Twin Client Reference

For the PT900, PT930, PT930SA, and PA960 Manufactured by Unitech

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Chapter 1 • Introduction

PowerNet Products Overview

PowerNet products bridge the gap between portable wireless devices and network applications, making the entire wireless enterprise as productive, efficient, and reliable as possible. The PowerNet family of products supports the following:

- All Internet-compatible wireless networks, encompassing virtually all wireless LAN technologies on the market today. Spectrum One, a proprietary spread spectrum wireless technology in the 900Mhz band, is also supported.

- All Internet-compatible wire network media, including Ethernet.

- All major user interfaces, including HTML, VT, 3270, and 5250.

- All possible network application architectures including direct client, client-server, and three-tier client server.

PowerNet consists of two major product families that work in unison to deliver a single, complete solution for the entire wireless enterprise. The focus of these products is described below.

- PowerNet **OpenAir**: Hardware and middleware solutions for the wireless automatic identification industry. This family includes the Linux-based **OpenAir Linux**, the Windows-based **OpenAir Windows**, the version of OpenAir Windows that loads directly on a customer's AS400 host, **OpenAir 400**, and the universal terminal client software, PowerNet **Twin Client**.

- PowerNet **DataLinc**: Application development tools for the wireless client-server environment. This currently includes PowerNet **AirLinc** for use with ODBC compliant databases.

PowerNet Twin Client Overview

PowerNet Twin Client is a software package that provides VT100, VT220, TN3270 (Telnet 3270), and TN5250 (Telnet 5250) emulation on portable terminals. It includes an easy-to-use Windows program for configuring and downloading the software to the portable terminals.

Modes of Operation

PowerNet Twin Client operates in either of two modes: *thick* client or *thin* client.

- Thick client mode (also referred to as *Telnet client* mode) provides a Telnet connection directly to host computers and their applications.

- Thin client mode (also referred to as *Server client* mode) communicates directly with a PowerNet OpenAir or PowerNet AirLinc server, which in turn provides the connection to host computers and their applications.

The primary difference between the two modes is in processing load distribution: In thick mode, all application protocol processing is performed on the terminal, while in thin mode, all of the processing takes place on an intermediate OpenAir or AirLinc server. Another important difference is optimization: In thin mode, the OpenAir or AirLinc server introduces display optimization, data compression, and several other techniques that can dramatically reduce wireless network traffic. These optimizations are not possible in thick mode.

All of the user interface features, functions, and capabilities remain the same, regardless of the mode of operation.

Major Features

PowerNet Twin Client for Unitech terminals offers the following benefits:

- **Simplicity:** Twin Client is preset to match the default keyboard overlays and functionality of the Unitech Telnet client. No special configuration procedures are required.

- **Management:** Administrators and integrators can monitor and modify the software revision and configuration of each portable terminal from any Windows PC attached to the TCP/IP network. Changes are downloaded to the terminals over the wireless LAN automatically.

- **Formatting:** The Twin Client Terminal Screen Formatter feature is built-in, allowing integrators to tailor host application displays to suit the needs of the terminal operators without modifying the applications.

- **Internationalization:** Error message language translations and character sets are menu selections. No additional integration is necessary.

- **Migration:** Conversion to a PowerNet OpenAir or PowerNet AirLinc client-server environment is automatic because the "thin" client is included in the Twin Client software already downloaded to the terminal.

In This Manual

This manual is organized as follows:

- Chapter one provides an overview of the PowerNet product line and an introduction to the PowerNet Twin Client.

- Chapter two describes how to load the PowerNet Twin Client Manager software on your PC.

- Chapter three describes how to quickly configure the PowerNet Twin Client Manager and the terminal for automatic, over-the-air software download and subsequent Telnet session startup.

- Chapter four describes how to change the *Standard* setup options specific to VT, 3270, and 5250 emulations. The simple, time-saving features for converting existing Unitech Telnet client installations to PowerNet are also described here.

- Chapter five describes how to use the *Advanced* setup options for VT, 3270, and 5250 emulations. These options are used to customize keyboard, display, scanner, timer, alarm, and printer operation.

- Chapter six describes how to use the Twin Client advanced integration tools to further customize terminal operation. The creation and use of mapping, macro, dialog, and scanner control objects are described.

- Chapter seven describes the use of the built-in Twin Client Formatter, and how to configure the portable terminal to use screen formatting.

- Chapter eight describes how to use the Auto-Configuration tool to manage and automatically maintain the software configuration of all terminals on the wireless network. Also described are software management procedures and options that are unique to Unitech terminals.

- Chapter nine is a reference for the ISO 8859-1 and ASCII character sets.

- Chapter ten is a reference for the default keyboard configurations for Unitech terminals using PowerNet Twin Client in advanced mode. Figures and tables are included for 3270, 5250, and VT. Also included for reference are the Unitech terminal control sequences.

- Chapter eleven is a reference for error message resolution in Twin Client.

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Chapter 2 • Installation

This chapter describes the installation of the PowerNet Twin Client software on a PC. The software is available on CD-ROM or it can be downloaded from the Connect web site. Instructions are provided for both methods.

Requirements

Installation of PowerNet Twin Client requires, at a minimum, the following:

- A Pentium-class processor
- 32 MB of RAM
- 10 MB of free hard disk space available
- The PT900, PT930, and PT930SA terminals require Microsoft Windows CE. The PA960 terminal requires Microsoft Windows CE 3.0 / Windows CE.NET 4.2.
- ActiveSync needs to be installed on the PC before downloading files to the terminal. ActiveSync is freely downloadable from the Microsoft web site, at www.microsoft.com/downloads. For instructions, go to www.msdn.microsoft.com.

Downloading from the Web

The PowerNet Twin Client software package can be downloaded from the Connect web site at http://www.connectrf.com. Click on *Partner Services* and then click on *Software Downloads*. Select the file named *PowerNet Twin Client for Unitech*.

Running Setup from a Download File

The downloaded file is a compressed archive. After extraction using a utility such as *WinZip* or *PKWARE*, folders are created on the hard disk as shown in the following figure.

Name	Size	Type
disk1		File Folder
disk2		File Folder
disk3		File Folder
disk4		File Folder

Click on the **Disk1** folder to view the files as shown in the following figure.

Click on the **Setup** application and proceed to the following section entitled *Installation* for further instructions.

Installation

The InstallShield wizard runs and presents the following screen.
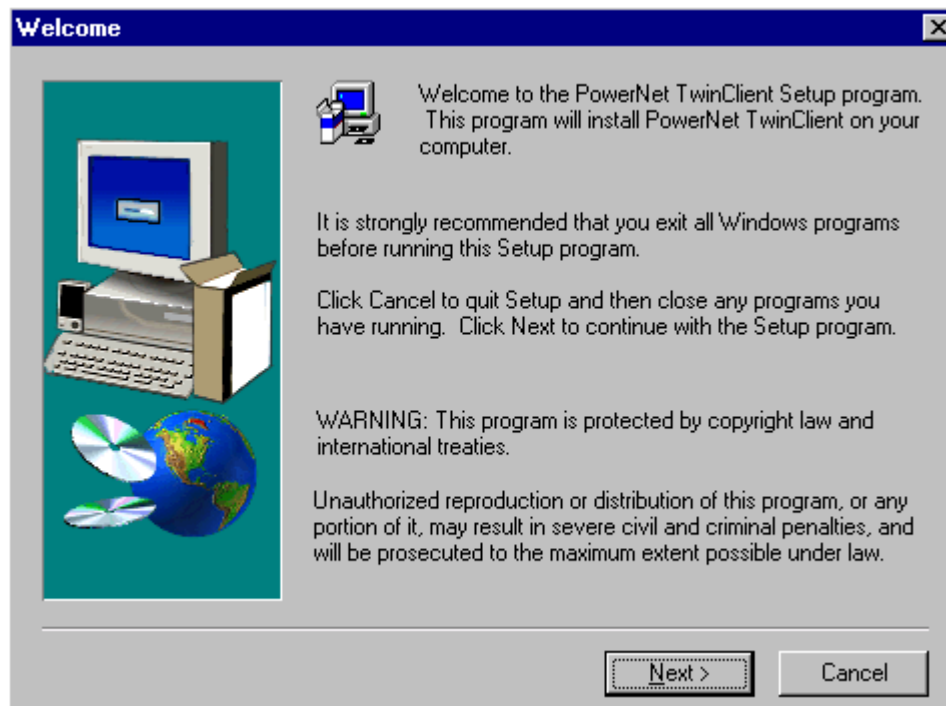
Click on **Next** to begin the installation process.
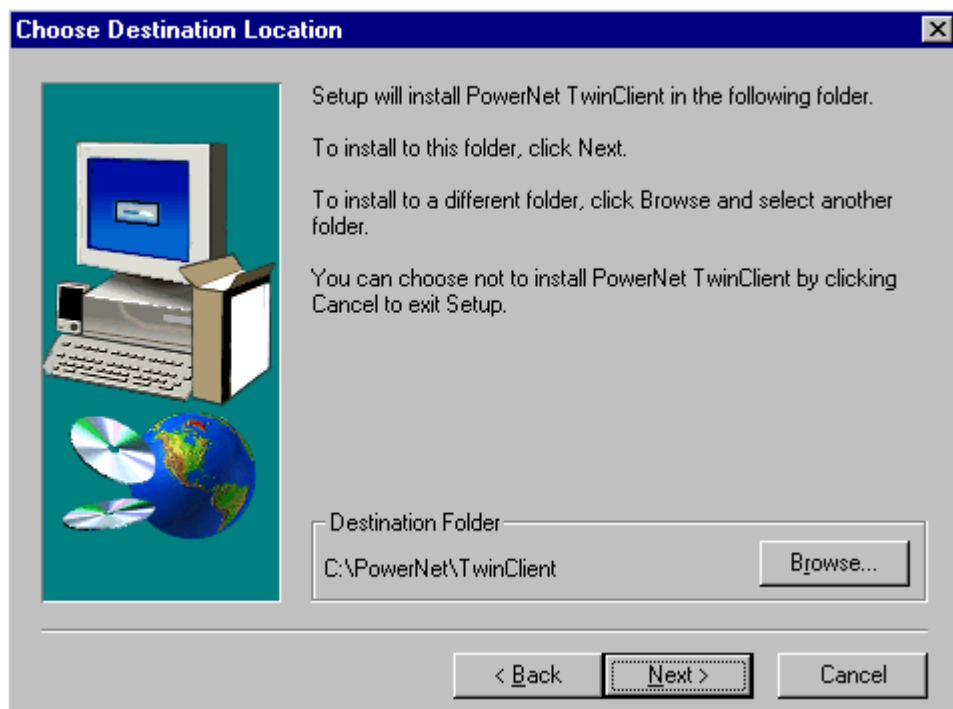
To change the default Destination Location, click on **B<u>r</u>owse** and select a location. Then click on **<u>N</u>ext**.
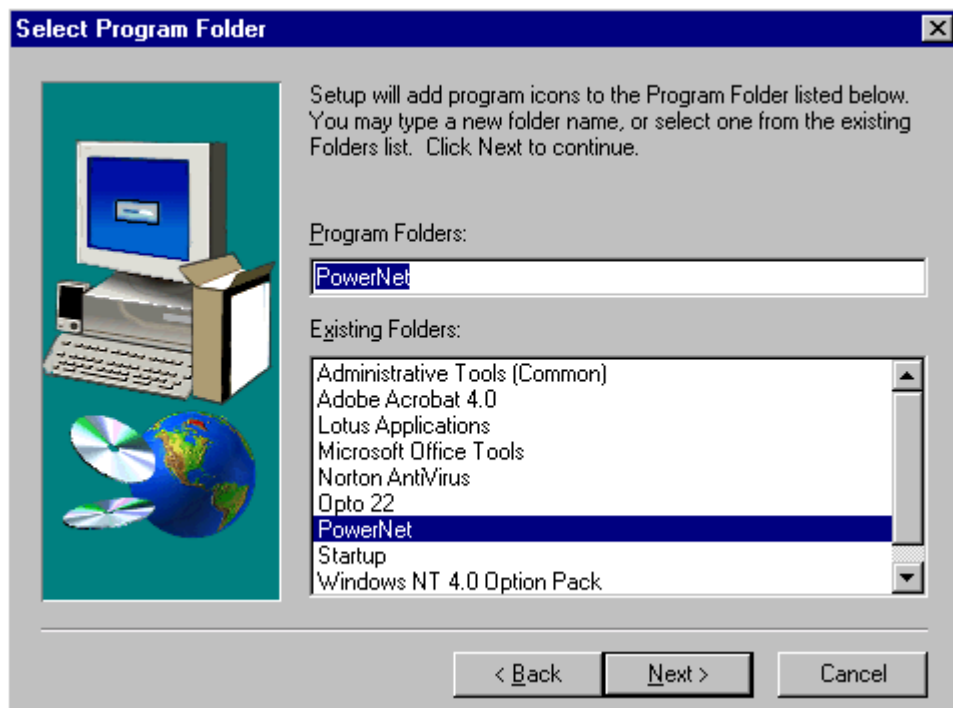
The default folder is PowerNet. This default may be changed either by selecting an existing program group or by typing in a new name at the prompt. Then click on **<u>N</u>ext**. The PowerNet Twin Client Manager and terminal files are then installed in the target folder.
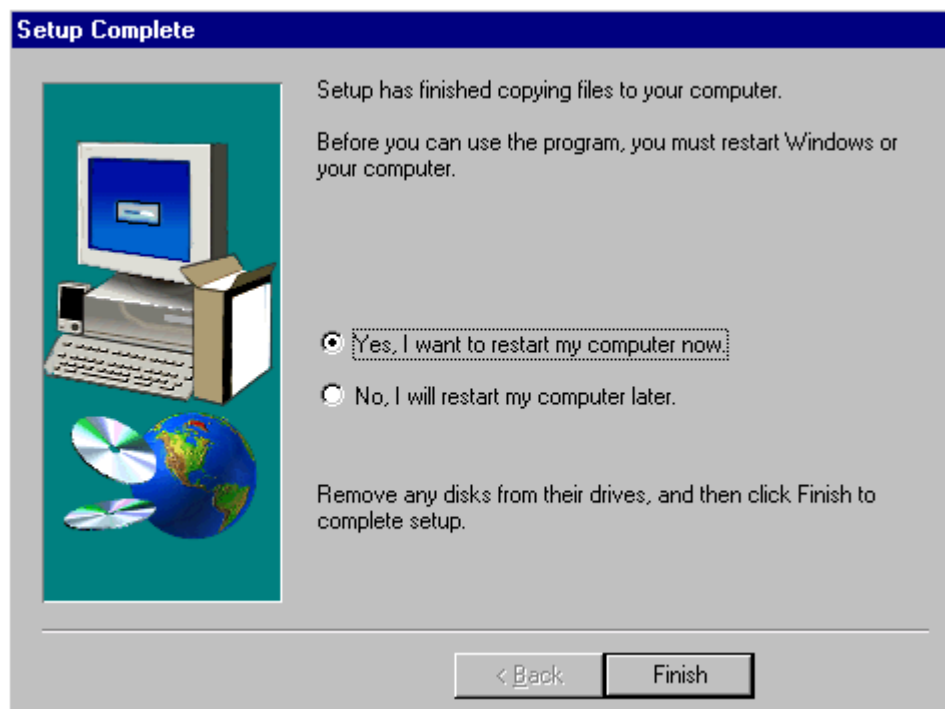
When the installation is complete, reboot the system to initialize the Twin Client software.

a. To reboot the system immediately, click on **Finish**.

b. To reboot later, click on the option to restart the computer later, and then click on **Finish**.

Running the Manager

The PowerNet Twin Client Manager is the utility that manages the terminal software and configurations.

Select **Start, <u>P</u>rograms**, **PowerNet**, and **Twin Client Manager**.

Note: If the PowerNet splash screen flashes for a second and ends when the Twin Client Manager is run, move the file at this link (http://www.connectrf.com/Documents/fix-flash.reg) to the system with the problem and then run it. This issue, found in earlier versions of the Twin Client Manager, has been fixed in later versions by using a later MS compiler and libraries.

The PowerNet Twin Client Manager screen appears as shown in the following figure. This is the administrator's main screen, and all functions are accessed from its menu bar, toolbar, and tabs.

Menu Bar

The menu bar provides access to the functions used to configure the terminals and manage their software. Subsequent chapters of this manual explain each menu and its options.
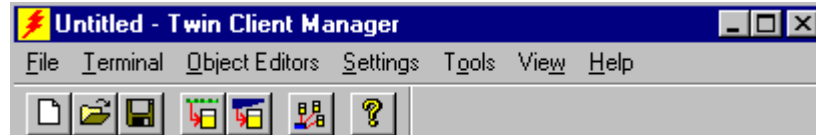
Toolbar

Found under the menu bar, the toolbar provides shortcuts to major features. The toolbar can be turned on or off by changing the Toolbar parameter found on the **View** menu. The shortcuts available from the toolbar are as follows.

	Create a new terminal configuration.
	Open an existing terminal configuration.
	Save the current terminal configuration.
	Download the configuration to the terminal.
	Download software to the terminal.
	Configure terminals automatically over the wireless network.
	View the PowerNet Twin Client Manager version.

The PowerNet Twin Client Manager is now successfully installed and ready for use. The next chapter provides detailed instructions for quickly configuring the terminal and starting a Telnet session.

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Chapter 3 • Quick Start

This chapter describes how to prepare the Twin Client Manager and the Unitech terminal for a Telnet session with the host. Following an initial serial download, the terminal software and configuration are managed automatically over the wireless network.

Note: Unitech terminals are normally delivered with Unitech files pre-installed. However, if the terminal does not have those files installed, refer to Chapter 8, *Sending Program and Configuration Files to the Terminal*, before proceeding.

Configuring the Manager

The first step is to configure the Twin Client Manager to meet site-specific requirements, and then prepare it for the automatic management of the terminal software and IP addresses. This simple procedure will require only a few minutes to complete.

Setting the Emulation

Click on **Start**, **Programs**, **PowerNet**, and **Twin Client Manager**, and then select the **Settings** menu, as shown below.
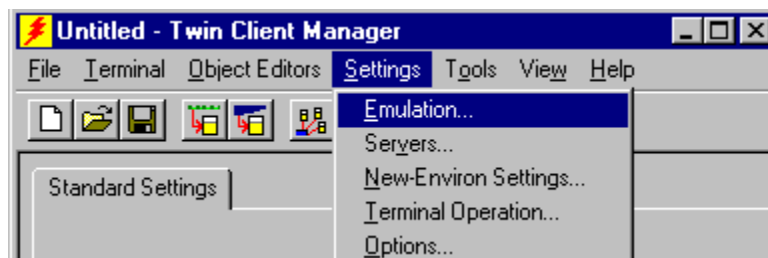
Click on **Emulation**, select the desired emulation, and then click on **OK**.
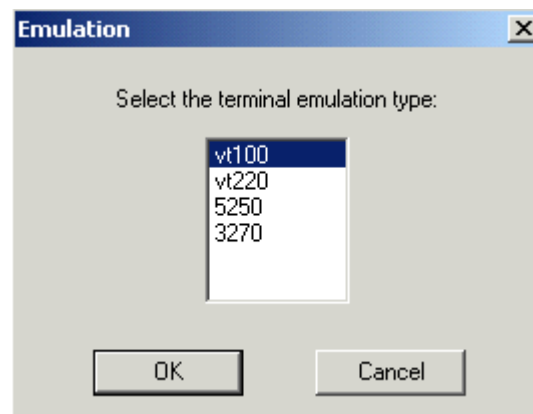
Setting the Servers

The Servers are the Telnet host systems the terminals will access.

To set these addresses from the **Settings** menu, click on **Servers** and then click on **Add**. Enter the name of each server, its IP address and IP port (normally 23 for Telnet servers), and emulation type. Then click on **OK**.
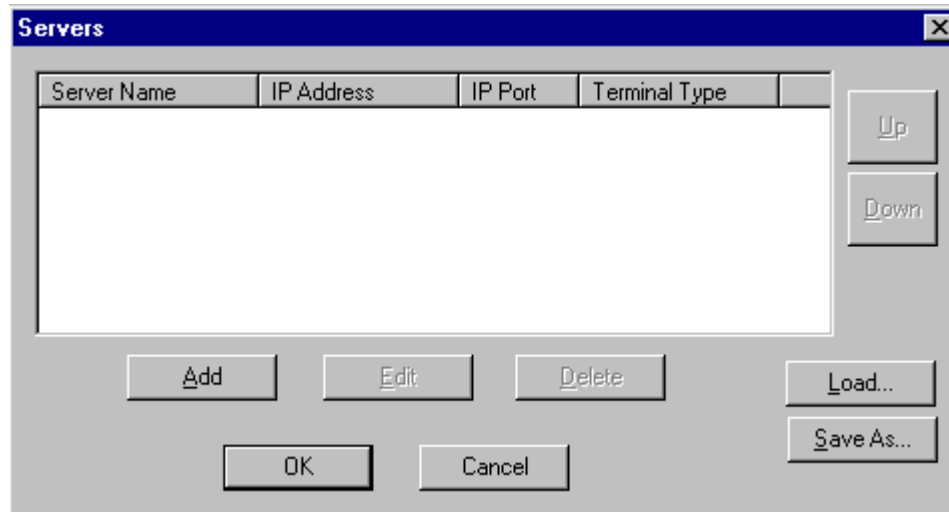
Repeat this step for each Telnet server the terminals are required to access. If an error is made in the name, IP address, IP port number, or terminal emulation type, click on the line that is in error and then click on the **Edit** button to make the corrections. Use the **Load** button if you want to load an .svr file. Use the **Save As** button if you want to save your file as an .svr file.

