 7	NONE	-	-
Select 8	NONE	-	-
			Back

Card Location

Displays the physical position of the XT types cabled to the SFB.

Card Type

Displays the type of XT SFB card for each position.

Card Name

Displays the name of the XT SFB card for each position.

Display XT Data

Click on Display to break out the individual display data for each type of card connected to the SFB, as shown in the following sections.

Navigation

Click the Back button to go back to the Data Display screen.

3.8.1 1MSSOE Data Display

From the Special Function Bus Data Display screen, click Display (on a 1MSSOE card) to display the current states of each of the 1MSSOE points.

1MSSOE Display							
	Page1 of 9	Go To	Go Next>	>			
Point	Point Name	Point Status	Point State	•			
1	Comm Status		CLOSED	•			
2	MSSOE_PNT1	F	OPEN	•			
3	MSSOE_PNT2	F	OPEN •				
4	MSSOE_PNT3	F	OPEN •				
5	MSSOE_PNT4	F	F OPEN				
6	MSSOE_PNT5	F	OPEN •				
7	MSSOE_PNT6	F	OPEN •				
8	MSSOE_PNT7	F	OPEN •				
9	MSSOE_PNT8	F	OPEN	•			
10	MSSOE_PNT9	F	OPEN	•			
11	MSSOE_PNT10	F	OPEN	•			
12	MSSOE_PNT11	F	OPEN	•			
13	MSSOE_PNT12	F	OPEN	•			
14	MSSOE_PNT13	F	OPEN	•			
15	MSSOE_PNT14	F	OPEN	•			
16	MSSOE_PNT15	F	OPEN	•			
			Bac	k)			

Figure 3-11 1MSSOE Display

Note: Point 1 is a Comm Status point that shows the health for the SOE channel. When the Point State is Closed, it means the SOE channel is not communicating. When it is Open, the channel is communicating.

Point

The physical point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point State

This will be either CLOSED or OPEN.

•

Displays a green dot for OPEN and a red dot for CLOSED.

Navigation

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 go back to the Special Function Bus Data Display screen.

3.8.2 ACI Data Display

From the Special Function Bus Data Display screen, click Display (on a ACI card) to display the Display Selection box. Display Selection will pop up, which allows you to choose Analogs, Status, or Accumulators.

Figure 3-12 Special Function Bus Data Display Special Function Bus Data Display

			ispiniy	
Card Location	Card Type	Card Name	Display XT Dat	ta
Select 1	1MSSOE	1MSSOE on BUS 1	<u>Display</u>	
Select 2	ACI	ACI on BUS 2	<u>Display</u>	
Select 3	NONE	NONE on BUS 3	-	Display
Select 4	NONE	NONE on BUS 4	_ AC	l Display
Select 5	NONE	-	-	<u>Analogs</u>
Select 6	NONE	-	-	<u>Status</u> Assumulate
Select 7	NONE	-	-	<u>Accumulato</u>
Select 8	NONE	-	-	
			E	Back

Card Location

The location of the card with a maximum of 8 positions.

Card Type

The type of card: 1MSSOE, ACI, or DO.

The name of the card. The name is fixed for 1msSOE and DO, but the name may be changed in Configuration for the ACI cards.

Display XT Data

Click on the Display legend to display card points. In the case of ACI, there are three types of points as shown above.

Navigation

Click Display legend to see points. Click the Back button to go back to the Data Display screen.

3.8.2.1 ACI Analog Data Display

From the Special Function Bus Data Display screen, click Display (on a ACI card) to display the Display Selection Box. Click Analogs on the Display Selection.

The ACI Analog Display shows all the AC analogs with the name you assigned (or accepted as default) during ACI Configuration. The point values will be based on the values you assigned (or accepted as default) during ACI Configuration.

		s Disping
Card # :	01	Card Name : ACI on BUS 1
	Page1 of 1 G	o To Go
Point	Point Name	Point Status Point Value
1	Watts Phase A	0.000
2	Watts Phase B	0.000
3	Watts Phase C	0.000
4	Watts Total	0.000
5	VAR Phase A	0.000
6	VAR Phase B	0.000
7	VAR Phase C	0.000
8	VAR Total	0.000
9	VA Phase A	0.000
10	VA Phase B	0.000
11	VA Phase C	0.000
12	VA Total	0.000
13	Fault Distance	-1.000
-	-	
-	-	
-	-	
		Back

Figure 3-13 ACI Analog Display ACI Analog Display

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point Value

Displays the point value in engineering units.

Navigation

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 go back to the Special Function Bus Data Display screen.

3.8.2.2 ACI Status Data Display

From the Special Function Bus Data Display screen, click Display (on the ACI row) to display the Display Selection Box. Click Status on the Display Selection.

The ACI Status Display shows all the AC status values with the name you assigned (or accepted as default) during ACI Configuration.

Figure 3-14 ACI Status Display					
	ACI Status Display				
Card # :	2 Card Nam	ie : ACI on BU	JS 2		
	Page1 of 1 Go To	Go			
Point	Point Name	Point Status	•		
1	Comm Status	CLOSED	•		
2	Fault Phase A	OPEN	•		
3	Fault Phase B	OPEN	•		
4	Fault Phase C	OPEN	•		
5	Fault Neutral	OPEN	•		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
-	-	-	-		
		Ba	ck		

Figure 3-14 ACI Status Display

Point

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point State

This will be either CLOSED or OPEN. Please note that the Fault status points will not change state during a fault. They are used as database place holders to get the information back to a protocol.

SAGE1-SFT-00001

ullet

Displays a green dot for OPEN and a red dot for CLOSED.

Navigation

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 Back button to go back to the Special Function Bus Data Display screen.

3.8.2.3 ACI Accumulator Data Display

From the Special Function Bus Data Display screen, click Display (on the ACI row) to display the Display Selection Box. Click Accumulators on the Display Selection.

The ACI Accumulator Display shows all the AC accumulator values with the name you assigned (or accepted as default) during ACI Configuration. Each accumulator register has a 32-bit unsigned field. The maximum value is 4,294,967,295. The next count will force a rollover to zero. Up to 32 bits are returned to the MTU depending on the protocol being used.

Card # :	2 Card Nam	e : ACI on BUS 2
	Page of Go To	Go
Point	Point Name	Count
1	+WH Phase A	0
2	-WH Phase A	0
3	+VARH Phase A	0
4	-VARH Phase A	0
5	+WH Phase B	0
6	-WH Phase B	0
7	+VARH Phase B	0
8	-VARH Phase B	0
9	+WH Phase C	0
10	-WH Phase C	0
11	+VARH Phase C	0
12	-VARH Phase C	0
13	+WH Total	0
14	-WH Total	0
15	+VARH Total	0
16	-VARH Total	0
		Back

Figure 3-15 ACI Accumulator Display ACI Accumulator Display

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Count

The maximum value is 4,294,967,295. The next count will force a rollover to zero.

Navigation

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 Back button to go back to the Data Display screen.

3.9 Analog Outputs Data Display

From the Data Display screen, click Analog Outputs to view the analog outputs.

	Analog Outpu	its (AO)	Display		
		_			
	Page1 of 1	Go To	Go		
Point	Point Name		Point Statu	s Point Value	
1	ANALOG 1			0.000	
2	ANALOG 2			1.000	
3	ANALOG 3			1.000	
4	ANALOG 4			1.000	
5	ANALOG 5			1.000	
6	ANALOG 6			1.000	
7	ANALOG 7			1.000	
8	ANALOG 8			1.000	
9	ANALOG 9			1.000	
10	ANALOG 10			1.000	
11	ANALOG 11			1.000	
12	ANALOG 12			1.000	
-	-		-	-	
-	-		-	-	
-	-		-	-	
-	-		-	-	
				Back	

Figure 3-16 Analog Outputs (AO) Display

The physical point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point Value

The engineering unit value based on the EGU Min and EGU Max scaling assigned during Configuration

Navigation

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 Back button to go back to the Data Display screen.

3.10 HSPCI Data Display

HSPCI is not supported.

Figure 3-17 HSPCI Message



3.11 Alarm Data Display

When you click on Alarms, you will get a screen similar to the screen below.

Figure	3-18	Alarms	Display
--------	------	--------	---------

	Alarms Display						
Point	Device Name	Point Name	Point Status	Point State	•	Alarm State	•
1	Hardware DI	DI_PNT_7		OPEN	•	OPEN	•
2	Hardware DI	DI_PNT_11		OPEN	•	OPEN	•
						Ba	ack

The physical point number of the alarm.

Device Name

The name of the device from which the status point originates.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See Section 3.2

Point State

This is the input to the Alarm. This will be either CLOSE or OPEN.

•

Displays a green dot for OPEN and a red dot for CLOSED.

Alarm State

This is the output of the Alarm. This will be either CLOSE or OPEN.

•

Displays a green dot for OPEN and a red dot for CLOSED.

Navigation

Click Back to return to the previous screen.

3.12 Serial Comm Data Display

From the Data Display screen, click the Serial Comm button to display the communications port data. This screen shows communications counters and port data for each port.

Display Communication Port Data						
Port Number	RTS	DTR	Name	Protocol	Comm Counters	Display Port Data
Port #1	к	К	Series V to Master	Series V	View	Port Data
Port#2	к	К	Port 2	DNPM	View	Port Data
Port#3	к	К	Port 3	Series V	View	Port Data
Port#4	к	К	Port 4	None	View	Port Data
Port#5	к	К	Port 5	None	View	Port Data
Port#6	к	К	Port 6	None	View	Port Data
Port#7	к	К	Port 7	None	View	Port Data
Port#8	К	К	Port 8	None	View	Port Data
Port#9	к	К	Port 9	None	View	Port Data
Port#10	к	К	Port 10	None	View	Port Data
Port#11	к	К	Port 11	None	View	Port Data
Port#12	к	К	Port 12	None	View	Port Data
						Back

Figure 3-19 Display Communication Port Data

Port Number

The physical port number.

RTS and DTR

Request To Send and Data Terminal Ready.

"K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. See Figure 3-20. Typically used as a Radio/Modem key output (Default Setting).

"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.

"L" represents Negative RS232 Voltage.

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

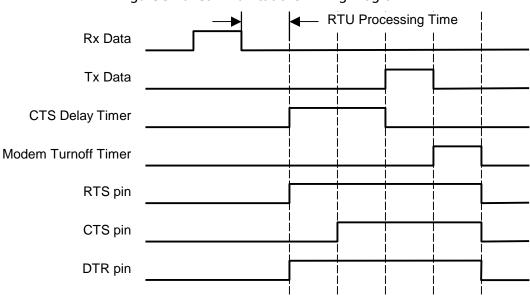


Figure 3-20 Communications Timing Diagram

Name

The port name assigned (or the default name accepted) during Configuration.

Protocol

The protocol assigned to the port. If no protocol is assigned, the legend will be NONE.

Comm Counters

Click the View button to see the communications counters for the port of interest.

Display Port Data

Click the Port Data button to see port data.

Navigation

Click the Back button to go back to the Data Display screen.

3.12.1 Internal COMM Status Points

A COMM Status point is automatically generated for any active port. Shown below is an example for DNPM.

ort #:2 ED #:1	Page1 of 1	Go To		Port Name : F Name : DNPM_)	
Point	Point Name	Р	oint 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	٠
5	IED_STS 5		F	OPEN	٠
6	IED_STS 6		F	OPEN	٠
7	IED_STS 7		F	OPEN	٠
-	-		-	-	-
-	-		-	-	-
-	-		-	-	-
-	-		-	-	-
-	-		-	-	-
-	-		-	-	-

Figure 3-21 DNPM COMM Status Point

COMM Status points will be open (green) when the comm. Channel or IED is operational, and closed (red) when the comm. Channel or IED is failed.

3.12.2 Global Freeze Points

These apply only when the Global Freeze has been configured. See the Global Freeze Configuration section in the Configuration chapter. Below is an example of the Global Freeze Points displayed after they have been mapped to a Master.

Port # : 3	3	DNPR Binary Inputs Display			Port Name : F	Port 3
	Pa	age1 of 1 Go To	Go			
Point	Device Name	Point Name	Assigned Class	Point Status	Point State	•
0	RTU Internal Status	PRM TIME SRC FAIL	1		OPEN	•
Global	Global Freeze	GlbI Frz Lockout	1		OPEN	•
Freeze I Points	Global Freeze	GlbI Frz Event	1		OPEN	•
3	RTU Internal Status	TIME SRC FAIL	1		OPEN	•
					B	ack

3.12.3 Comm Counters

3.12.3.1 Series 5 Example

Click the View button under Comm Counters for S5R. The Communication Counters Display screen is dynamic and will be continually updated. This screen is provided for troubleshooting communications.

Series V Communication Counters Display				
Port #:1		Port Name : Port 1		
Point	Counter Name	Counts		
1	Messages Received	0		
2	Messages Sent	0		
3	RX Timeouts	0		
4	B4 Timer Violations	0		
5	IB Timer Violations	0		
6	Questionable Requests	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	Back		

Figure 3-22 S5F	Communication	Counters Display
-----------------	----------------------	------------------

Point Number

A logical point number for reference only.

Counter Name

The following counters are monitored:

Messages Received

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

3-27

Messages Sent

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

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.

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.

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.

Questionable Requests

This indicates the cumulative number of questionable requests since the last reset or power-up.

Security Errors

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

Parity Errors

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

Overrun Errors

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

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.

Hardware DCD Errors

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

Hardware CTS Errors

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

Counts

The counts for each type of Counter.

Data Trap

When you click on Configure for Data Trap, you get the following display.

Figure 3-23 Data Trap Screen

	D	ata Trap			
Port/Socket:	Port: 2				
	Targe	t	Current		
TX Bytes		0		4556	(INACTIVE,
RX Bytes		0		8190	COLLECTING, or
State		INACTI	VE		
Configure		Analyze		Back	

The Data Trap function is always in one of three states, "INACTIVE", "COLLECTING"" or "COMPLETE". Configure or Analyze will stop an active collection of data. Data collection can be started and other GUI functions can be performed while the data is being collected.

Note 1: Only one instance of Data Trap can run at a time.

Note 2: The Data Trap function button appears under the Comm Counters Display for every protocol.

Click on Configure, then select the port you want to analyze as shown below.

(This field can be) from 1 KB to	Dat	ta Trap	Configura	tion	X
1024 KB. The			et Port: 2		
default is 8 KB		e(KB)	8		
Immediate Start	St	art	Stop	Start o	n Reset

Figure 3-24 Data Trap Configuration

If you use the "Start on Reset" function, after the next reset of the RTU and for only that reset, the Data Trap function will be started with this configuration before any communications is initiated by the RTU. This will allow the user to capture startup sequences (initialization opcodes, deadband downloads, etc).

The Stop function is used to cancel the current collection of data and to cancel a "Start on Reset" request.

When you click Start, the state is updated to COLLECTING.

Data Trap will stay in the Collecting state until either of the Target values is reached or the user manually stops the collection.

Figure 3-25 Data Trap COLLECTING

Data Trap				
Port/Socket:	Port: 1			
		Target	Current	t
TX Bytes		8192		668
RX Bytes		8190		1080
State	Port: 1		COLLECTING	
Configure		Ana	alyze	Back

With the Configuration Target shown above, the results are as shown below.

Figure 3-26 Data Trap COMPLETE

	5	1			
Data Trap					
Port/Socket:	Port: 2				
		Target	Current		
TX Bytes		8192		8192	
RX Bytes		8190		7055	
State	Port: 2		COMPLETE		
Configure		Ana	ilyze	Back	

Notice that the data gathering stage stops when either the TX or the RX hits the Target size, or when you click on either Configure or Analyze.

Click Analyze. If you have never executed a Data Trap analysis before, you will get blank fields under Hex Data and ASCII Data as shown below. The reason why you don't immediately see the results is because the program does not do a real time presentation. The program creates a file with a default name of dt_data.log.

Figure 3-27 Initial Data Trap Analysis Window

Data Trap Analysis

Hex Data 0 1 2 3 4 5 6 7 8 9 10 11	12 13 14 15 16 17	Ascii Data 0 1 2 3 4 5 6 7 8 91011121314151617
Start Time: File Info Filename : C:\dt_data.log Download Open	Byte Information Direction Time [ms] Error Decimal IB Time [ms]	Search Search for a sequence of Hex or ASCII Characters. Space Delimited. Search For: Find Search Hex or ASCII Hex

To see the results of the analysis, click Download to get the following download window, then click Save.

Note: You are responsible for keeping track of the port number and protocol that a log file represents. You may want to name the file to keep track of this. Example: Port4_SEL.log.

Figure 3-28 Download Window

Select folder in	which to save Data Trap file		? 🔀
Savejn:	🖙 Local Disk (C:)	• 🖬 🍅 🖬 •	
\square	🛅 16819 Methil 🛅 A_Writer	CMy Documents	🕑 boot.ini 🗐 CAPTURE
Recent	Companion Software	C Program Files	E CAPTURE
	Config.Msi		📄 dt_data1 🗐 dt_data.l
Desktop	Documents and Settings	CRLL	IO.SYS
My Documents	Epson Projector Warranty	Telvent	The second secon
	CADER 998 on Telvent-Oblowys Lotus	Carminal WINDOWS	i pagefile.:
My Computer			>
	File <u>n</u> ame: dt_data.log		<u>S</u> ave
My Network Places	Save as type: *.log	•	Cancel

The Data Trap Analysis window will return. Now click Open (you will get another window like above, only it will be for Open). The Data Trap Analysis window will be similar to the one below.

Figure 3-29 Data Trap Analysis Window

Data Trap Analysis Ascii Data Hex Data 5 6 7 8 9 10 11 12 13 14 15 16 17 4 5 6 7 8 9 10 11 12 13 14 15 16 17 0 1 2 3 4 0 1 2 3 05 64 14 C4 05 00 FE FF 0F A8 C0 CB 01 3C 02 06 3C FF d . < 03 06 3C 04 06 3C 01 06 63 A8 FF 05 64 14 C4 05 00 FE С d FF 0F A8 C1 CB 01 3C 02 06 3C 03 06 3C 04 06 3C 01 06 . < < . < 05 64 11 C4 05 00 FE FF 86 50 C2 CB 01 3C 02 7B C6 FF d Р 06 3C 03 06 3C 04 06 CB 2B FF 05 64 14 C4 05 00 FE FF K d OF A8 C3 CB 01 3C 02 06 3C 03 06 3C 04 06 3C 01 06 4B < 1A FF 05 64 14 C4 05 00 FE FF 0F A8 C4 CB 01 3C 02 06 3C 03 06 3C 04 06 3C 01 06 7A 5D FF 05 64 05 C0 05 00 d < 5 64 0C C4 05 00 FE FF 12 4A C5 CB 01 FE FF 31 E9 FF 32 00 07 01 4A FC Byte Information Start Time: FRI OCT 05 17:31:56 2007 Search Direction Receive Search for a sequence of Hex or ASCII File Info Characters. Space Delimited. Time 13249 [ms] Filename : C:\dt_data1.log Search For: Framing Find Error Overrun Parity Search Hex or ASCII Hex • Download Open Decimal IB Time 24 [ms] Done

Hex data bytes are on the left, ASCII data bytes are on the right. Each block is a byte of data.

When you click in a block, the selected block will turn to a blue background, which simply means it's been selected. White text with black background (34) means the block is part of a Receive string. Black text with white background (45) means the block is part of a Transmit string.

Further information about each byte may be found under the heading Byte Information. Here you will see (once again) if the block is Transmit or Receive, the Time in milliseconds from the beginning of the sample, and the error codes, as follows:

Framing Overrun Parity

Further, the blocks (bytes) that represent errors will be in red (🕕) against a black background.

The Decimal field reveals the decimal equivalent of the Hex/ASCII byte. IB Time is the Interbyte time before each byte.

On the right-hand side of the window, you may search for a particular byte pattern in either Hex of ASCII.

Note: By default, the program reads the dt_data.log file from your PC. If you want to read, or save to, another named file, you must specify.

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.

3.12.3.2 2179 Example

Click the View button under Comm Counters for 2179. The Communication Counters Display screen is dynamic and will be continually updated. This screen is provided for troubleshooting communications.

2179 Communication Counters Display Port # : 2 Port Name : Port 2 Point Counter Name Counts 1 Attempts 0 2 Good Replies 0 0 3 No Replies 4 **RX** Timeouts 0 0 5 CRC Errors 6 Framing Errors 0 7 0 Overruns 8 Parity Errors 0 Configure Data Trap View IED Comm Counters Reset Reset Comm Counters Back

Point Number

A logical point number for reference only.

Counter Name

The following counters are monitored:

Attempts

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

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.

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.

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.

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.

Framing Errors

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

Overruns

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

Parity Errors

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

Counts

The counts for each type of Counter.

Data Trap

See Section 3.12.3.1

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 : Po							he : Port 2		
IED #	IED Name	Messages Sent	Valid Replies	No Replys	Timeouts			Overrun 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

IED

The number of the IED

IED Name

The name of the IED

Messages Sent

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

Valid Replies

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

No Replies

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

Timeouts

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

Security Errors

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

Framing Errors

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

Overrun Errors

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

Parity Errors

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

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.

3.12.4 Display Port Data, Series 5 Example

From the Display Communication Port Data screen, click on Port Data for the S5R. You will get the screen shown in Figure 3-31.

S5R Communication Display				
Port # : 1	Port Name : Port 1			
Туре	Number	View		
Analogs Inputs	200	View		
Status Inputs	200	View		
Accumulators	200	View		
Digital Outputs*	0			
Analog Outputs	0	View		
Binary Outputs*	128			
		Back		

Figure 3-31	S5R	Communication	Display
-------------	-----	---------------	---------

Туре

The type of point.

Number

The quantity of each data type as configured in the RTU.

View

The View button allows you to view the current point values.

Navigation

Port # : *n* tells you which port you are looking at. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click the Back button to go back to the Data Display screen.

3.12.4.1 Analogs Inputs, Series 5 Example

From the S5R Communication Display screen, click on View for Analog Inputs.

S5R Communication Display				
Port # : 3 Port Name : Port 3				
Туре	Number	View		
Analogs Inputs	200	View		
Status Inputs	200	View		
Accumulators	98	View		
Digital Outputs*	0			
Analog Outputs	0	View		
Binary Outputs*	96			
		Back		

Figure 3-32 Port Data

The inputs are shown in Figure 3-33.

Port#∶4		Page1 of 1	Go To	GO		ort Name : Port_4
Point	Device Name	Point Name	Deadband	Point Status	Point Value	Point Counts
0	Hardware Analogs	ANALOG 1	7		2.931	1172
1	Hardware Analogs	ANALOG 2	7		0.000	0
2	Hardware Analogs	ANALOG 3	7		0.000	0
3	Hardware Analogs	ANALOG 4	7		0.000	0
4	Hardware Analogs	ANALOG 5	7		0.000	0
5	Hardware Analogs	ANALOG 6	7		0.000	0
6	Hardware Analogs	ANALOG 7	7		0.000	0
7	Hardware Analogs	ANALOG 8	7		0.000	0
8	PoleCat 1	IED_ANALOG 0	7		0.000	0
9	PoleCat 1	IED_ANALOG 1	7		5.213	104
10	PoleCat 1	IED_ANALOG 2	7		-5.203	-104
11	PoleCat 1	IED_ANALOG 3	7		-6.250	-125
12	PoleCat 1	IED_ANALOG 4	7		-6.250	-125
13	PoleCat 1	IED_ANALOG 5	7		-6.250	-125
14	PoleCat 1	IED_ANALOG 6	7		-6.250	-125
15	PoleCat 1	IED_ANALOG 7	7		-6.250	-125
						Back

Figure 3-33 Analog Inputs (AI) Display

S5R Analog Inputs Display

Point

The protocol point number the value is being returned as.

Device Name

The device from which the point originates.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Deadband

The deadband, which may be downloaded from the Master Station, is used to determine the analog counts that must change from the last reported counts before the point is marked to be reported. Exceptions are reported to the Master Station on the next valid scan for this point. At reset, all deadbands are assigned a value of 7.

Point Status

See Section 3.2.

An **H** or **L** will appear in the Point Status column when the point's input is outside the range of the configured point as follows:

Input Range	Н	L
±5VDC/±1mA	>+5.0 VDC	<-5.0 VDC
0-5VDC/0-1mA	>+5.0 VDC	< 0.0 VDC
1-5VDC/4-20mA	>+5.0 VDC	<+1.0 VDC

Point Value

The engineering unit value based on the Min and Max scale factors assigned during Configuration.

Point Counts

The counts to be returned to the Master Station based on the current configuration of the point.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.4.2 Status Inputs, Series 5 Example

Click Status on the Port Data Display to display the Series 5 Status inputs. The display is continually updated to show the present input state.

