

VRC2500

REMOTE FACILITIES MANAGEMENT



Installation & Operations Manual

BURK
TECHNOLOGY

VRC2500 Installation & Operation Manual

January 2002 (revision A)

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This equipment complies with the requirements of the EU guidelines:

89/336/EEC “Electromagnetic Compatibility”
73/23/EEC “Electrical operating material for use within specific voltage limits”

Conformity of the equipment with the above guidelines is attested by the CE mark.

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1 Introduction

The VRC2500 is a remote facilities management system designed to monitor and control equipment and facilities in remote locations. Intelligence, reliability, and versatility make the VRC2500 system one of the best values in remote facilities management today.

The VRC2500 has the unique ability to operate unattended. A PC is only required for setup and monitoring, not for smart operation.

Included with the VRC2500 is the highly innovative operating software package built around the VRC2500 hardware platform. The software is used in the configuration and monitoring of I/O units. Using the software, the VRC2500 is ready to help users face the challenges of the new millennium.

What's In This Manual

Overview gives product descriptions, operation requirements and pre-installation information. This section is designed to help familiarize you with the controls and connections before you begin installing the equipment.

Installation & Setup provides detailed information on installing the VRC2500 software and connecting the hardware to your equipment.

Site Management takes you through each of the Unit and Voice functions and describes how to configure your unit.

Using Dial-Up describes the Dial-Up features and shows you how to manage your equipment via telephone.

Managing Tasks and Data illustrates the data process from captures to printouts using Data Browser and Scheduler.

Creating Macros explains the structure and language of macros, as well as providing many examples of macro commands.

Appendices provide troubleshooting and specification information. A section on pinouts includes diagrams of cables, connectors, and jumpers. A glossary and index are located after the Appendices.

Contacting Burk Technology

Customer Support

For additional help on installing, setting up or operating the VRC2500, please contact us at the following:

Phone: 978-486-0086
Fax: 978-486-0081
E-mail: support@burk.com
Website: www.burk.com

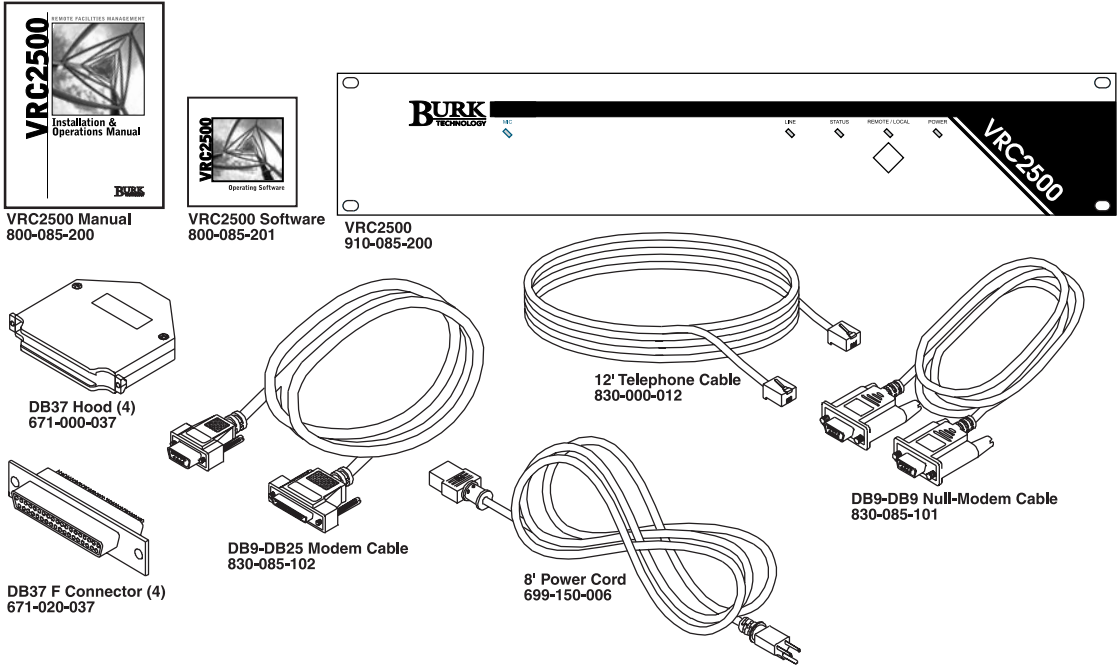
Sales

Phone: 978-486-0086
800-255-8090 (sales only)
Fax: 978-486-0081
E-mail: sales@burk.com
Website: www.burk.com

Unpacking

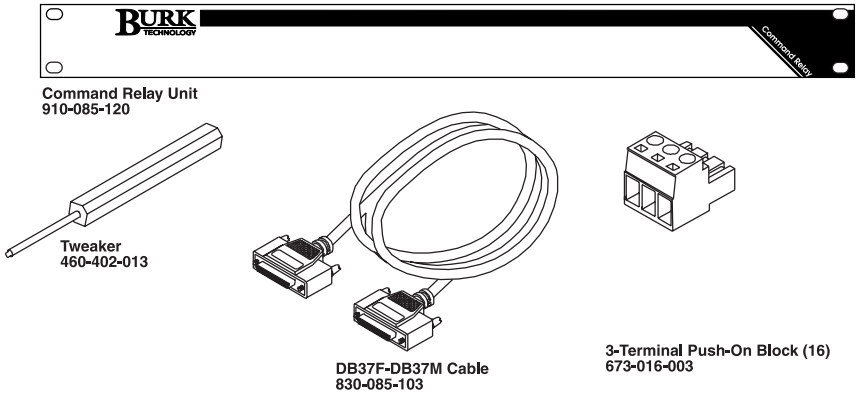
You should have received the following items with each VRC2500 unit you have purchased.

VRC2500 Package



You should have received the following items with each Command Relay unit you have purchased.

Command Relay Unit



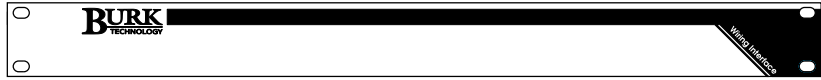
! Burk Technology is not responsible for product damage during shipment. You must make any claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears to be damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

You should have received the following items with each Wiring Interface unit you have purchased.

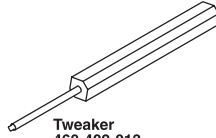


If you have not received all of the items shown with your shipment, contact Burk Technology at the number listed on the bottom of this page.

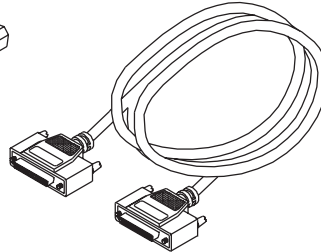
Wiring Interface Unit



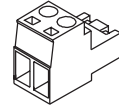
Wiring Interface Unit
910-085-110



Tweaker
460-402-013



DB37F-DB37M Cable
830-085-103



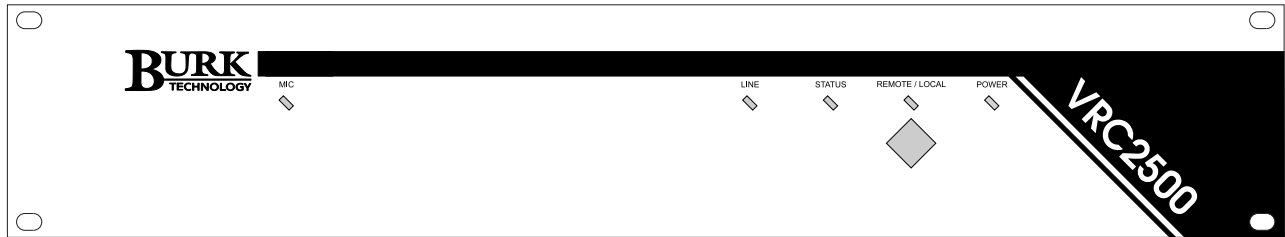
2-Terminal Push-On Block (16)
673-016-002

2 Overview

About the VRC2500

- Automatic functions are embedded in the VRC unit — no external PC required after the initial setup and calibration
- Fully customizable macros allow the VRC2500 to respond automatically to situations
- Alarm notifications by telephone, pager, or computer
- Programmable data-capture function that collects metering and status data and inserts it into a Microsoft Access® compatible database
- Establish remote connection to VRC2500 via dial-up and dedicated telephone lines, radio links (RF), or direct serial port connection
- Dial-Up option allows you to monitor status and metering channels, and issue commands with any touch-tone phone
- Create custom print jobs using collected data stored in the VRC2500 software's database
- Automate print jobs and data collections by scheduling them as recurring or one-time tasks

Controls & Connections



VRC2500, Front View

VRC2500 UNIT

Remote/Local Allows you to switch operational modes. Remote mode allows normal operation of the unit. Local mode prevents the unit from issuing commands. The Local mode is used when performing maintenance on the equipment.

Power LED

Green =	OK
Amber =	Corrupt firmware or hardware failure
Off =	No power

Remote/Local LED

Green =	Remote mode
Red =	Local mode
Amber =	Operating system failure must upload new firmware
Flashing Green/Amber =	Firmware problem
Off =	No firmware or power off

Status

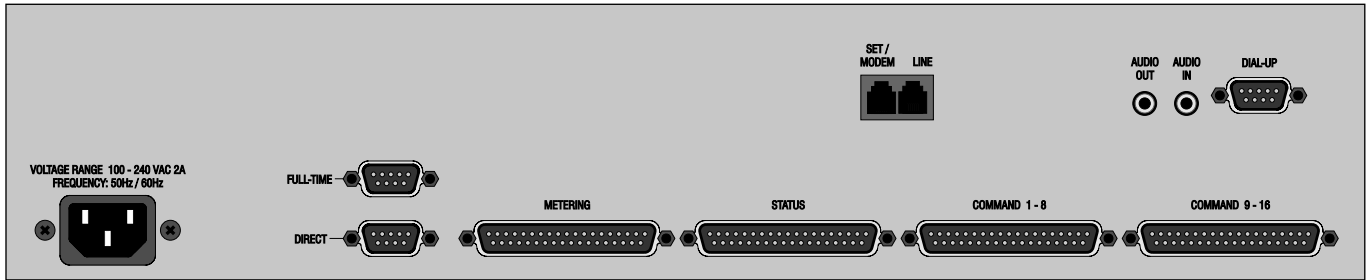
Green =	Normal voice operation
Flashing Red =	Local mode
Off =	Voice firmware not loaded

Line

Green =	Voice mode session in progress
Red =	Data mode session in progress
Off =	Telephone line not in use

Mic

Dial-up callers can audibly monitor remote location



VRC2500, Rear View

- Power** The VRC2500 accommodates power from 100 - 240VAC at 50/60Hz.

- Full-Time** Serial connection for full-time data connection such as a four-wire modem.

- Direct** Serial connection for direct connection to PC. Also used for firmware upgrades.

- Metering** Analog inputs with range of 0 to +10VDC and -5 to +5VDC.

- Status** Binary inputs with range of -30 to +30VDC with CMOS/TTL thresholds.

- Command 1-8** Open collector A/B output channels 1 through 8 can sink 250mA at 30VDC.

- Command 9-16** Open collector A/B output channels 9 through 16 can sink 250mA at 30VDC.

- Set/Modem** RJ-11 connector for modem or telephone set.

- Line** RJ-11 connector for on-site telephone line.

- Audio Out** Audio from the telephone line can be routed to this output for possible use as emergency audio feed to transmitter.

- Audio In** Allows external audio (such as off-air monitor) to be fed to the phone line.

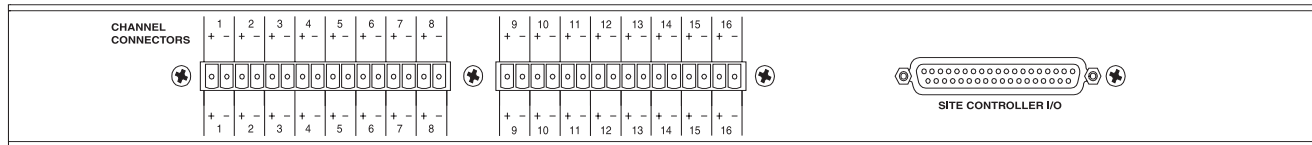
- Dial-Up** Serial connection for external dial-up modem. Also used when upgrading voice firmware.



Wiring Interface Unit, Front View

WIRING INTERFACE UNIT

The Wiring Interface unit facilitates the connection of your site equipment to the VRC2500 unit. It has no front panel controls.



Wiring Interface Unit, Rear View

Channel Connectors Channel Connectors can accept up to 16 channels for metering or status readings from your site equipment. You will need two Wiring Interfaces to make all the connections. Two-terminal push-on connectors are used with the Wiring Interface unit.

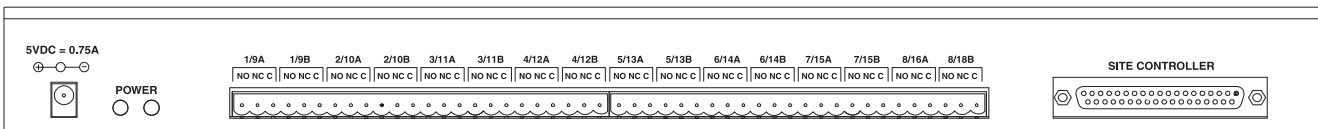
Site Controller I/O Connects to the Metering or Status connection on the VRC unit using a DB37-to-DB37 cable.



Command Relay Unit, Front View

COMMAND RELAY UNIT

The Command Relay unit provides isolation between the VRC unit's solid-state open-collector outputs and your equipment. Each Command Relay unit can connect up to eight Command Output channels on your VRC unit. It has no front panel controls.



Command Relay Unit, Rear Panel

Power LED When the VRC unit is powered up, both power LEDs should be green, indicating 5VDC power.

Connectors for Command Channels Three-terminal push-on connectors are inserted here.

Site Controller Connects to the Command 1-8 or Command 9-16 connection on the VRC unit.

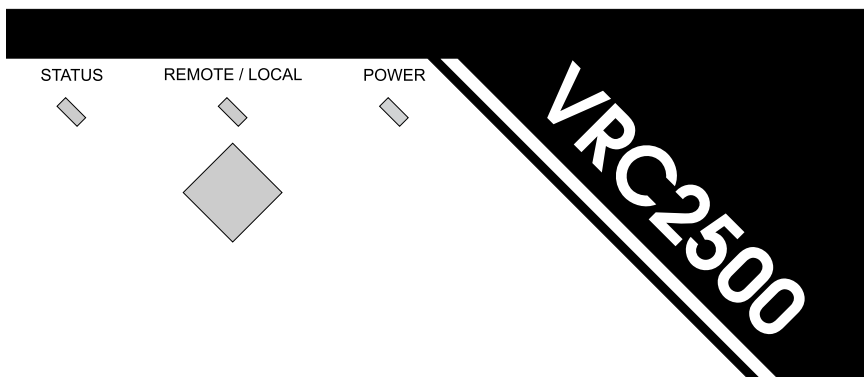
Safety Information

If you are performing maintenance on your communications equipment, you should press the REMOTE/LOCAL button on your VRC2500 unit to switch into Local mode. The LED indicator changes to a solid red color. Local mode prevents the unit from issuing command outputs. All metering and status information is still available to remote users.

The VRC software also indicates whether a unit is in Remote or Local mode. If the unit is in Local mode, a small padlock appears on the General Setup icon in the Site window.



WARNING! Possible severe injury may occur if a command channel is activated while you are performing maintenance on your equipment. It is critical that you switch the I/O unit from REMOTE to LOCAL mode before working with connected equipment.



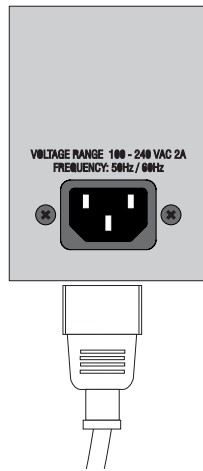
Remote/Local Button on VRC2500

The VRC2500 software requires Windows® 98 or Windows® NT 4 with Service Pack 5. **If you are running Windows NT, you need to be logged in as the Administrator before attempting to install the software.**

- Pentium 166 MHz minimum (200 MHz or higher recommended)
- Windows® 98 or Windows® NT 4 w/ SP5
- 50MB free hard drive space
- 32MB RAM minimum (64MB RAM minimum for Windows NT)
- Video card capable of 800x600 screen resolution at 256 colors (1024x760 screen resolution recommended)
- One available COM port for each direct cable connection
- 19.2kbps or faster modem
- CD-ROM Drive
- Multimedia speakers (if using the audible alarm feature)

Software Requirements

Pre-Installation Information



VRC Unit Power Source

Power Connections

The VRC2500 unit is designed to operate with a wide range of voltages. It accepts an AC voltage input range of 100-240 VAC, 50/60 Hz, without the need to manually change settings. Power-line swings and brownouts within this range have no effect on I/O unit operation.

Surge Protection

Although the VRC2500 has built-in resistance to voltage changes, we recommend that you use a power surge protector or line conditioner on the incoming AC line. Lightning strikes and other high surges in voltage levels will damage your VRC2500 system and connected equipment if it is not properly protected.

Battery Backup

We recommend that you connect your VRC2500 to a battery backup system. An I/O unit connected to battery backup will be able to start a generator or take other steps to restore power to your remote site. The VRC2500 will also be able to notify you of the power outage by phone, pager, or data, depending on the configuration of your system.

GSC3000 Lynx Users

! Do not install the VRC2500 software if you already have the GSC3000 Lynx software on your computer.

If you currently have the GSC3000 Lynx software on your computer, do not install the VRC2500 software. You will be prompted with a warning message (shown below) advising you not to continue with the installation. Use the Lynx software to connect to your VRC2500. The Lynx software will identify your VRC2500 as a GSC3000 I/O 16 and a GSC Voice Interface.



3 Installation & Setup

This section outlines the step by step process that should be followed in order to ensure proper installation of your VRC products.

Only program functions that are relevant to the installation are described in this chapter. More detailed descriptions and operation information are provided in subsequent chapters.

We strongly recommend that you bench test the equipment to ensure it is functioning properly and that you have made the right connections before you install at your transmitter site.

Software Installation



If you are installing on a PC running Windows NT, you must be logged in as the Administrator.



VRC2500 software will not run properly if Lynx software is installed on your PC. The software packages are mutually exclusive. If you are using GSC3000 Lynx software and VRC2500 units, do NOT install the VRC2500 software. Abort the installation. Use the Lynx software to set up and operate your VRC2500 unit(s).



A DCOM98 error message pops up during installation if the DCOM98 version on your computer is newer than the version included with the software package. If you would like to use the version included with the software you will need to uninstall your current version. Otherwise, click OK and proceed with the installation.

INSTALL

1. Boot the PC to the Windows operating system. Make sure that all other programs or applications are closed. Insert the VRC2500 CD into the CD-ROM drive.
2. If the Autorun feature is enabled on the PC, a window pops up with the option to install the VRC2500 software or exit. (See figure below.)
3. Click INSTALL to launch the InstallShield Wizard.



VRC2500 Install Menu

If the Autorun window does not open, click on the Windows START menu and choose RUN. Type "<drive>:\setup.exe" where <drive> is the letter of the CD-ROM drive (e.g., D:\setup.exe).



Setup launches the InstallShield Wizard.

4. The InstallShield Wizard guides you through several screens, including Welcome, License Agreement and User Information. Click NEXT or YES to move to the next screen or NO or CANCEL to end the installation process. You must enter a serial number at the User Information screen if one is not automatically inserted.

- Choose the directory where VRC2500 will be installed. We recommend that you use the default directory.



Choose Destination Location Window



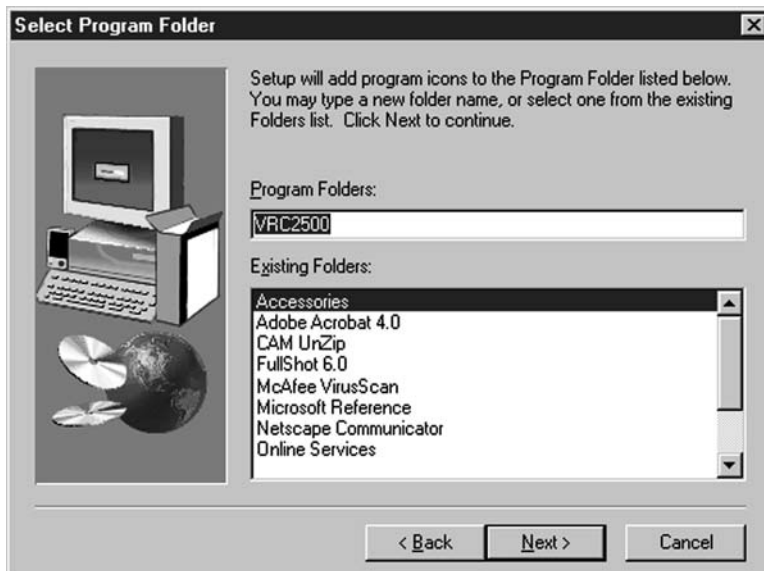
To select an alternate destination directory, click **BROWSE** and use the

Choose Folder window to find the desired location. Click **OK** to return to the previous window.



Browse for Installation Folder

- Click **NEXT**. In the Type of Setup window, select from Typical Install (for most users), Compact Install (minimum install), and Custom Install.
- Click **NEXT**. The Select Program Folder window shows which Program Folder starts the VRC2500 software.



Select Program Folder Window

- Click **NEXT**. The Install Summary window displays the current install settings for your review.

9. Click NEXT to begin installation.

After a few moments, a window appears on the screen indicating that installation is complete.

10. You must restart your computer to finalize the installation process. You can restart now or wait until later. Click the appropriate radio button in the Setup Complete window and then FINISH to end the installation procedure.

The VRC2500 Program Folder is now installed in your Start Menu. You start the VRC2500 program from this location.

Clicking on **Site Manager** and **VRC2500 Scheduler** inserts a program icon for each on your Windows taskbar system tray and runs them in the background. Clicking on the Site Manager icon opens the VRC Explorer program.

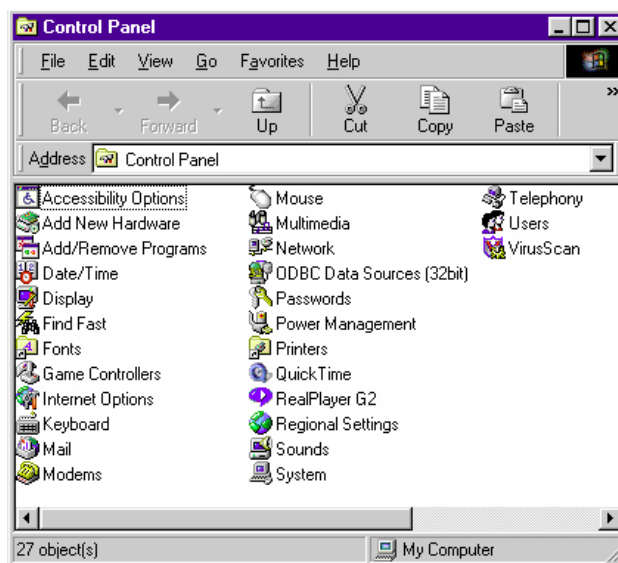
The **Registered Components Checker** is a used if by Technical Support you ever need to contact Technical Support. It has no other function.

Communication Properties

PC COM PORT SETUP IN WINDOWS

In order to use the VRC2500 software, you must establish configuration parameters for the PC's serial ports.

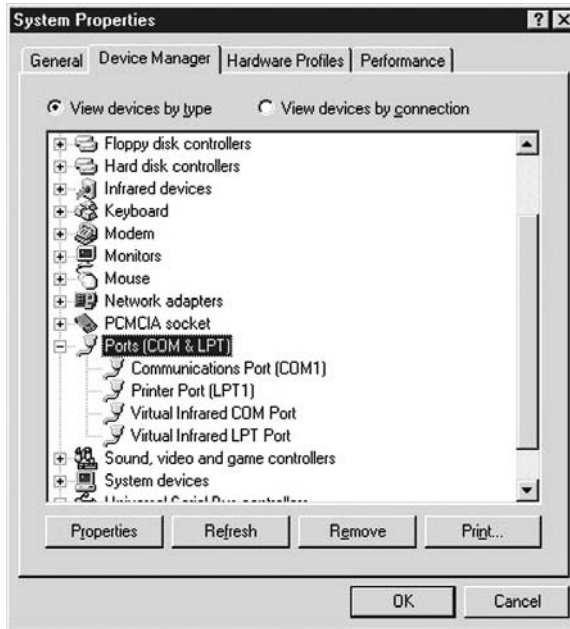
1. Go to the Windows Start menu, select Settings, and open the Control Panel.



Windows Control Panel

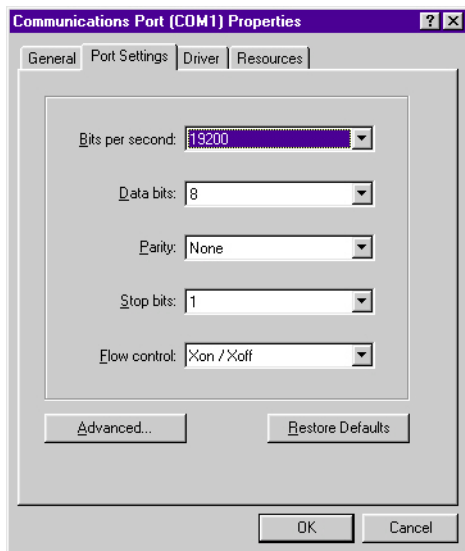
- Double-click the System icon to open the System Properties window.

- Click on the Device Manager tab. Double-click on PORTS to display a list of ports recognized by Windows.



Windows Device Manager

- Double-click on the COM port that will be used with the VRC2500 software to open the COM Port Properties window.
- Click on the Port Settings tab. If you are using more than one COM port, you need to check the settings on each one. Use the following settings for VRC2500 units:



Bits per second:
19200

Data bits:
8

Parity:
None

Stop bits:
1

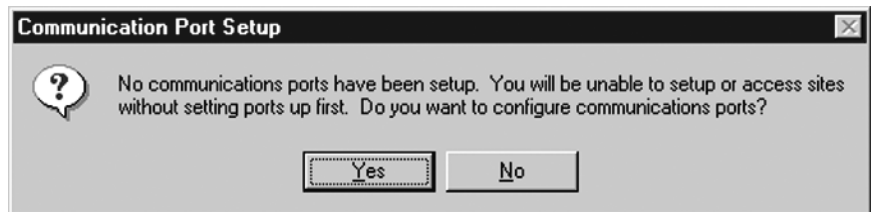
Flow control:
Xon / Xoff

Use the same settings for a modem or a direct serial connection from the PC to the VRC unit.

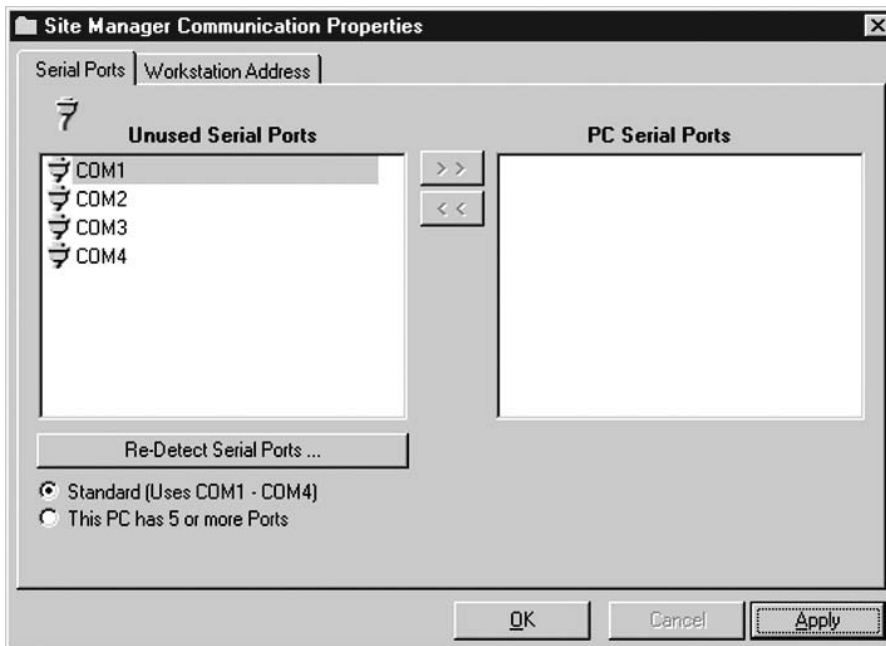
CONFIGURING PC COM PORTS

After setting up the PC COM ports through Windows, you need to configure them in the VRC2500 software using the Communications Properties utility.

1. Open VRC Explorer from the VRC2500 Program Group in the Windows Start menu. The first time you open VRC Explorer, a message box asks if you want to configure COM ports. Click YES to open the Communications Properties window. The prompt only appears the first time you open Explorer. The Configure Serial Ports and Modems icon on the VRC Explorer toolbar also opens this utility.

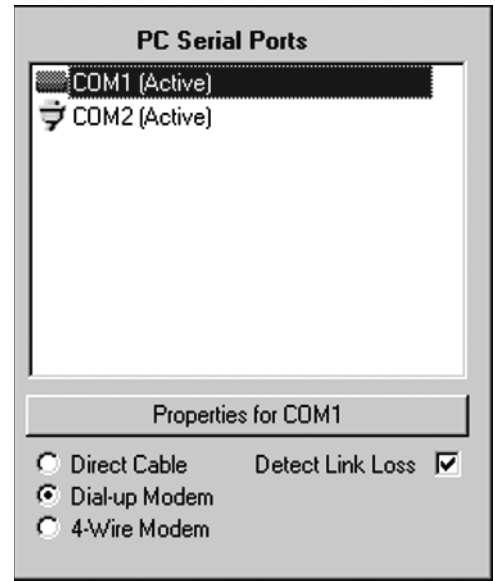


2. Click RE-DETECT SERIAL PORTS. The program checks the PC's serial COM ports numbered 1-4. If the PC running the VRC2500 software has a serial port expander, select the radio button labeled THIS PC HAS 5 OR MORE PORTS. The program then checks COM ports numbered 1-9. VRC software only supports COM ports 1-9.



3. Select the COM ports by clicking on the entry and then clicking the double right arrow. To remove a previously selected COM port, click on the entry and then click the double left arrow. Click APPLY to set your selections.

4. Single-click on the active port in the PC Serial Ports area to display more configuration choices.
5. Click on the radio button that corresponds with the type of modem or connection you are using.
6. Check on the Link Loss box if you want this port to listen for link loss. Link loss notification alerts any PC that is connected to a site if the connection fails. The PC automatically attempts to reconnect up to three times when it senses a link loss, provided the option is enabled.



Repeat steps 4-6 for each active port.

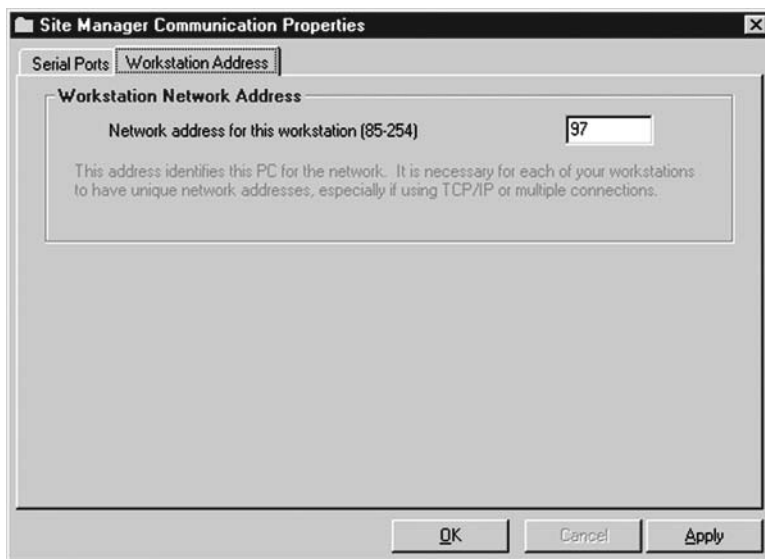
7. Click APPLY to save changes. Click OK to close the window or click on the tabs at the top to move to another option.

SETTING THE WORKSTATION ADDRESS

This address allows the VRC2500 unit to identify which PC is connected to the site. It is necessary that each of your PCs connecting to a VRC site have a unique workstation address.

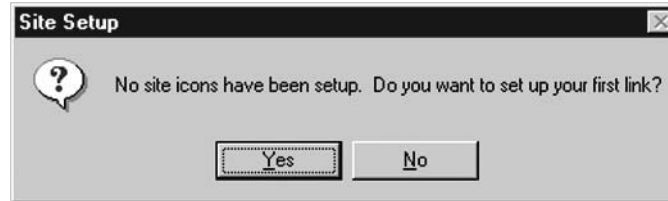
A default workstation address is automatically generated. You can accept this number as long as it is not used by another PC.


To change the default address, click on the Workstation Address tab of the Site Manager Communication Properties window. Enter a number from 85 to 254 in the white box. Click APPLY or OK to save changes.

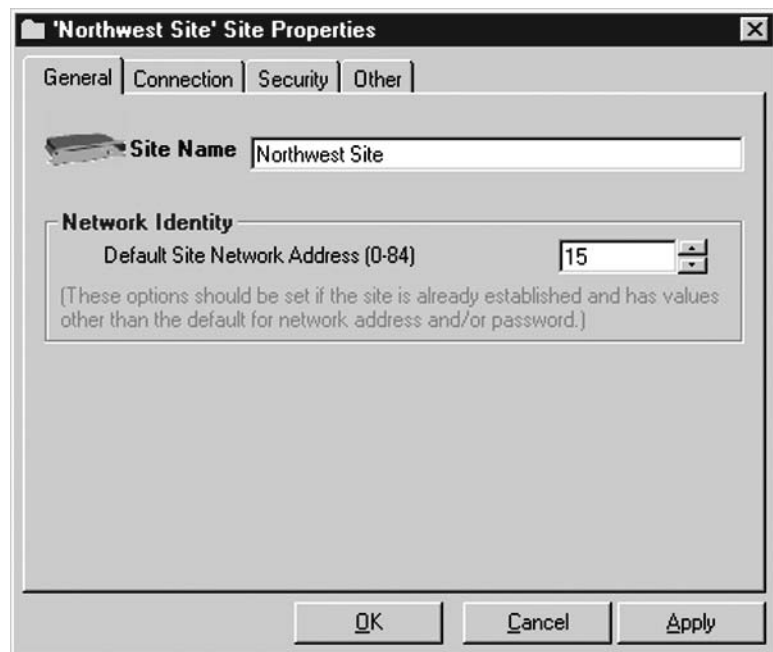


Site Setup

When you close the Communication Properties utility, a prompt window opens asking you to set up your site icons. This only happens the first time you set up a site icon. Click YES to open the New Site Properties window.

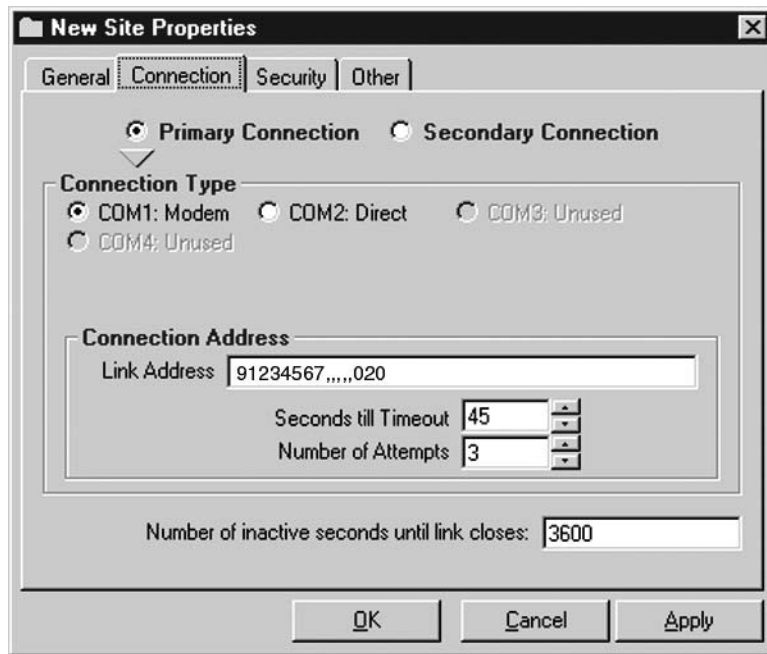


 You can also open the New Site Properties window by clicking on the New Site icon on the Explorer toolbar.



Each site must have a unique network address. To avoid confusion, we recommend numbering your first site "0," your second site "1," your third site "2," and so forth.

1. Enter a name for the site. The site name can be any combination of characters up to 28 characters long. The site name will replace the default label of New Site on the site icon and site windows as shown in the figure above.
2. Assign a site network address to the site. The Network Address must be numbered in the range of 0 to 84 and must be unique to that site.



The Security and Other options can be configured at a later time. See page 44 for a detailed description of these options.

- Click on the Connection tab. Determine the method(s) of connection from the PC to the Site. Click on the PRIMARY CONNECTION radio button and choose which of the active COM ports is to be used. If a direct connection is selected, no further information needs to be entered.

If desired, a secondary connection method may be selected. Click on the SECONDARY CONNECTION radio button. Now a different connection path may be configured. The secondary connection is used if the primary connection fails.

Link Address If a Dial-up Modem connection is selected, the telephone number, including any dial-out prefixes and area codes, must be entered in the Link Address box. The phone number should be followed by several commas (each represents a 2 second pause) and the code 020 for Data Mode (,,,,,020).

Timeout and Attempts Choose the number of seconds the PC waits for the answering modem to connect before it disconnects, and the number of attempts to connect to the site before stopping. The number of idle seconds before disconnecting defaults to 3600 seconds (1hr).

- Set up site icons for all of your sites.

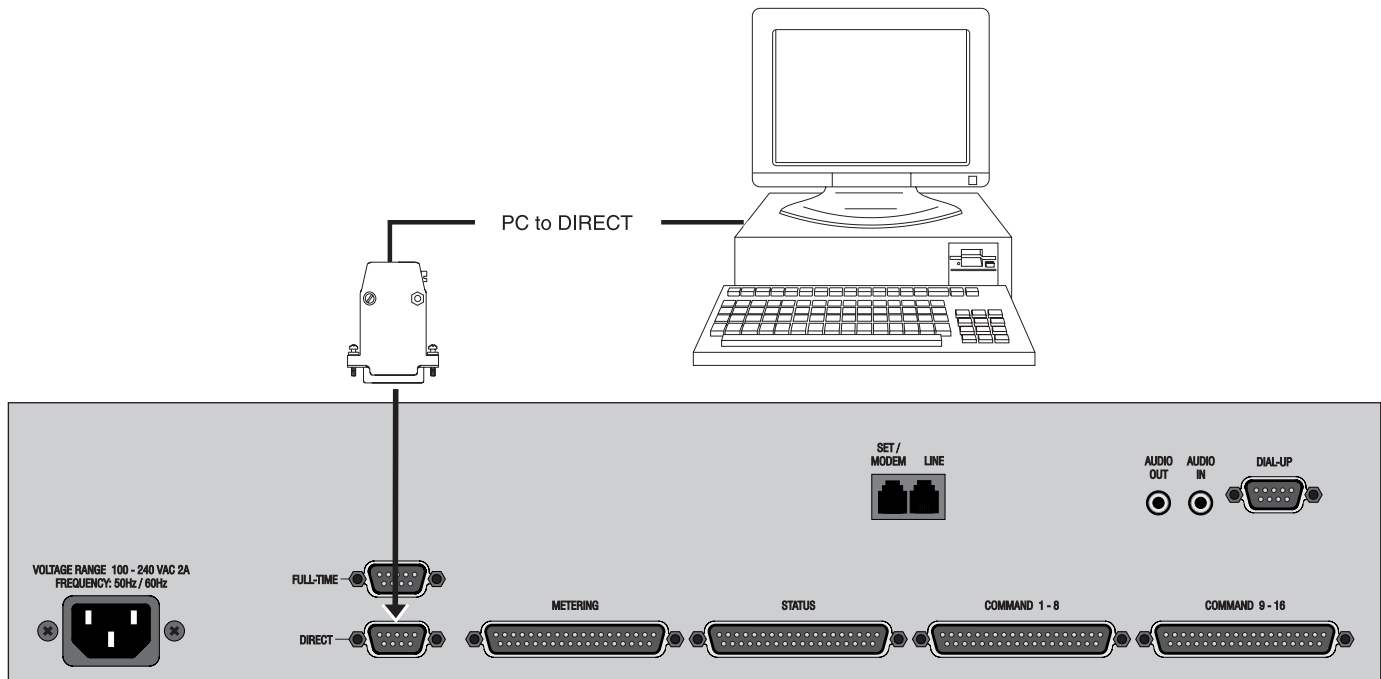
Communicating with VRC Site



If your PC's COM port is a DB25 connector, you need a DB25 female-to-DB9 male straight-through adapter to connect to the provided cable. See Appendix E for cable pinouts.

DIRECT CONNECTION

Before you can configure your VRC unit settings, you must first establish a direct connection from your PC to the VRC unit. Connect the VRC unit's DIRECT port to the COM port you set up as the Primary Connection for your PC (see page 22). The DIRECT port is a DB9 male connector. Your PC COM port is either a DB9 male connector or a DB25 male connector. Cables are provided for connection to a DB9 COM port (most common).



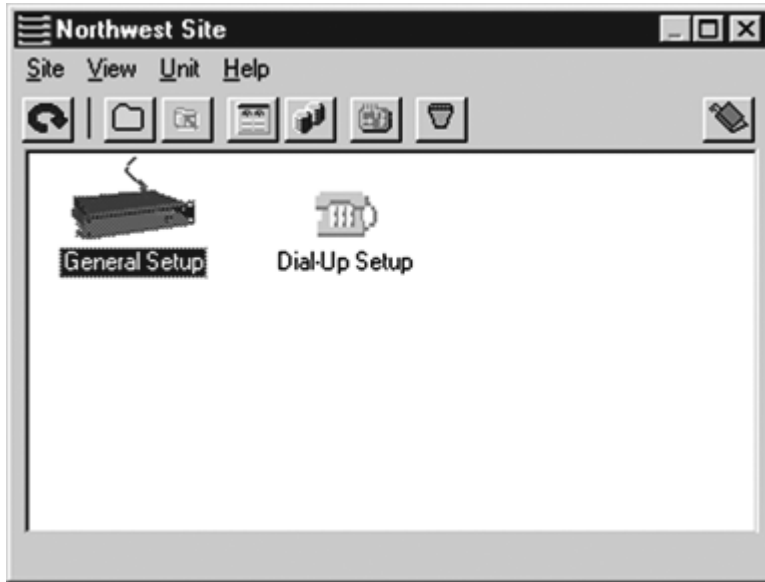
Whether making a direct connection or connecting through a modem, **use only the provided null-modem cable**. This cable is wired to meet the specific requirements of the VRC unit. To extend the serial cable, connect the serial cable to your VRC unit and plug a straight-through extension cable into the cable. You need a female-to-male extension to make the connections. See **Appendix E: Pinouts** for more information.



A description of all connection ports can be found on page 7.

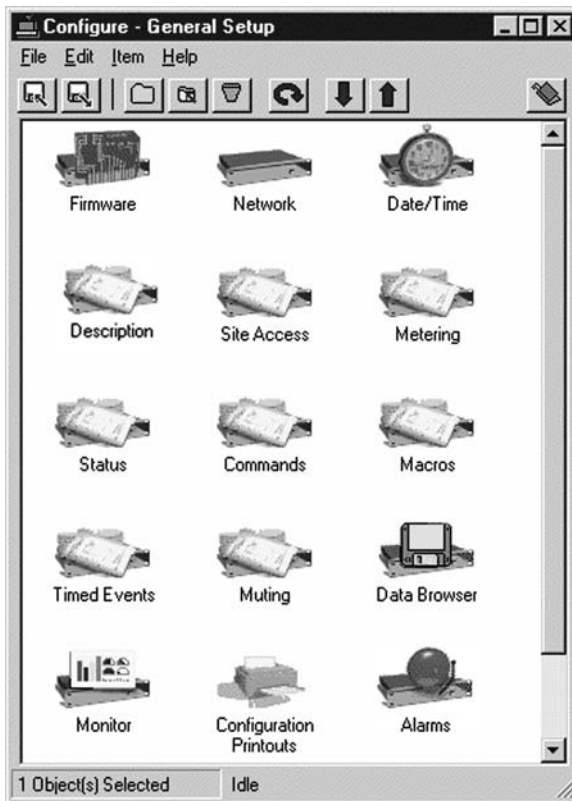
Establishing Software Connection

1. Once a direct serial connection is established, open your VRC Explorer by clicking on the Explorer Main Program shortcut in the Start menu.
2. Double-click on the site icon (see page 21) that corresponds with the VRC unit you are directly connected to from your PC.