On CE terminals it is possible to use DNS (Domain Name System) lookup to determine the host address. To set this up, key in the full DNS name in the "Server Name" field and set the IP address to 0.0.0.0.

Note: Some DOS terminals also support DNS host lookup. You can determine if your device supports this by looking for the presence of a DNS setup option under "Terminal Setup" (Shift C).
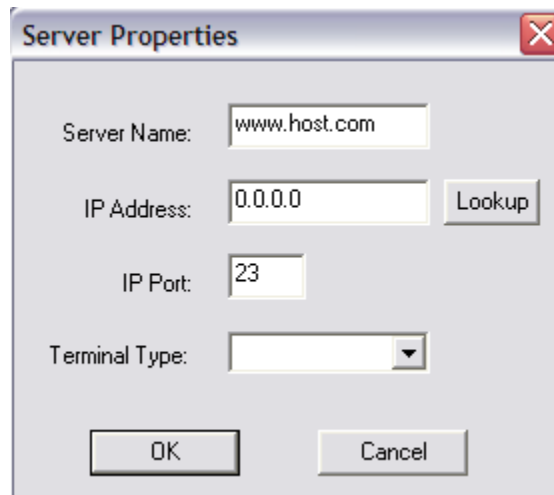
When the client sees the address of 0.0.0.0, it will issue a DNS lookup on the value in the "Server Name" field to determine the true IP address.

Please make sure that you have DNS set up on the terminal. On CE terminals, use the control panel. On DOS terminals, use the Shift C menu.

You can also "Test" the DNS name lookup in Twin Client Manager (if the Windows PC is using the same DNS server as the RF terminal). Just click on the "Lookup" button and the true IP will be returned in the IP address field.

Please make sure to set the address back to 0.0.0.0 before sending this to the terminal.

Setting Terminal Operations

In the Twin Client menu under **Settings**, choose **Terminal Operation**.

Run AirLoader on terminal can be selected, and the AirLoader server IP address can be entered. The Windows CE options of Run application at startup, Hide task bar, and Use GUI menus and screens can be selected.
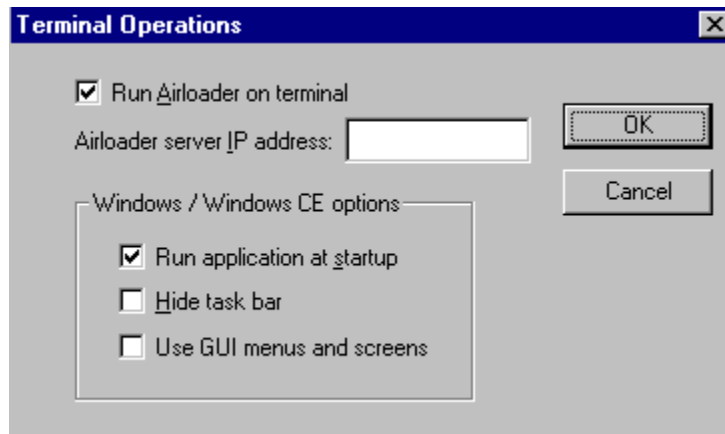
Click on **OK** when finished.

Setting Terminal Model and COM Port

The default serial connection to the Unitech cradle is through COM1. To select a specific Unitech terminal model and keypad, or to change the COM port assignment, click on the **Options** menu as shown.
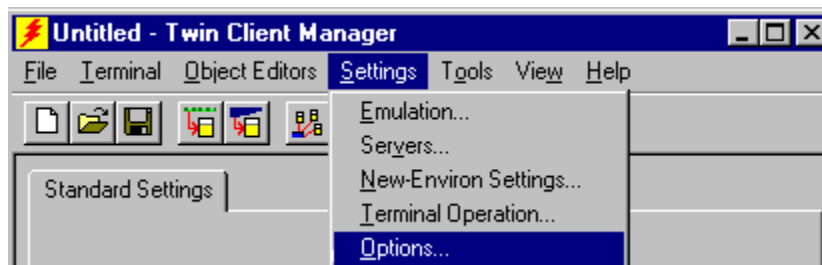
To maintain compatibility with existing Unitech Telnet client keyboard layouts, a specific terminal model and keypad must be selected from the Terminal Model window.
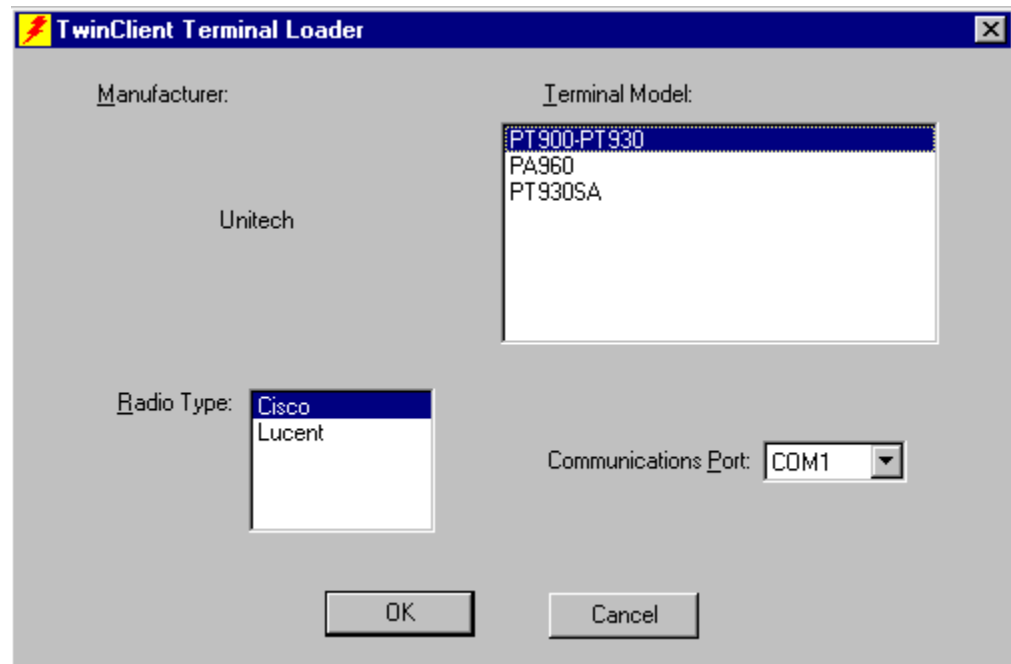
Saving the Configuration

Click on **File**, and **Save As**, and then enter a name for this configuration.
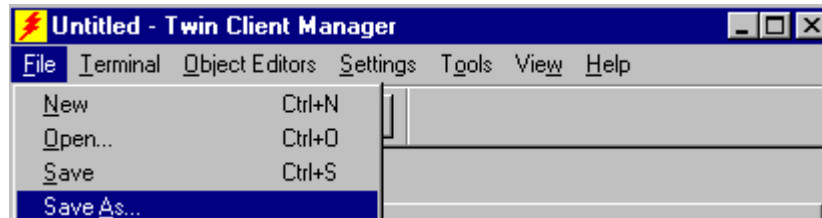
For the purposes of this example, the name is vt100.
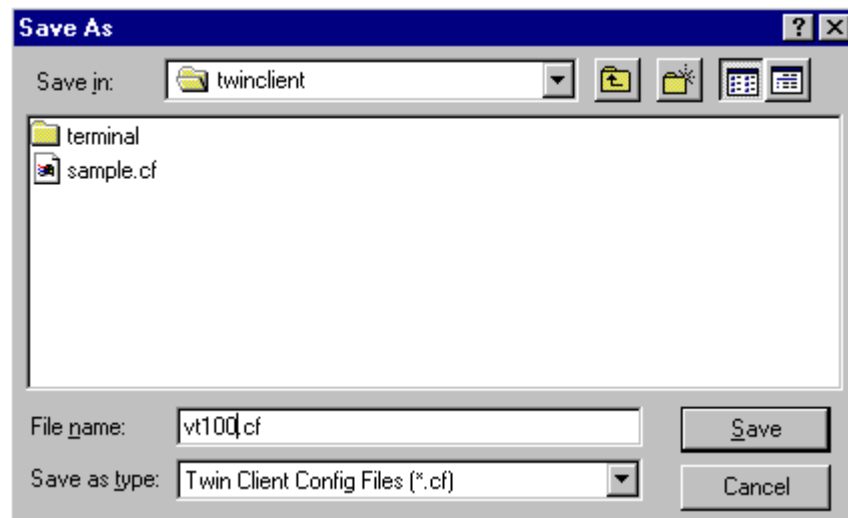
Setting Airloader Auto-Configuration

The configuration download and IP address assignment for each terminal will take place automatically by setting the Airloader Auto-Configuration options.

Click on the **Air̲loader** option in the **T̲ools** menu.

Note: If the Airloader Auto-Configuration window does not display the options, click on the **Advanced<<** button.

If multiple network adapters are installed on the PC, ensure that the desired network adapter is selected. The adapter selection can be changed by clicking on the **Change** button.
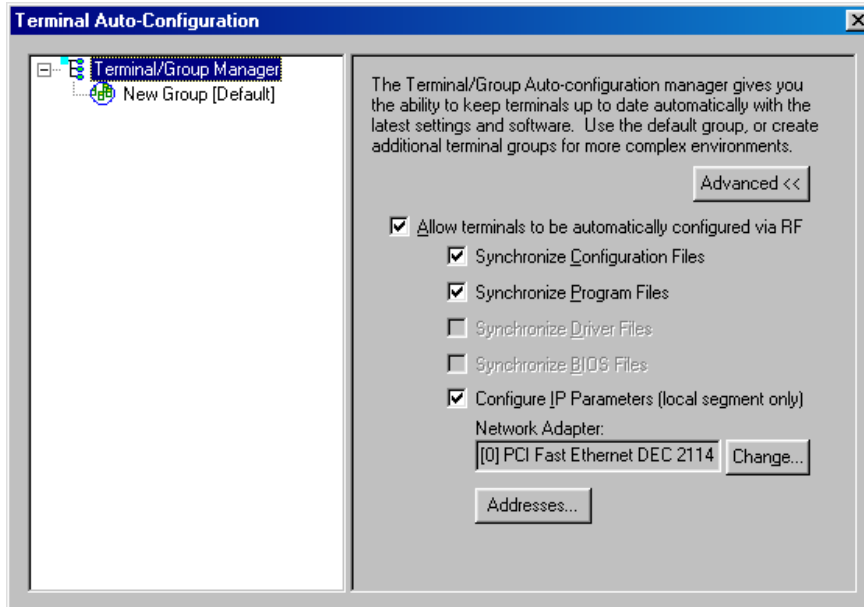
This powerful software management tool is described in detail in *Airloader Auto-Configuration*. For now, it is sufficient simply to use it for assignment of the initial terminal configuration and IP address, both of which can be easily changed later. Ensure that all of the check boxes are checked as shown above.

To assign terminal IP addresses automatically over the wireless network, check all of the boxes as shown above. Then click on the **Addresses** button and enter the desired range in the **F̲rom** and **T̲o** boxes as shown in the following figure.
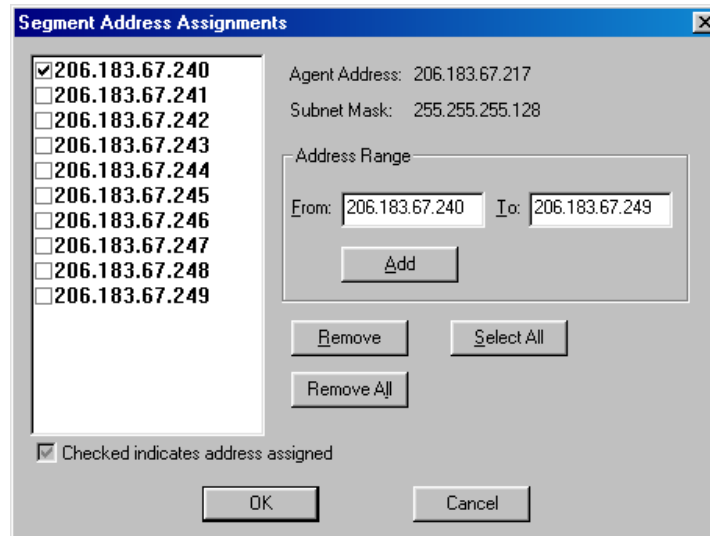
After setting the address range, click on **OK** to return to the Airloader Auto-Configuration screen and then click on the box next to **Terminal/Group Manager**.

The display expands to show the default terminal group. Next, click on the **New Group** icon and use the **Browse** button to select the configuration file saved earlier.
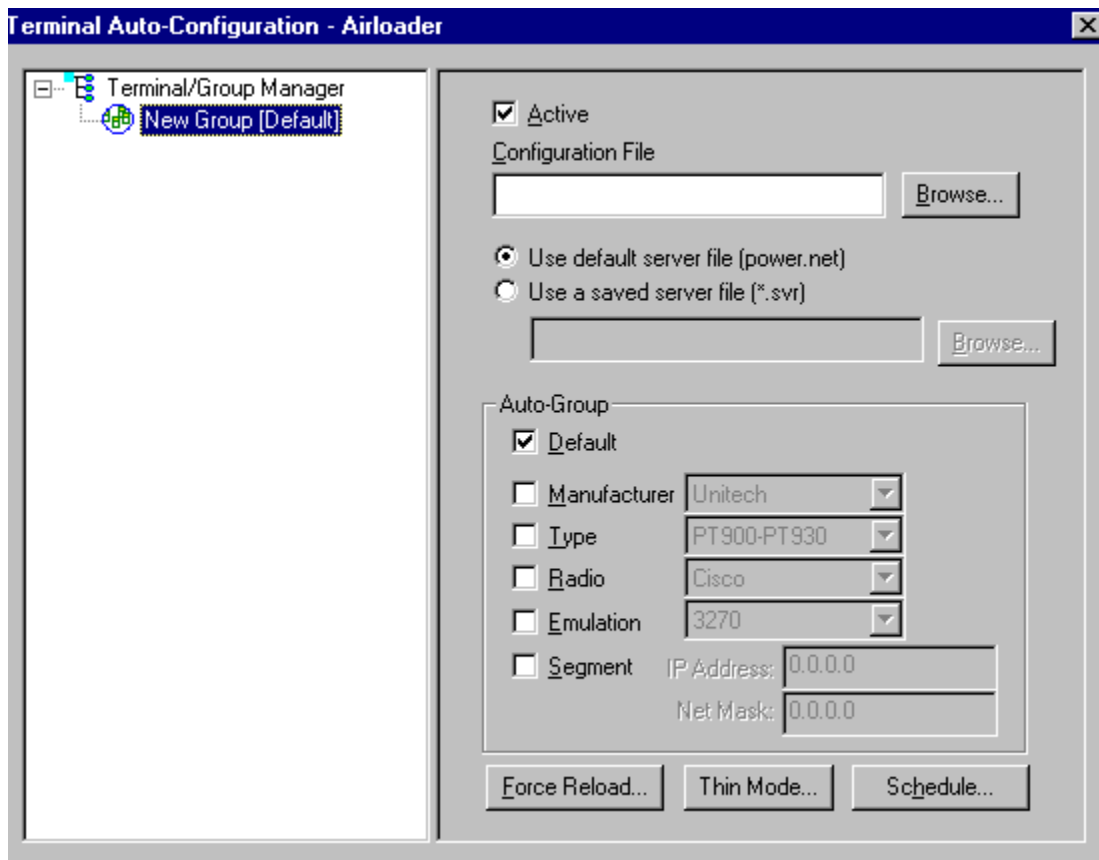
Check the **<u>Active</u>** box, and the system is now configured to automatically download IP addresses, software, and configuration files to the terminals. Click on the ⊠ box in the upper right corner to return to the main menu.

Note: The software does not need to be authorized now. It can be authorized later, after a Telnet session has been established. The procedure is described in the Chapter 4 section, *Authorizing PowerNet*.

Configuring the Terminal for Download

On the PC, click on **Start**, **Programs**, **PowerNet**, and **Twin Client Manager**. Under the **Terminal** menu, choose **Send Program Files to Terminal**, as shown below.
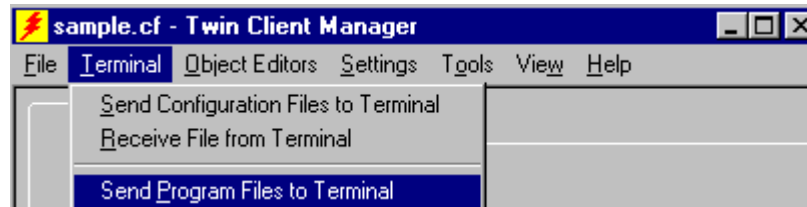
The following screen is displayed.
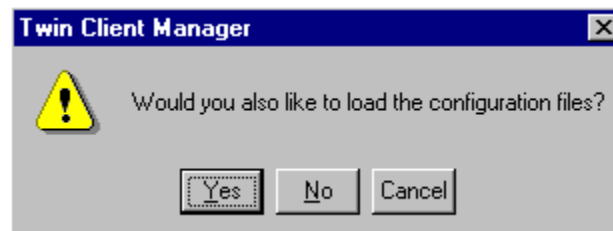
Choose **Yes** at the prompt. The following screen is displayed.
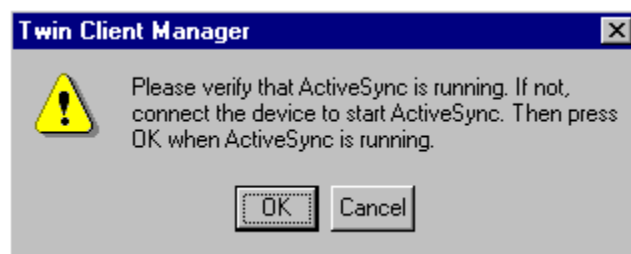
Click on **OK**.

Downloading the Files

Turn on the power to the terminals in the cradle, which should display the following screen.

```
Comm Parameters

Start?    <ENT>
```

Press **Enter** on the terminal and return to the Twin Client Manager to click on the **OK** button. The following should be displayed on the terminal while the download is in progress.

```
Program loader

Receiving:
```

The download requires approximately 2 minutes to complete.

Following a successful download a status code of 0000 is displayed on the terminal. Use the following table of status codes to troubleshoot a download failure.

Status Code	Error
0002	Receive overrun
0004	Receive parity
0008	Receive framing
0010	Programming voltage absent
0020	DSR or CD detected on open
0080	ABORT key pressed
0100	CD lost during session
0600	NVM EEPROM failed to erase
0800	Receive time-out error
1000	Control start character time-out
2000	CTS inactive time-out
4000	Receive buffer full

In the event of a failure, verify the following:

- The null modem cable connection between terminal and PC and condition of all connectors.
- The specification of correct COM port.
- The correct cradle power supply.
- The blinking of the charging light on the cradle, indicating proper seating of terminal in cradle.

Warm Booting the Terminal

Following a successful file download, and at any time it is necessary to update the terminal software and/or configuration, the terminal must be warm booted.

Model	Instructions
PT900-PT930 PT930SA	Following Power OFF - Click on **Start**, **Programs**, **File Explorer**, and **Windows**. Select the **boot mode** icon. Choose **OK**.
PA960	While the PA960 is operating, insert a pin (a paper clip works well) into the reset hole on the back of the terminal, right below the PCMCIA cover.

The completion of the warm boot is indicated by the following terminal display.

```
LOAD EMULATOR USING
1 - AirLoad
2 - Serial Download
```

Note: To minimize download time, remove the terminal from the cradle.

Enter **1** to continue. Option 2 is used for custom download options and is described in the Chapter 8 section entitled *Sending Program and Configuration Files to the Terminal*.

The terminal then associates with an access point, contacts the Twin Client Manager, and then downloads the program, configuration, and IP address of the terminal.

During the download, progress messages are displayed on the terminal. Pauses in activity of up to 10 seconds will be observed as the terminal writes to EEPROM. The download requires approximately 2 minutes to complete.

The following table describes the error messages that will be displayed on the terminal in the event of a download failure, and can be used as a guide to correcting the problem.

