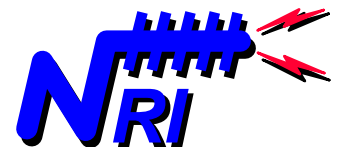


The SCADA Web Interface
Telemetry And Control System Engineering Series

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Navionics Research, Inc.
Saint Louis, Missouri USA
wireless-telemetry.com

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1 INTRODUCTION

In 1995, Navionics Research introduced the **WiSTAR** Network, an acronym derived from **W**ireless **S**ystem **T**elemetry **A**nd **R**emote-Control. This product was designed to solve the problems posed by the complex distributed control and monitoring requirements of the rural water and wastewater industries.

During the early design of the WiSTAR Telemetry System, tools were added to the C³ SCADA Server Computer to enable remote access to the telemetry system – enabling the Operators, Navionics Research, and the Consulting Engineers to study past history and perform upgrades, diagnostic procedures, and troubleshooting from great distances.

The first remote access was accomplished via Microsoft's "Dialup Networking Server" contained in Windows95 and above (The Microsoft "Plus Pack" was required for Windows95.) Personnel could connect to the Telemetry System via a remote, modem-equipped computer (but only one person at a time). An installation of Navionics Research software was also required on the remote computer.

However, with the growth of the internet and internet-related software technologies, Navionics Research set a goal of providing secure remote access through the internet. Only internet web browser software would be required on the remote computer (included with all modern computer operating systems), and multiple personnel could connect simultaneously. A further benefit is that an extremely remote user need not incur long-distance telephone charges if a local internet access telephone number is available.

Also, the types of remote computers are virtually limitless. Today, compatible computers and devices include notebooks, netbooks, desktop PC's, and SmartPhones (such as iPhones, Microsoft Windows Mobile Phones, Blackberries, and many others).

The purpose of this tutorial is to provide assistance to operators, engineers, and service personnel who wish to interact with a Navionics Research Web-Based SCADA System. Each chapter focuses on a specific task, and detailed sequential procedures are given to accomplish this task. Minimal previous computer experience is required of the reader.

2 BASICS

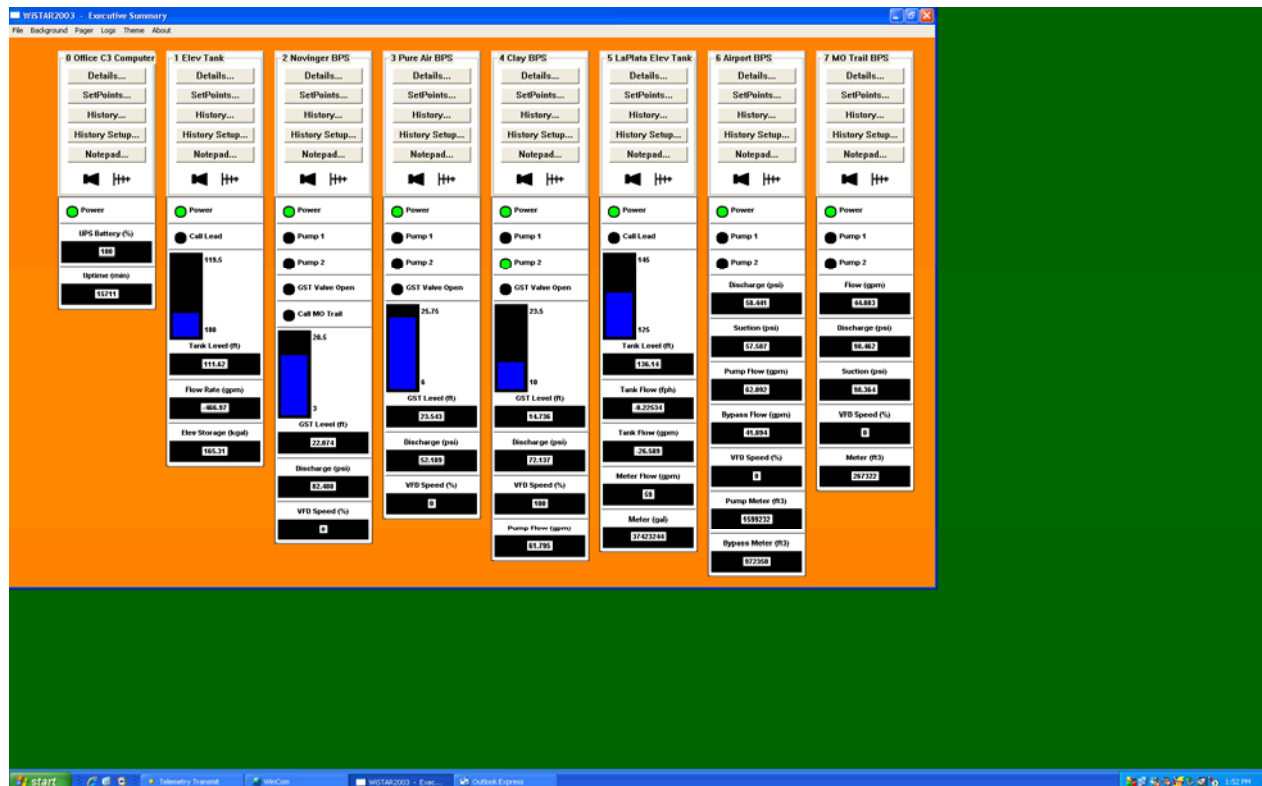
On the C³ SCADA Server Computer, the following four (4) applications should always be running:

WiSTAR Executive
WinCom
Telemetry_Transmit
Eudora Email Client (or Outlook Express)

If any one of the above programs is halted for any reason, the system will not function properly. Therefore, take special care not to halt any of these programs.

In order to clear one or more of the above critical programs from the screen, always use the minimize button (_) rather than the close button (X) in the upper right-hand corner of each program's window.

If one of these programs is inadvertently halted, then double-left-click on the program's icon to restart it.