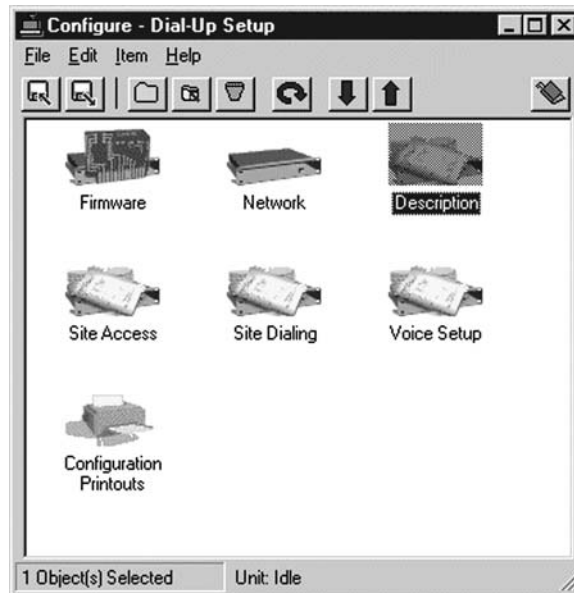
Configuration setup is described in the following chapter.

3. The Site window (which has the name you assigned) opens displaying the General Setup and Dial-up Setup icons. The General Setup is used to configure Metering, Status, and Command inputs. The Dial-Up Setup is used to configure Site Dialing and Voice Properties and and allows you to use a telephone to interact with the VRC2500. Double click the General Setup icon to open the Configure window.



The Configure window displays 14 General Setup options. Clicking on an icon will open its respective window where you can configure the settings. The information is then uploaded to the VRC2500 site. Detailed configuration instructions are provided in the following chapter.

To access the Dial-Up settings, click the Dial-Up Setup icon in the Site window. There are seven Dial-Up options.



Connecting Equipment

Modems

There are several ways to communicate with your VRC2500. In addition to the direct COM port connection, you can use a PC with a modem to communicate remotely with the site modem connected to a VRC unit. If you connect a dial-up modem to the Dial-Up port on the VRC unit, you can also use any Touch-tone™ telephone to retrieve information or issue commands. The following pages describe how to install and configure different types of modems.

Follow the manufacturer's instructions for installing the modem into the monitoring PC. Your PC modem does not need to be configured through the VRC software utilities. You may manually adjust the DIP switches as needed according to the instructions in the modem User Guide.

Recommended Modems

You may use an internal or external full feature modem for your monitoring PC. Site modems must be external.

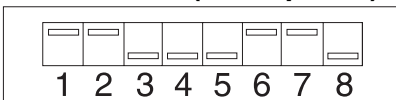
The recommended dial-up modem is the U.S. Robotics 56K V.90 External Fax Modem.

The recommended two-wire and four-wire leased line modems are Motorola V.3400, MultiTech MT2838BL and MultiTech MT5600BL. These recommendations are subject to change without notice.

DIAL-UP MODEM CONFIGURATION

DIP Switches The required DIP switch settings for the U.S. Robotics Sportster® 33.6 and 56K V.90 are shown below.

PC or Voice (Dial-Up Port)



DIP Switch Settings for Modem connected to PC or Dial-Up Port

If you are using a different modem, the DIP switches (or command equivalents) must be configured to enable your modem to operate in the same manner. The table on the following page defines the operational parameters associated with each DIP switch on the U.S. Robotics 56K V.90 modem.



DO NOT use a cellular modem. A cellular connection is not reliable and although it may support the required baud rate for a VRC2500 system, it is not supported by Burk Technology.



A Winmodem®, or any software modem, does not provide the proper control signals required by the VRC software and hardware.

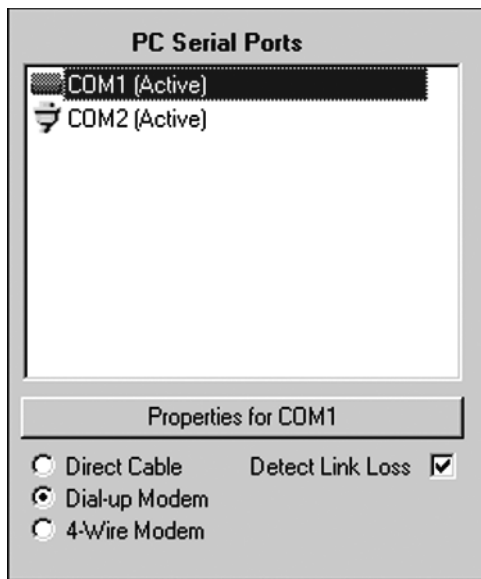


You must cycle the power on the VRC unit before the modem is detected and before any outbound calls for alarms are made.

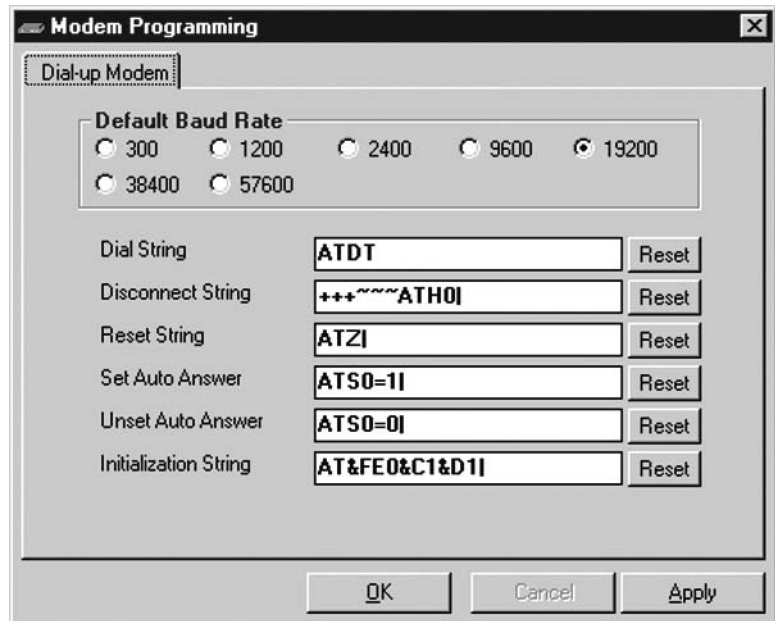
DIP SWITCH	POSITION	DEFINITION
1	UP	Data Terminal Ready
2	UP	Verbal Result Codes
3	DOWN	Enables Result Code Display
4	DOWN	No echo, offline commands
5	UP	Enables auto answer
	DOWN	Disables auto answer
6	UP	Carrier detect normal
7	UP	Load NVRAM defaults
8	DOWN	Smart mode

Communication Properties

The initialization strings and baud rates generated by the Communication Properties utility are for use with the US Robotics 56K V.90 modem. If you are using a different brand, you may modify them using the Communications Properties utility and selecting PROPERTIES FOR COM "X".



COM Port Connections



Modem Programming Window

Search the modem command strings for functional equivalents. You may need to modify Set Auto Answer, Unset Auto Answer, and Initialization strings in order to match the VRC's requirements.

The table at left defines each of the commands used in these strings.

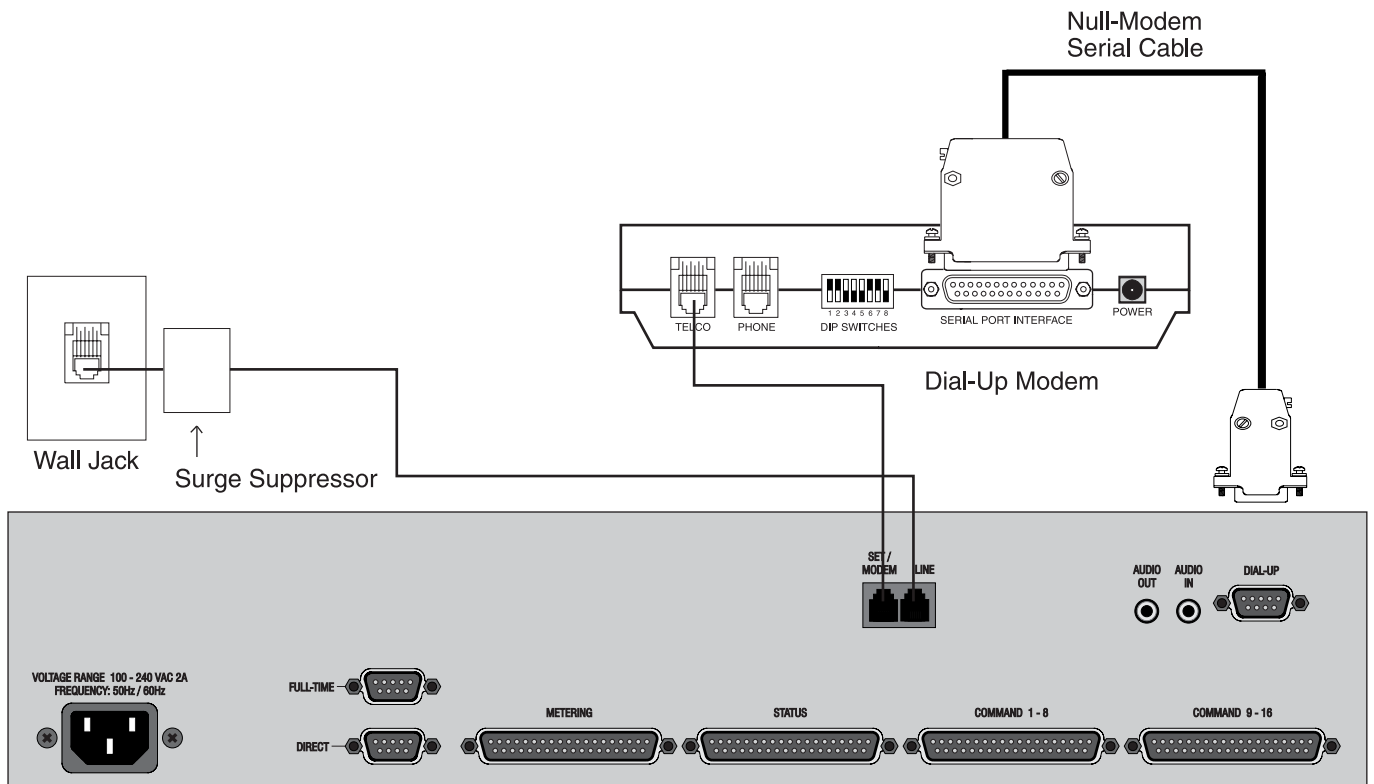
DIAL-UP MODEM CONNECTION

This connection enables you to remotely retrieve information and issue commands using any Touch-tone telephone or your PC.

1. Route the telephone line through a TELCO surge suppressor (not included) to the LINE jack on VRC2500.
2. Connect the VRC2500 SET/MODEM jack to the TELCO jack on the dial-up modem.
3. Use the serial cable to connect the DIAL-UP port on the VRC2500 to the modem's serial interface port.

COMMAND	DEFINITION
AT	Required Command Prefix.
S0	Sets the number of rings in Auto Answer Mode. When set to 0, Auto Answer is OFF.
S0=1	Auto Answer after 1 ring.
S0=0	Auto Answer disabled.
&F	Loads a generic template. &F is the same as &F0.
E0	Sets local echo OFF.
&C1	Sets Carrier Detect (CD) signal to normal operations.
&D1	Sets DTR operations. 14.4: Reserved and 28.8: reserved.

! Damage to your VRC2500 system caused by voltage surges is not covered under the terms of your warranty.



COMMAND	DEFINITION
AT	Required Command Prefix.
S0	Sets the number of rings in Auto Answer Mode. When set to 0, Auto Answer is OFF.
S0=1	Auto Answer after 1 ring.
S0=0	Auto Answer disabled.
&F	Loads a generic template. &F is the same as &F0.
E0	Sets local echo OFF.
&C1	Sets Carrier Detect (CD) signal to normal operations.
&D1	Sets DTR operations. 14.4: Reserved and 28.8: reserved.

FOUR WIRE LEASED-LINE MODEM CONFIGURATION

Program and configure your four-wire modem before you make connections to your RF equipment. You need two four-wire modems: one for your monitoring PC, and one for your site.

The VRC2500 software package currently supports three types of 4-wire modems: Motorola V.3400, MultiTech MT5600BL, and MultiTech MT2834BL.

If you are using a different brand or model of modem, you may need to modify the Set Auto Answer, Unset Auto Answer and Initialization strings to match the VRC's requirements. The table at right defines each of the commands used in these strings.

DIP Switches

You may also need to adjust the DIP switch settings. The table below provides the DIP switch definitions required for the MultiTech MT2834BL.

DIP SWITCH	POSITION	DEFINITION
1	DOWN	DTR (Data Terminal Ready) forced ON at all times
2	UP	SDLC (Synchronous Data Link Control) Mode ON
3	UP	Command Mode Response OFF
4	UP	AS/400 Mode OFF
5*	UP DOWN	Answer Mode ON (Transmitter) Originate Mode ON (Studio)
6	UP	Slave Clocking OFF
7	DOWN	RTS (Request to Send signal forced ON at all times
8	DOWN	Command Mode ON
9	DOWN	Remote Digital Loopback ON
10	UP	Lease Line Operation
11	DOWN	Internal Clock Selected
12	DOWN	Asynchronous Mode ON
13	DOWN	19,200 bps Operation
14	UP	
15	UP	CD/DSR (Carrier Detect/Data Set Ready) from Interface
16	UP DOWN	2-Wire Leased Line 4-Wire Leased Line

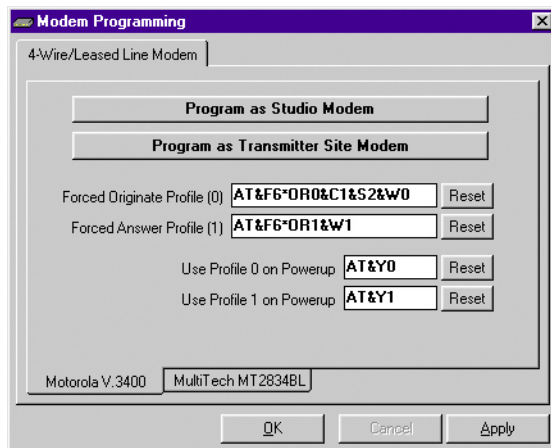
* Use appropriate setting for your installation.

Motorola V.3400

1. Connect the first modem to your PC with the provided DB9-DB25 serial cable and turn on the power.
2. Open the Communication Properties window and re-detect the ports. The PC COM port connected to the four-wire modem should be recognized as a Direct Serial connection.
3. Select the COM port and click Properties for COM “x” to open the Modem Programming window.



Label each modem as studio or transmitter to help avoid mix-ups.

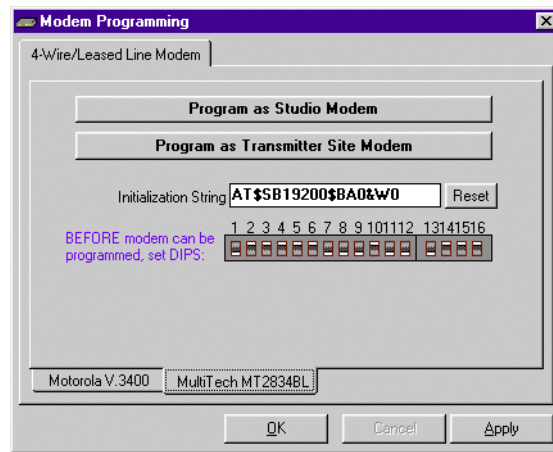


Modem Programming Window, Motorola V.3400

4. Click the bottom tab labeled Motorola v.3400.
5. Click Program as Transmitter Site Modem. When the first modem is programmed, connect the second modem to the PC COM port and program it as the studio modem.

MultiTech MT2834BL

1. Connect the first modem to your PC with the provided DB9-DB25 serial cable and turn on the power.
2. Open the Communication Properties window and re-detect the ports. The PC COM port connected to the four-wire modem should be recognized as a Direct Serial connection.
3. Select the COM port and click Properties for COM “x” to open the Modem Programming window.
4. Click the bottom tab labeled MultiTech MT2834BL. Before you can program the modem, you must set DIP switches as indicated on the screen.



Modem Programming Window, MultiTech MT2834BL

5. Turn on modem. The lights on the front of the modem will flash as the modem begins to initialize. When the lights stop flashing, you have approximately 10 seconds to click the appropriate Program button. If the modem finishes initializing before you click the Program button, it will not accept the programming. You will need to power cycle the modem and program again.
6. Program the first modem as either Studio or Transmitter. Make sure you label your modem so that you know which modem is which.
7. After the window shows a successful modem programming, change the DIP switches as instructed onscreen. When finished, connect the second modem directly to the PC COM port and program it using the other option.



Successful Modem Programming

Before programming the MT5600BL, set the modem to the following:

Studio Modem

Set to 4 WIRE LEASE ORIG mode
SYNC/ASYN option set to ASYN NORM

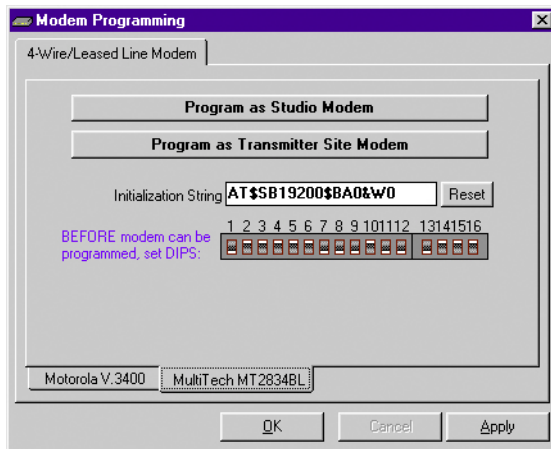
Transmitter Modem

Set to 4 WIRE LEASE ANSWER mode
SYNC/ASYN option set to ASYN NORM

MultiTech MT5600BL

1. Designate one modem as the Studio modem and one as the Transmitter modem. Connect the first modem to your PC with the provided DB9-DB25 serial cable and turn on the power.
2. Use your modem user's guide to setup your modem to use the settings listed to the left.

- In the Modem Programming window, select the bottom tab labeled MultiTech MT2834BL.



- Change the initialization string to **AT&SB19200&E0&E4&D2&W.**
- Click either Program as Studio Modem or Program as Transmitter Modem depending on which modem you are working with. A message window will indicate successful programming.
- Connect the second modem and repeat the programming process.

Label your modem as transmitter or studio as soon as you finish programming to ensure they do not get mixed up.

FOUR-WIRE MODEM CONNECTION

Begin by testing your four-wire modem on the bench. This allows you to ensure that the modems are communicating and to calibrate your RF equipment before you attempt remote operation. Connect the modem using the instructions given by the modem manufacturer.

RS-232 Interface

The serial interface port on the back of the modem is a DB25 female connector. Use the provided null-modem serial cable to connect the modem to your PC or I/O unit. A four-wire modem should always be connected to COM1 on the I/O unit, never to COM2. See Four-Wire Installation Diagram on the next page.

The VRC unit must be power cycled before the modem is detected and any outbound calls for alarms are made.



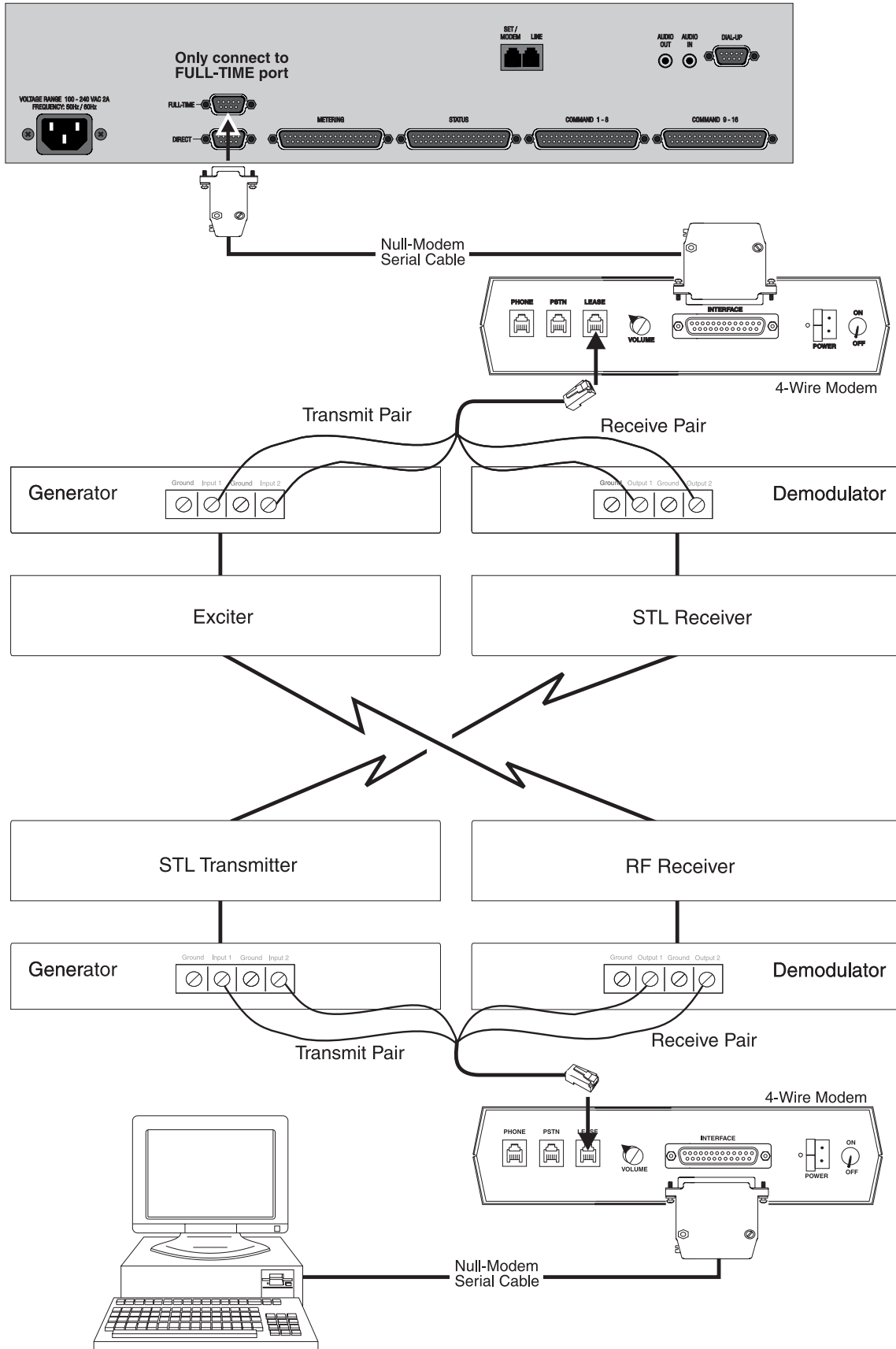
The modem status needs to be idle when you program it. If the modem immediately tries to connect, turn it off, then back on while pressing ENTER. Once the status reads idle, press the “down arrow” two times. This will step the modem down the menu and prevent it from connecting until it is returned to the status screen.



Please disregard the DIP switch settings shown on screen. They are for the MT2834BL. The MT5600BL does not have DIP switches.



The RF audio channel used for your connection needs to handle 19,200 bps in both directions, or your connection may be unnecessarily slow or unreliable.



TWO-WIRE LEASED-LINE MODEM

If connecting to a two-wire leased-line (also called dedicated or private lines), you need a two-wire modem capable of leased-line operation. We recommend the MultiTech four-wire modem. You need to make sure the modem is set up for two-wire leased line operation. If using a MT2834BL, adjust DIP switch 16. See DIP switch table on page 36.

Follow the four-wire modem configuration instructions beginning on page 26.

Connect the Studio modem to the PC using the manufacturer's instructions. Connect the Transmitter modem to the VRC unit using the FULL-TIME (COM 1) port

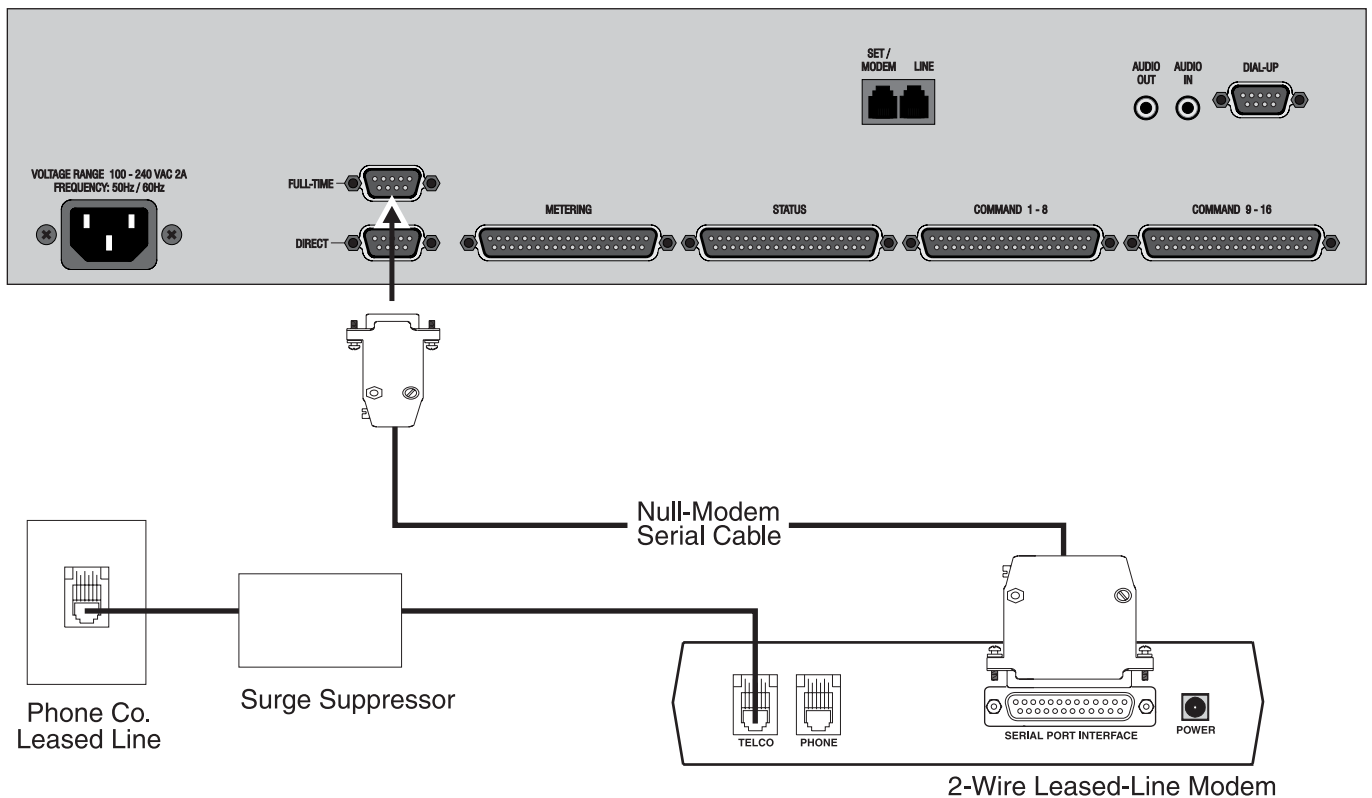
Modem serial connections should be made using the provided null-modem serial cable.



Never use the DIRECT Port for leased-line operation.



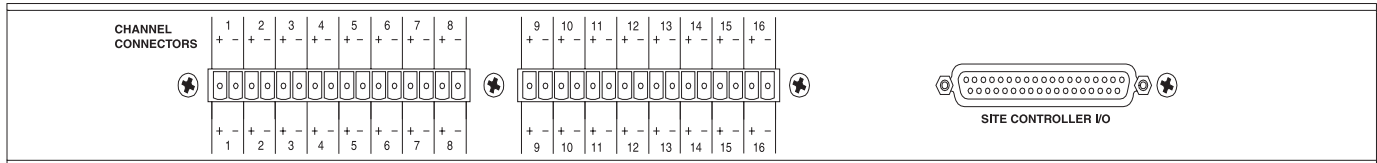
You must cycle the power on the VRC unit before the modem is detected.



Connecting Two-Wire Leased-Line Modem to VRC Unit

Connecting a Wiring Interface

The Wiring Interface is designed to simplify the connection of metering and status inputs to the GSC3000 or the VRC2500. It provides easy pin-for-pin wiring using push-on blocks. No soldering is required. You will need two Wiring Interfaces (one for metering and one for status) if you are connecting to a 16-channel unit.



WARNING! Carefully position your push-on connectors in relation to the screened legend on the back of the unit; overlapping from one channel to the other causes the Wiring Interface to feed incorrect data to the I/O units and may damage your I/O units.



The input voltage of the status channel must not exceed the range of $\pm 30V$.



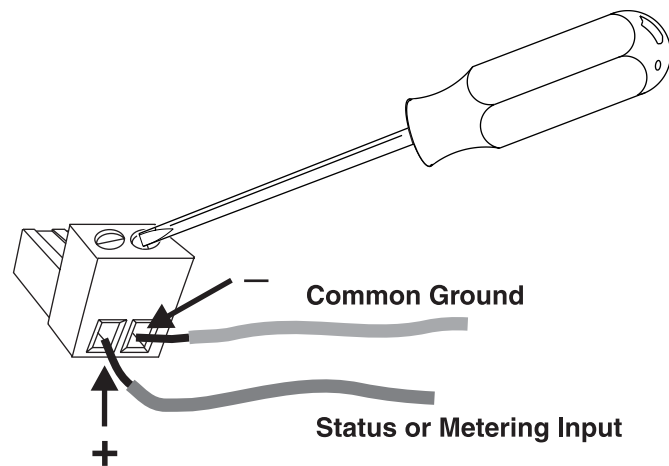
The input voltage of the meter channel must not exceed the range of 0-10VDC or -5 to 5VDC (determined by the setup configuration).



The metering sample voltage should be at least in the 2V range. This increases accuracy of the reading. If the sample voltage is small, the calibration constant must be large. This causes greater fluctuations in the meter reading.

CONNECTING INPUTS

1. Designate one Wiring Interface as status and one as metering.
2. Connect the site equipment input wires to the push-on connectors on the Wiring Interface.
3. Connect the push-on blocks to the Wiring Interface.
4. Connect the Wiring Interface to the I/O unit using the provided DB37 cable.

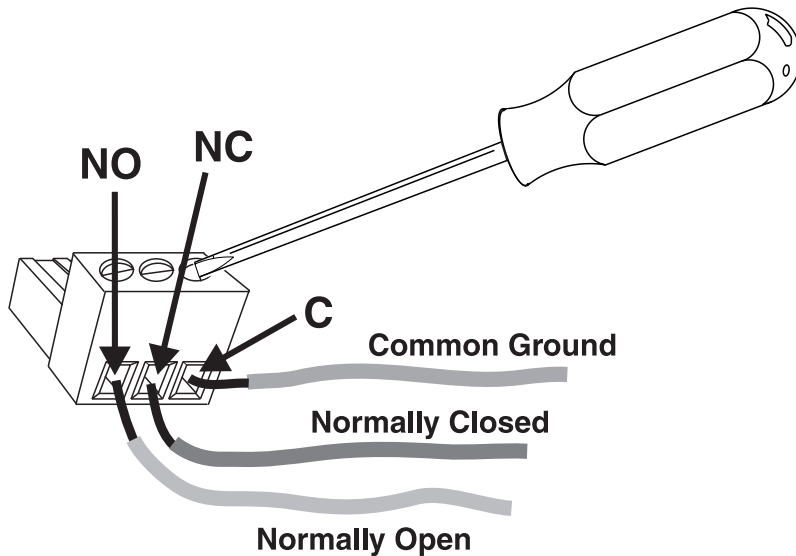


The two terminals on the push-on connector correspond with the contacts on the back panel of the Wiring Interface: + (status or metering) and - (common ground). Insert the push-on connector into the back-panel connector on the Wiring Interface with the set screws facing up.

Floating Grounds

You may use an isolation amplifier if the metering or status inputs have a floating ground. If any ground for these inputs is a floating ground, it must be connected to an isolation amplifier before you connect it to the Wiring Interface. The VRC2500's inputs will not tolerate a floating ground.

The Command Relay unit provides isolation between your GSC or VRC unit and your equipment. Each Command Relay unit can connect up to eight Command output channels. You will need two Command Relay units to make all the channel connections on a 16 channel unit. No soldering is required.





CONNECTING INPUTS

1. Wire your equipment to the provided three-terminal push-on connectors. Insert the correct wire into the connector opening and tighten down the top screw. One three-terminal push-on block is provided for each relay. Each Command channel has two relays: A and B. The three terminals in the push-on connector correspond with the contacts on the back panel of the Command Relay unit (standard Form C, from left to right): NO (normally open), NC (normally closed), and C (common). Insert the push-on connector into the back-panel connector on the Command Relay unit, with the set screws facing up.

Connecting a Command Relay Unit

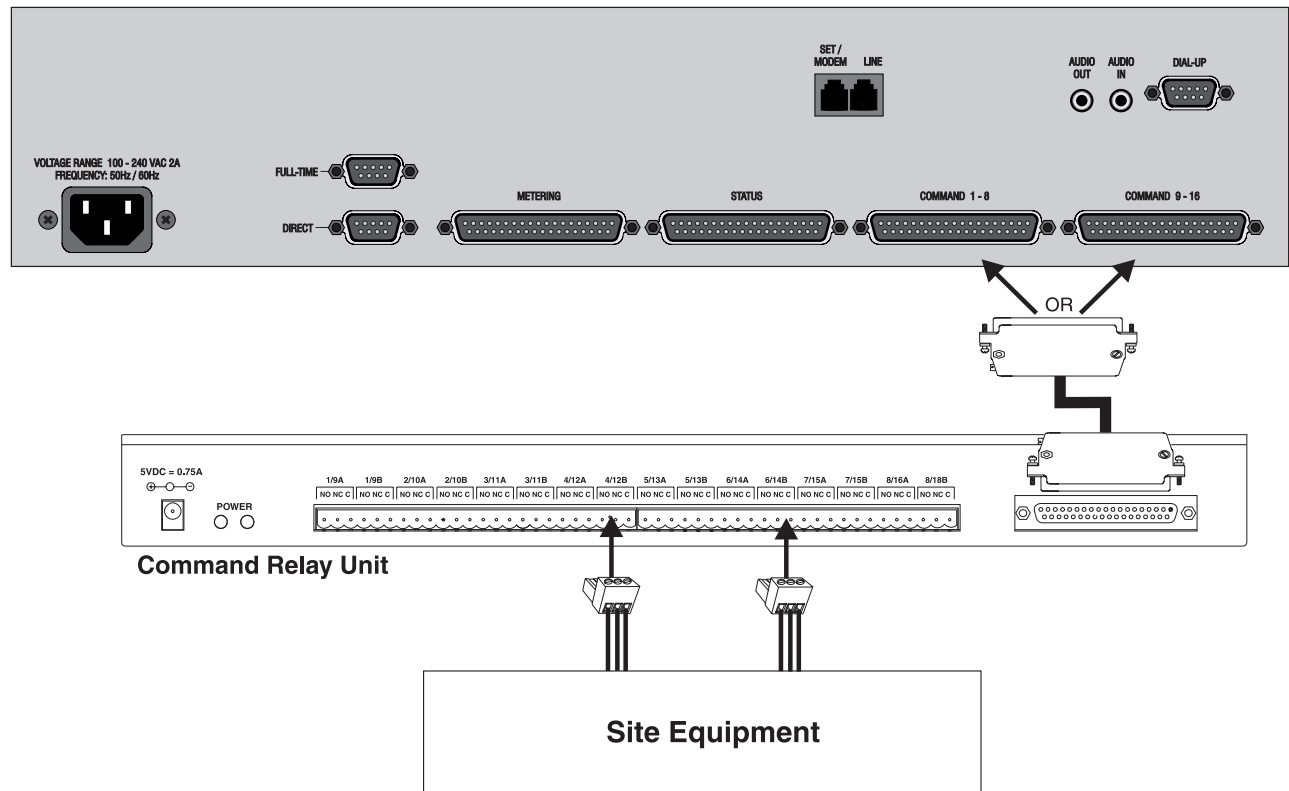
! **WARNING!** Carefully position your push-on Connectors in relation to the screened legend on the back of the unit. Overlapping from one channel to the other can cause improper command-channel operation or damage to your equipment.

 The Command outputs on the I/O unit are open collector outputs, maximum 250 mA 30VDC, momentary or latching. The Command Relay Unit is required if the current draw is more than 250 mA or to provide protection and isolation for your GSC or VRC unit.

 Power is supplied through the DB37 command-output connector. No external power is required for operation with a GSC3000 or VRC2500 system. If used with the VRC2000, the Command Relay Unit will require an optional power supply for proper operation.

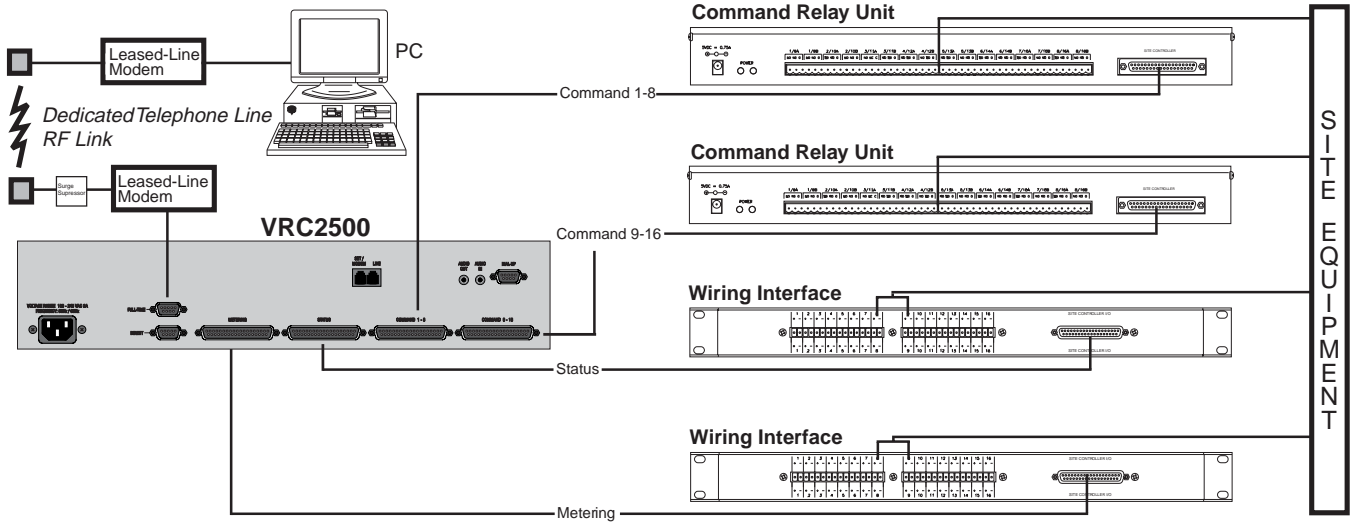
2. Connect the Command Relay Unit to the I/O unit using the provided DB37 cable. Two pins on the DB37 connector are used to power the Command Relay unit. When your GSC or VRC unit is powered up, verify that both power LEDs on the back panel of the Command Relay unit are green, indicating 5VDC power.

Connecting Site Equipment to the VRC Unit Using a Command Relay Unit

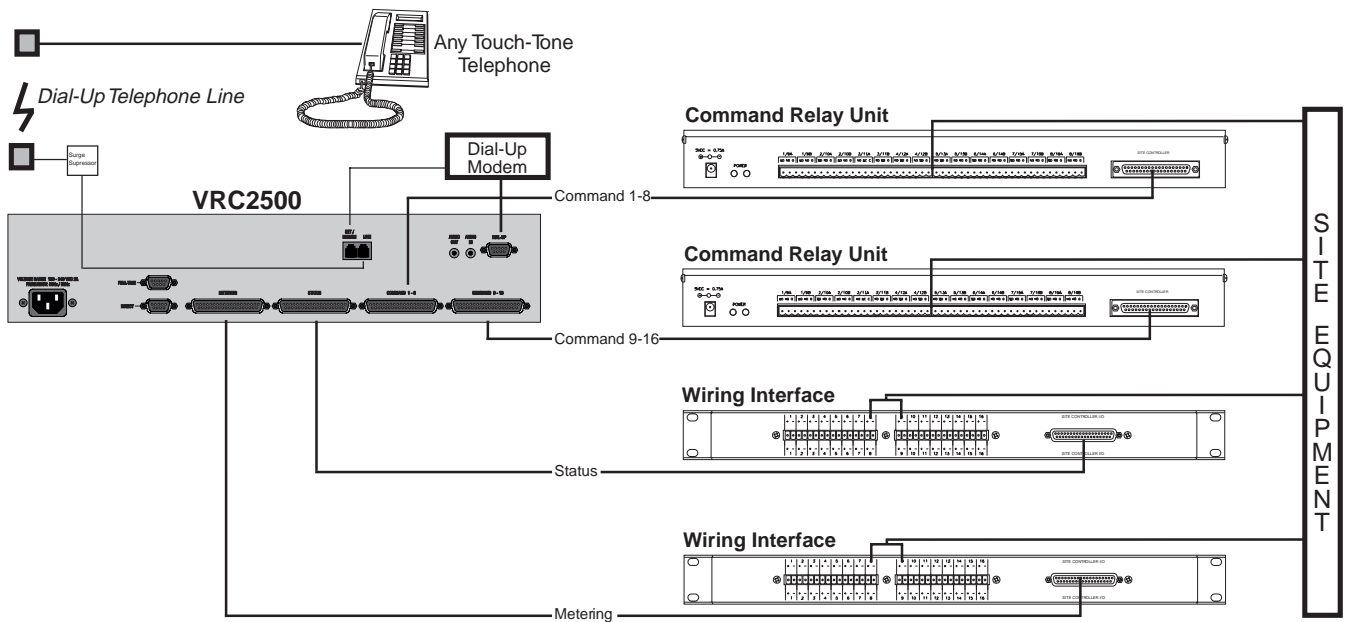


COMPLETED HARDWARE INSTALLATION

Hardware Install with Leased-Line Modem



Hardware Install with Dial-Up Modem



4 Site Management



VRC Explorer Control Bar

The VRC Explorer control bar is the tool you will use the most in managing your site and units. All of the available features of the software can be launched from this control bar.

This chapter describes the different programs accessed through the VRC Explorer control bar and explains how to use them to configure your site and units.

To display the VRC Explorer toolbar, go to the Start menu and select the VRC2500 program group, and then click on VRC Explorer - Main Program. The white area of the control bar displays an icon for your site which you can click on to connect with your site. Shortcut buttons are located on the toolbar to help you configure your site, connections, and program.

BUTTON DESCRIPTIONS



New Site creates a new site entry in the control bar. Whenever a new VRC2500 site needs to be set up, click this button.



Open Site connects you to the selected site. Double-clicking on a site's icon also creates a connection.



Adjust Properties for Site allows properties of any selected site or sites to be edited. You can also right-click on a site's icon and select the Properties menu item.



Create an Archive allows you to create all the configuration settings, macros, timed events, and Voice Interface information for a VRC unit.



Open a Unit Archive allows you to open a previously saved archive file for editing or uploading to the I/O or Voice Interface unit.



Set Explorer Preferences allows you to customize the position, sound, and other properties associated with VRC Explorer.



Configure Serial Ports and Modems provides the control and configuration information needed to have the VRC2500 software connect to your various VRC2500 sites.



Data Browser allows you to open, import and export any VRC database. Limited print options are also available through this program.



Scheduler Task Editor opens the Scheduler program so you can view, add, delete, or modify any jobs that need to run automatically and are associated with the VRC software.



Minimize and Exit allow you to exit the program completely or minimize the program so that only the entry on the Windows task bar is visible.



About shows the version, build, and serial number of the VRC2500 control software.

CONTROL BAR PROPERTIES

Right-clicking the mouse in any open area of the control bar pops up a menu that allows the features and characteristics of Explorer to be changed.

New Site creates a new site entry.

Refresh updates the control bar display.

Control Bar Position adjusts the position of the control bar to either bottom (default), left, right, or top of your screen.

Arrange Windows makes the viewable windows arrange themselves in whatever pattern you select in the Properties window under the Explorer Tab and Window Placement.

Keep on Top keeps VRC Explorer on top of other windows on the desktop.

Close closes Explorer.

Properties opens the Properties Window which has four tabs: Explorer, Viewer, Industry and Audio Properties.

About shows the version, build, and serial number of the VRC2500 software.

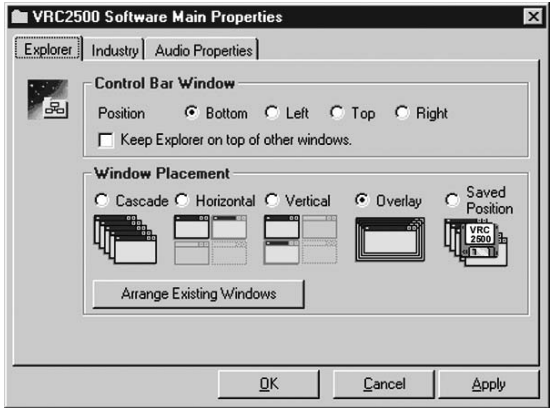


Properties Menu Showing Position Options

PROPERTIES WINDOW



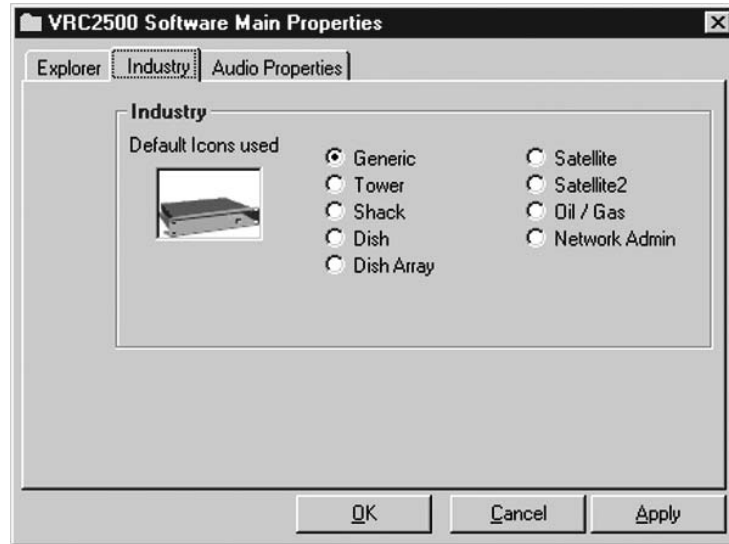
To open the Explorer Properties window, click **Set Explorer Preferences**.