Error Indication	Possible Cause	Corrective Action
NOT Associated	Invalid NETID	Run **CFG24** (or current Unitech radio setup program) and set NETID to match the access point. See *Terminal Setup Using Twin Client Menus*.
No AirLoad Manager Found	AirLoad Manager not active, or not installed on the LAN segment	Ensure that the PC with Twin Client Manager is on the same segment and that the PC is operating. If the PC is not on the same segment, enter the address of the PC in response to the terminal prompt.
Manager not Active	Previously identified AirLoad Manager is no longer found.	Same as above.
Unable to open connection	IP stack on terminal failed to load.	Reload Unitech driver files.
Timeout waiting for data	Transient communications failure	Reboot terminal. If problem persists, check the RFSYNC.log in the PowerNetTN directory.
Download aborted	Socket closed during download	Ensure PC is operating. Reboot terminal and retry.
Manager inactive	PC not operating	Restart the PC.

After taking the corrective action, the terminal must be booted again. A successful wireless connection and download is indicated by the display of the Twin Client main menu shown below.

```
Twin Client
© 1991-2006, Connect, Inc.

Keypress to Continue
```

Note: The date of 2006 on the terminal is updated at the time of a new release.

The terminal is now ready to establish a Telnet session with the host system.

Starting a Telnet Session

At the Twin Client main menu on the terminal, press any key to establish the connection. Until the terminal has been authorized, the following screen is displayed.

```
RECOVERABLE ERROR
Terminal not
Authorized for
Twin Client

Keypress to Continue
```

It is not necessary to authorize the terminal at this time, so press any key to continue. The terminal will establish a connection with the host system and start emulation. If the terminal fails to connect to the host, refer to the following table.

Failure Cause	Corrective Action
Incorrect Host IP address	Correct the Host List address on the terminal. Refer to the Chapter 4 sub-section *Terminal Setup Using Twin Client Menus* for instructions.
Incorrect netmask value	Access Radio Setup menu and correct the netmask value. Refer to *Terminal Setup Using Twin Client Menus* for instructions.

After a Telnet session has been successfully established, the terminal will remain in session for a maximum of 30 minutes at a time until it has been authorized. Once authorized, there is no software restriction to the session time. The instructions for authorizing the terminal are presented in *Authorizing PowerNet* in Chapter 4.

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Chapter 4 • Standard Setup

The default terminal setup is sufficient for most installations. However, to meet site-specific requirements, it may be necessary to customize terminal operation. The standard setup options simplify this process and can be modified by the following methods:

- Using the Twin Client Manager.
- Using the Twin Client terminal menu system.

This chapter describes how to use the Twin Client Manager and the terminal menu systems to set up the terminal. Also described are the methods for authorizing the terminal software.

Setup Using Twin Client Manager

The Twin Client Manager provides a Standard Settings tab for automatic setup of the terminals. Select **Standard** from under the **View** menu. The options within this tab may vary according to the emulation selected, each of which is described below.

VT Settings

Select the VT emulation setup by clicking on the **Settings** menu and then the **Emulation** menu, as shown below.
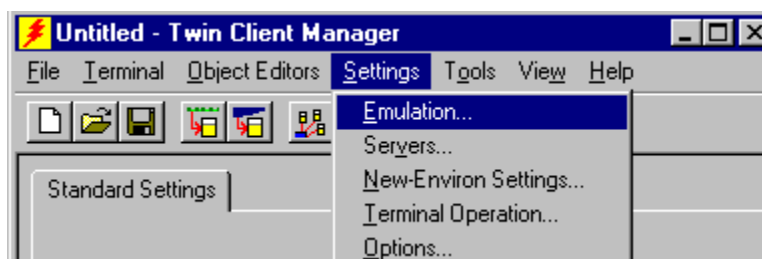
Then click on the **VT100** or **VT220** selection, as shown below.
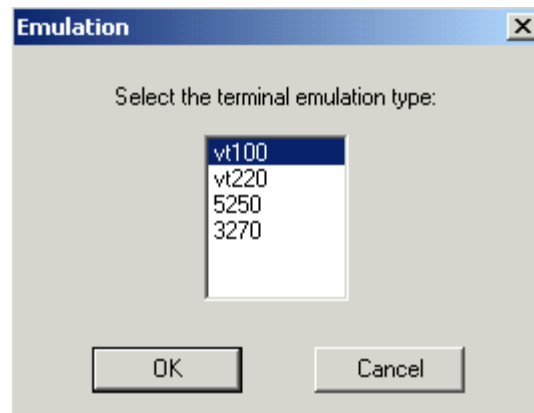
Click on **OK** after the selection is made, and return to the main Twin Client Manager menu. The standard settings tab will now reflect the settings for VT emulation.

Quadrant Mode

This scrolling list option defines the rules by which the terminal display is positioned in the larger host display. As defined by Twin Client, quadrants are fixed position "windows" in the host display, and the terminal display is located on whatever quadrant contains the current cursor position.

Off disables quadrant processing and Twin Client simply centers the current host input field in the terminal display.

On enables quadrant processing. However, input fields that cross quadrant boundaries result in a shift to the left in order to locate as much of the current input field on the terminal display.

Soft always positions on a quadrant boundary regardless of input field boundaries. Viewing keys are enabled.

Hard is the same as **Soft** except the viewing keys are disabled.

Lock locks the terminal display origin (upper left corner) to fixed row and column (x,y) coordinates in the host display. The coordinates are zero-based.

Font

The Font Size scroll box provides a choice of font size for the display of characters. The Bold Font check box enables (checked) and disables (unchecked) the display of characters in bold font.

Key Click

This check box enables (checked) or disables (unchecked) audible key clicks from the terminal. The default value is **on** (checked).

Printer Type

This scrolling list selects the attached printer type. The default value is **none**, indicating that no printer is attached.

5250 Settings

Select the 5250 emulation setup by clicking on the **Settings** menu and then the **Emulation** menu, as shown below.
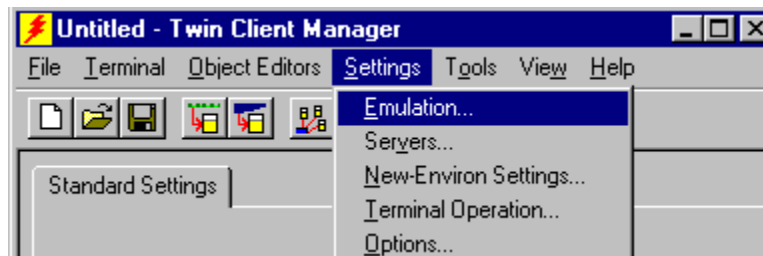
Then click on the **5250** selection, as shown below.
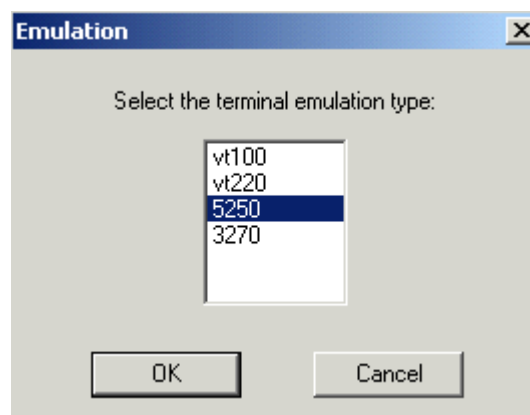
Click on **OK** after the selection is made, and return to the main Twin Client Manager menu. The standard settings tab will now reflect the settings for 5250 emulation.

Quadrant Mode

This scrolling list option defines the rules by which the terminal display is positioned in the larger host display. As defined by Twin Client, quadrants are fixed position "windows" in the host display, and the terminal display is located on whatever quadrant contains the current cursor position.

Off disables quadrant processing and Twin Client simply centers the current host input field in the terminal display.

On enables quadrant processing. However, input fields that cross quadrant boundaries result in a shift to the left in order to locate as much of the current input field on the terminal display.

Soft always positions on a quadrant boundary regardless of input field boundaries. Viewing keys are enabled.

Hard is the same as **Soft** except the viewing keys are disabled.

Lock locks the terminal display origin (upper left corner) to fixed row and column (x,y) coordinates in the host display. The coordinates are zero-based.

Font

The Font Size scroll box provides a choice of font size for the display of characters. The Bold Font check box enables (checked) and disables (unchecked) the display of characters in bold font.

Key Click

This check box enables (checked) or disables (unchecked) audible key clicks from the terminal. The default value is **on** (checked).

Printer Type

This scrolling list selects the attached printer type. The default value is **none**, indicating that no printer is attached.

3270 Settings

Select the 3270 emulation setup by clicking on the **Settings** menu and then the **Emulation** menu, as shown below.
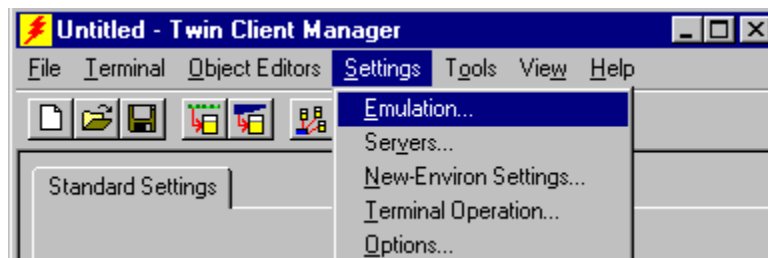
Then click on the **3270** selection, as shown below.
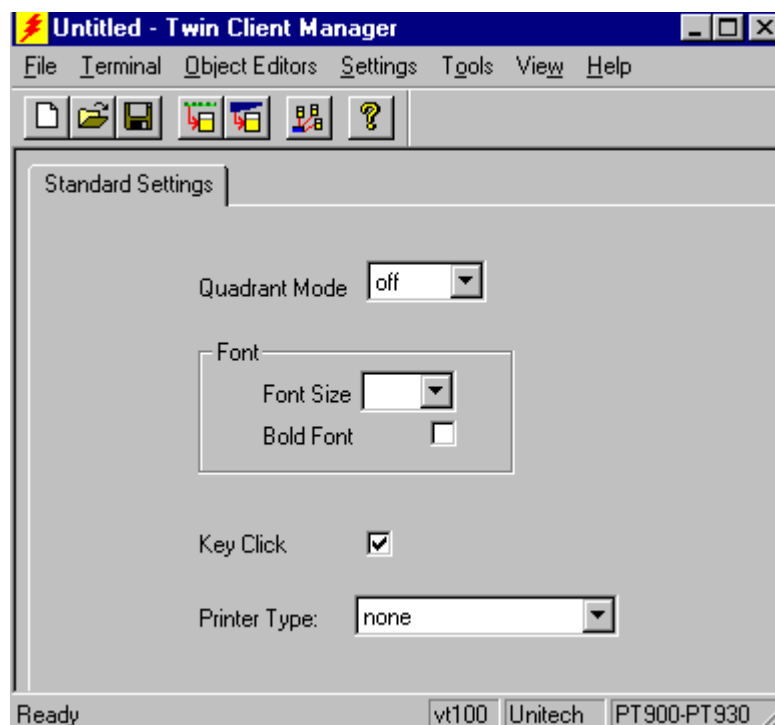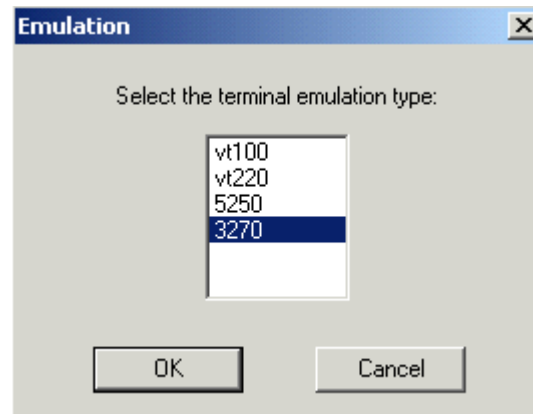

Click on **OK** after the selection is made, and return to the main Twin Client Manager menu. The standard settings tab will now reflect the settings for 3270 emulation.

Quadrant Mode

This scrolling list option defines the rules by which the terminal display is positioned in the larger host display. As defined by Twin Client, quadrants are fixed position "windows" in the host display, and the terminal display is located on whatever quadrant contains the current cursor position.

Off disables quadrant processing and Twin Client simply centers the current host input field in the terminal display.

On enables quadrant processing. However, input fields that cross quadrant boundaries result in a shift to the left in order to locate as much of the current input field on the terminal display.

Soft always positions on a quadrant boundary regardless of input field boundaries. Viewing keys are enabled.

Hard is the same as **Soft** except the viewing keys are disabled.

Lock locks the terminal display origin (upper left corner) to fixed row and column (x,y) coordinates in the host display. The coordinates are zero-based.

Font

The Font Size scroll box provides a choice of font size for the display of characters. The Bold Font check box enables (checked) and disables (unchecked) the display of characters in bold font.

Key Click

This check box enables (checked) or disables (unchecked) audible key clicks from the terminal. The default value is **on** (checked).

Printer Type

This scrolling list selects the attached printer type. The default value is **none**, indicating that no printer is attached.
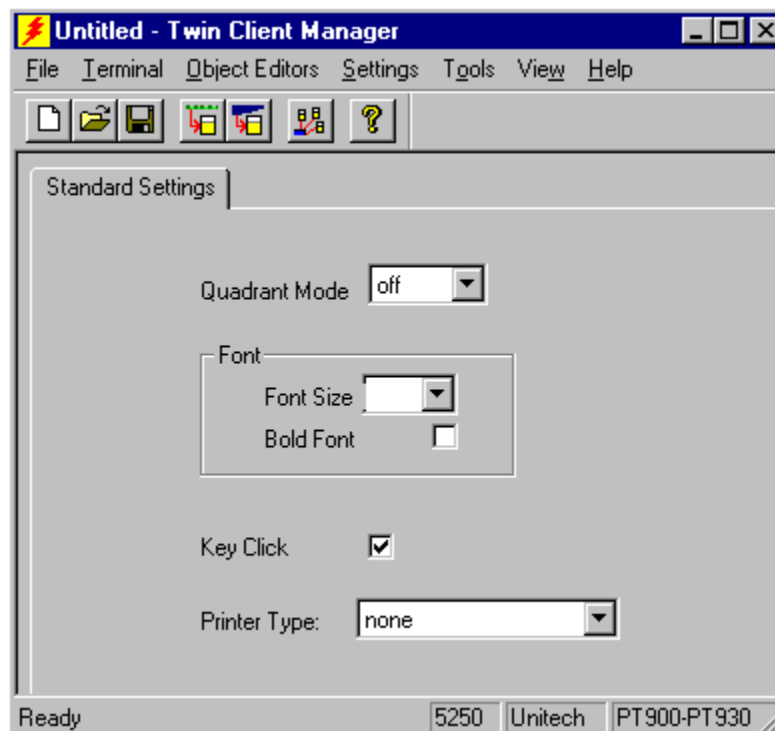
Terminal Setup Using Twin Client Menus

The Twin Client terminal software provides an internal menu system for configuring certain parameters on the terminal and for switching between thin and thick modes of operation. To access this menu system, press uppercase **C** at the startup screen as shown in the following figure.

```
Twin Client
© 1991-2006, Connect, Inc.

Keypress to Continue
```

The following menu appears in thick (Telnet) mode:

```
Edit Server/Host IPs
Edit License Key
Switch Client Modes
Run Client Emulator
Exit to OS
```

The following menu appears in thin (Server) mode:

```
Edit Server/Host IPs
Run Site Survey
Switch Client Modes
Run Client Emulator
Exit to OS
```

Use the **Up-Arrow** and **Down-Arrow** keys to navigate the menu, and press **Enter** to select the highlighted option. Each menu option is described below.

Edit Server Host IPs

If the host IP address or addresses were not pre-configured as described in the Setting the Servers section of *Configuring the Manager*, or if you wish to change those settings using the terminal menus, select this option and enter up to four Host IP addresses as required.

```
   Host 0
IP 206.183.67.155
Port 23__


<F3> Save <F7> Quit
```

Press **F3** to save the configurations.

Edit License Key

The client software can be authorized automatically, as described in the next section, *Authorizing PowerNet*. This menu option permits authorization of each terminal manually. Select this option to obtain the terminal's Identification Code, which is used to obtain the Authorization code from the Connect web site, as described in the next section.

The 12-digit value displayed at the top of the terminal screen is the Identification Code for the terminal.

```
00A0F826E614
Authorization
   _____

not authorized

<F3> Save <F7> Quit
```

Type the Authorization code into the field as it appears on the web site. Punctuation characters, such as the hyphen (-), are required. Press **F3** to save the Authorization code.

Run Site Survey

This option (a feature of Spectrum 1) is applicable to Release 5.0 and may be obsolete for your terminal.

Switch Client Modes

The PowerNet Twin Client normally operates in thick mode, which provides direct connection to Telnet hosts. It can also operate in thin mode, through a PowerNet OpenAir server. Select the **Switch Modes** menu option to switch between thin and thick modes of operation. Note that the host socket address for the PowerNet OpenAir servers is 1800, which must also be changed in the **Edit Host List** menu described above.

Run Client Emulator

After all desired changes have been made, select the **Run Emulator** option to return to the Twin Client main menu. Then press any key to establish the Telnet session and begin emulation. Refer to *Starting a Telnet Session* for further instructions.

Authorizing PowerNet

Each PowerNet Twin Client will run for 30 minutes at a time without authorization. Uninterrupted operation for a production environment is the result of authorizing the software.

The Twin Client Manager can automatically authorize the terminal over the wireless network if the following requirements are met:

- A PC running Twin Client Manager is connected to the wire LAN segment with at least one access point within range of the terminal.

- The System ID of the PC on which Twin Client Manager is installed has been used to obtain a site license Authorization code from the Connect web site.

To obtain the System ID of the Twin Client Manager, click on the **Authorization** option in the **Tools** menu, as shown below.
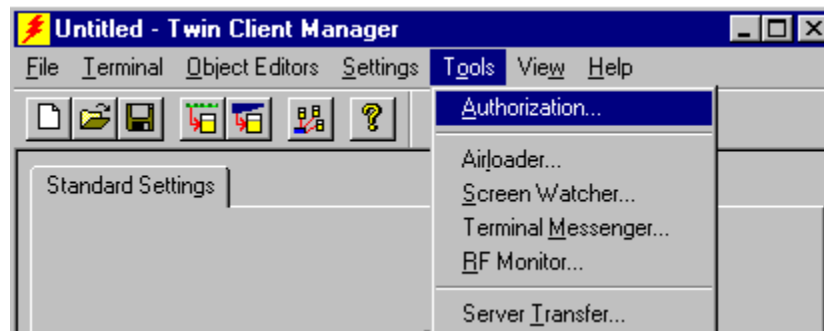
The Authorization window is displayed as shown below.
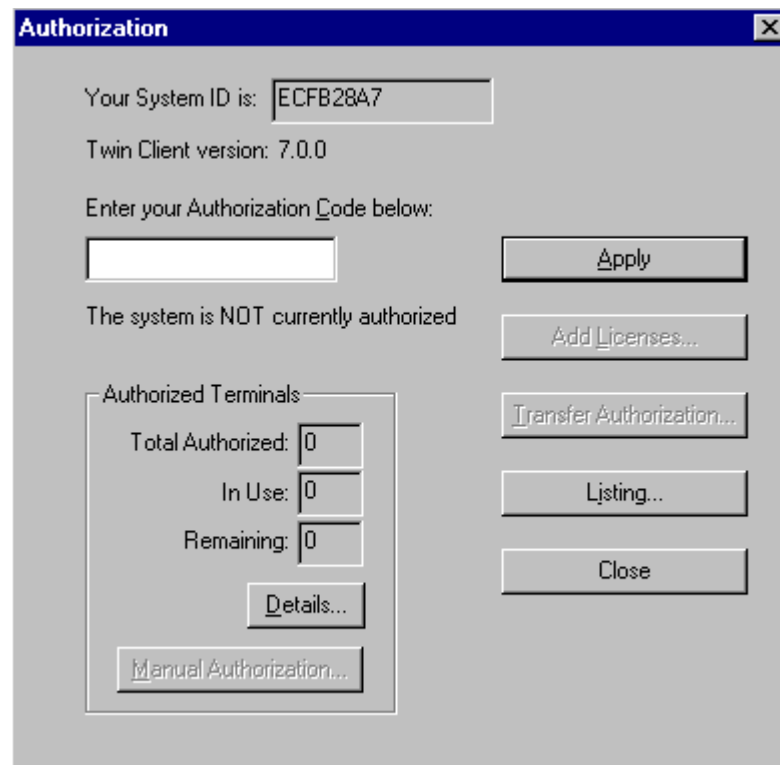
Go to http://www.connectrf.com. Click on **Partner Services**. Click on the **Generate Authorization** icon at the top of the page. Follow the directions on the web site.