A Screen Snapshot Of An Actual SCADA Server.

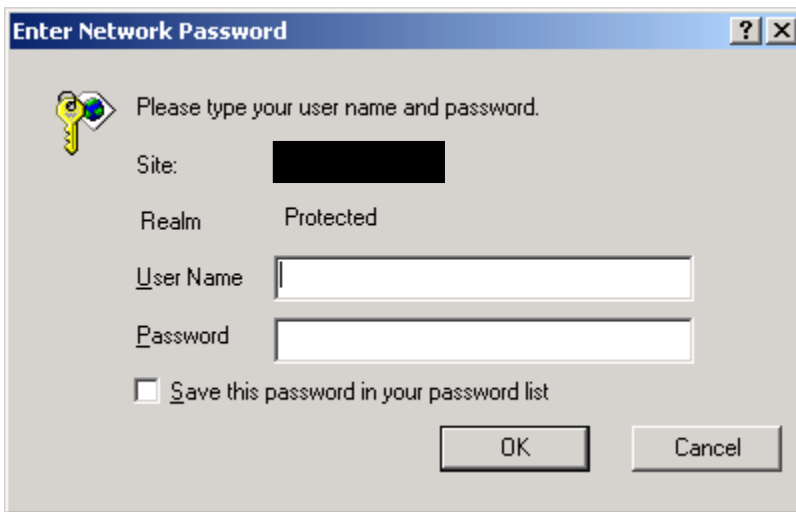
3 MAKING CONTACT FROM A REMOTE LOCATION

The web browser of choice should be started. The web interface supports the following web browsers (plus most others):

- Microsoft Internet Explorer
- Netscape Navigator
- Mozilla
- Microsoft Pocket Internet Explorer

In the “Address Bar”, the address of the Telemetry System should be entered. The address is provided by Navionics Research, and is specific to each Telemetry System.

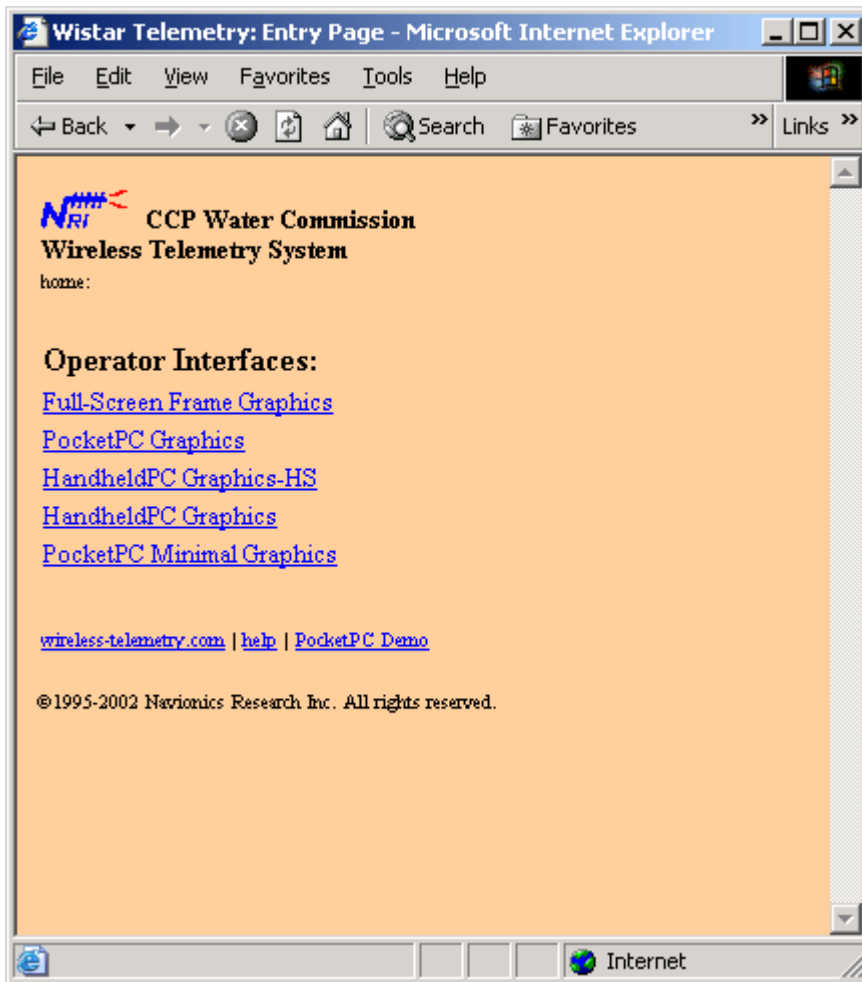
If the connection is successful, a window similar to the following will be presented:



The provided “Username” and “Password” should be entered.