Explorer Tab

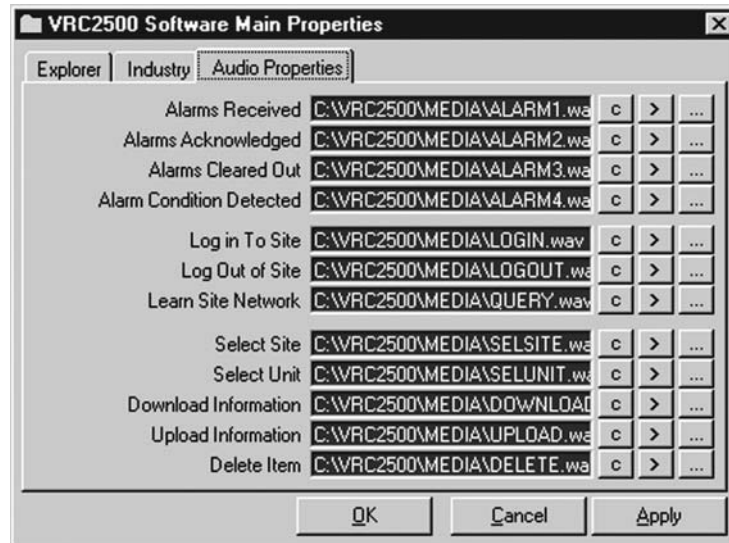
This section changes the position of the of the VRC Explorer control bar to either the bottom, left, top, or right edge of the your desktop. You can also choose to have VRC Explorer stay on top of all other windows (including any other Windows programs you may be running).

Settings will be saved anytime you click **Apply** or **OK**. Clicking **Reset Saved Windows List** before clicking Apply or OK discards any changes made.



Industry Tab

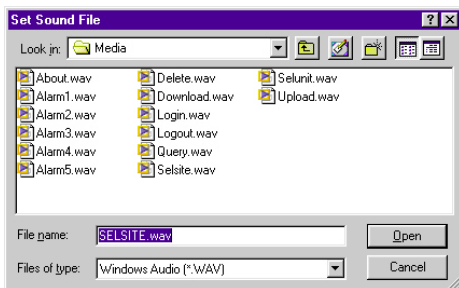
This section allows you to choose from a list of standard industry icons for use as your site icon in the VRC Explorer control bar. All site icons will be the same and you cannot mix icons.



Audio Properties Tab

This section allows you to select whether an audible sound will occur for the listed events. The default .WAV file for each event is shown when the tab is viewed.


- C** clears the entry.
- >** plays the .WAV file.
- ...** opens a standard browse window enabling you to find and select a different .WAV file to be played by that event.





Site Properties

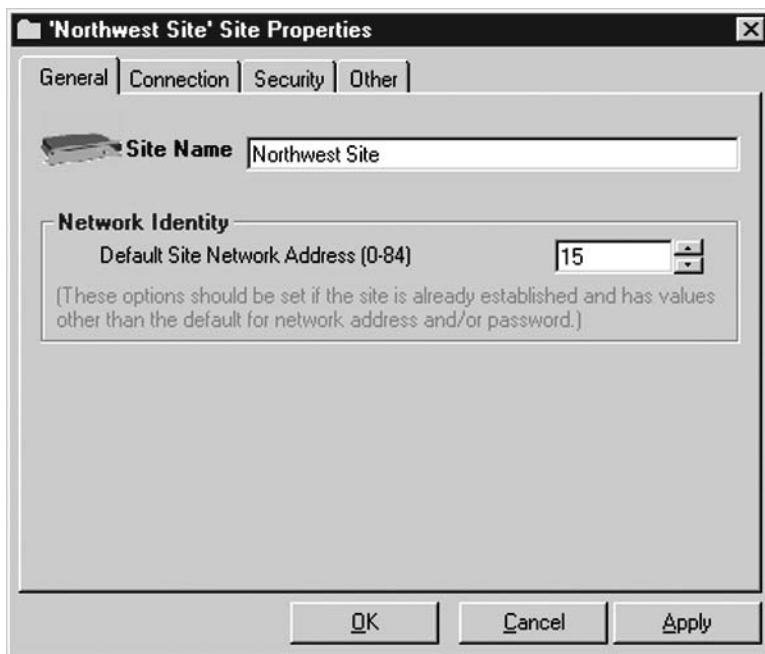
ADJUSTING SITE PROPERTIES

Adjusting site properties is done through the **Site Properties window**. There are two ways to open this window.

 The new site button opens a New Site Properties window that is used to create a new icon for your site on the VRC Explorer control bar. You will also use the properties window to name your site, assign a network number, and also defining the connection to the site.

 To change or add information in a site's property window, click on the site icon and then the Adjust Site Properties button from the toolbar, or right-click on the Site icon and select Properties from the menu.

 **All database records use the site network number and unit number as references. If you do not assign a different network address to each of your sites, all data will be merged together as though it came from a single site.**



The **Site Properties window** has four tabs: General, Connection, Security and Other.

General

The general tab is where you enter your site's name and network address here. See page 19 for more detailed instructions.

Connection

Configure the connection method you are using to communicate with your site. See page 18 for more detailed instructions.

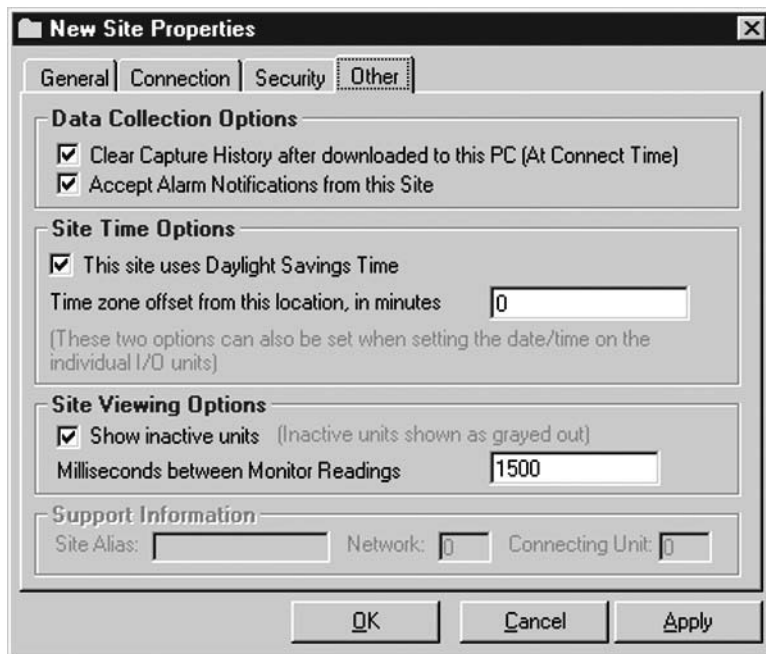


Security

The security tab allows default passwords to be saved for either the logged in user of the PC or for the site itself.

The default password is "gentner." The user password must be entered when logging on to your site unless you have checked the Save Password box on the Windows Password Prompt box.

The **site password** is used for automated processes such as collection jobs which connect and download data captures from units. **The site password cannot be changed from this location. Use the Site Access utility (see page 56 for details).**



Other Tab

The other tab is used to set data collection options, time options and viewing options.

Data Collection Options

The “Clear Capture History after downloaded to this PC” option will delete data captures from the I/O units buffer upon downloading. Although it is checked by default, only one computer should have this option selected. To prevent alarms from reporting to this connection, simply un-check the box for “Accept Alarm Notifications From this Site.” When not selected, that PC will not receive any alarm notices from that site.

Site Time Options

Change the VRC's internal clock to adjust for Daylight Savings Time. If the site and the PC are in different Time Zones, enter the number of minutes the site time zone differs from the PC time zone (e.g., 60, -120).

Site Viewing Options

Show inactive units that have been connected to a G-bus network at this site, but are not connected at this time. Change the refresh rate for monitor readings (1000ms to 30000ms). The default setting is 3000ms. If you are using programs like PC Anywhere and Remotely Possible that affect the viewing display, try increasing the refresh rate.



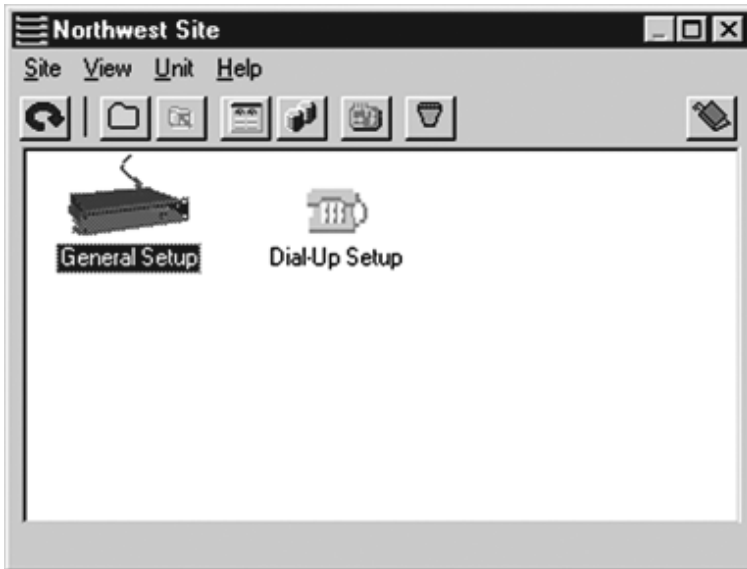
To disable the “Remember My Password” feature when you log on to your site, erase the password entry in the User Password box.



If you are using a product like PC Anywhere or Remotely Possible, changing the Monitor Readings refresh rate can improve the Viewer display.



Only one PC should be designated to capture and clear the history. All other PCs connecting to your VRC2500 should have the “Clear Capture History” option unchecked.



Site Window Showing General and Dial-Up Setups

OPENING A SITE

To open or connect to a site, click on the Open Site icon on the toolbar or right-click on the site icon and select connect, or double-click the site icon.

VRC2500 prompts you to enter your VRC password, which is default set to "gentner."

Once a connection is established, the Site window displays the General Setup and Dial-Up Setup icons for the VRC2500.

Site Window Toolbar

The Site window toolbar allows you to quickly access functions that are also found under the menu options.



Refresh updates the window and displays the most current information.



Configure Unit Programming opens the Configure window for the highlighted Setup icon.



Close Item closes the selected auxiliary windows.



View (Monitor) this Unit opens the monitoring program and allows you to monitor the site.



Data Browser opens the Data Browser program and allows you to create collection and print jobs.



Firmware uploads firmware to the VRC2500.



Delete Cached Information empties the computer's cache of the VRC's settings.



Close closes the Site window.

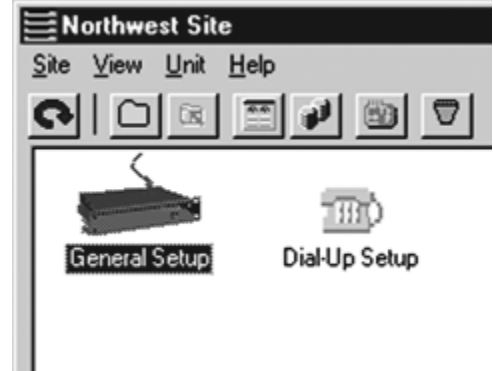


You can also right-click on the General Setup and Dial-Up Setup icons to open a menu that offers most of the options on the toolbar.

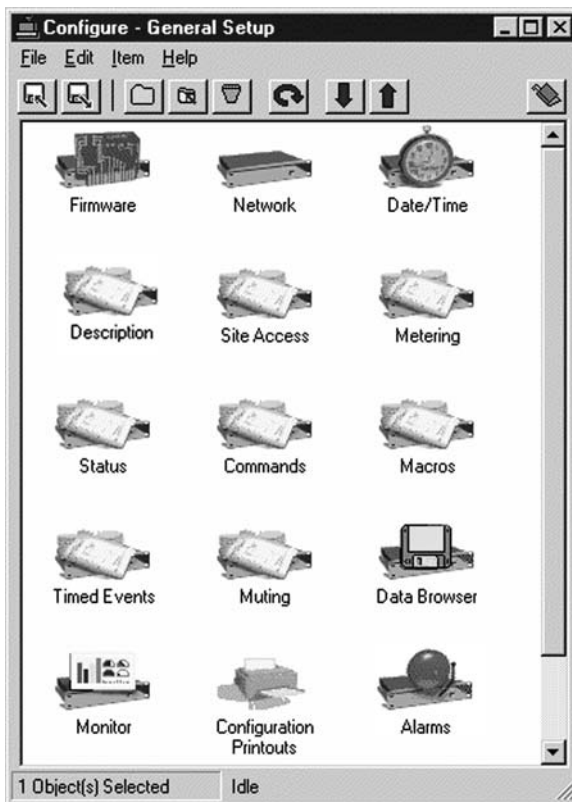
General Setup

The section describes unit options that are accessed and configured through General Setup. Each VRC2500 unit has some or all of the features described in this section available for modification. Not all of the settings need to be changed or have data entered in order for the software or hardware to function fully. This is left the user's discretion.

To configure the General Setup, open the site through the VRC Explorer Control bar. Click on the General Setup icon in the site window. This will open the General Setup Configure window.



General and Dial-Up Icons in Site Window



General Setup Configuration Window



The Alarms icon is only visible when alarms are pending.

TOOLBARS

There are two toolbars used when configuring your unit. The first is the configure toolbar at the top of the configure window. The second is the auxiliary windows toolbar which appears on the left side of the window for each setup option. Both toolbars are described on the following pages.

Configuration Toolbar



Archive Item saves unit settings into an archive file for use with another unit or as a back-up copy.



Extract Item from Archive opens a browse window of archived files. Selecting a file applies the archived settings to the unit.



Open Item opens the selected unit setting or function window. Double-clicking the setting icon will also open the window.



Close Item closes the selected auxiliary windows.



Delete Item deletes selected items within the auxiliary windows.



Refresh this View updates the window and displays the most current information.



Download Item moves information from the VRC unit to the PC workbench.



Upload Item moves information from the PC workbench to the VRC unit.



Close this Window closes the Configuration window.

Auxiliary Toolbar



Upload Component moves information into the VRC unit from the PC workbench.



Download Component moves information from the chosen VRC unit onto the PC workbench.



Copy to Clipboard copies settings to the Windows clipboard. This information can be copied into another VRC unit's setup.

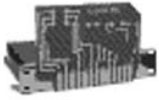


Copy from Clipboard copies settings from the clipboard to the VRC unit setup.



Clear to Defaults resets the current window to the system defaults.

FIRMWARE



Firmware

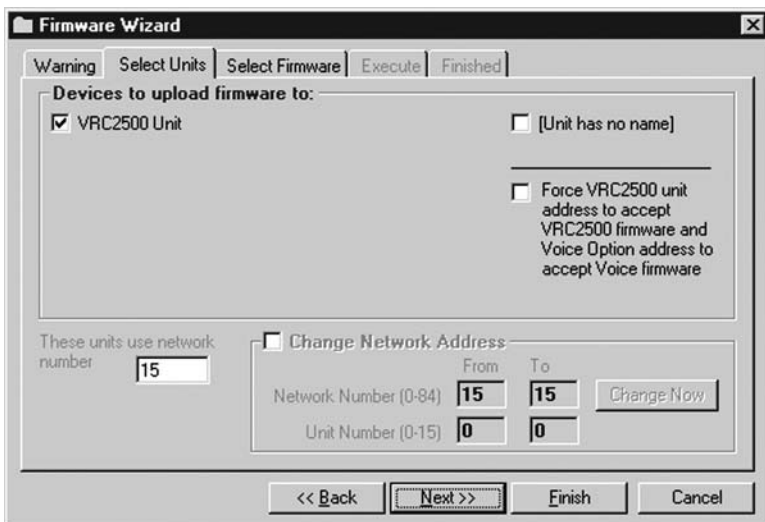
The Firmware utility in the General Setup Configuration window allows you to upgrade your current firmware when new versions become available.

1. Connect your computer via the included cable to the DIRECT port on your VRC2500 unit.
2. Double-click the Firmware icon in the Configure Unit window to open the **Firmware Wizard**. You can also right-click on the unit icon in the Site window and select “**Upload Firmware.**”



Firmware Wizard, Warning Tab

3. Continue to the Select Units tab by clicking **Next**.



Firmware Wizard, Select Units Tab



The VRC2500 comes preloaded with current firmware. It is not necessary to upload firmware to a new unit. If you are replacing corrupt firmware or if your unit has no firmware loaded on it, please follow the firmware upload procedure in the Troubleshooting section on page 210.



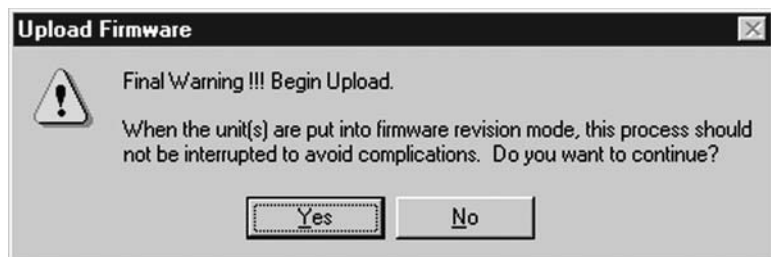
The FORCE option should only be used if advised by technical support. This forces the version of firmware uploaded to be based on the address of the Unit or Voice component, rather than the detected device type.

- Continue to the Select Firmware tab by clicking **Next**.



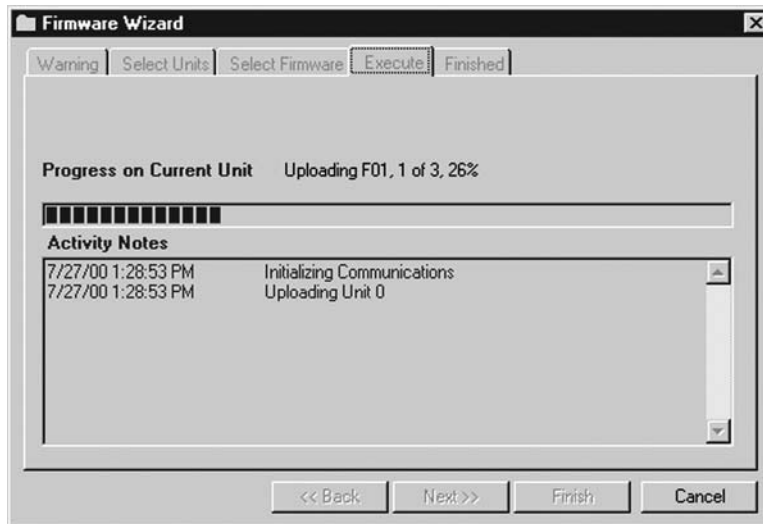
Firmware Wizard, Select Firmware Tab

- Select the default files or browse for alternate firmware files. To select an alternate file, click **Browse** to locate the new file you wish to use. Once you have selected the new file, click **Open**. This file will now be selected and listed in the VRC2500 Unit or Dial-Up firmware field.
- Click **Finish**. A warning window will ask you if you are sure the process should continue. This is your last chance to change your mind. To continue, click **Yes**.



Final Warning

- The Execute tab displays the progress of the Firmware update. When the upload is completed, the Firmware Wizard moves to the Finished tab.



Firmware Wizard, Execute Tab



Firmware Wizard, Finished Tab

- Click **Close** to close the wizard.

NETWORK



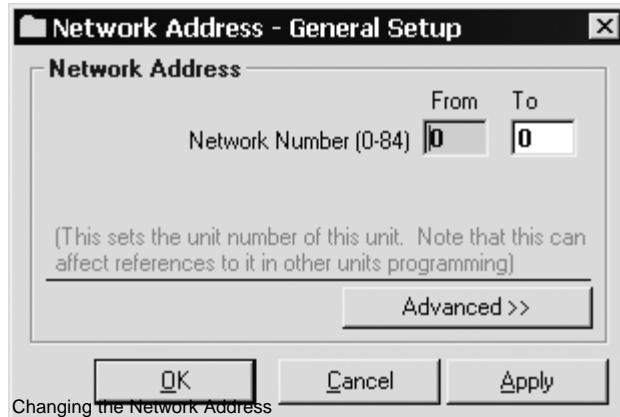
Network

The Network function allows you to change the Network number you originally assigned in the Site Properties window.

1. Double-click the Network icon in the General Setup Configuration window to open the Network Address window.



The Advanced button opens additional options and should only be used with assistance from a Technical Support representative.

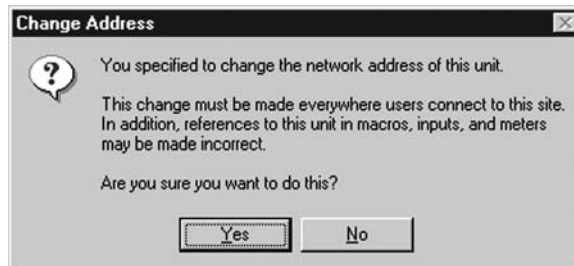


Changing the Network Address



All database records use the site network number as a reference. If you do not assign different network numbers to each of your sites, all data will be merged together as though it came from a single site.

2. Enter the new number in the TO box. The number must be between 0 and 84. Click **Apply** to set the change. Each site must have a different network number. It is recommended that you number your first site "0," your second site "1," your third site "2," and so on.
3. When finished, click **OK** or **Apply**. A confirmation window opens. Click **Yes** to complete the change or **NO** to cancel.



Change Address Confirmation Window

The network number change is automatically entered in the Dial-Up Setup so there is no need to open the Network function in the Dial-Up Configure window.

DATE/TIME

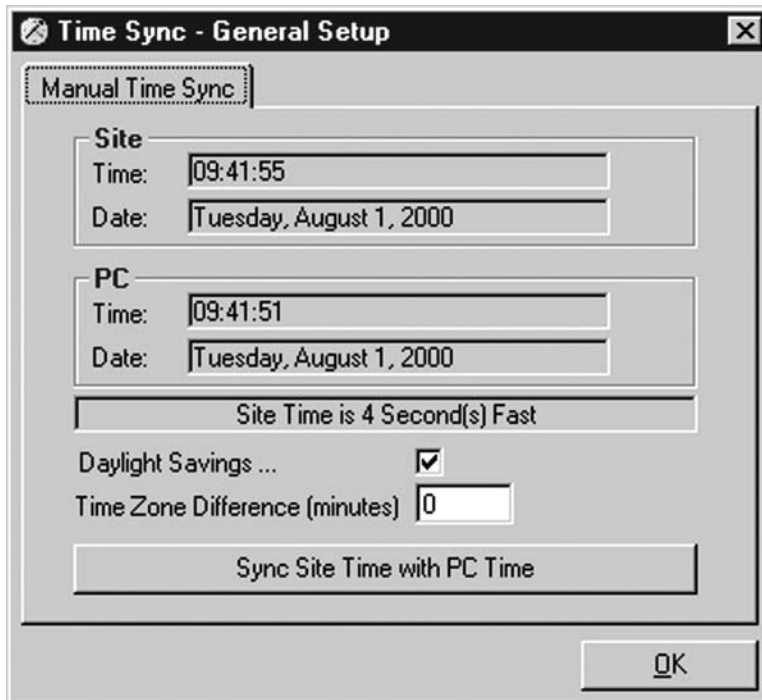


Date/Time

The Date/Time feature synchronizes the VRC2500's clock to the clock of a connected PC.

The Date/Time synchronization feature works best if you use a 3rd-Party program to synchronize your computer's clock to national and/or international time standards through a modem or internet connection.

1. Click on the **Date/Time** icon to open the Time Sync window which displays the current Site and PC times.



Time Sync General Setup Window

2. Click **Sync Site Time with PC Time**.

You can configure your VRC to use Daylight Savings hours and changeover dates if desired. Please note that the Daylight Savings change does **not** change any times listed in Timed Events.

Any Time Zone differences between the PC and the Site may be entered in order to keep the proper time on the unit when synchronizing.

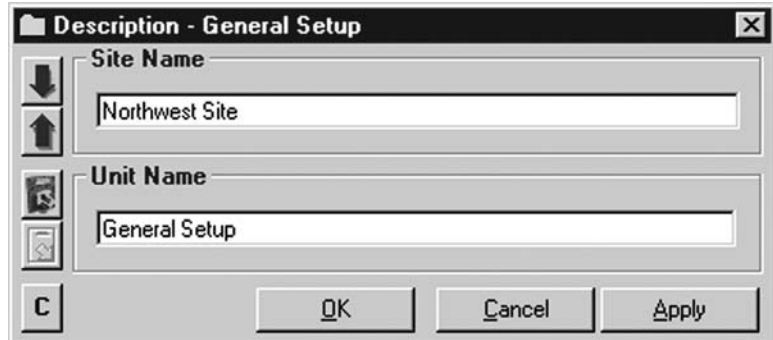
SITE DESCRIPTION



Description

The site was named in the Site Properties window, see page 21, however, up to this point the the General Setup unit has had no name. Description allows you to name the General Setup icon.

1. Double-click the Description icon in the Configure window to open the Description window.



Site Description Window

2. Enter the Unit name. The name can consist of any alphanumeric title up to 20 characters long.

The Site name cannot be changed from this location. Use the Site Properties window instead.

- 3 Click **OK**, **Apply** or **Upload Component** to save the name.

The Configure window and General Setup icon in the Site window now use the unit name.

SITE ACCESS



Site Access

The Site Access utility enables an administrative user to set up access levels for any other user, as well as assign user passwords.

1. To set up or change the Site Access, double-click the **Site Access** icon in the Configure window. This opens the Site Access window.
2. Enter the user's name (limit 32 characters) and password (limit 8 characters). Clicking the "A" button next to the access code toggles the password from readable text to asterisks.



3. Select the user access level. **System**—read all settings, issue commands and macros, view and edit other users' access settings, and program settings for inputs, outputs, and macros. **Operator**—read all settings and issue commands and macros. **Observer**—read only all settings.

4. Click **Add** to add a new user. Click **Update** to open the selected user and make any necessary changes to the user's settings. Click **Remove** to remove the user from the Site Access list.

All changes and additions are enabled by clicking **OK**, **Apply**, or the blue **Upload Component** arrow.

The **Change Site Access** button allows you to change the site password the system uses to run automated tasks.



Changing the Site Password



Metering

METERING INPUTS

The analog, or Metering Inputs, on a VRC2500 unit are programmed in the Meter Table window. To open the Meter Table, double-click on the Metering icon in the Configure window.

Meter Table - Unit 0												
General	Name	Unit	Type	Max Value	1U Limit	1U Alarm	1U Delay	1U Action	1L Limit	1L Alarm	1L Delay	1L Action
1			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
2			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
3			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
4			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
5			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
6			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
7			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
8			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
9			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
10			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
11			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
12			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
13			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
14			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
15			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	
16			0 To 10	10.000	10.000	None	0.0		0.000	None	0.0	

Metering Inputs Table

The following parameters are edited through this window:

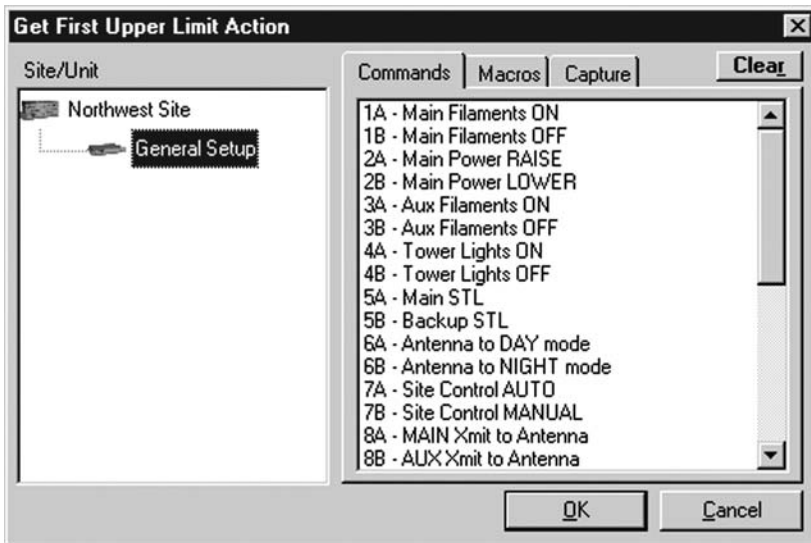
Parameter	Description
Name	Input a name of up to 32 characters for the metering input. This name is used in all monitoring applications.
Unit	Enter the unit of measurement (volts, watts, amps, etc.) used by metering channel. Limit of four characters.
Type	From the pull-down menu select type of meter.
Linear 0 to 10	Allows an analog input of 0VDC up to +10VDC with the same ratio assigned for all values in that range.
Linear -5 to +5	Allows an analog input of -5VDC up to +5VDC with the same ratio assigned for all values in that range.
Linear to Power	Allows an analog input to this channel of 0VDC up to +10VDC with an exponential ratio calculated for all values in that range.
Indirect Power	Disables direct input to the channel. The displayed value is based on the input values of the previous two channels. For example, the value of Channel 2 and the value of Channel 3 are multiplied to give the value for Channel 4.

Parameter	Description
Max Value	This value cannot be edited. It displays the default maximum value that is displayed in the monitoring application. Used for Tech Support.
1U Limit	1st Upper Limit. Enter the value that can trigger an alarm condition and/or cause a macro to run, or command to execute.
1U Alarm	Assign the type of alarm that triggers when the 1U limit is exceeded.
Critical	Causes an immediate attempt by the site to dial designated phone numbers and report that an alarmed condition is occurring at the site. A PC with a full-time connection to the site receives an on-screen notification of the alarm.
Warning	Causes no immediate alarm action to be taken, but records time and cause of alarm in log file. If a critical alarm is reported at a later time, any non-cleared warning alarms are mentioned at that time.
None	No alarm action is taken.
1U Delay	Enter the amount of time (programmable in tenths of a second) that the unit waits after the 1U Limit is exceeded before executing the programmed action and issuing an alarm. If the value drops back below the limit during the delay time, no alarms are reported and no action is taken.
1U Action	Determine the action the GSC3000 unit uses whenever the 1U Limit is exceeded and the 1U Delay is timed out. Clicking on the drop-down menu activates a pop-up window where you specify a command, macro, or data capture.
1L Limit	1st Lower Limit. Enter the value that can trigger an alarm condition and/or cause a macro to run, or command to execute.
1L Alarm	Assign the type of alarm that triggers when the 1L limit is exceeded.
1L Delay	Enter the amount of time (programmable in tenths of a second) that the unit waits after the 1L Limit is exceeded before executing the programmed action and issuing an alarm. If the value drops back below the limit during the delay time, no alarms are reported and no action is taken.
1L Action	Determine the action the GSC3000 unit uses whenever the 1L Limit is exceeded and the 1L Delay is timed out. Clicking on the drop-down menu activates a pop-up window where you specify a command, macro, or data capture.



Meter calibration is done through the Monitor program. See page xx.

The 2nd Upper and 2nd Lower options, not listed, function in the same manner as the 1st Upper and 1st Lower. Refer to the 1st Upper and 1st Lower instructions in the table above when setting up the 2nd Upper and 2nd Lower options.



Action Window

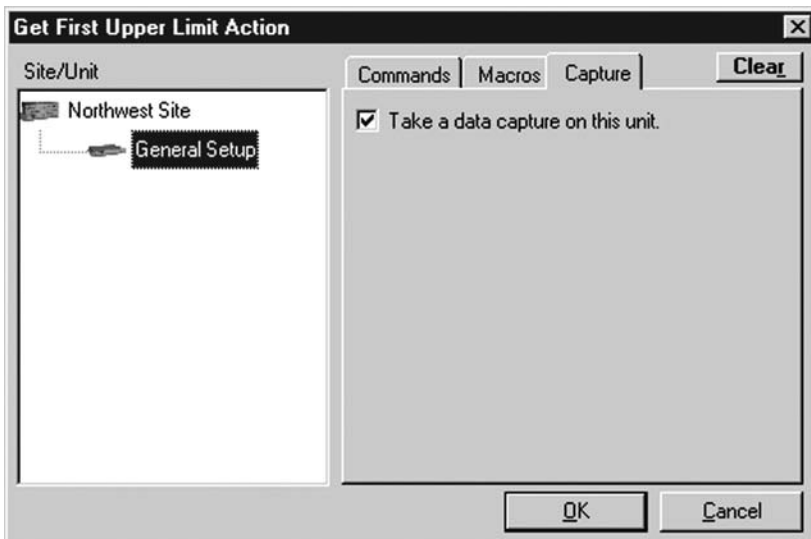
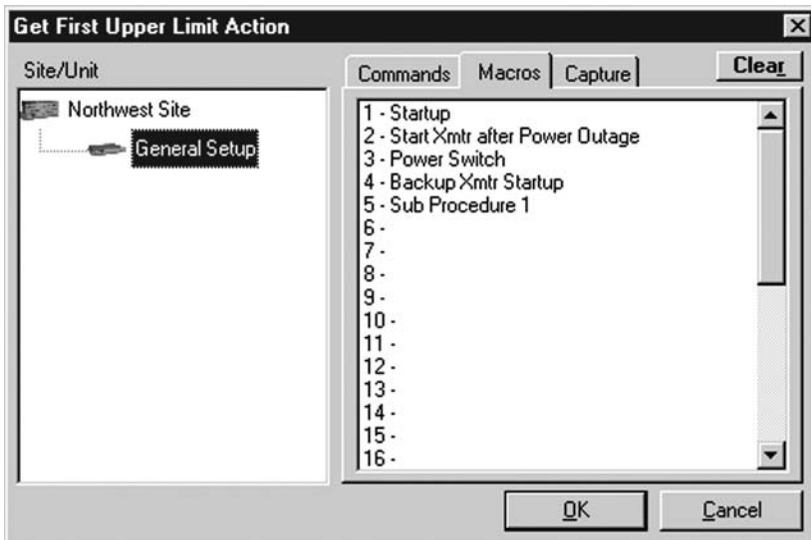
The Action window opens when you click on the drop-down arrow in the column for 1U Action, 1L Action, 2U Action, or 2L Action. In the Site/Unit pane, you select the which unit is to receive the action.

Commands Tab Select any command channel from any unit connected via the G-bus at this site and activate it. Select unit first, then select command to issue.

Macros Tab Select any macro from any unit connected via the G-Bus at this site and run it.

CAUTION: If only one upper and lower limit is needed, use the second upper (2U) and second lower (2L). When the second limits are exceeded, the unit takes the action specified for the second limits and ignores the first. Setting the first limits only could create a situation where the action is ignored because the second limit was passed also.

Capture Tab Select whether or not this unit captures information at this time for future downloads or archives using the VRC Database software.



STATUS INPUTS



Status

The digital inputs, or status inputs, on an I/O unit are programmed in the Status Input Table. To open the Input Table window, double-click on the Status icon in the General Setup window.

Input Table -									
General Low State High State									
	Type	Low Name	Alarm	Delay	Action	High Name	Alarm	Delay	Action
1	Pull-Down		None	0.0			None	0.0	
2	Pull-Up		None	0.0			None	0.0	
3	Pull-Up		None	0.0			None	0.0	
4	Pull-Up		None	0.0			None	0.0	
5	Pull-Up		None	0.0			None	0.0	
6	Pull-Up		None	0.0			None	0.0	
7	Pull-Up		None	0.0			None	0.0	
8	Pull-Up		None	0.0			None	0.0	
9	Pull-Up		None	0.0			None	0.0	
10	Pull-Up		None	0.0			None	0.0	
11	Pull-Up		None	0.0			None	0.0	
12	Pull-Up		None	0.0			None	0.0	
13	Pull-Up		None	0.0			None	0.0	
14	Pull-Up		None	0.0			None	0.0	
15	Pull-Up		None	0.0			None	0.0	
16	Pull-Up		None	0.0			None	0.0	

Buttons: OK, Cancel, Apply

Status Input Window

The following areas can be edited through this window:

Type

Depending on the output method used by the equipment being monitored, either Pull-Up or Pull-Down must be selected.

Pull-Up should be selected if monitored equipment provides a contact closure to indicate a Low state. **Pull-Down** should be selected if monitored equipment provides a DC voltage to indicate a High state.

Low Name

Label shown on monitoring software when status condition is in a Low or False state.

High Name

Label shown on monitoring software when status condition is in a High or True state.

Alarm

Use the pull-down menu to choose the type of alarm you want issued when a change in state occurs. If you do not want to receive alarms, select None. If you want the alarms to register and display on-screen, but do not want the VRC unit to attempt to notify you, choose Warning. If you want to be notified of an alarm, select Critical and the VRC unit will attempt to call out (or open the alarm window) when the input changes state. Alarms may be set to occur when the status makes a transition from the predetermined optimal state to the opposite logic level.

Delay

Is the amount of time, definable to tenths of a second, that the unit waits after the alarm condition is continuously asserted before executing the programmed action and/or issuing an alarm. If the input status changes back to the non-alarmed state before the delay time has elapsed, alarms or actions will not occur at that time.

Action

The Action Window allows you to select what kind of response the VRC2500 unit uses whenever the specified alarm state is achieved and the delay is exceeded. Clicking on the drop-down menu, pops up a window allowing you to select the desired action. An action can be executed on any unit on the G-Bus network. Refer back to page 56 for a description of each tab in the Action Window.

COMMANDS OUTPUT



Commands

The command output channels are programmed in the Commands Output Table. To open the Output Table window, double-click on the Commands icon in the General Setup window.

The following parameters can be edited:

Type

There are two possible types of command outputs: **Momentary** should be selected if the command signal sent lasts only as long as the Delay setting has been configured. **Latching** should be selected if the command signal sent stays active until changed by another command. Ignores the delay setting.

Delay

The amount of time, definable to 1/10 second increments up to 25.5 seconds, that a momentary command output is activated. Command channels A and B are mutually exclusive. When channel A is active, channel B will be inactive. When channel B is active, channel A is inactive.

A Name

The label displayed by monitoring software when a channel's last command output activation was the A state.

B Name

The label displayed by monitoring software when a channel's last command output activation was the B state.

Once you have made your changes, click on the **Apply** button or the blue **Upload Component** button to upload the changes to your VRC unit.

	Type	Delay	A Name	B Name
1	Momentary	0.1		
2	Momentary	0.1		
3	Momentary	0.1		
4	Momentary	0.1		
5	Momentary	0.1		
6	Momentary	0.1		
7	Momentary	0.1		
8	Momentary	0.1		
9	Momentary	0.1		
10	Momentary	0.1		
11	Momentary	0.1		
12	Momentary	0.1		
13	Momentary	0.1		
14	Momentary	0.1		
15	Momentary	0.1		
16	Momentary	0.1		

MACROS



Macros

Macros are written and compiled in the Macro Programming window. To open this window, double-click the Macros icon in the Configure Unit window.

See **Chapter 6: Creating Macros**, for detailed information on writing and using macros.

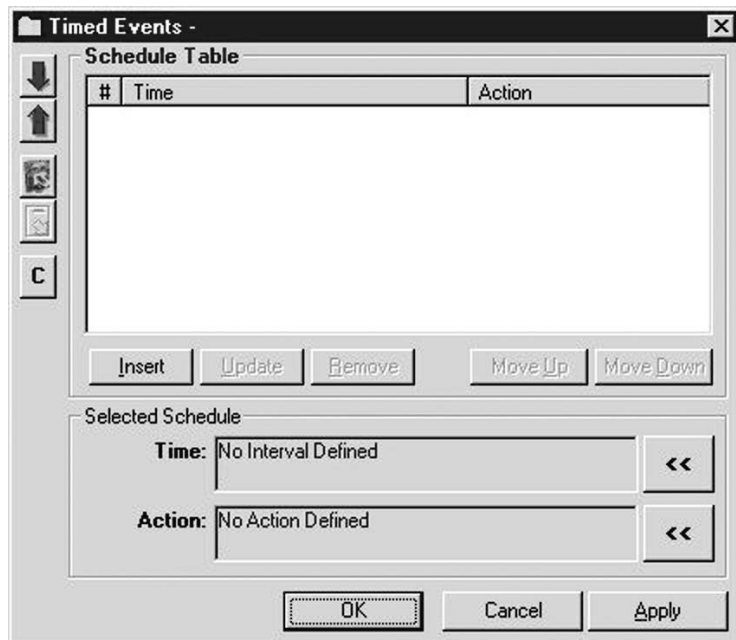
TIMED EVENTS



Timed Events

Timed Events is the internal scheduling program of the VRC2500 unit. It is most commonly used to execute data captures but can also control command outputs and macros.

The Timed Events program is accessed through the Configure window. Click on the Timed Events icon to open the Timed Events window. From this window you can create new timed events as well as edit existing entries.



New Entry Window

Creating a New Entry

To create a new entry, click on the double-left arrow next to the time field. This opens the Command Schedule Time window where you specify the date and time for the event. Click **OK** or **Apply** to set the time and return to the main window. Once you have defined the time for the event, choose the double-left arrow next to action to define what action will occur. You will define the action using the Action Window (see page 56).

Getting the Date Right

If the event is to occur during a specific month, enter a value from 1 to 12 in the month area. If the event is to occur on a specific day of each month, or of any particular month, enter a value from 1 to 31 in the day area. **If no values are entered in any field, all possible dates or times are assumed.**

For example, if an event is to occur each month on the 15th, the MM/DD entry would look like this:

If the event is to occur only on July 15th, the MM/DD entry would look something like this:

To set an event to occur on only one day of the week, select that day. The default is set for every day of the week.

Getting the Time Right

Specify in hours, minutes, and seconds, when this event is to take place. **In any of the three openings, if no value is entered, the event will occur in every possible combination of times where the values are true.**

For example, if the event is to occur every hour at thirty minutes

after the hour, and only once during that hour, the entry would look like this:

If the event was to occur at a particular hour, but execute every second of every minute during that hour, the entry looks like this:

- Click on the double-left arrow on the line titled ACTION. This opens the Select an Action window. Make sure the unit you are configuring is highlighted. Choose one of the three possible actions - command, macro, or capture. To execute a command and a capture in the same entry, you must create a macro. See page 119.



The VRC2500 will handle 192 captures before overwriting the oldest capture to store the next one.

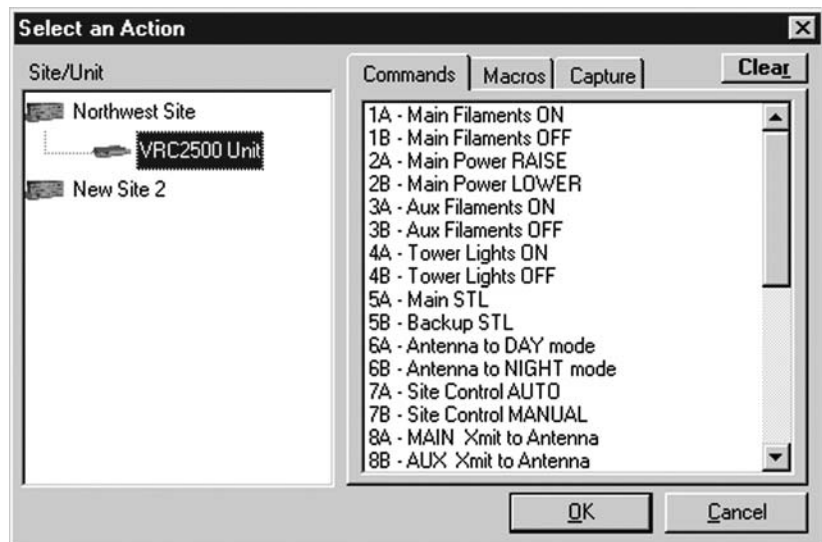


Avoid this configuration.
The program will attempt to execute the action on every second of every minute during that hour.

3. Single-click on the unit label in the area in the left half of the window to select the appropriate VRC unit.
4. Click on the tab which corresponds with the type of action (either commands, macros, or capture) you are scheduling.
5. Select the Action and Click OK.