	S5R Status Inputs Display				
Port # : 3	Page1 of	f 13 Go To Go		Port Name : N	Port 3 ext>>
Point	Device Name	Point Name	Point Status	Point State	e 🔹
0	Hardware DI	DI_PNT_1		CLOSE	•
1	Hardware DI	DI_PNT_2		OPEN	•
2	Hardware DI	DI_PNT_3		OPEN	•
3	Hardware DI	DI_PNT_4		OPEN	•
4	Hardware DI	DI_PNT_5		OPEN	•
5	Hardware DI	DI_PNT_6		OPEN	•
6	Hardware DI	DI_PNT_7		OPEN	•
7	Hardware DI	DI_PNT_8		OPEN	•
8	Hardware DI	DI_PNT_9		OPEN	•
9	Hardware DI	DI_PNT_10		OPEN	•
10	Hardware DI	DI_PNT_11		OPEN	•
11	Hardware DI	DI_PNT_12		OPEN	•
12	Hardware DI	DI_PNT_13		OPEN	•
13	Hardware DI	DI_PNT_14		OPEN	•
14	Hardware DI	DI_PNT_15		OPEN	•
15	Hardware DI	DI_PNT_16		OPEN	•
					Back

Figure 3-34 Status Display

Point

The protocol point number the state is being returned as.

Device Name

The name of the device from which the status point originates.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point State

This will be either CLOSE or OPEN.

•

Displays a green dot for OPEN and a red dot for CLOSED.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.4.3 Accumulators Inputs, Series 5 Example

Click Accumulators on the Port Data Display to display the Series 5 Accumulator inputs.

ort #:4 D #:1				Port Name : Port Name : SVM_IED_
	Page1 of 3	Go To Go		Next≯
Point	Point Name		Point Status	Count
0	IED_ACC 0		F	
1	IED_ACC 1		F	
2	IED_ACC 2		F	
3	IED_ACC 3		F	
4	IED_ACC 4		F	
5	IED_ACC 5		F	
6	IED_ACC 6		F	
7	IED_ACC 7		F	
8	IED_ACC 8		F	
9	IED_ACC 9		F	
10	IED_ACC 10		F	
11	IED_ACC 11		F	
12	IED_ACC 12		F	
13	IED_ACC 13		F	
14	IED_ACC 14		F	
15	IED_ACC 15		F	

Figure 3-35 Accumulator Display

Point

The protocol point number the value is being returned as.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Count

The count of the accumulator at the time the Master asks for a freeze.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.4.3. Digital Outputs, Series 5 Example

Click Analog Outputs on the Port Data Display to display the Series 5 analog outputs.

Series V Digital Outputs Display

		ocrico i bigitar	outputs bisping			
ort # : 5		Page1 of 1	Go To Go		Port Name : I	Port
Pnt	Device Name	Р	oint Name	Point Status	Point State	•
0	ISaGRAF_IF	F	RLL_DO 0	U	OPEN	
1	ISaGRAF_IF	F	RLL_DO 1	U	OPEN	•
2	ISaGRAF_IF	F	RLL_DO 2	U	OPEN	
3	ISaGRAF_IF	F	RLL_DO 3	U	OPEN	
-	-		-	-	-	
-	-		-	-	-	+
-	-		-	-	-	┝
-	-		-		-	+
-	-		-	-	-	
-	-		-	-	-	
-	-		-	-	-	+
-	-		- -	-	-	+
-	-		-		-	+
-	-		-	-	-	
					E	Back

Figure 3-36 Digital Outputs Display

Point

The protocol point number as it is written from the MTU.

Device Name

The name of the device from which the point originates.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point State

This will be either CLOSE or OPEN.

Displays a green dot for OPEN and a red dot for CLOSED.

3.12.4.4 Analog Outputs, Series 5 Example

Click Analog Outputs on the Port Data Display to display the Series 5 analog outputs.

S5R Analog Outputs Display						
Port #:9					Por	rt Name : Port9
	Page	e1 of 2 G	о То 📃 🖸 Со			Next>>
Point	Device Name	Point Name	Poi	nt Status	Point Value	Point Counts
0	Base Board AO	ANA_OUT 1			-10.000	0
1	Base Board AO	ANA_OUT 2			-5.000	0
2	Base Board AO	ANA_OUT 3			-5.000	0
3	Base Board AO	ANA_OUT 4			-5.000	0
4	Base Board AO	ANA_OUT 5			-5.000	0
5	Base Board AO	ANA_OUT 6			-5.000	0
6	Base Board AO	ANA_OUT 7			-5.000	0
7	Base Board AO	ANA_OUT 8			-5.000	0
8	Base Board AO	ANA_OUT 9		F	-5.000	0
9	Base Board AO	ANA_OUT 10		F	-5.000	0
10	Base Board AO	ANA_OUT 11		F	-5.000	0
11	Base Board AO	ANA_OUT 12		F	-5.000	0
12	No Device	Spare			0.000	0
13	No Device	Spare			0.000	0
14	No Device	Spare			0.000	0
15	No Device	Spare			0.000	0
						Back

Figure 3-37 Analog Outputs Display

Point

The protocol point number as it is written from the MTU.

Device Name

The name of the device from which the point originates.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point Value

The engineering unit value based on the EGU Min and EGU Max scaling assigned during Configuration

Point Counts

The last raw count value sent from the RTU.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.4.5 Binary Outputs, Series 5 Example

The current state of Binary Outputs are not viewable.

3.12.5 2179 Example

3.12.5.1 Pulse Accumulators, 2179 Example

From the 2179 IED Display screen, click on View for Pulse Accumulators. The panel as shown in Figure 3-38 will appear. From this panel, you make the selection of what data type to display.

2179 IED Display			
Port # : 5 IED # : 1	Port Name : Port 5 IED Name : 2179_IED_1		
Туре	View Data		
Pulse Accumulators	View		
Two Bit Status	View		
Simple Status	View		
Analog Inputs	View		
Control Outputs			
	Back		

Figure 3-38 Port Data

Click View on the Pulse Accumulator row to Display the Accumulator Inputs. The inputs are shown in Figure 3-39.

	2179 Accumulator Inputs [Display
ort # : 5 ED # : 1	IEC	Port Name : Port 5 Name : 2179_IED_1
	Page1 of 1 Go To G	0
Point	Point Name	Count
40	IED_ACC_40	171
41	IED_ACC_41	171
42	IED_ACC_42	171
43	IED_ACC_43	41
44	IED_ACC_44	24 24
45	IED_ACC_45	24
46	IED_ACC_46	107
47	IED_ACC_47	0
48	IED_ACC_48	0
49	IED_ACC_49	0
4A	IED_ACC_4A	0
4B	IED_ACC_4B	0
4C	IED_ACC_4C	0
4D	IED_ACC_4D	0
4E	IED_ACC_4E	0
4F	IED_ACC_4F	40
		Back

Figure 3-39 2179 Accumulator Inputs Display

Point

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Count

The counts coming from the IED based on the current configuration of the point.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.5.2 Two Bit Status, 2179 Example

Click View on the Two Bit Status row on the Port Data Display to display the 2179 two bit status inputs. The display is continually updated to show the present input state.

Port # : 5 IED # : 1	2179 Two Bit Sta Page1 of 1		I V Port Name : F Name : 2179_I	
Point	Point Name	Point Status	Point State	•
0-0	IED_MCD_00-0		CLOSED	•
0-1	IED_MCD_00-1		CLOSED	•
0-2	IED_MCD_00-2		CLOSED	•
0-3	IED_MCD_00-3		OPEN	•
0-4	IED_MCD_00-4		OPEN	•
0-5	IED_MCD_00-5		OPEN	•
0-6	IED_MCD_00-6		OPEN	•
0-7	IED_MCD_00-7		OPEN	•
1-0	IED_MCD_01-0		CLOSED	•
1-1	IED_MCD_01-1		CLOSED	•
1-2	IED_MCD_01-2		CLOSED	•
1-3	IED_MCD_01-3		OPEN	•
1-4	IED_MCD_01-4		OPEN	•
1-5	IED_MCD_01-5		OPEN	•
1-6	IED_MCD_01-6		OPEN	•
1-7	IED_MCD_01-7		OPEN	•
			Ba	ck 🛛

Figure 3-40 2179 Two Bit Status Display

Point

The point number of the change bit.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point State

This is the state of the status bit. This will be either CLOSED or OPEN.

•

Displays a green dot for OPEN and a red dot for CLOSED.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.5.3 Simple Status, 2179 Example

Click View on the Simple Status row on the Port Data Display to display the 2179 Simple Status inputs. The display is continually updated to show the present input state.

	2179 Simple Statu	is Inputs Display	/
Port # : 5	i		Port Name : Port 5
IED #:1	Page1 of 1		Name : 2179_IED_1
Point	Point Name	Point Status	Point State •
-1	COMM_STS	Point Status	OPEN •
-			
30-0	IED_STS_30-0		CLOSED •
30-1	IED_STS_30-1		CLOSED •
30-2	IED_STS_30-2		CLOSED •
30-3	IED_STS_30-3		OPEN •
30-4	IED_STS_30-4		OPEN •
30-5	IED_STS_30-5		OPEN •
30-6	IED_STS_30-6		OPEN •
30-7	IED_STS_30-7		OPEN •
30-8	IED_STS_30-8		CLOSED •
30-9	IED_STS_30-9		CLOSED •
30-10	IED_STS_30-10		CLOSED •
30-11	IED_STS_30-11		OPEN •
30-12	IED_STS_30-12		OPEN •
30-13	IED_STS_30-13		OPEN •
30-14	IED_STS_30-14		OPEN •
			Back

Figure 3-41 2179 Simple Status Display

Point

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point State

This will be either CLOSED or OPEN.

Displays a green dot for OPEN and a red dot for CLOSED.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.5.4 Analog Inputs, 2179 Example

Click View on the Analog Inputs row on the Port Data Display to display the 2179 analog inputs.

	2179 Analog Inputs Display			
Port # : 5	i			ort Name : Port 5
IED #:1			IED Na	me : 2179_IED_1
	Page1 of 1	Go To	GO	
Point	Point Name	Point Status	Point Value	Point Counts
80	IED_AI_80		90.002	29491
81	IED_AI_81		0.002	0
82	IED_AI_82		0.002	0
83	IED_AI_83		0.002	0
84	IED_AI_84		0.002	0
85	IED_AI_85		0.002	0
86	IED_AI_86		0.185	60
87	IED_AI_87		0.185	60
88	IED_AI_88		0.185	60
89	IED_AI_89		20.586	6745
8A	IED_AI_8A		0.002	0
8B	IED_AI_8B		0.002	0
8C	IED_AI_8C		0.002	0
8D	IED_AI_8D		-21.492	-7043
8E	IED_AI_8E		0.002	0
8F	IED_AI_8F		0.002	0
				Back

Figure 3-42 2179 Analog Inputs Display

Point

The point number.

Point Name

The point name assigned (or the default name accepted) during Configuration.

Point Status

See section 3.2

Point Value

The engineering unit value based on the EGU Min and EGU Max scaling assigned during Configuration

Point Counts

The raw value being returned from the IED.

Navigation

Click <<Prev to navigate to the previous 16 points, if applicable. Port #: n tells you which port you are looking at. 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. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click Next>> to go to the next 16 points, if applicable. Click the Back button to go back to the Data Display screen.

3.12.5.5 Control Outputs, 2179 Example

The present state of Control Outputs is not viewable.

3.13 Ethernet Comm Data Display

Ethernet Comm will display whatever protocols have been activated for Ethernet. A different protocol may be configured for each socket. Please see the config@WEB Protocols manuals for protocol-over-Ethernet details.

Display Communication Port Data				
Socket Number	Name	Protocol	Comm Counters	Display Port Data
Socket # 1	Socket 1	DNPR	View	Port Data
Socket # 2	Socket 2	DNPM	View	Port Data
Socket # 3	Socket 3	None	View	Port Data
Socket # 4	Socket 4	None	View	Port Data
Socket # 5	Socket 5	None	View	Port Data
Socket # 6	Socket 6	None	View	Port Data
Socket # 7	Socket 7	None	View	Port Data
Socket#8	Socket 8	None	View	Port Data

Figure 3-43 Display Ethernet Communication Port Data

3.14 GPS Data Display

Under Display Data tab, click GPS. The GPS Display should look similar to Figure 3-44 if you have enabled the GPS as explained in the Configuration chapter.

GPS Display Data					
RTU/	GPS Time S	Sync Diag	nosti	cs	
Current RTU Date/T		11/14/20			
Date/Time of last sy	nc	11/14/20)02 22	:14:06	
RTU Milliseconds at la	ast sync	3683617			
Seconds between sy		15.000			
Milliseconds since last		902			
		Health			
Antenna Connection		ОК			
Receiver Status		Doing po	sition f	ixes	
	<u>Satellit</u>	<u>es in use</u>			
10-					
9-					
8-					
s 7-					
S 7- T 6- E 5- N 4- G 3- T 3-					
E 5-					
N 4-					
G . T 3-					
H 2-					
1-					
0-					
1-					
1-					
7 8	11 2	26 27	28	31	29
	SATE	LLITES			
					Back

Figure 3-44 GPS Display

3.14.1 RTU/GPS Time Sync Diagnostics

Current RTU Date/Time

Current RTU Date and Time from the GPS. This is UTC (previously called GMT) time.

Date/Time of last sync

This value is the last time that the time was set using data from the GPS connected to the RTU.

RTU Milliseconds at last sync

This is the value of the internal 1ms counter of the RTU when the time was last set from the GPS receiver.

Seconds between syncs

This reflects the sync interval set up during configuration.

Milliseconds since last Pulse

This is the number of milliseconds since the last top-of-the-second Pulse from the GPS.

3.14.2 GPS Health

Antenna Connection

This line will reveal if the antenna is connected or not, or if there is another problem with the antenna or lead. Compare Figure 3-44 to Figure 3-45. The possible messages are

"OK" "Short or open"

Receiver Status

Reports the Receiver Status. Compare Figure 3-44 to Figure 3-45. The possible messages are:

- "Doing position fixes" "No GPS time vet" "Need initialization" "PDOP too high" "No satellites available" "Only 1 satellite available" "Only 2 satellites available" "Only 3 satellites available" "No satellites usable" "Only 1 satellite usable" "Only 2 satellites usable" "Only 3 satellites usable"
- "Unknown code"

Satellites in use

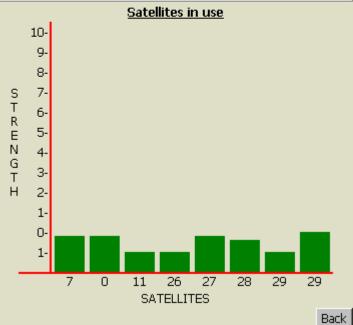
The GPS module tracks up to eight satellites, giving each satellite's I.D. number (bottom, X axis) and relative signal strength (left side, Y axis). For best results (that is, to track the most satellites with the highest possible signal strength), your GPS antenna must have an unobstructed view of the sky. If buildings or trees block the antenna, fewer satellites will be tracked at any given time. This could result in intermittent loss of time sync.

Navigation

Click the Back button to go back to the Data Display screen.

Figure 3-45 GPS Display With Antenna Disconnected

GPS Display Data			
RTU/GPS Time Sync Diagnostics			
Current RTU Date/Time	11/14/2002 22:37:45		
Date/Time of last sync	11/14/2002 22:37:13		
RTU Milliseconds at last sync 5070614			
Seconds between syncs	15.000		
Milliseconds since last Pulse	19390		
GPS Health			
Antenna Connection	Short or open		
Receiver Status	No usable satellites		



3.15 RLL Data Display

Please see the following manual for further information:

config@WEB Relay Ladder Logic Manual, Part # S2200-AAA-00003

3.16 Applications Data Display

Please refer to the config@WEB Applications manual.

3.17 Logs

3.17.1 SOE Log

The SOE Log Configuration determines the number of SOE Events stored in the RTU. The SOE Log Display will display all events stored. In addition, as new events take place, they will show up on the SOE Display as they are happening. Even as the Event Log in the RTU rolls over according to the number configured (first in, first out), the display will retain all events as long as the display is up on your computer. Therefore, you may see many more events in the display than are Set in Configuration.

Sequence Of Events Log							
Event	Date/	Time▼	Device Name	Point Name	State		
1	07/23/2007	07:38:22.591	RTU Internal Status	CONFIG CHG	1	^	
2	07/23/2007	07:38:00.271	RTU Internal Status	LOGGED IN	1		
3	07/23/2007	06:58:54.001	RTU Internal Status	RLL RUN	1	≡	
4	07/23/2007	06:58:54.001	RTU Internal Status	IED FAIL	1		
5	07/23/2007	06:58:54.000	RTU Internal Status	TIME SRC FAIL	0		
6	07/23/2007	06:58:54.000	RTU Internal Status	PRM TIME SRC FAIL	0		
7	07/23/2007	06:23:04.044	RTU Internal Status	LOGGED IN	1		
8	07/20/2007	12:55:40.642	RTU Internal Status	LOGGED IN	0		
9	07/20/2007	12:53:59.327	RTU Internal Status	LOGGED IN	1		
10	07/20/2007	12:39:47.001	RTU Internal Status	RLL RUN	1		
11	07/20/2007	12:39:47.001	RTU Internal Status	IED FAIL	1		
12	07/20/2007	12:39:47.000	RTU Internal Status	TIME SRC FAIL	0		
13	07/20/2007	12:39:47.000	RTU Internal Status	PRM TIME SRC FAIL	0		
14	07/20/2007	12:36:25.500	DNPM_IED_1 Sta49	COMM_STS	1		
15	07/20/2007	12:15:51.053	RTU Internal Status	LOGGED IN	0		
16	07/20/2007	11:41:28.894	RTU Internal Status	LOGGED IN	1		
17	07/20/2007	11:18:56.217	RTU Internal Status	ETHERNET LINK	1		
18	07/20/2007	11:17:58.860	DNPM_IED_1 Sta49	IED_STS 47	1		
19	07/20/2007	11:17:58.860	DNPM_IED_1 Sta49	IED_STS 46	1	~	
Downloa	ad				В	ack	

Figure 3-46 SOE Log Display

The default SOE Log Display is sorted by Date/Time with the most recent at the top. You may reverse this sorting by clicking on the Date/Time header, as shown by the arrow above. You may also sort by Device Name, Point Name, or State, either in ascending or descending order, by clicking on these headers.

In addition to the SOE Log Display shown above, the SOE Log may be saved as a file by clicking on Download.

You will be given the choice of opening the log, or saving the log as shown below.

Figure 3-47 File Download

File Dov	vnload 🛛 🔀
Do you	u want to open or save this file?
	Name: soelog.txt Type: Text Document, 11.2KB From: 172.18.150.51
	<u>Open</u> <u>Save</u> Cancel
2	While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. <u>What's the risk?</u>

If you save the file, you will get a dialog box as shown.

Figure	3-48	Save	As
--------	------	------	----

Save As								? 🗙
Savejn:	🞯 Desktop	•	*	G	Ð	Þ	•	
D Recent	My Documents My Computer My Network Pla							
Desktop	Graphics Progra	ams						
My Documents	Shortcuts to Fo	lders						
My Computer								
	File <u>n</u> ame:	soelog.txt				~		<u>à</u> ave
My Network	Save as <u>t</u> ype:	Text Document				*		ancel

When this file is opened, it will look as shown below.

Figure 3-49	SOE	log	File
-------------	-----	-----	------

	⊻iew <u>H</u> elp								
NextSlot=				100 MaxSlots= 1					
<rec <="" dt="07/20/2007" id="</th><th>801" th=""><th>' TM="07:46:58.001'</th><th>' VAL="1"</th><th>PN="RLL RUN</th><th>"</th><th></th><th>Internal</th><th></th><th></th></rec>	' TM="07:46:58.001'	' VAL="1"	PN="RLL RUN	"		Internal			
<rec <="" dt="07/20/2007" id="</td><td>802" td=""><td>' TM="07:48:16.043'</td><td>' VAL="1"</td><td>PN="LOGGED IN</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="07:48:16.043'	' VAL="1"	PN="LOGGED IN	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>803" td=""><td>' TM="07:50:37.108'</td><td>' VAL="1"</td><td>PN="CONFIG CHG</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="07:50:37.108'	' VAL="1"	PN="CONFIG CHG	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>804" td=""><td>' TM="07:55:05.001'</td><td>' VAL="0"</td><td>PN="PRM TIME SRC FAIL</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="07:55:05.001'	' VAL="0"	PN="PRM TIME SRC FAIL	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>805" td=""><td>' TM="07:55:05.001'</td><td>' VAL="0"</td><td>PN="TIME SRC FAIL</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="07:55:05.001'	' VAL="0"	PN="TIME SRC FAIL	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>806" td=""><td>' TM="07:55:05.001'</td><td>' VAL="1"</td><td>PN="IED FAIL</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="07:55:05.001'	' VAL="1"	PN="IED FAIL	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>807" td=""><td></td><td></td><td>PN="RLL RUN</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>			PN="RLL RUN	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>808" td=""><td>' TM="07:55:22.020'</td><td>' VAL="1"</td><td>PN="LOGGED IN PN="CONFIG CHG PN="PRM TIME SRC FAIL</td><td>"</td><td></td><td>Internal</td><td></td><td></td></rec>	' TM="07:55:22.020'	' VAL="1"	PN="LOGGED IN PN="CONFIG CHG PN="PRM TIME SRC FAIL	"		Internal			
<rec <="" dt="07/20/2007" id="</td><td>809" td=""><td>' TM="07:59:37.299'</td><td>' VAL="1"</td><td>PN="CONFIG CHG</td><td></td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="07:59:37.299'	' VAL="1"	PN="CONFIG CHG		DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>810" td=""><td>' TM="08:05:52.001'</td><td>' VAL="0"</td><td>PN="PRM TIME SRC FAIL</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="08:05:52.001'	' VAL="0"	PN="PRM TIME SRC FAIL	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>811" td=""><td>' TM="08:05:52.001'</td><td>' VAL="0"</td><td>PN="TIME SRC FAIL</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>	' TM="08:05:52.001'	' VAL="0"	PN="TIME SRC FAIL	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>812" td=""><td>' TM="08:05:52.001'</td><td>' VAL="1"</td><td>PN="IED FAIL</td><td></td><td></td><td>Internal</td><td></td><td></td></rec>	' TM="08:05:52.001'	' VAL="1"	PN="IED FAIL			Internal			
<rec <="" dt="07/20/2007" id="</td><td>813" td=""><td>' TM="08:05:52.001'</td><td>' VAL="1"</td><td>PN="RLL RUN</td><td></td><td></td><td>Internal</td><td></td><td></td></rec>	' TM="08:05:52.001'	' VAL="1"	PN="RLL RUN			Internal			
<rec <="" dt="07/20/2007" id="</td><td>814" td=""><td></td><td></td><td></td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>				"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>815" td=""><td>' TM="08:26:21.000'</td><td>' VAL="0"</td><td>PN="PRM TIME SRC FAIL</td><td></td><td></td><td>Internal</td><td></td><td></td></rec>	' TM="08:26:21.000'	' VAL="0"	PN="PRM TIME SRC FAIL			Internal			
<rec <="" dt="07/20/2007" id="</td><td>816" td=""><td></td><td></td><td></td><td></td><td></td><td>Internal</td><td></td><td></td></rec>						Internal			
<rec <="" dt="07/20/2007" id="</td><td>817" td=""><td></td><td></td><td></td><td></td><td></td><td>Internal</td><td></td><td></td></rec>						Internal			
<rec <="" dt="07/20/2007" id="</td><td>818" td=""><td></td><td></td><td></td><td></td><td></td><td>Internal</td><td></td><td></td></rec>						Internal			
<rec <="" dt="07/20/2007" id="</td><td>819" td=""><td></td><td></td><td></td><td></td><td></td><td>Internal</td><td></td><td></td></rec>						Internal			
<rec fail<="" id="</td><td></td><td></td><td></td><td>PN=" prm="" src="" td="" time=""><td></td><td></td><td>Internal</td><td></td><td>50 S 24</td></rec>			Internal		50 S 24				
<rec <="" dt="07/20/2007" id="</td><td>821" td=""><td></td><td></td><td></td><td></td><td></td><td>Internal</td><td></td><td></td></rec>						Internal			
<rec <="" dt="07/20/2007" id="</td><td>822" td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></rec>									
<rec <="" dt="07/20/2007" id="</td><td>823" td=""><td></td><td></td><td>PN="LOGGED IN</td><td>"</td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"/></td></rec>			PN="LOGGED IN	"	DN="RTU	Internal	Status	"/>	
<rec <="" dt="07/20/2007" id="</td><td>824" td=""><td></td><td></td><td>DN="RT.T. RUN</td><td>"</td><td>DN="PTU</td><td>Internal Internal Internal</td><td>Status</td><td>"15</td></rec>			DN="RT.T. RUN	"	DN="PTU	Internal Internal Internal	Status	"15	
<rec <="" dt="07/20/2007" id="</td><td>825" td=""><td></td><td></td><td>PN="LOCGED IN</td><td></td><td>DN="RTU</td><td>Internal</td><td>Status</td><td>"15</td></rec>			PN="LOCGED IN		DN="RTU	Internal	Status	"15	
<rec <="" dt="07/20/2007" id="</td><td>826" td=""><td></td><td></td><td></td><td></td><td></td><td>Internal</td><td></td><td></td></rec>						Internal			
<rec fail<="" id="</td><td></td><td></td><td></td><td>PN=" prm="" src="" td="" time=""><td></td><td></td><td>Internal</td><td></td><td></td></rec>			Internal						
<rec 20="" 2007<="" id="</td><td>828" pm-"07="" td=""><td>' mm="11.11.05.000</td><td>VAL- 0</td><td>DN-"THE SAC PAID</td><td></td><td>DN- "PTU</td><td>Internal</td><td>Ctotuc</td><td></td></rec>	' mm="11.11.05.000	VAL- 0	DN-"THE SAC PAID		DN- "PTU	Internal	Ctotuc		
<rec 11.11.05.000<="" id="</td><td>020 DI- 07/20/2007</td><td>' mm=" td=""><td>VAL- 0</td><td>DN-"TED BATT</td><td></td><td>DN= "DMU</td><td>Internal</td><td>Ctatus</td><td></td></rec>	VAL- 0	DN-"TED BATT		DN= "DMU	Internal	Ctatus			
<rec 11.11.05.000<="" id="</td><td>029 DI- 07/20/2007</td><td>' mw-" td=""><td>VAL- 1</td><td>PN- IED FAIL</td><td>"</td><td>DN= KIU</td><td>Internal</td><td>Ctatus</td><td></td></rec>	VAL- 1	PN- IED FAIL	"	DN= KIU	Internal	Ctatus			
<rec id="</td><td>030 DI- 07/20/2007</td><td>IM- 11.11.05.000</td><td>VAL- I</td><td>PN- KLL KON</td><td></td><td>DN- KIU</td><td>THEETHAL</td><td>- 40</td><td>"></rec>									
	031 DT= 07/20/2007	TM= 11:17:55.024	VAL- U	PN= COMM_STS		DN= DNP	M_IED_I SC M IED_1 GH	a49 - 40	
<rec <="" id="</td><td>032 DT= 0//20/200/" td=""><td>IM-"11:1/:30.860"</td><td>VAL= 1"</td><td>PN="TIME SRC FAIL PN="TIME SRC FAIL PN="IED FAIL PN="COMM_STS PN="IED_STS 0 PN="IED_STS 13 PN="IED_STS 14 PN="IED_STS 16</td><td></td><td>DN= "DNP</td><td>M TRD 1 ST</td><td>a49 - 40</td><td>"/> "/></td></rec>	IM-"11:1/:30.860"	VAL= 1"	PN="TIME SRC FAIL PN="TIME SRC FAIL PN="IED FAIL PN="COMM_STS PN="IED_STS 0 PN="IED_STS 13 PN="IED_STS 14 PN="IED_STS 16		DN= "DNP	M TRD 1 ST	a49 - 40	"/> "/>	
<rec <="" dt="07/20/2007" id="</td><td>033" td=""><td>TM= 11:17:58.860</td><td>VAL="1"</td><td>PN= IED_STS 13</td><td></td><td>DN="DNP</td><td>M_IED_I ST</td><td>a49 - 40</td><td></td></rec>	TM= 11:17:58.860	VAL="1"	PN= IED_STS 13		DN="DNP	M_IED_I ST	a49 - 40		
<rec "<="" 2u="" 2uu="" id="</td><td>034 DT=" td="" u=""><td>TM="11:17:58.860"</td><td>VAL="1"</td><td>PN= IED_STS 14</td><td></td><td>DN="DNP"</td><td>M_IED_I St</td><td>a49 - 40</td><td>"/></td></rec>	TM="11:17:58.860"	VAL="1"	PN= IED_STS 14		DN="DNP"	M_IED_I St	a49 - 40	"/>	
<rec <="" dt="U//2U/2007" id="</td><td>835" td=""><td>TM="11:17:58.860"</td><td>VAL="1"</td><td>PN="IED_STS 16</td><td></td><td>DN="DNP</td><td>M_IED_1 St</td><td>a49</td><td>"/></td></rec>	TM="11:17:58.860"	VAL="1"	PN="IED_STS 16		DN="DNP	M_IED_1 St	a49	"/>	