Authorized Terminals

The number of terminals authorized, the number of terminals in use, and the number of terminals remaining is provided in the Authorized Terminals box on the lower left side of the screen.

Click on the **Details** button to number the options in the screen below in the order of your priority.

Note: The terminal may or may not be able to utilize the Formatter feature depending on its Authorization codes.
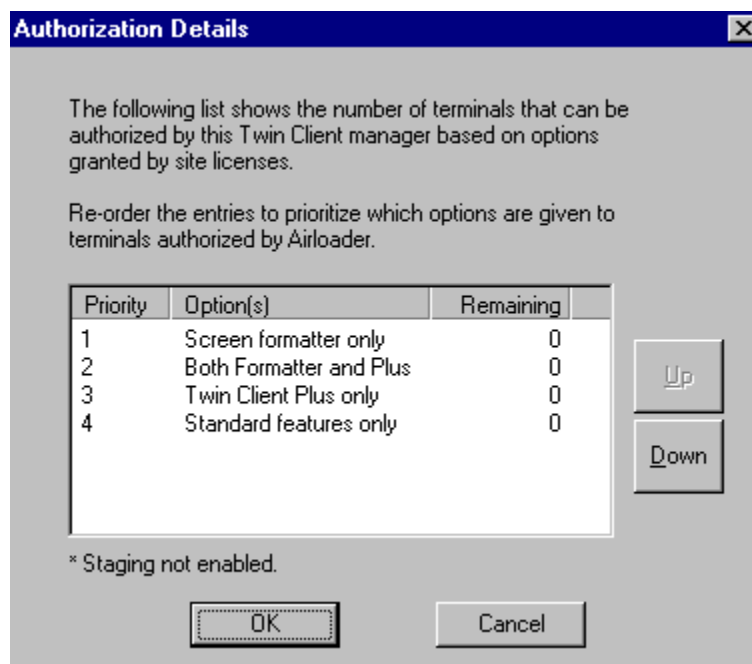
Click on an option and move it using the **Up** and **Down** buttons.

Click on **OK** when finished.

The **Manual Authorization** button is an alternate method of obtaining an Authorization code for a terminal. This method does not utilize Airloader, as does the other method.

Click on this button, manually enter your mac address in the screen that appears, and click on **OK**. This enables you to generate individual Authorization codes.

Adding Licenses

The Add Licenses feature is used when adding additional licenses to an already site licensed Twin Client Manager. (i.e. Twin Client Manager is licensed for 10, and the customer purchases another 10 licenses to make a total of 20.)

From Twin Client Manager, choose **Authorization** from under the **Tools** menu. Click on the **Add Licenses** button.
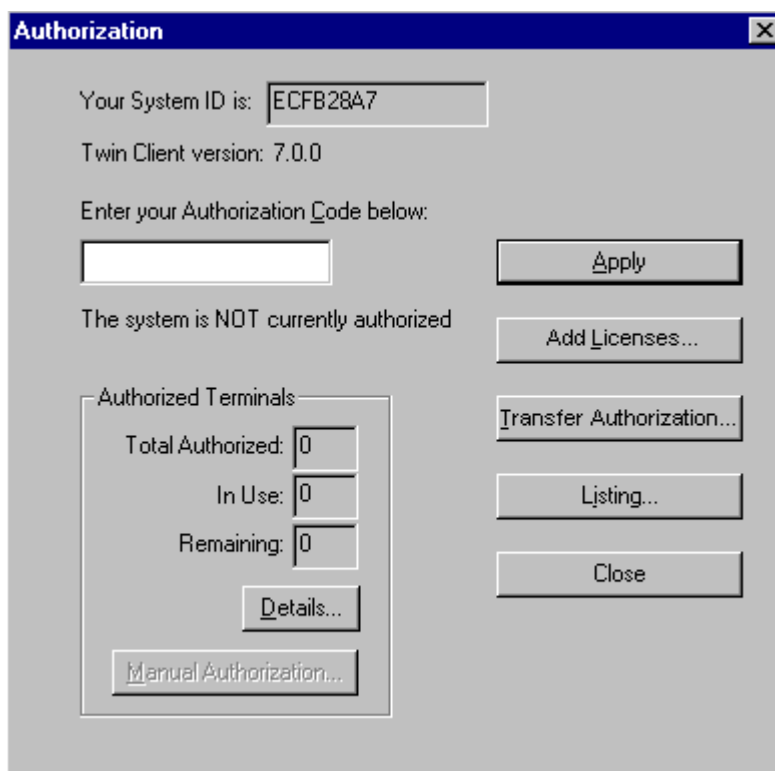
A pop-up box appears with the Machine ID and a space for the additional license's Authorization code. Enter the additional license's Authorization code and click on **OK**.

Use the Machine ID in the pop-up box instead of the original Machine ID to get your Authorization code.

If adding users, click on the **Add Licenses** button before generating the Authorization code to get the most current Machine ID.

Transferring Licenses

The Transfer Licenses feature is used when moving a site license from one PC to another. After Twin Client Manager is installed on a new PC, you will need the System/Machine ID for it.

From Twin Client Manager, select **Authorization** from under the **Tools** menu.

Click on the **Transfer Authorization** button on the old PC. You will be asked for the new System ID. Enter this new System ID. It will generate an Authorization code for the new PC's Twin Client Manager.
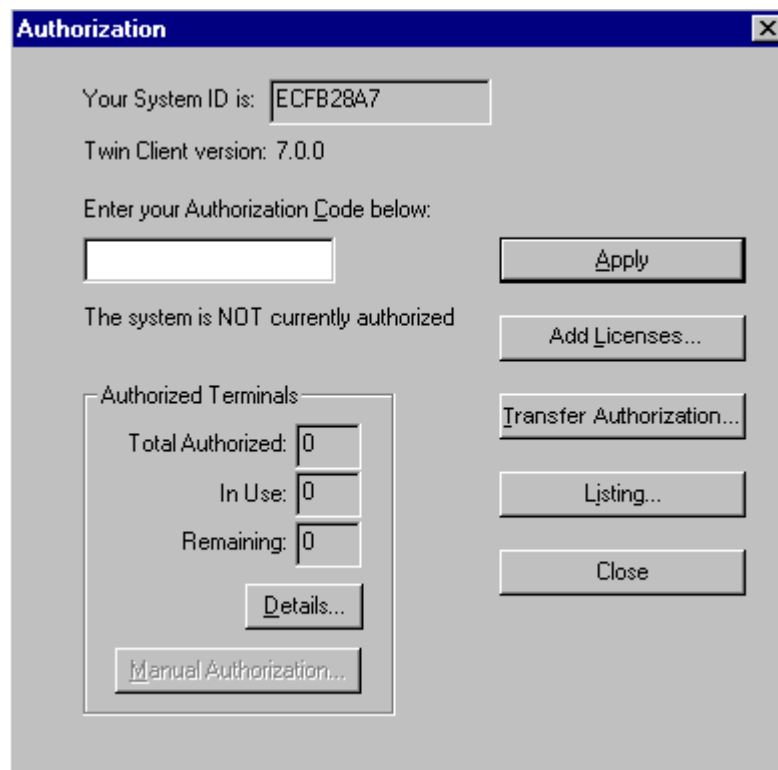
Note: This feature only works if there are licenses remaining on the old PC.

Listing

Click on the **Listing** button to view Authorization codes used along with corresponding serial numbers.

The Authorization codes used along with their corresponding serial numbers will appear.

Click on **OK** when finished.

Click on the **Close** button when finished.

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Chapter 5 • Advanced Setup

The PowerNet Twin Client permits the customization of all aspects of terminal operation without custom programming. This chapter describes all of the advanced setup options. Additional advanced customization features, using the Object Editors, are described in Chapter 6.

Selecting the Advanced Setup

The Twin Client Manager is installed in the Standard Setup mode. To change to the Advanced mode, click on the **View** menu and then on **Advanced**.
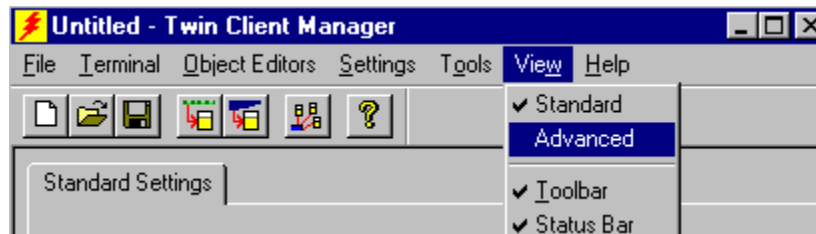
As a result, a new set of tabs is displayed, as shown below.
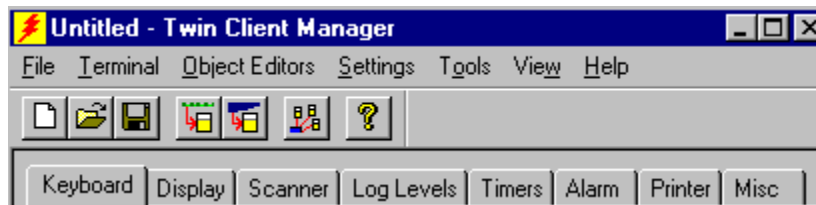
The following sections in this chapter describe each of the tabs and the options within each tab.

Customizing the Keyboard

Clicking on the **Keyboard** tab displays the setup options related to the terminal keyboard and its operation.
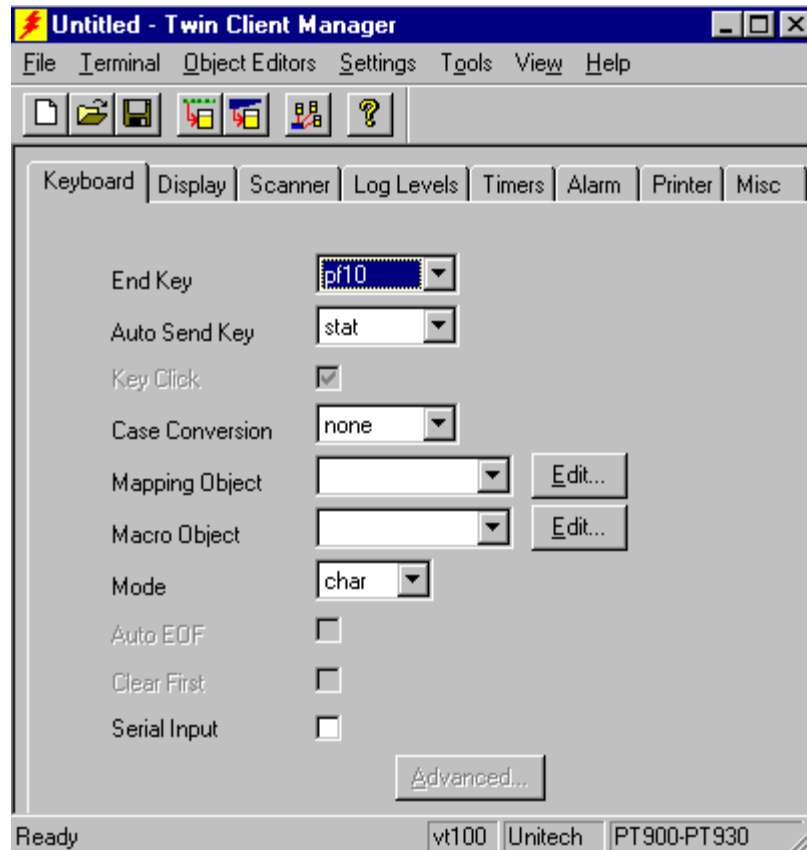
End Key

This scrolling list selection is used to set the terminal key that terminates both the host connection and the wireless session. The default is **PF10**.

Auto Send Key

This scrolling list selection is used to set the keystroke to be sent automatically by the terminal when an input field on the terminal is filled with keyed input. That is, if an input field is 9 characters long, and 9 characters are manually keyed into the field, the Auto Send key is automatically transmitted with the 9 characters. The default is **tab**. Selecting **noop** disables this feature.

Note: Selecting the Length Check option on the Scanner tab disables the Auto Send Key.

Case Conversion

This scrolling list selection allows automatic conversion of keyed input to upper or lower case. The default value is **none**, meaning no conversion takes place.

Mapping Object

This feature of PowerNet Twin Client allows for custom keyboard development. For example, the **tab** key can changed to generate a **PF4**. This is an advanced integration tool and its use is described in Chapter 6.

Macro Object (VT Only)

This feature is used to assign a key sequence to a specific terminal key. For example, the PF1 key can be set to generate a sequence such as **receiving**. This is an advanced integration tool and its use is described in Chapter 6.

Mode (VT Only)

This scrolling list selection controls the transmission characteristics of the VT emulation. In **char** mode, each keystroke generates an individual transmission. In **block** mode, a transmission takes place only after a control key, such as **Enter** or a **PF** key, is depressed. The block mode is more efficient. Refer to Chapter 6, *Advanced Display Options for VT*, for more details on setting block mode operation.

Note: When set to **char** mode, the **Collection timer** value in the Timers tab should be set to between 30 and 50 milliseconds for maximum performance.

Auto EOF (3270 only)

This check box option enables (checked) or disables (unchecked) the automatic erasure of all data in a field prior to keyed or scanned data input. The default value is disabled (unchecked).

Clear First (3270 only)

This check box option enables (checked) or disables (unchecked) the automatic erasure of all data in a field prior to keyed or scanned data input. The default value is disabled (unchecked).

Serial Input

This check box option enables (checked) or disables (unchecked) the viewing of the terminal screen in hyperterminal.

Advanced (3270 only)

Clicking on the Advanced button brings up the Advanced 3270 Keyboard screen and provides a variety of special key generation options. This is an advanced integration tool and its use is described in Chapter 6.

Customizing the Display

Clicking on the **Display** tab shows the options related to the terminal display and its operation.

Quadrant Mode

This scrolling list option defines the rules by which the terminal display is positioned in the larger host display. As defined by Twin Client, quadrants are fixed position "windows" in the host display, and the terminal display is located on whatever quadrant contains the current cursor position.

Off disables quadrant processing and Twin Client simply centers the current host input field in the terminal display.

On enables quadrant processing. However, input fields that cross quadrant boundaries result in a shift to the left in order to locate as much of the current input field on the terminal display.

Soft always positions on a quadrant boundary regardless of input field boundaries. Viewing keys are enabled.

Hard is the same as **Soft** except the viewing keys are disabled.

Lock locks the terminal display origin (upper left corner) to fixed row and column (x,y) coordinates in the host display. The coordinates are zero-based.

Scroll Mode

This scrolling list option selects the rule used for moving the terminal display within the host display using the viewing keys.

Half scrolls the terminal display in half-screen increments. For example, given a 16-column screen, the screen is scrolled left and right 8 columns at a time.

Full scrolls the terminal display in full screen increments. For example, given a 16-column screen, the screen is scrolled left and right 16 columns at a time.

Language

This scrolling list option selects the display character mapping and the translation table used for error messages displayed on the terminal. The default value is English. The file umsgs.txt, which is installed with PowerNet Twin Client, contains all of the current language translations.

In the event a specific language is not translated, or if a specific message is not correctly translated, visit the Connect web site at http://www.connectrf.com and check the Support page for a related Tech Note. If the issue has not been addressed, email support@connectrf.com and request a Product Change Request (PCR).

Cursor Appearance

This scrolling list option selects the manner in which the cursor is displayed on the terminal. The default value is **hard**.

Type	*Appearance*
Soft	Blinking Underscore (_)
hard	Blinking Block ■
hide	None

Mapping Object

This feature is used to modify the displayed character set. This is an advanced integration option and its use is described in Chapter 6.

Dialog Object

This feature is used to build session automation scripts, and is an advanced integration option described in Chapter 6.

Formatter

This feature is used to re-format the host display onto the terminal display. This is an advanced integration option and is described in Chapter 6.

Relocation Group

This option group allows rows of the host display to be relocated automatically. This option is particularly useful when the application generates important error messages on a specific row that is not necessarily within the terminal's display area.

Source

Defines the starting row (zero-based) in the host display that is relocated to the destination row of the host display. The default is zero (0).

Destination

Defines the starting source row location (zero-based) in the host display. Default is zero (0).

Row Count

Specifies the number of host display rows to be relocated, starting with the row defined by the Source option and continuing from top to bottom of the display. The default, zero (0), disables row relocation.

Move Blank

This check box enables unconditional relocation (checked), or enables relocation only when data is present on the source row or rows (unchecked). The default is unchecked.

Reverse Video

This check box enables (checked) or disables (unchecked) the processing of the reverse video display attribute on the terminal. The default value "default" is on (checked).

Wait Message

This check box enables (checked) or disables (unchecked) the display of the message Waiting for Data on the terminal display. This message is used to indicate that the terminal has transmitted data to the host application and is waiting for a response. The default value is enabled (checked).

Default Data (3270/5250 only)

This check box enables (checked) or disables (unchecked) editing of data present in the current input field prior to entry of new data by the terminal operator.

Font Size

Font options chosen here are small, medium, larger, and largest.

Bold Font

This check box enables (checked) or disables (unchecked) the display of characters in bold font.

Advanced (VT only)

This button accesses setup options for controlling all aspects of VT display attribute mapping and masking. This is an advanced integration tool and its use is described in Chapter 6.

Customizing the Scanner

Clicking on the **Scanner** tab shows the options related to the terminal scanner and its operation.
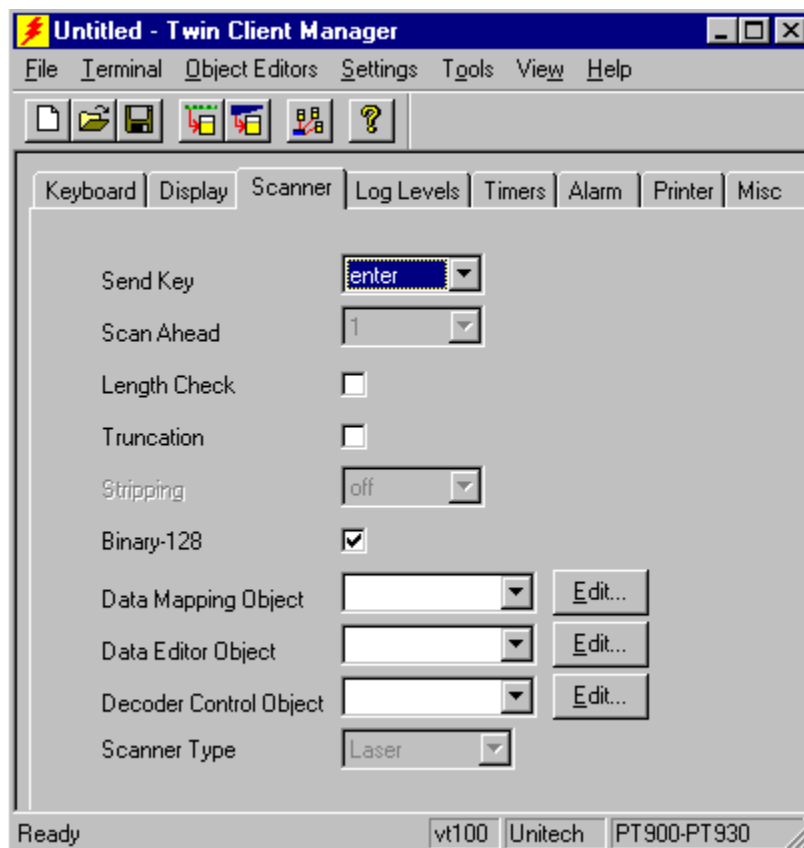
Send Key

This scrolling list option defines the control key automatically transmitted with scanned data. The list of keys depends on the type of emulation in use. The **noop** key indicates that no automatic control key will be sent. The default value is **Enter**.

Scan Ahead

This scrolling list option defines the number of scans that can be transmitted by the terminal without a response from the host system. The maximum is 24, and default is 1.

Set to 0, scan ahead is disabled and you cannot scan again until the host response has been received.
Set to 1, there is no scan ahead limit.
Set to 2 and above, and the software will let you scan that many times until a host response is received. So if you set it for 3, it will allow you to scan only 2 more times before the host responds to the first scan.

Length Check

With Length Check off, and Auto Enter key set to "noop": Keyed or scanned input that is equal to or greater than the field length results in an error "Entry Too Long" and no data is transmitted.

With Length Check off, and Auto Enter key set to anything other than "noop":
a. Keyed input equal to the field length: The data and the specified Auto Enter key are transmitted.
b. Keyed input greater than field length: This is not possible, due to a) above.
c. Scanned input equal to or greater than the field length: The data is transmitted. If the data is greater than the field length, that data is distributed among subsequent input fields and the Scan Termination key is transmitted (unless it is set to "noop").

With Length Check on: The Auto Enter key and its functionality are disabled for both scanned and keyed input.