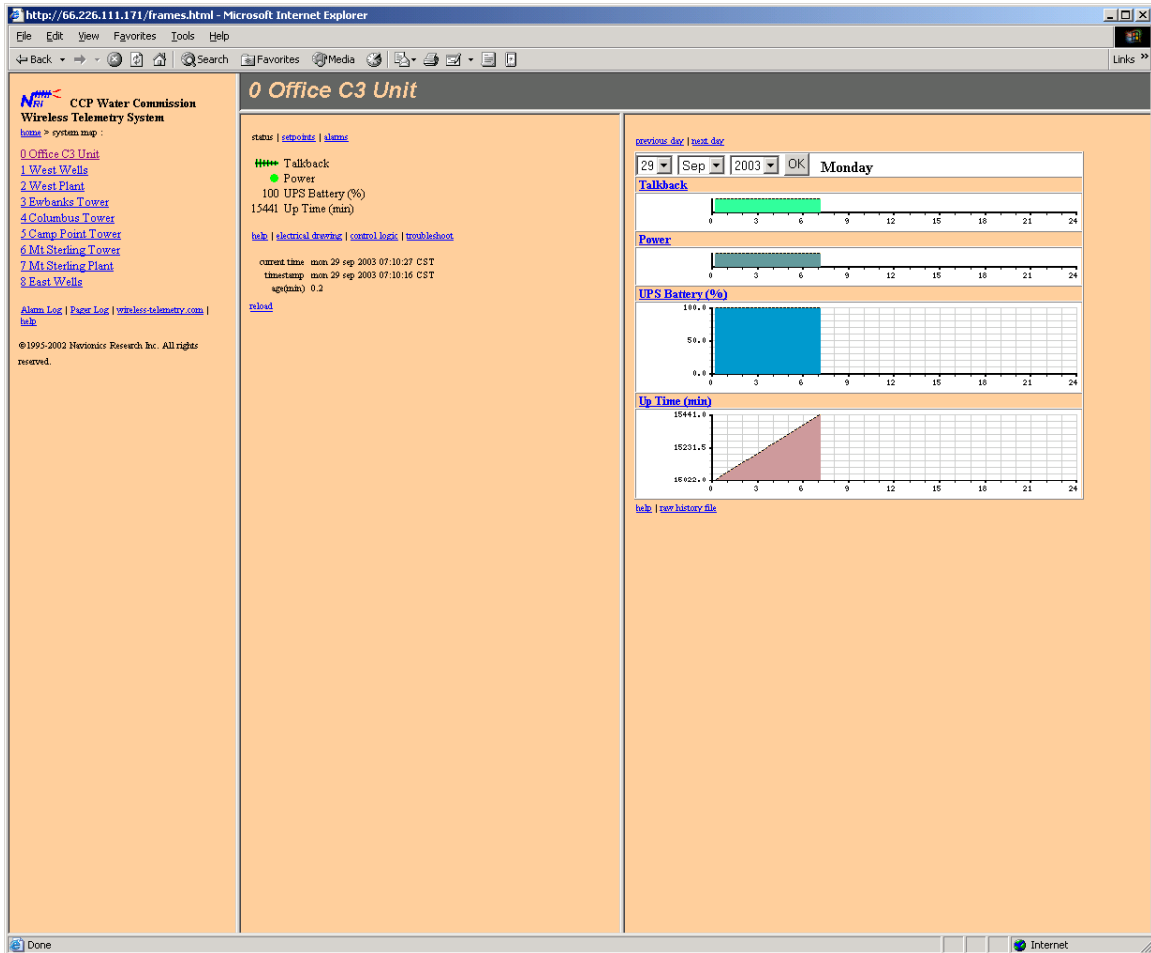
Important Note! Do not place a check mark next to “Save this password in your password list”. Navionics Research recommends typing your username and password with each connection attempt.

After connection is made, the following screen will be presented:



At this point, select the type of interface desired. For desktop computers, the “Full-Screen Frame Graphics” option is the most-used. “PocketPC Graphics” is mainly used for the PocketPC, but some prefer it for the desktop, as well.

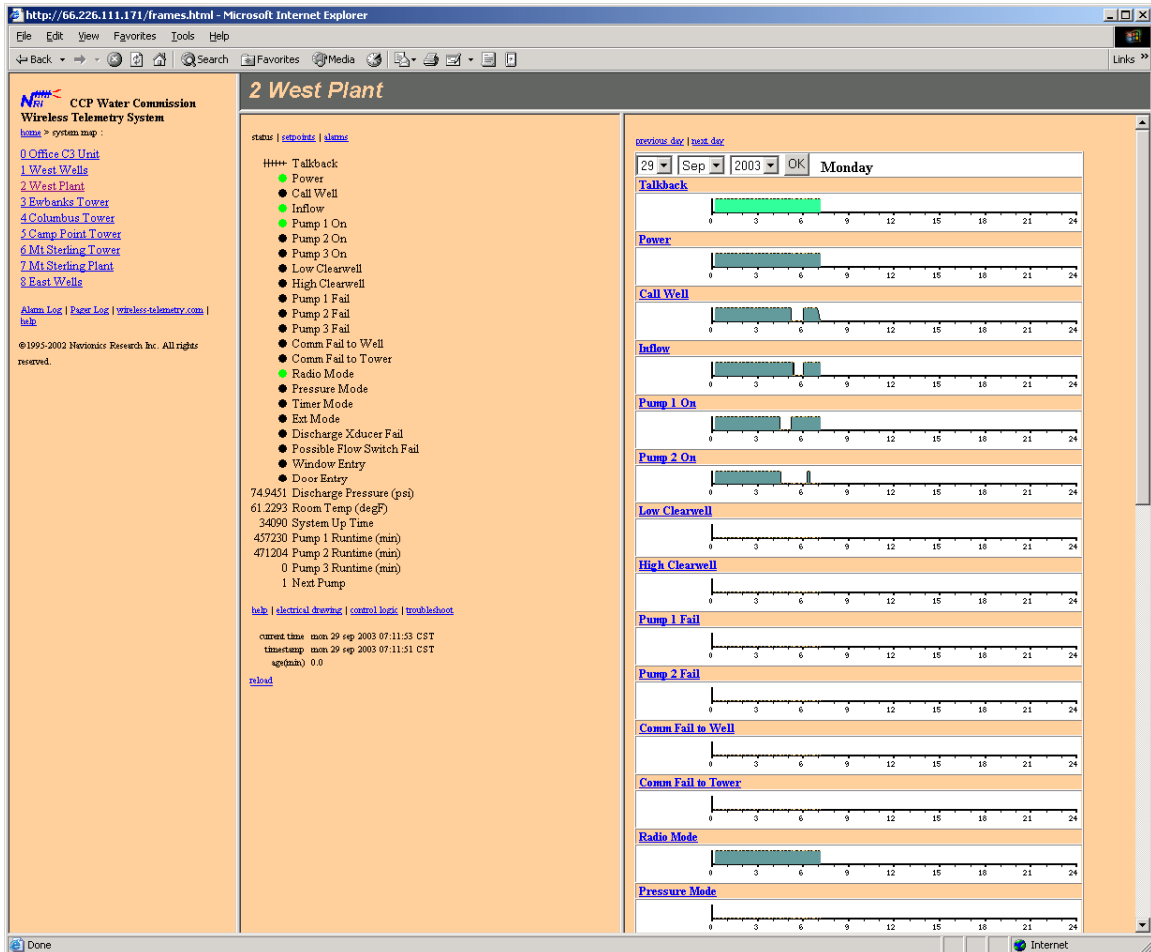
After selecting “Full-Screen Frame Graphics”, a screen similar to the following will be presented:



Note that each RTU site can be selected by left-clicking the appropriate name in the leftmost frame.