Event

Text

Line Number

Date

Time

3.17.2 User Log

The User Log Configuration determines the number of User Events stored in the RTU. The User Log Display will display all events stored. In addition, as new events take place, they will show up on the User Log Display as they are happening. Even as the Event Log in the RTU rolls over according to the number configured (first in, first out), the display will retain all events as long as the display is up on your computer. Therefore, you may see many more events in the display than are Set in Configuration. In addition, the Date/Time, Events and Text headers may each be clicked on in order to sort the data.

User Log							
Line	Line Date/Time¥		Text				
1	06/20/2007	04:34:15.115	Logged In	User: Admin, IP: 172.18.146.45			
2	06/20/2007	03:33:41.146	Logged Out	IP: 172.18.146.45			
3	06/20/2007	02:58:49.949	Logged In	User: Admin, IP: 172.18.146.45			
4	06/20/2007	02:48:48.177	Reset	RTU Reset: Type NORMAL			
5	06/20/2007	02:48:30.522	Logged In	User: Admin, IP: 172.18.150.50			
6	06/20/2007	02:45:44.059	Reset	RTU Reset: Type NORMAL			
7	06/20/2007	02:43:53.145	Logged In	User: Admin, IP: 172.18.150.50			
8	06/20/2007	02:37:20.133	Reset	RTU Reset: Type NORMAL			
9	06/20/2007	02:37:01.467	Logged In	User: Admin, IP: 172.18.150.50			
10	06/20/2007	01:46:23.122	Reset	RTU Reset: Type NORMAL			
11	06/20/2007	01:46:02.326	Logged In	User: Admin, IP: 172.18.146.72			
12	06/20/2007	01:35:24.718	Reset	RTU Reset: Type NORMAL			
13	06/20/2007	01:35:10.002	Logged In	User: Admin, IP: 172.18.146.72			
14	06/20/2007	01:22:46.148	Reset	RTU Reset: Type NORMAL			
15	06/20/2007	01:22:03.375	Logged In	User: Admin, IP: 172.18.146.45			

Figure 3-50 User Log Display

Download

In addition to the User Log Display shown above, the User Log may be saved as a file by clicking on Download.

Back

You will be given the choice of opening the log, or saving the log as shown below.

Figure 3-51 File Download

File Download	×
Do you want to open or save this file?	
Name: userlog.log Type: Text Document, 24.3KB From: 172.18.150.51 <u>O</u> pen <u>S</u> ave Cancel	
While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. <u>What's the risk?</u>	

If you save the file, you will get a dialog box as shown.

Figure	3-52	Save As
--------	------	---------

Save As							? 🔀
Save jn:	🞯 Desktop		*	0	ð 6	• 🖽 🕈	
D Recent	Hy Documents My Computer My Network Pla EPSON	ces					
Desktop	FTP Graphics Progra Logs MTs	ims					
My Documents	Construction Shortcuts to Fo Spy Killers Constructions	lders					
My Computer							
	File <u>n</u> ame:	userlog.log				~	<u>S</u> ave
My Network	Save as <u>typ</u> e:	Text Document				~	Cancel

When this file is opened, it will look as shown below.

Figure	3-53	User.log	File
inguic	5 55	oscinog	1 IIC

ile <u>E</u> dit F <u>o</u> rmat	Alex Helb	
extSlot=	16 NextId= 16 Slot1 Id= 1 NMsgs= 15 MaxSlots= 200	
REC ID="	1" DT="06/20/2007" TM="01:22:03.375" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	
REC ID="	2" DT="06/20/2007" TM="01:22:46.148" TYPE="Reset" " TXT="RTU Reset: Type NORMALD	"/>
REC ID="	3" DT="06/20/2007" TM="01:35:10.002" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	
REC ID="	4" DT="06/20/2007" TM="01:35:24.718" TYPE="Reset" " TXT="RTU Reset: Type NORMALD	"/>
REC ID="	5" DT="06/20/2007" TM="01:46:02.326" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	
REC ID="	6" DT="06/20/2007" TM="01:46:23.122" TYPE="Reset " TXT="RTU Reset: Type NORMALD	"/>
REC ID="	7" DT="06/20/2007" TM="02:37:01.467" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	150.50 "/>
REC ID="	8" DT="06/20/2007" TM="02:37:20.133" TYPE="Reset " TXT="RTU Reset: Type NORMALD	"/>
REC ID="	9" DT="06/20/2007" TM="02:43:53.145" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	150.50 "/>
REC ID="	10" DT="06/20/2007" TM="02:45:44.059" TYPE="Reset " TXT="RTU Reset: Type NORMALD	"/>
REC ID="	11" DT="06/20/2007" TM="02:48:30.522" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	150.50 "/>
REC ID="	12" DT="06/20/2007" TM="02:48:48.177" TYPE="Reset " TXT="RTU Reset: Type NORMALD	"/>
REC ID="	13" DT="06/20/2007" TM="02:58:49.949" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	146.45 "/>
REC ID="	14" DT="06/20/2007" TM="03:33:41.146" TYPE="Logged Out " TXT="IP: 172.18.146.45	"/>
REC ID="	15" DT="06/20/2007" TM="04:34:15.115" TYPE="Logged In " TXT="User: Admin, IP: 172.18.	146.45 "/>
19952994 - 6096991		
Line	Date Time Event Text	

3.17.3 System Log

The System Log Display will display all events created by system tasks, informational and system errors. In addition, as new events take place, they will show up on the Sytem Log Display as they are happening.

System Log							
ID	Date/Time¥		Task	Function	Message		
8483	11/06/2011	04:00:46	dnpRouteUdp	dnpRoute	No repeated Ports, exiting task		
8482	11/06/2011	04:00:46	Startup	startup	Time since last restart: 431 days, 14 Hrs 23 Min 27 Secs		
8481	11/06/2011	04:00:46	Startup	startup	RTU App starting at: 11/06/2011 04:00:46		
8480	11/06/2011	04:00:46	Startup	m1_uif	System Log File detected at startup		
8488	11/05/2011	23:11:59	dnpRouteUdp	dnpRoute	No repeated Ports, exiting task		
8487	11/05/2011	23:11:59	Startup	inCrashMode	WARNING: Restart time window(90 secs) violated 1 times (Max=3)		
8486	11/05/2011	23:11:59	Startup	startup	Time since last restart: 0 days, 1 Hrs 39 Min 29 Secs		
8485	11/05/2011	23:11:59	Startup	startup	RTU App starting at: 11/05/2011 23:11:59		
8484	11/05/2011	23:11:59	Startup	m1_uif	System Log File detected at startup		
8553	11/15/2010	08:17:23	CAL		Missing Analog point number 1, ID -1		
8552	11/15/2010	08:17:23	CAL		Missing Analog point number 0, ID -1		
8551	11/15/2010	08:17:02	dnpRouteUdp	dnpRoute	No repeated Ports, exiting task		
8550	11/15/2010	08:17:02	Startup	startup	Time since last restart: 0 days, 0 Hrs 31 Min 0 Secs		
8549	11/15/2010	08:17:02	Startup	startup	RTU App starting at: 11/15/2010 08:17:02		
8548	11/15/2010	08:17:02	Startup	m1_uif	System Log File detected at startup		
8547	11/15/2010	07:46:23	CAL		Missing Analog point number 1, ID -1		
8546	11/15/2010	07:46:23	CAL		Missing Analog point number 0, ID -1		
8545	11/15/2010	07:46:02	dnpRouteUdp	dnpRoute	No repeated Ports, exiting task		
8544	11/15/2010	07:46:02	Startup	startup	Time since last restart: 0 days, 0 Hrs 14 Min 22 Secs 💌		
Download					Back		

Figure 3-54 System Log Display

3.17.4 Alarming

Please see the Alarming chapter in the Applications manual.

3.17.5 Annunciator

Please see the Annunciator chapter in the Applications manual.

Command Output

This chapter tells you how to Command Output devices on the RTU. Other chapters cover Configuration, Data Display, Upload/Download, and Administration. See the appendices for hardware User Interface connections. See Chapter 1 for Comm Port Configuration, Point Mapping, and Scaling.

Only those items that may be commandable will be highlighted. Other buttons that are not commandable will not be highlighted.

Log in and click the Command tab. You should see a display similar to Figure 4-1.

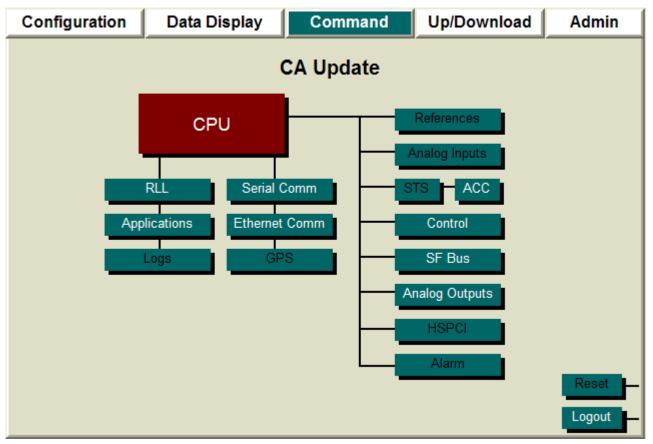


Figure 4-1 Command Screen

4.1 Command ACC

From the Command screen, click ACC to reset accumulators. The resulting screen will be similar to the one below.

	Page1 of 1	Go To Go					
Point	Name	Current Count	New Count	Operation			
1	DI_PNT_1	9	0	Execute			
2	DI_PNT_2	0	0	Execute			
3	DI_PNT_3	0	0	Execute			
4	DI_PNT_4	0	0	Execute			
5	DI_PNT_5	0	0	Execute			
6	DI_PNT_6	0	0	Execute			
Reset All Hardware Accumulators Reset							
Reset All Accumulators Reset							

Point

The point number.

Name

The point name assigned (or the default name accepted) during Configuration.

Current Count

The count read from the running ACC register.

New Count

Enter a count for a new starting point (i.e., if zero is entered, the count starts from zero).

Operation

Click the Execute button to begin at the count entered under New Count.

Reset All Hardware Accumulators

This button will reset Current Count to zero for all hardware accumulators.

Reset All Accumulators

This button will reset the current count to zero for all accumulators, hardware and IED.

Note: IED accumulators will be reset to zero only until the next count is received from the IED.

Navigation

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 go back to the Command screen.

4.2 Control Command

From the Command screen, click Control to exercise controls. You may choose Execute Time and either Trip or Close for any SBO. Click the Execute button to execute.

Command SBO							
	Next page	>>					
Point	Name	Execute Time (ms)	Po	int Operati	ons		
1	SBO 1	500	Trip	C Close	Execute		
2	SBO 2	500	O Trip	C Close	Execute		
з	SBO 3	500	O Trip	Close	Execute		
4	SBO 4	500	O Trip	Close	Execute		
5	SBO 5	500	O Trip	O Close	Execute		
6	SBO 6	500	O Trip	O Close	Execute		
7	SBO 7	500	O Trip	O Close	Execute		
8	SBO 8	500	O Trip	C Close	Execute		
9	SBO 9	500	O Trip	O Close	Execute		
10	SBO 10	500	O Trip	O Close	Execute		
11	SBO 11	500	O Trip	O Close	Execute		
12	SBO 12	500	O Trip	C Close	Execute		
13	SBO 13	500	O Trip	O Close	Execute		
14	SBO 14	500	O Trip	O Close	Execute		
15	SBO 15	500	O Trip	O Close	Execute		
16	SBO 16	500	O Trip	O Close	Execute		
Trip on S	SBO 1 : Successful				Back		

Figure 4-3 Command SBO

Point

The point number.

Name

The point name assigned (or the default name accepted) during Configuration.

Execute Time (ms)

Accept the default execute time or choose another execute time by typing in the time in milliseconds.

Point Operations

Trip Click the Trip button to select Trip.

Close

Click the Close button to select Close.

Execute

The Execute button will be active only if either the Trip or the Close has been selected. Once it is active, clicking the button will execute the action.

Status

The Status message at the lower left will show the result of your command.

Navigation

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 go back to the Command screen.

4.3 SF Bus Command

4.3.1 SFB Digital Output Command

Points on a DO XT card on the SFB may be commanded, as shown below. Enter the Momentary Relay Duration (or accept the default), click either Open or Close on the point you want to command, then click Execute.

SFB Digital Output Command.							
Page 1 of 1 GoTo Go							
Point	Name	Momentary Relay Duration	Point Operations				
1	DO_PNT 1	500	💿 Open 🔿 Close 🛛 Execute				
2	DO_PNT 2	500	Open O Close Execute				
3	DO_PNT 3	500	Open O Close Execute				
4	DO_PNT 4	500	Open O Close Execute				
5	DO_PNT 5	500	Open O Close Execute				
6	DO_PNT 6	500	Open O Close Execute				
7	DO_PNT 7	500	Open O Close Execute				
8	DO_PNT 8	500	Open O Close Execute				
9	DO_PNT 9	500	Open O Close Execute				
10	DO_PNT 10	500	Open O Close Execute				
11	DO_PNT 11	500	Open O Close Execute				
12	DO_PNT 12	500	Open O Close Execute				
13	DO_PNT 13	500	Open O Close Execute				
14	DO_PNT 14	500	Open O Close Execute				
15	DO_PNT 15	500	Open O Close Execute				
16	DO_PNT 16	500	Open O Close Execute				
Open or	n DO_PNT 1 : Successful		Back				

Figure 4-4 SFB Digital Output Command

Point

The point number.

Name

The point name assigned (or the default name accepted) during Configuration.

Momentary Relay Duration (ms)

Accept the default execute time or choose another execute time by typing in the time in milliseconds.

Point Operations

Open

Click the Open button to select Open.

Close

Click the Close button to select Close.

Execute

The Execute button will be active only if either the Open or the Close has been selected. Once it is active, clicking the button will execute the action.

Status

The Status message at the lower left will show the result of your command.

Navigation

Click the Back button to go back to the Command screen.

4.4 Analog Outputs Command

From the Command screen, click Analog Outputs to exercise analog output controls. The resulting screen will be similar to Figure 4-5

Ŭ •							
	Page1 of 1	Go To	ào				
Point	Name	Range	Value	Operation			
1	ANA_OUT 1	-10.000 to 10.000	-10.000	Execute			
2	ANA_OUT 2	-5.000 to 5.000	-5.000	Execute			
3	ANA_OUT 3	-5.000 to 5.000	-5.000	Execute			
4	ANA_OUT 4	-5.000 to 5.000	-5.000	Execute			
5	ANA_OUT 5	-5.000 to 5.000	-5.000	Execute			
6	ANA_OUT 6	-5.000 to 5.000	-5.000	Execute			
7	ANA_OUT 7	-5.000 to 5.000	-5.000	Execute			
8	ANA_OUT 8	-5.000 to 5.000	-5.000	Execute			
9	ANA_OUT 9	-5.000 to 5.000	-5.000	Execute			
10	ANA_OUT 10	-5.000 to 5.000	-5.000	Execute			
11	ANA_OUT 11	-5.000 to 5.000	-5.000	Execute			
12	ANA_OUT 12	-5.000 to 5.000	-5.000	Execute			
ANA_C	OUT 1 : Success			Back			

Figure 4-5 Command Analog Outputs Command Analog Outputs (AO)

Point

The point number.

Name

The point name assigned (or the default name accepted) during Configuration.

Range

The EGU range as determined by the values chosen in the Configuration.

Value

Enter a value within the Range to exercise the point.

Operation

Click the Execute button to execute the command.

Status

The Status message at the lower left will show the result of your command.

Navigation

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 go back to the Command screen.

4.5 Alarm Command

Note: This feature not presently supported.

4.6 Serial Comm Command

From the Command screen, click Serial Comm to exercise serial comm controls. The resulting screen will be similar to Figure 4-6.

The Command Communication Port Data has two aspects, depending on the protocol: Command Port Data, and Test Mode. The Port Data button will be grayed out if the port reports to a Master because you cannot command a Master. If the port is an IED or subremote port, then the Command Port Data button will be active.

Port Number	RTS	DTR	Name	Protocol	Command Port Data	Test Mode
Port#1	К	К	Series 5 to Master	Series V	Port Data	Normal 💌
Port#2	К	К	2179 to IED	2179	Port Data	Normal 💌
Port#3	к	К	Port 3	None	Port Data	Normal Mark
Port#4	к	К	Port 4	None	Port Data	Space
Port#5	к	К	Port 5	None	Port Data	Alt
Port#6	к	К	Port 6	None	Port Data	Normal 🗠
Port#7	к	К	Port 7	None	Port Data	Normal 🗠
Port#8	К	К	Port 8	None	Port Data	Normal 🗠
Port#9	К	К	Port 9	None	Port Data	Normal 💌
Port#10	К	К	Port 10	None	Port Data	Normal 💌
Port#11	К	К	Port 11	None	Port Data	Normal 🗠
Port#12	К	К	Port 12	None	Port Data	Normal 💌

Port Number

The physical port number.

RTS and DTR

Request To Send and Data Terminal Ready.

"K" represents Keyed (Radio/Modem).

The RTU firmware asserts/deasserts the signal according to the protocol timing configuration. See Figure 4-7. Typically used as a Radio/Modem key output (Default Setting).

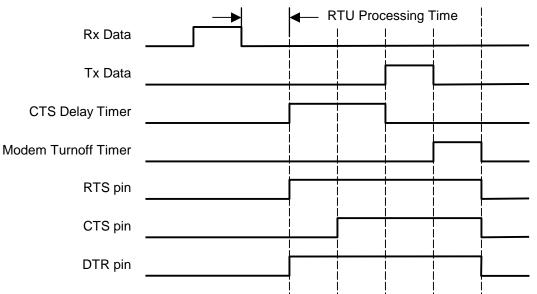
"H" represents Positive RS232 Voltage.

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.

"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 assigned (or the default name accepted) during Configuration.

Protocol

The protocol assigned (if any) during configuration.

Command Port Data

The Port Data button will be grayed out if the port reports to a Master because you cannot command a Master. If the port is an IED or subremote port, then the Command Port Data button will be active. Please see the following section 4.6.1 Command Port Data.

Test Mode

Test Mode is active for any port that has been assigned a protocol. The four modes are shown in the drop-down menu in Figure 4-6. To test the port, select either Mark, Space, or Alt. Please see the Maintenance chapter of the S2X00 manual for the details of Test Mode.

Navigation

Click the Back button to go back to the Command screen.

4.6.1 Command Port Data

From the Command Communication Port Data screen, under Command Port Data, click the Port Data button. In this example, we use a 2179 port that has four IEDs configured on it. You will get a screen similar to Figure 4-8.

Figure 4-8 Port Data

	2179 IED Command								
Port #	Port # : 6 Port Name : Port								
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			
3	2179_IED_3	З	Y	Standard	TBM-150, SOT-500, AOT-3500	Command			
4	2179_IED_4	4	Y	Standard	TBM-150, SOT-500, AOT-3500	Command			
	Back								

IED

The IED number on this port.

IED Name

The IED name assigned (or the default name accepted) during Configuration.

IED Address

The IED Address assigned during configuration.

On Scan

Tells you whether or not the IED is being scanned by the RTU. Yes is Y, No is N.

Device Type

Tells you the Device Type. In the case of 2179, this column could be Standard, as in the example, or Energyline.

Message Timers(ms)

TBM means Time Between Messages, SOT means Select to Operate Time, and AOT means After Operate Time. A number follows each acronym. That number is the time in milliseconds selected during Configuration of the IED.

Slave Data

The Slave Data column has a Command button. Please see section 4.6.1.1 Command Slave Data below for further instructions.

Navigation

Port # : *n* tells you which port you are looking at. Port Name : *name* tells you the name you assigned during configuration (or the default name). Click the Back button to go back to the Data Display screen.

4.6.1.1 Command Slave Data

From the 2179 IED Command screen, click Command under the Slave Data column. You will get a screen similar to Figure 4-9.

rigare i b izb command								
2179 IED Command								
Port # : 6 Port Name : Port IED # : 1 IED Name : 2179_IED_								
Туре	Command							
Pulse Accumulators								
Two Bit Status								
Simple Status								
Analog Inputs								
Control Outputs	Command							
	Back							

Figure 4-9 IED Command

The only command available is Control Outputs. The command gives you a screen similar to Figure 4-10. From this screen you may exercise various Outputs within the IED.

Туре

The types of points which may be available.

Command

There will be a Command button in the row of the point-type which is appropriate for command. Inappropriate points for command will not have the Command Button in that row. Please see Figure 4-10 and the text that follows the figure for more information

Navigation

Port # : *n* tells you which port you are looking at. Port Name : *name* tells you the name you assigned during configuration (or the default name). IED # : *n* tells you which IED you are looking at. IED Name : *name* tells you the name you assigned during configuration (or the default name). Click the Back button to go back to the IED Command screen.

Click the Command button under Command to get the Control Output Command screen as shown in Figure 4-10. You may choose either Trip or Close for any Control. Click the Execute button to execute.