There are specific functionalities related to the various settings of length checking and the Auto Enter key. Setting the Auto Enter key to "noop" disables the Auto Enter function (i.e., automatic transmission of data when the field is filled or overfilled) for both scanned and keyed input. When it is set to anything other than "noop", keyed and scanned input is distinguished and the Auto Enter key is effective only for keyed input. Scanned data that is equal to or greater than the field length is terminated with the Scan Termination key instead of the Auto Enter key.

Note: Enabling Length Check disables the Truncation option (described below).

Truncation

This check box option enables (checked) or disables (unchecked) the automatic truncation of scanned data that is greater than the length of the input field. With both Truncation and Length Checking disabled, oversized scans are automatically applied to subsequent input fields as needed. If either option is enabled, this automatic application is disabled. The default value is disabled (unchecked).

Stripping

This scrolling list option controls the rule for automatically removing trailing spaces and underscore characters. The rules are defined as follows:

Rule	*Operation*
off	No stripping is performed.
space	Trailing spaces are stripped.
score	Trailing underscores are stripped.
both	Both trailing spaces and underscores are stripped.

Binary-128

This check box enables (checked) or disables (unchecked) the processing of binary code 128 bar codes on the terminal. The default value is enabled (checked).

Caution: If this option is disabled and binary-128 barcodes are used, the results are unpredictable.

Data Mapping, Data Editor, and Decoder Control

These are advanced integration tools and are described in Chapter 6.

Scanner Type

This scrolling list option defines the type of special scanner attachment in use, if present.

External Scanner Setup

RF terminals can be ordered with an Internal scanner or they can support an external scanner. The external scanner is connected to the bottom of the terminal through the serial port. This requires the RS232 adapter be installed. The external scanner can be made to work even if an internal scanner is present. However, scanner decoder controls only apply to the internal scanner as the user only has access to the internal decoder.

The external scanner must be a serial based scanner. These are scanners that have on board decoder hardware/software and output their signals by normal RS232 signaling methods. These external scanners are controlled by their respective manufacturers' program controls provided in the manual accompanying the scanner from the manufacturer.

The serial data stream, which the scanner outputs, needs to be in specific data format and speed. The RF terminal user manual has the setup for some popular scanners in this manual. It also includes the required bar codes to setup these scanners.

The following is an example of a setup for an RF terminal.

The order in which to set up the scanner is:

1 - (SET RS-232C DEFAULTS)

2 - (SET ALL DEFAULTS)

3 - RS-232 HOST BAUD RATE (9600)

4 - RS-232 HOST PARITY (NONE)

5 - RS-232 HOST DATA TRANSMISSION FORMATS (<DATA><SUFFIX>)

6 - RS-232 HOST PREFIX/SUFFIX VALUES (SUFFIX)

7 - RS-232 HOST PREFIX/SUFFIX VALUES (<1><0><1><3>)

Setting Log Levels

The terminal maintains a logging facility that can be used by Technical Support and Engineering to assist in problem resolution. These levels should always be set to zero (0).
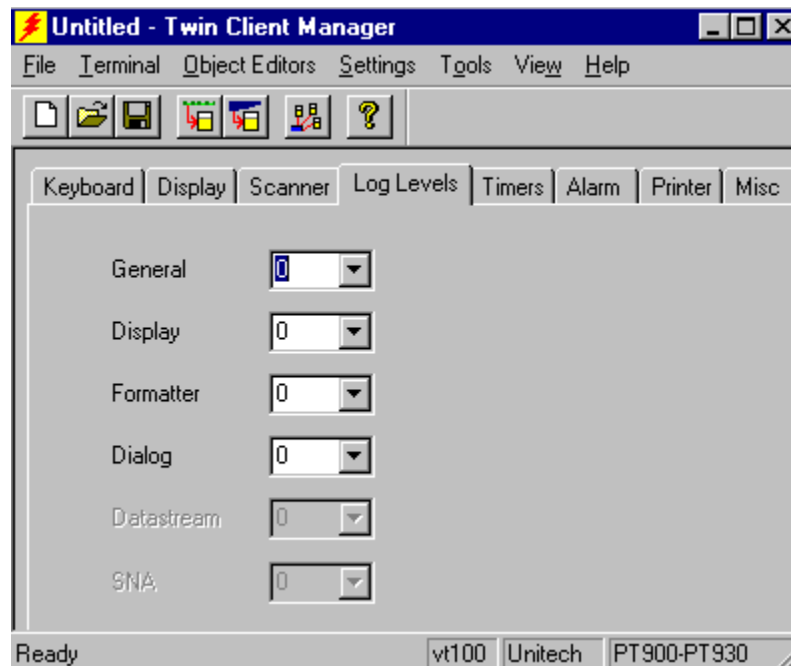
Customizing Timers

Clicking on the **Timers** tab shows the options related to the terminal timers, as shown below.
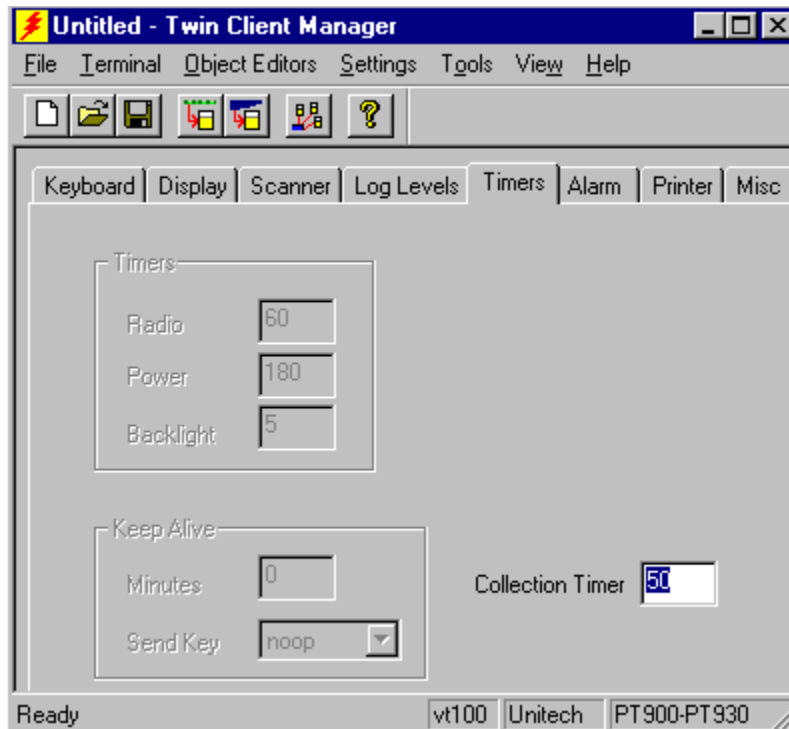
Timers Group

Radio

This numeric input field defines the length of time, in seconds, during which the terminal activates the radio and waits for a response from the host application. After the time is exceeded, an error message is displayed on the terminal. The default value is 120.

Power

This numeric input field defines the length of the time, in seconds, after which inactivity of the scanner, keyboard, or radio results in a power saving shutdown of the terminal. The default is 300 (5 minutes).

Backlight

This numeric input field defines the length of time, in seconds, during which the terminal's display backlight remains on after keyboard or scanner input. When set to a value other than 0, the terminal turns on the backlight for the amount of time specified. Backlight use reduces battery life. The default value is 5.

Keepalive (3270/5250 only)

This option group circumvents host application connection timeouts by automatically generating the selected keystroke when the terminal is inactive for the specified period of time, in minutes.

Collection Timer (VT only)

This scrolling list option specifies the number of milliseconds the terminal waits for inactivity from the host before processing received data. This feature is useful in situations where the application and network latency fragments host transmissions to the terminal, and also when host applications generate intermediate displays that are not used. The default value is 100.

Note: For maximum performance, adjust the collection time to 30-50ms when **Mode** on the **Keyboard** tab is set to **char**.

Customizing Alarms

Clicking on the **Alarm** tab shows the options related to the terminal alarm mechanisms, as shown below.
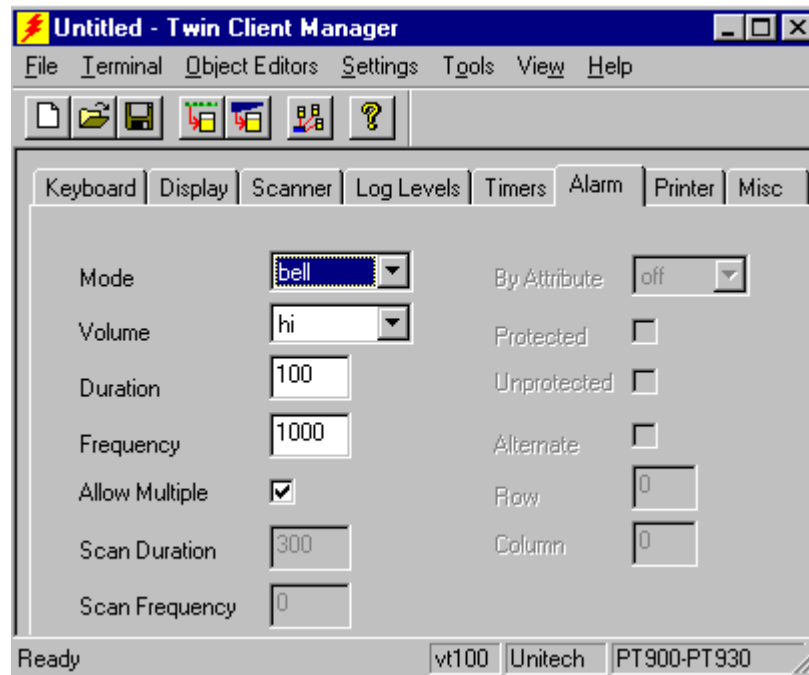
Mode

This scrolling list option defines the operation of the audible alarm and scanner light on the terminal. Default is **bell**.

- **Off** disables the audible alarm.
- **Bell** enables the audible alarm as a double beep.
- **Flash** enables the scan indicator light as the alarm - no audible alarm sounds.
- **Both** enables the double beep and the scan indicator light as the alarm.
- **Spec1** enables the audible alarm as a single beep.
- **Spec2** enables a single beep and the scan indicator light as the alarm.

Volume

This scrolling list option set the volume of the audible alarm. The default is setting is **hi**.

Duration & Frequency

The next two options, duration and frequency, are used to make a distinction between alarms and scan decode tones when the **Mode** is set to **spec1** or **spec2**.

Duration

This numeric entry field defines the length of the alarm sound in milliseconds. The default is 150.

Frequency

This numeric entry field defines the frequency of the audible alarm in Hertz. The default, zero (0) selects the terminal's factory-set default which is terminal model dependent. The default value is 2048.

Allow Multiple

This check box enables (checked) or disables (unchecked) multiple alarms in a single host transmission.

Scan Duration & Frequency

The next two options, scan duration and frequency, relate to the tones generated when the scan decoder successfully identifies a symbology.

Scan Duration

This numeric input field defines the duration of the tone generated by a successful scan decode, in milliseconds. The default is 300.

Scan Frequency

This numeric entry field defines the frequency of the scan decode tone in Hertz. The default, zero (0), selects the terminal's factory-set default which is terminal model dependent.

By Attribute (3270 only)

This scrolling list entry defines how 3270 field attributes can be used to generate alarms. The choices are **off** (the default), **pen** for the light pen attribute, **num** for numeric attribute, **hi** for high intensity attribute, and **hal** for high intensity and light pen attributes.

Protected

This check box enables (checked) or disables (unchecked) the processing of the field attribute into audible alarms for all protected fields on the display.

Unprotected

This check box enables (checked) or disables (unchecked) the processing of the field attribute into audible alarms for all unprotected fields on the display.

Alternate (5250 only)

This check box enables (checked) or disables (unchecked) the conversion of a single digit character at a specified row and column on the 5250 display into the corresponding number of audible alarms.

Row

This numeric input field specifies the zero-based row number in the 5250 display of the alternate alarm digit.

Column

This numeric input field specifies the zero-based row number in the 5250 display of the alternate alarm digit.

Customizing Printers

Clicking on the **Printer** tab shows the options related to the terminal printer, as shown below.
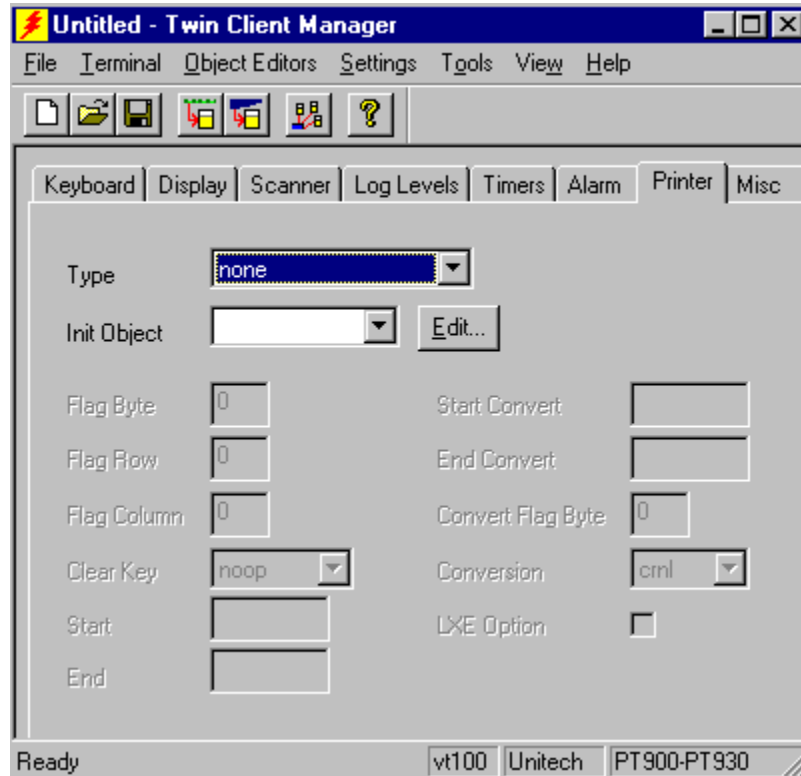
Type

This scrolling list option defines the type of printer attached to the terminal. The default is **none**.

Init Object

This feature allows printer initialization commands to be sent to the terminal immediately after the terminal establishes a session. This is an advanced integration tool and is described in Chapter 6.

Flag Byte, Row, Column, and Clear Key (3270,5250 only)

This group of options provides 3270 and 5250 host application direct control over the terminal printer. See the *Start and End* later in this section for an alternate method. VT applications rely on standard escape sequences for the printing function.

Flag Byte

This numeric input field is a decimal value that corresponds to the ASCII-converted value of an EBCDIC character generated by the host application. When the Flag Byte is set to a non-zero value, the terminal checks the host display for the value at the specified

row and column (see Flag Row and Flag Column below). If the Flag Byte is present, all data in the display that follows the Flag Byte is routed directly to the printer, up to the next occurrence of a Flag Byte value in the display or else the end of the display.

Flag Row

This numeric input field specifies the row (zero-based, range of 0 to23) where the Flag Byte (defined above) is located.

Flag Column

This numeric input field specifies the column (zero-based, range of 0 to79) where the Flag Byte (defined above) is located.

Clear Key

This scrolling list option defines the keystroke transmitted by the terminal after printing has completed. Set the key to **noop** to disable transmission.

Start and End (3270 and 5250 only)

This option group provides the host application direct control over the terminal printer.

Start

Specifies a unique character sequence that, when encountered in the host display, indicates that all subsequent characters up to but not including the End character sequence are to be transmitted to the printer attached to the terminal. The default value is blank which also indicates that this option is not in use.

Note: The print data limit is 1.5 K.

End

Specifies a unique character sequence that terminates collection of data from the host display area for transmission to the printer attached to the terminal. The default value is blank which also indicates that this option is not in use.

Start and End Convert (3270/5250 only)

This option group provides for conversion of print data collected with the Start and End option group from ASCII characters in hexadecimal format (0-9 and A-F) to binary. The feature allows binary data that might otherwise interfere with the emulation to be included in the display area. The host application is responsible for generating the hexadecimal data.

Start Convert

Specifies a unique character sequence (ASCII-converted) within the print data collected with the Start and End options that indicates the subsequent character pairs are hexadecimal values that are converted to binary. A blank value, default, indicates that this option is not in use.

End Convert

Specifies a unique character sequence (ASCII-converted) that terminates binary conversion. Default, blank, indicates that this option is not in use.

LXE Option (3270/5250 only)

This check box enables (checked) or disables (unchecked) the processing of print data embedded in the datastream according to LXE printing rules.

Convert Flag Byte and Conversion (3270 only)

This option group defines the conversion of a single character (Convert Flag Byte) found in the 3270 print data, to a printer control sequence defined by the Conversion scroll list.

Convert Flag Byte

This numeric input field defines an ASCII value, in decimal format, that will be converted to a printer control sequence as defined by the Conversion option. The default value is zero (0), which disables conversion.

Conversion

Specifies what the Flag Byte is converted to. The options are **crnl**, **cr**, and **nl**, which represent ASCII carriage return new line, carriage return, and new line, respectively. The default value is **crnl**.

Miscellaneous Customizations

Clicking on the **Misc** tab shows the following options window.
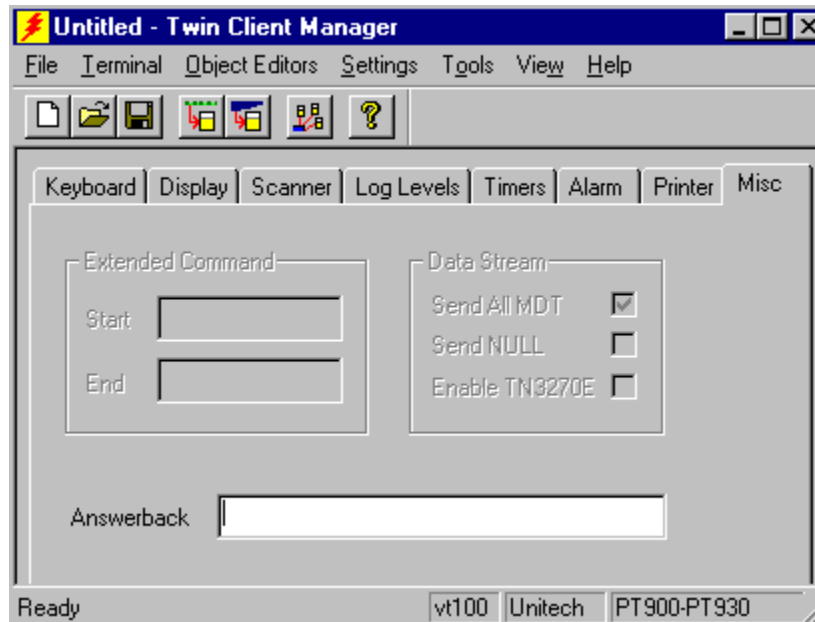
Extended Command Group (3270 and 5250 only)

This option group provides 3270 and 5250 host applications with the same extended command set available to VT applications. Refer to Chapter 6 for a detailed description of the Extended Commands.

Start

Specifies a unique character sequence that, when encountered within the host display, indicates that all subsequent characters up to but not including the End sequence, are to be interpreted as an Extended Command. Default, blank, indicates that the option is not in use.

End

Specifies a unique character sequence that terminates the Extended Command.

Data Stream Group (3270 only)

Send All MDT

This check box enables (checked) or disables (unchecked) the transmission of all fields with the MDT (Modified Data Tag) bit set. When disabled, only unprotected fields are transmitted. The default is enabled, which transmits all fields with the MDT set.

Send NULL

This check box enables (checked) or disables (unchecked) the transmission of NULL characters to the host system. The default value is disabled.

Note: For AS400 hosts, this option must be checked.

Enable TN 3270E

If this box is checked, will negotiate using TN3270E rules (see RFC 2355). If this box is unchecked, will not negotiate TN3270E and will use IBM 3278 Mod 2.

Answerback (VT only)

This text input field defines the response returned to the host application when the answerback command (as defined under VT emulation) is received. If this value is left blank, the terminal automatically returns an ASCII string corresponding to the emulation in use (vt100 or vt220). Non-graphic characters may be embedded in the answerback field using the escape sequence \nnn , where the backslash is followed by three digits representing the octal value. Refer to Chapter 9, *ASCII Character Set Octal Values*.

$1 = terminal number. IP terminals = last two octets of the IP address.
Spectrum One = 065-511

Inserting the sequences "$A", "$B", "$C", and "$D" into the answerback string results in a substitution of four octets, three octets, two octets, and the last octet of the terminal IP address, respectively, as shown below.

$A - all four octets of the IP address (206.183.067.226)
$B - the last 3 octets (183.067.226)
$C - the last 2 octets (067.226)
$D - the last octet (226)

Given a terminal with an IP address of 206.183.67.226, the following examples demonstrate how substitution and non-graphic escape sequences are processed.