4 VIEWING STATUS

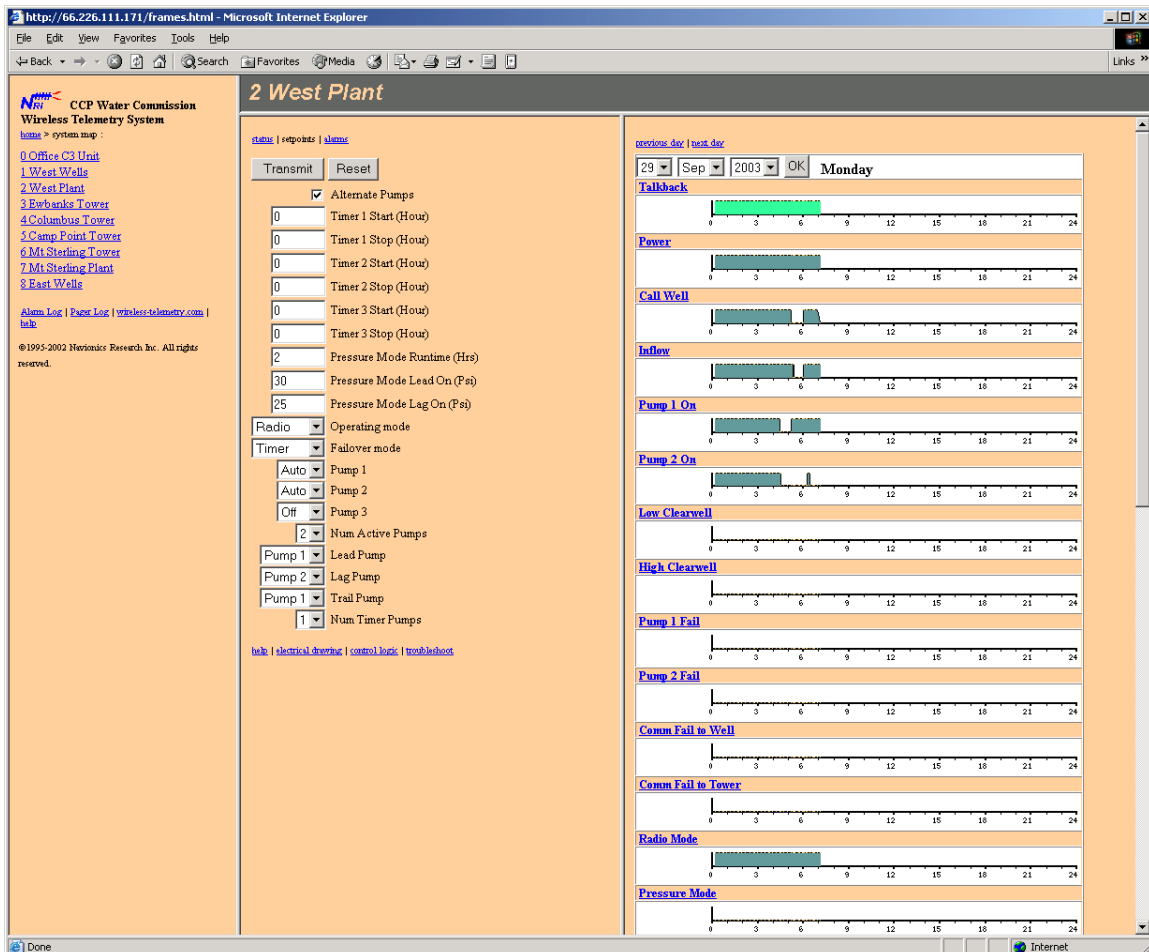
In the following screen, the “West Plant” was selected:



Note that “Status”, “Setpoints”, and “Alarms” are available through the middle frame. Also, “History” is available through the right frame.

5 SETPOINT MODIFICATIONS

In the following screen, the “Setpoints” have been selected in the middle frame. Setpoints can be modified from this screen.



The user must press the “Transmit” button to send new setpoints to the RTU. After the user presses the “Transmit” button, a “Success” or “Failure” dialog will be displayed after a maximum 45 second delay.

The setpoints cannot be considered to be in effect unless the “Success” dialog is presented afterwards.

If the “Failure” dialog is presented, the user should first make sure that WinCom is running in the background. If WinCom is running and a “Failure” dialog was presented, then the target RTU did not receive the transmission. The user should retry the procedure up to several attempts until the “Success” dialog is presented.

6 ALARM MODIFICATIONS

In the following screen, the “Alarm Settings” have been selected in the middle frame. Alarm Settings can be modified from this screen.

The screenshot displays the "2 West Plant" alarm settings interface. The left sidebar contains a navigation menu with links for "0 Office C3 Unit", "1 West Wells", "2 West Plant", "3 Burbanks Tower", "4 Columbus Tower", "5 Camp Point Tower", "6 Mt Sterling Tower", "7 Mt Sterling Plant", and "8 East Wells". The main content area is divided into three sections:

- Control Section:** Includes "alarm" and "alarm" links, a "threshold" field set to "3600", and "OK" and "Reset" buttons.
- Alarm List Table:** A table with columns for "Level 2", "Level 1", "Inactive", "Invert", and "Power". The "Power" column is checked for several items.
- Parameter Section:** Includes "High / Low" settings for "Discharge Pressure (psf)" (130 / 70) and "Room Temp (degF)" (140 / 20).