	2179 Control Out	put Com	mand			
Port #:6 IED #:1						
1077,1	Page 1 of 2	GoTo	Go	: 2179_IED_1 Next >>		
SEQ# (Hex)	Name	P	oint Operat	ions		
00	Control-00	 Trip 	O Close	Execute		
01	Control-01	O Trip	O Close	Execute		
02	Control-02	O Trip	O Close	Execute		
03	Control-03	O Trip	O Close	Execute		
04	Control-04	O Trip	O Close	Execute		
05	Control-05	O Trip	O Close	Execute		
06	Control-06	O Trip	O Close	Execute		
07	Control-07	O Trip	O Close	Execute		
08	Control-08	O Trip	O Close	Execute		
09	Control-09	O Trip	O Close	Execute		
0A	Control-OA	O Trip	O Close	Execute		
OB	Control-0B	O Trip	O Close	Execute		
OC	Control-OC	O Trip	O Close	Execute		
OD	Control-0D	O Trip	O Close	Execute		
0E	Control-OE	O Trip	O Close	Execute		
OF	Control-OF	O Trip	O Close	Execute		
Trip on C	iontrol-00 : Successful			Back		

Figure 4-10	Control	Output	Command
-------------	---------	--------	---------

SEQ# (Hex)

This hex number is the number used by the IED vendor to tag the control. See the IED vendor's documentation.

Name

The point name assigned (or the default name accepted) during Configuration.

Point Operations

Trip

Click the Trip button to select Trip.

Close

Click the Close button to select Close.

Execute

The Execute button will be active only if either the Trip or the Close has been selected. Once it is active, clicking the button will execute the action.

Status

The Status message at the lower left will show the result of your command.

Navigation

Port # : *n* tells you which port you are looking at. Port Name : *name* tells you the name you assigned during configuration (or the default name). IED # : *n* tells you which IED you are looking at. IED Name : *name* tells you the name you assigned during configuration (or the default name). Click the Back button to go back to the IED Command screen.

4.7 Ethernet Command

Please refer to the specific protocol in the config@WEB Protocols Manual.

4.8 RLL Command

Please see the following manual for further information:

config@WEB Relay Ladder Logic Manual, Part # S2200-AAA-00003

4.9 Applications Command

Please see the following manual for Applications Commands that are supported.

config@WEB Applications Manual, Part # S2200-AAA-00006

CHAPTER 5 Upload/Download

This chapter tells you how to Upload and Download files to/from the RTU. The purpose for Upload/Download is to obtain an archive of the RTU's files, or to update the RTU's files.

Other chapters cover Configuration, Data Display, Command, and Administration. See the appendices for hardware User Interface connections. See Chapter 1 for Comm Port Configuration, Point Mapping, and Scaling.

Note: When the Upload/Download is being used for the first time, certain necessary files will be loaded onto your computer. You can see a list of these files in the IE Settings appendix.

5.1 Introduction

The Upload/Download feature allows you to Get from the RTU or Send to the RTU all the associated files for the following functions:

GUI	The collection of many types of files making up the RTU's configuration display
Application	The firmware
Configuration	The collection of XML files making up the RTU's configuration
Operating System	This is the third-party OS called VxWorks that all RTU programs run on.
Templates	Templates are protocol/IED specific. They are files that allow you to copy a particular setup for an IED, save the file, then load that setup file (template) into another RTU for the same IED.

Note 1: Your main interest in Up/Download is to back up your Configuration. However, it is prudent to back up all data (GUI, Application, and Configuration). When Uploading and Downloading these files, always follow the sequence of **G**UI, **A**pplication, then **C**onfiguration. An easy way to remember the sequence is with the acronym **GAC**.

Note 2: This chapter does not cover the details of firmware upgrade. Complete instructions for firmware upgrade can be found in the zip file containing the new firmware. The latest firmware and documentation is on the Customer Website. See Accessing the Customer Website appendix.

5.2 Getting Files From the RTU

Click on the Up/Download tab from the main page. A screen similar to Figure 5-1 will appear. The functions are explained below.

	ligare 5 i	op/Download Sci	cen	
Configuration	Data Display	Command	Up/Download	Admin
— File Tra	nsfer File Type Configuration Result	Get from RTU Send to RTU	Connection 172.18.150.51 User Name	
1	Not connected to RTU	Cancel	Password Connect	
- RTU In	formation Name	D	ate Size	
Part				
GUI App O/S	File		(size)	Reset
				Logout

Figure 5-1 Up/Download Screen

Note: You must login to the Up/Download Screen

User Name

Any valid User Name with Up/Download privilege. (See Ch 6 Administration)

Password

Password corresponding to said User Name.

Figure 5-2 Up/Download Screen after logging in

Configuration	Data Display	Command	Up/Do	ownload	Admin
File Transf	er		Connection -	Í.	
	File Type nfiguration Result nnected to RTU	Get from RTU Send to RTU Cancel	172.18.150 User Name Admin Password	.51	
- RTU Inform					
	Name		Date	Size	
RTU	Config@WEB				
Part No	. C3414-500-0011	E0_B0			
Configu	ration C3413-500-001)	× ·	10-15-01		
GUI	C3414-500-001	EO_BO.gui S	9/7/2009	4423680	
App File	e C3414-500-0011	E0_B0.out S	9/1/2009	2458761	Reset
0/S	vxWorks	:	9/1/2009	4568326	
					Logout

File Transfers

File Type (drop-down menu)

Configuration	The collection of XML files making up the RTU's configuration
Application	The firmware
	The collection of many types of files making up the RTU's configuration display
Operating System	VxWorks (may contain other files)
Templates	Files used to transfer IED configurations

Get from RTU (button)

Get file(s) from the RTU.

Send to RTU (button)

Send file(s) to the RTU.

Cancel (button)

Cancel the GET operation.

Connection

The IP address of your RTU.

RTU Information

RTU

The RTU name assigned under Configuration/CPU/RTU Name.

Part No.

The part number assigned to the firmware by Telvent.

Configuration

The Configuration name assigned by Telvent.

GUI

The GUI name and version number assigned by Telvent.

App File

The Application file name assigned by Telvent.

O/S

The operating system.

Navigation

Click Reset to reset the RTU. Click Logout to log out of the interface. Click any other tab to move to another RTU function.

5.2.1 Running Up/Download for the First Time

Note: Be sure to set security setting properly as detailed in Appendix A, Internet Explorer Settings.

The first time you run Up/Download (or after installing a new version of firmware), your PC will load a FileXfer.CAB file. This is a large file, so there will be a short delay. You will get a series of Security Warnings as shown below. (To save space, the entire screen is not shown.)

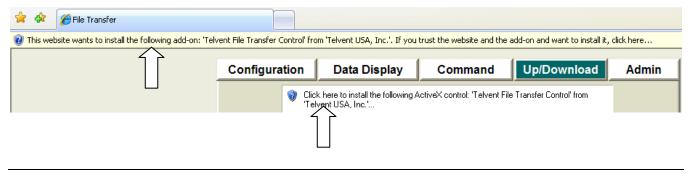


Figure 5-3 Security Warning 1

If you click either area as shown above, you will get the following message.

Figure 5-4 Security Message 2



If you click on "Install ActiveX Control..." as shown above, you will get the warning shown below. Click on the Install button to complete the ActiveX installation.

Figure 5-5 Security Message 3

Internet	Explorer - Security Warning	K
Do you	want to install this software?	
	Name: Telvent File Transfer Control Publisher: <u>Telvent USA, Inc.</u>	
💙 Mor	re options	
1	While files from the Internet can be useful, this file type can potentially harm your computer. Only install software from publishers you trust. <u>What's the risk?</u>	

5.2.2 Get Procedure

The following steps will guide you in getting the files from the RTU to your PC or laptop.

- 1. Click on the File Type drop-down menu and select Configuration.
- 2. Click on the 'Get from RTU' button. You will get a dialog box as shown below:

Use def	ault pathname?
2	Use the default path of "C:\Telvent\SAGE2300\Config@WEB\Configuration\"?
	Yes No.

3. The dialog box shows you the default path as follows:

c:\Telvent\<rtutype>\<rtuname>\Configuration\

where RTU type would be SAGE2300, SAGE1310, etc. and the RTU name will be the name that was entered in the configuration. Note that the path structure will contain the RTU name without any spaces. It is strongly recommended to use the default path for ease of upload/download.

4. Click Yes if you want to use the default path.

- 5. If you click No, you will have to supply your own path, or navigate to a folder of your choice.
- 6. Click Save.
- 7. Repeat steps 1. through 6. for the other file types, if needed. Notice that the path name varies with the file type name.
- 8. During file transfer there may be some long pauses. This is normal.
- 9. When finished, your PC should contain the following directory structure with all of the RTU files:

c:\Telvent\<rtutype>\<rtuname>\application

\configuration \GUI \OperatingSystem \Templates

Configuration	Data Display	Comman	d Up	/Download	Admin
File Tra	nsfer		Connect	ion Get files	from the RTU
	File Type Configuration Result Connected to RTU	Get from RTU Send to RTU Cancel	User N Admin Passwe	ord	
- RTU Ini RTU	formation Name		Date	Connect Size	
Part	-	-001E0_B0			
Conf	iguration C3413-500	-001××	10-15-01		
GUI	C3414-500	-001E0_B0.gui	9/7/2009	4423680	
Арр	File C3414-500	-001E0_B0.out	9/1/2009	2458761	Reset
0/S	vxWorks		9/1/2009	4568326	Logout

Figure 5-6 Configuration Download to PC

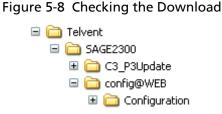
- 10. Click Yes for the default path or choose your own path.
- 11. You will see a total progress bar incrementing to the right as the file(s) are transferred to your PC. When the download is finished, the Result window will say OK.

			rigare 57 B		rriogress		
	Configurat	tion Dat	a Display	Command	Up/D	ownload	Admin
Overa progr trans	all ress of	File Transfer F Configuratio	ile Type	Get from RTU Send to RTU Cancel Cancel C_B0 ↔ C_B0.gui	Connection 172.18.15 User Nam Admin Password	0.51	Reset Logout

12. In the case of Configuration, if the transfer is successful, you will get a message in the Result window as shown below:



13. Inspect your file structure with Windows Explorer or through My Computer. You should have a folder that looks like Figure 5-8. You will have a SAGE*nnnn* folder depending on your particular config@WEB RTU.



5.3 Sending Files to the RTU

The most common files you might want to send from your PC to the RTU are the configuration files. If the downloaded configuration is the same firmware version as the present firmware in the RTU, the process is straightforward. If you are saving a configuration on your PC while you upgrade your firmware from Telvent's customer website (see Appendix C), then you must follow the procedure explained in a document on the website.

The following steps will guide you in sending (as an example) the configuration files from your PC or laptop to the RTU.

- 1. Click on the File Type drop-down menu and select 'Configuration'.
- 2. Click the 'Send to RTU' button. A navigation window will appear.
- 3. Navigate your way to the XML folder under the Configuration folder.
- 4. Click Open.
- 5. As shown, a prompt will appear showing you the file(s) that you are about to replace.



6. Click OK to replace, or Cancel to abort the Send command.

Configuration	Data Display	Command	Up/Download	Admin
File Trans	fer	Co	onnection	1
Co	File Type Infiguration - Result	Send to RTU	172.18.150.51 Jser Name Admin Password	
Select RTU	Configuration to Send			? 🔀
Lool	My Recent Docu Desktop	ments	✓ ③ 参 ▷ □	port11.xr
My Recent Documents	S My Computer	:)	inrgcalc.xml port1.xml	port13.xr port14.xr
U Desktop	Config	@WEB	port2.xml port3.xml	port15.xr port16.xr port33.xr
My Documer	nts Q DVD/CD-RW	/ Drive (D:) Pisk (E:)	port5.xml port6.xml port7.xml port7.xml	port34.xr port35.xr port36.xr port36.xr port37.xr
My Compute	🔍 My Network Pla	-HOUFILE01 (srv-houfile01)' aces	(H:) port9.xml	port38.xr
S	D3_P5			<u>Open</u>
My Network Places	< Files of <u>type</u> :	Open as <u>r</u> ead-only	•	Cancel

Figure 5-9 Configuration Download to RTU

7. You will see a total progress bar incrementing to the right as the file(s) are transferred to your RTU. When the transfer is finished, the Result window will say OK.

Configura	tion	Data	Display	Command	Up/	Download	Admin
Overall progress of	– File Trar	nsfer Fil Configuratior	le Type • • •	Get from RTU	Connection 172.18. ⁻ User Na Admin Passwoi	on 150.51 ime rd	
transfer	RTU Part I	No. iguration	Name Config@WEB C3414-500-0018 C3413-500-0018 C3414-500-0018 C3414-500-0018 vxWorks	≪ E1.gui	Date 10-15-01 6/7/2010 6/7/2010 9/1/2009	Size 4444160 2459464 4568326	Reset Logout

Figure 5-10 Download to RTU in Progress

Note: If you are sending GUI, Application, and Configuration to the RTU, be sure to refresh the browser before sending Configuration.

When sending Templates to the RTU, you have the choice to retain templates that are already in the RTU and add to them, or delete the templates that are already there. You will get the following message:



Delete T	emplate Files?
2	The Template folders in the RTU contain 3 template file(s). Click 'Yes' to add new files and update the existing files.
	Click 'No' to delete all the template files on the RTU and upload new ones.
	Click 'Cancel' to stop this operation.
	Yes No Cancel

Note: You must reset the target RTU before the new configuration becomes active.

CHAPTER 6 Administration

This chapter tells you how to set up Usernames and Passwords on the RTU. Other chapters cover Configuration, Data Display, Command, and Upload/Download. See the appendices for hardware User Interface connections. See Chapter 1 for Comm Port Configuration, Point Mapping, and Scaling.

Note: The number of concurrent login sessions is limited to five (5). Concurrent logins are a useful technique for viewing the results of an action (usually in Command mode) in the Display mode. Analysis is facilitated if the user sets up two windows on his PC, one for Command login, one for Display login.

Warning: Each concurrent login session must be logged out properly (i.e., if the browser is killed without logging out, the session will be active until the session times out).

The initial default setup is for a Username of "Admin" and a Password of "Telvent1!". Please note, the Username and Password fields are case sensitive. As the Administrator of the SAGE RTU, login using this Username and Password, as shown in Figure 6-1. Click Login.

Figure 6-1	Logaina	ın
inguic o i	Logging	

TELVENT	SAGE 2400
Config@WEB Username: Password: Enable Post Message.	Login
C0 Release C3413-500-001C0 23-Jun-2005	×
Warning: This computer program is protected by copyright law and international tre this program or any portion of it, may result in severe civil and criminal penalties possible under the law.	

If you login incorrectly, you will get a screen as follows.

Figure 6-2 Screen for Incorrect Login

TELVENT	SAGE 2400
Config@WEB Username: Password: Enable Post Message. The Username and Password supplied do n with any account. Please reenter Username Password. Login details are case sensitive.	
C0 Release C3413-500-001C0 23-Jun-2005	•
logout Pos	t Message
Warning: This computer program is protected by copyright law and international treati this program or any portion of it, may result in severe civil and criminal penalties; an possible under the law.	

After logging in correctly, click the Admin tab. The Admin screen should look like Figure 6-3.

Note: The Admin account is a special account. It cannot be deleted. However, both the Username and Password can be changed.

Figure 6-3 The Admin Screen						
Configuration	Data Display	Command	Up/Download	Admin		
Config@WEB						
ID	Description		Delete Preferences			
1	Administrator	Admin 🖉				
Add User Reset						
Session timeout value is : 180 min. Edit						
				Logout		

Click the Edit icon as shown in Figure 6-9. As an Administrator, the first thing you might want to do is change the generic Username and/or Password for the Administrator. If you type in an improper username, you will get the following message:

Note: Spaces and some special characters are not allowed in the Username or Password. The allowed characters are shown in the Information box shown below.





Figure 6-5 Error Message for Improper Password



Figure 6-6 Error Message for Improper Password



Figure 6-7 Error Message for Improper Password



Figure 6-8 Error Message for Improper Password

Window	vs Internet Explorer	×
⚠	Not a valid Password. Password must contain atleast one of these characters $\sim ! \oplus \# \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$?]
	ОК	

After you change the password and/or username for the Administrator, click Submit.

Note: The Admin account is a special account. It cannot be deleted. However, both the Username and Password can be changed.

Configuration	Data Display	Com	nand	Up/C	ownload	Admin		
Config@WEB								
ID	Description	Username	Edit D	elete	Preferences			
1	Administrator	Admin	P					
		Edit	user detia	als.				
	Use	rname	Admin					
		sword	••••					
		enter sword	••••					
	Des	cription	Administ	rator				
	Pref	ferences						
		Confi	guration					
		Data	Display					
Add User		Comn				Reset		
Session timeout value is : 180			ownload		-			
		Admir	1			Logout		
		FTP						
			Can	cel Su	bmit			

Figure 6-9 Edit User Screen

Note: For security reasons, Passwords are never visible.

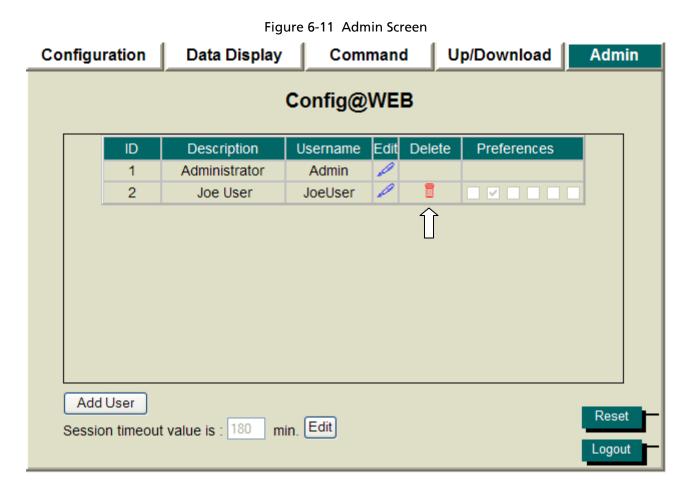
As Administrator, you can add users by clicking on the Add User button, as shown in Figure 6-10. In the example, Joe User was given Display privileges only.

Warning: The Administrator can create a user that has all the privileges of the Administrator. Such a user could login and change the Password of the Administrator.

	Figu	ire 6-10 Add	ing a User			
Configuration	Data Display	Com	mand	Up/Dowr	nload 📗	Admin
ID	Description	Username	Edit De	elete Prefe	erences	
1	Administrator	Admin	P			
		Edit	user detia	ls.	1	
	Use	ername	JoeUser			
		ssword	•••••			
		-enter ssword	•••••			
		scription	Joe User			
	Pre	eferences				
		Confi	guration			
Add User		Data	Display			
Session timeout value is : 180		Comr				Reset
			ownload			Logout
		Admi	n			
		FTP				
			Canc	el Submit		

Note that the Administrator can check boxes in the above display that grants privileges that correspond to tabs, plus FTP. FTP is an acronym for File Transfer Protocol. FTP privileges allow a user to move files into or out of the RTU using an FTP program.

When you click Submit, the new Admin screen will look like Figure 6-11. Notice that the Administrator can delete the Joe User account any time by clicking on the trash can.



When the Administrator created the Joe User account shown above, only Data Display privileges were granted. The screen below shows the results of the Joe User login. Notice that all tabs except the Data Display tab are grayed out.

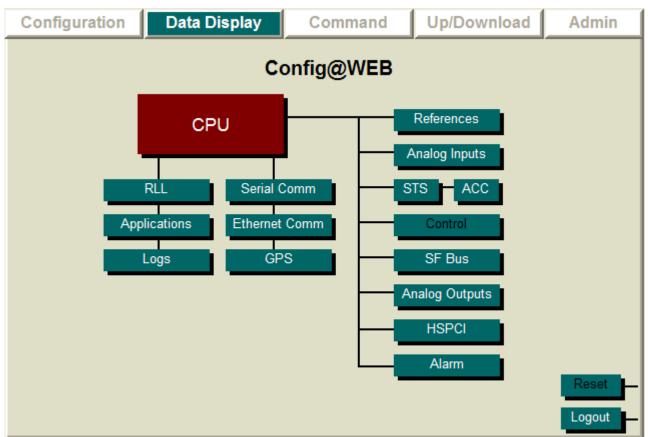


Figure 6-12 Joe User Login

The new user that you added may be easily deleted by logging in as Administrator, then clicking on the trashcan icon, as shown in Figure 6-11. When you click on the trashcan to delete a user, you will get a warning message as shown in Figure 6-13.

Microsoft Internet Explorer 🛛 🔀
Do you want to delete this user.
OK Cancel

The resultant screen looks like Figure 6-14.

There is also a function in the Admin screen to change the Session timeout, as shown. Session timeout is a security feature. If the user is not submitting a configuration, refreshing the current page, or accessing any page on the GUI during a login for the amount of time shown in the Session timeout value below, the session will be automatically logged out. The Administrator can change the Session timeout by clicking on Edit.

Warning: If you are configuring points and the session times out, any configuration changes that have not been submitted will be lost. Be sure to submit all changes in a timely manner.

Configuration	Data Display	Command	Up/Download	Admin					
Config@WEB									
ID	Description	Username Edit	Delete Preferences						
1	Administrator	Admin 🖉							
Add User									
Session timeout value is : 180 min. Edit									
	Logout								

Figure 6-14 Admin Screen After Deleting User

The resulting screen looks like Figure 6-15. When you place your cursor in the editing window, you will see a range (at the bottom left of your screen) of 5 to 180 minutes. Enter the new timeout value and click the Set button. The new timeout value will not take effect until you reset the RTU.

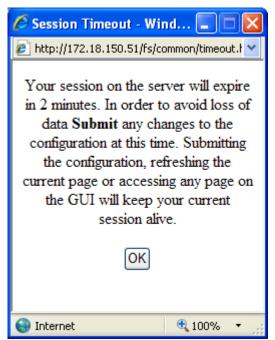
Figure 6-15 Editing Timeout Value	Figure 6-15	Editing Timeout Value
-----------------------------------	-------------	-----------------------

Configuration	Data Display	Command	Up/Download	Admin					
	Config@WEB								
ID	Description		Delete Preferences						
1	Administrator	Admin 🖉							
Add User									
	Session timeout value is : 20 min. Set								
				Logout					

Two minutes before the session times out, you will get a warning message as shown below.

Note: If your computer is running software that blocks popups, the following Session Timeout message may not appear, although the session will still timeout at the correct time.

Figure 6-16 Session Timeout Warning Message



When a Session times out, the Login screen looks as shown below.

Figure 6-17 Timed Out Login

TELVENT	SAGE 2300
Config@WEB Username: Password: Enable Post Message. Session Timed out.	Login
Iogout Post Warning: This computer program is protected by copyright law and international treaties this program or any portion of it, may result in severe civil and oriminal penalties; and possible under the law.	

When you are ready to Logout, click the Logout button. You will get a warning window as shown below.

Figure 6-18 Logout Warning					
Windows Internet Explorer 🛛 🔀					
2	Are you su	ure you want to l	ogout		
(ок	Cancel			

When you click OK, you will be logged out.

Internet Explorer Settings

A.1 Internet Explorer 8

The SAGE RTU GUI has to be run in "Compatibility View".

To turn on Internet Explorer Compatibility View

- 1. Open Internet Explorer.
- 2. Click the **Tools** button, and then click **Compatibility View**.

If Internet Explorer recognizes a webpage that is not compatible, you will see the Compatibility View button on the Address bar. To turn Compatibility View on or off, click the **Compatibility View** button. From now on, whenever you visit this website, it will be displayed in Compatibility View. However, if the website receives updates to display correctly in the current version of Internet Explorer, Compatibility View will automatically turn off.

A.2 Internet Security Options

The config@WEB GUI Interface uses ActiveX controls in its operation. These signed controls must be installed on your PC before the GUI will be able to Up/Download files to the RTU and display Datatrap data. If you do not have privileges to change these settings, your IT department may have to install the controls for you. The following steps show how to access these settings on your PC.

- 1. Login as administrator
- 2. Launch IE
- 3. Select the Tools drop-down menu
- 4. Select Internet Options
- 5. Click Security tab
- 6. Click the "Internet" icon
- 7. Click the Default Level button to get a baseline setup
- 8. Click Custom Level

See Section A.6 for a list of the packaged files that need to be installed on your PC for all of the functions of the GUI to work.

Figure A-1 Internet Options Security Tab

Internet Options						
General Security Privacy Content Connections Programs Advanced						
Select a Web content zone to specify its security settings.						
Internet Local intranet Trusted sites Restricted sites						
Internet This zone contains all Web sites you Sites						
Security level for this zone						
Custom Custom settings. - To change the settings, click Custom Level. - To use the recommended settings, click Default Level.						
<u>C</u> ustom Level <u>D</u> efault Level						
OK Cancel Apply						

All Security Setting for ActiveX must be set to either Prompt or Enable, as shown below. Click OK at the end.

Figure A-2	Custom	Level	Settings
------------	--------	-------	----------

Security Settings
Settings:
 ActiveX controls and plug-ins Download signed ActiveX controls Disable Enable Prompt Download unsigned ActiveX controls Disable Enable Prompt Initialize and script ActiveX controls not marked as safe Disable Enable Enable Prompt Initialize and script ActiveX controls not marked as safe Disable Enable Enable Disable Disable Enable
Prompt Dup ActiveY controls and plug inc Prompt Reset custom settings
Reset to: Medium Reset

Note: If using IE7, select Enable for "Allow status bar updates via script", as shown below.