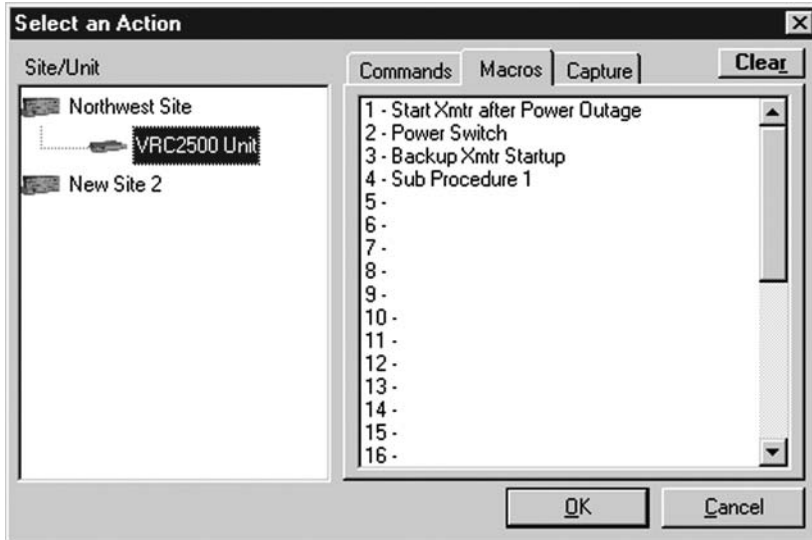
Commands

The default tab lists the Command Channels available for the selected unit on the current site. If no labels have been programmed into the unit, only the channel number and switches 'A' and 'B' are visible. After selecting the appropriate command channel and state, click on the OK button to close the window and to insert the information into the Timed Events window.



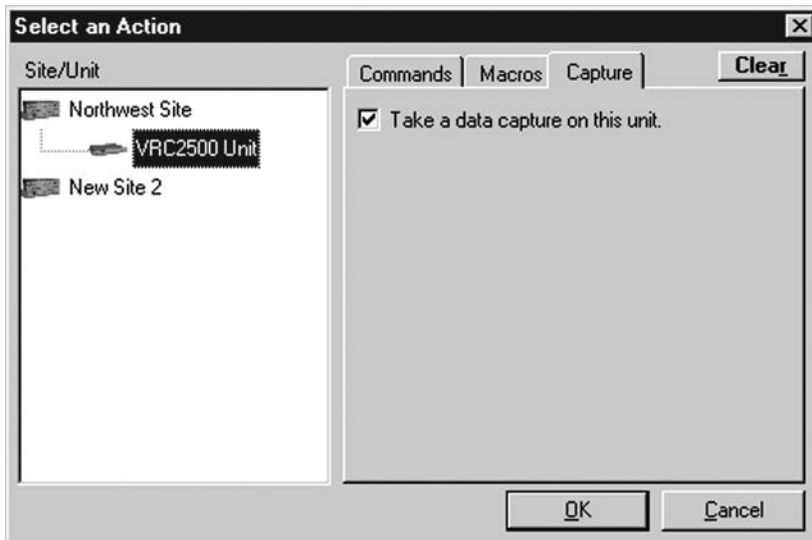
Macros

This tab lists the available macros on the selected VRC unit. Highlight the desired macro by clicking on it once, and then click OK to close the window and to insert the information into the Timed Events window.

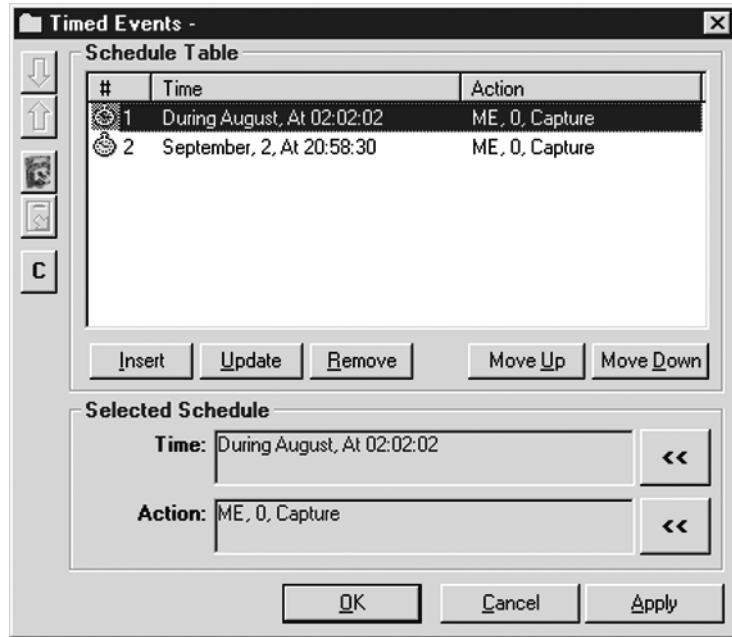


Capture

Check the box to select data capture as the action. Click on the OK button to close the window and insert the information into the Timed Events window.



Clicking on the CANCEL button closes the Action window, and no entries are saved or transferred to the Timed Events window.



- Once you have set the time and the action, click **Insert** to insert the task on the schedule table.
- Click **OK** or **Apply** to upload the event into the VRC2500.

Use the following options listed below to add, move, update, or remove timed events.



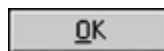
UPDATE allows you to save an edited event.



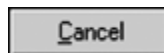
REMOVE permanently deletes the selected event from the list.



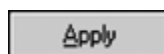
MOVE UP and **MOVE DOWN** change the order in which the events are displayed in the schedule table.



OK uploads the event and closes the window.



CANCEL restores an event if you inadvertently remove it. It also closes the window.



APPLY uploads the event and leaves the window open for further editing.

MUTING



Muting

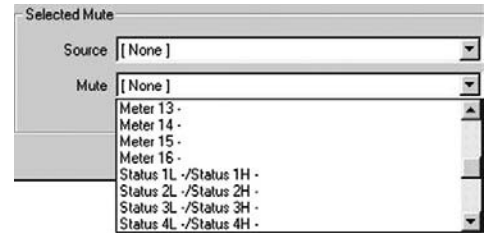
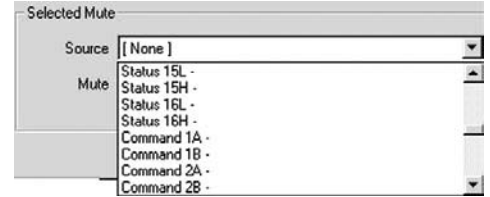
The Muting utility allows you to define a condition that causes one or more Metering or Status channels to ignore alarms, macros, or commands that may have occurred in the unmuted state. For example, if the main transmitter is on, you can mute conditions on the standby transmitter.



You can create a macro to handle more complex mute functions.

To open the Mute window, click on the Muting icon. All previously programmed mute states are displayed in the main area.

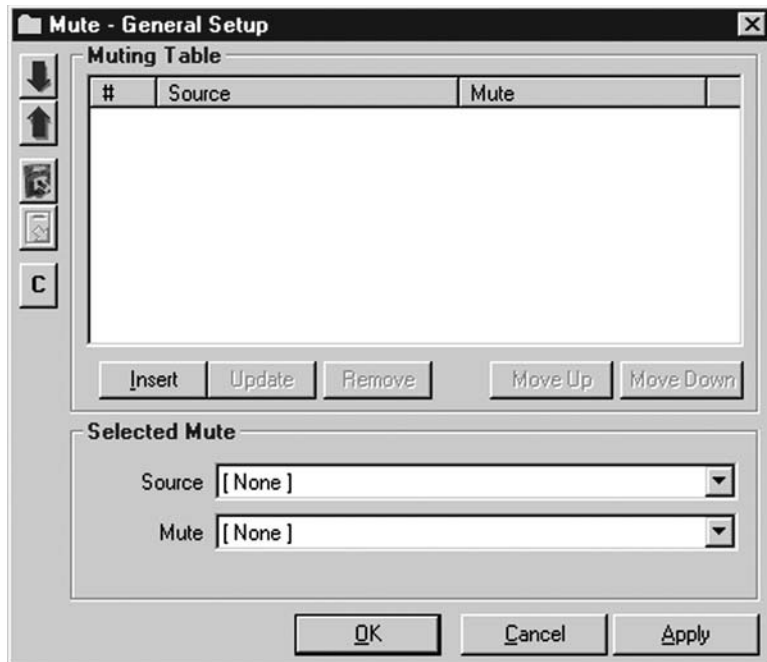
1. To create a new entry, select a source status or command channel and the state to enable the mute function (e.g., Status 12 Low, Command 1B, etc.).
2. Select the metering or status input channel to be muted (e.g., Meter 2, Status 4, etc.).
3. Click **Insert** to move the mute entry into the main display area. **Upload** (blue up arrow) must be clicked before the change is loaded into the VRC unit. All entries have an icon on the left hand side of the main view area.



Mute Selection

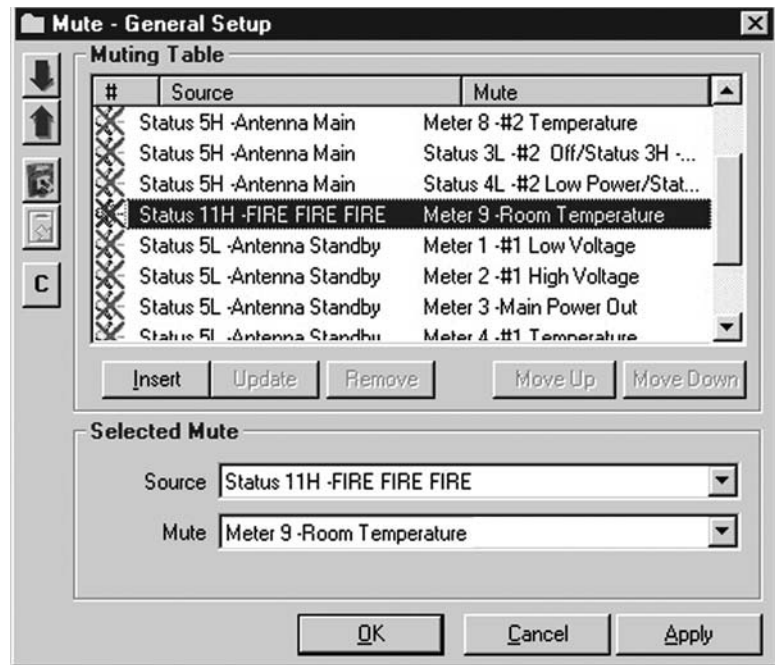
To modify an existing mute entry, select the entry, make the changes needed, and then click **Update**. This updates the main view area.

To delete an unwanted mute entry, select the entry and then click **Remove**. The entry is deleted from the list.





Mute entries are executed in the order they appear in the list shown in the main view area. If multiple entries for the same channel are entered, the desired result may not occur due to the command sequence. To modify the order of execution, select the desired entry and use the Move Up or Move Down buttons. For complex muting assignments, the use of macros, with MUTEMETER(X) and MUTESTATUS(X) commands may be necessary.



To make viewing easier, the amount of space provided for the three columns (#, Time, Action) can be adjusted by positioning the mouse cursor over the line separating two of the headings until the cursor becomes a dark black crosshair. Hold the left mouse button down and move the column separator to the desired position.

Changes will not go into effect until they have been uploaded into the selected VRC unit.

DATA BROWSER



Data Browser

The Data Browser enables you to set data collection and print jobs. To open the Data Browser, double-click the Data Browser icon in the Configure window or click the Data Browser icon on the VRC Explorer Control Panel.

See **Chapter 7: Managing Tasks & Data** for information on using the Data Browser.

MONITOR



Monitor

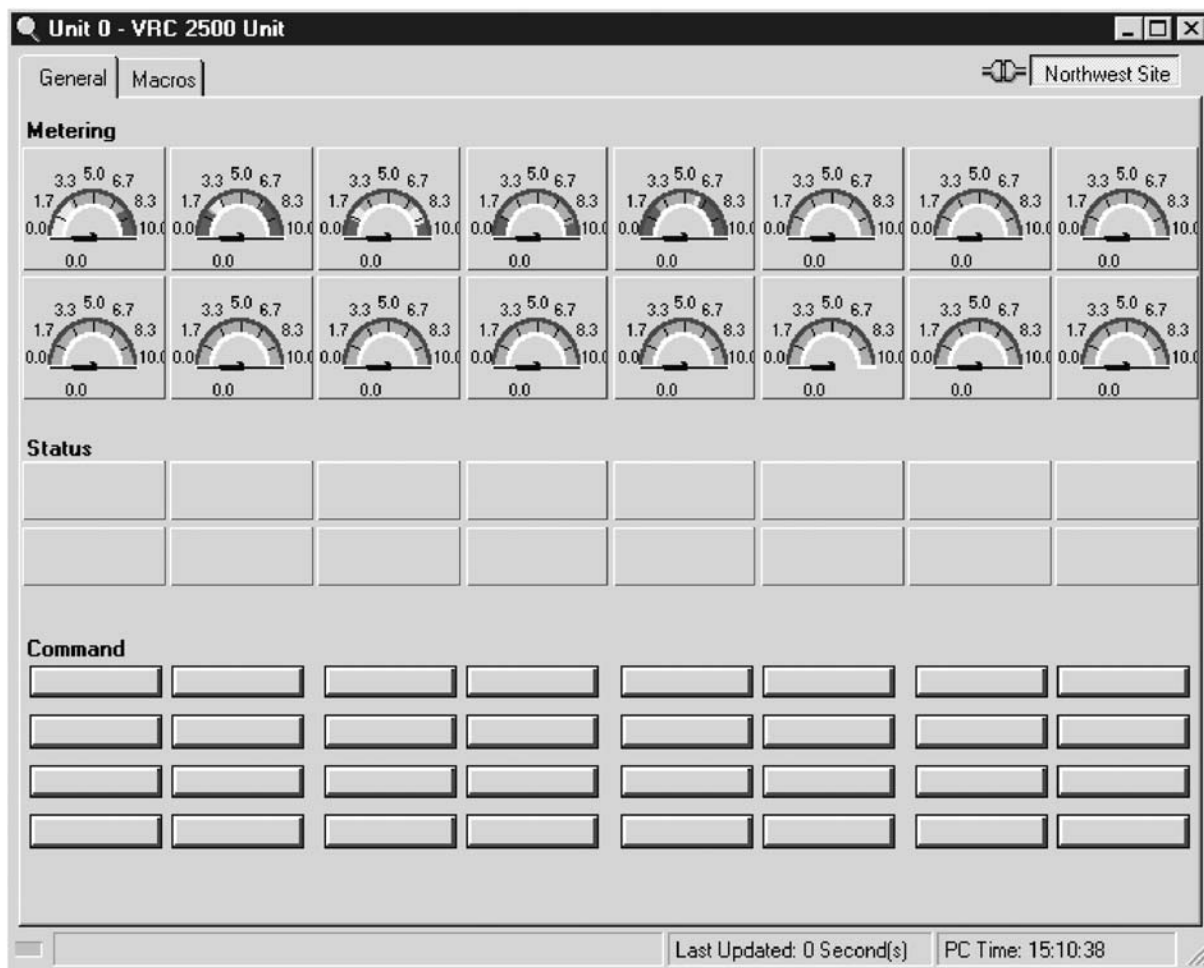
The VRC2500 software provides you with a Monitor window that shows all Status, Command, Meter, and Macro channels you have entered information for.

To open the Monitor window, double-click the Monitor icon in the Configure window.

General Tab

Channels in an alarm condition are shown with a red background. A muted channel has a light gray background. You can view the states of the Status inputs, analog values of the Meter inputs, states of the Command outputs, the last time the PC updated the display, which connection last cleared any alarms, and the current time of the PC's clock.

You can also specify up to 16 Commands (A and B) which can be manually executed on the VRC unit.



Default Monitoring View



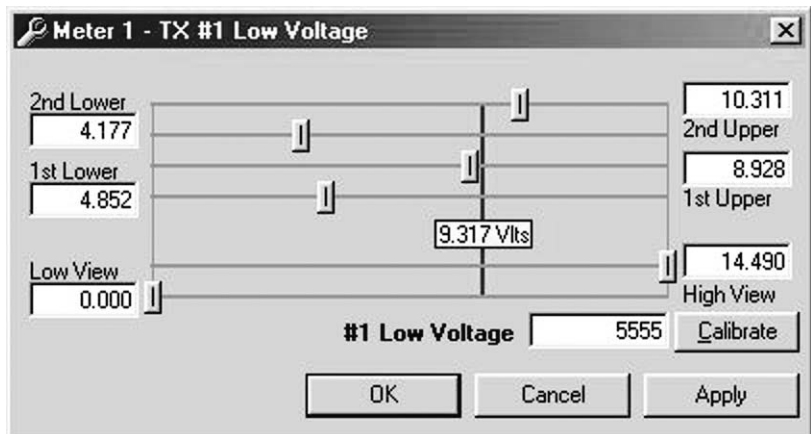
Always calibrate your input when the sample is at its peak level. If you calibrate using a lower sample, the calibrated value may change dramatically once the peak value is reached.

Macros Tab

Conditional automatic command functions can be done with macros. Click on the Macros tab to see available macros.

CALIBRATION

To calibrate a metering channel, double-click on the meter for that channel in the Monitor window to open the Calibration window. The Calibration window (shown below) allows modification of both Upper and Lower Limits, the minimum and maximum views displayed, and the calibration of the currently displayed value.



Meter Calibration Window

To change the calibration, click on the value field to edit the displayed calibrated value. Once you have made the changes, click on the **Calibrate** button instead of hitting enter. This will change the displayed calibrated value to the new value. The view fields will use the new calibration constant for all future input values on this channel. When you are finished adjusting the limit parameters and calibration, click **OK** or **Apply** to save changes and return to the Monitor window.

The displayed calibrated value will not change on other PCs that are connected at the same time. To see the new values on the other connected PCs, the user must download the changes from the unit or reconnect to the unit.

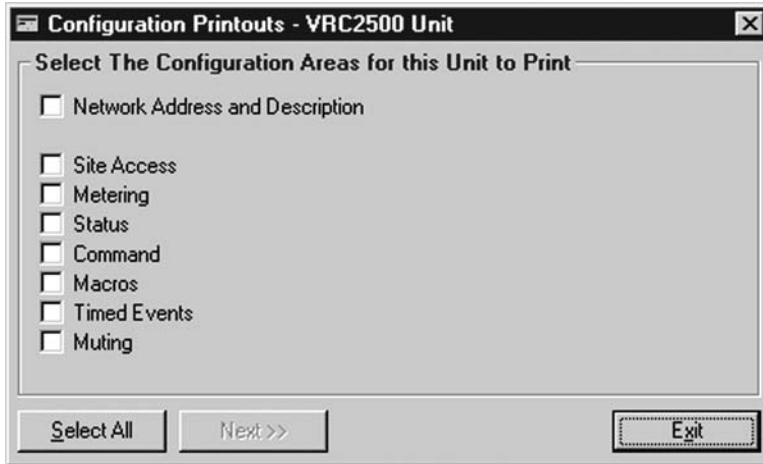
CONFIGURATION PRINTOUTS



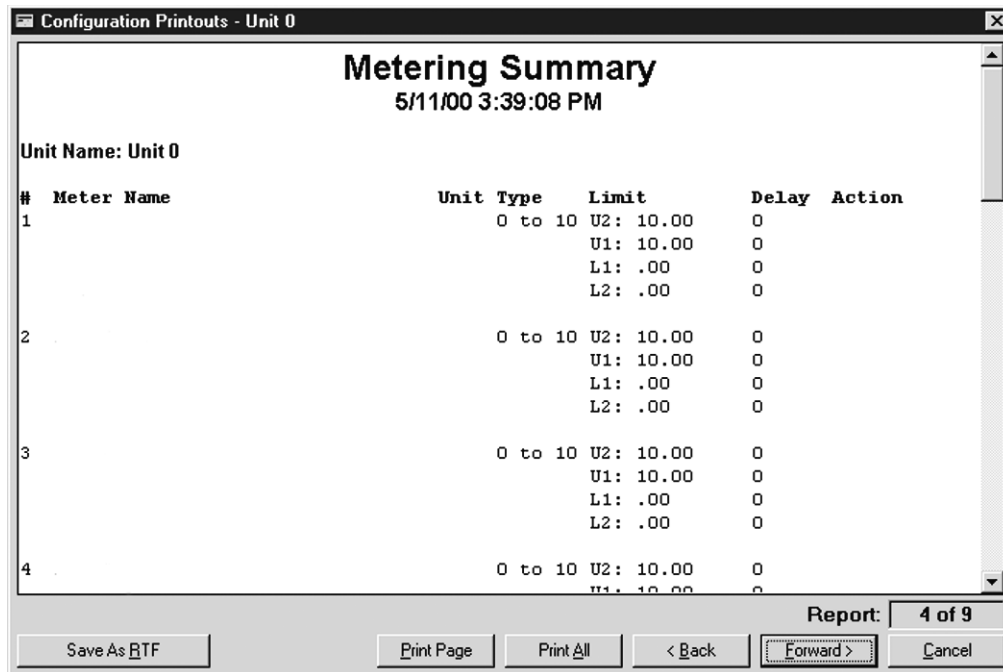
The Configuration Printouts Utility allows you to select and print a hard copy of your unit settings.

Configuration Printouts

To open the Configuration Printouts window, click on the Configuration Printouts icon in the Configure Unit window.



1. Click on the box next to the settings you want printed. You can also choose select all to print all of your setups.
2. Click **Next** to open a preview window. If you select more than one configuration area, the Forward and Back buttons let you navigate through the different pages.



Configuration Printouts Preview Window

Save As RTF

SAVE AS RTF saves output pages as a Rich Text File. Select the destination location and name via the standard Windows browser. To combine the areas on the same page, click SAVE AS RTF and do a copy and paste from each RTF to a new document.

Print Page

PRINT PAGE only prints the current page.

Print All

PRINT ALL prints all of the selected pages.

< Back

BACK and **FORWARD** enable you to navigate through the different pages.

Cancel

CANCEL stops the print process and returns you to the Configuration Printouts window.



Unit Indicating Alarms

ALARMS



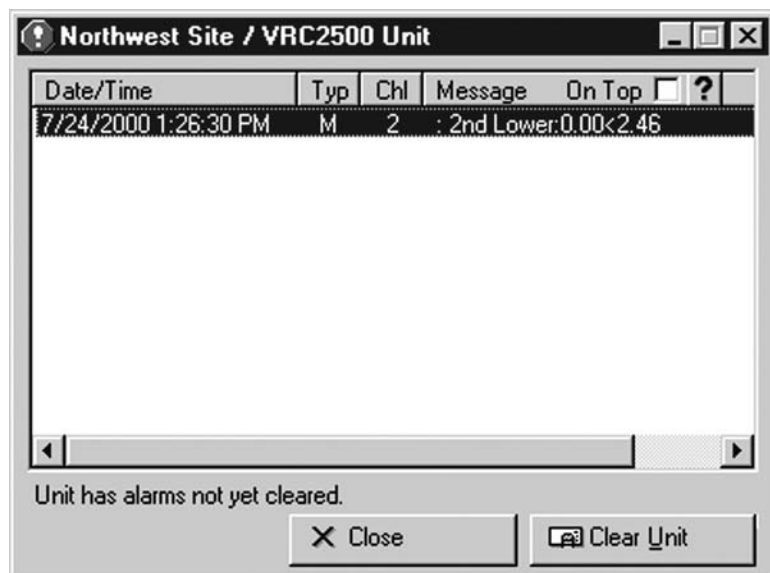
Alarms

When a unit has an alarm, the Configure window displays an icon for the Alarm Handler program. Double-click the Alarms icon to open the Alarm Handler window.

An alarm is also displayed in the Site window above the affected unit (see image to the left).

The Alarm Handler window shows the date/time of the alarm, the type, the channel, and the alarm text message.

You can close the window without clearing the alarms or you can click **Clear Unit** to clear the alarm.



Alarm Handler Window

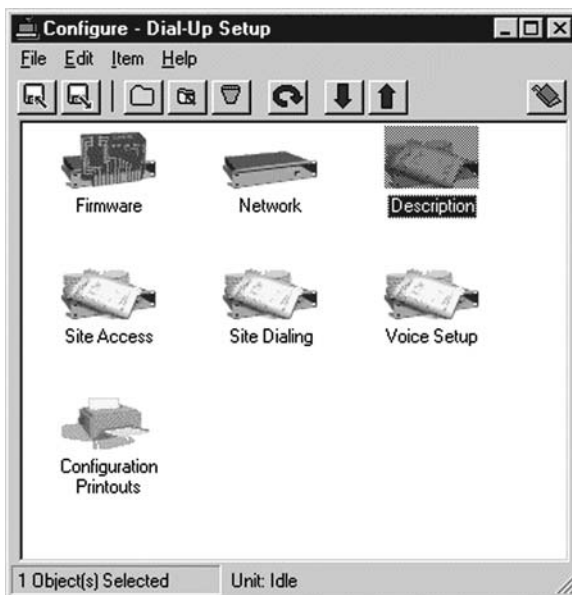
Dial-Up Setup

This section describes in detail the Dial-Up settings and how to configure them. Each VRC2500 unit has some or all of the features described in this section available for modification. Not all of the features need to be changed or have data entered in order for the software or hardware to function fully. This is left to the user's discretion.

To configure the Dial-Up settings, open the site through the Control Bar. Click on the Dial-Up Setup icon in the Site window to open the Configure window for Dial-Up.



Dial-Up Setup Icon in Site Window



Dial-Up Configure Window

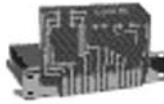
Toolbars

There are two toolbars you will use in configuring the Dial-Up component. The first is the Configure toolbar found at the top of the Dial-Up Configure window. The second appears on the left side of the auxiliary windows which open when you click on an icon in the Configure window. For a detailed description of these toolbars, see page 46.



The VRC2500 comes preloaded with current firmware. It is not necessary to upload firmware to a new unit. If you are replacing corrupt firmware or if your unit has no firmware loaded on it, please follow the firmware upload procedure in the Troubleshooting section on page 210.

FIRMWARE



Firmware

The Firmware utility in the Dial-Up Configure window allows you to upgrade your current Dial-Up firmware when new versions become available.

1. Connect to the DIAL-UP port on your VRC2500 unit.
2. Double-click the Firmware icon in the Dial-Up Configure window to open the Firmware Wizard. You can also right-click on the Dial-Up icon in the Site window and select "Upload Firmware."

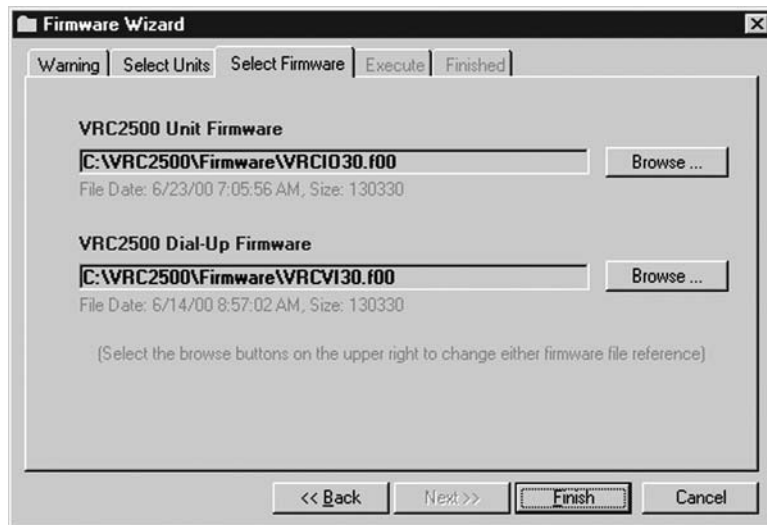


The FORCE option should only be used if advised by technical support. This forces the version of firmware uploaded to be based on the address of the Unit or Voice component, rather than the detected device type.

3. Continue to the Select Units tab by clicking NEXT



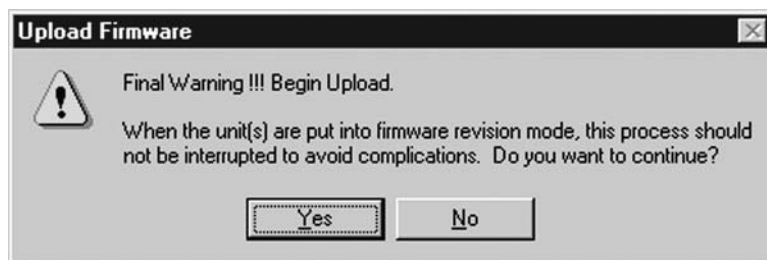
- Continue to the Select Firmware tab by clicking NEXT.



- Select default or browse for alternate firmware files.

To select an alternate file, click the Dial-up Firmware BROWSE button, which opens a standard Windows browse window. Locate the alternate file and click OPEN. This selects the file and returns you to the Select Firmware tab.

- Click FINISH. A warning window asks if you are sure the process should continue. This is your last chance to change your mind. To continue, click YES.



- The Execute tab displays the progress of the Firmware update. When the upload is completed, the Firmware Wizard moves to the Finished tab. Click CLOSE to close the wizard.

**The Execute and Finished Tabs are shown on page 49.



The **Advanced** button opens additional options and should only be used with assistance from Technical Support .

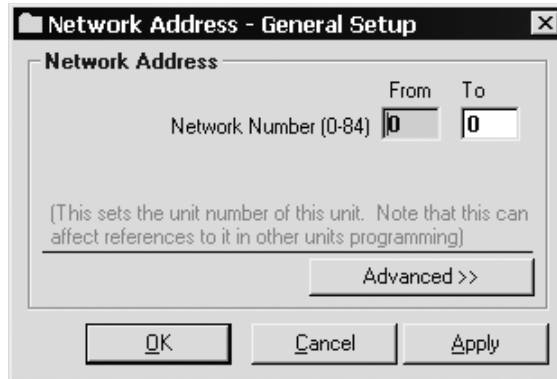
NETWORK



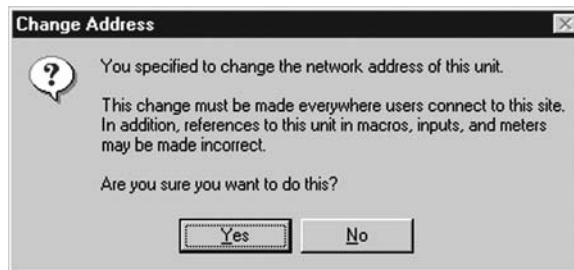
Network

The network number can be changed using this function or through the General Setup Configure window. The network number must be the same in both the General and Dial-Up Setups of the VRC2500 unit.

1. Double-click the Network icon in the Dial-Up Configure window to open the Network Address window.



2. Enter the new number in the TO box. The number must be between 0 and 84. Click APPLY to set the change.
3. When finished, click OK or APPLY. A confirmation window opens. Click YES to complete the change or NO to cancel.



SITE DESCRIPTION

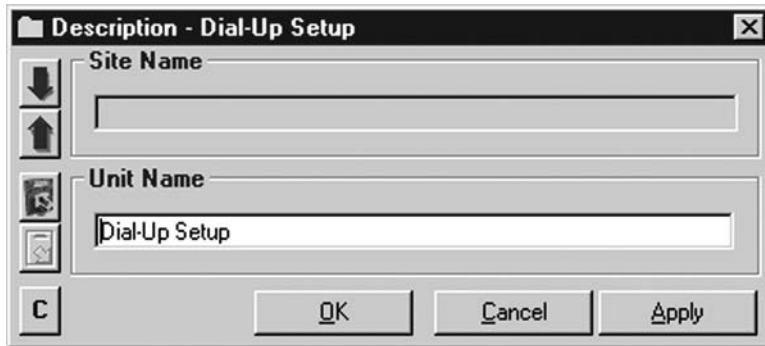


Description

The site was named in the Site Properties window, see page 21, and the General Setup icon was named in the last section see page 56, however, up to this point the Dial-Up icon has had no name. The Description function in the

Dial-Up Configure window allows you to name the Dial-Up icon.

1. Double-click the Description icon in the Configure window to open the Description window.



2. Enter the Dial-Up component name. The name can consist of any alphanumeric title up to 20 characters long.

The Site name cannot be changed from this location.

3. Click OK, APPLY or UPLOAD to save the name.

SITE ACCESS



Site Access

To avoid confusion, the Dial-Up Site Access settings should be the same as the General Setup Site Access settings. Open the General Setup Site Access window and use the Copy to the Clipboard function to capture the settings. In

the Dial-Up Site Access window click the Copy From the Clipboard icon to paste the settings into the Dial-Up Site Access window.



When using a modem, the VRC unit must be power cycled before the modem is detected and any outbound calls for alarms are made.

SITE DIALING



Site Dialing

The Site Dialing settings allow you to configure how the VRC unit dials out whenever there is an Alarm condition.

The unit can call a pager, make a data connection, leave a message on a telephone, or call a telephone number and wait for an access code to be entered.

Site Dialing Window



Start and Stop times cannot cross midnight. If an entry would normally cross midnight, two entries must be used (5:00 PM to 11:59 PM and also 0:00 AM to 3:00 AM).

1. Click on the site dialing icon to open the Site Dialing setup window.
2. Check the box for “**Dial with touch-tone (Not Pulse)**”
3. In the number box, enter the phone number to be dialed (limit 48 characters). Include all prefixes and area codes if needed. For pagers, include a comma for every two-second wait needed before sending the DTMF numbers to be displayed by the receiving pager.
4. Select the number of attempts the VRC2500 unit makes to call a phone number before moving to the next phone entry. There is a one minute pause between each attempt.
5. The **Dial When** pull down menu allows the options of **Always** dialing the number (24 hours a day, 7 days a week), **Every Day** (between the start and stop times), **Weekdays** (Monday through Friday between start and stop times), and **Weekends** (Saturday and Sunday between start and stop times).
6. Select one of the following contact methods; **Pager**, **Data**, **Voice Leave Message** or **Voice Enter Password**. If you select Data, you must have an external modem connected. The other contact methods do not require a modem. See **Chapter 5: Using Dial-Up** for more information.
7. To activate these settings, click **OK**, **Apply**, or the blue upload arrow.

VOICE SETUP



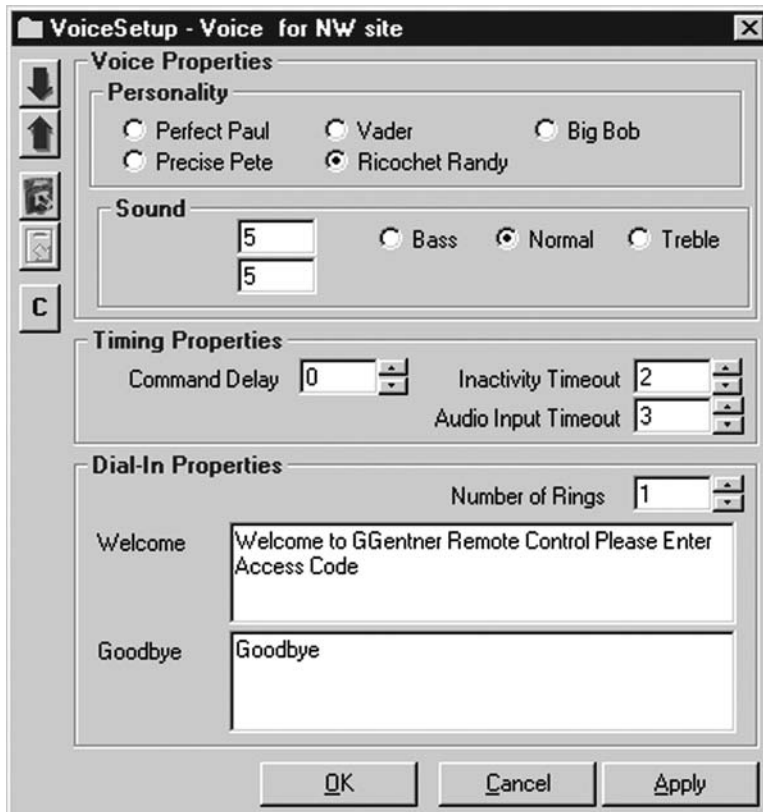
Voice Setup

The VRC2500 has text-to-speech capabilities that enable it to read the information to you over a standard telephone connection. You can retrieve data for command, metering and status channels, alarms, and macros.



Detailed usage information for the Dial-Up feature is provided in Chapter 5: Using Dial-Up.

The Voice properties are configured in the Voice Setup window. To open this window, double-click on the Voice Setup icon in the Dial-Up Configure window.



Dial-Up Voice Setup Window

Voice Properties

Personality – adjusts the vocal characteristics of the Dial-Up. The five options are Perfect Paul (default), Vader, Big Bob, Precise Pete, and Ricochet Randy.

Volume – adjusts audio level coupled onto the phone line and can be adjusted from a level of 0 (softest) to 9 (loudest). Five is the default level.

Pitch – adjusts the basic audio pitch of the synthesized voice. There are three choices – Bass, Normal (default), and Treble. In some noisy environments, setting the voice to Treble makes it easier to understand.

Speed – adjusts the voice's delivery speed from 0 (slowest) to 9 (fastest). Five is the default speed.

Timing Properties Settings

Command Delay – The command delay function can be set from 0-15 seconds (default is zero). This function allows a delay time after a command is issued via DTMF before the command is performed. This allows time for a miskeyed command to be cancelled (0# - Escape/Cancel Command).

Inactivity Timeout – can be set from 1 to 15 minutes; default is 2 minutes. If no DTMF tones are issued to the Dial-Up in this amount of time, the Dial-Up will automatically drop the line.

Audio Input Timeout – can be set from 1 to 15 minutes with the default being 3 minutes. This timeout pertains to any audio being sent along the RJ-11 LINE jack. When audio is coming in from the microphone or Audio In connector, that audio automatically stops being transmitted when this timer runs out.

Dial-In Properties Settings

Number of Rings – is the number of rings the Dial-Up detects before it seizes the line. This value can be from 1 to 10 with 1 being the default.

Welcome – is the greeting the voice unit gives when a user calls in, or when the unit calls out with verbal alarms.

The welcome phrase can be customized (limit 250 characters) to include the station call letters or other words relevant to the facility. If the unit has difficulty pronouncing certain words, it may be necessary to spell the word(s) phonetically.

Some users may prefer to begin with the words "Welcome to the ..." and include the words "Please enter access code" at the end of the Welcome. This will remind users that they have to enter an access code to operate the Dial-Up. However for security purposes, we suggest using a phrase that will remind you to enter the access code without using the words "access code" or "passcode."

Goodbye – is also programmable. The Goodbye phrase must be no more than 250 characters.

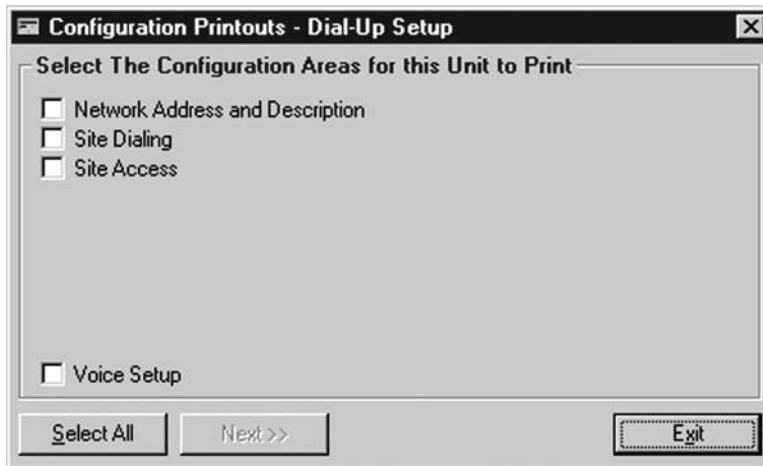
CONFIGURATION PRINTOUTS



Configuration Printouts

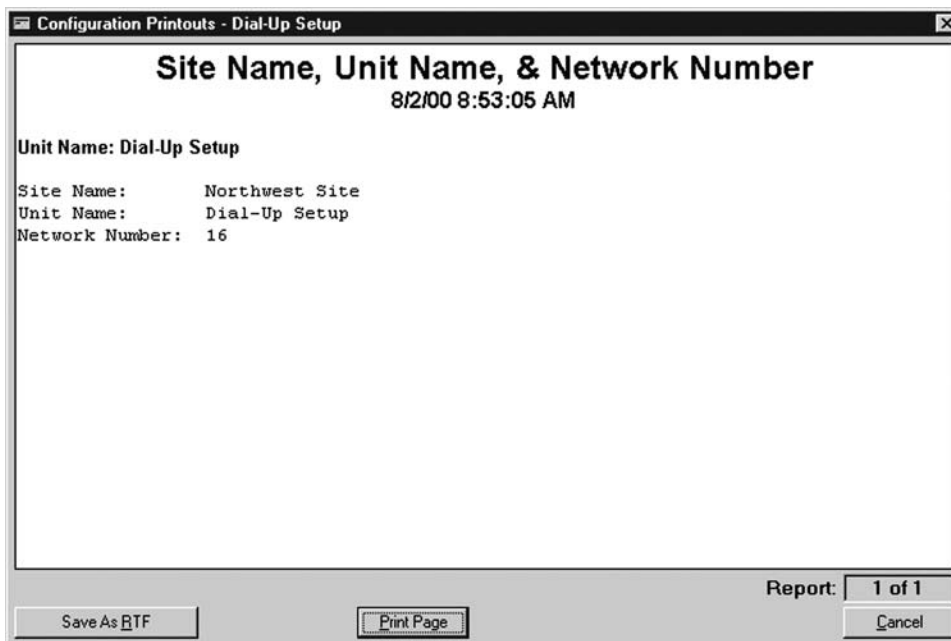
The Configuration Printouts Utility allows you to select any Dial-Up settings to be printed for a hard copy archive.

To open the Configuration Printouts window, click on the Configuration Printouts icon in the Dial-Up Configure window.



Check the function settings you want printed.

Click NEXT to open a preview window. If you select more than one configuration area, the FORWARD and BACK buttons let you navigate through the different pages.



Using Archives



You can select settings separately. Use <CTRL> + Mouse click to highlight the setup icons you want archived.

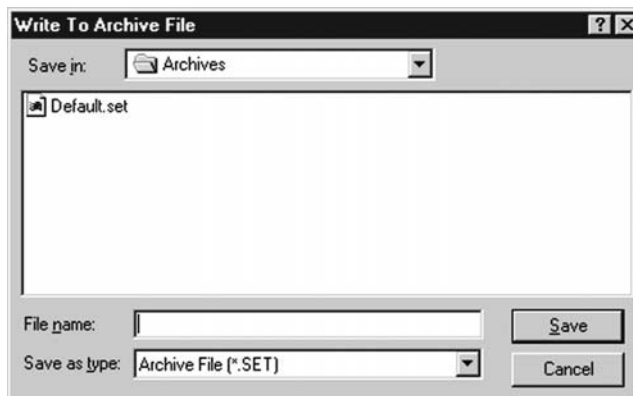
CREATING ARCHIVES

Once you have configured the General and Dial-Up settings, you should archive the settings for use as a back-up copy or for use with another VRC2500.

1. To create an archive, open the General Setup Configure window.
2. From the Edit menu, choose SELECT ALL SETUPS. The setup icons are highlighted.



3. Click the Archive Item icon which opens a Save window.




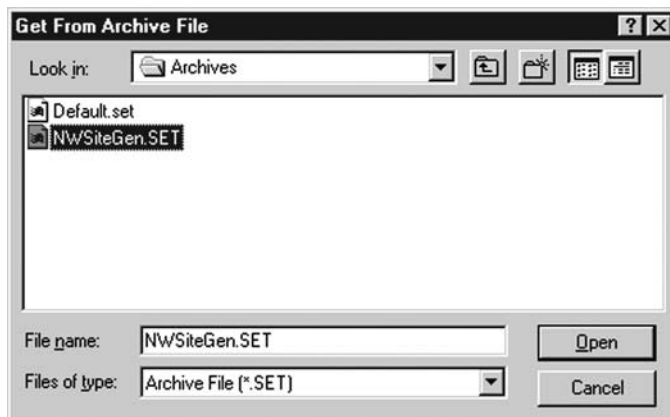
4. Name the file. The name should help you easily identify the archive file and corresponding unit. The file will have a .SET extension.
5. To archive your Dial-Up settings, open the Dial-Up configure window and follow steps 2-4.



You can select settings separately for loading. Use <CTRL> + Mouse click to highlight the setup icons for the settings you want updated.

LOADING ARCHIVE FILES INTO VRC UNIT

1. To load archive files into a VRC2500 unit, open the site and click on the General Setup or Dial-Up Setup icon (depending on which .SET files you are loading).
2. From the Edit menu, choose SELECT ALL SETUPS. The setup icons will be highlighted.
3. Click the EXTRACT ITEM FROM ARCHIVE icon which  opens a Browse window.
4. Select the appropriate .SET file and click open. This will load your archived settings.



EXPLORER ARCHIVE FEATURE



The Create a Unit Archive icon on the Explorer toolbar enables you to create a .SET file without being connected to a VRC2500. Click on the icon to open the Archive Setup window and select the setting you want to configure. Follow the instructions above for saving and loading .SET files.



The Open a Unit Archive icon opens a Browse window that allows you to open an existing .SET file and edit the settings. Follow the instructions above for saving and loading .SET files.

5 Using Dial-Up

The Dial-Up feature of the VRC2500 operates by DTMF tones. Using any Touch-tone telephone, you can call the VRC2500 to request readings on status and metering channels, issue commands, check for pending alarms, and/or clear the alarms. This chapter describes how to access and operate the Dial-Up feature.

CONNECTIONS

There are two ways to connect to your VRC2500: Data Connection or Voice Only Connection. Decide which communication mode you will use and make the appropriate connections to the VRC2500 unit.

Data Mode

The Data Connection requires a dial-up modem to be connected to the DIAL-UP port on the VRC2500. This connection is illustrated in **Chapter 3: Installation & Setup**. The dial-up modem connection allows you to use both the Data (PC) and Voice (telephone) modes of the VRC2500.