The right sidebar shows a "previous day" selection for "Monday, Sep 29, 2003" and a series of 24-hour bar charts for various alarms: Talkback, Power, Call Well, Inflow, Pump 1 On, Pump 2 On, Low Clearwell, High Clearwell, Pump 1 Fail, Pump 2 Fail, Common Fail to Well, Common Fail to Tower, Radio Mode, and Pressure Mode.

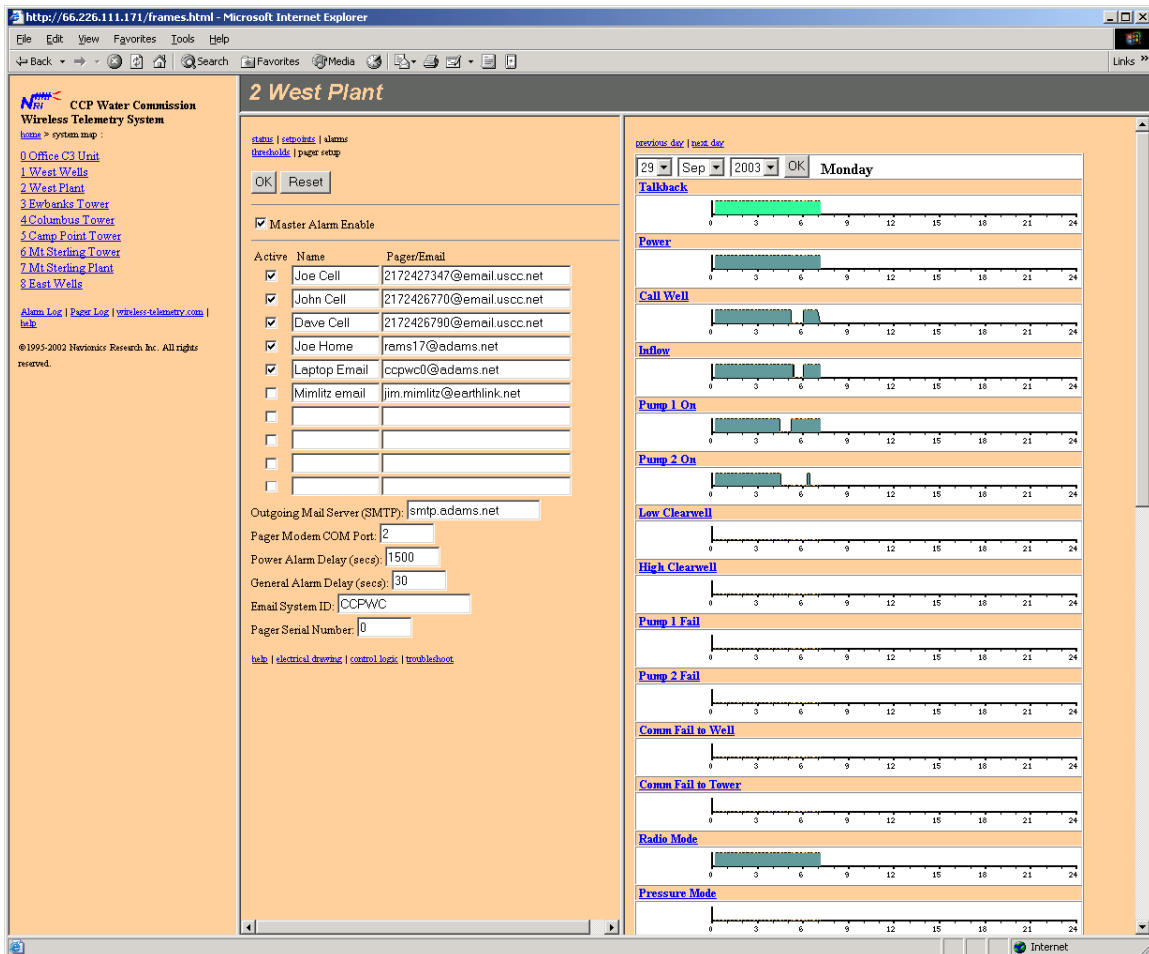
Changes to the Alarm Settings are not made unless the “OK” button is pressed, and a “Success” dialog is presented.

The new alarm settings cannot be considered to be in effect unless the “Success” dialog is presented afterwards.

If the “Failure” dialog is presented, the user should first make sure that the WiSTAR-Executive is running in the background. If the WiSTAR-Executive is running and a “Failure” dialog was presented, then the alarm subsystem software did not receive the transmission. The user should retry the procedure up to several attempts until the “Success” dialog is presented.

7 PAGER SETUP

In the following screen, the “Pager Setup” has been selected in the middle frame. Pager/Email Settings can be modified from this screen.