Figure A-3	Status Bar	Updates
------------	------------	---------

Security Set	ttings - Internet Zone	
- Settings		
	Enable Prompt Allow Programmatic clipboard access	
	Disable Enable Prompt	
	Allow status bar updates via script Disable Enable Allow websites to prompt for information using scripted wind(
	 Disable Enable Scripting of Java applets 	
	Disable Enable Promot	
	fect after you restart Internet Explorer	
-Reset custo	m settings	
<u>R</u> eset to:	Medium-high (default)	
	OK Cancel	

The first time you run Up/Download, you must be logged in as administrator. You will get a a series of Security Warning as shown below. (To save space, the entire screen is not shown.)

Figure A-4 Security Warning 1

🚖 🍄 🌈 File Transfer					
🕡 This website wants to install the following add-on: 'Telv	ent File Transfer Control' fro	m 'Telvent USA, Inc.'. If you	trust the website and the	add-on and want to install it, o	lick here
	Configuration	Data Display	Command	Up/Download	Admin
		there to install the following A vent USA, Inc.'	ActiveX control: 'Telvent Fi	le Transfer Control' from	

If you click either area as shown above, you will get the following message.

Appendix A – Internet Explorer Settings	config@WE	B Software Users Gui	de		A-5
	Figure A-5	Security Messag	ge 2		
😪 🕸 🌈 File Transfer					
🕡 This website wants to install the following add-on: 'Telv	ent File Transfer Control' fro	m 'Telvent USA, Inc.'. If you	trust the website and the	add-on and want to install it,	click here
	Configuration	Data Display	Command	Up/Download	Admin
		k here to install the following A vent USA Install ActiveX C What's the Risk File Transfer Contro	Control	ol: 'Telvent	

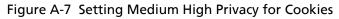
If you click on "Install ActiveX Control..." as shown above, you will get the warning shown below. Click on the Install button to complete the ActiveX installation.



Internet	Explorer - Security Warning	\times
Do you	want to install this software?	
	Name: Telvent File Transfer Control	
	Publisher: Telvent USA, Inc.	
× Mor	re options	
1	While files from the Internet can be useful, this file type can potentially harm your computer. Only install software from publishers you trust. <u>What's the ris</u>	<u>ik?</u>

A.3 Internet Privacy Options

The GUI interface uses cookies through Internet Explorer. If your Privacy setting is too high, there might be a problem displaying some screens. To fix this potential problem, launch IE and select the Tools drop-down menus, then select Internet Options. From the Internet Options dialog box, click the Privacy tab. Set the slider bar for Medium High and click OK, as shown in Figure A-7.



Internet Options
General Security Privacy Content Connections Programs Advanced
Settings Move the slider to select a privacy setting for the Internet zone.
 Hedium High Blocks third-party cookies that do not have a compact privacy policy Blocks third-party cookies that use personally identifiable information without your explicit consent Blocks first-party cookies that use personally identifiable information without implicit consent
Import Advanced Default
Web Sites To override cookie handling for individual Web sites, click the Edit button.
OK Cancel <u>Apply</u>

A.4 Connections Options

Click the Connections tab. You will get a screen similar to Figure A-8.

Figure A-8 Connections Tab

ernet Optio	ns		?
eneral Secur	ity Privacy Content	Connections	Programs Advance
To set	up an Internet connec	tion, click	Set <u>u</u> p
-Dial-up and V	/irtual Private Network s	setti <u>ng</u> s	
			A <u>d</u> d
			<u>R</u> emove
Choose Setti server for a	ngs if you need to conf connection.	igure a proxy	Settings
Never dia	I a <u>c</u> onnection		
🔿 Dial <u>w</u> her	never a network connec	ction is not pres	ent
🔿 Always di	al my default c <u>o</u> nnectio	n	
Current	None		S <u>e</u> t Default
Local Area N	etwork (LAN) settings-		
LAN Settings	do not apply to dial-up		LAN Settings
Choose Setti	ngs above for dial-up s	ettings.	
	ОК	Ca	ncel Apply

From the Connections tab, click LAN Setting. Make sure that you check "Automatically detect setting," as shown in Figure A-9. Do <u>not</u> check "Use a proxy server... "

Figure A-9 LAN Settings

Local Area Network (LAN) Settings 🛛 🔹 💽 🔀
Automatic configuration Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.
Automatically detect settings
Use automatic configuration <u>s</u> cript
Address
Proxy server
\Box Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).
Address: Port: Advanced
Bypass proxy server for local addresses
OK Cancel

A.5 Working Online

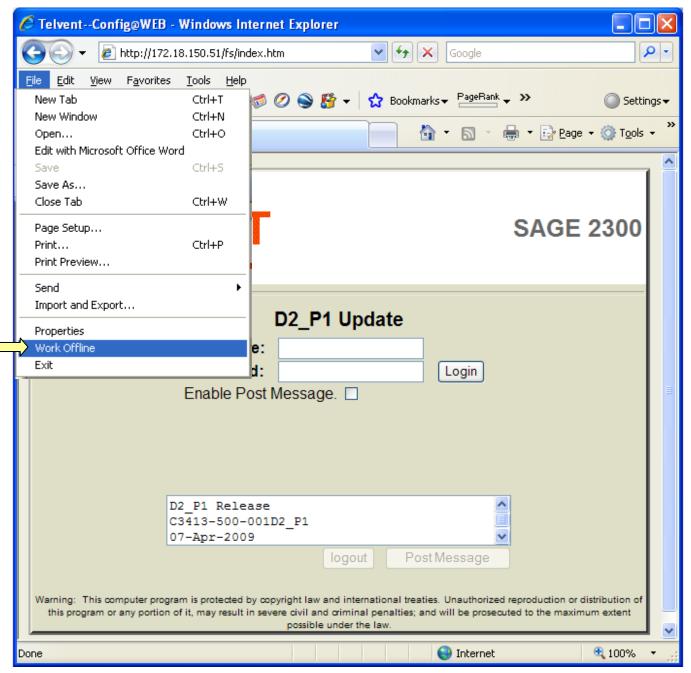
When Internet Explorer is running, watch for a "Working Offline" icon at the bottom right of the window as shown in Figure A-10. The existence of this icon means that IE is showing cached pages and NOT showing the live connection over the Ethernet cable, whether it's a direct connect (crossover cable), or a LAN connect. If you see the icon, you must take action.

Figure A-10 Working Offline Icon

🖉 TelventConfig@WEB	- Windows Internet Explorer	[Working Offline]	
🚱 🗢 🙋 http://172	2.18.150.51/fs/index.htm	🖌 🛃 🗙 Google	P-9
File Edit ⊻iew Favorite Google G		🔹 😭 Bookmarks 🗙 PageRank 🗸 🚿) Settings 🗸
🚖 🕸 🌈 TelventConf	ig@WEB		≩ Page → 🍈 Tools → 🎽
TELV	ENT	SA	GE 2300
r	D2_P1 l	Jpdate	
	Username:	·	
	Password:	Login	
	Enable Post Message.		
	D2_P1 Release	<u>^</u>	
	C3413-500-001D2_P1 07-Apr-2009		
		gout Post Message	
		nternational treaties. Unauthorized reproduc ninal penalties; and will be prosecuted to the er the law.	
Done	× 1	😜 Internet	🔍 100% 🔻 📑
	You are currently working offline. To	connect, click Work Offline on the File me	enu.

To correct the problem, click on the File menu and make sure Work Offline is <u>unchecked</u> (clear), as shown in Figure A-11.





A.6 Downloaded Files

The following Package Files are provided as part of the GUI file to support the Up/Download and Data Trap Analysis functions.

Package File	Files installed	Version	Install Folder
FileXfer.CAB	fileXfer.ocx	2.8.0.2	IE addons folder.
	XceedFtp.dll	1.1.6461.0	System Folder
HexViewer.CAB	HexViewerocx	1.0.0.3	IE addons folder.

Table A-1 Telvent Supplied and Signed Package Files

Package File	Files installed	Version	Install Folder
VBRun60.cab	ADVPACK.DLL	4.71.1015.0	Systems Folder
	asycfilt.dll	2.40.4275.1	п
	comcat.dll	4.71.1460.1	п
	msvbvm60.dll	6.0.97.82	п
	oleaut32.dll	2.40.4275.1	u
	olepro32.dll	5.0.4275.1	u
	stdole2.tlb	2.40.4275.1	u
	W95INF16.DLL	4.71.704.0	u
	W95INF32.DLL	4.71.16.0	u
ComDlg32.cab	Comdlg32.ocx	6.1.97.82	u
MSComCtl.cab	MSComCtl.ocx	6.1.97.82	u
MsFlxGrd.cab	MsFlxGrd.ocx	6.1.97.82	u
Msinet.cab	Msinet.ocx	6.1.97.82	u

Table A-2 Microsoft Supplied and Signed Package Files

Crash Recovery & Safe Mode

B.1 Crash Recovery Configuration

Crash Recovery is a state of the RTU that allows you to back out of a bad configuration gracefully. The recovery process is based on the premise that you can have a way to boot VxWorks without running any applications. This allows you to reconfigure the RTU without actually having to run the last configuration.

See Figure B-1 and the field explanations below the figure.

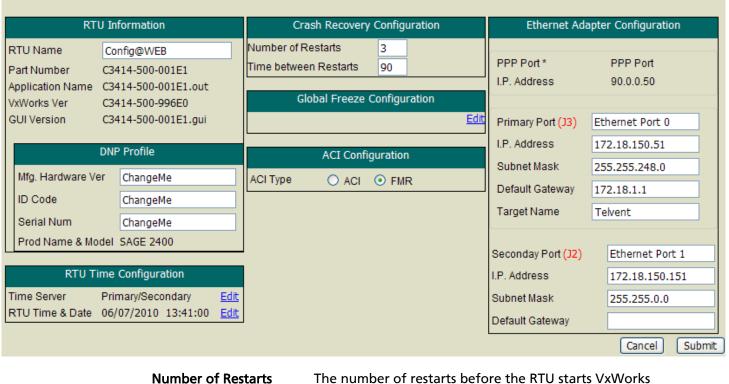


Figure B-1 Crash Recovery Configuration

CPU Configuration

Time between RestartsInternational conditions (for troubleshooting purposes).Time between RestartsIf crash happens in shorter time, it is logged as a restart.Works best under normal conditions if the user accepts
the default value.

Example: If the RTU crashes (or is reset, or the power cycles) within 90 seconds after the beginning of bootup, that counts as one restart. If this happens three times in a row, the RTU goes into Crash Recovery mode.

Notice that the default Time between Restarts is 90 seconds. Because the RTU takes about 60 seconds to reboot, 30 seconds is allowed for a crash. If you have reason to believe that the configuration problem takes longer to crash the RTU, enter a longer Time between Restarts.

When the RTU is running in Crash Recovery mode, the Login looks like Figure B-2. There are notices on other screens as well. Crash Recovery mode should be used only for reconfiguring the RTU to the previous working configuration. After reconfiguration, reset the RTU to go back to normal mode.

TELVENT **SAGE 2300** C3 Update Username: Password: Login Enable Post Message. This Device is running in crash recovery mode. Please correct the configuration and reset device. C3 Update C3413-500-001C3 06-Oct-2005 logout Post Message Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program or any portion of it, may result in severe civil and criminal penalties; and will be prosecuted to the maximum extent possible under the law.

Figure B-2 Running in Crash Recovery Mode

The RTU may be forced into Crash Recovery mode by the simple expedient of switching off RTU power, switching it back on, waiting 60 seconds for bootup, then switching power off again within 90 second (assuming default settings). Do this three times in a row. On the fourth power-on, the RTU will bootup in Crash Recovery mode.



```
🛃 Terminal - METSO.TRM
                                                                           _ 🗆 🗵
<u>File Edit Settings Phone Transfers Help</u>
 Mem Top
             = 6ef000
 Phus Mem Top = 6ff000
Current Date/Time: 5/7/2002 10:34:33
VxWorks Creation Date: Mar 28 2002
Metso VxWorks Version: 1.20 [Version passed to App = 1.20]
Press the SPACE bar to run the GUI only...
Running /c:/R0204021.out ...
undefined symbol: __etext
ld error: error reading file (errno = 0x1c0001).
task spawned: id = 0x5ebf8c, name = t1
->
-> 0x5ebf8c (t1): startup: RTU App starting at: 4/7/2002 10:34:40
0x5ebf8c (t1): startup: Time since last restart: 0 days, 0 Hrs 0 Min 49 Secs
0x5ebf8c (t1): inCrashMode: WARNING: Restart time window(90 secs) violated 3 tim
es (Max=3)
0x5ebf8c (t1): << Crash has been detected!!! Only HTTP Server Task started >>
->
     Duplicate
                     Page Up
                                    Next Record
                                                       Write
                                                                      Level: 1
                                                                    02:20:20 PM
      Go To
                    Page Down
                                   Previous Record
                                                     Main Menu
```

B.2 Crash Recovery by Uploading a Safe Configuration

But what if you can't remember the last configuration that worked? The answer is, once you get a configuration that works, you should download it and store it in a safe place. If a bad configuration drives the RTU into crash recovery, upload the safe configuration and reboot. See the Upload/Download chapter.

B.3 Safe Mode

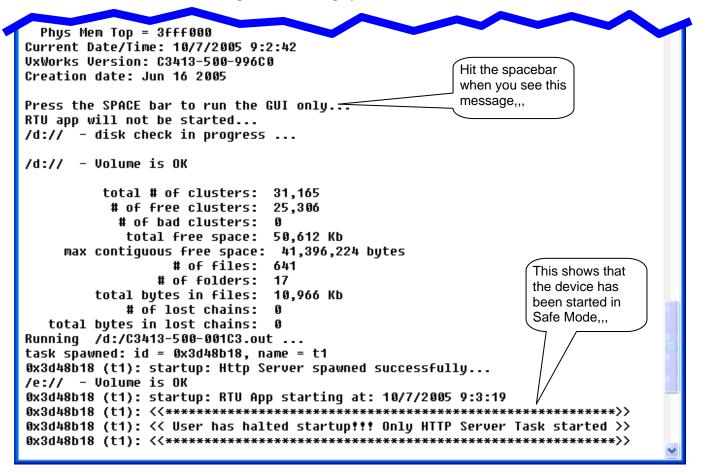
There is a possibility that the RTU is resetting intermittently because of an untenable configuration, but not resetting consistently enough to drive the RTU into Crash Recovery mode. In this case, you may force the RTU into Safe Mode. Safe Mode is the same as Crash Recovery mode, only the user is allowed to enter Safe Mode intentionally.

You must enter Safe Mode from the console. During the early part of bootup, press the spacebar when the following message appears. You must be quick because there is only a two second window to do this.

Ele Edit Format View Help System BIOS Configuration, (C) 2002 General Software, Inc. System CPU System CPU System CPU System CPU Software, Inc. Softw				
System CPU : 80486 Low Memory : 633KB Coprocessor : Enabled Extended Memory : 633KB Floppy 0 Type : 1.44 MB, 3.5" Serial Ports 1-2 : 03F8 02F8 Ide 0 Type : 3 Parallel Ports : Ide 1 Type : 3 Parallel Ports : Ide 0 Type : 806/02/05 Manufacturing Mode Disabled U1.6 : : : V1.6 : : : U2.6 : : : : : : : : : : : : : : : : : : : : : :				
System CPU : 80486 Low Memory : 633KB Coprocessor : Enabled Extended Memory : 633KB Floppy 0 Type : 1.44 MB, 3.5" Serial Ports 1-2 : 03F8 02F8 Ide 0 Type : 3 Parallel Ports : Ide 1 Type : 3 Parallel Ports : Ide 0 Type : 806/02/05 Manufacturing Mode Disabled U1.6 : : : V1.6 : : : U2.6 : : : : : : : : : : : : : : : : : : : : : :				
Coprocessor : Enabled Extended Memory : 63MB Floppy Ø Type : 1.44 MB, 3.5" Serial Ports 1-2 : 03F8 02F8 Floppy 1 Type : Not installed Serial Ports 3-4 : : I de Ø Type : 3 Parallel Ports : : : I de Ø Type : 3 Parallel Ports : : : I de Ø Type : 3 ROM Shadowing : Enabled : I de Ø BIOS Date : 06/02/05 Manufacturing Mode : Disabled : V1.6 : : : : : V1.6 : : : : : : V1.6 : : : : : : : . :				
VxWorks System Boot Copyright 1984-1998 Wind River Systems, Inc.				
UxWorks System Boot Copyright 1984-1998 Wind River Systems, Inc.				
Copyright 1984-1998 Wind River Systems, Inc.				
Copyright 1984-1998 Wind River Systems, Inc.				
CPU: PC 486				
CPU: PC 486 Version: 5.4.2 BSP version: 1.2/0 Creation date: Jun 16 2005, 09:06:14				
Bootrom Version: C3413-500-997C0				

Figure B-4 Beginning of Bootup

Figure B-5 Hitting Spacebar and Results



The results of starting up in Safe Mode are shown below. Other screens beyond Login are marked with the Safe Mode message.

Figure B-6 Safe Mode

TELVENT		SAGE 2300
C3	Update	
Username:		
Password:		Login
Enable Post Messa This Device is in Safe M	-	ations halted. Only
	n active in this	mode.
C3 Update C3413-500-001C3		
06-Oct-2005		~
	logout	PostMessage
Warning: This computer program is protected by copyright law this program or any portion of it, may result in severe civil a possibl		alties; and will be prosecuted to the maximum extent

APPENDIX C Accessing The Customer Website

Use your browser to go to the Telvent RTU website (<u>http://www.telventblogs.com/RTU/</u>) and type in Username and Password. If you have not registered for this website, contact Telvent RTU Support.

://www.telventblogs.com/RTU/	
	FELVENT
Smart Information for a Sustainable World	
SAGE Smart RTUs	
	Customer Service RIG Software
Login	Search
Username:	Categories
Customer	Applications (1)
Password:	Customer Service (1)
•••••	Data Parser Tools (1)
	🖉 General Info (6)
Submit Query	New Features (2)
To request a username and password email: duane.gilbert@telvent.com	Tips & Tricks (2)
	Archives
	🚍 April 2011
	Arch 2011
	📑 January 2011
	🚍 December 2010
	🚍 September 2010
	Web Links
	Telvent Smart Grid
	Follow Us on Twitter
	Tag Cloud

After logging in click on the 'Documentation' tab for general Documentation.

mart Information for a Sustainable World	TELVENT		
SAGE Smart RTUs			
News Documentation Firmware Updates Cust	tomer Service RIG Software		
Documentation	Subpages		
Click on the link to access the desired material.	SAGE Data Sheets		
	Manuals for SAGE RTUs		
DATA SHEETS - Short specifications and capabilities brochures for the SAGE products.	🛅 Drawings		
MANUALS - PDF versions of all the SAGE family Smart RTU manuals.	💾 White Papers		
DRAWINGS - PDF drawings that may be helpful.	💾 Product Bulletins		
PRODUCT BULLETINS - Important notices about product obselescence, security concerns, functions, etc.	Categories		
concerns, functions, etc.	Applications (1)		
	Customer Service (1)		
	🖉 Data Parser Tools (1)		
	🖉 General Info (6)		
	New Features (2)		
	Tips & Tricks (2)		
	Archives		
	April 2011		
	📑 March 2011		
	The second s		
	🔄 January 2011		

Click on 'Manuals' to Download RTU Manuals.

http://www.telventblogs.com/RTU/page.cfm/data-sheets/manuals

in the formation from Contained in Marked a	TELVENT
mart Information for a Sustainable World	
SAGE Smart RTUs	
News Documentation Firmware Updates	Customer Service RIG Software
Manuals for SAGE RTUs	Subpages
Config@WEB Quick Start Guide.doc	SAGE Data Sheets
Quick guide to connecting the browser for configuring the RTU	Manuals for SAGE RTUs
🖉 Config@WEB RTU Update Guide.pdf	💾 Drawings
Quick guide for performing a firmware update to the RTU	🕒 White Papers
🔎 SAGE 3030 Magnum Operations & Maintenance Manual	Product Bulletins
🖉 SAGE 3030 Operations & Maintenance Manual	Search
🗏 SAGE 2400 Operations & Maintenance Manual	Categories
🖉 C3414 CPU Operations & Maintenance Manual	Applications (1)
Covers the LX800 model CPU	Customer Service (1)
P	Data Parser Tools (1)
SAGE 2000 Schematics & Layout Drawings Manual Covers all individual SAGE circuit cards	🖉 General Info (6)
	New Features (2)
Config@WEB Protocols MTU-RTU V9.3.pdf Covers protocols where the RTU is being polled	Tips & Tricks (2)
covers protocols where the KTO is being polled	
🖉 Config@WEB Protocols-RTU-IED V6.1.pdf	Archives
Covers protocols where the RTU is doing the polling	April 2011
P Config@WEB Applications V5.0.pdf	Arch 2011
Details of all the applications that are included in SAGE RTUs	📃 January 2011
🖉 Config@WEB Software V0.0.pdf	🚍 December 2010
Config@WEB Software V0.0.pdf Details funtionality of the User interface for the SAGE RTUs	🔚 September 2010

You may also Download the latest firmware by Clicking on the 'Firmware Updates' tab. This is the Firmware page. Please note that there are two sets of firmware for the RTUs, one for the 586 CPU (C3413) and one for the latest LX-800 CPU (C3414).

TELVENT		
Smart Information for a Sustainable World		
SAGE Smart RTUs		
News Documentation Firmware Updates Cust	omer Service RIG Software	
Firmware Updates	Subpages	
There are currently two versions of firmware available for the SAGE RTUs. Select the	🖳 C3413 - 586 CPU	
correct CPU type to download a Zip file containing the latest firmware release.	🕒 C3414 - LX800 CPU	
Note: Firmware for CPUs are not interchangable.	🖹 Data Trap Parser Programs	
	🖺 Archive	
C3413 – Select for units equipped with a 586 CPU.	Search	
Firmware	Categories	
(1310, 1330, 1350, 2300, 3030, 3303)	Applications (1)	
	Customer Service (1)	
C3414 – Select for units equipped with a LX800 CPU.	Data Parser Tools (1)	
	🖉 General Info (6)	
Firmware	New Features (2)	
(1410, 1430, 1450, 2400, 3030 Magnum)	Tips & Tricks (2)	
*Note: Exercise care to ensure firmware GUI, Application and Configuration files are handled appropriately.	Archives	
nanoleu appropriately.	🚍 April 2011	
	🚍 March 2011	
The following link is for a program that takes the SAGE Data Trap capture	🖃 January 2011	
and translates the hex data into a more usable (English) format.	🚍 December 2010	
Data Trap Parser	🚍 September 2010	
Vata Trap Parser	Web Links	
	Telvent Smart Grid	
	Follow Us on Twitter	

Ethernet Connection

D.1 Where Do You Start?

Let's start with the basics: You have a Windows PC and a config@WEB RTU. Figure D-1 shows the possible combinations of your situation.

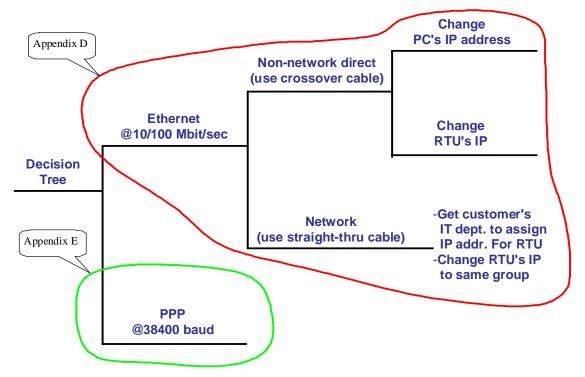


Figure D-1 Decision Tree for Connection to config@WEB

The advantage of using Ethernet connection is high speed. The disadvantage is that you might have to change your PC's IP address.

The advantage of using PPP connection is that you have the possibility of having a dial-up channel to your RTU for long distance configuration and monitoring if a network is unavailable. The disadvantage is the slow speed.

This appendix deals with the Ethernet branch of the decision tree. See Appendix B if you are interested in the PPP connection.

D.1.1 Non-Network Ethernet Communication With RTU

• You need an Ethernet Crossover Cable (supplied with each RTU)

- You need a PC with a static IP address and automatic dialup turned off (see later in this appendix)
- You need to have both RTU and the PC have IP addresses within the same group (you can change either the RTU IP address or the PC IP address). If you change the PC IP address, record the old setup so that you can return)

Note: It is possible to have two different TCP/IP profiles <u>if</u> you have two different NIC cards in your PC.