Voice Only

Voice Only Connection requires only a telephone line routed from your wall jack to the LINE jack on the VRC2500. This connection supports the Voice Only mode of the VRC2500 and is illustrated on the following page.



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.

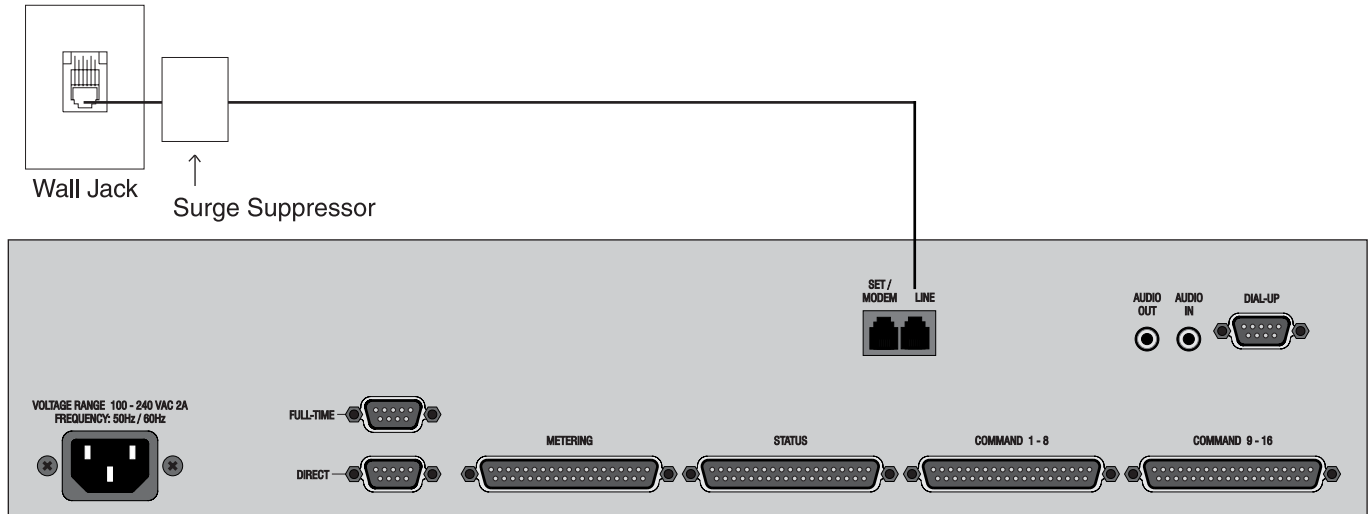


Numbers and phrases sent to the VRC2500 with a DTMF keypad will be offset with a telephone icon (☎) and quotation marks (“ ”). In instances where the VRC2500 responds verbally, the VRC’s verbiage will be set off by a bullet (•) and printed in SMALL CAPS.

Voice Only Connection

This connection enables you to remotely retrieve information and issue commands using any Touch-tone telephone.

1. Route the telephone line through a TELCO surge suppressor to the LINE jack on VRC2500.



Connecting a Telephone Line to the VRC2500

SELECTING THE CORRECT MODE

The VRC2500 has two modes of operation: Data Mode and Voice Only Mode. The Data Mode allows you to interact with your site using a PC or laptop. You can also access the Voice feature using a Touch-tone telephone. The Voice Only Mode allows you to interact with your site using a Touch-tone telephone. You can not retrieve data using a PC when connected for this mode.

Data Mode

From your PC or laptop, click on the site icon in the Explorer toolbar. Once connected to the site, use the VRC software to retrieve and view data. Make sure you have entered the proper settings in the Site Properties window including the connection phone number.

To access the Voice Mode, call the connection phone number using a Touch-tone telephone. When prompted, enter your access code to begin a Voice Mode session.

Voice Only Mode

Call the Dial-Up using a Touch-tone telephone. When prompted, enter your access code to begin a Voice mode session.

CALLING THE VRC2500

Dial the connection number. The VRC2500 will answer after the programmed number of rings and give its programmed welcome phrase.

Enter Access Code

Enter your observer or operator access code followed by the # key. The default password is "4368637#." The VRC2500 responds:

- SCANNING NETWORK. [BEEP] ... [BEEP] ...

If alarms are pending, the VRC2500 will report the alarms. When finished scanning the network, the VRC2500 says:

- DONE SCANNING NETWORK. X UNITS FOUND

If alarms are pending, the VRC2500 will read the alarm messages. If alarms are not pending, the VRC2500 will say:

- NO ALARMS PENDING

The VRC2500 will then announce:


- CONNECTION TO UNIT X COMPLETE

STATUS AND METER CHANNEL READINGS

After the initial login stage and VRC unit selection, the following status and meter channels can be monitored.

List Status Titles


To receive a verbal list of status titles for the VRC2500, enter:

 "7 #"

The VRC2500 will respond with the status-channel description(s) if a text description has been entered via the General Setup Configuration window. If no text has been entered, the VRC2500 will remain silent.

Request Status Reading

Enter the following code in order to request a reading from a status channel:

 "7 x x *"

Retrieving Information & Issuing Commands



The VRC will allow you three attempts to enter the password. If three consecutive mistakes are made entering the password, the VRC2500 will automatically hang up. A "#" must be entered at the end of the password being used when entering DTMF key strokes.



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.



Substitute the appropriate code for the x x that corresponds with the channel number to be accessed (e.g. 01 is channel one, 11 is channel 11).



Substitute the appropriate code for the x x that corresponds with the channel number to be accessed (e.g. 01 is channel one, 11 is channel 11).



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.

List Meter Titles

To receive a verbal list of metering titles, enter:

☎ "6 #"

The VRC2500 will respond with the metering-channel description(s) if a text description has been entered via the General Setup Configuration window. If no text has been entered, the VRC2500 will remain silent.

Request Meter Reading

Enter the following code in order to request information about a metering channel:

☎ "6 x x *"

The VRC2500 will respond with the phrase set up for the metering channel followed by the actual current reading of the metering.

COMMANDS, MACROS AND CAPTURES

List Commands

To receive a verbal list of the commands, enter:

☎ "2 #"

The VRC2500 will respond with the command description(s) if a text description has been entered via the General Setup Configuration window. If no text has been entered, the VRC2500 will remain silent.

Access Command Channel

Access the command channel by entering the following code:

"2 x x *" or "2 x x #"

The VRC2500 will respond with the command-channel description. The "*" activates switch A and the "#" activates switch B.

Activate Switch (A or B)


Enter the following code to activate switch A:

☎ "2 x x *"

The VRC2500 will respond with the programmed phrase identifying switch A and activate the selected command channel's switch A.

OR

Enter the following code to activate switch B:

 "2 x x #"


The VRC2500 will respond with the programmed phrase identifying switch B and energize the selected command channel's switch B.

Each switch is activated after entering "*" or "#" and the command-delay time elapses. Either symbol can be entered several times in a row (if desired).

You can then enter additional "*" or "#" to adjust the output as desired.

List Macros


To receive a verbal list of the macro titles and numbers, enter:

 "5 #"

The VRC2500 will respond with the macro titles and numbers if a text description has been entered via the General Setup Configuration window. If no text has been entered, the VRC will remain silent.

Run Macros


To run a macro, enter the following code:

 "5 x x #"

The VRC2500 will perform the functions detailed in the macro.

Perform Data Capture

Enter the following code to perform a data capture:


 "0 4 0 *"

The VRC2500 will capture data for later reference at a logged-on PC and say:

- UNIT INFORMATION CAPTURED

ENDING A CALL

Sign off from the Dial-Up by entering the following code:

 "9 9 9"

The VRC2500 will respond with the programmed goodbye message, then hang up the telephone line.



The VRC2500 will also automatically hang up if no codes are entered for the user-defined number of minutes.



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.

Checking & Clearing Alarms



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.

Alarm Actions


#	Step Forward
*	Step Back
8	Repeat Last Alarm
6*	Report Mode
3 or 0#	Exit Alarm Reporting
010	Erase All Alarms and Exit



Clearing an alarm does not mean that the condition that caused the alarm has been corrected.

CHECK FOR ALARMS

To determine what alarms are present, enter the following code:

 "0 0 0"

The VRC2500 will respond:

- CHECKING FOR ALARMS ON UNIT X

If no alarms are present, the VRC2500 will respond:

- NO ALARMS PENDING ON CURRENT UNIT


The VRC2500 will also tell what mode the user is in (operator mode or observer mode).

If alarms are present, the VRC2500 will list the alarm conditions, beginning with the oldest alarm stored in the system. After each alarm is reported, the following options are possible: scroll forward and back through the alarm list using the # (forward) and * (back) keys; repeat the alarm just reported with the 8 key; report the current mode by entering 6* ; exit the alarm routine with 3 or 0#; or erase all alarms with 010.

Once the cause of an alarm is determined, the problem can be corrected by issuing commands to the appropriate command channels.

CLEAR ALARMS

To clear all alarms stored through the Dial-Up, enter:

 "0 1 0"

This clears all alarms. Be careful with this command, since alarms cannot be recalled once they have been cleared.

STATUS CHANNEL ALARMS

Status-channel alarms are generated when the sample changes its state (e.g. a status channel sample goes low or high). For example, if an alarm is generated and cleared, a new alarm will not be generated until the status channel goes back to its nominal condition then changes state to the alarm condition. The alarm is generated by the change between high and low states.

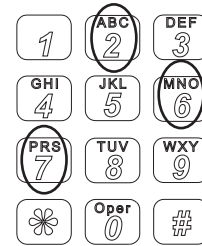
METERING CHANNEL ALARMS

Metering-channel alarms are generated the same way as status-channel alarms. The second high limit for a metering channel could be set to generate an alarm. If an alarm is generated and cleared, a new alarm will not be generated until the metering-channel's sample returns to the metering-channel's nominal range and then rises to above the second high limit. Once again, the alarm is generated by the transition over the tolerance limit.

General Usage

REMEMBERING VRC2500 CODES

The codes for status, metering, and command channels correspond to the letters that are etched into the number keys of a standard DTMF telephone.



DTMF keypad

Thus, command corresponds with 2, metering corresponds with 6, and status corresponds with 7.

MUTING OUTBOUND TELEPHONE NUMBERS

The VRC2500 can be prevented from calling alarms to an outbound telephone number(s) by entering the following code:

☎ “1 0 1 *” through ☎ “1 0 5 *”

The VRC2500 will respond:

- PHONE NUMBER X DISABLED

This disables alarm reporting for that outbound telephone number. To enable the outbound telephone number(s) again, enter:

☎ “1 0 1 #” through ☎ “1 0 5 #”

The VRC2500 will respond:

- PHONE NUMBER X ENABLED

You can also disable alarm reporting to all outbound telephone numbers can for one hour. To disable alarm reporting, enter:

☎ “0 3 0 *”

The VRC2500 will respond:

- ALARM REPORTING DISABLED



The disabled outbound telephone number will remain disabled until reactivated via DTMF code.



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.




Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.

This is useful when reprogramming the unit or making changes to connected site equipment.

Sample Scenario

Maintenance needs to be performed on the transmitter. Naturally, the best time for the transmitter to be down is around 2 a.m. Just shutting down the transmitter will generate alarms, calling a supervisor at 2 a.m. or calling the station engineer who is performing the maintenance (and already knows the transmitter is down). Thus, the station engineer could shut down the transmitter for a one-hour period to perform the maintenance, and with the alarms disabled, the system would not call the outbound telephone numbers to report them. If maintenance is finished prior to the one-hour period, the alarm reporting can be enabled manually.

To enable alarm reporting before the end of the one-hour period, enter:


 "0 3 0 #"

The VRC2500 will respond:

- ALARM REPORTING ENABLED

QUERY CURRENT VRC UNIT


Occasionally, it may be necessary to query the VRC2500 to determine its network address, the security level where the user is logged on, etc. To do so, enter:

 "0 *"

The VRC2500 will respond with its network number and identify the access level (observer or operator).

Remote/Local Status

To determine the state of the Remote/Local button on the VRC2500 unit, enter:

 "0 9 0"

The VRC2500 will respond with the state of the Remote/Local button (remote mode or local mode).

CHECKING CURRENT DATE AND TIME

To check the VRC2500's real-time clock, enter:

☎ "0 6 0"

The VRC2500 will respond with the current date and time (in military time).

USING THE SOUND SENSOR

The VRC2500 unit contains a small condenser microphone built into its front panel. This microphone can be activated at any time to listen to any sounds being generated in the vicinity of the VRC2500. This is handy to check for proper operation of cooling fans or other noisy equipment or even listening for voices in the area of your VRC2500 (in the case of a security alarm).

To activate the sound sensor, enter:

☎ "0 5 0 #"

The VRC2500 will respond:

- INTERNAL MICROPHONE ON

To deactivate the sound sensor at any time prior to the end of the user-defined duration, enter:

☎ "0 5 0 *"

The VRC2500 will respond:

- INTERNAL MICROPHONE OFF

USING THE AUDIO OUT CONNECTOR

The VRC2500 can patch incoming telephone audio to the VRC2500's Audio Out back-panel connector. This is helpful if you need to broadcast audio directly from the telephone over your transmitter.

Selecting the Audio Out path can be done using DTMF tones.

To route telephone audio to the Audio Out connector, enter:

☎ "0 8 0 #"



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.




Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.

The VRC2500 will respond:

- EXTERNAL AUDIO OUTPUT ON

Telephone audio will continue to be routed to the Audio Out connector until the user-defined number of seconds runs out, or until the Audio Out routing is manually deactivated (whichever comes first).

To deactivate the two-wire Telco audio routing through the Audio Out connector, enter:

 "0 8 0 *"

The VRC2500 will respond:


- EXTERNAL AUDIO OUTPUT OFF

USING THE AUDIO IN CONNECTOR

The VRC2500 can send audio to the telephone line from the Audio In back-panel connector. When checking to see if the transmitter is broadcasting from a location outside of the station's coverage area, this feature is especially useful.

Selecting the Audio In path can be done using DTMF tones.

To send the VRC2500's Audio In to the telephone, enter:


 "0 7 0 #"

The VRC2500 will respond:

- EXTERNAL AUDIO INPUT ON

Audio will continue to be routed from the Audio In connector until the Audio In routing is manually deactivated or until the inactivity timer times out (see Inactivity Timeout, page 72).

To deactivate the two-wire Telco audio routing from the Audio In connector, enter:


 "0 7 0 *"

The VRC2500 will respond:

- EXTERNAL AUDIO INPUT OFF

REPORT MODE


To determine the mode the VRC2500 is currently in, enter:

 "6 *"

The VRC2500 will respond with either operator or observer mode.

REPORT SITE NUMBER AND SECURITY LEVEL


To report the site number of the VRC2500 and the security level, enter:

 "0 *"

The VRC2500 will respond with the site number and observer or operator access.

REPORT FIRMWARE VERSION NUMBER

To report the firmware version number of the VRC2500, enter:


 "8 0 0"

The VRC2500 will respond with the site number and the firmware version number for the Dial-Up.

ESCAPE/CANCEL COMMAND

The VRC2500 can be programmed to pause for a specified length of time (See Command Delay, page 82 before issuing commands. This gives you a chance to clear/escape entered DTMF codes before the codes are acted on in the case of error.

To clear the VRC2500 memory command buffer, enter:

 "0 #"

The VRC2500 responds:

- CANCELED

New commands can now be entered.



Please refer to Appendix A for a complete list of the DTMF codes to use when accessing the Voice Interface in Voice Mode.

SINGLE/MULTIPLE RESPONSES FROM STATUS/METERING CHANNELS

Either single or multiple responses can be requested from status and metering channels.

Single Response

A single response is requested by entering "*" after the status or metering-channel code. This instructs the VRC2500 to send only a single response to your request, which will be accurate as of the exact time the "*" was entered.

Multiple Response

A multiple response is requested by entering "#" after the status or metering-channel code. This instructs the VRC2500 to give three consecutive responses (at five-second intervals) for the metering or status channel. Each response will be accurate as of the time of the response. Multiple responses allow changes in status or metering-channel inputs to be tracked over a short period of 15 seconds.

6 Creating Macros

Macros are powerful tools for maximizing the capabilities of your VRC2500 system. When the VRC2500 runs a macro, it issues a string of software commands that can be complex and precise. The macros can be automatically initiated by a timed event or as an action associated with an out-of-tolerance condition in Metering or Status. Macros may also be run manually by clicking on the macro button from within the monitoring software.

The VRC2500 is capable of holding a maximum of 32 macros with a maximum storage space of 10KB total for all macros.



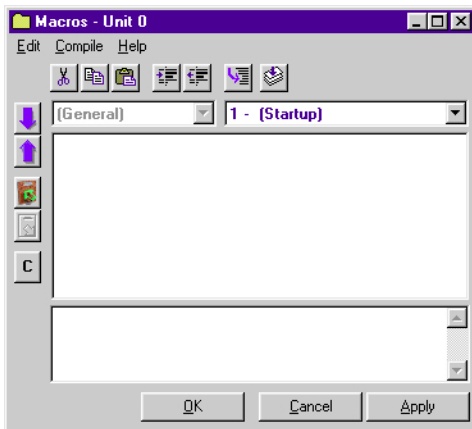
Macro #1 will execute automatically on power-up. Unless a macro is specifically written for a startup procedure, it is not advisable to use the memory location for macro #1 on any unit.

Programming Window



Macros

The Macro window is where all macros are written, compiled, uploaded or downloaded. To open the Macro window, double-click on the Macro icon in the Unit Configuration window. This window has a tool bar with the following capabilities:



Macro Window



Cut Text removes selected text from the window and places it on the clipboard. The text is available to paste in another area or macro. The information will be lost if you click on Cut or Copy again.



Copy Text places a copy of selected text on the clipboard. The text is available to paste in another area or macro. The information on the clipboard will be lost if you click on Cut or Copy again.



Paste Text inserts the text that has been cut or copied into the window where the cursor is positioned. You can paste multiple times for multiple copies.



Indent moves the left margin to the right.



Outdent moves the left margin to the left.



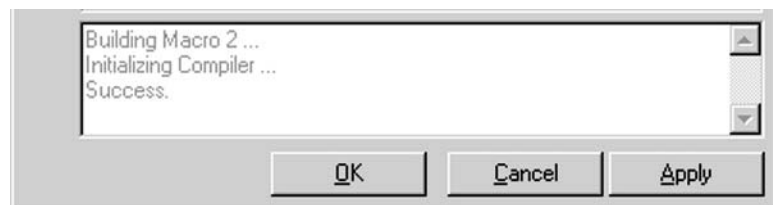
Insert References opens a menu that allows you to select a macro code to be inserted into the macro being created or edited. The basic outline of a macro using that command displays in the macro window.



Compile takes the text entered into the Macro window and compiles it into machine code that the VRC2500 can use and checks the macro for obvious errors such as syntax and formation. This does not upload the new macro into the VRC2500. The bottom screen of the window displays the compilation process and notes any errors that are found.



Reference Menu



Macro Compiler Section of Macro Window

Macro Structure

A macro consists of the macro name, a sequence of instructions, and an instruction to end the macro. Macros can be any length, and with the exception of macro and alarm names, lines within the macro may be any desired length. The macro will continue to the next line automatically unless you have entered a [CR] or a “ : ” (ENTER or a colon) to end the line. The total compressed memory used for macro programming cannot exceed 10KB per I/O unit. It is unlikely that you'll ever reach this limit.

Beginning a Macro

Each macro must be identified by name in the first line of the macro itself. The word MACRO is used just prior to the name with the name enclosed in double-quote marks (“ ”). All macros must end with the line MEND for macro end. Alarms or warnings issued within a macro also use double-quote marks and are identified by typing: ALARM “text” or WARNING “statement.”

Remarks may be inserted anywhere in the macro by using single quote (‘ ’) marks around them.

Ending a Macro

There is one manual method and five software methods of ending a macro. The manual method is to right-click on the macro button on the monitor view window. This brings up a list of the currently running macros and their titles. Click on the macro to kill it and then click on the End Macro button.

The software methods include the five commands that can be inserted into any macro. See table at right.

Macro Source Code

The near-English text that you create a macro with is called source code. The source code syntax is shown on the next page.

EXP and **NUM**, as used in the table, are not valid source code. They denote the use of a number. When programming macros, enter the appropriate Site or I/O unit ID number, status, metering, or command channels, or macro number instead of EXP or NUM. **CR** refers to a carriage return or enter; a colon (:) can also be used to separate instructions within a macro line. Where parentheses “ () ” are shown, the parentheses must be included in the source code. Where brackets “ [] ” are shown, the brackets are there to set off the item only – such as [CR] – the brackets are not included in the source code. Commas “ , ” that are shown must be included.

END [CR] Stops the macro immediately and exits.

EXIT [CR] – Stops the macro immediately and exits.

KILL X [CR] – Terminates macro #X on this I/O unit.

MEND [CR] – Used as the last line of every macro. Macro is exited because it is finished.

RETURN [CR] – Stops the macro immediately and exits.



Although macro structures include an argument for addressing different sites, I/O units configured at one site cannot activate commands or macros at another site. Therefore, the sites should always be referenced as ME.

Source Code Components	Description
A to Z (with the exception of G)	Local Variables – used internally by single macro
G(1) to G(8)	Global Variables – usable by other macros in I/O. When a global variable changes in one macro, a change is seen in all macros using that variable.
High	1– A constant that cannot have any other value
Low	0– A constant that cannot have any other value
On	1– A constant that cannot have any other value
Off	0– A constant that cannot have any other value
>	Greater than – comparison
<	Less than – comparison
<>	Not equal to – comparison
=	Equal to or comparison
+	Add – arithmetic function
–	Subtract – arithmetic function
*	Multiply – arithmetic function
/	Divide – arithmetic function
%	Mod Operator – returns the integer remainder
()	Parenthesis – used to maintain mathematical hierarchy
:	Statement separator
!	Boolean operator – reverses value of expression
AND	Boolean operator – requires both conditions to be true
COS(x)	Cosine – expressed in radian values not degrees
EXP(x)	Exponent – returns the exponential of x
LOGE(x)	Natural Log
OR	Boolean operator – requires either condition to be true
POW(x,y)	Power – x to the power of y
SIN(x)	Sine – expressed in radian values not degrees
SQR(x)	Square Root
TAN(x)	Tangent – expressed in radian values not degrees
YEAR	Returns the current 4-digit year (2000, 2001, etc.)
MONTH	Returns numeric equivalent of the current month (1-12)
DAY	Returns the current day of the month (13, 17, 31, etc.)
DAYOFWEEK	Returns numeric equivalent of the day of the week (0-6) Sun – Sat
HOUR	Returns current hour (0-23)
MINUTE	Returns current minute (0-59)
SECOND	Returns current second (0-59)

Source Code Components	Description
ALARM "text string" [CR]	Alarm text message displayed on computer alarm window
CAPTURE [X,Y,Z,A, OR B] [CR]	Captures data at Site X, on Unit Y
COMMAND [X,Y,Z,A, OR B] [CR]	Closes A or B contact for particular command channel on Site X, Unit Y, Channel Z
DELAY [X] [CR]	Delays X before processing next line. Adjustable in tenths of a second.
ELSE [instruction]	Used when IF condition is not met
END [CR]	Exits macro prematurely
IF [condition] THEN [instruction]	Used to execute commands IF certain conditions are met
KILL x [CR]	Terminates Macro X on that I/O unit
L1METER(X) [CR]	Returns 1st Lower Limit value for Meter Channel X
L1METER(X)=EXP [CR]	Assigns new value to 1st Lower Limit of Meter Channel X
L2METER(X) [CR]	Returns 2nd Lower Limit value for Meter Channel X
L2METER(X)=EXP [CR]	Assigns new value to 2nd Lower Limit of Meter Channel X
MACRO [X,Y,Z] [CR]	Executes a macro located on Site X, Unit Y, Macro Z
MACRO "text string" [CR]	First line in any macro – names that particular macro
ME	Can be used to describe both the current site and/or unit macro resides on
MEND [CR]	Last line in any macro – ends that particular macro
METER(X)	Returns the calibrated value of Meter Channel X
METERAD(X)=EXP [CR]	Assigns new A-to-D (A/D) value to Meter Channel X
METERCC(X)=EXP [CR]	Sets calibration constant for Meter Channel X
METERF(n)=NewValue	The NewValue is a floating point number and must be within the calibrated A/D range of the given channel
METEROFF(X) [CR]	Turns off A/D sampling of Meter Channel X on current I/O unit
METERON(X) [CR]	Turns on A/D sampling of Meter Channel X on current I/O unit
MUTEMETER(X) [CR]	Mutes Meter Channel X on current I/O unit
MUTESTATEMETER(n)	Returns True (1) if Meter Channel (n) is muted
MUTESTATESTATUS(n)	Returns True (1) if Status Channel (n) is muted
MUTESTATUS(X) [CR]	Mutes Status Channel X on current I/O unit
REMLOC	Remote/Local state – returns 1 for local mode, 0 for remote
STATUS(X)	Returns HIGH (1) or LOW (0) for Status Channel X
U1METER(X) [CR]	Returns 1st Upper Limit value for Meter Channel X
U1METER(X)=EXP [CR]	Assigns new value to 1st Upper Limit of Meter Channel X
U2METER(X) [CR]	Returns 2nd Upper Limit value for Meter Channel X
U2METER(X)=EXP [CR]	Assigns new value to 2nd Upper Limit of Meter Channel X
UNMUTEMETER(X) [CR]	Unmutes Meter Channel X on current I/O unit
UNMUTESTATUS(X) [CR]	Unmutes Status Channel X on current I/O unit
WARNING "text string" [CR]	Inserts a text message into the alarm buffer for later viewing
WEND [CR]	Encloses commands with WHILE statement
WHILE [condition]	Executes commands that follow the while command and will loop until WHILE condition is no longer true

TYPES OF MACROS

COMMANDS

To issue a command in a macro, begin a new line with the word “Command.” This is followed by the location of the command output that will be triggered.

1. Identify the site (your VRC2500 unit). This is the site network number or the word “ME.”
2. Identify the VRC unit controlling the command output by using the word “ME.”
3. The final entry in the command line is the actual command output that is to change state. Possible values here are 1-16 and either A or B. If desired, a number based on a variable can be inserted into the command channel location instead of a channel number and letters A or B. This can be useful in “While loops” that increment the variable value each pass. Switch A for channels 1 - 16 would equal a variable value of 1 - 16. Switch B would equal 17 - 32.

Macro Line Example

Command ME, ME, 10A [CR]

Description

“Command” tells the macro it will issue a command
The first “ME” refers to the site. The second “ME” refers to this VRC unit. 10A refers to the command output to be executed (CR) Carriage Return or Enter

NESTED MACROS

A macro can also trigger another macro. As with commands, macros are identified by site and VRC unit. Start the line with the word “Macro ME, ME,” followed by the macro number to be run.

Macro Line Example

Macro ME, ME, 5 [CR]

Description

“Macro” tells the macro it will be triggering another macro
The first “ME” refers to the site. The second “ME” refers to this VRC unit. The “5” means Macro #5 on this I/O will be run. [CR] Carriage Return or Enter.

An example of a nested macro would be a macro re-defining upper and lower metering limits that are placed at the end of a power change macro.

CAPTURE

Captures are used to obtain a snapshot of the VRC unit. Captures include data from the metering, status, and command channels and includes the date and time of the capture.

To create a capture of the VRC unit, begin a new line in the macro with the word "CAPTURE" followed by the site and unit ID numbers, then end the line with a carriage return or colon.

Each VRC2500 can store up to 192 captures. An alarm will be generated any time that the buffer is 75% full. The VRC Scheduler can be configured to automatically download these captures.



Macros within macros do not act as sub-routines. They will run concurrently with the originating macro. If you need to execute a full macro sequence prior to running another macro, see the sub-procedure example on page 119.

Macro Line Example

Capture ME, ME [CR]

Description

A capture will occur for this I/O unit at this site immediately

DELAY

For various reasons, it may occasionally be necessary to include a pause between lines of code. The DELAY command will accomplish this task. Delay time is set in seconds and tenths of seconds. You will need to use a decimal point to indicate tenths of seconds. The maximum value available for a delay time is 6,553.5 seconds or 1 hour 49 minutes and 13.5 seconds.

Macro Line Example

Delay 60.4 [CR]

Delay 3600 [CR]

Description

Wait 60.4 seconds before executing the next line of code

Wait 6 minutes before executing the next line of code

REMARK

Remarks can be placed anywhere within a macro. Remarks must be enclosed by single quote (' ') marks. A remark is not a functioning part of the macro. It is for user understanding only.

Macro Line Example

'Limits changed for lower power' [CR]

Description

Any text in single quote marks is a remark.

ALARM

An alarm message can be generated within a macro by using the word "ALARM" followed by the descriptive text within double quotation marks (" "). The alarm messages will show up in the Alarm window whenever the alarm statement is executed. Macro alarms are treated as critical alarms. All normal alarm notification procedures will apply including dial-out messaging. Each alarm message can contain up to 32 characters.

Macro Line Example	Description
Alarm "The building is on fire!" [CR]	The statement in quotes will appear in the alarm window when this line is executed.

WARNING

A warning message can be generated within a macro by using the word "WARNING" followed by the desired text within double quote (" ") marks (the warning message will show up in the alarm window whenever the next critical alarm condition occurs). Macro warnings are treated as non-critical alarms. No alarm notification will occur until a critical alarm occurs. Up to 32 characters may be in each warning message. Multiple warning statements may be in a single macro if more characters are needed.

Macro Line Example	Description
Warning "Power change complete" [CR]	The statement in double-quotes will appear in the alarm window when the next critical alarm occurs.

IF/THEN/ELSE

This feature allows the macro to perform conditional functions, such as initiating a command output if a metering or status channel gives a certain reading. IF/THEN/ELSE statements can be placed anywhere within a macro. The “IF” and the “THEN” must be on the same line in the macro. The “ELSE” statement is on a line by itself and is not required in order for the IF/THEN condition to be evaluated. The “ENDIF” statement must be included as the last line for any IF/THEN statement.

Macro Line Example	Description
IF status(3)=low THEN [CR] Command ME, ME, 1A [CR] Delay 50 [CR] Command ME, ME, 16A [CR]	“IF” begins the IF/THEN statement These command lines will execute only if status input is equal to LOW
ENDIF [CR]	“ENDIF” ends the IF/THEN statement (more command statements in a macro can be included before and/or after this IF/THEN portion)

Macro Line Example	Description
IF MUTESTATESTATUS(5)=1 AND meter(12)>3500 THEN [CR]	Status Channel 5 must be muted AND Meter Channel 12 must be more than 3500 before Macro #2 on this unit executes
MACRO ME, ME, 2 [CR] ELSE [CR] COMMAND ME, ME, 9B [CR] ENDIF [CR]	If the above is FALSE then Command Channel 9 on this unit will close ‘B’ output

WHILE/WEND

This statement is used to repeat a command or set of commands as long as a specific condition exists. The statement begins with the word “WHILE” followed by a specific condition. The next few lines are instructions that are followed while that condition is still valid. The “WEND” instruction is the last line of the WHILE statement and concludes the set of instructions.

Macro Line Example	Description
WHILE meter(5)<50 [CR] Command ME, ME, 12A [CR] WEND [CR]	While Meter Channel 5’s value is less than 50 then execute Command Channel 12’s ‘A’ output Ends the WHILE statement – macro may continue

A WHILE statement can also be set up as a variable loop which executes a specific set of commands as long as the value of the variable is within a specified parameter.

Macro Line Example

```
X=1
While X<10 [CR]
  Command ME, ME, 6B [CR]
  Capture ME, ME [CR]
  X=X+1
WEND
```

Description

Initializes the variable 'X' to a value of 1
 While 'X' is less than 10, the next few lines will be repeated
 Command Channel 6 on this unit activates the 'B' output
 A snapshot of this unit will occur each pass at this point
 The value of variable 'X' is increased by 1
 While loop ends here when X=10

Note: This will create 10 captures within a few seconds.

MUTE/UNMUTE

Any or all metering and status inputs can be muted so that any alarm conditions that may be caused by an out-of-tolerance meter reading or by an unwanted status condition will not occur as it normally would. The "UNMUTE" statement can return any selected muted inputs to their nominal states. This may be useful if site maintenance work is being done. If a critical alarm is inadvertently triggered, it will take no action.

Monitoring views have a background change on any meter or status input channel that is muted. The view returns to normal when unmuted.

To mute either a meter or status channel, begin the macro line with the words "MUTEMETER" or "MUTESTATUS" followed by the channel number in parentheses. To unmute either a meter or status channel, begin the macro line with the words "UNMUTEMETER" or "UNMUTESTATUS" followed by the channel number in parentheses.

Macro Line Example

```
MUTEMETER(5) [CR]
MUTESTATUS(12) [CR]
UNMUTEMETER(5) [CR]
UNMUTESTATUS(12) [CR]
```

Description

Meter Channel 5 on this unit is now muted
 Status Channel 12 on this unit is now muted
 Meter Channel 5 on this unit is now unmuted
 Status Channel 12 on this unit is now unmuted

MUTESTATEMETER/MUTESTATESTATUS

These commands check to see if the input channel selected is in a muted state. They do nothing to modify the state. When the channel is muted it will return a value of 1. When the channel is un-muted, it will return a value of 0.

To find out what the state of an input channel is, begin the macro line with the words "MUTESTATEMETER" or "MUTESTATESTATUS" followed by the channel number in parentheses.

Macro Line Example	Description
While MUTESTATUSMETER(5) = 1	While Meter Channel 5 of this unit is muted, execute the WHILE statement

VARIABLES

There are two types of variables available for use in a macro. The first type is a LOCAL variable. This type of variable is usable only in the currently running macro. Any results saved or equated to a variable inside of a particular macro will be deleted or lost as soon as that macro is finished. There may be up to 32 local variables. Local variable names may be from 1 up to 64 characters in length and must start with an alphabetic character. Local variables cannot use reserved names that are on the source code list.

The second type of variable is a GLOBAL variable. This type of variable can be used by multiple macros on the same I/O unit and is not lost unless power to an I/O unit is lost. Global variables must start with the letter "G" followed by the variable number in parentheses. There are eight variable names available for global variables (G(1) to G(8)).



A global variable, changed on one macro, will cause a change to the corresponding global variable in all macros on that unit. The global variable on one unit will not affect the global variables on other units in the network.

Macro Line Example	Description
POWER = meter(3)/meter(9) [CR]	Sets the variable POWER equal to this unit's Meter Channel 3 divided by this unit's Meter Channel 9.
G(1)=STATUS(9) [CR]	Sets the Global Variable 1 to 0 if Status Channel 9 on this unit is low, and to 1 if it is high.

CONSTANTS

There are constants that cannot have any other value. These constants may be used in any macro or combination and may have other variable's values set to theirs.

HIGH = 1

LOW = 0

ON = 1

OFF = 0

REMLOC

The REMLOC statement allows the I/O unit to return a value to indicate if it is in a REMOTE or LOCAL state. This equates to the front panel push button on each I/O that causes the REMOTE/LOCAL LED to illuminate solid or flash RED when pressed. It does not matter which I/O unit caused the changes of state as each I/O on the site's network returns the same value.

Macro Line Example

```
IF REMLOC=1 THEN [CR]
  END [CR]
ELSE [CR]
  MACRO ME, ME, 4 [CR]
ENDIF [CR]
```

Description

Check REMOTE/LOCAL state
If in local mode, end macro. If not in local
local mode, run Macro #4 on this unit. Then
end statement.

STATUS

The status statement returns the high or low state of the desired status channel. Enter the word "STATUS" followed immediately by the channel number inside of parentheses.

Macro Line Example

```
IF STATUS(3)=LOW THEN [CR]
```

Description

If Status Channel 3 is low, then the instruction continues

MATHEMATICAL STATEMENTS

The macro program has a wide range of mathematical statements that may be used to achieve your desired outcome. Each statement will use standard notation with parentheses being used to define a computational hierarchy. Some standard trigonometric operators may be used as well.

Numerical results of mathematical computations are not always exact. For example, -4 would not come back as 2. It would come back as 1.9999 or 2.0001. Take this into consideration when using mathematical statements in any macro.

A list of supported mathematical statements is available on the table on page 120.

> GREATER THAN

Macro Line Example	Description
<pre>If meter(3)>50 Then [CR] End [CR] Else [CR] Command ME, ME, 1A [CR] ENDIF [CR]</pre>	<p>Compares Meter Channel 3 of this unit to the value of 50. If Meter Channel 3 is GREATER THAN 50, the macro ends. If Meter Channel 3 is NOT GREATER THAN 50, then issue command 1A on this unit.</p>

< LESS THAN

Macro Line Example	Description
<pre>If meter(3)<50 Then [CR] End [CR] Else [CR] Command ME, ME, 1A [CR] ENDIF [CR]</pre>	<p>Compares Meter Channel 3 of this unit to the value of 50. If Meter Channel 3 is LESS THAN 50, the macro ends. If Meter Channel 3 is NOT LESS THAN 50, then issue command 1A on this unit.</p>

< > NOT EQUAL TO

Macro Line Example	Description
<pre>If meter(3)<>50 Then [CR] End [CR] Else [CR] Command ME, ME, 1A [CR] ENDIF [CR]</pre>	<p>Compares Meter Channel 3 of this unit to the value of 50. If Meter Channel 3 is NOT EQUAL TO 50, the macro ends. If Meter Channel 3 is EQUAL TO 50, then issue command 1A on this unit.</p>

= EQUAL TO

Macro Line Example

```
If meter(3)=50 Then [CR]
  End [CR]
Else [CR]
  Command ME, ME, 1A [CR]
ENDIF [CR]
```

Description

Compares Meter Channel 3 of this unit to the value of 50
If Meter Channel 3 is EQUAL TO 50, the macro ends
If Meter Channel 3 is NOT EQUAL TO 50 then issue
Command 1A on this unit.

+ ADD

Macro Line Example

```
Z = meter(1)+meter(2) [CR]
```

Description

The variable Z is now equal to the floating point value of
Meter Channels 1 and 2 of this unit ADDED together

- SUBTRACT

Macro Line Example

```
Z = meter(1)-meter(2) [CR]
```

Description

The variable Z is now equal to the floating point value of
Meter Channel 1 MINUS Meter Channel 2 of this unit

* MULTIPLY

Macro Line Example

```
Z = meter(1)*meter(2) [CR]
```

Description

The variable Z is now equal to the floating point value of
Meter Channels 1 and 2 of unit MULTIPLIED together

/ DIVIDE

Macro Line Example

```
Z = meter(1)/meter(2) [CR]
```

Description

The variable Z is now equal to the floating point value of
Meter Channel 1 DIVIDED by Meter Channel 2 of this unit

% Returns the integer value of the remainder of a division problem. 5%2=1

Macro Line Example

```
X = meter(3)%98 [CR]
```

Description

The value of X is now equal to the integer remainder of
Meter Channel 3 of this unit divided by 98

() PARENTHESES

Parentheses must be in pairs. The computation of the innermost pair is resolved before moving outward to the next computation.

Macro Line Example

```
Z = (meter(1)+meter(2))/35 [CR]
```

Description

The variable Z is now equal to the floating point value of Meter Channels 1 and 2 of this unit ADDED together then divided by 35

! BOOLEAN NOT OPERATOR

The “!” operator makes the statement following it the opposite of what it normally would have been.

Macro Line Example

```
If !(MONTH=12) Then [CR]
    Macro ME, ME, 18 [CR]
Else [CR]
    Macro ME, ME, 19 [CR]
ENDIF
```

Description

If the current month on this unit is NOT 12 run Macro #18 on this unit. If the current month is 12, run Macro #19 on this unit.

AND BOOLEAN OPERATOR

All conditions joined by the AND operator must be true or the whole statement is considered false.

Macro Line Example

```
IF (A=B) AND (B=C) THEN [CR]
```

Description

Both statements must be TRUE before THEN will execute

OR BOOLEAN OPERATOR

At least one statement separated by an OR operator must be true for the whole expression to be considered true.

Macro Line Example

```
IF (A=B) OR (B=C) THEN [CR]
```

Description

If either statement is TRUE, THEN execute

COS COSINE**Macro Line Example**

```
IF COS(x)>.5 THEN [CR]
```

Description

Returns the cosine value of variable ‘X’ in comparison to .5 (Values expressed in radians)

SIN SINE**Macro Line Example**

```
IF Sin(x)<.5 THEN [CR]
```

Description

Returns the sine value of variable ‘X’ in comparison to .5 (Values expressed in radians)

TAN TANGENT

Macro Line Example

WHILE Tan(y) >1.0 [CR]

Description

Will stay in While loop as long as the Tangent of 'Y' is above 1 (Values expressed in radians)

EXP EXPONENTIAL

 $\exp(x + y) = \exp(x)\exp(y)$ $\exp(0) = 1$ $\exp(-x) = 1/\exp(x)$ **Macro Line Example**

Z = EXP(meter(3)) [CR]

Description

Variable 'Z' is now equal to the exponential of Meter Channel 3 of this unit

LOGE NATURAL LOGARITHM

Returns the natural logarithm of a number. Natural logarithms are based on the constant e (2.71828182845904). Values entered must be a positive real number for which you want the logarithm.

Macro Line Example

Z = Loge(meter(4)*meter(12)) [CR]

Description

Variable 'Z' is now equal to the natural logarithm of the Product of Meter Channels 4 and 12 of this unit

POW POWER

Raises variable x to the power of y. X^Y **Macro Line Example**

Z = POW (meter(3), meter(2)) [CR]

Description

Variable 'Z' is now equal to the floating point value of Meter Channel 3 raised to the power of the floating point value of Meter Channel 2 of this unit

SQR SQUARE ROOT

Returns the square root of X. \sqrt{X} **Macro Line Example**

meter(10)=SQR(meter(3)) [CR]

Description

Meter Channel 10 on this unit is now equal to the SQUARE ROOT of Meter Channel 3 of this unit

YEAR

Returns the four-digit year in the current I/O unit.

Macro Line Example

IF YEAR<2001 Then [CR]

Description

Compares the four-digit year of this I/O unit to 2001

MONTH

Returns the decimal equivalent of the current month (1-12).

Macro Line Example	Description
IF MONTH=4 Then [CR]	Compares the current month of this I/O unit to 4 (April)

DAY

Returns the decimal equivalent of the Day of the Month (1-31).

Macro Line Example	Description
IF DAY<16 Then [CR]	Executes statement if it is the first half of the month

DAY OF WEEK

Returns the numeric equivalent of the Day of the Week starting with Sunday (0-6)

Macro Line Example	Description
IF DAYOFWEEK=0 [CR]	Executes statement only on Sunday

HOUR

Returns the current hour of this I/O unit based on a 24-hour clock

Macro Line Example	Description
While HOUR=0 [CR]	Executes following command statements continuously during first HOUR of each day

MINUTE

Returns the current minute (0-59)

Macro Line Example	Description
While MINUTE=30 [CR]	Executes following command statements continuously during 30th MINUTE of an hour

SECOND

Returns the current second (0-59)

Macro Line Example	Description
IF SECOND=45 THEN [CR]	Executes statement if SECOND equals 45

METERING MACROS

Macros can be used to modify all parameters pertaining to the metering input channels, including the A/D values, calibration constants, and upper and lower alarm limits. They can enable/disable each channel's input and retrieve the current floating point value of any meter channel.

This ability is useful for long-term functions such as when a transmitter changes its power output. A macro can make the power change and also change the upper and lower limits.

When making these changes, it is suggested that the meter channel being modified use the previously described MUTEMETER command as one of its first lines of code. Also, remember to use the UNMUTEMETER command when finishing the macro.

METER

The METER command allows a macro to retrieve the floating point value of a particular meter channel. A metering channel can be set to the same value as another metering channel or to a set value. For these values to remain unchanged, the meter channel must stop collecting new data by the use of the METEROFF command explained later.

The METER statement must be immediately followed by parentheses with the channel number inside.

Macro Line Example	Description
METER (5) = METER(9) [CR]	Meter Channel 5 of this unit is now equal to Meter Channel 9
WHILE METER(12)<100	As long as Meter Channel 12 of this unit is less than 100 the WHILE loop will cycle

METERAD

After receiving the analog input voltage on a meter input, it is converted to a digital integer value. This value is called the A/D (A to D) value. A macro can read or modify that value. The A/D hardware has 4096 “bins” that it fills up in proportion to the maximum input value (typically +10VDC) and the actual input value. If the input range was set to 0VDC to +10VDC and the actual input value was +5VDC, then the A/D value would be 2047 $((4096 \div 2) - 1)$.

The METERAD statement is immediately followed by the channel number inside of parentheses.

Macro Line Example	Description
METERAD(5) = 390 [CR]	Sets the A/D value of Meter Channel 5 on this unit to 390
METERAD(3) = METERAD(13) [CR]	Sets the A/D value of Meter Channel 3 on this unit to the same value as Meter Channel 13 on this unit

METERCC

The calibration constant of each metering channel is unique and may be modified manually or by a macro. The calibration constant is a multiplier that is applied to the input A/D value before being usable by monitoring software or mathematical functions in a macro. This way a +3VDC input can be made to equate to 2.1KW (Kilowatts). The calibration constant in this instance would be approximately 0.00171 $(2.1 \div (4096 * .3))$. For a displayed reading of 50,000 and an input of +8.5VDC, the calibration constant would be approximately 14.3596 $(50000 \div (4096 * .85))$. The .3 and .85 in the above equations represent a percentage of a maximum value: 3 volts of 10 volts possible and 8.5 volts out of 10 volts possible.

The METERCC value is a floating point value and is entered in an equation form with METERCC followed by the channel number inside of parentheses on one side of the equation and its floating point value on the other.