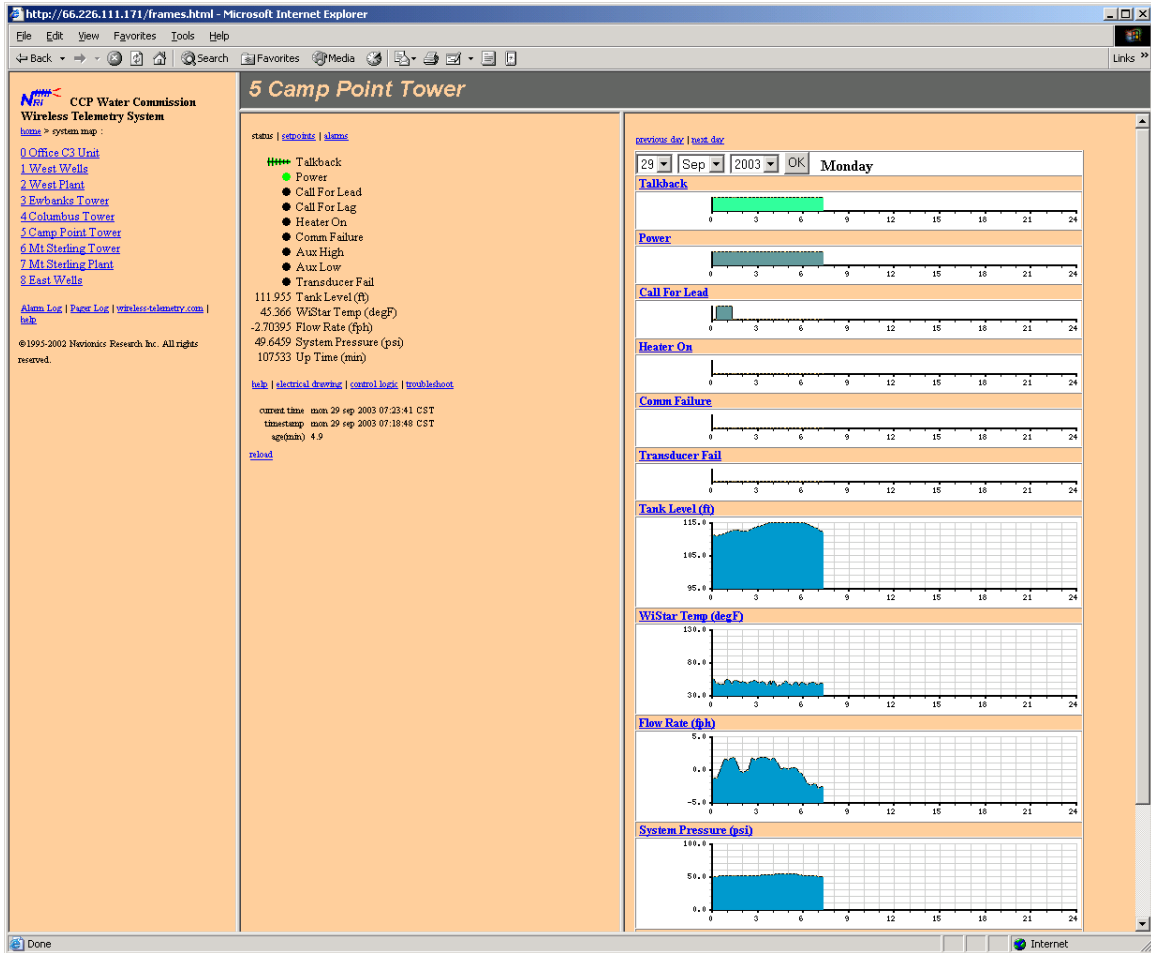
Changes to the Pager/Email settings are not made unless the “OK” button is pressed, and a “Success” dialog is presented.

The new pager/email settings cannot be considered to be in effect unless the “Success” dialog is presented afterwards.

If the “Failure” dialog is presented, the user should first make sure that the WiSTAR-Executive is running in the background. If the WiSTAR-Executive is running and a “Failure” dialog was presented, then the alarm subsystem software did not receive the transmission. The user should retry the procedure up to several attempts until the “Success” dialog is presented.