D.1.1.1 Physical Setup

The physical connection is straightforward, as shown in Figure D-2 and Figure D-3

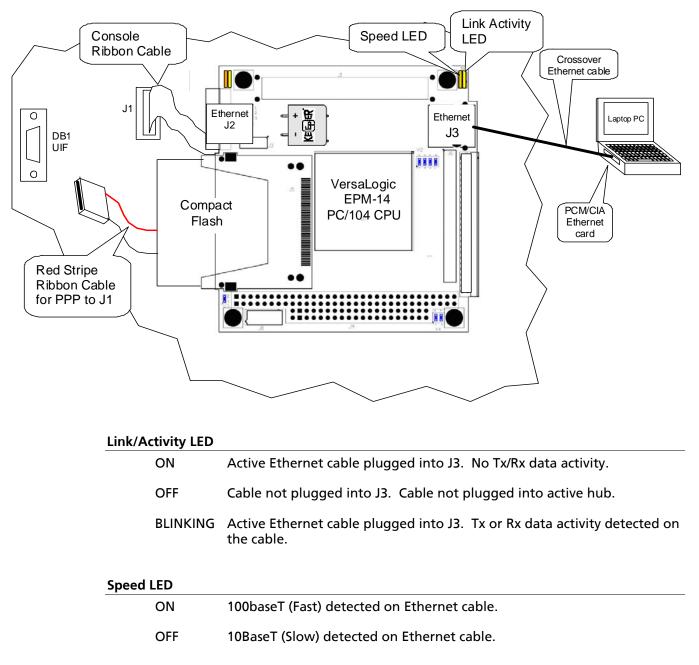


Figure D-2 Connecting Directly to Ethernet

Power/Run LED

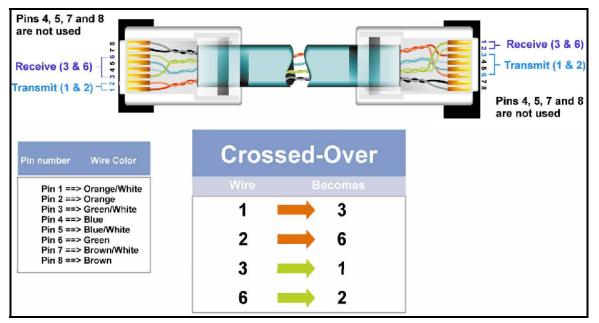
ON Either booting up or in Safe Mode / Crash Recovery Mode

BLINKING Normal CPU running mode

Compact Flash Access LED – Not Applicable for C3414 CPU

FLASHES CPU is accessing the Compact Flash memory

Figure D-3 Crossover Ethernet Cable



D.1.2 Network Ethernet Communication With RTU

- You need your IT department to assign an IP address and submask for your RTU
- You need to set the RTU to the above IP address and submask
- You need a straight-through Ethernet Cable connected to your network

D.1.2.1 Physical Setup

The absolute best way to operate is to have the RTU on a network. This allows you to access the RTU remotely. See Figure D-4.

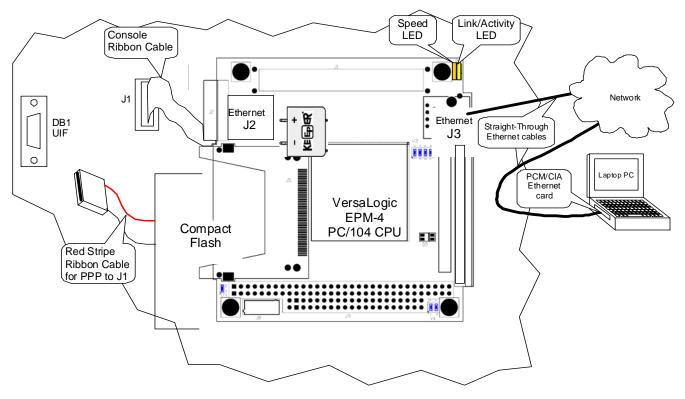
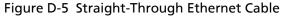


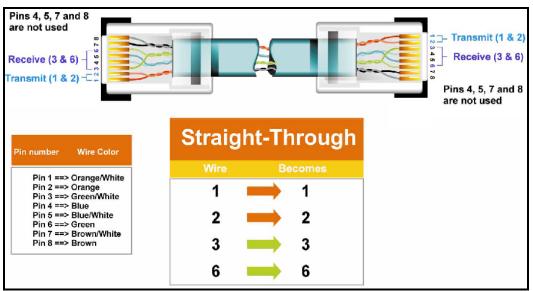
Figure D-4 Connecting to Ethernet Network

Note: Obtain an IP address for your RTU from your IT department. The subnet mask for your RTU must match the subnet mask for your group. Do <u>not</u> use an IP address already on your network.

Note: You must reboot the RTU by turning it off/on before the new IP address will take effect.







D.2 How to Find/Change Your RTU's IP Address

If you do not know the IP address of your RTU, you may ask the RTU "whoru" (who are you) from the console. It's easy to talk to the CPU card through the console. Set the ribbon cable on the card as shown in Figure D-6. Connect a three-wire null modem cable between your PC and DB1 on the RTU. Use any terminal emulation program, such as Terminal, or HyperTerminal. This example is for a SAGE 3400 baseboard. Please refer to the hardware document for the baseboard you are using for the designation of the connectors.

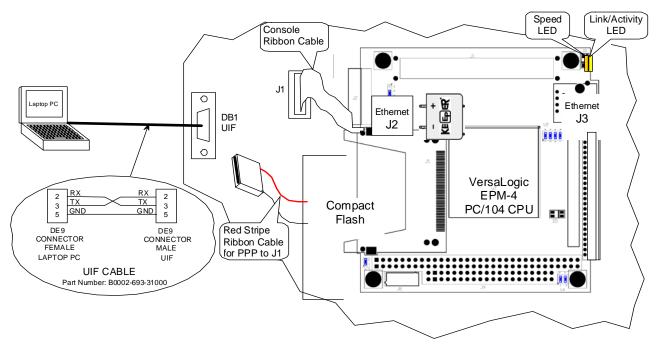


Figure D-6 Talking to the RTU Through the Console

Set communication parameters on the terminal emulation program as shown in Figure D-7.

Figure D-7 Terminal Emulation Communication Parameters

Communicatio	ons	2
	0 300 0 600 0 4800 ⊙ 9600	© 1200 © 19200 Cancel
− <u>D</u> ata Bits – © <u>5</u>	07 08	<u>S</u> top Bits ⊙1 ○1.5 ○2
_ <u>P</u> arity	<u> </u>	<u>C</u> onnector
• None	⊙ Xon/Xoff	None 🔺
Odd	C Hardware	COM1: COM2:
CEven	C None	
C Mark		
C Space	□ Parity Chec <u>k</u>	🗌 Ca <u>r</u> rier Detect

Hit Enter a few times until you get a prompt, then type "whoru" as shown in Figure D-8.

Figure D-8 Console Display

🛃 Terminal - T	ELVENT. TRM			- 🗆 X
<u>File Edit Settings</u>	<u>Phone</u> <u>T</u> ransfers	<u>H</u> elp		
-> -> -> -> whoru IP Address = Subnet Mask = value = 26 = -> ->	255.255.0.0			•
Duplicate	Page Up	Next Record	Write	Level: 1
Go To	Page Down	Previous Record	Main Menu	02:51:30 PM

Note: Obtain an IP address for your RTU from your IT department. The subnet mask for your RTU must match the subnet mask for your group. Do <u>not</u> use an IP address already on your network.

The following console commands are available:

setip	Set the IP address
showip	Show the IP address and subnet mask
whoru	Show the IP address and subnet mask (same as showip)

setip is the only command that takes an argument. The description of the argument is:

The format of the command is setip "ddd.ddd.ddd.ddd:hhhhhhh"

where ddd.ddd.ddd.ddd is an IP address, e.g., 172.18.150.53, and hhhhhhh is a subnet mask represented in hex format, e.g., ffff0000 is the subnet mask 255.255.0.0.

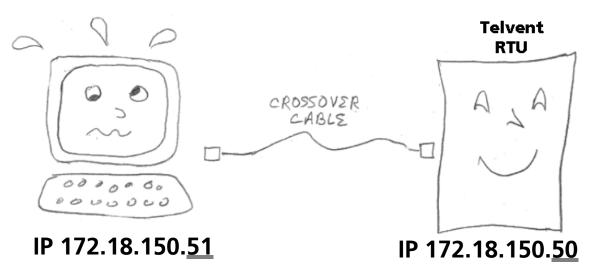
As an example, the following command sets the IP address to 172.18.150.100 and the subnet mask to 255.255.255.0.

setip "172.18.150.100:ffffff00"

Note: You must reboot the RTU by turning it off/on before the new IP address will take effect.

D.3 How to Find/Change Your PC's IP Address

You may change your PC's IP address to one almost the same as the IP address on the RTU (as shipped). This method is rather painful because your PC is probably set with an IP that your network likes. If you use your PC on your network again, you will have to change it back.



If you decide to change your PC's IP address, keep these points in mind:

- Telvent RTUs are shipped with a Class B IP address (172.18.150.50). This means the Mask you set on your PC should be 255.255.0.0.
- Your PC may have been set to obtain an IP address from your network server at boot-up. You must assign a static IP address to your PC (when connected directly to the RTU, there will be no server to assign your PC's IP address).
- Your PC may also have been set to automatically try to dial-in. You will have to disable this function.

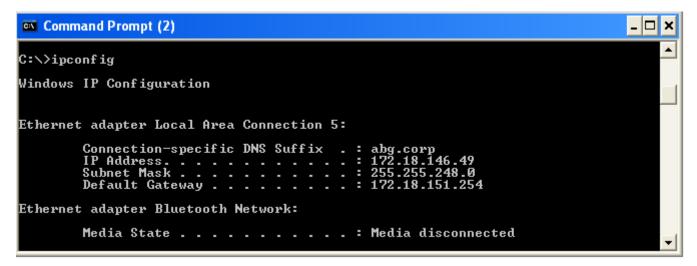
D.3.1 Windows XP Pro and Vista

D.3.1.1 Finding Your PC's IP

If you don't know your PC's IP address, go to a command line and type this command:

IPCONFIG

Example:



D.3.1.2 Setting Up the Alternate Connection

When you want to switch from your network connection to your RTU through a crossover cable, XP makes it easy because of the "Alternate Connection" setup. Proceed as follows.

From the Control Panel, right-click on Local Area Connection and select Properties as shown below.

S Network Connec	tions				
<u>File E</u> dit <u>V</u> iew Fa	avorites <u>T</u> ools Adva <u>n</u> ced <u>F</u>	<u>t</u> elp			1
G Back 🔹 🕥	🏂 🔎 Search 🌔 Fo	Iders 🛄 - 🔀	t		
Address 🔕 Network C	onnections				🖌 🔁 Go
Name	Type	1	Status	Device Name	Phone # or
Dial-up	Disable				
2 PPP Connection	Status Repair		Disconnected	PPP 38400	0670
LAN or High-Spee	Bridge Connections				
📥 Local Area Connec [—]	igh-Speed Inter Enabled SiS 900 PCI Fast Etherne Create Shortcut				
Wizard	Delete				
New Connection W	Rename				
<	Properties	1			>

Figure D-9 Right-Click on Local Area Connection

Select Internet Protocol (TCP/IP) and click on the Properties button as shown below.

🕹 Local Area Connection Properties 🛛 🔹 💽
General Authentication Advanced
Connect using:
SiS 900 PCI Fast Ethernet Adapter
<u>C</u> onfigure
This connection uses the following items:
 Client for Microsoft Networks Elie and Printer Sharing for Microsoft Networks
🗹 🗐 QoS Packet Scheduler
Internet Protocol (TCP/IP)
Install Uninstall Properties
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Sho <u>w</u> icon in notification area when connected
OK Cancel

Figure D-10 TCP/IP Properties

You computer will probably be set for "Obtain an IP address automatically", as shown below. If so, click on the Alternate Configuration tab.

Figure D-11 TCP/IP Properties

Internet Protocol (TCP/IP) Properties 🛛 🛛 💽 🔀				
General Alternate Configuration				
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.				
Obtain an IP address automatica	ally			
Use the following IP address: —				
IP address:	· · · · ·			
Sybnet mask:				
Default gateway:				
⊙ 0 <u>b</u> tain DNS server address auto	omatically			
OUse the following DNS server ac	ddresses:			
Preferred DNS server:				
Alternate DNS server:				
	Ad <u>v</u> anced			
	OK Cancel			

The PC will revert to the Alternate Configuration if the PC cannot find an IP address from the Ethernet cable. After entering the alternate configuration, click OK.

Figure D-12 Alternate Configuration

Internet Protocol (TCP/IP) Properties		
General Alternate Configuration		
If this computer is used on more than on settings below.	e network, enter the alternate IP	
O Automatic private IP address		
● User configured		
IP address:	172 . 18 . 150 . 49	
S <u>u</u> bnet mask:	255.255.0.0	
Default gateway:		
Preferred DNS server:	· · ·	
Alternate DNS server:	· · ·	
Preferred <u>W</u> INS server:		
Alternate WI <u>N</u> S server:		
	OK Cancel	

D.4 Network, PC, & RTU Notes D.4.1 IP Address & Network Classifications

IP addresses are 32 bits divided into 4 bytes

Networks are classified into three sizes:

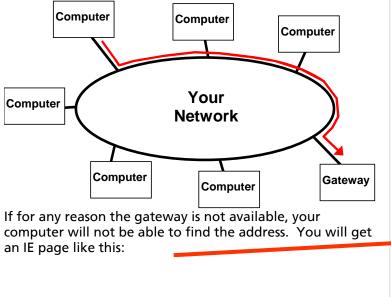
Class	1st Byte	2nd Byte	3rd Byte	4th Byte	Subnet Mask
А	1 – 126	PCs	PCs	PCs	255.0.0.0
В	128 – 191	Network	PCs	PCs	255.255.0.0
C	192 – 223	Network	Network	PCs	255.255.255.0

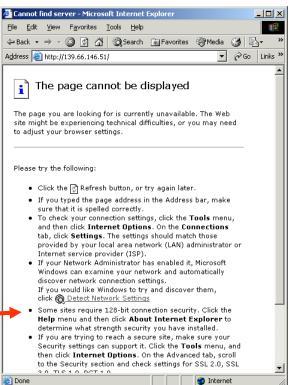
Notes: 1st byte always belongs to network PCs = Address of individual nodes (PCs) Network = Address extension of network Default subnet mask (some cases may differ)

Example: 172.18.150.51 = Class B network, 1st two bytes for network location, last two bytes for individual nodes; Mask = 255.255.0.0

D.4.2 IP Address & Gateways

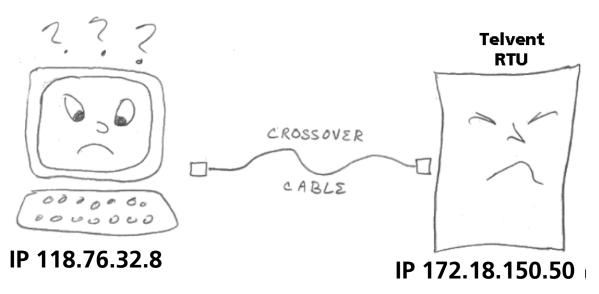
When you ask your computer to find an IP address whose 1st byte does not match your computer's IP 1st byte, your computer knows to go straight to the gateway of your network (because that address lies outside your network):





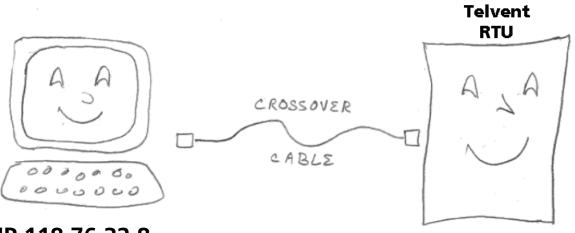
D.4.3 IP Address Mismatch

This is the same analogy as your computer trying to connect directly to a Telvent config@WEB RTU when they have different 1st bytes in their IP addresses:



D.4.4 IP Address Non-network Match

The best method is to set the RTU's IP address within the same group as your own network's IP addresses. The address you choose should not be the same as your PC, or any other PC on your network. If in doubt, ask your IT department to assign IP addresses to your Telvent RTUs. If and when you graduate your RTU operation to a network, your RTUs will be ready.

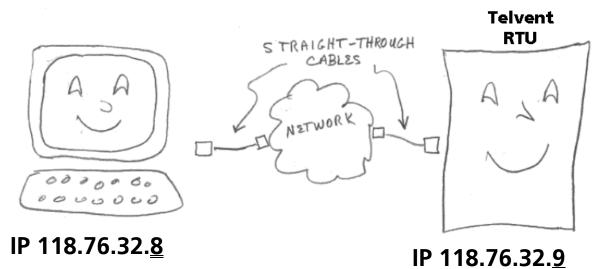


IP 118.76.32.8

IP 118.76.32.9

D.4.5 IP Address Network Match

The same principle applies if you put your RTUs on your network: The IP addresses must be in the same group as your existing IP addresses, yet every address must be unique.



APPENDIX E PPP Connection

E.1 General PC Requirements

- All software that's necessary to connect to Telvent RTUs comes with Windows XP (at the present time, PPP has been verified only for Windows XP Pro).
- Internet Explorer 6.0 or higher.

The PPP (Point-to-Point Protocol) is slower than Ethernet, but it has the advantage of requiring no changes in your PC's TCP/IP settings.

E.2 Where Do You Start?

Let's start with the basics: You have a Windows PC and a config@WEB RTU. Figure E-1 shows the possible combinations of your situation.

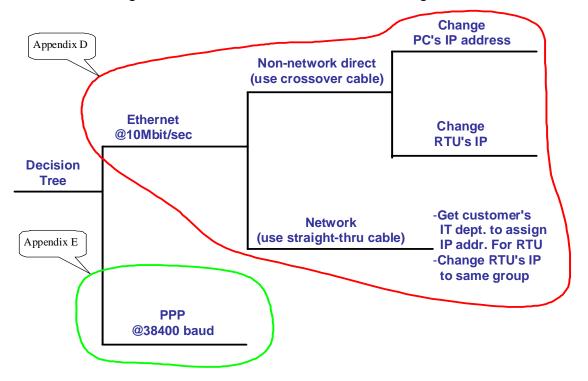


Figure E-1 Decision Tree for Connection to config@WEB

The advantage of using Ethernet connection is high speed. The disadvantage is that you might have to change your PC's IP address.

The advantage of using PPP connection is that you have the possibility of having a dial-up channel to your RTU for long distance configuration and monitoring if a network is unavailable. The disadvantage is the slow speed.

This appendix deals with the PPP branch of the decision tree. See Appendix D if you are interested in the Ethernet connection.

E.3 Steps to Achieve PPP

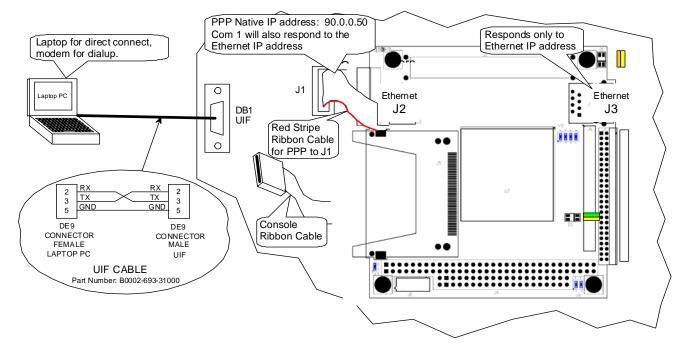
The following steps will be covered in the remainder of this appendix:

- Proper physical connection
- WinXP Setup

Creating WinXP dialup network connection for WNPPP Creating WinXP direct serial network connection for WNPPP Routine PPP connections

E.4 Physical Connection

PPP uses the User Interface Port (UIF), as shown in Figure E-2. Notice that the ribbon cable with the red strip must be connected to J1 on the baseboard. Also notice that you must use a three-wire null modem cable exactly as shown (no other lines connected, no jumpered pins).





F	-2
E	-5

Signal	Pin	Description	Туре
DCD	1	Data Carrier Detect	Input
RX	2	Receive Data	Input
TX	3	Transmit Data	Output
DTR	4	Data Terminal Ready Output	
DGND	5	Digital Ground	n/a
DSR	6	Data Set Ready	Input
RTS	7	Request To Send	Output
CTS	8	Clear To Send	Input
RI	9	Ring Indicator	n/a

Table E-1 PPP & Console Connector Pin-outs

E.5 Modem Settings for PPP

This section describes the modem settings that have yielded the most successful results in connecting to the RTU's PPP port.

E.5.1 Overview

The PPP EIA-232 serial port is fixed at 38,400 BPS rate, and therefore requires a modem that can negotiate a connection with another modem at a similar speed. The slowest modem 'connect' speed observed that can still maintain adequate communications is ~24,000 BPS. If your negotiated modem-connect speed is less than this, the PPP connection is likely to fail.

The modem connected to the RTU is used in a passive slave mode (it never initiates a PPP connection), therefore the modem's EIA-232 serial port cannot be 'auto-Bauded' at runtime. The serial connect speed must be set manually before placing the modem in service. If the EIA-232 serial speed is not correctly set to 38,400 BPS, a successful PPP connection will never be established. In addition, the serial data that the RTU is looking for to indicate that a PPP connection is being attempted requires that the modem also be configured to suppress any event strings such as "RING" or "CONNECT 384000", and to suppress the echoing of all AT commands.

E.5.2 Setting The Modem's Serial Baud Rate

Most modems retain the last used serial baud rate through a power cycle, so all modem settings should be made at the 38,400 BPS baud rate. When the modem is powered off and installed for use, it will power back up with the serial port already at the 38,400 BPS baud rate.

All settings must be downloaded to the modem before placing the modem in service. Most Hayes-compatible modems have settings profiles that can be selected to be used at startup. The downloaded settings for use with PPP should be written to one of these profiles, and using the proper Hayes commands, that profile should be selected to be used at startup.

E.5.2.1 Sample Settings

Below are the settings used to establish a successful connection with a US Robotics modem connected to the RTU. The modem connected to the PC trying to establish a PPP connection should be configured similarly:

- B1 U.S. answer tone E0 – Echo OFF F1 – Local echo OFF
- M1 Speaker on until connect (optional)
- Q1 Suppress result codes
- Y0 Default Profile 0
- Z1 Resets modem to Profile 0
- &D0 DTR override
- &H0 Flow control disabled
- &I0 Software flow control disabled
- &K1 Auto enable/disable data compression
- &N0 Variable connect speed
- &R1 Ignore RTS
- &S0 DSR override; always ON
- &U0 Floor connect speed disabled

These settings should be written to Profile 0 using the &W0 command.

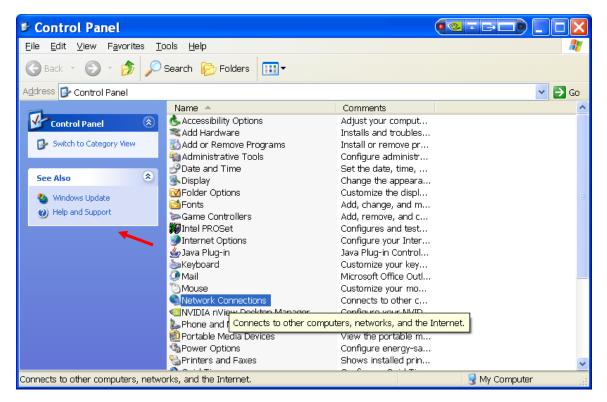
Note: Even though the above settings are for a Hayes-compatible modem, consult your modem's documentation to verify the correct command needed to accomplish what the above settings do.

E.6 Creating a Dialup PPP Network Connection for XP

Note: before attempting any PPP connections, disconnect your computer from your LAN to avoid DNS server conflicts. When you finish your PPP session, you may reconnect your LAN.

Note: Use a three-wire null modem cable.

In the Control Panel, double-click on the Network Connections icon:



Click on the "Create a new connection" link:

Solution Network Connection	S	0 🥺 I 🕞	
<u>Eile E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> o	ools Adva <u>n</u> ced <u>H</u> elp		A*
🌀 Back 🔹 🕥 🕤 🏂 🔎	Search 😥 Folders 🛄 🔻		
Address 🔇 Network Connections			🗸 🄁 Go
	Name	Туре	Status
Network Tasks 🛛 🛞	LAN or High-Speed Internet		
Create a new connection	Local Area Connection 2	LAN or High-Speed Inter	Enabled
	zard, which helps you create a connection to the	Internet, to another computer	r, or to your workplace n
See Also			
Network Troubleshooter			
Other Places 🙁			
Control Panel My Network Places My Documents My Computer			
Details 🙁			
Network Connections System Folder			
	<		>
1 objects			

The Connection Wizard will start, presenting the following window. Click "Next".



For Network Connection Type, pick "Connect to the network at my workplace", then click "Next".

New Connection Wizard
Network Connection Type What do you want to do?
 Connect to the Internet Connect to the Internet so you can browse the Web and read email. Connect to the network at my workplace Connect to a business network (using dial-up or VPN) so you can work from home, a field office, or another location. Set up an advanced connection Connect directly to another computer using your serial, parallel, or infrared port, or set up this computer so that other computers can connect to it.
< <u>B</u> ack <u>N</u> ext > Cancel

Select "Dial-up connection" as to how to connect. Click "Next".