Macro Line Example	Description
METERCC(14) = 2.583 [CR]	Assigns the value of 2.583 to Meter Channel 14's calibration constant on this unit
METERCC(12) = METERCC(3)/14 [CR]	Assigns the value of this unit's Meter Channel 3's calibration constant divided by 14 to this unit's Meter Channel 12's calibration constant

L1METER 1st Lower Limit U1METER 1st Upper Limit
L2METER 2nd Lower Limit U2METER 2nd Upper Limit

The definition of a meter channel's lower or upper limit is defined in the configuration section. The use of these statements allows a macro to receive a limit's value or change that setting to a predefined value. This is useful when changing existing limits in a pre-planned manner, without the need to mute one input channel and unmute another. See the Power Change macro example on the following page.

The statement is followed by the channel number within parentheses and is then set equal to another floating point value. All values are after the calibration constant is applied.

Macro Line Example

L1METER(1) = 65.00 [CR]
 U2METER(1) = 115 [CR]
 IF L2METER(1) = 50 THEN [CR]

Description

Sets the 1st Lower Limit on Meter Channel 1 of this unit to 65
 Sets the 2nd Upper Limit on Meter Channel 1 of this unit to 115
 Allows a conditional command to execute if the 2nd Lower Limit of Meter Channel 1 on this unit is equal to 50

METERF(n)

The NewValue is a floating point number and must be within the calibrated A-D range of the given channel.

Macro Line Example

METEROFF(16) [CR]
 METERF(16) = 8.321 [CR]

Description

Turns off Meter Channel 16 from new display updates
 Meter Channel 16 will now display the value 8.321

METEROFF/METERON

The METERON/METEROFF commands allow a macro to start or stop a metering channel from converting the analog value into a digital value. This is useful when a calculated value needs to be displayed in a monitoring view. When given the command of Meteroff, the meter channel will not display analog readings taken from the input. A value can now be entered by using meterAD(x) or meterF(x) statements.

Either statement is followed by the metering channel number to be turned on or off inside of parentheses.

Macro Line Example

METEROFF(14) [CR]
 METERON(15) [CR]

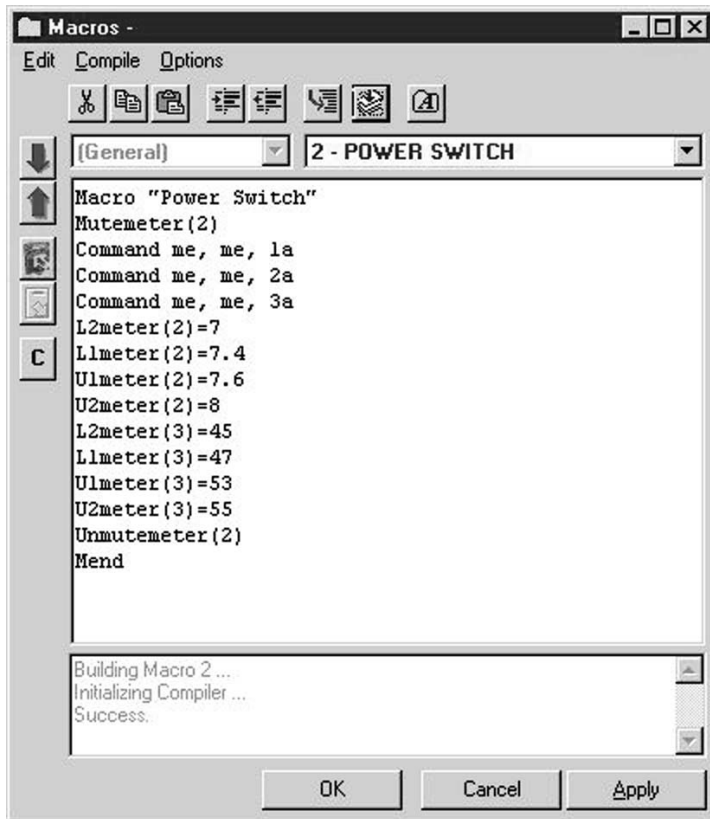
Description

Turns this unit's Meter Channel 14 off
 Turns this unit's Meter Channel 15 on

Macro Examples

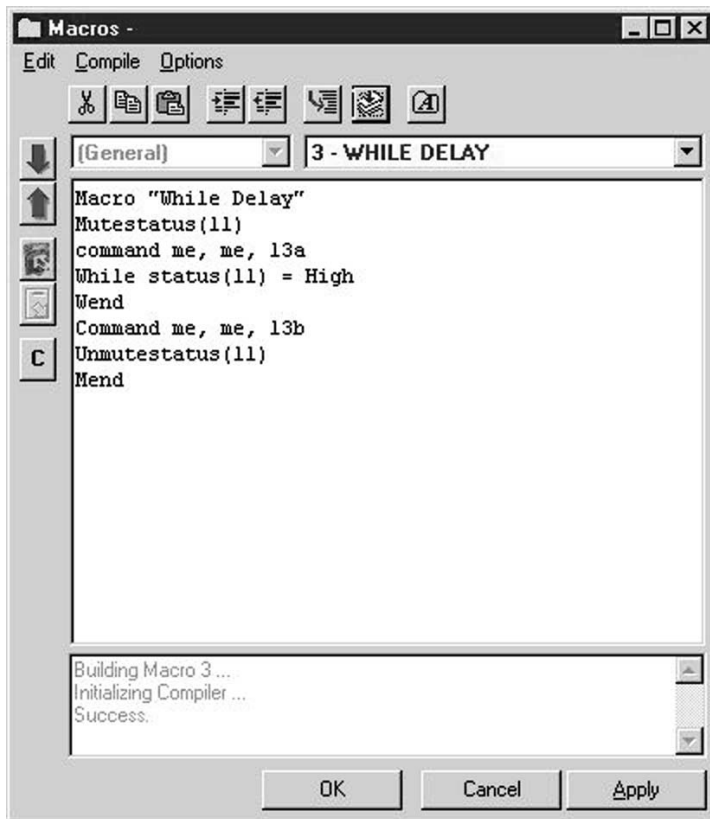
The following pages contain several examples of typical macros. If further assistance is needed in learning how to program macros, visit the support section of the Burk Technology website at www.burk.com.

Power Change



Power Change Macro

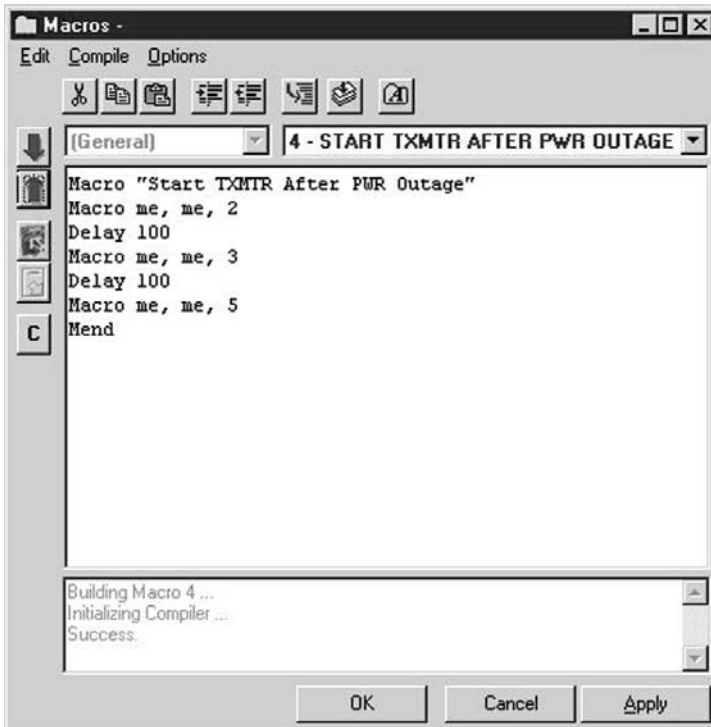
This example shows a power change and a limit change. First, the macro mutes Meter Channel 2 to prevent any alarms that might be triggered before the new limits are established. The macro issues three commands to initiate the power change. Then the macro sets new limits for Meter Channel 2. The 2nd Lower Limit is set to 7 and the 1st Lower Limit is set to 7.4. The 1st Upper Limit is set to 7.6 and the 2nd Upper Limit is set to 8. The macro also sets new upper and lower limits for Meter Channel 3 but does not mute the channel. After all adjustments are completed, the macro unmutes Meter Channel 2 and ends.



While Delay Macro

While Delay

This example shows how a While statement can set up a variable loop which pauses a macro until a defined set of conditions are met. First, the macro mutes Status Channel 11, then issues Command 13a. The While statement checks the reading of Status Channel 11. As long as Status Channel 11 is "High," the macro will continue to loop and check the status. When Status Channel 11 is no longer High, the While statement ends and the macro issues Command 13b. Last, the macro unmutes Status Channel 11 and ends.



Start Transmitter Macro

Start Transmitter

This is an example of a macro that starts other macros after a short time delay. The first line starts Macro #2. There is a 10-second delay, then Macro #3 is started. After another delay of ten seconds, Macro #5 begins. Each line of code takes approximately .2 seconds to run.

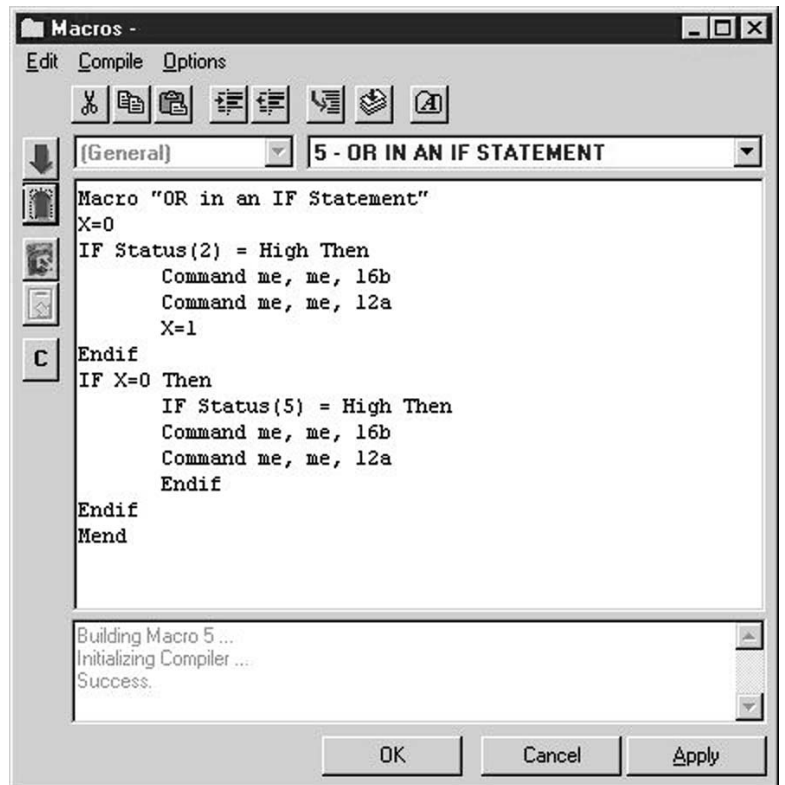
NOTE: This macro shows a time delay only. Each macro will start immediately after the specified amount of delay time whether or not the previous macro has finished. This type of macro should be used with caution because too many macros running simultaneously (more than eight) will cause an alarm. If a macro needs to be completed before continuing on to the next part of the macro, follow the sub-procedure example on page 119.

OR in an IF/THEN Statement

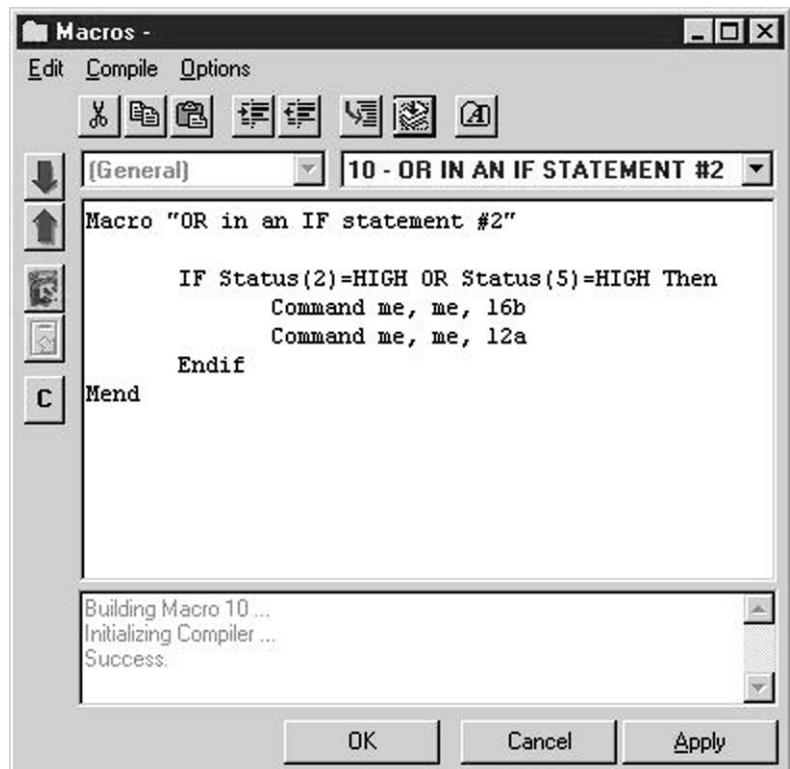
This example shows how a macro can examine a situation, then choose the appropriate course of action. The first line sets an individual variable "X." This line is important because it enables the macro to recognize whether or not it has already taken some kind of action. The first "IF" statement checks Status Channel 2. If the reading on this channel is "High," then the macro issues Commands 16b and 12a, and changes the individual variable to X = 1. If the reading on Status Channel 2 is not "High," the "IF" statement ends without issuing the commands or changing the variable.

The next "IF" statement checks the individual variable. IF X = 1, then commands have been issued, the "IF" statement is skipped and the macro ends. If X = 0 still, then the "IF" statement continues execution. Here another "IF" statement checks Status Channel 5. If the reading on this channel is "High," the macro issues Commands 16b and 12a, then ends the macro.

The second example shows how the same results can be achieved by the use of the "OR" statement in an "IF/THEN" command.



Or In If/Then Statement Macro



Or in If/Then Statement Macro



And In If/Then Statement Macro

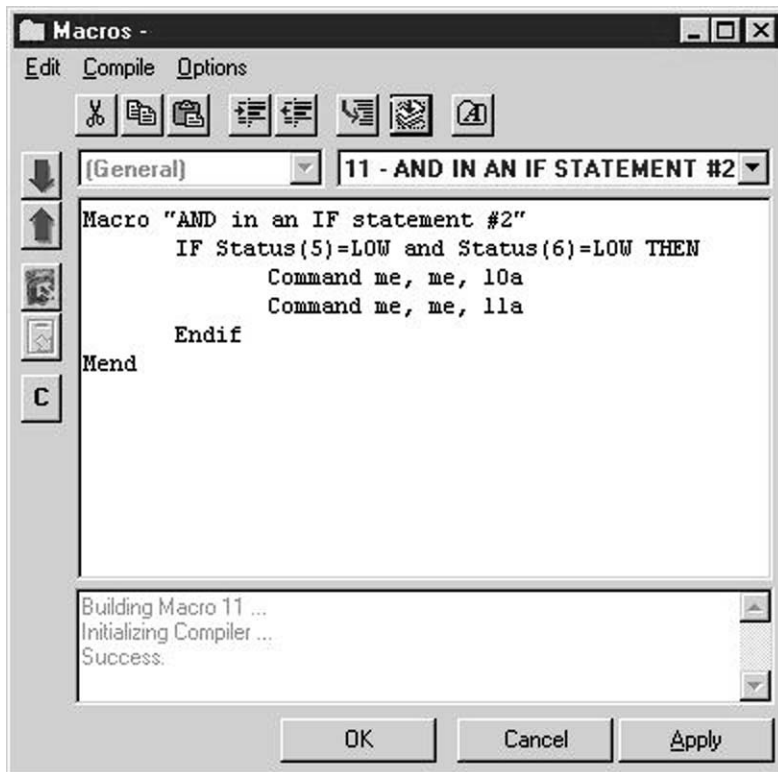
AND in an IF/THEN Statement

This example shows a macro examining two factors in a situation and then taking action if both factors require it.

First, the macro checks Status Channel 5. If the reading on this channel is not "Low," the IF statement is skipped and the macro ends. If the reading on Status Channel 5 is "Low," then the macro checks Status Channel 6. If the reading on Status Channel 6 is also "Low," the macro then issues Commands 10a and 11a. If Status Channel 6 is not "Low," then no action is taken and the macro ends.

In order for any commands to be issued, both conditions must be true.

The second example shows how the same results can be achieved by the use of the "AND" statement in the "IF/THEN" command.



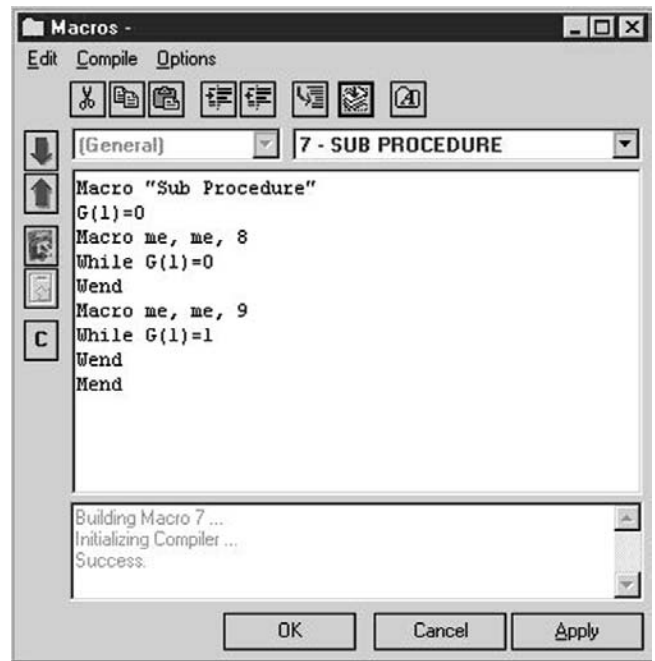
And in If/Then Statement Macro

Sub Procedure

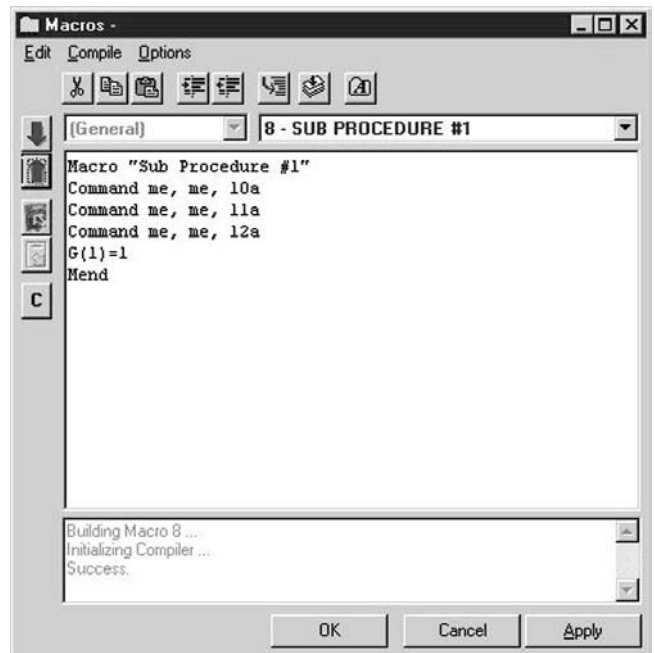
These examples show how global variables may be used in nested macros to ensure that each macro is finished before another one begins. The first line sets the global variable number one to a value of zero. This line sets up a variable loop that prevents subsequent macros from starting before the current one has finished running. The second line launches Macro #8 which issues three Commands; 10a, 11a, and 12a, after which the global variable is made equal to 1.

While Macro #8 is executing, Macro #7 is paused in a variable loop established by the WHILE statement that lasts as long as G(1) = 0. When Macro #8 changes the global variable to 1, Macro #7 ends the WHILE statement and launches Macro 9. Macro #9 issues three commands and then changes the value of the global variable to 2 and then ends.

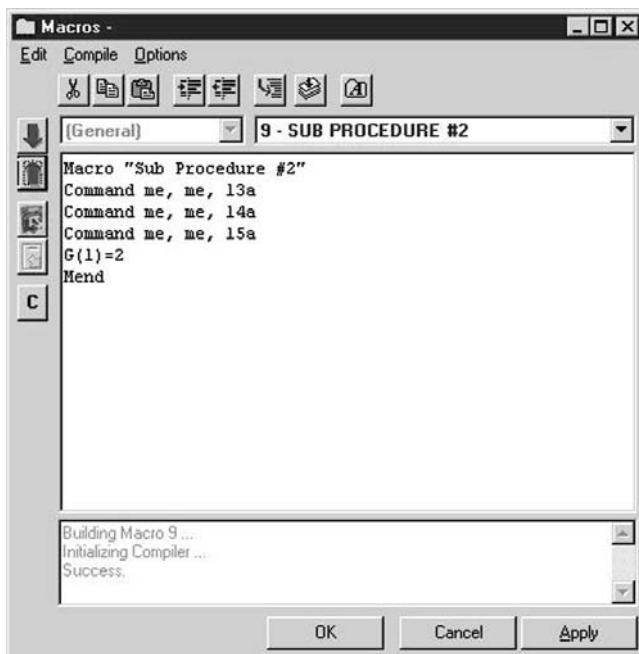
Macro #7 is paused by the second WHILE statement until Macro #9 changes the global variable to 2. Macro #7 then ends the WHILE statement and ends the macro.



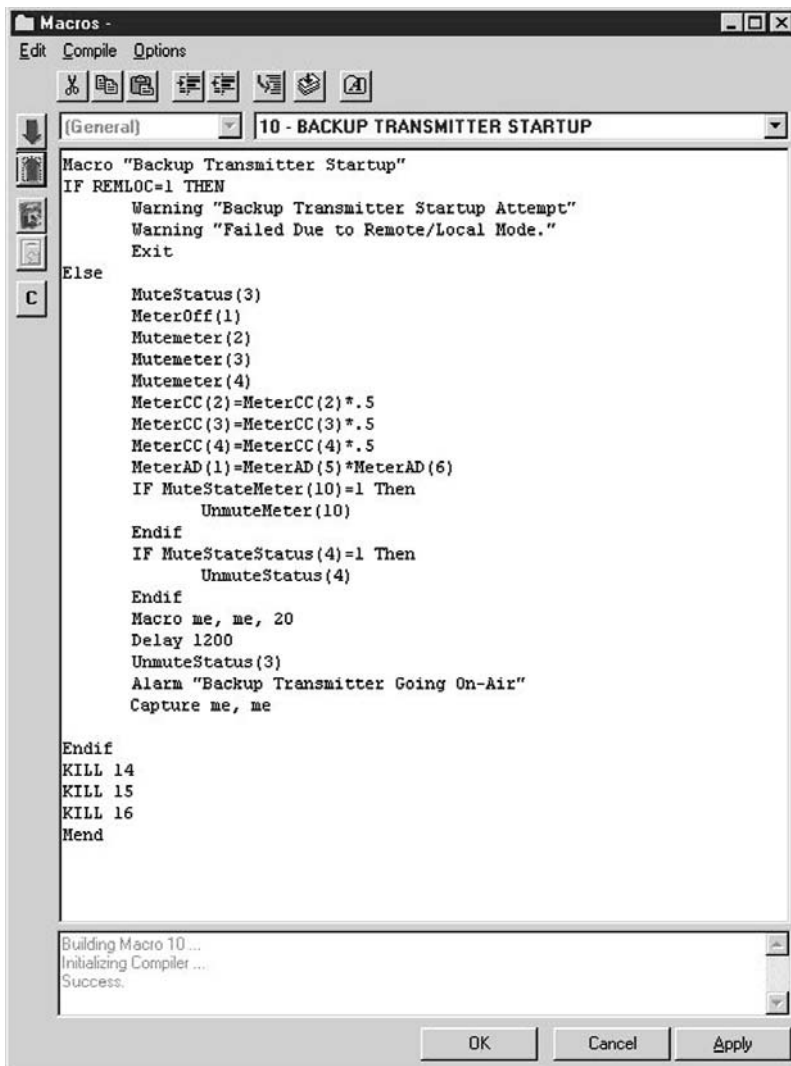
Sub Procedure Macro



Sub Procedure Macro



Sub Procedure Macro



Self-Directed Startup Macro

Self-Directed Startup

This example shows some more of the versatility of the macro language. Here, a status channel triggered Macro #10 to run. The macro first tests to find out if the REMOTE/LOCAL button on the front panel is in LOCAL mode. If it is, the macro ends immediately.

If the unit is in REMOTE mode, then the macro proceeds. The unit MUTES the status channel that starts the macro. Meter Channel 1 is then turned off along with the muting of Meter Channels 2, 3, and 4. The Calibration Constants of Meter Channels 2, 3, and 4 are adjusted for the new power output levels of the backup transmitter. The displayed value viewed by monitoring software of Meter Channel 1 is equated to the product of Meter Channels 5 and 6.

Since other macros could have made changes to various meter or status input channels, Status Channel 4 and Meter Channel 10 are tested to make sure they are active or unmuted. Then Macro #20 on this unit is started, which is the full power-up routine. This macro waits 2 minutes for Macro #20 to finish. Status Channel 3 is unmuted. An alarm is generated, notifying the dial-out connections and any full-time direct connect stations that the backup transmitter is now going on-air. A capture is made to show the current state of all inputs and outputs for database use as needed. Just in case any other macros dealing with the backup transmitter are running, they are terminated to stop any interference. The macro then ends normally.

Macro Worksheet

Site Name / Number: _____

Unit Name: _____

	Macro Name	Description
1	(Startup)	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
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14		
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32		

7 Managing Tasks & Data

The data management process consists of three steps:

- 1. Captures** Using your VRC2500's Timed Events program you can schedule routine data captures on your VRC2500. Data captures are also an available action choice when setting up Metering and Status channel alarm conditions. Macros can also be used to generate captures. Once a capture is taken, it is stored in VRC2500's memory until the next time you connect to the site at which point the data is downloaded to a file on your PC. When data is being downloaded, a small Data icon appears over the unit icon. When the download is finished, the icon disappears.
- 2. Collection** Once the captures have been stored, they will need to be collected and imported into the database. When the data is collected, you can browse and select data, create reports and schedule print jobs.
- 3. Print Jobs** The third step is creating a hard copy of the data.

This chapter discusses two powerful tools that facilitate data and task management. The **Data Browser** enables you to manage your data and perform collection and print jobs. The **Scheduler** is used to manage tasks and to create automated tasks for running any VRC2500 program or Windows executable file.

Data Browser

CREATING DATA CAPTURES

You can create a data capture using one of the following methods:



If the Data Browser can't find the default database, or if the default database

doesn't match the backup database, it will open the Data Manager which allows you to manually select the correct database. When a usable database is selected, the Data Browser will open.

- Schedule routing data captures in Timed Events (page 60).
- Select data capture as the metering or status channel alarm action (page 54).
- Program a data capture macro (page 101).

COLLECTING DATA

After data is captured, you need to collect the data. This is done through the Data Manager utility.



Open the Data Browser by clicking on the button in the VRC Explorer control bar.



Data Browser

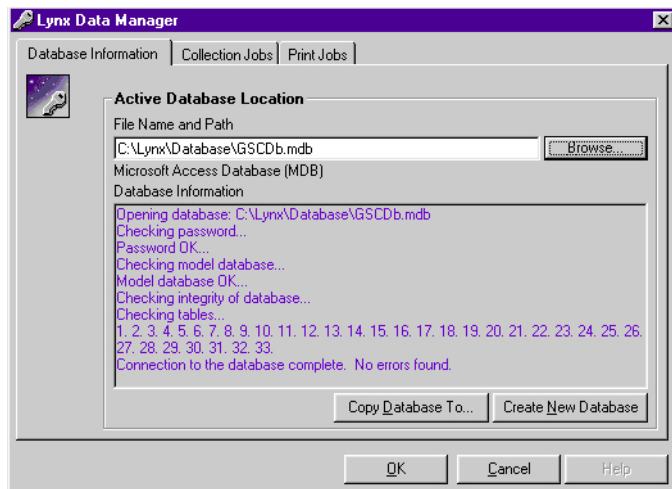
Or you can click on the Data Browser icon in the Unit Configuration Window. It may take a few moments for Data Browser to open.

Unit Name	Ch#	Log Time	Type	Meter	M Tolerance	M Mute	Units
Unit 0	1	01/09/2001 8:18:00 AM	0	0.000	1L		
Unit 0	2	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	3	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	4	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	5	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	6	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	7	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	8	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	9	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	10	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	11	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	12	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	13	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	14	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	15	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	16	01/09/2001 8:18:00 AM	0	0.000			
Unit 0	1	01/09/2001 8:18:02 AM	0	0.000	1L		
Unit 0	2	01/09/2001 8:18:02 AM	0	0.000			
Unit 0	3	01/09/2001 8:18:02 AM	0	0.000			
Unit 0	4	01/09/2001 8:18:02 AM	0	0.000			
Unit 0	5	01/09/2001 8:18:02 AM	0	0.000			
Unit 0	6	01/09/2001 8:18:02 AM	0	0.000			
Unit 0	7	01/09/2001 8:18:02 AM	0	0.000			
Unit 0	8	01/09/2001 8:18:02 AM	0	0.000			
Unit 0	9	01/09/2001 8:18:02 AM	0	0.000			

Data Browser Main Screen



Click the **Data Manager** button on the Data Browser toolbar. The Data Manager window opens on the Database Information tab.



Data Manager Window, Database Information tab



The Database Information tab allows you to create, copy or find a database.

Browse opens a allows you to search for and select the database file. Copy Database To allows you to save a copy of the database to a new location. Create New Database allows you to create a new VRC compatible database.

To Create a Collection Job

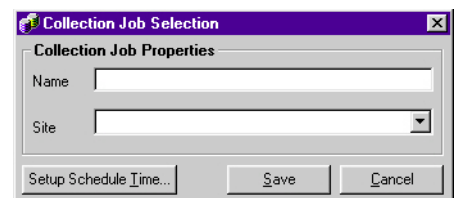
1. Enable only one computer to clear the capture history after collection jobs.

This option is set in the site properties window under the Other tab. The computer you will use to do collections should have the **Clear Capture History After Downloaded to this PC** option selected. Please note that by default this option is selected. If you don't unselect this option, every computer that connects to this site and does captures will erase all capture data from the site. Please make sure that you unselect this option for other computers that connect to the site. Only one computer should have this option checked.

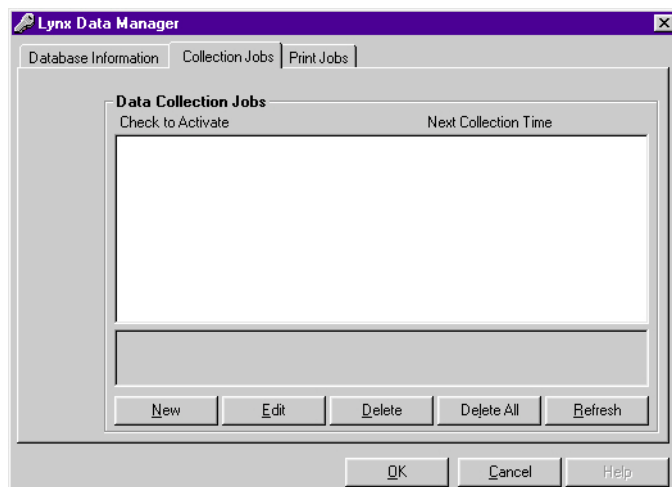
2. On the **Collection Jobs** tab, Click **New**. The Collection Job Properties window opens. Enter a name for the collection job. Choose a name that will allow future users to understand what type of collection job is occurring.



If you are using Windows NT, you must be logged on as the Administrator in order to set up scheduled Collection and Print jobs.



New Collection Job Selection



Data Manager Window, Collection Jobs Tab

3. Select the site from the drop-down menu.
4. Click **Setup Schedule Time**. This opens a task window, which allows you to set dates and times for each data collection. Specify the date, time, and frequency of the collection.

Setting Times for Job Collection



When scheduling Collection jobs, we recommend that you schedule the collection to occur five minutes after the unit capture has occurred to avoid overlapping capture and collection times.

Interval Type

To create a recurring task, use options in the left column to schedule a job to occur every month, week, day, hour, or minute.

To schedule a job to skip intervals of time, such as every other month, every three weeks, every 5 days, or every 30 minutes, use the options in the right column.

Months/Weekdays

If a job is to run only on selected months, check the box in front of those months. If all boxes are blank (default), the job will run every month.

If a job is to run only on selected days, check the box in front of those days. If all boxes are blank (default), the job will run on every day of the week.

Day of Month/Hour/Minute/Second

If a job is to run on a specific day of the month, or at a specific hour, minute, or second of the day, use the drop down boxes. All time intervals, that are more specific than the interval type selected, must be filled in or all possible combinations are executed. For example, a daily task must have the hour, minute, and seconds specified or the job will attempt to execute every second of that day.

The text area displays a text description in a simple English phrase describing the job's scheduled run time(s).

Task

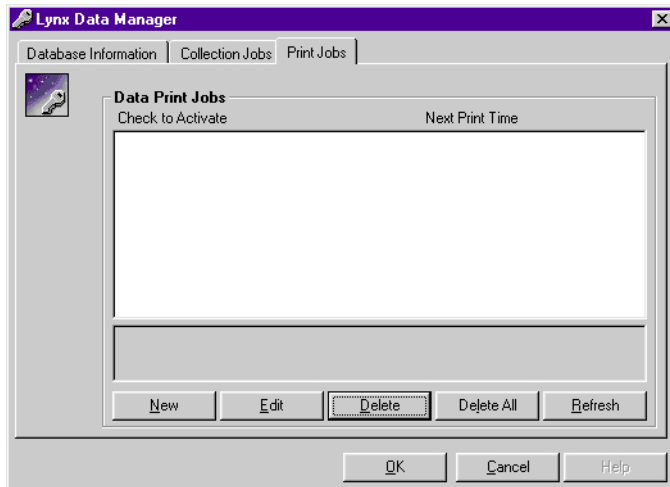
The Job name already appears in the task name field. If you would like to change the name you may do so here.

5. Click **OK** to return to the Collection Job Properties window.
6. Click **Save** to save this entry into the Data Manager and Scheduler. Clicking **Close** exits the window without saving any changes.

PRINTING DATA

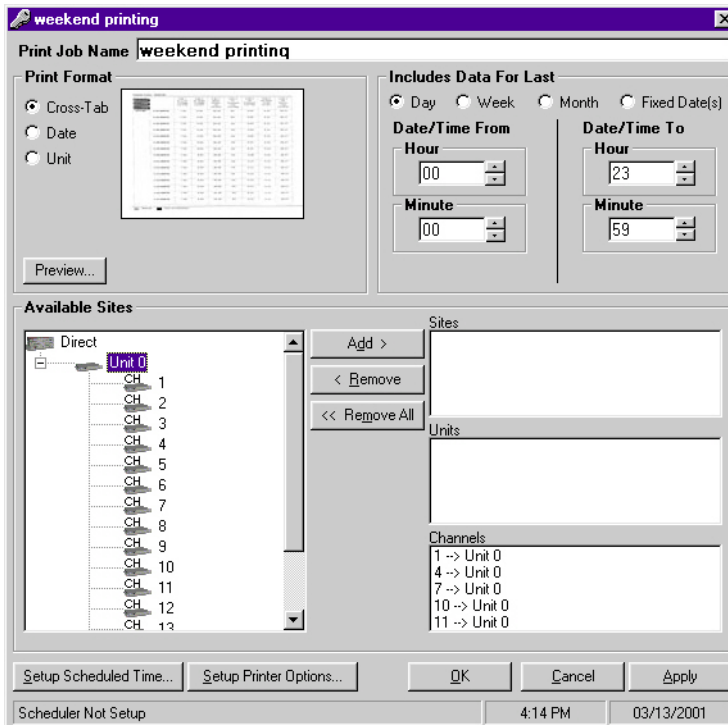
Many users find that it works best to do a print job every hour or every three hours. The following steps demonstrate how to set up an hourly print job.

1. Click on the Print Jobs tab in the Data Manager window.



Data Manager Window, Print Jobs tab

2. Click New. This opens the print job properties window.



Print Job Properties

3. Enter the Name of the print job and select one of the three print format options. Once you have selected a print format, you will see all available sites to print.



Before you can set up a print job, a collection job must have already taken place. You will not see any sites or I/O units in the available sites window until the collection has occurred.



Print and Collection jobs should only be created and edited in the Data Manager.

Do NOT edit in the Scheduler. If you need to make changes to jobs, it is best to delete the old entry and enter a new job.

4. In the **Includes Data For Last ...** section, select **Day**. Enter the time using the following table as a guide.

For captures taken during the hours from ...	Setting in table Date/Time From		Setting in table Date/Time To	
	Hour	Minute	Hour	Minute
midnight to 1:00 A.M.	00	00	01	01
1:00 A.M. to 2:00 A.M.	01	01	02	01
2:00 A.M. to 3:00 A.M.	02	01	03	01
continue in same manner				
10:00 P.M. to 11:00 P.M.	22	01	23	01
11:00 P.M. to midnight	22	59	23	59

If you want a different data selection, specify the date range for the data to be included in the report.

Select **Day** for the previous calendar day.

Select **Week** to enable the options at the bottom of the window. Select the starting and ending days of the week.

Select **Month** to change the options to calendar days of the month. Select a date range from the previous 1 to 31 days.

Select **Fixed Date(s)** to change the Date/Time options. Select the date range by entering the precise month, day, year, hour, minute and second.



Importing, exporting, adding to, changing, or deleting the database can affect the print jobs that are stored in the database and in the VRC2500 Scheduler. If you modify the database, the print job loses its link to the database. To reassociate your print jobs to the current database, you need to open your print jobs in the Data Manager window. Select each print job individually and click Edit to open the Print Job window. Then click OK to close the window.

5. Select sites, units, and channels from the Available Sites window and click **Add**. Clicking on the plus sign (+) in front of the site name allows you to view units and channels. Only sites with collected data appear in the Available Sites window.
6. Click **Setup Scheduled Time**. Select **Daily** in the Interval Type section. Leave the Months, Weekdays, and Day of Month areas blank. Define the Hours, Minutes, and Seconds.

Example: If the Date/Time settings for the data range are from 5:01 to 6:01, schedule the print time as Hour: 6, Minute: 01, and Second: 10.

If you do not want an hourly print job, set up the frequency using the instructions on page 126 as a guide.

7. Click **Apply** and then **OK** to return to the print job properties window and then **Apply** and **OK** to return to the Data Browser.

CUSTOM PRINT JOB REPORT SAMPLES

Unit Name: Unit #0

Cross Tab Report

Channel#	Ch# 1 #1 Low Voltage Un:Vlts	Ch# 2 #1 High Voltage Un:KV	Ch# 3 Main Power Out Un:KW	Ch# 4 #1 Temperat ure Un:Deg	Ch# 5 #2 Filament Un:Vlts	Ch# 6 #2 Plate Volts Un:KV	Ch# 7 #2 Power Out Un:KW	Ch# 8 #2 Temperat ure Un:Deg	Ch# 9 Room Temperat ure Un:Deg	Ch# 10 Reflected Power Un:Watt	
05/19/20 00	09:09:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	3.33
	09:10:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:12:00AM	9.60	7.75	50.20	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:13:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	3.33
	09:14:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	56.00	60.00	4.17
	09:15:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:16:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:17:00AM	9.59	7.75	50.15	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:18:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:19:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:21:00AM	9.60	7.75	50.17	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:22:00AM	9.59	7.75	50.15	23,753.1	0.75	0.00	0.00	70.00	60.00	4.17
	09:23:00AM	9.60	7.74	50.13	23,753.1	0.75	0.00	0.00	56.00	60.00	4.17
	09:24:00AM	9.59	7.74	50.07	23,753.1	0.75	0.00	0.00	70.00	60.00	3.33

Signature _____



Muted



Out of Toleran

05/19/2000

Direct Connection

Date Report

Ch#	Metering	Value	Units	T	M	Status	T	M	Command
2000/05/19 09:09:00									
<i>Unit Name: Unit #0</i>									
1	#1 Low Voltage	9.596	Vlts	1U		#1 Low Voltage Off			Transmitter 1 On
2	#1 High Voltage	7.748	KV			#1 Master Off			#1 High Power
3	Main Power Out	50.174	KW			#1 Low Power			#2 Off
4	#1 Temperature	-23,753.107	Deg	2L		#1 Power Raise			#2 Low Power
5	#2 Filament	0.752	Vlts	2L		#2 Filament Off			Antenna Main
6	#2 Plate Volts	0.000	KV	2L		#2 Plate Off			S T L Main
7	#2 Power Out	0.000	KW	2L		#2 Low Pwer			Power to AC Mains
8	#2 Temperature	70.000	Deg			#2 Power Lower			Generator Off
9	Room Temperature	60.000	Deg			Antenna to Standby			AC, Okay
10	Reflected Power	3.333	Watt			S T L Standby			
11	AC Phase 1	0.220	KV			Power to Generator			Smoke Alarm OK
12	AC Phase 2	0.220	KV			Blower On			Security Okay
13	AC Phase 3	0.220	KV			Generator Start			
14	Generator Phase 1	0.176	KV			AC Mains Breaker Off			
15	Generator Phase 2	0.183	KV			#1 Mains Power Off			
16	Generator Phase 3	0.220	KV			#2 Mains Power On			

Signature _____

1

Direct Connection


Unit Report

Signature _____

Time	Unit Name Ch#	Name	Metering		T	M	Status		Command
			Value	Units			State	M	
00/05/19 09:09:00	Unit #0	1	#1 Low Voltage	9.60	Vlts	1U	Transmitter 1 Off		#1 Low Voltage Off
		2	#1 High Voltage	7.75	KV		#1 Low Power		#1 Master Off
		3	Main Power Out	50.17	KW		#2 On		#1 Low Power
		4	#1 Temperature	-23,753.11	Deg	2L	#2 High Power		#1 Power Raise
		5	#2 Filament	0.75	Vlts	2L	Antenna Standby		#2 Filament Off
		6	#2 Plate Volts	0.00	KV	2L	S T L Standby		#2 Plate Off
		7	#2 Power Out	0.00	KW	2L	Power to Generator		#2 Low Pwer
		8	#2 Temperature	70.00	Deg		Generator Running		#2 Power Lower
		9	Room Temperature	60.00	Deg		AC, NO POWER		Antenna to Standby
		10	Reflected Power	3.33	Watt				S T L Standby
		11	AC Phase 1	0.22	KV		FIRE FIRE FIRE		Power to Generator
		12	AC Phase 2	0.22	KV		Danger Intruder		Blower On
		13	AC Phase 3	0.22	KV				Generator Start
		14	Generator Phase 1	0.18	KV				AC Mains Breaker Off
		15	Generator Phase 2	0.18	KV				#1 Mains Power Off
		16	Generator Phase 3	0.22	KV				#2 Mains Power On

ADMINISTRATIVE TOOLS

The Administrative Tools allow you to delete database information, set up users with passwords, monitor actions to the database, read the error log and delete the error log.


 To access the administrative tools, click on the **Administrative Tools** icon on the Data Browser Toolbar. You must enter a password to use the administrative tools. The default Administrator password is stored in the database as "gentner." The Administrator password can be changed from the Administrative Tools window.

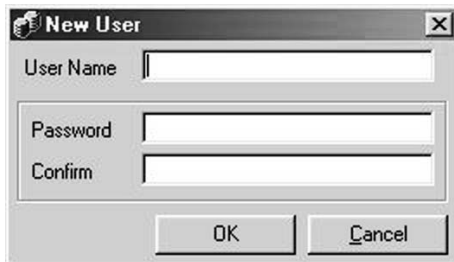
All passwords are encrypted and then stored in the database. The default password to the database is "gentner." The passwords can not be seen in the database and will be shown as 0's and 1's.

After correctly entering your password, the Administrative Tools window opens.

Administrative Tools Toolbar

The following features are available in the Administrative Tools toolbar:


 **Add New User** opens a new window where the administrator can enter a new name and password for a user. This person is now able to modify or delete any database used by the VRC2500 software.



The "New User" dialog box contains three input fields: "User Name", "Password", and "Confirm". Below the fields are "OK" and "Cancel" buttons.

Login Screen

 **Edit User** allows an Administrator to edit the selected user's name in the Administrative Tools window.

 **Delete User** allows an Administrator to delete the selected user's name in the Administrative Tools window.



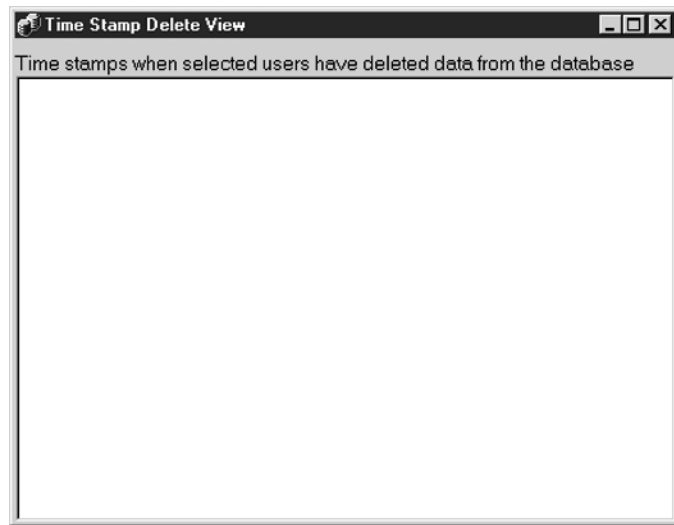
Password Prompt



Administrative Tools Window



View Monitor File allows the Administrator to see who has deleted information from the database, with the timestamp of when it occurred.