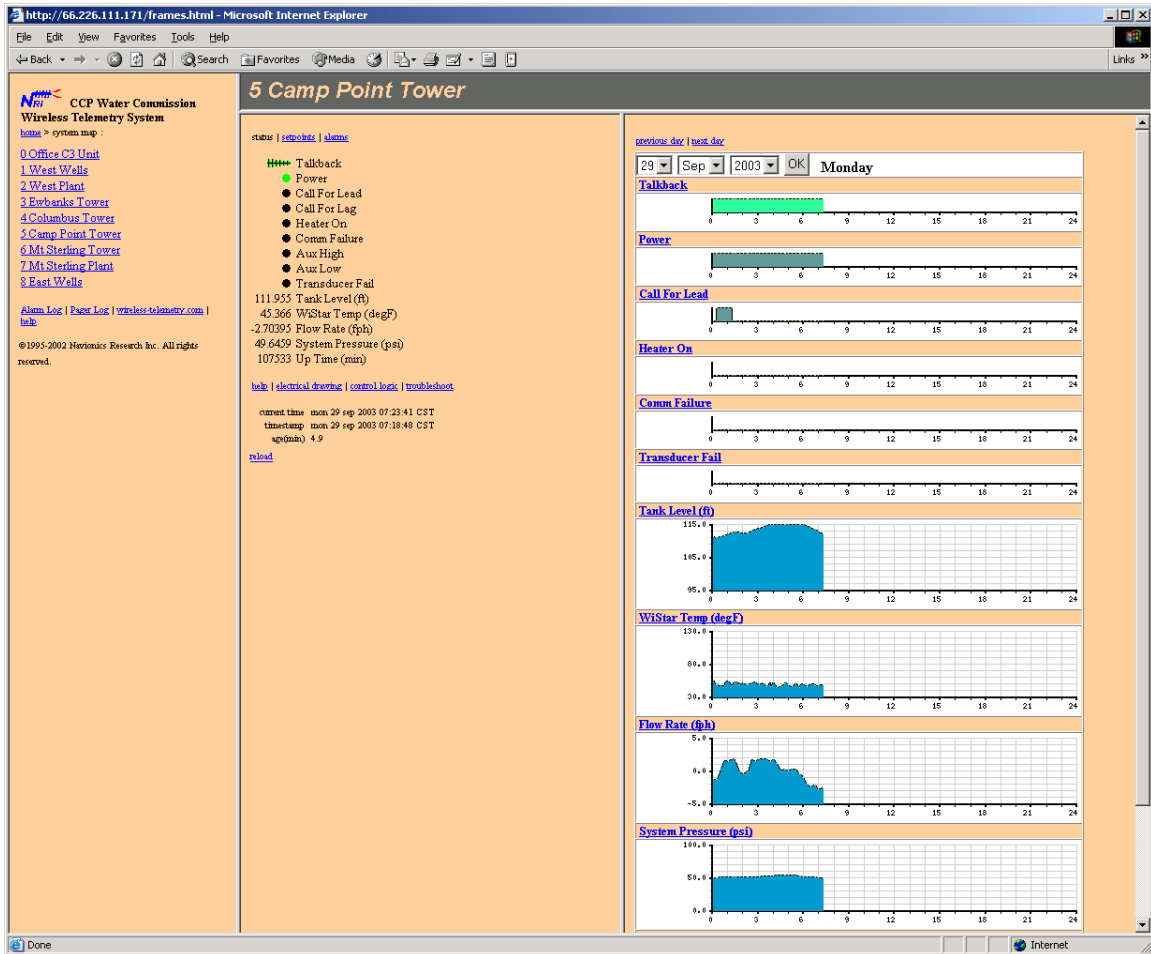
8 HISTORY VIEW

In the following screen, the “History Viewer” is shown in the right frame. History for any day can be selected by either navigating with the “previous day” and “next day” links, or by using the date selection menus. In order to activate the date selection, the “OK” button must be selected.



9 ALARM LOGS

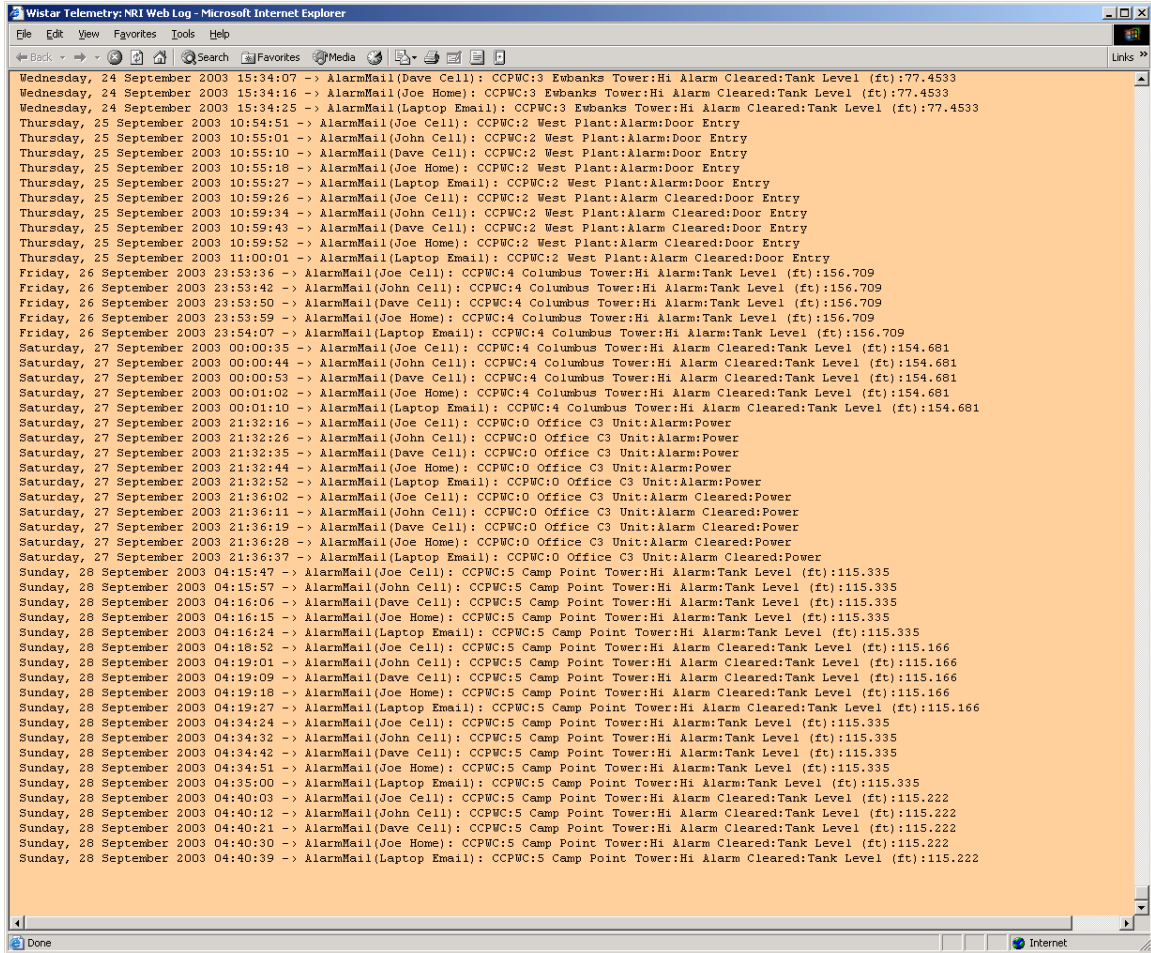
Both the “Alarm Logs” and “Pager Logs” can be viewed by pressing the appropriate links in the bottom of the left frame.