Answerback	*Data Sent in Response to Answerback Command*
Hello World	Hello World
$A	206.183.067.226
RF$A	RF206.183.067.226
RF$A\015	RF206.183.067.226<carriage return>
$B	183.067.226
RF$B	RF183.067.226
RF$B\015	RF183.067.226<carriage return>
$C	067.226
RF$C	RF067.226
RF$C\015	RF067.226<carriage return>
$D	226
RF$D	RF226
RF$D\015	RF226<carriage return>

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Chapter 6 • Advanced Integration

This chapter describes the use of the advanced integration features built in to the PowerNet Twin Client. These features make it possible to tailor Twin Client operation to meet special customer requirements without custom programming.

Integration *objects* are used to implement the Twin Client advanced integration capability. An editor is used to create and modify each object, and the objects are associated with a terminal configuration using the *Advanced* setup options described in the previous chapter. The objects then become part of the terminal's software configuration and as a result are supported by the powerful Auto-Configuration tools described in the Chapter 8 section, *Airloader Auto-Configuration*.

Clicking on the **Object Editors** menu of the PowerNet Twin Client Manager displays the editor menu.
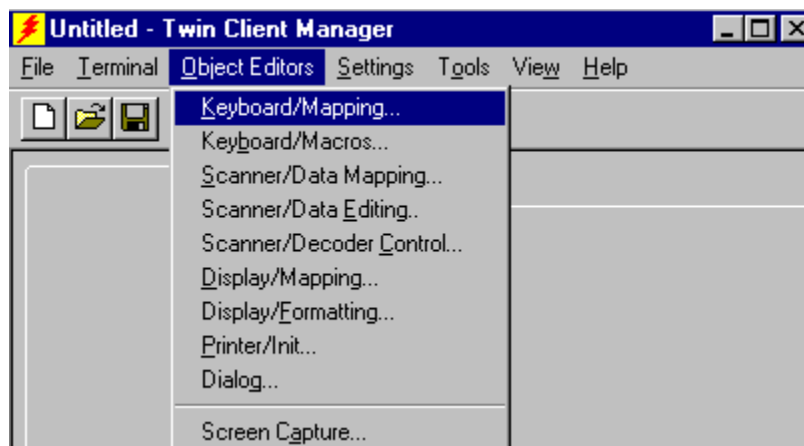
The following sections describe the use of each object, how to create the object, and how to assign the object to a terminal configuration using the Advanced Setup options.

A detailed description of the Extended Commands, which are used by applications to dynamically control the terminal scanner and keyboard, is included in this chapter. The advanced emulation-specific configuration options to which the previous chapter refers are also described here.

Keyboard/Mapping

The Keyboard/Mapping object is used to change the functionality of the terminal keyboard. This feature is most often used to simplify keyboard usage and reduce operator workload. It is also used to reduce re-training requirements when introducing new terminal models.

The need for keyboard mapping is a result of the size-restricted keypads common to all portable terminal devices. Compensating for the physical limitations, the manufacturer uses state *modifier* keys to expand the functionality of the keypad. As a result, many keys (e.g., the **Up-Arrow** key) require the operator to press two or more keys to emulate a single keystroke. Because many applications tend to rely heavily on a small group of keys, it is advantageous to map those frequently used keys to single key strokes, thus increasing both productivity and user acceptance.

Creating the Object

Create the object by clicking on **Object Editors**, then click on **Keyboard/Mapping**. The Unitech keyboard appears.
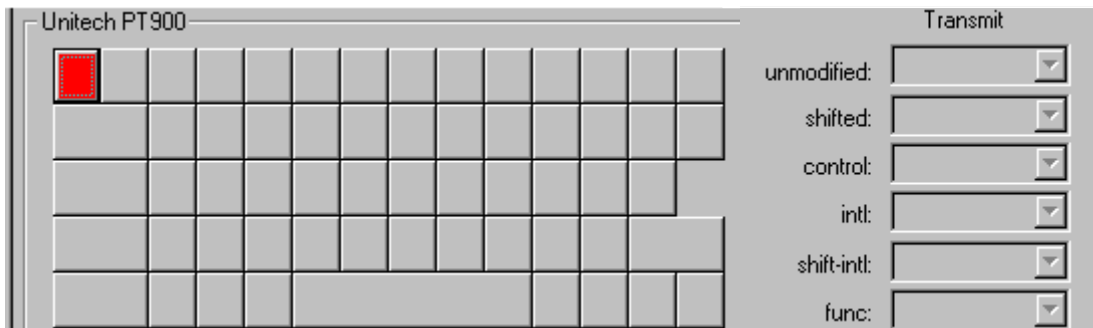
The Keyboard Mapper screen provides a mock-up of a keypad on the left side of the window, and options for key remapping on the right. By clicking on a key on the keypad mock-up, the available options that apply to that key appear on the right. For example, clicking on the key at the lower right corner of this model changes the display as follows.
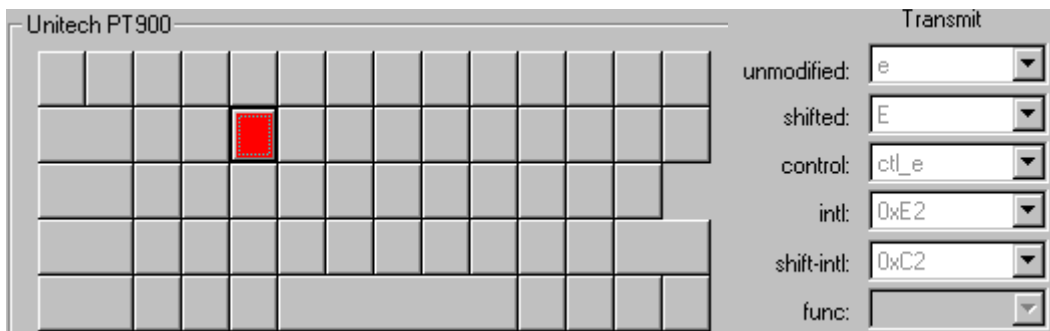
The first column on the right side of the window, entitled Transmit, defines the emulation key assigned to the highlighted keypad button in each of the available keyboard *states* (unshifted, shifted, alpha lock, etc.). Each modified key state is initially blank, indicating that the PowerNet default is in effect and no changes will be made to that key or its Mode of operation. Refer to Chapter 10 for the table of default PowerNet key assignments for the Unitech terminal.
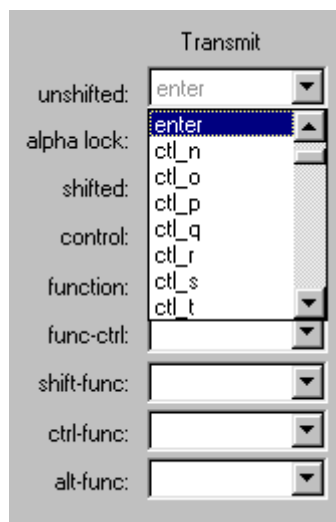
After a key is selected, the Mode options change depending on the key selection. The Mode column defines the action taken by the selected key combination.

The table of mode options, and their effect, is as follows.

xmit	Transmits the key.
noop	Disables the key.
edleft	Non-destructive backspace (moves) to the left of the cursor within a field.
edrite	Non-destructive space (moves) to the right of the cursor within a field.
edbksp	Destructive backspace (moves) to the left of the cursor within a field.
edeeof	Erases from current position to end of field.
edefld	Erases entire field.
lhelp	Displays terminal ID, date, time, and terminal software version number.
scan	Activates the scanner.

Saving and Assigning the Object

Save the object by clicking on **File**, and **Save As**, and then enter a name. For the purposes of this example, the name is vt.
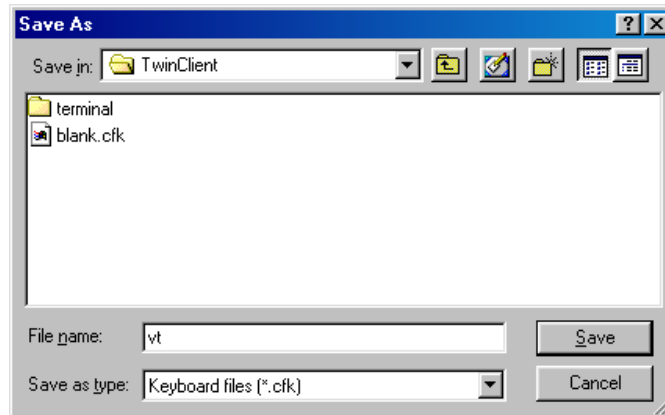
Then click on **Save**. Return to the PowerNet Twin Client Manager menus by clicking on the ☒ button at the upper right corner of the Keyboard Mapper window.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Keyboard tab, then on the Mapping Object list button, and finally on the object name.
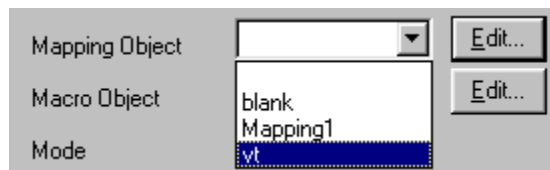
Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the keyboard mapping will take effect.

Keyboard Macros

The Keyboard/Macro object is used to assign sequences of characters to the VT programmable function keys. Using this feature, strings of characters can be assigned to a single keystroke.

Creating the Object

Create the object by clicking on **Object Editors**, then **Keyboard/Macros**, and then enter a file name. For the purposes of this example, the name is vt.
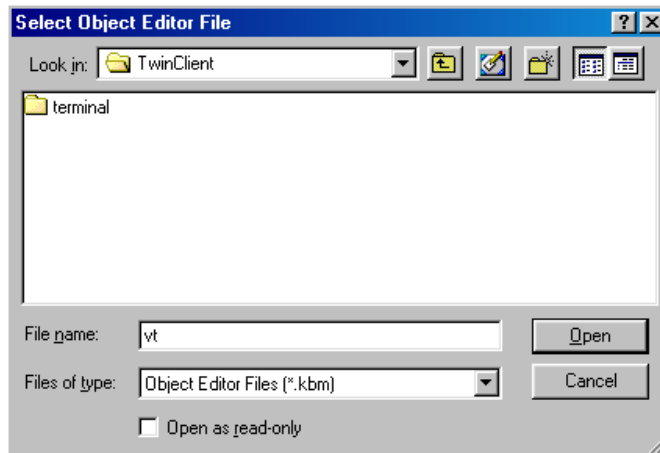
Click on the **Open** button, and then click on the **Yes** button to create the new file.
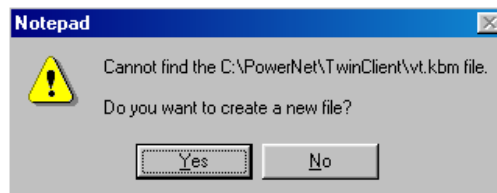
The Notepad utility is then invoked. The Keyboard/Macro object is a text file with one entry per line. Each entry uses the following format,

<keyname>=<macro string>;

where <keyname> is PF1 to PF24, and <macro string> is the macro text assigned to that specific key. For example, to assign the text "vt100" followed by a carriage return to the PF9 key, the entry is:
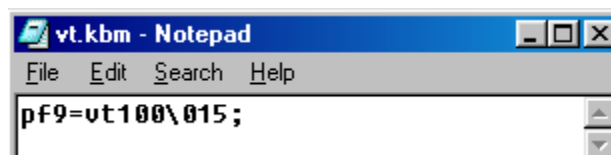
Note: **\015** represents the octal value for "carriage return". Refer to Chapter 9, *ASCII Character Set Octal Values*.

Saving and Assigning the Object

Save the object by clicking on **File**, then on **Save**, and then on **Exit**, which returns to the Twin Client Manager menu.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Keyboard tab, then on the Macro Object list button, and finally on the object name.

Mapping Object		Edit...
Macro Object		Edit...
Mode	vt	

Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the keyboard macro will take effect.

Scanner/Data Mapping

The Scanner/Data Mapping object defines barcode sequences that, when encountered in scanned data, are automatically converted to emulator keystrokes. This feature can be used to reduce or eliminate keyboard entry by the operator. That is, instead of pressing the **PF3** key to access a help screen, the operator scans a barcode that is *mapped* to the keystroke.

Creating the Object

Create the object by clicking on **Object Editors**, then **Scanner Data/Mapping**, and then enter a file name. For the purposes of this example, the name is vt.
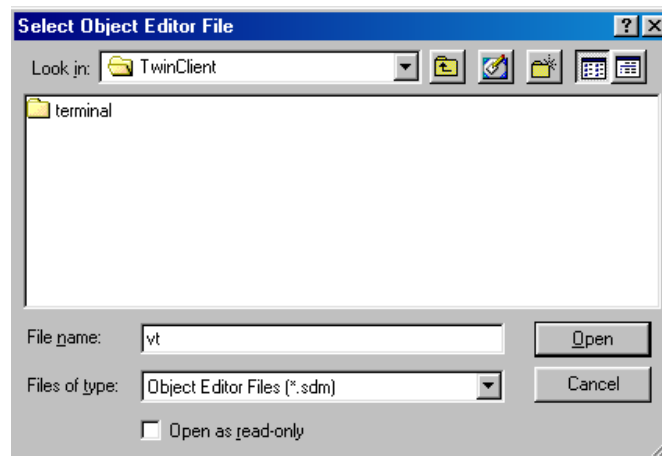
Click on the **Open** button, and then click on the **Yes** button to create the new file.
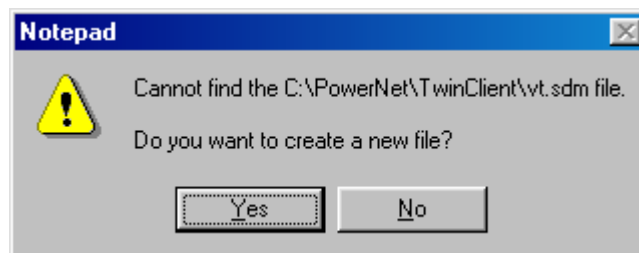
The Notepad utility is then invoked. The Scanner/Data mapping object is a text file with one entry per line. Each entry uses the following format,

<barcode>=<keystroke>;

---

where <barcode> is the scanned barcode and <keystroke> is the keystroke to send when the barcode is scanned. The following example object demonstrates three scan data mappings, including the mapping of barcode $H to the **PF3** keystroke.
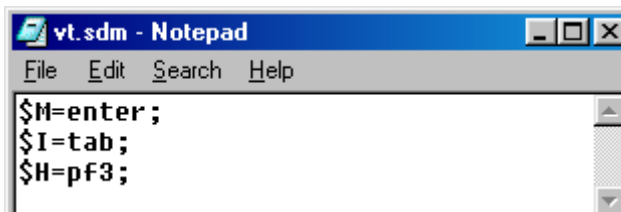
Note: The Scanner/Data Mapper accepts octal notation. See the example below.

```
#
# Sample scanner data mapping object
#
#Format is:
# barcode scanned = send this;
#For 5250 and 3270, only AID keys can be sent Pf1-Pf24, enter,
clear, sysreq.
#When a barcode is scanned containing "001253" a Pf4 is sent to
the host
001253=pf4;
ENT=enter;
TB=tab;
#Vt100 examples
#For a tab
#When a barcode is scanned containing "thisisatab" the tab is
sent
#with octal values obtained from a standard ASCII chart
thisisatab=\009;
#For an enter
thisisanenter=\015;
#For pf1
*=\033[OP\015;
```

Saving and Assigning the Object

Save the object by clicking on **File**, then on **Save**, and then on **Exit**, which returns to the Twin Client Manager menu.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Scanner tab, then on the Data Mapping Object list button, and finally on the object name.
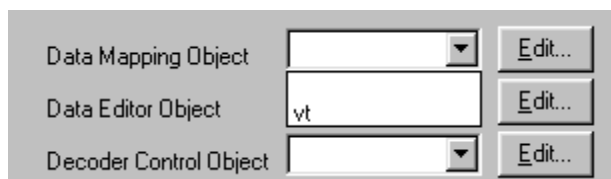

Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the scanner data mapping will take effect.

Scanner/Data Editing

The Scanner/Data Editing object defines the rules for recognizing barcode patterns and performing automatic manipulations on the barcode before it is transmitted to the host application. This feature is most often employed when upgrading wedge-based systems.

Creating the Object

Create the object by clicking on **<u>O</u>bject Editors**, then **Scanner/Data <u>E</u>diting**.
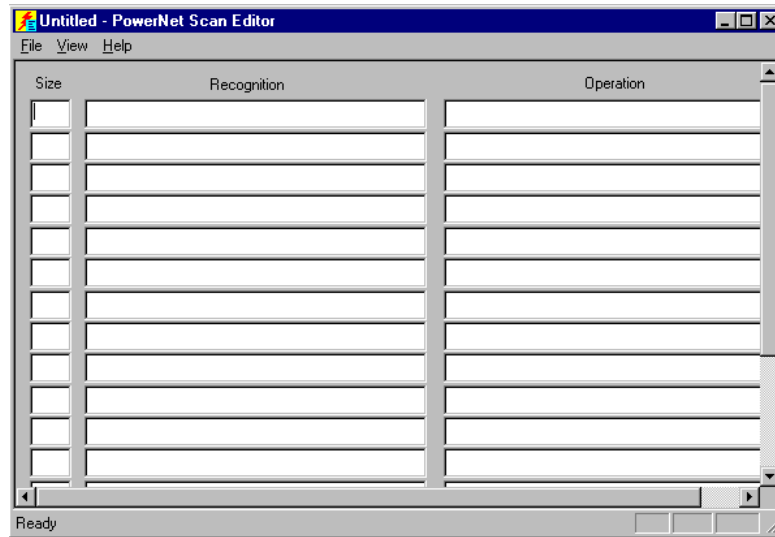
Barcode recognition is based on the Size (length) and Recognition specifiers. Once the pattern is recognized, Operation specifiers manipulate the barcode.

The **recognition** specifiers consist of the four characters shown in the following table:

- **A**   Alpha character
- **N**   Numeric character
- *****   Any character
- **=**   Must match next character

The **operation** specifiers consist of the following constructs:

- **X**   Delete character
- *****   Copy as is
- **( )**   Substitute
- **""**   Insert

How these specifiers identify and manipulate data is illustrated below.

Barcode	Size	Recognition	Operation	Result
PN-1245	7	AA=-NNNN	"F"*******	FPN-1245
5A5567BBAT	10	**********	**********"M"	5A5567BBATM
TGR87	5	=T=GAN*	**(S)**	TGS87
78-RHG	6	NN=-AAA	**X***	78RHG

Saving and Assigning the Object

Save the object by clicking on **File**, and **Save As**, and then enter a name. For the purposes of this example, the name is vt.
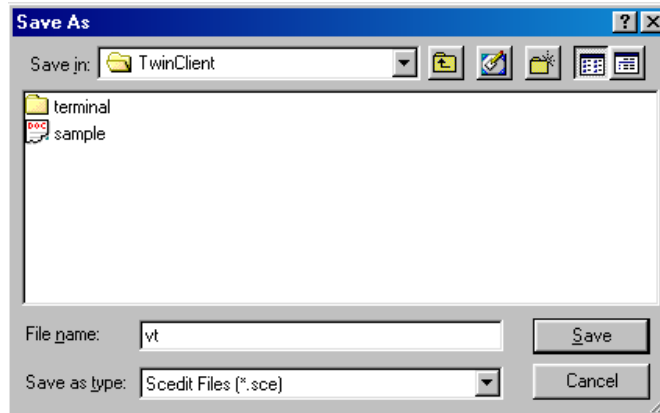
Then click on **Save**. Return to the PowerNet Twin Client Manager menus by clicking on the ⊠ button at the upper right corner of the Scan Editor window.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Scanner tab, then on the Data Editor Object list button, and finally on the object name.
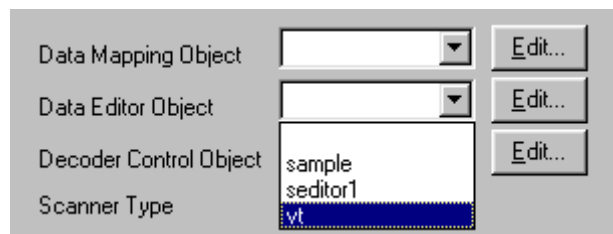

Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the scan data editor object will take effect.

Scan/Decoder Control

The Scan/Decoder Control object modifies the operation of the scan decoder in the terminal. Any of the supported symbologies can be enabled or disabled, and all of the parameters associated with a specific symbology can be modified to meet specific customer requirements.

This feature is used primarily to reduce errors and increase performance. For example, a terminal used in a receiving application can be restricted to symbologies used only in the receiving department, thus reducing the opportunity for scan decoder errors and, in many cases, increasing scanner performance. As another example, the scan decoder can be instructed to return a successful scan only when the barcode is of a certain length. As a result, the opportunity for a scan decoder error is further reduced.

PowerNet Twin Client also allows the scanner to be controlled dynamically by the application. This is accomplished through the use of the *Extended Command* set, which is described later in this chapter.