Time Stamp File



View Error Log File opens the error log for review. This should only be used with the assistance of a technical support representative.



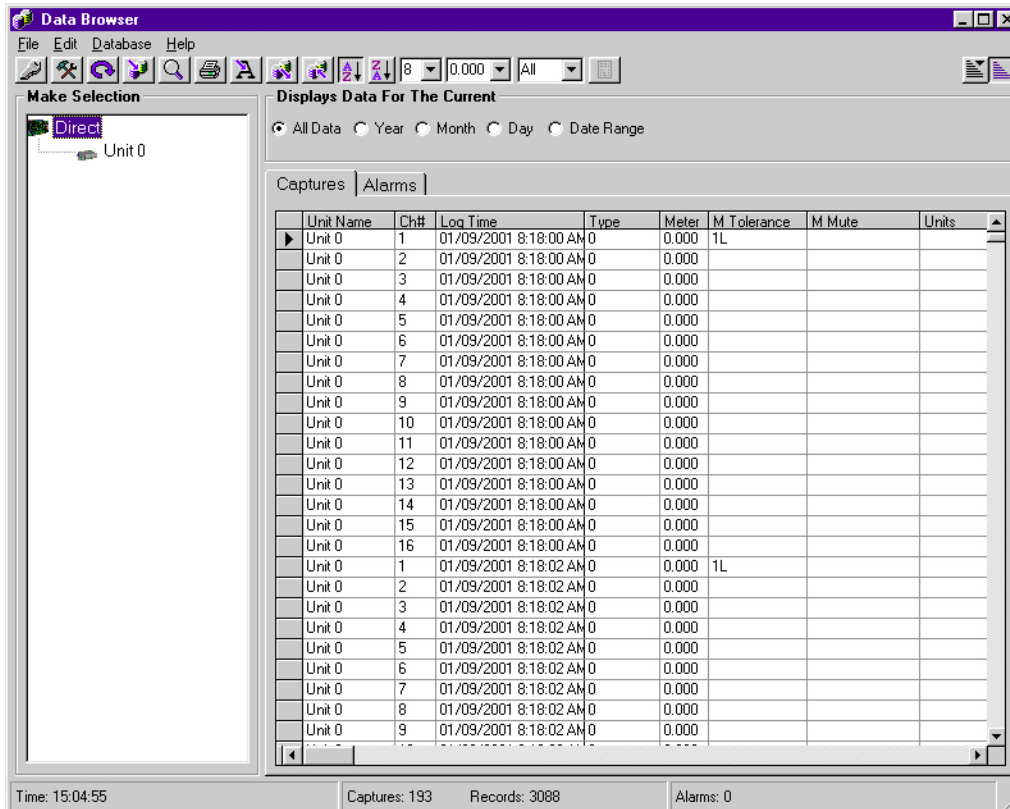
Delete Error Log File allows an Administrator to permanently delete the error log. Use sparingly and only if everything has been working well or as instructed by support personnel.



Close

Click **Close** to close the Administrative Tools window.

CUSTOMIZING THE DATABASE GRID



Database Grid

The “database grid” is a major component of the Data Browser. It is here that you can select your sites, units, metering, status, and command channels and view the information in a spreadsheet-like grid. You can also permanently delete data for a site or unit or delete a time stamp.

There are two tabs on the Database Grid. One displays captures for the selected units and channels, the other displays alarms.

Grid Column Definitions

Captures

Unit Name displays the name you assigned to the selected unit.

Channel # displays the metering, status, and/or command channel number 1-16 (1-8 for an I/O 8 unit) you have selected. If you have selected all three types of channels, they will be grouped on the same row by channel number.

Log Time shows the time of the last data capture on the selected channel(s).

Type displays the type of meter (represented by a numeric value) used by the selected channel. 0 = 0 – 10 Volt Scale, 1 = -5 – +5 Volt Scale, 2 = Linear to Power Scale, 3 = Indirect Power Scale.

Meter gives the meter value at the time of the last log capture.

M Tolerance displays the first and second upper and lower limits set for the selected meter channel.

M Mute shows if the selected meter channel is muted or unmuted.

Units gives the unit of measurement used by the meter channel (Volts, Amps, Kilowatts, etc.)

Status displays an H or L indicating whether the channel is a high or low channel.

S Tolerance displays the user specified condition that will trigger an alarm on this channel.

S Mute shows if the selected status channel is muted or unmuted.

Command displays an A or B depending on the last command given on the selected channel.

Note opens a note window where you can enter comments.

Alarms

Site Name displays the name you assigned to the selected site.

Unit Name displays the name you assigned to the selected unit.

Alarm Time displays the time of alarms reported on the selected channel.

Type shows whether the alarm was reported on a metering or status channel.

Condition gives the alarm threshold for the channel, displaying the preset condition for an alarm and current condition. A meter condition might show $5.2V > 5$ meaning that the preset condition for the meter channel is 5 and the current condition is 5.2 thus triggering an alarm. A status condition might show XMTR OFF signifying that if the transmitter is off an alarm is triggered.

Message displays the textual description of the alarm.

Note opens a note window allowing you to document alarms, conditions, and actions taken.

To Delete a Time Stamp

1. In the make selection pane, select the unit that has a time stamp to be deleted.
2. Select the time stamp to be deleted. The complete row needs to be selected.

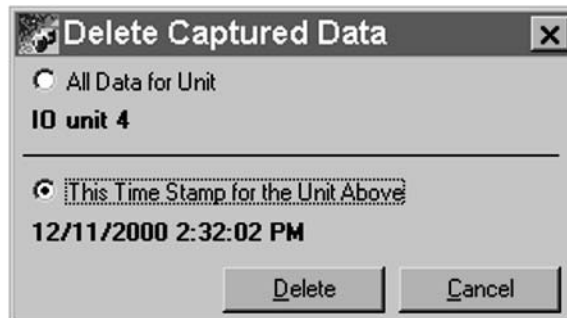
Unit Name	Ch#	Log Time	Type	Meter	H.Tolerance	H.Mute	Units	Status	S.Tot/S.Mute
IO unit 4	1	12/11/2000 2:32:02 PM	E 800	2L			-1	Fx #1 Fldm	
IO unit 4	2	12/11/2000 2:32:02 PM	E 800	2L				Fx #1 Plus	
IO unit 4	3	12/11/2000 2:32:02 PM	E 800					Fanvlt	
IO unit 4	4	12/11/2000 2:32:02 PM	E 800					Fanvlt	
IO unit 4	5	12/11/2000 2:32:02 PM	E 800	2L				Fanvlt	
IO unit 4	6	12/11/2000 2:32:02 PM	E 800					Fanvlt	
IO unit 4	7	12/11/2000 2:32:02 PM	E 800					Fanvlt	
IO unit 4	8	12/11/2000 2:32:02 PM	E 800					Generator	
IO unit 4	9	12/11/2000 2:32:02 PM	E 800				amps	Al. Chan	
IO unit 4	10	12/11/2000 2:32:02 PM	E 800					Vlt	
IO unit 4	11	12/11/2000 2:32:02 PM	E 800					Wtg	Smoke Alarm
IO unit 4	12	12/11/2000 2:32:02 PM	E 800					EngC	Security Dr.
IO unit 4	13	12/11/2000 2:32:02 PM	30 000	2L				EngC	
IO unit 4	14	12/11/2000 2:32:02 PM	E 800					Vlt	

3. Right-click on the unit and then click Delete Site or Unit Data.


Ch#	Log Time	
IO unit 4	1	12/11/2000 2:32:02 PM
IO unit 4	2	12/11/2000 2:32:02 PM
IO unit 4	3	12/11/2000 2:32:02 PM
IO unit 4	4	12/11/2000 2:32:02 PM
IO unit 4	5	12/11/2000 2:32:02 PM
IO unit 4	6	12/11/2000 2:32:02 PM
IO unit 4	7	12/11/2000 2:32:02 PM
IO unit 4	8	12/11/2000 2:32:02 PM
IO unit 4	9	12/11/2000 2:32:02 PM
IO unit 4	10	12/11/2000 2:32:02 PM

! Advanced users can open their site's database with Microsoft Access® which provides them with a much wider range of database capabilities than those provided with the Data Browser. Customized queries, sorting, storage, and reporting are some of these capabilities. Burk Technology is not able to provide any technical assistance to users wishing to explore these enhanced features. All modifications to the database are done by the user with the understanding that any and/or all data may be lost by doing this. There is no possible way to reconstruct damaged or destroyed data when done outside of the VRC2500 software.

4. Select **This Time Stamp for the Unit Above** and verify the time stamp shown is correct. Click **Delete**. A confirmation window will open. Click **Yes** to delete the time stamp and rebuild the database.

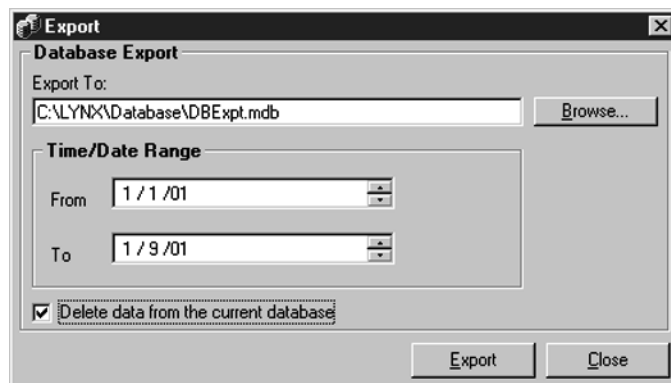


To Delete Time Stamps by Date Range

1. Click the **Export Database** button  on the Data Browser toolbar.
2. In the Export Database Window, enter the date range to be deleted.



You must define the date range for the data you wish to export. The Export Database Window will not reflect the date range selected in the Database Grid.



Export Database Window

3. Select **Delete data from the current database**. This removes the data from the Data Browser.
4. Click **Export**. The data will be exported to the destination database. If you desire to delete the information completely, you can use Windows Explorer to delete the database you have exported the information to.

If you do not select the delete option, the data will remain in the Data Browser as well as the database you export to.

ORGANIZING DATA

The Data Browser toolbar and menus have options that allow you to arrange the columns, to sort, and even to add notations. Data can be displayed for the current year, month, day, or you can specify a date range, or view all data.

In the example on page 133, only unit 0 in the New Site location is seen. Then, the data is sorted by Channel Number and Time Stamp. Only information from channel #1 is displayed.

The Alarms data can be sorted and filtered in the same fashion. Once the data is organized as desired, click on the print icon for a hard copy.

Data Browser Tools



Data Manager opens the Data Manager utility, which enables you to schedule data and print jobs.



Administrative Tools opens the Administrative Tools window.



Refresh Data refreshes the data grid. The Data Browser automatically refreshes after downloading new site data.



Download Now allows you to get information from a site immediately.

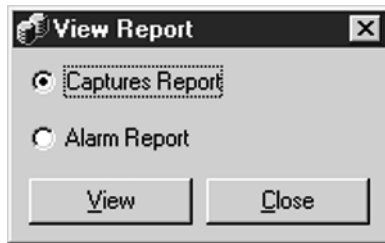
To Create an Immediate Capture and Collection

1. Connect to the site.
2. Create a Capture on Demand macro (see page 101).
3. Open the monitor view and click the capture macro.
4. In Data Browser, click on the **Download Now** button to open the Import Data window.
5. Select the site to download from the drop-down menu.



Data Import Window

6. Click **Download**. This will retrieve any captures currently in the I/O unit to be downloaded to the database.



Report Preview



Preview Report allows you to preview the data before printing. You can select a report type to show only the capture readings (metering, status, and command data) or the history of alarms generated by sites where data has been downloaded. You can also choose a report that combines both types of reports sorted by date. The report is displayed exactly as it appears on the paper and can be printed from this screen.



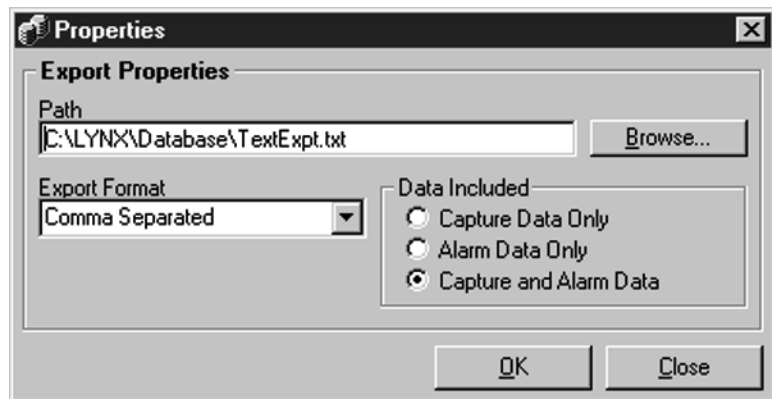
Print Report prints site and unit data using a standard report format. This format is not one of the report formats in the scheduled Print Jobs. If you are using the Database Grid view options and are viewing information by date range, the print feature will still print all data from the selected site/unit. The Database Grid sort and date range option will not affect the way the printout looks.



Export to a Text File takes the data in your database and exports it to a text file. This data can then be put into a spreadsheet or other formats.

To Print Selected Data

1. Click the **Export to Text File** button on the Data Browser toolbar.



2. Name the .txt file in the file save path or accept the default name. Choose the format for the text export and select the data to be included. Click **OK**.
3. Import the text file into a spreadsheet. Edit and print as desired.



MDB Import and Export imports or exports a Microsoft database type database into or from the Data Browser. It cannot import a database file that is not configured the same as a database created by the software.

Data Manipulation Tools




These functions work only on the Database Grid. They do not affect any other report created in the print jobs section.

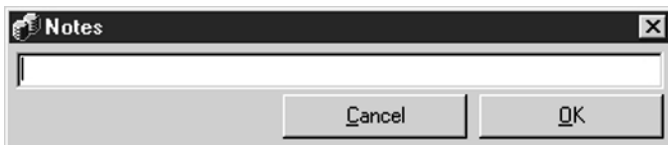
The first two buttons are for sorting. You can sort alphabetically from A-Z or Z-A using the Meter Name field.


The first drop down menu allows the font size to be adjusted from 8 - 24 pitch.


The second drop down menu adjusts the accuracy of the metering channel to the desired decimal point of accuracy, e.g. if the data was 1.679 and the accuracy was changed to 0.0 the displayed data would be 1.7.

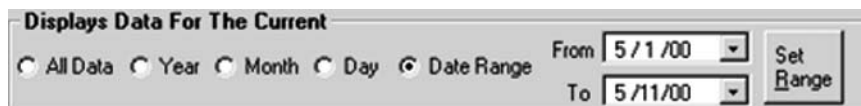
The third drop down menu adjusts the basic filtering of data. Normally, all 16 channels are displayed, but one single channel can be chosen if desired, and the meter, status, and command information for that channel is visible.

 Notes lets you insert a comment in the note column of the Database Grid on the selected row. You can also double-click in any cell to open the notes window.



 **Custom Sort** allows you to select one or more columns for the sort sequence. The display window next to the button shows the sort order. Click Default Sort to remove the custom sort order.

 **Default Sort** causes the Data Grid to sort by unit ID, then Time Stamp then channel number. This is also the default seen whenever the Data Browser program is started.



Display data for the current selection by the current year, month, day, or view all data or a specified date range by selecting the appropriate button.

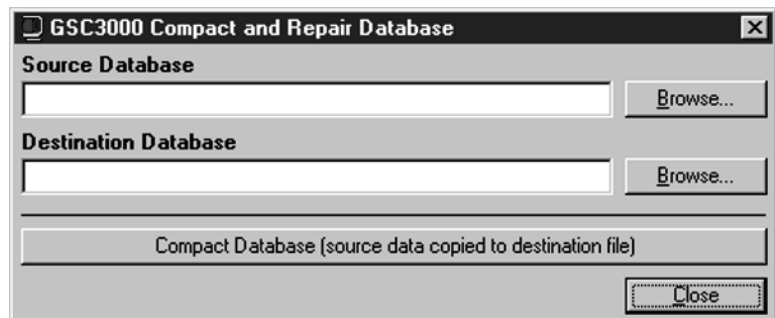
DATABASE COMPACT UTILITY

The Database Compact program allows you to reduce the size of your database by removing deleted time stamp entries (deleted entries are not visible through the Data Browser but still occupy space in the database) and saving only the current entries in a new database.

To Compact your Database

There is no icon for database compact utility in the VRC2500 program group. To access this utility, you must do the following:


1. Click on the My Computer icon on your Windows Desktop,
2. Choose the drive you have the VRC2500 software installed on, and choose the VRC2500 program directory. By default the program will be installed in C:\VRC2500, but you may have installed it to another location.
3. In the VRC2500 program directory, click on the icon for GSCompDB.exe.
4. In the VRC2500 Compact and Repair Database window, browse to and select the source database.
5. Click Browse to determine the location of the new file. Type in the name of the new database or use the default name.



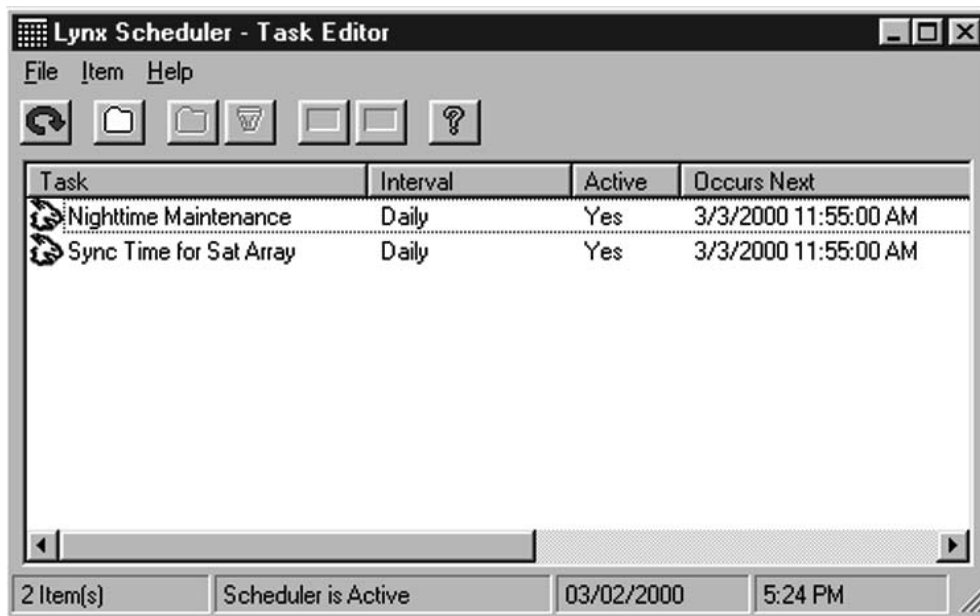
6. Click **Compact Database**.

You will use the compacted database as your current database. After compacting, you can then delete the original database and rename the new compacted database with the original name.


VRC2500 Scheduler

 The VRC2500 Scheduler is a scheduling program that needs to be active on the PC in order for the tasks to execute. The types of events controlled by the VRC2500 Scheduler include reports, and capture downloads, as well as Windows executable files and other software components.

Scheduler is accessed through the VRC Explorer Control Bar. Click on the Scheduler icon to open the Scheduler Task Editor window. From this window you can create new timed events as well as edit existing entries.



Creating a New Entry

 Click on the **New Task** icon. This will open a window allowing you to setup a new scheduled task. Please see “User Defined Tasks” on the following page for information on setting up a new task.

User Defined Tasks

User defined tasks are set through the New Scheduled Task window. These tasks are programs or executable files that run at a specified time, such as batch files, e-mail programs, and internet searches.

1. Specify the date, time and frequency.

Setting Times in Scheduled Task Window

Interval Type

To create a recurring task, use the options in the left column to schedule a job to occur every month, week, day, hour, or minute.

To schedule a job to skip intervals of time, such as; every other month, every three weeks, every 5 days, or every 30 minutes, use the options in the right column.

Months/Weekdays

If a job is to run only on selected months, check the box in front of those months. If all boxes are blank, the job will run every month.

If a job is to run only on selected days, check the box in front of those days. If all boxes are blank, the job will run every day of the week.

Day of Month/Hour/Minute/Second

If a job is to run on a specific day of the month, or at a specific hour, minute, or second of the day, use the drop down boxes. All time intervals, that are more specific than the interval type selected, must be filled in or all possible combinations will be executed. For example, a daily task must have the hour, minute, and seconds specified or the job will attempt to execute every second of that day.

Text Area

The Text Area displays a text description in a simple English phrase describing the job's scheduled run-time(s).

2. Enter the name of the task. This is the entry text visible in the Scheduler window.
3. Specify the program path or click on **Browse (...)** to open a Browse window and select the program manually.
4. If you need any program arguments to be parsed, enter the information. Not all programs require data to be present here.

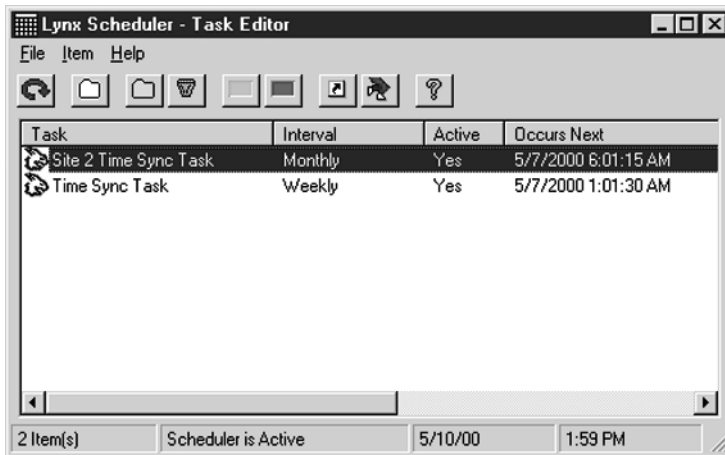
5. Check **Execute if Time is Passed** to force the job to run if it was not able to run at the specified time.

Once all the necessary information is entered, click on the **OK** button to add this job to the VRC2500 Scheduler. The job is now visible in the Scheduler's job window.









When the task is selected (highlighted), the rest of the icons on the tool bar become active.



Scheduled events will not update the "Occurs Next" field while the Scheduler window is open, unless you refresh the screen or close and re-open the window.



Task Editor Window with Active Toolbar

-  Click **refresh** to recalculate all the listed jobs according to their next execution date.
-  By highlighting a schedule entry and then clicking **edit**, you can modify any of the parameters associated with the job.
-  If a job is no longer needed, it can be removed by highlighting the job and clicking **delete**. The job is then permanently removed.
-  The **activate** icon forces the Scheduler to run the selected job the next time it is scheduled to run.
-  The **deactivate** icon forces the Scheduler to ignore a particular job until it is activated again.
-  You can create a shortcut to a task by clicking on the **shortcut** icon.
-  The **execute** icon executes the task immediately.
-  The **help** on this program button brings up the help application and open up the section on the VRC Scheduler.

A Appendix A

Voice Interface Modes & Codes

Modes

The Voice Interface, also called “dial-up”, has two basic modes, **Voice** and **Data**.

Normally, the Voice Interface will answer the line in voice mode. This allows it to respond to DTMF commands and it will respond to these commands with text-to-speech vocal responses. At dial-in, the Voice Interface will ask for the site access password. You will have three attempts to enter the correct password. After three incorrect tries you will be disconnected.

The Voice Interface can be switched to data mode at dial-in by adding commas (two second pause) and the digits “020” to the modem dial-out number (ie. 555-1212,,,020). This change is made in the “Site Dialing” window.

Configuration and setup of the Voice Interface can only be done using a PC and you must be connected to the Voice Interface in data mode. You cannot configure and setup the Voice Interface in voice mode.

There are two levels of access in voice mode. **Operator** access allows you to issue commands, run macros, and monitor your metering and status channels. **Observer** access allows you to only monitor metering and status channels.

You can call up to five telephone numbers, which are entered in the “Site Dialing” configuration. You can call out in one of the following modes: **Pager**, **Data**, **Voice (Leave Message)** and **Voice (Enter Password)**.

Codes

The following is a list of DTMF commands you can enter when accessing the Voice Interface in voice mode. These commands allow you to issue commands, run macros, and monitor your metering and status channels.

COMMAND	FUNCTION
000	ALARM MODE - REPORT ALL ALARMS (CURRENT I/O UNIT)
#	NEXT ALARM
*	PREVIOUS ALARM
8	REPEAT CURRENT ALARM
3	EXIT ALARM MODE (#0)
6*	MODE PLUS ACCESS LEVEL (OBSERVER, OPERATOR)
0#	ESCAPE/CANCEL
010	CLEAR ALL ALARMS AND EXIT ALARM MODE
020	AT DIAL-IN, SWITCHES FROM VOICE TO DATA MODE
030#	ENABLE ALARM REPORTING
030*	DISABLE ALARM REPORTING FOR ONE HOUR
040#	REQUERY NETWORK
040*	CAPTURE DATA (CURRENT I/O UNIT)
050#	INTERNAL MICROPHONE ON
050*	INTERNAL MICROPHONE OFF
060	TIME (REAL TIME CLOCK)
070#	EXTERNAL AUDIO INPUT ON
070*	EXTERNAL AUDIO INPUT OFF
080#	EXTERNAL AUDIO OUTPUT ON
080*	EXTERNAL AUDIO OUTPUT OFF
090	REMOTE/LOCAL BUTTON STATE
101* - 105*	DISABLE DIAL-OUT NUMBER 1-5
101# - 105#	ENABLE DIAL-OUT NUMBER 1-5
201* - 216*	COMMAND CHANNEL SWITCH A
201# - 216#	COMMAND CHANNEL SWITCH B
501# - 532#	MACRO (RUN)
601# - 616#	METERING CHANNEL 1-16, REPORT ONCE
601* - 616*	METERING CHANNEL 1-16, REPORT THREE TIMES
701# - 716#	STATUS CHANNEL 1-16, REPORT ONCE
701* - 716*	STATUS CHANNEL 1-16, REPORT THREE TIMES
800	REPORT FIRMWARE VERSION NUMBER
900-915	SELECT I/O UNIT
999	DISCONNECT (GOODBYE MESSAGE, END SESSION)
2#	REPORT CURRENT I/O UNIT COMMAND TITLES
5#	REPORT CURRENT I/O UNIT MACRO TITLES
6#	REPORT CURRENT I/O UNIT METERING TITLES
6*	REPORT CURRENT MODE (OBSERVER, OPERATOR, ALARM)
7#	REPORT CURRENT I/O UNIT STATUS TITLES
0#	ESCAPE/CANCEL
0*	REPORT CURRENT I/O UNIT SECURITY LEVEL

***Bold titles** indicate commands that can be issued only with operator access.

B Appendix B

Configuration Documents

The following worksheets are provided as a tool for planning an installation or archiving settings in hard copy format.

SITE DIALING

<u>VRC2500 Site Dialing Worksheet</u>	
Site Name / Number:	_____
Unit Name:	_____
Line on VRC is a direct RS-232 Connection?	_____ YES _____ NO
Dial with Touch-Tone (not Pulse)?	_____ YES _____ NO

Outbound Telephone Numbers

Telephone Number	Connection Type	# of Attempts	Dial When	Start Time
	Data, Pager, Voice, Voice W/Access	1 -5	Always, Weekdays, Weekends, Every Day	24 Hour Format, Do not cross Midnight
1				
2				
3				
4				
5				

SITE ACCESS

VRC2500 Site Access Worksheet

Site Name / Number: _____

Unit Name: _____

Site Access Code: _____

	User Name	Access Code	Access Level System, Operator, Observer
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

METERING

VRC2500 Metering Channel Setup Worksheet

Site Name/ Number: _____

Unit Name: _____

	Name	Meter Type	1st Upper Limit			1st Lower Limit			
			Alarm Type	Delay	Action	Alarm Type	Delay	Action	
		0 to 10, -5 to +5, Power, Indirect	None, Warning, Critical	0.0 to 25.5 in .10 second increments	None, Command, Macro, Capture		None, Warning, Critical	0.0 to 25.5 in .10 second increments	None, Command, Macro, Capture
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

	Name	Meter Type	2nd Upper Limit			2nd Lower Limit			
			Alarm Type	Delay	Action	Alarm Type	Delay	Action	
			None, Warning, Critical	0.0 to 25.5 in .10 second increments	None, Command, Macro, Capture		None, Warning, Critical	0.0 to 25.5 in .10 second increments	None, Command, Macro, Capture
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

STATUS

VRC2500 Status Channel Setup Worksheet

Site Name / Number: _____

Unit Name: _____

Status Type	Low				High			
	Name	Alarm Type	Delay	Action	Name	Alarm Type	Delay	Action
Pull-Up, Pull-Down		None, Warning, Critical	0.0 to 25.5 in .10 second increments	None, Command, Macro, Capture		None, Warning, Critical	0.0 to 25.5 in .10 second increments	None, Command, Macro, Capture
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

COMMANDS

VRC2500 Command Channel Setup Worksheet

Site Name / Number: _____

Unit Name: _____

	Command Type	Delay (Duration)	A Name	B Name
	Momentary, Latching	In .10 Second Increments		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

MACROS

VRC2500 Macro List Worksheet

Site Name / Number: _____

Unit Name: _____

	Macro Name	Description
1	(Startup)	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		

TIMED EVENTS

VRC2500 Timed Event Worksheet

Site Name / Number: _____

Unit Name: _____

	Time Interval <small>Yearly, Monthly, Weekly, Daily, Hourly, Day of Week</small>	Action <small>Command # A or B, Macro #, Capture</small>
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		

MUTING

<u>VRC2500 Mute Assignments Setup Worksheet</u>				
Site Name / Number: _____				
Unit Name: _____				
Source Channel Type Causing Mute	Source Channel Causing Mute	Condition Causing Mute	Channel Type to be Muted	Channel to be Muted
Status, Command	1 - 16	High, Low, A, B	Status, Meter	1 - 16
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				

C Appendix C

Database Table Configuration

TABLE: CAPTURECHANNEL_T

Properties

Date Created:	10/11/1999 3:10:51 PM Def.	Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	True
RecordCount:	0	RowHeight:	285

Columns

Name	Type	Size
ID	Number (Long)	4
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	1	
ColumnWidth:	Default	
Ordinal Position:	1	
Required:	False	
Source Field:	ID	
Source Table:	CaptureChannel_T	
IDTitle	Number (Long)	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	True	
Source Field:	IDTitle	
Source Table:	CaptureChannel_T	

Name	Type	Size
<i>TimeStamp</i>	<i>Date/Time</i>	8
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	2940	
Format:	General Date	
Ordinal Position:	3	
Required:	True	
Source Field:	TimeStamp	
Source Table:	CaptureChannel_T	
<i>Value</i>	<i>Number (Double)</i>	8
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	False	
Source Field:	Value	
Source Table:	CaptureChannel_T	
<i>Muted</i>	<i>Yes/No</i>	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	106	
Format:	Yes/No	
Ordinal Position:	5	
Required:	False	
Source Field:	Muted	
Source Table:	CaptureChannel_T	
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	6	
Required:	False	
Source Field:	Note	
Source Table:	CaptureChannel_T	

Name	Type	Size
<i>Tolerance</i>	<i>Text</i>	<i>3</i>
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	7	
Required:	False	
Source Field:	Tolerance	
Source Table:	CaptureChannel_T	
<i>ValueCommand</i>	<i>Yes/No</i>	<i>1</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	106	
Format:	Yes/No	
Ordinal Position:	8	
Required:	False	
Source Field:	ValueCommand	
Source Table:	CaptureChannel_T	
<i>IDCommand</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	9	
Required:	False	
Source Field:	IDCommand	
Source Table:	CaptureChannel_T	
<i>ValueStatus</i>	<i>Yes/No</i>	<i>1</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	106	
Format:	Yes/No	
Ordinal Position:	10	
Required:	False	
Source Field:	ValueStatus	
Source Table:	CaptureChannel_T	
Source Field:	IDStatus	
Source Table:	CaptureChannel_T	

Name	Type	Size
<i>IDStatus</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	11	
Required:	False	
Source Field:	IDStatus	
Source Table:	CaptureChannel_T	
<i>STolerance</i>	<i>Text</i>	3
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	12	
Required:	False	
Source Field:	STolerance	
Source Table:	CaptureChannel_T	
<i>SMuted</i>	<i>Yes/No</i>	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	106	
Format:	Yes/No	
Ordinal Position:	13	
Required:	False	
Source Field:	SMuted	
Source Table:	CaptureChannel_T	

Relationships

UnitRevC_T	CaptureChannel_T	UnitRevC_T	CaptureChannel_T	ID	1	• IDCommand
Attributes:	Enforced, Cascade Updates, Cascade Deletes					
Attributes:	One-To-Many					
UnitRevM_T	CaptureChannel_T	UnitRevM_T	CaptureChannel_T	ID	1	• IDTitle
Attributes:	Enforced, Cascade Updates, Cascade Deletes					
Attributes:	One-To-Many					
UnitRevS_T	CaptureChannel_T	UnitRevS_T	CaptureChannel_T	ID	1	• IDStatus
Attributes:	Enforced, Cascade Updates, Cascade Deletes					
Attributes:	One-To-Many					

Table Indexes

Name	Number of Fields
<i>CaptureChannel_TID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	CaptureChannel_TID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending
<i>IDCommand</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	IDCommand
Primary:	False
Required:	False
Unique:	False
Fields:	IDCommand, Ascending
<i>IDStatus</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	IDStatus
Primary:	False
Required:	False
Unique:	False
Fields:	IDStatus, Ascending
<i>iTitleTime</i>	2
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	iTitleTime
Primary:	False
Required:	True
Unique:	True
Fields:	IDTitle, Ascending TimeStamp, Ascending
<i>Muted</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	Muted
Primary:	False
Required:	False
Unique:	False
Fields:	Muted, Ascending

Name	Number of Fields
<i>PrimaryKey</i>	2
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	IDTitle, Ascending
TimeStamp,	Ascending
<i>UnitRevC_TCaptureChannel_T</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	True
Ignore Nulls:	False
Name:	UnitRevC_TCaptureChannel_T
Primary:	False
Required:	False
Unique:	False
Fields:	IDCommand, Ascending
<i>UnitRevM_TCaptureChannel_T</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	True
Ignore Nulls:	False
Name:	UnitRevM_TCaptureChannel_T
Primary:	False
Required:	False
Unique:	False
Fields:	IDTitle, Ascending
<i>UnitRevS_TCaptureChannel_T</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	True
Ignore Nulls:	False
Name:	UnitRevS_TCaptureChannel_T
Primary:	False
Required:	False
Unique:	False
Fields:	IDStatus, Ascending
<i>Value</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	Value
Primary:	False
Required:	False
Unique:	False
Fields:	Value, Ascending

User Permissions

admin

Group Permissions

Admins
Users

TABLE: DELUSER_T

Properties

Date Created: 10/14/1999 1:19:50 PM Def. Updatable: True
 Last Updated: 01/06/2000 11:20:19 AM OrderByOn: False
 RecordCount: 0

Columns

Name	Type	Size
<i>Id</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	1	
Required:	False	
Source Field:	Id	
Source Table:	DelUser_T	
<i>UserID</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	False	
Source Field:	UserID	
Source Table:	DelUser_T	
<i>TimeStamp</i>	<i>Date/Time</i>	<i>8</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	3360	
Format:	General Date	
Ordinal Position:	3	
Required:	False	
Source Field:	TimeStamp	
Source Table:	DelUser_T	
<i>Activities</i>	<i>Text</i>	<i>200</i>
AllowZeroLength:	False	
Attributes:	Variable Length	

Name	Type	Size
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	8580	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	False	
Source Field:	Activities	
Source Table:	DelUser_T	

Relationships

Password_TDelUser_T	Password_T	DelUser_T	ID	1	UserID
Attributes:	Enforced, Cascade Updates, Cascade Deletes				
Attributes:	One-To-Many				

Table Indexes

Name	Number of Fields
<i>ID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	Id
Primary:	False
Required:	False
Unique:	False
Fields:	Id, Ascending
<i>Password_TDelUser_T</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	True
Ignore Nulls:	False
Name:	Password_TDelUser_T
Primary:	False
Required:	False
Unique:	False
Fields:	UserID, Ascending
<i>PrimaryKey</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	Id, Ascending

Name	Number of Fields
<i>UserID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	UserID
Primary:	False
Required:	False
Unique:	False
Fields:	UserID, Ascending

<u>User Permissions</u>	<u>Group Permissions</u>
admin	Admins
	Users

TABLE: NPREPORT_T

Properties

Date Created:	09/27/1999 2:00:07 PM	Def. Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	False
RecordCount:	3		

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	NPReport_T	
<i>PathNameReport</i>	<i>Text</i>	<i>50</i>
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	5535	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	False	
Source Field:	PathNameReport	
Source Table:	NPReport_T	

<u>Table Indexes</u>		
Name		Number of Fields
<i>ID</i>		1
Clustered:	False	
Distinct Count:	3	
Foreign:	False	
Ignore Nulls:	False	
Name:	ID	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	ID, Ascending	
<i>PathNameReport</i>		1
Clustered:	False	
Distinct Count:	3	
Foreign:	False	
Ignore Nulls:	False	
Name:	PathNameReport	
Primary:	False	
Required:	False	
Unique:	True	
Fields:	PathNameReport, Ascending	
<i>PrimaryKey</i>		1
Clustered:	False	
Distinct Count:	3	
Foreign:	False	
Ignore Nulls:	False	
Name:	PrimaryKey	
Primary:	True	
Required:	True	
Unique:	True	
Fields:	ID, Ascending	
<u>User Permission</u>	<u>Group Permissions</u>	
admin	Admins	
	Users	

TABLE: PASSWORD_T

Properties

Date Created: 10/14/1999 12:46:27 PM Def. Updatable: True
 Last Updated: 01/06/2000 11:20:19 AM OrderByOn: False
 RecordCount: 1

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	Password_T	
<i>Password</i>	<i>Text</i>	<i>100</i>
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	3390	
Description:	Password has to be unique because it is the only way to identify the user	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	False	
Source Field:	Password	
Source Table:	Password_T	
<i>UserName</i>	<i>Text</i>	<i>50</i>
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	False	
Source Field:	UserName	
Source Table:	Password_T	

Relationships

Password_TDelUser_T	Password_T	DelUser_T	ID	1	UserID
Attributes:	Enforced, Cascade Updates, Cascade Deletes				
Attributes:	One-To-Many				

Table Indexes

Name	Number of Fields
<i>ID</i>	1
Clustered:	False
Distinct Count:	1
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending
<i>Password</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	Password
Primary:	False
Required:	False
Unique:	True
Fields:	Password, Ascending
<i>PrimaryKey</i>	1
Clustered:	False
Distinct Count:	1
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	ID, Ascending

User Permissions

admin

Group Permissions

Admins

Users

TABLE: PASTE ERRORSProperties

Date Created:	12/20/1999 4:48:54 PM	Def. Updatable:	True
Last Updated:	12/20/1999 4:48:54 PM	RecordCount:	0

Columns

Name	Type	Size
<i>Tolerance</i>	<i>Text</i>	255
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
Ordinal Position:	0	
Required:	False	
Source Field:	Tolerance	
Source Table:	Paste Errors	

User Permissions

admin

Group Permissions

Admins

Users

TABLE: PRINTTASKS_T

Properties

Date Created: 09/27/1999 2:00:07 PM Def. Updatable: True
 Last Updated: 01/06/2000 11:20:19 AM OrderByOn: False
 RecordCount: 0

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	1	
ColumnWidth:	1170	
Ordinal Position:	1	
Required:	False	
Source Field:	ID	
Source Table:	PrintTasks_T	
<i>WhereClause</i>	<i>Text</i>	<i>255</i>
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	15030	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	False	
Source Field:	WhereClause	
Source Table:	PrintTasks_T	
<i>TimeFrom</i>	<i>Date/Time</i>	<i>8</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Description:	If it is run for the current date	
Format:	General Date	
Ordinal Position:	3	
Required:	False	
Source Field:	TimeFrom	
Source Table:	PrintTasks_T	

Name	Type	Size
<i>TimeTo</i>	<i>Date/Time</i>	8
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Description:	If the report is run for the current date	
Format:	Medium Time	
Ordinal Position:	4	
Required:	False	
Source Field:	TimeTo	
Source Table:	PrintTasks_T	
<i>Weekly/Monthly</i>	<i>Yes/No</i>	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Description:	If It is Weekly then = true	
DisplayControl:	106	
Format:	Yes/No	
Ordinal Position:	5	
Required:	False	
Source Field:	Weekly/Monthly	
Source Table:	PrintTasks_T	
<i>DaysFrom</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Description:	Date range for the filter report	
DisplayControl:	Text Box	
Ordinal Position:	6	
Required:	False	
Source Field:	DaysFrom	
Source Table:	PrintTasks_T	

Name	Type	Size
<i>DaysTo</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Description:	If it is end of the month refers it has to be set to zero	
DisplayControl:	Text Box	
Ordinal Position:	7	
Required:	False	
Source Field:	DaysTo	
Source Table:	PrintTasks_T	
<i>DisplayedName</i>	<i>Text</i>	<i>50</i>
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	1950	
Description:	If it is end of the month refers it has to be set to zero	
DisplayControl:	Text Box	
Ordinal Position:	8	
Required:	False	
Source Field:	DisplayedName	
Source Table:	PrintTasks_T	
<i>IdReport</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
Description:	Indexed	
DisplayControl:	Text Box	
Ordinal Position:	9	
Required:	False	
Source Field:	IdReport	
Source Table:	PrintTasks_T	

Name	Type	Size
<i>DateFrom</i>	<i>Date/Time</i>	8
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	2865	
Description:	When is run once a year	
Format:	General Date	
Ordinal Position:	10	
Required:	False	
Source Field:	DateFrom	
Source Table:	PrintTasks_T	
<i>DateTo</i>	<i>Date/Time</i>	8
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	4845	
Description:	When the report is run once a year	
Format:	General Date	
Ordinal Position:	11	
Required:	False	
Source Field:	DateTo	
Source Table:	PrintTasks_T	
<i>PrinterName</i>	<i>Text</i>	255
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	4500	
Description:	Sets printer handle to print to	
DisplayControl:	Text Box	
Ordinal Position:	12	
Required:	False	
Source Field:	PrinterName	
Source Table:	PrintTasks_T	
<i>PrintRangeFromPage</i>	<i>Number (Byte)</i>	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	1	
Description:	Sets starting page number	
DisplayControl:	Text Box	
Ordinal Position:	13	
Required:	False	
Source Field:	PrintRangeFromPage	
Source Table:	PrintTasks_T	

Name	Type	Size
<i>PrintRangeToPage</i>	<i>Number (Byte)</i>	<i>1</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	1	
Description:	Sets EndPage default all	
DisplayControl:	Text Box	
Ordinal Position:	14	
Required:	False	
Source Field:	PrintRangeToPage	
Source Table:	PrintTasks_T	
<i>Copies</i>	<i>Number (Byte)</i>	<i>1</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	1	
Description:	number of copies to print	
DisplayControl:	Text Box	
Ordinal Position:	15	
Required:	False	
Source Field:	Copies	
Source Table:	PrintTasks_T	

Table Indexes

Name	Number of Fields
<i>ID</i>	<i>1</i>
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending
<i>IdReport</i>	<i>1</i>
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	IdReport
Primary:	False
Required:	False
Unique:	False
Fields:	IdReport, Ascending

Name	Number of Fields
<i>PrimaryKey</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	ID, Ascending

Table: PrintTasks_T

User Permissions	Group Permissions
admin	Admins Users

TABLE: SITE_T

Properties

Date Created:	09/27/1999 2:00:08 PM	Def. Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	False
RecordCount:	0		

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	Site_T	
<i>SiteName</i>	<i>Text</i>	50
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	True	
Source Field:	SiteName	
Source Table:	Site_T	

Name	Type	Size
<i>SiteNetworkNumber</i>	<i>Number (Integer)</i>	<i>2</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	2055	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	True	
Source Field:	SiteNetworkNumber	
Source Table:	Site_T	
<i>HeaderText</i>	<i>Text</i>	<i>50</i>
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	3285	
DisplayControl:	Text Box	
Ordinal Position:	3	
Required:	False	
Source Field:	HeaderText	
Source Table:	Site_T	

Relationships

Site_T	Unit_T	ID	1	•	SiteID
Attributes:	Enforced, Cascade Updates, Cascade Deletes				
Attributes:	One-To-Many				

Table Indexes

Name	Number of Fields
<i>ID</i>	<i>1</i>
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending
<i>PrimaryKey</i>	<i>1</i>
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	ID, Ascending

Name	Number of Fields
<i>SiteName</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	SiteName
Primary:	False
Required:	False
Unique:	False
Fields:	SiteName, Ascending
<i>SiteNetworkNumber</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	SiteNetworkNumber
Primary:	False
Required:	False
Unique:	False
Fields:	SiteNetworkNumber, Ascending
<u>User Permissions</u>	<u>Group Permissions</u>
admin	Admins Users