View of the Alarm Log:

Date	Time	Level	Alarm Description
Thursday, 18 September 2003	09:24:37	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Thursday, 18 September 2003	09:39:33	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Thursday, 18 September 2003	09:49:34	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Thursday, 18 September 2003	09:54:35	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Thursday, 18 September 2003	09:55:29	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Thursday, 18 September 2003	09:58:19	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Friday, 19 September 2003	04:00:12	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Friday, 19 September 2003	05:36:26	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Friday, 19 September 2003	05:37:36	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Friday, 19 September 2003	05:41:27	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Friday, 19 September 2003	08:41:32	LEVEL 2	ALARM: 4 Columbus Tower: Power
Friday, 19 September 2003	08:46:33	LEVEL 2	ALARM CLEARED: 4 Columbus Tower: Power
Friday, 19 September 2003	09:36:22	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Friday, 19 September 2003	09:40:10	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Saturday, 20 September 2003	03:15:13	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Saturday, 20 September 2003	03:16:49	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Saturday, 20 September 2003	03:26:54	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Saturday, 20 September 2003	03:30:10	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Saturday, 20 September 2003	03:41:55	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Saturday, 20 September 2003	03:45:11	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Sunday, 21 September 2003	16:20:05	LEVEL 2	ALARM: 2 West Plant: Door Entry
Sunday, 21 September 2003	16:52:08	LEVEL 2	ALARM: 0 Office C3 Unit: Power
Sunday, 21 September 2003	16:52:18	LEVEL 2	ALARM CLEARED: 0 Office C3 Unit: Power
Monday, 22 September 2003	05:11:32	LEVEL 2	HI-ALARM: 3 Ewbanks Tower: Tank Level (ft)
Monday, 22 September 2003	05:11:37	LEVEL 2	HI-ALARM CLEARED: 3 Ewbanks Tower: Tank Level (ft)
Monday, 22 September 2003	08:05:27	LEVEL 2	ALARM CLEARED: 2 West Plant: Door Entry
Tuesday, 23 September 2003	12:37:39	LEVEL 2	HI-ALARM: 4 Columbus Tower: Tank Level (ft)
Tuesday, 23 September 2003	12:45:05	LEVEL 2	HI-ALARM CLEARED: 4 Columbus Tower: Tank Level (ft)
Wednesday, 24 September 2003	15:21:58	LEVEL 2	HI-ALARM: 3 Ewbanks Tower: Tank Level (ft)
Wednesday, 24 September 2003	15:33:49	LEVEL 2	HI-ALARM CLEARED: 3 Ewbanks Tower: Tank Level (ft)
Thursday, 25 September 2003	03:21:25	LEVEL 2	HI-ALARM: 3 Ewbanks Tower: Tank Level (ft)
Thursday, 25 September 2003	03:21:40	LEVEL 2	HI-ALARM CLEARED: 3 Ewbanks Tower: Tank Level (ft)
Thursday, 25 September 2003	05:32:27	LEVEL 2	HI-ALARM: 3 Ewbanks Tower: Tank Level (ft)
Thursday, 25 September 2003	05:32:36	LEVEL 2	HI-ALARM CLEARED: 3 Ewbanks Tower: Tank Level (ft)
Thursday, 25 September 2003	10:43:18	LEVEL 2	ALARM: 2 West Plant: Power
Thursday, 25 September 2003	10:48:29	LEVEL 2	ALARM CLEARED: 2 West Plant: Power
Thursday, 25 September 2003	10:54:19	LEVEL 2	ALARM: 2 West Plant: Door Entry
Thursday, 25 September 2003	10:59:25	LEVEL 2	ALARM CLEARED: 2 West Plant: Door Entry
Friday, 26 September 2003	15:41:16	LEVEL 2	ALARM: 0 Office C3 Unit: Power
Friday, 26 September 2003	15:41:21	LEVEL 2	ALARM CLEARED: 0 Office C3 Unit: Power
Friday, 26 September 2003	16:26:19	LEVEL 2	ALARM: 8 East Wells: Power-123
Friday, 26 September 2003	16:33:05	LEVEL 2	ALARM CLEARED: 8 East Wells: Power-123
Friday, 26 September 2003	16:38:35	LEVEL 2	ALARM: 8 East Wells: Power-123
Friday, 26 September 2003	16:43:36	LEVEL 2	ALARM CLEARED: 8 East Wells: Power-123
Friday, 26 September 2003	18:06:13	LEVEL 2	ALARM: 0 Office C3 Unit: Power
Friday, 26 September 2003	18:06:18	LEVEL 2	ALARM CLEARED: 0 Office C3 Unit: Power
Friday, 26 September 2003	23:53:03	LEVEL 2	HI-ALARM: 4 Columbus Tower: Tank Level (ft)
Saturday, 27 September 2003	00:00:34	LEVEL 2	HI-ALARM CLEARED: 4 Columbus Tower: Tank Level (ft)
Saturday, 27 September 2003	21:31:45	LEVEL 2	ALARM: 0 Office C3 Unit: Power
Saturday, 27 September 2003	21:36:01	LEVEL 2	ALARM CLEARED: 0 Office C3 Unit: Power
Sunday, 28 September 2003	04:15:15	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Sunday, 28 September 2003	04:18:50	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)
Sunday, 28 September 2003	04:33:52	LEVEL 2	HI-ALARM: 5 Camp Point Tower: Tank Level (ft)
Sunday, 28 September 2003	04:40:02	LEVEL 2	HI-ALARM CLEARED: 5 Camp Point Tower: Tank Level (ft)

View of the Pager Log:



10 TROUBLESHOOTING COMMON PROBLEMS

A. Talkback Alarms Reported From All Remote RTU's:

Possible Cause 1: "WinCom.exe" Program Not Running

Solution 1: If "WinCom.exe" is not shown on the Status Bar at the bottom of the screen, double-left-click on the "WinCom" icon on the screen background. All talkback alarms should clear within approximately 15 minutes.

Possible Cause 2: Radio Failure

Solution 2: Call Navionics Research for phone support.

B. Remote Telemetry Access Not Available:

Possible Cause 1: "Telemetry Transmit" Program Not Running

Solution 1: If "Telemetry Transmit" is not shown on the Status Bar at the bottom of the screen, double-left-click on the "Telemetry Transmit" icon on the screen background. Remote access should become available immediately.

Possible Cause 2: Internet Connection Not Active (Dialup Modem)

Solution 2: After automatic updates are installed, a reboot is necessary and oftentimes the automatic internet reconnection will stop operating until the computer is rebooted. Therefore, reboot the computer, and listen for the dialup modem to connect. If these measures are successful, remote access should become available immediately.

Possible Cause 3: Unknown Cause

Solution 3: Call Navionics Research for phone support.

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