New Connection Wizard
Network Connection How do you want to connect to the network at your workplace?
Create the following connection: Dial-up connection
Connect using a modem and a regular phone line or an Integrated Services Digital Network (ISDN) phone line.
Virtual Private Network connection Connect to the network using a virtual private network (VPN) connection over the Internet.
< <u>B</u> ack <u>N</u> ext > Cancel

Give the new connection a name. This will also be the name of the shortcut placed on the desktop after completing the Connection Wizard. Click "Next".

New Connection Wizard
Connection Name Specify a name for this connection to your workplace.
Type a name for this connection in the following box. Company N <u>a</u> me
Telvent Dialup PPP
For example, you could type the name of your workplace or the name of a server you will connect to.
< <u>B</u> ack <u>N</u> ext > Cancel

Enter the phone number of the remote modem site. Enter any special dial parameters here. For example, a comma pauses dialing for 2 seconds. Click "Next".

New Connection Wizard
Phone Number to Dial What is the phone number you will use to make this connection?
Type the phone number below. Phone number: 1, 713 123 4567 You might need to include a "1" or the area code, or both. If you are not sure you need the extra numbers, dial the phone number on your telephone. If you hear a modem sound, the number dialed is correct.
< <u>B</u> ack <u>N</u> ext > Cancel

Make this connection available for "Anyone's Use", if desired. Otherwise, this connection will only be available to the current user.

New Connection Wizard
Connection Availability You can make the new connection available to any user or only to yourself.
A connection that is created for your use only is saved in your user account and is not available unless you are logged on. Create this connection for: ④ <u>Anyone's use</u> ④ <u>My</u> use only
< <u>B</u> ack <u>N</u> ext > Cancel

Before completing the Connection Wizard, check the "Add a shortcut to this connection to my desktop" box. Click "Finish".

New Connection \	Vizard
S	Completing the New Connection Wizard
	You have successfully completed the steps needed to create the following connection:
	Telvent Dialup PPP Share with all users of this computer
	The connection will be saved in the Network Connections folder.
	Add a shortcut to this connection to my desktop
	To create the connection and close this wizard, click Finish.
	< <u>B</u> ack Finish Cancel

When the Connection Wizard completes, the following window will appear. Click "Properties".

Connect T	elvent Dialup PPP 🛛 <table-cell> 🔀</table-cell>
<u>U</u> ser name: <u>P</u> assword:	
Me only	er name and password for the following users: tho uses this computer
Djal:	1, 713 123 4567 💌
<u>D</u> ial	Cancel Properties <u>H</u> elp

The following window will appear. The modem for this PC should be present in the "Connect using:" field. Click "Configure".

🕨 Telvent Dialup PPP Properties 🛛 🛛 🔀
General Options Security Networking Advanced
Connect using:
Modem - Conexant SmartHSFi V92 56K DF PCI Modem (CDM3
Configure
Phone number
Arga code: Phone number:
Country/region code:
Use dialing rules Dialing Rules
Sho <u>w</u> icon in notification area when connected
OK Cancel

Make sure the settings for the modem on your PC match these. Click "OK".

Modem Configura	tion 🛛 🛛 🔀
Conexant SmartHSFi	V92 56K DF PCI Modem (COM3)
<u>M</u> aximum speed (bps):	115200 💌
Modem <u>p</u> rotocol	~
Hardware features	
Enable hardware flow cor	ntrol
Enable modem error contr	rol
Enable modem compressi	on
Show terminal window	
🗹 Enable mo <u>d</u> em speaker	
	OK Cancel

Click on the "Options" tab. Make sure the "Prompt for name and password, certificate, etc." checkbox is UNCHECKED. At the bottom of the window, click on the "X.25" button.

Telvent Dialup PPP Pro	operties ? 🔀
General Options Security Networking	Advanced
Dialing options ✓ Display progress while connecting ☐ Prompt for name and password, cert ☐ Include Windows logon domain ✓ Prompt for phone number	ificate, etc.
Redialing options	
<u>R</u> edial attempts:	3
Time between redial attempts:	1 minute 💌
Idle time before hanging up:	never 💌
Redial if line is dropped	
<u>×.25</u>	
	OK Cancel

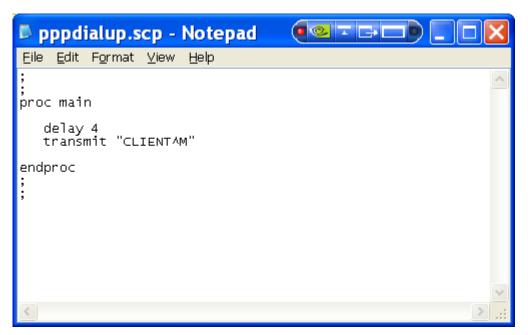
Make sure the settings on this window match these. Click "OK".

X.25 Logon Settings 🛛 🛛 🛛 🔀
Select your X.25 network provider and type the X.121 address of the remote server:
Network:
(none)
X.121 <u>a</u> ddress:
Optional User data:
Eacilities:
OK Cancel

Click on the "Security" tab. In the "Security options" area make sure the settings on your PC match these. In the Interactive logon and scripting area, make sure the "Run script" checkbox is CHECKED. Click on the "Edit" button to create the script required to handshake with the remote RTU. Once the script file is created, click on the "Browse" button to navigate to and select the script file. The path and name of the script file should appear in the field next to the "Run script" checkbox.

🕨 Telvent Dialup PPP Properties 🛛 🛛 🔀
General Options Security Networking Advanced
Security options • Typical (recommended settings)
Validate my identity as follows: Allow unsecured password
Automatically use my Windows logon name and password (and domain if any)
Require data encryption (disconnect if none)
Advanced (custom settings) Using these settings requires a knowledge of security protocols.
Interactive logon and scripting
<u>R</u> un script: tings\pe-deanl\Desktop\pppdialup.scp
<u>E</u> dit <u>B</u> rowse
OK Cancel

Create and save the script to any safe location on your PC. The contents of the script should contain the following.



Click on the "Networking" tab. The "Type of dial-up server" field should be PPP. In the "This connection uses the following items:" area, make sure only Internet Protocol (TCP/IP)" is selected (checkbox is CHECKED). Click the "Settings" button.

🕨 Telvent Dialup PPP Properties 🛛 🛛 🔀
General Options Security Networking Advanced
Type of dial-up server I am calling:
PPP: Windows 95/98/NT4/2000, Internet
<u>S</u> ettings
This connection uses the following items:
The Internet Protocol (TCP/IP) File and Printer Sharing for Microsoft Networks
Client for Microsoft Networks
Install Uninstall Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
OK Cancel

In the PPP Settings window, make sure all of the items are UNCHECKED. Click "OK".

PPP Settings	? 🗙
 Enable LCP extensions Enable software compression Negotiate multi-link for single link connections 	
ОК	Cancel

Click on the "Internet Protocol (TCP/IP)" item, and click on the "Properties" button. Click on the "Obtain an IP address automatically" and "Obtain DNS server address automatically" radio buttons are selected. Click on the "Advanced..." button.

eneral	TCP/IP) Properties ?
You can get IP settings assigned supports this capability. Otherwis administrator for the appropriate I	e, you need to ask your network
Obtain an IP address autor	natically
Use the following IP addres	S. ————
IP address:	
— Use the following DNS serv	ver addresses:
OUse the following DNS serv Preferred DNS server:	ver addresses:
	ver addresses:
Preferred DNS server:	ver addresses:
Preferred DNS server:	
Preferred DNS server:	
Preferred DNS server:	

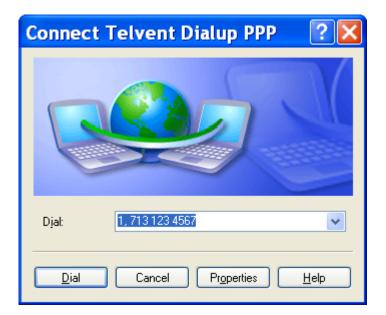
Select the "General" tab if not already selected. Select the "Use default gateway on remote network" checkbox (CHECKED). In the "PPP link" area, make sure the "Use IP header compression" checkbox is UNCHECKED. Click OK. (No changes to the DNS and WINS tabs are required)

Advanced TCP/IP Settings 🛛 🔹 🔀
General DNS WINS
This checkbox only applies when you are connected to a local network and a dial-up network simultaneously. When checked, data that cannot be sent on the local network is forwarded to the dial-up network.
✓ Use default gateway on remote network
PPP link Use IP header compression
OK Cancel

Click on the "Advanced" tab. Change the settings if necessary to match the following. Click "OK".



The Dialup Network Connection window will now appear as shown:



Dialup Network Connection setup is complete. Click on the Dial button to initiate the call.

E.7 Creating a Direct Serial Network Connection for XP

In the Control Panel, double-click on the Network Connections icon:

E Control Panel		(
<u>Eile E</u> dit <u>V</u> iew F <u>a</u> vorites	<u>T</u> ools <u>H</u> elp		A.
🕞 Back 🔹 🌍 🍷 🏂 🍃	Search 🦻 Folders 🛄 🔻		
Address 🔂 Control Panel			🔽 🄁 Go
-	Name 🔺	Comments	^
Control Panel (*) Switch to Category View	≪Add Hardware	Adjust your comput Installs and troubles Install or remove pr Configure administr	
See Also 🏾 📚	Solphay	Set the date, time, Change the appeara	
 Windows Update Help and Support 	Folder Options	Customize the displ Add, change, and m Add, remove, and c	
	Intel PROSet Internet Options Java Plug-in Keyboard	Configures and test Configure your Inter Java Plug-in Control Customize your key	
	Mail	Microsoft Office Outl Customize your mo Connects to other c	
	Connects to other computers, netwo	rks, and the Internet. ep	
	Portable Media Devices Power Options Printers and Faxes	View the portable m Configure energy-sa Shows installed prin	
Connects to other computers, net			🚽 My Computer

Click on the "Create a new connection" link:

Network Connections			
<u>Eile E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> i			
🌀 Back 🔹 🕥 🕤 🏂 🔎	Search 💫 Folders 🛄 🕶		
Address 🔇 Network Connections			🗸 🄁 Co
Network Tasks	Name Dial-up	Туре	Status
Create a new connection	🖢 Telvent Dialup PPP	Dial-up	Disconnected
Start the New Connection Wiza	ard, which helps you create a connection to the Ir	ternet, to another computer,	or to your workplace net
See Also 🉁	Direct		
Network Troubleshooter	🗇 Telvent Direct PPP	Direct	Disconnected
	LAN or High-Speed Internet		
Other Places 🙁	Local Area Connection 2	LAN or High-Speed Inter	Enabled
Control Panel			
Section 2015 My Network Places			
🕒 My Documents 💡 My Computer			
Details 🙁			
Network Connections System Folder			
	K		>
3 objects			.::

The Connection Wizard will start, presenting the following window. Click "Next".

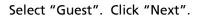


For Network Connection Type, pick "Set up an advanced connection", then click "Next".

New Connection Wizard
Network Connection Type What do you want to do?
 Connect to the Internet Connect to the Internet so you can browse the Web and read email. Connect to the network at my workplace Connect to a business network (using dial-up or VPN) so you can work from home, a field office, or another location. Set up an advanced connection: Connect directly to another computer using your serial, parallel, or infrared port, or set up this computer so that other computers can connect to it.
< <u>B</u> ack <u>N</u> ext > Cancel

Select "Connect directly to another computer". Click "Next".

New Connection Wizard
Advanced Connection Options Which type of connection do you want to set up?
 Select the connection type you want: Accept incoming connections Allow other computers to connect to this computer through the Internet, a phone line, or a direct cable connection. Connect directly to another computer Connect to another computer using your serial, parallel, or infrared port.
< <u>B</u> ack <u>N</u> ext > Cancel



New Connection Wizard
Host or Guest? To connect two computers, your computer must be identified as either a host or a guest.
Choose the role you want for this computer: Host This computer has the information you want to access. Our Duest This computer is used to access information on the host computer.
< <u>B</u> ack <u>N</u> ext > Cancel

Give the new connection a name. This will also be the name of the shortcut placed on the desktop after completing the Connection Wizard. Click "Next".

New Connection Wizard
Connection Name What is the name of the other computer you are connecting to? Image: Connecting to iteration is a second
Type the name of the other computer in the following box. Computer N <u>a</u> me
Telvent Direct PPP
The name you type here will be the name of the connection you are creating.
< <u>B</u> ack <u>N</u> ext> Cancel

Select the serial port on your computer that will be used to connect to the RTU. Click "Next".

New Connection Wizard	
Select a Device This is the device that will be used to make the connection.	I)
<u>S</u> elect a device:	
Communications cable between two computers (COM1)	*
< <u>B</u> ack <u>N</u> ext >	Cancel

Make this connection available for "Anyone's Use", if desired. Otherwise, this connection will only be available to the current user.

New Connection Wizard
Connection Availability You can make the new connection available to any user or only to yourself.
A connection that is created for your use only is saved in your user account and is not available unless you are logged on. Create this connection for:
< <u>B</u> ack <u>N</u> ext > Cancel

Before completing the Connection Wizard, check the "Add a shortcut to this connection to my desktop" box. Click "Finish".

New Connection Wizard	
EN.	Completing the New Connection Wizard
	You have successfully completed the steps needed to create the following connection:
	Telvent Direct PPP Share with all users of this computer
	The connection will be saved in the Network Connections folder.
	Add a shortcut to this connection to my desktop
	To create the connection and close this wizard, click Finish.
< <u>B</u> ack Finish Cancel	

When the Connection Wizard completes, the following window will appear. Click "Properties".

Connect Telvent Direct PPP 🛛 🛛 🔀		
User name:		
Password:		
Save this user name and password for the following users:		
● Me o <u>nly</u> Anyone who uses this computer		
Connect Cancel Properties Help		

The following window will appear. The serial port selected in the setup should be present in the device field. Click "Configure".

🛩 Telvent Direct PPP Properties 🛛 🛛 🔀
General Options Security Networking Advanced
<u>S</u> elect a device:
Communications cable between two computers (COM1)
C <u>o</u> nfigure
Show icon in notification area when connected
OK Cancel

Set the Maximum speed to 38400 bps, and UNCHECK all check boxes. Click "OK".

Modem Configurat	tion 🔹 🔀	
Communications cable between two computers (COM1)		
<u>M</u> aximum speed (bps):	38400	
Modem protocol	×	
Hardware features Enable hardware flow control Enable modem error control Enable modem compression		
Show terminal window	OK Cancel	

Click on the "Options" tab. Make sure the "Prompt for name and password, certificate, etc." checkbox is UNCHECKED.

Telvent Direct PPP Press	operties ? 🔀						
General Options Security Networking	Advanced						
Dialing options Display progress while connecting Prompt for name and password, cert Include Windows logon domain	tificate, etc.						
Redialing options							
<u>R</u> edial attempts:	3						
<u>T</u> ime between redial attempts:	1 minute 💌						
Idle time before hanging up:							
🔲 Redial if line is dropped							
	OK Cancel						

Click on the "Security" tab. In the "Security options" area select the "Advanced (custom settings) radio button. Click the "Settings..." button.

🕿 Telvent Direct PPP Properties 🛛 🛛 🔀
General Options Security Networking Advanced
Security options O Iypical (recommended settings)
Validate my identity as follows:
×
 Automatically use my Windows logon name and password (and domain if any)
Require data encryption (disconnect if none)
Advanced (custom settings)
Using these settings requires a knowledge <u>S</u> ettings
OK Cancel

In the "Data encryption" field pull-down menu, select "Optional encryption (connect even if no encryption)". In the "Logon security" area, select the "Allow these protocols" radio button, and CHECK all the checkboxes as shown. Click OK.

Advanced Security Settings 💦 🛛 🛛 🕄
Data encryption:
Optional encryption (connect even if no encryption)
C Logon security
O Use Extensible Authentication Protocol (EAP)
✓
Properties
Allow these protocols
☑ Unencrypted password (PAP)
Shiva Password Authentication Protocol (SPAP)
Challenge Handshake Authentication Protocol (CHAP)
Microsoft CHAP (MS-CHAP)
✓ Allow older MS-CHAP version for <u>W</u> indows 95 servers
Microsoft CHAP Version 2 (MS-CHAP v2)
 For MS-CHAP based protocols, automatically use my Windows logon name and password (and domain if any)
OK Cancel

If a warning box comes up as shown, click Yes.

Network	c Connections
	The protocols you have selected include PAP, SPAP, and/or CHAP. If one of these is negotiated, data encryption will not occur. Do you want to keep these settings?
	Yes No

Click on the "Networking" tab. The "Type of dial-up server" field should be PPP. In the "This connection uses the following items:" area, uncheck everything that can be unchecked except Internet Protocol (TCP/IP)", which should be checked.. Click the "Settings" button.

🗲 Telvent Direct PPP Properties 🛛 🛛 🔀						
General Options Security Networking Advanced						
Typ <u>e</u> of dial-up server I am calling:						
PPP: Windows 95/98/NT4/2000, Internet						
Settings						
This connection uses the following items:						
 ✓ Thernet Protocol (TCP/IP) □ □ □ File and Printer Sharing for Microsoft Networks □ □ □ Client for Microsoft Networks 						
I <u>n</u> stall <u>U</u> ninstall Properties						
Description Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.						
OK Cancel						

In the PPP Settings window, make sure all of the items are UNCHECKED. Click "OK".



Click on the "Internet Protocol (TCP/IP)" item, and click on the "Properties" button. Click on the "Obtain an IP address automatically" and "Obtain DNS server address automatically" radio buttons are selected. Click on the "Advanced..." button.

Internet Protocol (T	CP/IP) Properties ? 🔀						
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.							
⊙ <u>@</u> btain an IP address automa	atically						
OUse the following IP address	:						
IP address:							
Use the following DNS server Preferred DNS server:	er addresses:						
<u>A</u> lternate DNS server:							
	Ad <u>v</u> anced						
	OK Cancel						

Select the "General" tab if not already selected. Select the "Use default gateway on remote network" checkbox (CHECKED). In the "PPP link" area, UNCHECK the "Use IP header compression" checkbox. (No changes to the DNS and WINS tabs are required) Click "OK" to close the "Advance TCP/IP Settings" window. Click OK again to exit the Internet Protocol (TCP/IP) Properties box.

Advanced TCP/IP Settings 🛛 🔹 🔀
General DNS WINS
This checkbox only applies when you are connected to a local network and a dial-up network simultaneously. When checked, data that cannot be sent on the local network is forwarded to the dial-up network.
Use IP header compression
OK Cancel

Click on the "Advanced" tab. Change the settings if necessary to match the following. Click "OK". The Direct PPP Network Connection will immediately try to establish a connection. Click the "Cancel" button to interrupt this process if desired.

🕿 Telvent Direct PPP Properties 🛛 🕐 🔀						
General Options Security Networking Advanced						
Internet Connection Firewall Protect my computer and network by limiting or preventing access to this computer from the Internet						
Learn more about Internet Connection Firewall.						
Internet Connection Sharing						
Allow other network users to connect through this computer's Internet connection						
Establish a dial-up connection whenever a computer on my network attempts to access the Internet						
Allow other network users to control or disable the shared Internet connection						
Learn more about Internet Connection Sharing.						
Settings						
OK Cancel						

Direct Network Connection setup is complete.

Console Commands

F.1 List of Console Commands

The console now has two command modes, "C" and "cmd".

Typing "cmd" at the console will bring you to the [VxWorks]# command prompt:

```
-> cmd
[vxWorks]#
[vxWorks]# help
List of the registered topics:
EDR
                    List of the shell commands related to ED&R.
                    List of basic shell commands.
basic
breakpoint
                    List of the shell commands related to breakpoints.
                    List of the shell commands related to file system.
filesystem
                    Interpreter shell commands.
interpreter
                    List of the shell commands related to memory.
memory
                   List of the shell commands related to kernel modules.
modules
network
                   Network commands
object
                   List of the shell commands related to objects.
                   List of the shell commands related to symbols.
symbols
                    List of the shell commands related to tasks.
tasks
                    VXMUX routines
vxmux
List of the registered commands:
                    Switch to C interpreter
С
                    Add an alias or display alias
alias
arp
                    IPNET arp control
bp
                    Display, set or unset a breakpoint
cd
                    Change current directory.
                    SSL Cipher Suites
ciphers
demangle
                    Display demangled string
dprintf
                    Insert a dynamic printf eventpoint
echo
                    Display a line of text
                    TCP/UDP echo client
echoclient
echoserver
                    TCP/UDP echo server
edr ...
                    Exit the shell session.
exit
expr
                    Evaluate expressions
file ...
                    FTP client
ftp
func ...
getenv
                    Get an environment variable
help
                    Display the list of the shell commands
ifconfig
                    IPNET interface configuration
ike
                    IPIKE daemon control
```

ipsecctrl config ipsec keyadm admin IPsec keys logout Logout the shell session. lookup Lookup a symbol mem ... module ... Browse and page through a text file. more IPNET socket and route stats netstat object ... ping IPNET ping utility ppp config pppconfig print ... Write formatted output printf pwd Display current working directory. Radius client radiusc Reboot the system reboot Repeat a command repeat IPNET route table control route SSL client s_client SSL server s_server s_time Time SSL connection set ... Set an environment variable setenv show ... Print slab cache information slab Suspend execution for an interval. sleep ssl_clt SSL client for performance measurements SSL server for performance measurements ssl_srv string ... System variable tool sysvar task ... unalias Remove an alias unset ... Display VxWorks version information. version vxslab Print VXMUX slab cache information [vxWorks]#

Typing "C" (upcase only) at the will switch back to the C interpreter:

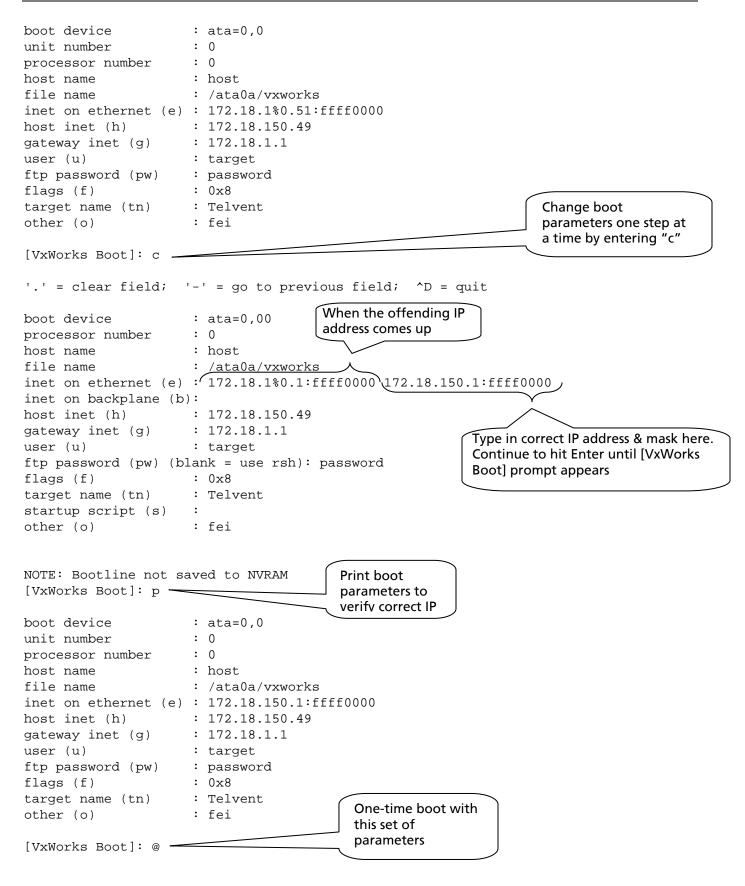
[vxWorks]#	C	
->		
->		
->		
-> help		
help		Print this list
dbgHelp		Print debugger help info
edrHelp		Print ED&R help info
ioHelp		Print I/O utilities help info
nfsHelp		Print nfs help info
netHelp		Print network help info
rtpHelp		Print process help info
spyHelp		Print task histogrammer help info
timexHelp		Print execution timer help info
h	[n]	Print (or set) shell history
i	[task]	Summary of tasks' TCBs
ti	task	Complete info on TCB for task
sp	adr,args	Spawn a task, pri=100, opt=0x19, stk=20000
taskSpawn	<pre>name,pri,opt,stk,adr,</pre>	args Spawn a task
tip	"dev=device1#tag=tagS	Strl", "dev=device2#tag=tagStr2",

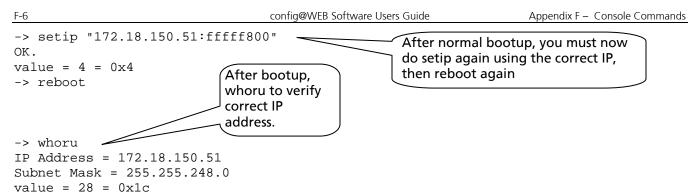
Appendix F – Console Commands config@WEB Software Users Guide Connect to one or multiple serial lines td task Delete a task ts task Suspend a task task Resume a task tr Type <CR> to continue, Q<CR> or q<CR> to stop: task Print pending task detailed info tw [task] Print pending task info W d [adr[,nunits[,width]]] Display memory adr[,width] Modify memory m [reg[,task]] Modify a task's registers interactively mRegs [task] Return task's program counter рс "user"[, "passwd"] Set user name and passwd iam whoami Print user name List devices devra [syms[,noAbort][,"name"]] Load stdin, or file, into memory ld (syms = add symbols to table: -1 = none, 0 = globals, 1 = all)["substr"] List symbols in system symbol table lkup lkAddr address List symbol table entries near address checkStack [task] List task stack sizes and usage Print the name of a status value printErrno value Spawn task to call function periodically period secs,adr,args... n,adr,args... Spawn task to call function n times (0=forever) repeat Print VxWorks version info, and boot line version Display or set shell configuration variables shConfig ["config"] Type <CR> to continue, Q<CR> or q<CR> to stop: strFree [address] Free strings allocated within the shell (-1=all) NOTE: Arguments specifying 'task' can be either task ID or name. value = 1 = 0x1-> Some of the more common "C" commands not listed in help: setip Set the IP address of the RTU whoru Get the RTU IP address Commonly used "cmd" command not listed in help Reboot the RTU reboot

F.2 Recovering From a Corrupt IP Address

If an illegal character has been entered as an IP address, the bootup process will stop at the [VxWorks Boot] prompt. The condition can be corrected by following the example below.