Creating the Object

Create the object by clicking on **Object Editors**, then **Scanner/Decoder Control**.
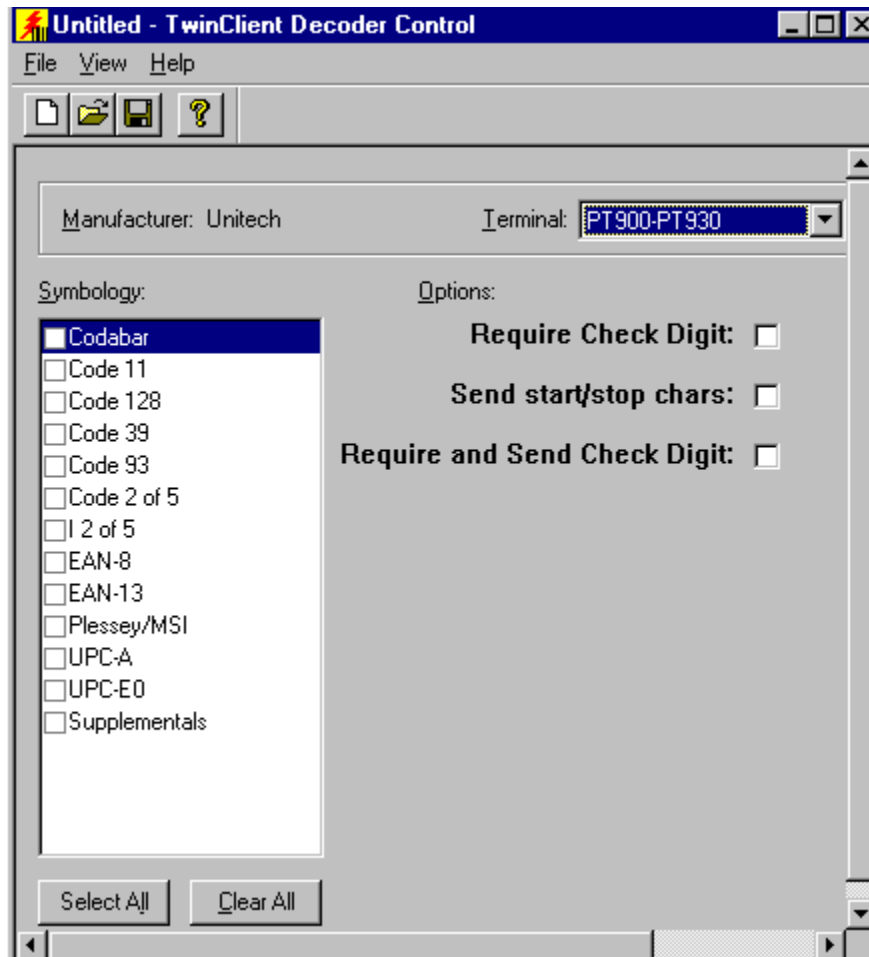
The check box next to the symbology enables (checked) or disables (unchecked) the symbology. The options for a specific symbology are available for modification by highlighting the select symbology.

Saving and Assigning the Object

Save the object by clicking on **File**, and **Save As**, and then enter a name. For the purposes of this example, the name is vt.
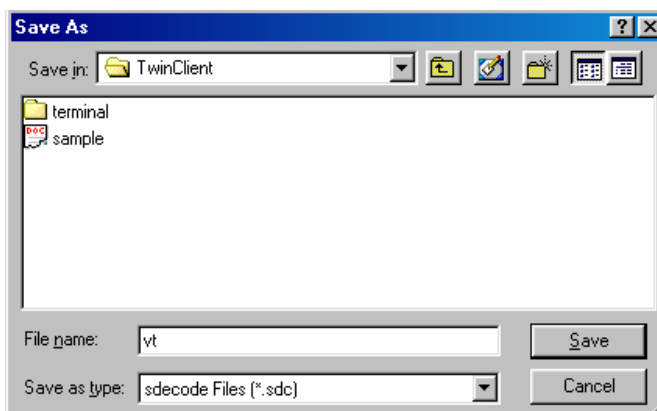
Then click on **Save**. Return to the PowerNet Twin Client Manager menus by clicking on the ☒ button at the upper right corner of the Decoder Control window.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Scanner tab, then on the Decoder Control Object list button, and finally on the object name.
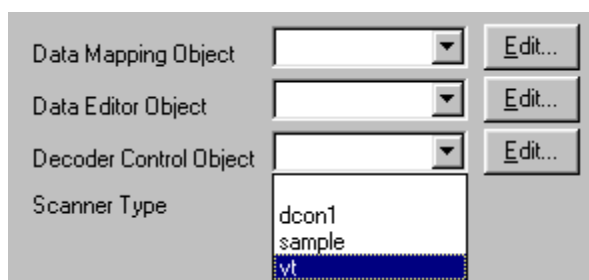
Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the scan decoder control object will take effect.

Display/Mapping

The Display/Mapping object is used to correct variations between application character sets and the terminal display character set. The terminal display uses the ISO-8859-1 font set, which is an international standard adhered to by most, but not all, applications. The display mapping is used to resolve any discrepancies.

Creating the Object

Create the object by clicking on **Object Editors**, then **Display/Mapping**, and then enter a file name. For the purposes of this example, the name is vt.
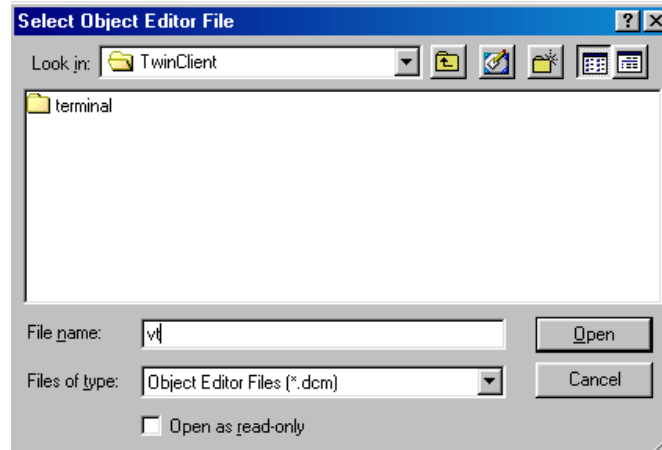
Click on the **Open** button, and then click on the **Yes** button to create the new file.
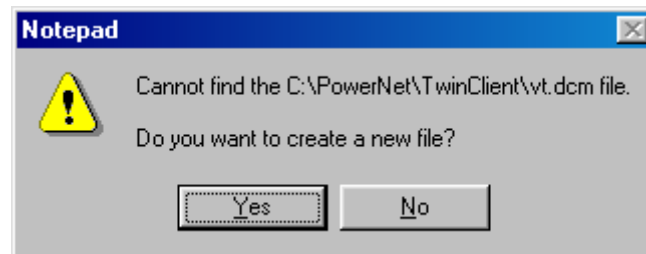
The Notepad utility is then invoked. The Display/Mapping object is a text file with one entry per line. Each entry uses the following format,

<application char>=<ISO-8859-1 char>,xlat;

where <application char> is the hexadecimal value of the character transmitted by the host application, and <ISO-8859-1 char> is the hexadecimal value of the desired terminal display character, followed by a comma, the word xlat, and a semicolon. Tables for both ISO-8859-1 and the ASCII character sets are in Chapter 9.

For the purposes of this example, the English character e (0x65) will be converted to an umlaut ë (0xEB) with the entry shown below. Note that that the two character hexadecimal values must be preceded by 0x.
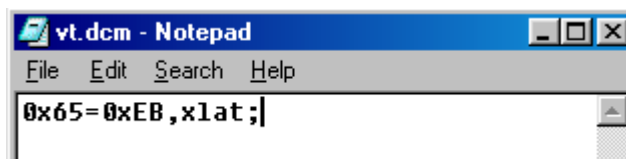
Saving and Assigning the Object

Save the object by clicking on **File**, then on **Save**, and then on **Exit**, which returns to the Twin Client Manager menu.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Display tab, then on the Mapping Object list button, and finally on the object name.
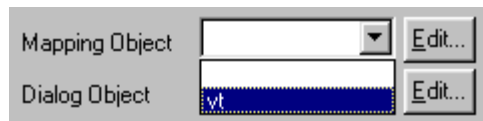
Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the display mapping object will take effect.

Display/Formatting

The Display/Formatting object is used to make the host application interface easier to use, without modifying the host application. Chapter 7 is devoted to the description of this important integration feature.

Printer/Init

The Printer/Initialization object is used to send initialization commands to the printer at the start of each terminal session. It can also be used to test printer operation.

Creating the Object

Create the object by clicking on **Object Editors**, then **Printer/Init**, and then enter a file name. For the purposes of this example, the name is vt.
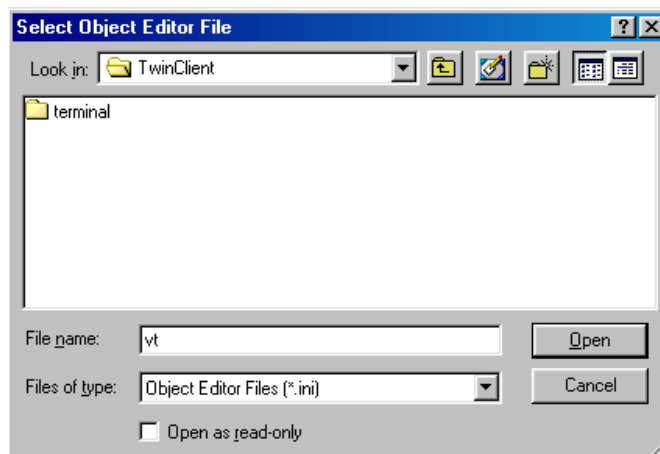
Click on the **Open** button, and then click on the **Yes** button to create the new file.
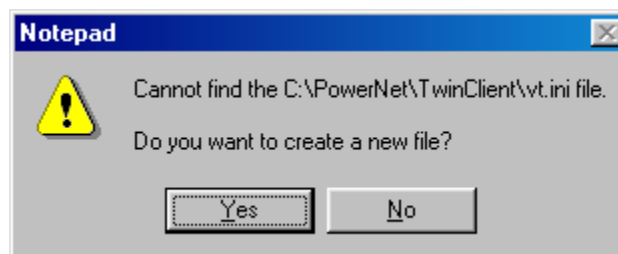
The Notepad utility is then invoked. The printer/init object is a text file, allowing for the entry of printer-specific commands. Refer to the documentation provided by the printer manufacturer for instructions.

Saving and Assigning the Object

Save the object by clicking on **File**, then on **Save**, and then on **Exit**, which returns to the Twin Client Manager menu.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Printer tab, then on the Init Object list button, and finally on the object name.
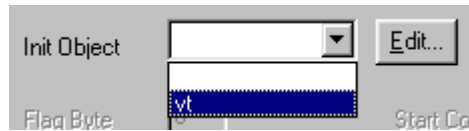
Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the init object will be transmitted to the printer at the start of the next Telnet session.

Dialog

The Dialog object is a script used to automate difficult or repetitive user interactions with the host application. It can be used to create terminal screens, collect input, generate output, and make decisions based upon terminal keyboard or scanner input, and host application data.

Creating the Object

Create the object by clicking on **Object Editors**, then **Dialog**. Commands selected from scrolling list on the right are added or inserted into the scripting area on the left using the click buttons between the two areas. The bottom left portion of the window is used to collect arguments for those commands that require them.
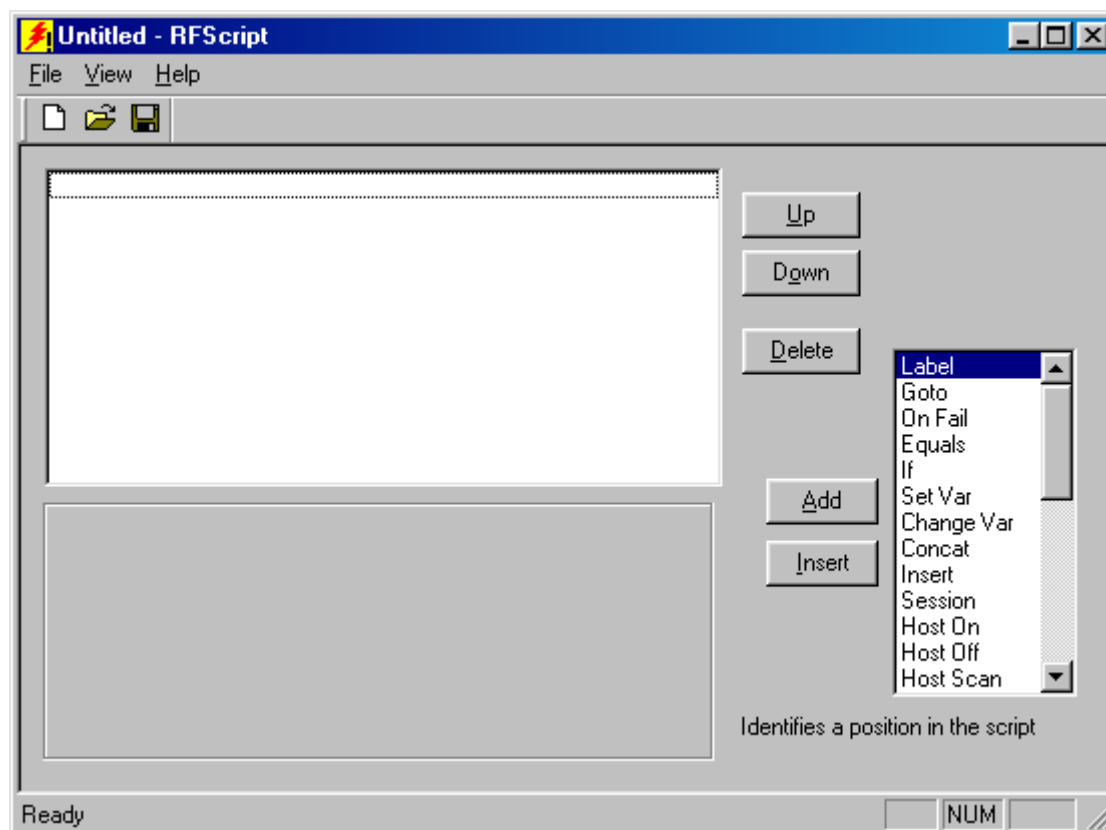
Commands and Arguments

Commands control the actions taken within the script. They can be used to interact both with the host and the terminal, and to modify activity based on comparisons of both terminal and host data. The following tables describe each command.

Commands

Label	Defines a target for the conditional branch commands Onfail, Equal, If, Host State, Host Scan, and the unconditional branch command, Goto.
Goto	Causes execution to begin unconditionally and immediately at the named target Label.
On Fail	Upon detection of a system error, execution continues at the named Label.
Equals	If the comparison is equal, branches to Label. Otherwise, execution continues with the next command.
0If	If the conditions of the comparison operator are true, branches to Label. Otherwise, execution continues with the next command. The numeric value comparison operators, which treat the values being compared numerically, are = (equal), != (not equal), > (greater than), and < (less than). The string value comparison operators, which treat the values as

Commands

character strings, are $= (equal) and $!= (not equal).

Set Var	Assigns a value to one of up to 36 variables.
Change Var	Adds to or subtracts from the value of a variable.
Concat	Adds characters to the end of a variable.
Session	Returns control of the session to the terminal operator. The operator returns control to the dialog object, at the next line, by pressing the key defined as the End Key in the Keyboard tab.
Host On	Initiates a TCP/IP connection to the host system.
Host Off	Terminates the TCP/IP connection to the host system.
Host Scan	Scans the host display for a value, and continues execution at the named label if the value is found.
Host Update	Refreshes the host display. This command is used after data has been sent to the host that may change the display, and prior to using the Host Scan or Host State conditional branch commands, or a Host Copy command.
Host Send	Transmits data and/or a keystroke to the host.
Host Copy	Copies characters from the host display to a variable.
Host State	If the state of the session matches the value supplied, execution begins at the named Label. The possible values are inactive, meaning the host session has not been established, and plu, which means the host session has been established.
Settle	Allows time for the host application to settle.
Term Enable	Initializes the terminal configuration parameters.
Term Clear	Clears the terminal display of all characters.
Term Display	Puts a value or the value of a variable on the terminal display.
Term Input	Prompts the terminal operator to input data.
Term No Echo	Prompts the terminal operator to input data, which will not be echoed on the terminal display.
Term Wait	Waits for any input from the terminal.
Term Logoff	Terminates the connection to the wireless network.
Exit	Terminates execution of the dialog object.
Sleep	Suspends all activity for the specified number of seconds.
Var Char	Sets the character used internally by the dialog processor to indicate the name of a variable. The character is normaLoglly

$. This command is used only when the first character of a value used in one of the conditional branching commands begins with a $.

Log   Writes a message to the terminal log.

Comment   Inserts documentation in the dialog object.

Adding Commands

The scrolling list box on the right side of the window is used to select a command. Click on the desired command and then click on the **Add** button to add the command to the dialog script.
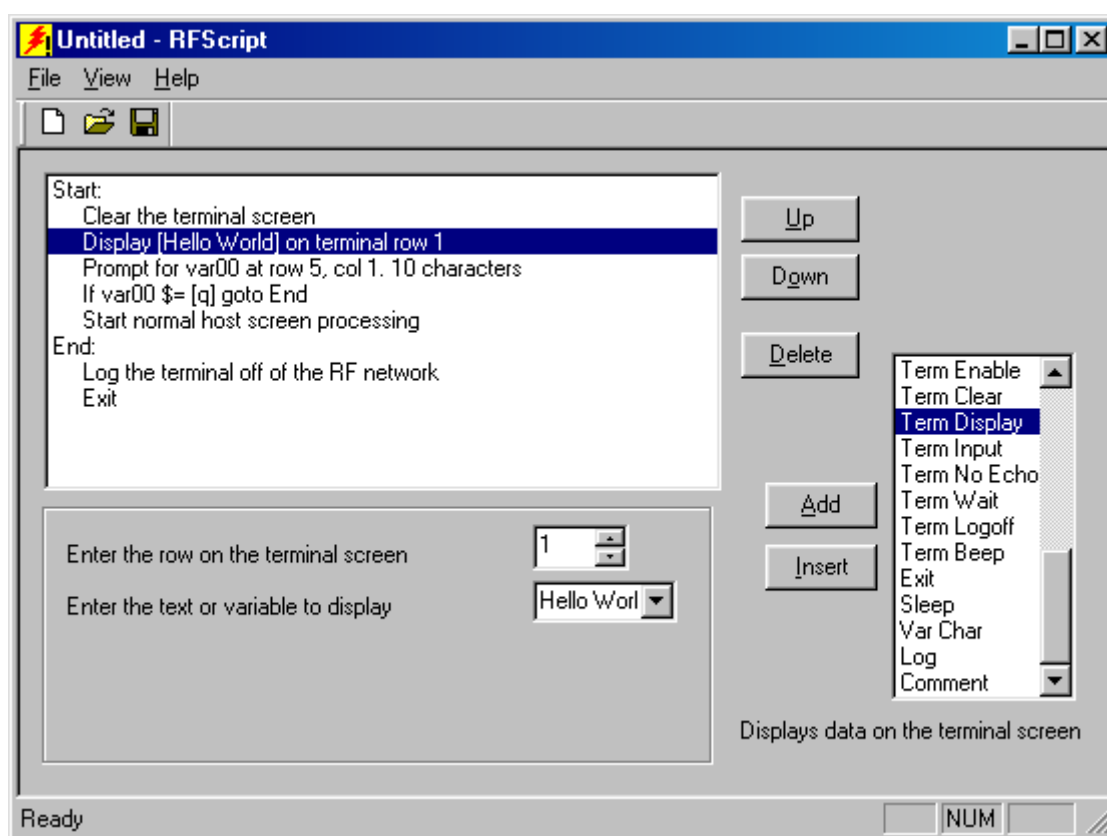
All commands that require arguments prompt for them in the box at the lower left side of the window. In the example above, the Term Display command requires a row number and either a variable or a character string. In this case the display string is Hello World. Note that the text entry field scrolls to the right so that text longer than the size of the box can be entered.

Inserting and Deleting Commands

Click on the desired dialog line on the upper left side of the window to highlight the line, then click on the **Insert** button to insert a new command above the selected line, or click on the **Delete** button to remove the line.

Using Variables and Labels

The dialog object provides up to 36 variables to store temporary data collected during the execution of the script.

These variables can be compared to fixed values or other variables using the **if** command. If the comparison is true, execution branches to the specified label.