TABLE: UNIT_T

Properties

Date Created:	09/27/1999 2:00:09 PM	Def. Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	False
RecordCount:	0		

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	Unit_T	

Name	Type	Size
<i>SitelD</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	False	
Source Field:	SitelD	
Source Table:	Unit_T	
<i>UnitName</i>	<i>Text</i>	50
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	True	
Source Field:	UnitName	
Source Table:	Unit_T	
<i>UnitAlias</i>	<i>Text</i>	20
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	3	
Required:	True	
Source Field:	UnitAlias	
Source Table:	Unit_T	
<i>UnitAddress</i>	<i>Text</i>	30
AllowZeroLength:	False	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	True	
Source Field:	UnitAddress	
Source Table:	Unit_T	

Relationships

Site_TUnit_T	Site_T	Unit_T	ID	1	SiteID
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Attributes:	Enforced, Cascade Updates, Cascade Deletes
Attributes:	One-To-Many

Unit_TUnitRevC_T	Unit_T	UnitRevC_T	ID	1	UnitID
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Attributes:	Enforced, Cascade Updates, Cascade Deletes
Attributes:	One-To-Many

TABLE: UNIT_T

Unit_TUnitRevM_T	Unit_T	UnitRevM_T	ID	1	UnitID
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Attributes:	Enforced, Cascade Updates, Cascade Deletes
Attributes:	One-To-Many

Unit_TUnitRevS_T	Unit_T	UnitRevS_T	ID	1	UnitID
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Attributes:	Enforced, Cascade Updates, Cascade Deletes
Attributes:	One-To-Many

Table Indexes**Name****Number of Fields***ID*

1

Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending

PrimaryKey

1

Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	ID, Ascending

Site_TUnit_T

1

Clustered:	False
Distinct Count:	0
Foreign:	True
Ignore Nulls:	False
Name:	Site_TUnit_T
Primary:	False
Required:	False
Unique:	False
Fields:	SiteID, Ascending

Name	Number of Fields
UnitAddress	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	UnitAddress
Primary:	False
Required:	False
Unique:	False
Fields:	UnitAddress, Ascending
UnitAlias	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	UnitAlias
Primary:	False
Required:	False
Unique:	False
Fields:	UnitAlias, Ascending
UnitID	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	UnitID
Primary:	False
Required:	False
Unique:	False
Fields:	SiteID, Ascending
UnitName	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	UnitName
Primary:	False
Required:	False
Unique:	False
Fields:	UnitName, Ascending

<u>User Permissions</u>	<u>Group Permissions</u>
admin	Admins Users

TABLE: UNITALARM_T

Properties

Date Created:	12/30/1999 6:19:43 PM	Def. Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	False
RecordCount:	0	RowHeight:	240

<u>Columns</u>	<u>Type</u>	<u>Size</u>
Name		
<i>ID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	UnitAlarm_T	
<i>UnitID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	True	
Source Field:	UnitID	
Source Table:	UnitAlarm_T	
<i>AlarmTimeStamp</i>	<i>Date/Time</i>	8
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	2805	
Format:	General Date	
Ordinal Position:	2	
Required:	False	
Source Field:	AlarmTimeStamp	
Source Table:	UnitAlarm_T	
<i>AlarmType</i>	<i>Number (Byte)</i>	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	3	
Required:	True	
Source Field:	AlarmType	
Source Table:	UnitAlarm_T	

Name	Type	Size
AlarmCond	<i>Number (Integer)</i>	2
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	True	
Source Field:	AlarmCond	
Source Table:	UnitAlarm_T	
AlarmMsg	<i>Text</i>	100
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	5	
Required:	True	
Source Field:	AlarmMsg	
Source Table:	UnitAlarm_T	
AlarmNote	<i>Text</i>	50
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Description:	The notes according FCC rules Ea	
DisplayControl:	Text Box	
Ordinal Position:	6	
Required:	False	
Source Field:	AlarmNote	
Source Table:	UnitAlarm_T	

Table Indexes

Name	Number of Fields
AlarmTimeStamp	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	AlarmTimeStamp
Primary:	False
Required:	False
Unique:	False
Fields:	AlarmTimeStamp, Ascending

Name		Number of Fields
<i>AlarmType</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	AlarmType	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	AlarmType, Ascending	
<i>ID</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	ID	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	ID, Ascending	
<i>PrimaryKey</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	PrimaryKey	
Primary:	True	
Required:	True	
Unique:	True	
Fields:	ID, Ascending	
<i>UnitID</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	UnitID	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	UnitID, Ascending	
<u>User Permissions</u>	<u>Group Permissions</u>	
admin	Admins	
	Users	

TABLE: UNITLOGS_TProperties

Date Created: 09/27/1999 2:00:10 PM Def. Updatable: True
 Last Updated: 01/06/2000 11:20:19 AM OrderByOn: False
 RecordCount: 0

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	UnitLogs_T	
<i>UnitID</i>	<i>Number (Long)</i>	<i>4</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	True	
Source Field:	UnitID	
Source Table:	UnitLogs_T	
<i>LogTimeStamp</i>	<i>Date/Time</i>	<i>8</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Format:	General Date	
Ordinal Position:	2	
Required:	True	
Source Field:	LogTimeStamp	
Source Table:	UnitLogs_T	

Name	Type	Size
<i>LogMsg</i>	<i>Text</i>	32
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	3	
Required:	True	
Source Field:	LogMsg	
Source Table:	UnitLogs_T	
<i>LogsNotes</i>	<i>Text</i>	50
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Description:	Notes according FCC rules Ea	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	False	
Source Field:	LogsNotes	
Source Table:	UnitLogs_T	

Table Indexes

Name	Number of Fields
<i>ID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending
<i>LogTimeStamp</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	LogTimeStamp
Primary:	False
Required:	False
Unique:	False
Fields:	LogTimeStamp, Ascending

Name	Number of Fields
<i>PrimaryKey</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	ID, Ascending
<i>UnitID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	UnitID
Primary:	False
Required:	False
Unique:	False
Fields:	UnitID, Ascending

<u>User Permissions</u>	<u>Group Permissions</u>
admin	Admins
	Users

TABLE: UNITREVC_T

Properties

Date Created:	09/27/1999 2:00:10 PM	Def. Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	False
RecordCount:	0		

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	1	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	UnitRevC_T	

Name	Type	Size
<i>UnitID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	False	
Source Field:	UnitID	
Source Table:	UnitRevC_T	
<i>CNameA</i>	<i>Text</i>	50
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	False	
Source Field:	CNameA	
Source Table:	UnitRevC_T	
<i>CNameB</i>	<i>Text</i>	32
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	3	
Required:	False	
Source Field:	CNameB	
Source Table:	UnitRevC_T	
<i>ChannelNumber</i>	<i>Number (Byte)</i>	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	False	
Source Field:	ChannelNumber	
Source Table:	UnitRevC_T	

Relationships

Unit_T	UnitRevC_T	Unit_T	UnitRevC_T	ID	1	UnitID
Attributes:		Enforced, Cascade Updates, Cascade Deletes				
Attributes:		One-To-Many				
UnitRevC_T	CaptureChannel_T	UnitRevC_T	CaptureChannel_T	ID	1	IDCommand
Attributes:		Enforced, Cascade Updates, Cascade Deletes				
Attributes:		One-To-Many				

Table Indexes

Name	Number of Fields
<i>ChannelNumber</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ChannelNumber
Primary:	False
Required:	False
Unique:	False
Fields:	ChannelNumber, Ascending
<i>CNameA</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	CNameA
Primary:	False
Required:	False
Unique:	False
Fields:	CNameA, Ascending
<i>CNameB</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	CNameB
Primary:	False
Required:	False
Unique:	False
Fields:	CNameB, Ascending
<i>ID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending

Name	Number of Fields
<i>PrimaryKey</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	ID, Ascending
<i>Unit_UnitRevC_T</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	True
Ignore Nulls:	False
Name:	Unit_UnitRevC_T
Primary:	False
Required:	False
Unique:	False
Fields:	UnitID, Ascending
<i>UnitID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	UnitID
Primary:	False
Required:	False
Unique:	False
Fields:	UnitID, Ascending
<u>User Permissions</u>	<u>Group Permissions</u>
admin	Admins Users

TABLE: UNITREVM_T

Properties

Date Created:	09/27/1999 2:00:10 PM	Def. Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	False
RecordCount:	0		

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	1	
ColumnWidth:	Default	
Ordinal Position:	1	
Required:	False	
Source Field:	ID	
Source Table:	UnitRevM_T	

Name	Type	Size
<i>UnitID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	True	
Source Field:	UnitID	
Source Table:	UnitRevM_T	
<i>Name</i>	<i>Text</i>	50
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	3	
Required:	False	
Source Field:	Name	
Source Table:	UnitRevM_T	
<i>Units</i>	<i>Text</i>	50
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	False	
Source Field:	Units	
Source Table:	UnitRevM_T	
<i>Type</i>	<i>Text</i>	50
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	5	
Required:	False	
Source Field:	Type	
Source Table:	UnitRevM_T	

Name	Type	Size
<i>Limit2U</i>	<i>Number (Double)</i>	<i>8</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	6	
Required:	False	
Source Field:	Limit2U	
Source Table:	UnitRevM_T	
<i>Limit1U</i>	<i>Number (Double)</i>	<i>8</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	7	
Required:	False	
Source Field:	Limit1U	
Source Table:	UnitRevM_T	
<i>Limit1L</i>	<i>Number (Double)</i>	<i>8</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	8	
Required:	False	
Source Field:	Limit1L	
Source Table:	UnitRevM_T	
<i>Limit2L</i>	<i>Number (Double)</i>	<i>8</i>
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	9	

Name	Type	Size
Required:	False	
Source Field:	Limit2L	
Source Table:	UnitRevM_T	
ChannelNumber	Number (Byte)	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	10	
Required:	False	
Source Field:	ChannelNumber	
Source Table:	UnitRevM_T	

Relationships

Unit_T	UnitRevM_T	Unit_T	UnitRevM_T	ID	1	UnitID
Attributes:	Enforced, Cascade Updates, Cascade Deletes					
Attributes:	One-To-Many					

UnitRevM_T	CaptureChannel_T	UnitRevM_T	CaptureChannel_T	ID	1	IDTitle
Attributes:	Enforced, Cascade Updates, Cascade Deletes					
Attributes:	One-To-Many					

Table Indexes

Name	Number of Fields
ChannelNumber	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ChannelNumber
Primary:	False
Required:	False
Unique:	False
Fields:	ChannelNumber, Ascending
ID	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending

Name		Number of Fields
<i>Name</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	Name	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	Name, Ascending	
<i>PrimaryKey</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	PrimaryKey	
Primary:	True	
Required:	True	
Unique:	True	
Fields:	ID, Ascending	
<i>Type</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	Type	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	Type, Ascending	
<i>Unit_UnitRevM_T</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	True	
Ignore Nulls:	False	
Name:	Unit_UnitRevM_T	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	UnitID, Ascending	
<i>UnitID</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	UnitID	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	UnitID, Ascending	

Name		Number of Fields
<i>Units</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	Units	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	Units, Ascending	

<u>User Permissions</u>	<u>Group Permissions</u>
admin	Admins Users

TABLE: UNITREVS_T

Properties

Date Created:	09/27/1999 2:00:11 PM	Def. Updatable:	True
Last Updated:	01/06/2000 11:20:19 AM	OrderByOn:	False
RecordCount:	0		

Columns

Name	Type	Size
<i>ID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size, Auto-Increment	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Ordinal Position:	0	
Required:	False	
Source Field:	ID	
Source Table:	UnitRevS_T	
<i>UnitID</i>	<i>Number (Long)</i>	4
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
Decimal Places:	Auto	
DisplayControl:	Text Box	
Ordinal Position:	1	
Required:	False	
Source Field:	UnitID	
Source Table:	UnitRevS_T	

Name	Type	Size
<i>SNameH</i>	<i>Text</i>	32
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	2	
Required:	False	
Source Field:	SNameH	
Source Table:	UnitRevS_T	
<i>SNameL</i>	<i>Text</i>	32
AllowZeroLength:	True	
Attributes:	Variable Length	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	Default	
DisplayControl:	Text Box	
Ordinal Position:	3	
Required:	False	
Source Field:	SNameL	
Source Table:	UnitRevS_T	
<i>NumberChannel</i>	<i>Number (Byte)</i>	1
AllowZeroLength:	False	
Attributes:	Fixed Size	
Collating Order:	General	
ColumnHidden:	False	
ColumnOrder:	Default	
ColumnWidth:	1590	
Decimal Places:	Auto	
Default Value:	0	
DisplayControl:	Text Box	
Ordinal Position:	4	
Required:	False	
Source Field:	NumberChannel	
Source Table:	UnitRevS_T	

Relationships

Unit_T UnitRevS_T	Unit_T	UnitRevS_T	ID	1	UnitID
Attributes:	Enforced, Cascade Updates, Cascade Deletes				
Attributes:	One-To-Many				
UnitRevS_T CaptureChannel_T	UnitRevS_T	CaptureChannel_T	ID	1	IDStatus
Attributes:	Enforced, Cascade Updates, Cascade Deletes				
Attributes:	One-To-Many				

Table Indexes

Name	Number of Fields
<i>ID</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	ID
Primary:	False
Required:	False
Unique:	False
Fields:	ID, Ascending
<i>NumberChannel</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	NumberChannel
Primary:	False
Required:	False
Unique:	False
Fields:	NumberChannel, Ascending
<i>PrimaryKey</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	PrimaryKey
Primary:	True
Required:	True
Unique:	True
Fields:	ID, Ascending
<i>SNameH</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	SNameH
Primary:	False
Required:	False
Unique:	False
Fields:	SNameH, Ascending
<i>SNameL</i>	1
Clustered:	False
Distinct Count:	0
Foreign:	False
Ignore Nulls:	False
Name:	SNameL
Primary:	False
Required:	False
Unique:	False
Fields:	SNameL, Ascending

Name		Number of Fields
<i>Unit_TUnitRevS_T</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	True	
Ignore Nulls:	False	
Name:	Unit_TUnitRevS_T	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	UnitID, Ascending	
<i>UnitID</i>		1
Clustered:	False	
Distinct Count:	0	
Foreign:	False	
Ignore Nulls:	False	
Name:	UnitID	
Primary:	False	
Required:	False	
Unique:	False	
Fields:	UnitID, Ascending	
<u>User Permissions</u>		<u>Group Permissions</u>
admin		Admins
		Users

D

Appendix D

Specifications

VRC2500

DIMENSIONS (W/H/D)

19" (48.3 cm) x 3.5" (8.9 cm) x
10.75" (27.3 cm); 2 rack units high

WEIGHT

11 lb (4.99 kg) - dry
16.95 lb (7.69 kg) - shipping

OPERATING TEMPERATURE

0 to 50°C

STORAGE TEMPERATURE

-30 to 70°C

FRONT PANEL CONTROLS

"Remote/Local" button for suspending the generation of command outputs. Power, Status, and Line indicator LEDs. "MIC" input for audibly monitoring remote location.

REAR PANEL CONNECTORS**POWER:**

100 to 240 VAC, 50 to 60Hz, at 15W

FULL-TIME & DIRECT PORTS:

DB9; serial communication at
19.2kbps

COMMAND 1–8:

DB37; open collector, 30VDC, 250mA maximum, clamped, momentary or latching, momentary duration programmable 0.1–25.5 seconds

COMMAND 9–16:

DB37; open collector, 30VDC, 250mA max, clamped, momentary or latching duration programmable 0.1–25.5 seconds

METERING:

DB37; input impedance > 100kOhms, unbalanced during measurement; >10mOhms, unbalanced, quiescent (nonsampling); 0–10VDC and -5 to 5VDC nominal; 2.44mVDC resolution (12-bit resolution over 10V range); input limits not to exceed -16VDC or 16VDC; sampling rate eight times per second per channel; RFI immunity at 70dB at 1MHz, 140dB at 100MHz, 170dB at 500MHz

STATUS:

DB37; 16 binary (low/high) channels;
input impedance > 24kOhms; input
voltage range -30 to 30VDC
continuous; toggle threshold
low-to-high with pull-down at 2.5VDC
(CMOS compatible), high-to-low with
pull-up at 1.5VDC (TTL compatible);
RFI immunity 70dB at 1MHz, 140dB
at 100MHz, 170dB at 500MHz

SET/MODEM:

RJ-11 connector for on-site modem or
telephone set.

LINE:

RJ-11 connector for telephone line.

AUDIO OUT:

Audio from the telephone line can be
routed to this output for possible use
as an emergency audio feed to
transmitter.

AUDIO IN:

Allows external audio (such as off-air
monitor) to be fed into the phone line.

SYSTEM TYPE

Embedded microprocessor-based with
battery backed real-time clock.

MEMORY TYPE

CMOS Static RAM/Flash EPROM
(battery backed)

INTERCONNECTION CIRCUIT

Standard toll-grade telephone circuit
or dedicated two or four wire
interconnection with toll-grade
performance; FCC registered;
Automatic answering

All specifications subject to change
without notice.

Wiring Interface

DIMENSIONS (W/H/D)

19"/48.3cm x 1.75"/4.5cm x 1"/2.5cm

WEIGHT

1.2 lb/0.55kg (dry)

2 lb/9kg (shipping)

REAR PANEL CONNECTORS**PUSH-ON BLOCK:**Push-on terminal block with slotted
set-screw connectors**SITE CONTROLLER I/O:**DB37 female; +/- contacts provided
at terminal block for polarized
status/metering inputs

Command Relay Unit

DIMENSIONS (W/H/D)19"/48.3cm x 1.75"/4.5cm x
11.25"/28.6cm**WEIGHT**

6 lb/2.72kg (dry)

8 lb/3.6kg (shipping)

REAR PANEL CONNECTORS**PUSH-ON BLOCK:**Push-on terminal block with slotted
set-screw connectors**SITE CONTROLLER:**

DB37 female

RELAY:NO, NC, C contacts provided at
terminal block for each relay (total of
16 relays); each relay rated at 5A,
125VAC or 3A, 48VDC**POWER REQUIREMENTS**

5VDC, 750mA, supplied by VRC2500

FCC PART 15 COMPLIANCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Changes or modifications not expressly approved by Burk Technology Incorporated could void the user's authority to operate the equipment.

WARRANTY

Burk Technology Incorporated (Manufacturer) warrants that this product is free of defects in both materials and workmanship. Should any part of this equipment be defective, the Manufacturer agrees, at its option, to:

A. Repair or replace any defective part free of charge (except transportation charges) for a period of one year from the date of the original purchase, provided the owner returns the equipment to the Manufacturer at the address set forth below. No charge will be made for parts or labor during this period;

B. Furnish replacement for any defective parts in the equipment for a period of one year from the date of original purchase. Replacement parts shall be furnished without charge, except labor and transportation.

This Warranty excludes assembled products not manufactured by the Manufacturer whether or not they are incorporated in a Manufacturer product or sold under a Manufacturer part or model number.

THIS WARRANTY IS VOID IF:

A. The equipment has been damaged by negligence, accident, act of God, or mishandling, or has not been operated in accordance with the procedures described in the operating and technical instructions; or,

B. The equipment has been altered or repaired by other than the Manufacturer or an authorized service representative of the Manufacturer; or,

C. Adaptations or accessories other than those manufactured or provided by the Manufacturer have been made or attached to the equipment which, in the determination of the Manufacturer, shall have affected the performance, safety or reliability of the equipment; or,

D. The equipment's original serial number has been modified or removed.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, APPLIES TO THE EQUIPMENT, nor is any person or company authorized to assume any warranty for the Manufacturer or any other liability in connection with the sale of the Manufacturer's products.

Manufacturer does not assume any responsibility for consequential damages, expenses, or loss of revenue or property, inconvenience, or interruption in operation experienced by the customer due to a malfunction in the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

In case of unsatisfactory operation, the purchaser shall promptly notify the Manufacturer at the address set forth below in writing, giving full particulars as to the defects or unsatisfactory operation. Upon receipt of such notice, the Manufacturer will give instructions respecting the shipment of the equipment, or such other matters as it elects to honor this warranty as above provided. This warranty does not cover damage to the equipment during shipping and the Manufacturer assumes no responsibility for such damage. All shipping costs will be paid by the customer.

This warranty extends only to the original purchaser and is not assignable or transferable.

Burk Technology
7 Beaver Brook Road
Littleton, MA 01460

Appendix E

Pinouts

Command 1-8 Pinouts

Pin	Description	Pin	Description
1	Command 1A	11	Command 6A
2	Command 1B	12	Command 6B
3	Command 2A	13	Command 7A
4	Command 2B	14	Command 7B
5	Command 3A	15	Command 8A
6	Command 3B	16	Command 8B
7	Command 4A	17-19	Reserved-Accessory Cnx
8	Command 4B	20-35	Command Return
9	Command 5A	36-37	Reserved-Accessory Cnx
10	Command 5B		

Command 9-16 Pinouts

Pin	Description	Pin	Description
1	Command 9A	11	Command 14A
2	Command 9B	12	Command 14B
3	Command 10A	13	Command 15A
4	Command 10B	14	Command 15B
5	Command 11A	15	Command 16A
6	Command 11B	16	Command 16B
7	Command 12A	17-19	Reserved-Accessory Cnx
8	Command 12B	20-35	Command Return
9	Command 13A	36-37	Reserved-Accessory Cnx
10	Command 13B		

Metering Pinouts

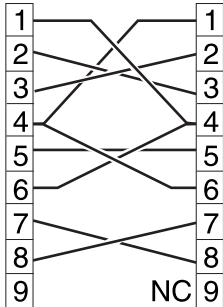
Pin	Description	Pin	Description
1	Metering 1	11	Metering 11
2	Metering 2	12	Metering 12
3	Metering 3	13	Metering 13
4	Metering 4	14	Metering 14
5	Metering 5	15	Metering 15
6	Metering 6	16	Metering 16
7	Metering 7	17-19	Reserved-Accessory Cnx
8	Metering 8	20-35	Metering Return
9	Metering 9	36-37	Reserved-Accessory Cnx
10	Metering 10		

Status Pinouts

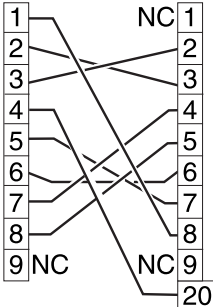
Pin	Description	Pin	Description
1	Status 1	11	Status 11
2	Status 2	12	Status 12
3	Status 3	13	Status 13
4	Status 4	14	Status 14
5	Status 5	15	Status 15
6	Status 6	16	Status 16
7	Status 7	17-19	Reserved-Accessory Cnx
8	Status 8	20-35	Status Return
9	Status 9	36-37	Reserved-Accessory Cnx
10	Status 10		

Cable Pinouts

DB9F to DB9F



DB9F to DB25M



Jumper Settings

Jumper	Default
JP1	Disengaged
JP2	Disengaged
JP3	Disengaged
JP4	Disengaged
JP5	Disengaged
JP6	Disengaged
JP7	Disengaged
JP8	Disengaged
JP9*	Disengaged

*Engaging JP9 will clear only the I/O module's standard memory, or standard memory and firmware.

F Appendix F

Troubleshooting

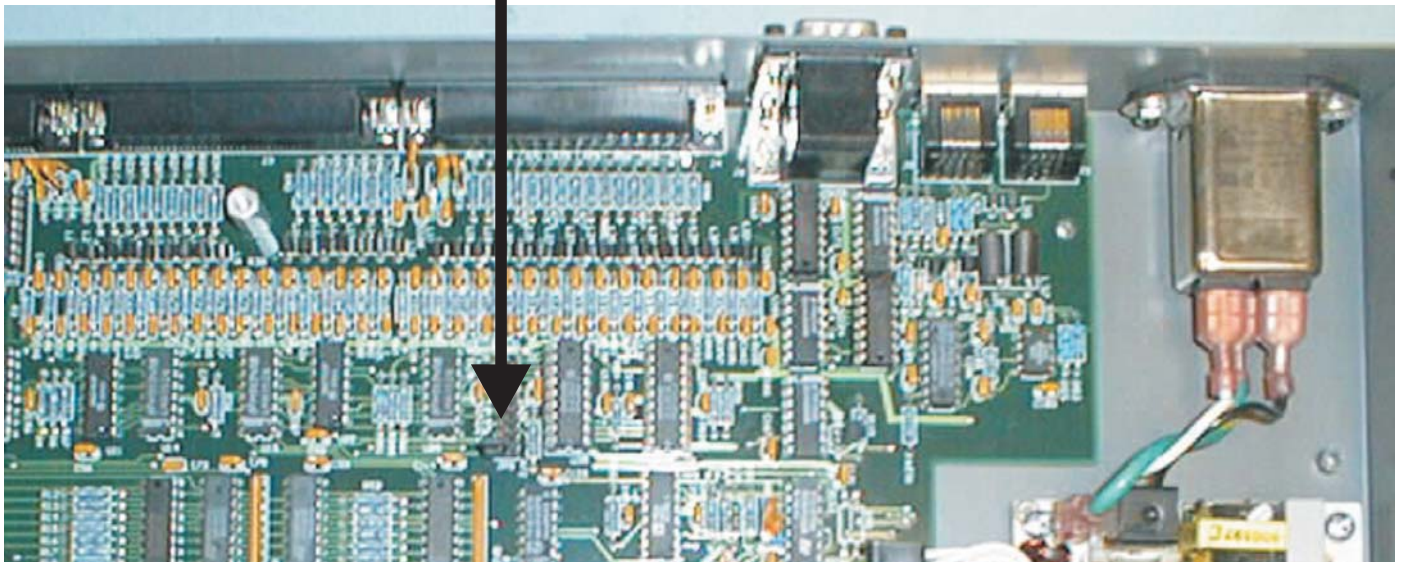
CLEARING STANDARD MEMORY & FIRMWARE

1. To clear the I/O module's standard memory and firmware, power down the VRC unit and remove the lid. Find the JP9 jumper. The I/O board is on the bottom level of the chassis.



To clear the memory and firmware for the voice interface module, follow the same procedure but use the JP1 jumper on the voice board instead of JP9 on the I/O.

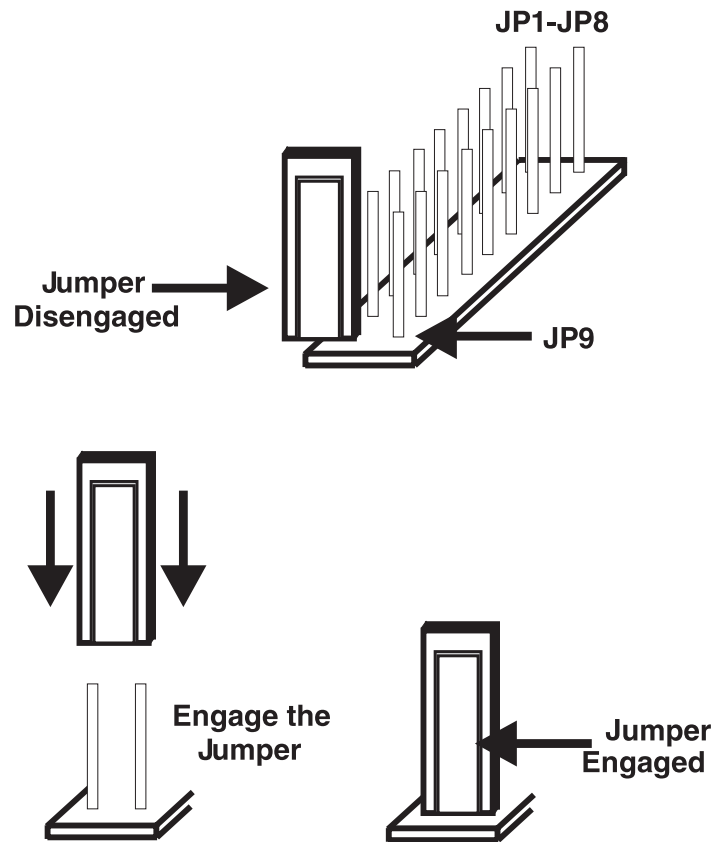
JP9 Jumper



2. Engage the JP9 jumper. This is done by pushing the jumper onto both pins to complete the circuit (refer to the drawing on the next page).



To clear the memory and firmware for the voice interface module, follow the same procedure but use the JP1 jumper on the voice board instead of JP9 on the I/O.



3. Power on the VRC unit. This will wipe the I/O module's standard memory and firmware. The REMOTE/LOCAL LED will turn off indicating that the I/O firmware and memory has been erased.
4. Power off the VRC unit.
5. Disengage the jumper by removing it and reconnecting it to one pin. When powered on again, you will need to reload the firmware and reconfigure your I/O unit.

You must cycle the power as described above to erase the firmware, otherwise only the standard memory will be erased.

If this happens...	It could be that...	Try this...
My mouse locks up when I try to connect to the site.	The COM port is either using the same interrupts as the mouse, or the COM ports share the same interrupts.	Try a different COM port. If you are using a serial port expansion card, check your settings to make sure it does not share settings with your mouse's COM port.
I cannot connect to the site using a modem.	The software is unable to establish communication with the modem or site.	<p>Check your modem's dial string, the phone number you are trying to call, and your site settings.</p> <p>Listen for your modem trying to negotiate a connection with the modem at the site. If they do not appear to be negotiating, check the modem at the site to make sure auto-answer is turned on (only if your modem is connected to an I/O unit).</p>
	Radio frequency interference (RFI) is preventing a clear communication.	Install an RFI filter next to the modem or voice interface unit – whichever one is closest to the telephone line.
The modem does not appear to be working.	The modem is not turned on.	Make sure the modem has power and is plugged in.
	The modem is not setup properly.	Check the DIP switch settings. Use other communications programs such as HyperTerminal to see if your modem is working correctly. Enter the dial, initialization, reset and auto-answer strings are setup in the VRC software. You should get a dial tone with the dial string and an OK on the other strings. If it doesn't work, you may need to change the default strings being used. You may need to consult your modem manual for further assistance.
	The serial cable is not compatible.	Make sure you are using the proper null-modem cable to connect to your modem. The cable between the PC and modem should be a full implementation (nine-pin connection) cable supporting carrier detect, RTS/CTS and send/receive.
I'm directly connected to the site but I am still having trouble communicating with it.	You are not using the proper COM port.	For a direct serial connection, you should be connected to the FULL-TIME port. For a dial-up modem connection, and for firmware upgrades, you must use the DIRECT port. The FULL-TIME port is for a four-wire or two-wire leased line modem or direct connection.

If this happens...	It could be that...	Try this...
I can't connect to the site using the VRC2500 software.	The modem is not answering.	Check the connection between the on-site modem and the VRC unit. Check the auto-answer status lights on the modem and make sure it is on.
	The VRC2500 unit is not powered or has not been power-cycled since installing the modem.	The modem must be turned on, plugged into the correct COM port, and the VRC unit must be power cycled before the modem will be detected by any outbound calls for alarms will be made.
	The COM ports aren't configured properly.	Direct connect the PC to the VRC unit to make sure they can communicate. Run the VRC Site Manager and make sure the ports are configured correctly.
	The modem isn't configured properly.	If you hear two sets of tones (both modems are attempting to connect), make sure that both modems are set to the same baud rate – 19,200 is recommended. Both modems should be set for the same speed. If they are not, the faster modem may not be auto-bauding down fast enough.
My dial-up modem connection is unreliable at the 19,200 baud rate.	Close proximity to a transmitter or other RF sources may cause interference with the modem signal.	Install an RFI filter in line with the modem or Voice Interface – whichever is connected to the TELCO line.
	The power LED on the Command Relay Unit(s) does not light, or only one lights.	The unit is not properly connected.
A fuse may have blown.		The VRC unit's 5VDC outputs are protected by chemical (self-healing) fuses which will reset in about 30 seconds once an overload has been removed. Unplug the DB37 connector and wait at least 30 seconds. Then, plug the connector back in. The power LEDs should light. If the problem persists, please call technical support.
The Alarm Handler does not report alarms. It says that the unit is not recognized.	The site password set in the Site Access window is not the same as the site password set under Site Properties.	Make sure that the site password in the Site Access window is the same as the password in the Site Properties window. Typically a change in one window automatically updates the other.

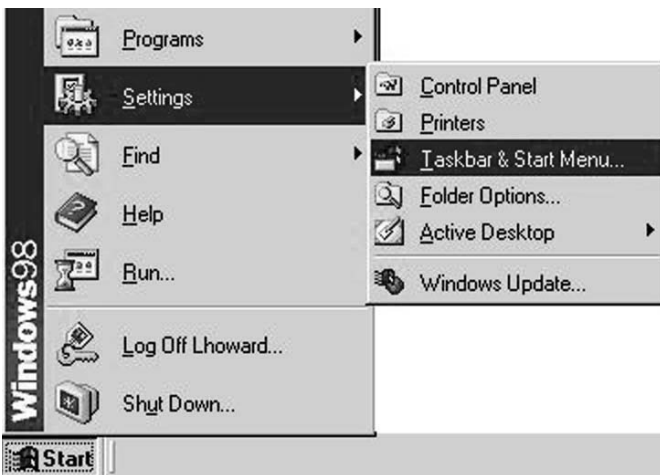
If this happens...	It could be that...	Try this...
I can't change the unit number.	You are not connected to the DIRECT port.	Connect to the DIRECT port on the back of the VRC unit.
	The serial cable is not compatible.	Use only the provided null-modem cable.
I can't upload firmware.	You are not connected to the DIRECT port.	Connect to the DIRECT port on the back of the VRC unit.
	The serial cable is not compatible.	Use only the provided null-modem cable.
I can't upload firmware or change the unit number.	Unit needs to be reset.	Install jumper JP9 and power cycle the unit. Remove the jumper and proceed with the upload firmware process and assign the unit number.
The front panel LEDs flash green and amber.	Unit has a defective chip.	The unit needs to be returned to the manufacturer for repairs.
The Power LED is green, the unit accepts programming, but the Remote/Local LED is off.	Unit has a hardware failure.	The unit needs to be returned to the manufacturer for repairs.
The LEDs are a solid amber color.	The firmware is corrupt.	Use the JP9 jumper to clear the firmware from the I/O module and then reload the firmware.
	Unit has a hardware failure.	The unit needs to be returned to the manufacturer for repairs.
Remote/Local LED is red and no commands are being issued.	The VRC unit is in local mode.	Press the Remote/Local button to switch the unit to remote mode.
The VRC unit loses its programming every time the power is cycled off and on.	JP9 jumper is not properly connected.	Verify that the JP9 jumper is disengaged. If disengaged, the jumper will be connected to one pin. If the jumper is engaged, both pins will be jumpered and your unit's memory will be cleared each time the unit is power cycled.
I am running Windows® 98 and I am getting DCOM errors.	The DCOM version you are running is older than the version the software is trying to install.	Choose "run" from the start menu. Type "command" and click ok. Change the directory by typing "cd C:\WINDOWS\SYSTEM\DCOM98\OLDOLE". Type "uninstall" and follow the instruction prompts. Reboot your machine to complete the uninstall. Re-installing the VRC2500 software will install the updated version of DCOM.



VRC Scheduler is automatically installed in the Windows startup folder so that it starts each time Windows boots or restarts. If you do not want it to automatically start, you can disable it by following these instructions.



Scheduler icon



Windows Start Menu

DISABLING AUTOMATIC START FEATURE

1. Click on the **Start** menu, select **Settings**, then **Taskbar and Start Menu**. Some systems may only show an option for Taskbar rather than for Taskbar and Start Menu (as pictured). However, both options open the Taskbar Properties window.
2. Next, select the **Start Menu Programs** tab, and click REMOVE.



Windows Taskbar Properties Window



Any scheduled events requiring actions by the PC will not occur if the Scheduler program is not running. If you've disabled VRC Scheduler, you must manually start it by clicking on its icon in the start menu.

3. In the Remove Shortcuts/ Folders window, select the StartUp directory. Click once on VRC2500 Scheduler. Then, click REMOVE. Click CLOSE. The program no longer starts automatically.

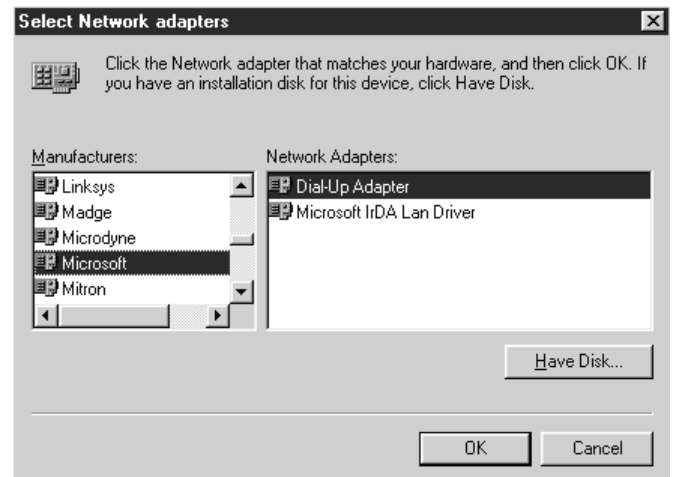
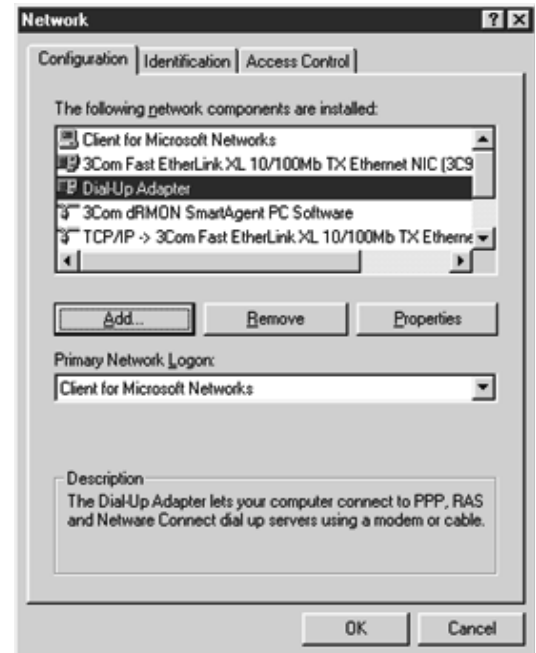
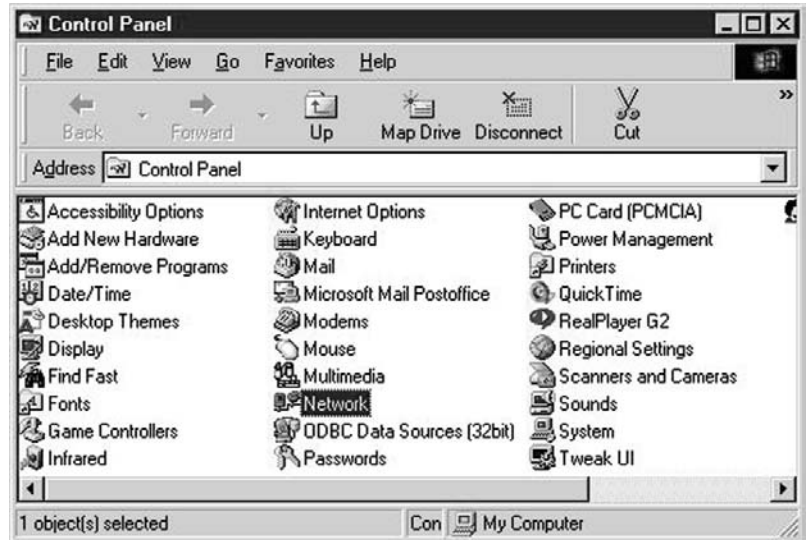


WINSOCK.DLL

If you receive a system error message when you start the server program stating that WINSOCK.DLL cannot be found, you will need to complete the procedure outlined on this page.

1. Click on the **Start** menu. Select **Settings** and then **Control Panel** to open the Control Panel window.
2. Double-click on the **Network** icon to open the Network window. Select **Dial-Up Adapter** and click **ADD** to open the **Select Network Component Type** window. Select **Adapter** and click **ADD**.
3. The **Select Network Adapters** window opens. Select **Microsoft** and **Dial-Up Adapter**. Click **OK**.

You will be prompted to reboot the PC. Click **OK**. If no network card is actually present or needed for this PC, after the above procedure is completed, you can open the network configuration window once again and remove the network components you just added. The WINSOCK.DLL file remains installed and the VRC2500 software functions normally.



UNINSTALLING VRC2500 SOFTWARE

1. Copy the **Archives**, **Custview**, and **Database** folders in your VRC2500 Program Directory to a backup or temporary folder.
2. Close all VRC programs including Scheduler and Site Manager. Right-click on the icons for these two programs on the Windows Taskbar and select Exit.
3. From the Start menu, open Control Panel. Double-click Add/Remove Programs. Select VRC2500 (your version of software may be listed as Gentner VRC2500) and click the Add/Remove button. Click OK to confirm removal.

Glossary

Alarm Handler: The Alarm Handler is a component of the VRC software. Whenever the VRC Site Manager receives an alarm, the Alarm Handler will inform you of the alarm.

Capture: A capture is a snapshot of the current readings on a VRC2500 unit. Information collected by a capture event includes the current state of the link loss, command output activity, and meter input readings. Captures are stored in the VRC unit until a user connects to the unit and downloads them to the connected PC, where they are stored in the VRC Database. A VRC unit will handle 192 captures before discarding the oldest capture in order to store the next one.

Command Relay Unit: The Command Relay Unit is a device that provides isolation between the VRC's I/O unit's solid-state open collector outputs and the site equipment that requires relay switching for operation.

Database: The database is a storage device that keeps the data for all the VRC2500 sites and units. If the user has multiple sites and units, only one database is needed to receive all data. The VRC database is compatible with Microsoft Access software.

Data Browser: Allows the user to sort, gather, and print the captured data from the VRC2500 unit(s). The Data Browser interfaces directly with the database to receive all of the shown data. The database can be stored on the local PC or on a network drive.

Dedicated Telephone Line: Also known as a leased-line. A dedicated line is a telephone line that is leased from the telephone company for reserved use. No dialing is required to connect via a dedicated telephone line. When connected to a VRC2500 system using a two or four-wire modem, a dedicated line operates in the same manner as a direct serial connection.

DIP Switch: Miniature rocker switches used by many modems for configuration purposes.

DTMF: Dual-tone multi-frequency (Touch-tone™) for dialing on a telephone system.

Firmware: Software that is stored in EPROM (Erasable Programmable Read Only Memory). Firmware can be uploaded from the configuration program to a VRC unit and also updates the unit's programming.

Floating Point: A decimal notation that describes a number. For example, 3.14 is referred to as a floating point number since the decimal value may appear at any position.

General Setup: General Setup is a component of the VRC2500 software. It is the primary tool in setting up the VRC2500 hardware and software. This application is used to setup all VRC unit functions such as status inputs, meter limits, command outputs, time of day events, and macros. Configuration is also used to setup site security, site time, and dial-out information.

Latching: A control signal that remains in a fixed state until released. This is opposed to a momentary control which is a pulsed signal.

Leased-Line: See Dedicated Telephone Line.

LED Light Emitting Diode. A semiconductor diode used in an electronic display that emits a light when subjected to an applied voltage.

Logging: A scheduled routine of having the PC connect to a VRC2500 site and gather current information on selected units and their respective input or output conditions. The Data Browser and Scheduler programs handle this function.

Macro: A string of software commands to a system that allows it to perform complex functions. Macros allow VRC2500 units to evaluate a situation and take corrective action based on the programmer's desired responses.

Monitoring: Handled by the viewer application. Live data viewing of input and output channels is available, as well as the ability to issue commands or run macros.

Network Address Number: Refers to the unique number that each VRC2500 site is assigned during configuration. This number allows the software to differentiate between more than one site when simultaneously connected.

Null-modem Cable: An RS-232 cable that reverses pins two and three. Use only the provided custom null-modem cable when connecting your PC to a VRC2500 unit.

PBX: Post Branch Exchange.

POTS: Plain Old Telephone Service. See Telephone Line.

Push-On Block: A connector block that simplifies pin-for-pin wiring between a VRC I/O unit and a Command Relay Unit or Wiring Interface Unit. No soldering is required; the block uses setscrews to lock down connections.

Remote Control System: Any system that is used to monitor and control equipment from a distance. The VRC2500 is a remote control system.

Remote Facilities Management: A more expansive term for remote control system. It refers to a remote control that is completely self-sufficient and self-monitoring, capable of controlling complete facilities instead of only limited equipment.

RF Link: Radio-Frequency communications link. An RF link refers to any modulated frequency communication between the VRC software and any other system including the VRC2500. This includes any sub-carrier generator/demodulator link using STL transmitters and receivers, microwave communication, spread-spectrum transceivers, etc.

RS-232: A standard DB9 serial connector used for connecting data processing units and control systems.

Serial Cable: The cable which connects the PC to a VRC2500 unit or modem. See Null-Modem Cable.

Source Code: The textual representation of programming instructions. With macros, the source code tells each macro how to perform its function and may include logical statements, functions, unit commands, and comments.

Telephone Line: In this manual, a telephone line is defined as the line delivered by the telephone company to an individual subscriber. Sometimes known as a POTS line, this is an analog line required by modems or fax machines.

Wiring Interface Unit: The Wiring Interface is designed to simplify connection of equipment to the VRC's I/O unit. It provides easy pin-for-pin wiring using push-on blocks. Used for connecting status and metering inputs only.

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