-> setip "172.18.1%0.51 OK.	:fffff800"		
<pre>value = 4 = 0x4 -> reboot</pre>		address wi [.]	ly entered IP th an illegal
(With a "bad" IP address reboots. Carefully wat following message appea	Once you hit are stuck. and reboot,		
Press any key to stop a 1	uto-boot		
[VxWorks Boot]: ?			xWorks Boot] pt, type ? to get
Commands:			options
<pre>? @ p c l g adrs e v d adrs[,n] m adrs f adrs, nbytes, value t adrs, adrs, nbytes devs Bootline Format:</pre>		.on	
	file h=# e=# b=# g=# u=usr [tn=targetname s=script o=		f=#
File System Boot Device boot device: fs file name: /FileSystem other: network device boot device: ata[=ctrl	DeviceName/vxWorks name	′ata0a∕vxWo	rks
Boot Flags: 0x0002 - load local 0x0004 - don't auto 0x0008 - quick auto	system symbols		
Available Boot Devices: Filesystem Devices: / Enhanced Network Devi [VxWorks Boot]: p	ata0a /ata00:2		Type "p" to verify the incorrect IP address





F.3 Checking Task Status

Typing the lowercase I into the console prompt shows the status of all tasks running. The critical clue to watch for, if you suspect a problem, is the STATUS of each task. PEND, READY, and DELAY are okay, but a SUSP means trouble. See below.

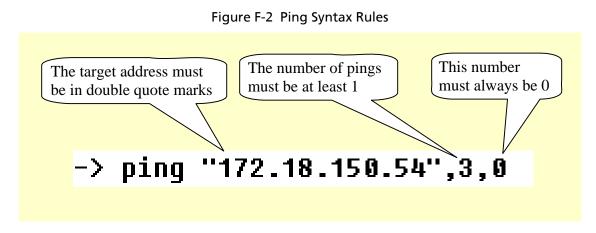
For instance, the tHTTPd task serves up web pages to Internet Explorer. If this task is SUSP, then there will be no response in I.E. from the RTU.

🖉 COM1 - Pul	TIY .							
->								
-> i								
NAME	ENTRY	TID	PRI	STATUS	PC	SP	ERRNO	DELAY
tIsrO	43eb60	 166a7ec		PEND	63d1b0	16d5f80	0	
tJobTask	5c96f0	166e250		PEND	63d1b0	16dbf30	0	0
tExcTask	5c8a70	7c1d20		PEND	63d1b0	7bf220	o	0
tLogTask	logTask	16d8978		PEND	63b06a	16e1ed0	0	0
tNbioLog	5ca6b0	166e6c0		PEND	63d1b0	16e8ef0	0	o O
tShellO	shellTask	18839bc		READY	6452e0	18c8120	0	Ő
tWdbTask	wdbTask	1891010		PEND	63d1b0	18b6f00	o	0
tErfTask	4460e0	16e5cf4		PEND	63d610	16edf20	0	0
ipcom tick>		187e348		DELAY	64320a	188af80	0	4
tAtaSvc0	432718	16de790		PEND	63d610	16c8f30	0	- 0
tNet0	ipcomNetTask	167cb10		PEND	63d1b0	170df20	6	o O
ipcom sysl>		1841278		PEND	63d610	184ae50	0	0
	ipcom telnet	166c1e4		PEND	63d1b0	1881e00	0	0
ippop work	40c16d	168c100		PEND	63d610	188ff30	0	U 0
		185a828		PEND	63d1b0	189ee10	0	0
ipftps	ipftps_main							3
ipiked	ipike_proc	1896b38		PEND+T	63d1b0	18b09b0	3d0004	
tXbdServic>		18b86e4		PEND+T	63d610	18cdf40	3d0004	58
t5Msec	clk_task_5ms	ef26d4c		PEND	63d1b0	1bOdf00	0	0
t50Msec	clk_task_50m	1b0a530		PEND	63d1b0	1b13f30	0	0
dcmgMain	dcmgMain	1c626e0			64320a	1c69f80		22
ETCP	etcpMain	18849b0			64320a	1c74f20		2
IsaIXD	dixdMain	1c7f6e8			64320a	1c85f60		3
dnTcpSrv17	dnpTcpServ	1be2558			63d1b0	1c54c90	0	0
dnTcpWrk17	tcpProcess	1842000			63b06a	1c59eb0	0	0
dnUdpSrv17	dnpUdp	1843290			63d1b0	1c5ecf0	0	0
DBC	ml_dbc	1b8ab50			63d1b0	1b92f10	3d0004	122
SCHED	1a5d340	1b85eb0			63b06a	1b8ceb0	0	0
cos	m1_cos	1b90970			63b06a	1b98e70	3d0004	172
CTLR	m1_ctlr	1b90c60			63b06a	1b9fe00	3d0004	30
ANA	m1_ana	1b9d980			63d1b0	1ba6f10	0	0
DAC	m1_dac	1b9dd50	205	PEND+T	63b06a	1baddf0	3d0004	105
ISaGRAF_IF	1931950	1babc70	205	PEND	63d1b0	1bc49a0	30065	0
DNPMCOM 1	dnp_dl_task	1bc1c70	205	PEND+T	63d1b0	1be9ea0	3d0004	17
DNP COM 17	dnp_dl_task	1bd0c00	205	PEND+T	63d1b0	1c01ea0	3d0004	15
USERLOG	usrlog_task	ef279b0	206	PEND	63b06a	1af2e70	3d0002	0
MBM COM 2	mbm_task	1bd0980	206	DELAY	64320a	1bf9e20	3d0004	46
DNP_APPR17	dnp_appr_tas	1bd7980	206	PEND+T	63d1b0	1c09ea0	0	171
DNP_APPM1	dnp_appm_tas	1bc99f0	207	PEND+T	63d1b0	1bf1e50	3d0004	
SOELOG	soelog_task	1bb2980	208	PEND+T	63d1b0	1bcbed0	3d0004	130
ALARMS	alarms_task	1bb2d68	208	PEND	63b06a	1bd2e90	0	0
SELF	m1_self	1ba4ad0	215	DELAY	64320a	1bb5a20	3d0001	57
GPST	gpst task	1bab980	215	PEND+T	63d1b0	1bbcf30	3d0004	147

Figure F-1 Checking Task Status

F.4 Pinging From The RTU

It has always been possible to ping the RTU from a device if you know the RTUs I.P. address. The RTU itself is now capable of sending a ping over TCP/IP with a console command. This function is useful if you want to check TCP/IP communication integrity directly from the RTU to any TCP/IP address compatible with the IP address range. See the syntax rules below.



The following figure shows the result of a ping



NIO	
B COM1 - PuTTY	
	~
-> whoru	
IP Address = 172.18.150.51	
Subnet Mask = 255.255.248.0	
value = -2048 = 0xfffff800	
-> ping "172.18.150.54",3,0 value = 0 = 0x0	
->	
Pinging 172.18.150.54 (172.18.150.54) with 64 bytes of data:	
Reply from 172.18.150.54 bytes=64 ttl=64 seq=0 time=0ms	
Reply from 172.18.150.54 bytes=64 ttl=64 seq=1 time=16ms Reply from 172.18.150.54 bytes=64 ttl=64 seq=2 time=33ms	
Reply from the to to the source of the sourc	
172.18.150.54 ping statistics	
3 packets transmitted, 3 received, 0% packet loss, time 2034 ms	
rtt min/avg/max = 0/16/33 ms	
->	
->	
	1

F.5 Finding the RTU's MAC Address

Enter the command shown below to retrieve the MAC address of the Ethernet circuits on the CPU card.

Figure F-4 Finding the CPU Card's MAC Address

🛃 сом	1 - Ритту		
->			
-> -> ->			
->			
->			
-> cmd			
[vxWor	ks]# ifconfig -a		
100	Link type:Local loopback Queue.cone		
	inet 127.0.0.1 mask 255.255.255.255		
	UP RUNNING LOOPBACK MULTICAST MTU:1500 metric:1 VR:0 ifindex:1	Type this command	
	RX packets:14 mcast:0 errors:0 dropped:4		
	TX packets:14 mcast:0 errors:0		
	collisions:0 unsupported proto:0		
	RX bytes:616 TX bytes:616		
fei0	Link type:Ethernet HWaddr 00:04:bf:92:28:e9 Queue:none		
	capabilities: TXCSUM VLAN_NTU VLAN_TXHWTAG VLAN_RXWTAG		
	inet 172.18.150.51 mask 255.255.248.0 broadcast 172.10.151.25	5	
	UP RUNNING SIMPLEX BROADCAST MULTICAST		
	NTU:1500 metric:1 VR:0 ifindex:2	Primary MAC	
	RX packets:11578 mcast:5054 errors:0 dropped:202 TX packets:6 mcast:0 errors:0	address	
	collisions:0 unsupported proto:0		
	RX bytes:1165k TX bytes:438		
pppO	Link type:Point to point Queue:none		
	inet 0.0.0.0 mask 255.255.255.255 peer 0.0.0.0		
	RUNNING POINTOPOINT MULTICAST		
	NTU:1500 metric:2 VR:0 ifindex:3		
	RX packets:0 mcast:0 errors:0 dropped:0		
	TX packets:21 mcast:0 errors:0 collisions:0 unsupported proto:0		
	RX bytes:0 TX bytes:393		
fei1	Link type:Ethernet HWaddr 00:04:bf:92:28:ea Queue:none		
	capabilities: TXCSUM VLAN MTU VLAN TXHWTAG VLAN RXHWTAG		
	inet 172.18.150.151 mask 255.255.0.0 broadcast 172.18.255.255	Secondary	
	UP SIMPLEX BROADCAST MULTICAST	MAC address	
	MTU:1500 metric:1 VR:0 ifindex:4		
	RX packets:0 mcast:0 errors:0 dropped:0		
	TX packets:0 mcast:0 errors:0		
	collisions:0 unsupported proto:0 RX bytes:0 TX bytes:0		
	a sycolo in sycolo		
[vxWor	ks] # 🧧		~

Note: Secondary Ethernet (fei1) is displayed only if the device has been configured via the Gui / Application firmware.

F.6 SBO Troubleshooting

Beginning with C3413-500-001C6 and newer firmware, the following function is available though the console to help trouble shoot the SBO bus. This function is valid only for the C3400 (SAGE 2300/SAGE 2400) and C3800 (SAGE 3030/SAGE 3030M) baseboards.

To use this function, connect your PC to the console port on the RTU and start the terminal emulation program. Type the <Enter> key and make sure that you get the "->" prompt.

Start the GUI and log on. Make sure to disconnect the field wiring from the point you are going to operate and perform the Trip or Close that does not work.

Type "c34_print_sbo_table" on the console (don't type the double quotes). After you have typed this in one time, you can type an "<ESC>k" to recall the history and type a "<Enter>" to execute the function again.

The following display is a successful trip of point 4 on the baseboard. If you have multiple executes (execute read - more than one bit set) or multiple selects (select read - more than one bit clear), the SBO control will fail. All of the IOPLD values will be 00 on a successful operation. The rt section of the display is valid only when the RTU detects a control erroer in real time. In this case, the RTU has started to perform the control but detects an error while the control is active. The selects expected and read, executes expected and read, and the time the relay was expected to close and time left to close to completion is displayed.

```
-> c34_print_sbo_table
progress counter
                   60
select expected bfff
                 bfff
select read
execute expected 0001
                 0001
execute read
sel shift loops
                    0
                    0
driver chk loops
IOPLD EXECUTE
                         00
IOPLD DID
                         00
IOPLD_SBO_CSEL_HI
                         00
IOPLD_SBO_CSEL_LO
                         00
IOPLD SBO CEXEC READ LO 00
IOPLD_SBO_CEXEC_READ_HI 00
rt select expected 0000
rt select read
                    0000
rt execute expected 0000
                    0000
rt execute read
rt time expected
                        0
                        0
rt time left err
value = 25 = 0x19
->
```

The following display is a execute fail trip of point 4 on the baseboard. Note that execute 0 and execute 7 (CEXEC0 and CEXEC7 on the schematics) are both 1. Execute 0 is used for the baseboard relays or the last XT position on the SBO bus if the baseboard points are disabled.

-> c34 print sbo table progress counter 50 select expected bfff select read bfff execute expected 0001 0081 execute read 0 sel shift loops 0 driver chk loops IOPLD EXECUTE 00 IOPLD DID 00 IOPLD_SBO_CSEL_HI 00 IOPLD_SBO_CSEL_LO 00 IOPLD SBO CEXEC READ LO 00 IOPLD_SBO_CEXEC_READ_HI 00 rt select expected 0000 rt select read 0000 rt execute expected 0000 0000 rt execute read rt time expected 0 0 rt time left err value = 25 = 0x19->

The following display is of a select fail, trip of point 4 on the baseboard. Note that select 14 and select 15 (CSEL14 and CSEL15 on the schematics) are both 0. The high byte of the selects is used for the baseboard relays.

-> c34_print_sbo_table progress counter 30 select expected bfff select read 3fff execute expected 0000 execute read 0000 sel shift loops 0 driver chk loops 0 IOPLD_EXECUTE 00 IOPLD DID 00 IOPLD_SBO_CSEL_HI 00 IOPLD_SBO_CSEL_LO 00 IOPLD SBO CEXEC READ LO 00 IOPLD_SBO_CEXEC_READ_HI 00 rt select expected 0000 0000 rt select read rt execute expected 0000 rt execute read 0000 0 rt time expected rt time left err 0 value = 25 = 0x19->

The progress counter code indicates the error/success code.

At reset or if there was an error detected on a previous SBO operation, a reset function is called to determine if the problem has cleared. These are the codes that this function produces.

- 100 initial check of registers on the baseboard failed, should have nonzero values in the IOPLD values
- 110 shifting of the select bits failed (shift in progress bit not set)
- 115 shifting of the select bits failed (shift in progress bit not clear)
- 120 execute bit stuck on
- 130 select bit stuck on
- 140 completion check of registers on the baseboard failed, should have nonzero values in the IOPLD values

These are the codes produced by the normal operation of the SBO control system.

- 10 check of registers on the baseboard failed, should have nonzero values in the IOPLD values
- 20 relay number out of range
- 30 select fail
- 40 check of registers on the baseboard failed, should have nonzero values in the IOPLD values
- 50 execute fail
- 60 successful operation

The Execute/Select column is based on the schematic. The digit before the "/" is the Execute number. The digit after the "/" is the Select number. For example, 0/8 CEXEC0/CSEL8. This combination is point 1 Trip.

Location	SBO Database Relay #	Sequential Relay #	Execute/Select	Comments
	π		0/0 to 0/7	do not exist
	1 trip to 4 close	1 to 8	0/8 to 0/15	baseboard relays
	5 trip to 12 close	9 to 24	1/0 to 1/15	1st 16-relay SBO XT
	13 trip to 20 close	25 to 40	2/0 to 2/15	2nd 16-relay SBO XT
	21 trip to 28 close	41 to 56	3/0 to 3/15	3rd 16-relay SBO XT
Bank 1 J7	29 trip to 36 close	57 to 72	4/0 to 4/15	4th 16-relay SBO XT
	37 trip to 44 close	73 to 88	5/0 to 5/15	5th 16-relay SBO XT
	45 trip to 52 close	89 to 104	6/0 to 6/15	6th 16-relay SBO XT
	53 trip to 60 close	105 to 120	7/0 to 7/15	7th 16-relay SBO XT
	61 trip to 68 close	121 to 136	8/0 to 0/15	8th 16-relay SBO XT
	69 trip to 76 close	137 to 152	9/0 to 1/15	9th 16-relay SBO XT
	77 trip to 84 close	153 to 168	10/0 to 2/15	10th 16-relay SBO XT
Bank 2 J8	85 trip to 92 close	169 to 184	11/0 to 3/15	11th 16-relay SBO XT
	93 trip to 100 close	185 to 200	12/0 to 4/15	12th 16-relay SBO XT
	101 trip to108 close	201 to 216	13/0 to 5/15	13th 16-relay SBO XT
	109 trip to116 close	217 to 232	14/0 to 6/15	14th 16-relay SBO XT
	117 trip to 124 close	233 to 248	15/0 to 7/15	15th 16-relay SBO XT

Table F-1 C3400 SBO Relay Assignments with Baseboard Enabled

The Execute/Select column is based on the schematic. The digit before the "/" is the Execute number. The digit after the "/" is the Select number. For example, 0/8 CEXEC0/CSEL8. This combination is point 61 Trip.

Location	SBO Database Relay #	Sequential Relay #	Execute/Select	Comments
	1 trip to 8 close	1 to 16	1/0 to 1/15	1st 16-relay SBO XT
	9 trip to 16 close	17 to 32	2/0 to 2/15	2nd 16-relay SBO XT
	17 trip to 24 close	33 to 48	3/0 to 3/15	3rd 16-relay SBO XT
Bank 1 J4	25 trip to 32 close	49 to 64	4/0 to 4/15	4th 16-relay SBO XT
	33 trip to 40 close	65 to 80	5/0 to 5/15	5th 16-relay SBO XT
	41 trip to 48 close	81 to 96	6/0 to 6/15	6th 16-relay SBO XT
	49 trip to 56 close	97 to 112	7/0 to 7/15	7th 16-relay SBO XT
	57 trip to 64 close	113 to 128	0/0 to 0/15	8th 16-relay SBO XT
	65 trip to 72 close	129 to 144	8/0 to 8/15	9th 16-relay SBO XT
	73 trip to 80 close	145 to 160	9/0 to 9/15	10th 16-relay SBO XT
	81 trip to 88 close	161 to 176	10/0 to 10/15	11th 16-relay SBO XT
Bank 2 J3	89 trip to 96 close	177 to 192	11/0 to11/15	12th 16-relay SBO XT
	97 trip to 104 close	193 to 208	12/0 to 12/15	13th 16-relay SBO XT
	105 trip to112 close	209 to 224	13/0 to 13/15	14th 16-relay SBO XT
	113 trip to120 close	225 to 240	14/0 to 14/15	15th 16-relay SBO XT
	121 trip to 128	241 to 256	15/0 to 15/15	16th 16-relay SBO XT
	close			

Table F-2 C3400 SBO Relay Assignments with Baseboard Disabled

Location	SBO Database Relay #	Sequential Relay #	Execute/Select	Comments
			0/0 to 0/15	do not exist
	1 trip to 8 close	1 to 16	1/0 to 1/15	1st 16-relay SBO XT
	9 trip to 16 close	17 to 32	2/0 to 2/15	2nd 16-relay SBO XT
	17 trip to 24 close	33 to 48	3/0 to 3/15	3rd 16-relay SBO XT
Bank 1 J3	25 trip to 32 close	49 to 64	4/0 to 4/15	4th 16-relay SBO XT
	33 trip to 40 close	65 to 80	5/0 to 5/15	5th 16-relay SBO XT
	41 trip to 48 close	81 to 96	6/0 to 6/15	6th 16-relay SBO XT
	49 trip to 56 close	97 to 112	7/0 to 7/15	7th 16-relay SBO XT

Table F-3 C3800 SBO Relay Assignments

Table F-4 C3800 / C3810 LANDAC II SBO Relay Assignments

Location	SBO Database Relay #	Sequential Relay #	Execute/Select	Comments
	1 trip to 8 close	1 to 16	1/0 to 1/15	1st 16-relay SBO XT
	9 trip to 16 close	17 to 32	2/0 to 2/15	2nd 16-relay SBO XT
	17 trip to 24 close	33 to 48	3/0 to 3/15	3rd 16-relay SBO XT
Bank 1 J7	25 trip to 32 close	49 to 64	4/0 to 4/15	4th 16-relay SBO XT
(C3810)	33 trip to 40 close	65 to 80	5/0 to 5/15	5th 16-relay SBO XT
	41 trip to 48 close	81 to 96	6/0 to 6/15	6th 16-relay SBO XT
	49 trip to 56 close	97 to 112	7/0 to 7/15	7th 16-relay SBO XT
	57 trip to 64 close	113 to 128	0/0 to 0/15	8th 16-relay SBO XT
	65 trip to 72 close	129 to 144	8/0 to 8/15	9th 16-relay SBO XT
	73 trip to 80 close	145 to 160	9/0 to 9/15	10th 16-relay SBO XT
	81 trip to 88 close	161 to 176	10/0 to 10/15	11th 16-relay SBO XT
Bank 2 J8	89 trip to 96 close	177 to 192	11/0 to 11/15	12th 16-relay SBO XT
(C3810)	97 trip to 104 close	193 to 208	12/0 to 12/15	13th 16-relay SBO XT
	105 trip to112 close	209 to 224	13/0 to 13/15	14th 16-relay SBO XT
	113 trip to120 close	225 to 240	14/0 to 14/15	15th 16-relay SBO XT
	121 trip to 128 close	241 to 256	15/0 to 15/15	16th 16-relay SBO XT
	129 trip to 136 close	257 to 272	1/0 to 1/15	17th 16-relay SBO XT
	137 trip to 144 close	273 to 288	2/0 to 2/15	18th 16-relay SBO XT
	145 trip to 152 close	289 to 304	3/0 to 3/15	19th 16-relay SBO XT
Bank 3 J9	153 trip to 160 close	305 to 320	4/0 to 4/15	20th 16-relay SBO XT
(C3800)	161 trip to 168 close	321 to 336	5/0 to 5/15	21th 16-relay SBO XT
	169 trip to 176 close	337 to 352	6/0 to 6/15	22th 16-relay SBO XT
	177 trip to 184 close	353 to 368	7/0 to 7/15	23th 16-relay SBO XT
	185 trip to 192 close	369 to 384	0/0 to 0/15	24th 16-relay SBO XT

The tables above have a Execute/Select column. The format of the information displayed is Execute/Select order (execute is before the slash, the select follows the slash). The following tables convert the Execute and Select to the bit patterns displayed in c34_print_sbo_table.

The Select will be displayed in the c34_print_sbo_table as the following bit patterns:

Table F-5 Select Bit Patterns

Select	Bit Pattern
0	FFFE
1	FFFD
2	FFFB
3	FFF7
4	FFEF
5	FFDF
6	FFBF
7	FF7F
8	FEFF
9	FDFF
10	FBFF
11	F7FF
12	EFFF
13	DFFF
14	BFFF
15	7FFF

The Execute will be displayed in the c34_print_sbo_table as the following bit patterns:

Table F-6 Execute Bit Patterns

Execute	Bit Pattern
0	0001
1	0002
2	0004
3	0008
4	0010
5	0020
6	0040
7	0080
8	0100
9	0200
10	0400
11	0800
12	1000
13	2000
14	4000
15	8000

APPENDIX G

A/D AC	Analog to Digital Alternating Current
ACI	AC Input
ADC	Analog to Digital Converter
Al	Analog Input, also AIN
ANSI	American National Standards Institute
AO	Analog Output, also AOUT
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
6	similar protocols
C	Celsius or the programming language C
CEB	Communication Expansion Board
check-back	Hardware/Software method of control output protection
CCITT	Comité Consultatif Internationale de Télégraphique et
CMOC	Téléphonique
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.
СТЅ	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
Dife	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

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 = Data Value – Data Min Data Max – 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
Н	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
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
IL	Instruction List language – one of the IEC 61131-3
	programming languages
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
2	"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
	Millisecond
msec MTU	
MUX	Master Terminal Unit, also Master Station Multiplexer
	Normally Closed relay contact
NC contact NEMA	Normally Closed relay contact National Electrical Manufacturers Association
NO contact O/S or OS	Normally Open relay contact
OSI	Operating System
	Open Systems Interconnection
OZ DC	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
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
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
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
Тх	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
-	Circuit that resets CPU if it fails to execute program
WH	Watt Hours
XB	Expansion Board
XML	Extensible Markup Language – The method used be Telvent 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).
ХТ	External Termination (panel, module or assembly)
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