Saving and Assigning the Object

Save the object by clicking on **File**, and **Save As**, and then enter a name. For the purposes of this example, the name is vt.
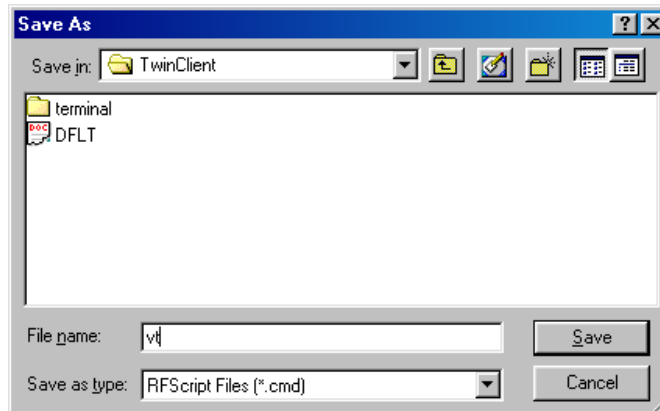
Then click on **Save**. Return to the PowerNet Twin Client Manager menus by clicking on the [X] button at the upper right corner of the Decoder Control window.

Next, assign the object to a terminal configuration by opening a terminal configuration from the **File** menu. Click on the advanced setup Display tab, then on the Dialog Object list button, and finally on the object name.
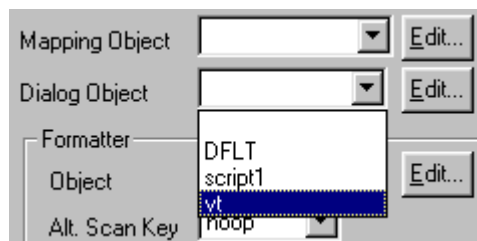

Save the updated terminal configuration by clicking on **File**, and then **Save**. The next time the terminal is booted, the new configuration will be downloaded automatically and the dialog object will take effect.

Extended Commands

The host application can control the terminal's scanner and keyboard dynamically, while the terminal is in session, by issuing the extended commands described in the following sections.

Dynamic Decoder Control

The format and content of the commands that control the scan decoder are described in the following sub-sections.

CODABAR Control

Extended Command:

        <ESC>[?0;<state>;<minlen>;<maxlen>;0z

- `State:`   Disable/enable codabar scanning. 0=disabled, 1=enabled.
- `Minlen:`   Minimum valid barcode length. Valid values are 1–54.

- `Maxlen:` Maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values are 1–54.

CODE 11 Control

Extended Command:

> `<ESC>[?11;<state>;<minlen>;<maxlen>;<depend>z`

- `State:` Disable/enable code 11. 0=disabled, 1=enabled.
- `Minlen:` Minimum valid barcode length. Valid values are from 4 to 54.
- `Maxlen:` Maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values are from 4 to 54.
- `Depend:` Number of check digit. Valid values are 0, 1, or 27.

CODE 128

Extended Command:

> `<ESC>[?2;<state>;<minlen>;<maxlen>;0z`

- `State:` Disable/enable code 128 scanning. 0=disabled, 1=enabled.
- `Minlen:` Specify minimum valid barcode length. Valid values are from 1 to 54.
- `Maxlen:` Specifies the maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values are from 1 to 54.

CODE 39

Extended Command:

> `<ESC>[?3;<state>;<minlen>;<maxlen>;<depend>z`

- `State:` Disable/enable code 39 scanning. 0=disabled, 1=enabled.
- `Minlen:` Specifies the minimum valid barcode length. Valid values are from 1 to 54.
- `Maxlen:` Specifies the maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values are from 1 to 54.
- `Depend:` Disable/enable full ASCII code 39 interpretation. 0=disabled, 1=enabled.

CODE 49

Extended Command:

> `<ESC>[?4;<state>;0;0;0z`

- `State:` Disable/enable code 49 scanning. 0=disabled, 1=enabled.

CODE 93

Extended Command:

> `<ESC>[?5;<state>;<minlen>;<maxlen>;0z`

- `State:` Disable/enable code 93 scanning. 0=disabled, 1=enabled.

- Minlen: Minimum valid barcode length. Valid values are 1–54.
- Maxlen: Maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values are 1–54.

D 2 of 5

Extended Command:

> <ESC>[?6;<state>;<minlen>;<maxlen>;0z

- State: Disable/enable code 25. 0=disabled, 1=enabled.
- Minlen: Minimum valid barcode length. Valid values range from 1–54.
- Maxlen: Maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values range from 1–54.

INTERLEAVED 2 OF 5

Extended Command:

> <ESC>[?7;<state>;<minlen>;<maxlen>;0z

- State: Disable/enable interleaved 2 of 5 scanning. 0=disabled, 1=enabled.
- Minlen: Minimum valid barcode length. Valid values range from 1 to 54.
- Maxlen: Maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values range from 1–54.

EAN-13

Extended Command:

> <ESC>[?8;<state>;0;0;0z

- State: Disable/enable EAN-13 scanning. 0=disabled, 1=enabled.

EAN-8

Extended Command:

> <ESC>[?9;<state>;0;0;0z

- State: Disable/enable EAN-8 scanning. 0=disabled, 1=enabled.

PLESSEY/MSI

Extended Command:

> <ESC>[?10;<state>;<minlen>;<maxlen>;<depend>z

- State: Disable/enable code MSI scanning. 0=disabled, 1=enabled.
- Minlen: Minimum valid barcode length. Valid values are from 4 to 54.
- Maxlen: Maximum valid barcode length. The maximum length must be greater than or equal to the minimum length. Valid values are from 4 to 54.
- Depend: Specifies the number of required check digits. Valid values are 0, 1, or 2.

UPC-A

Extended Command:

        <ESC>[?13;<state>;0;0;0z

- `State:`   Disable/enable UPC-A scanning. 0=disabled, 1=enabled.

UPC-E0

Extended Command:

        <ESC>[?14;<state>;0;0;0z

- `State:`   Disable/enable UPC-E0 scanning. 0=disabled, 1=enabled.

UPC-E1

Extended Command:

        <ESC>[?15;<state>;0;0;0z

- `State:`   Disable/enable UPC-E1 scanning. 0=disabled, 1=enabled.

Supplemental Barcode Handling (UPC/EAN) Options

Extended Command:

        <ESC>[?12;<state>;<minlen>;<maxlen>;<depend>z

- `State:`   This flag should always be set to one.
- `Minlen:`   Specifies if two character supplementals are enabled/disabled (only applies to transmit mode 1). 0=no codes with two character supplementals decoded, 1=codes with two character supplementals decoded.
- `Maxlen:`   Indicates if five character supplementals are enabled/disabled (only applies to transmit mode 1). 0=no codes with five character supplementals decoded, 1=codes with five character supplementals decoded.
- `Depend:`   Specifies the supplemental transmit mode. 0=no supplementals transmitted to host, supplemental enable/disable ignored. 1=only codes with the appropriate supplemental (from minlen/maxlen) decoded. 2=all codes sent as is, supplemental enable/disable ignored.

Disabling All Decoders

Extended Command:

        <ESC>[?z

This command is used to disable all barcodes on the handheld. Typically this would be issued before turning on an individual barcode type just to make sure of the state of the active barcodes.

Input Mode Command

The input mode parameter sent from the application controls (via the host application) whether the terminal accepts input from the keyboard, the scanner or both. The format of this command is as follows:

> <ESC>[!1;<mode>z

The mode parameter can be one of the following:

Mode	Action	Description
0 (default)	Scan and Key	Data initially accepted from either the keyboard or scanner. Scanning, allowed on a partially keyed field, causes the keyed data to be discarded and the scanned data to be accepted.
1	Scan or Key	Data initially accepted from either the keyboard or scanner. Scanning is not allowed on a partially keyed field. If the operator clears the field then scanning is again allowed.
2	Scan Only	Data accepted only from the scanner. Use caution when using this command, bad barcode can block the user from completing input.
3	Key Only	Data accepted only from keyboard, the scanner off.

Key Input Mode Command

The processing of keyed input can be controlled dynamically, while the terminal is in session. The format of this command is as follows:

> <ESC>[!2;<mode>z

The mode parameter can be one of the following.

Mode	Description
0 (default)	Accepts characters between 0x20 and 0x7F.
1	Accepts alphabetic characters only.
2	Accepts numeric characters only.
3	Accepts alphanumeric characters only.

For example, to allow keyboard input of numeric characters only, use the following sequence:
> <ESC>[!1;3z<ESC>[!2;2z

(HEX equivalent: 1B 5B 21 31 3B 33 7A 27 5B 21 32 3B 32 7A)

To reset the terminal back to normal input, use the following sequence:
                                  <ESC>[!1;0z<ESC>[!2;0z
(HEX equivalent: 1B 5B 21 31 3B 30 7A 27 5B 21 32 3B 30 7A)

Dynamic Font Change

Where DoubleHigh and DoubleWide can each be either 0 or 1:
<ESC>[!5;<DoubleHigh>;<DoubleWide>;z

To set only Double High mode:
<ESC>[!5;1;0;z

To set only Double Wide mode:
<ESC>[!5;0;1;z

To set Double High, Double Wide mode:
<ESC>[!5;1;1;z

To restore normal fonts:
<ESC>[!5;0;0;z

Advanced Display Options for VT

The Advanced button in the advanced view Display tab is active when VT100 or VT220 emulation is selected. This option group controls how display attributes are processed, and it can also be used to simulate block mode operation (see the Mode option description in the Chapter 5 section, *Customizing the Keyboard*).
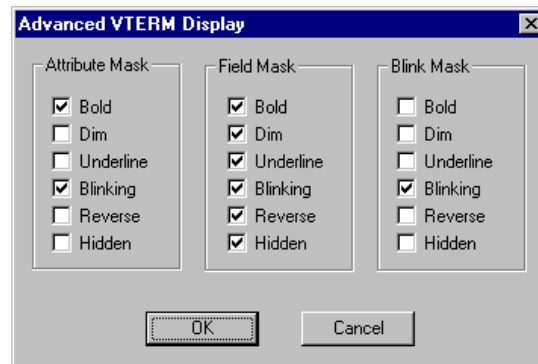
Attribute Mask

This check box group enables (checked) or disables (unchecked) the display of the indicated character attribute. Unitech character-based terminal displays are capable of displaying only the Reverse and Blinking attributes. All other attributes, if enabled, are displayed in Reverse, except for those attributes checked in the Blink Mask group (see below).

Field Mask

The VT100 and VT220 protocols do not support the more efficient block mode of operation that is standard in the 3270 and 5250 protocols, since there are no VT100 or VT220 protocol commands for defining input fields.

However, Twin Client makes it possible to simulate block mode operation by using video display attributes to define input fields. Each box checked in the Field Mask window indicates a video attribute that will be recognized as an input field specification by the emulator. During a terminal session with a host, whenever the cursor is positioned on character with the selected attribute(s), all characters to the right of that position with the same attribute are interpreted to specify the length of the input field.

Blink Mask

This check box group is used to enable (checked) or disable (unchecked) the conversion of the selected attribute to Blinking.

Advanced 3270 Keyboard Options

The **Advanced** button in the advanced view **Keyboard** tab is active when the 3270 emulation is selected. The option groups in this window are used to automate keystroke generation under the special conditions described in the following subsections. It is also used determine the action taken with oversized scans.
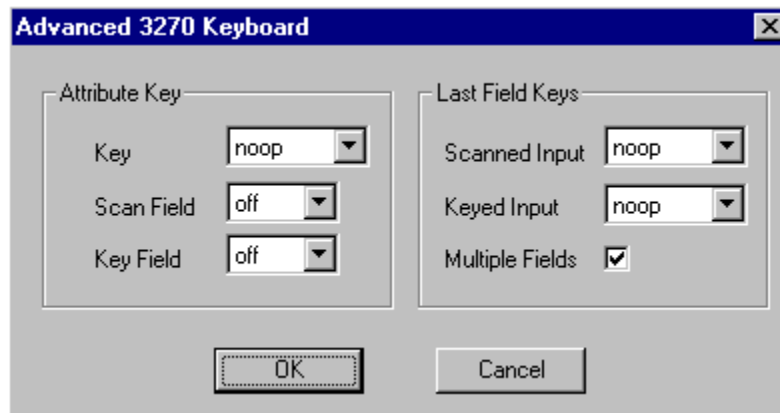
Attribute Key

This option is used to automatically transmit a keystroke to the 3270 host when the 3270 field matches the selected attribute. The automatic keystroke generation can be based on whether the input is scanned, or keyed, or both.

Note: When this feature is made active (setting the Key to a value other than **noop** and setting the Scan Field and or Key Field to a value other than off) it overrides all other automatic keystroke generation rules except for the Last Field Keys rules (described later in this section).

Key

This scrolling list box is used to select the 3270 keystroke sent with scanned or keyed input when the field matches the selected attribute setting specified in Scan Field and Key Field (described below). This option overrides all other automatic keystroke generation, except for Last Field processing. The default key setting of **noop** disables this function.

Scan Field

This scrolling list box selects the 3270 field attribute that, when data is scanned into the field, results in automatic transmission of the selected Key with the data to the host. The choices are **pen** (for 3270 Light Pen Enabled), **num** (for 3270 Numeric Only), **hi** (for 3270 High Intensity), and **hal** (for 3270 High Intensity and Light Pen Enabled). The default value is **off**.

Key Field

This scrolling list box selects the 3270 field attribute that, when data is keyed into the field and the field is completely filled, results in automatic transmission of the selected Key with the data to the host. The choices are **pen** (for 3270 Light Pen Enabled), **num** (for 3270 Numeric Only), **hi** (for 3270 High Intensity), and **hal** (for 3270 High Intensity and Light Pen Enabled). The default value is **off**.

Last Field Keys

This option is used to automate keystroke generation when the keyed or scanned input is into the last field on the 3270 display.

Note: When this rule generates a keystroke, it overrides all other automatic keystroke generation rules (i.e., Scan Key, Auto Send Key, and Attribute Key).

Scanned Input

This scrolling list box is used to select the 3270 keystroke to be sent when data is scanned into the last field on the 3270 display. The default value is **noop**, which disables this function.

Keyed Input

This scrolling list box is used to select the 3270 keystroke to be sent when data is keyed into the last field on the 3270 display, and the field is filled. The default value is **noop**, which disables this function.

Multiple Fields

This check box enables (checked) the Last Field Keys group only if the host display contains more than one input field.

NEW ENVIRON Telnet Extension

The NEW ENVIRON Telnet extension, also known as *Workstation ID*, is a mechanism for providing named variables with values to the host system via a Telnet negotiation at the beginning of each terminal session.

The **New Environ** option under the Twin Client Manager's **Settings** menu is used to create the variables, which are applied to all terminal configurations. Variables can be created that apply only to specific terminals (indicated by IP address). It is also possible to create variables that apply to all terminals.
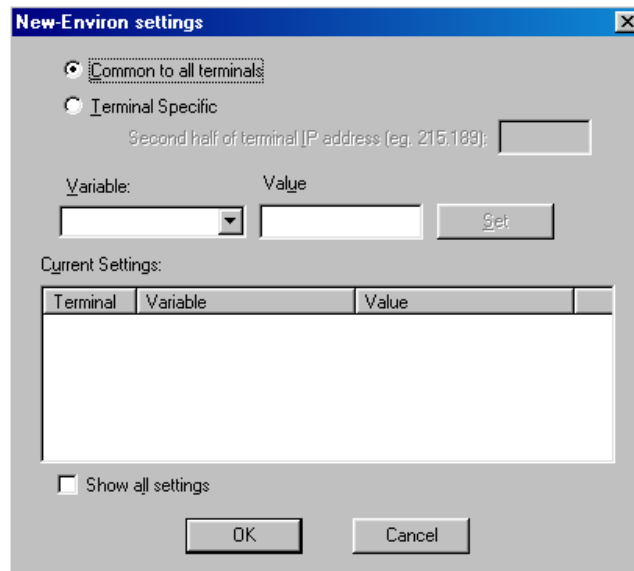
Creating Common Settings

Variables that apply to all terminal sessions are created by clicking on the **Common to all terminals** button, and then entering the Variable and Value in the respective boxes. Then click on the **Set** button.

The variable and its value are then displayed in the bottom list window.

Creating Terminal Specific Settings

Variables that apply to specific terminal sessions are created by clicking on the **Terminal Specific** button, and entering the last two octets of the terminal IP address. Then enter the Variable and Value in the respective boxes and click on the **Set** button.

Note: Click on the **Show all settings** check box to display both terminal specific and common variables.

When you set up the IP address in the New Environment entry form, you can get an "**Invalid terminal address**" error message. This error is from a routine that checks the IP address for accuracy. In IP settings, it is possible to use octal notation rather than the more common decimal method we see most often.

The rule is that if there is a leading zero, it assumes octal notation and checks for a valid octal value (legal octal values are 0-7). For example, if the second half of your terminal IP address is 078.131, the 8 in the .078 is what causes the error. The terminal client needs the leading zero(s) to correctly find the IP address. This leads to a catch 22.

Note: The following work-around will require that you hand edit the configuration file to add the leading zeros if required.

1. Enter the address as normal without any leading zeros. If they are all 3-digit octets, you need do nothing. If any octet is less than 3 digits, do the next step.

2. Open the **PowerNet\TwinClient\tnenv.cf** file for edit. Add leading zeros to entries:

   78.132:DEVNAME=RF001;! → 078.132:DEVNAME=RF001;!
   1.133:DEVNAME=RF002;! → 001.133:DEVNAME=RF002;!
   12.134:DEVNAME=RF003;! → 012.134:DEVNAME=RF003;!

   Save and send this to the terminal by doing a "**Terminal/Send Configuration Files to Terminal**" operation.

Changing and Deleting Settings

Variable names and their values can be modified or deleted by clicking on the variable in the list window. Change the variable or value by editing the **Variable** and/or **Value** boxes, and click on the **Set** button. To delete the variable, press the **Delete** key on the PC. Deleted variables will continue to appear in the pull down list until after the settings have been saved.

Saving New Environ

Click on the **OK** button to save the New Environ settings.

TN3270E Negotiation

The following defines the TN3270E negotiation, permitting the transfer of some of the TN3270E Sub-negotiation variables such as **Lunames** from the Telnet terminal to the host during session initialization.

Note: This pertains to 3270 emulation.

TN3270E is implemented on OpenAir Linux using two text files located in the working directory (refer to /etc/.CRF/WORKDIR). The **tnenvcom.cf** file allows for the definition of variables that will be shared by all devices, and the **tnenv.cf** file allows for the definition of terminal-specific variables. These files are currently created and maintained with the system editor.

Line Entry Format, **tnenvcom.cf**:

VARIABLE=VALUE;

Example ***DEVTYP=IBM-3278-2;*CONNECT=RFZ81;**

This will assign all terminals the luname of RFZ81.

Line Entry format, **tnenv.cf**:

IDENT:VARIABLE=VALUE;[VARIABLE=VALUE]…!

Where IDENT is either the last two octets of the terminal's IP address, or the three digit Spectrum address (065-511). Multiple variables can be defined, separated by semicolons. The entry is terminated with an exclamation.

Example file:

#IP terminals fully qualified octets 7 characters:

010.031:*DEVTYPE=IBM-3278-2;*CONNECT=RF3278.001;!

010.032:*DEVTYPE=IBM-3278-2;*CONNECT=RF3278.002;!

This will assign the terminal with an IP address of xxx.yyy.010.031 a device type of IBM-3278-2 to the luname of RF3278.001.

New Environ Negotiation

The following defines the New Environ negotiation, permitting the transfer of environmental variables from the Telnet terminal to the host during session initialization.

Note: This pertains to the 5250 and VT emulations.

New Environ is implemented on OpenAir Linux using two text files located in the working directory (refer to /etc/.CRF/WORKDIR). The **tnenvcom.cf** file allows for the definition of variables that will be shared by all devices, and the **tnenv.cf** file allows for the definition of terminal-specific variables. These files are currently created and maintained with the system editor.

Line Entry Format, **tnenvcom.cf**:

VARIABLE=VALUE;

Line Entry format, **tnenv.cf**:

IDENT:VARIABLE=VALUE;[VARIABLE=VALUE]…!

Where IDENT is either the last two octets of the terminal's IP address, or the three digit Spectrum address (065-511). Multiple variables can be defined, separated by semicolons. The entry is terminated with an exclamation.

Example file:

#IP terminals fully qualified octets 7 characters:

010.031:DEVNAME=RF5291.001;!

#Spectrum ONE fully qualified radio ID 3 characters

065:DEVNAME=RF5291.002;!

Chapter 7 • The Display Formatter

The display formatter adapts full screen Telnet applications to the portable terminal environment without any modification to the host application. This powerful tool is included with PowerNet Twin Client, and is also used with the OpenAir server when the Twin Client is operating the server-based "thin" mode.

A screen capture utility (included with the Twin Client Manager) is used to access the host application via Telnet and "capture" the host displays. Once captured, the screens are processed into a screen formatter *object* and assigned to a terminal configuration, which can then be downloaded automatically to the terminal, over the wireless network.

The Twin Client Display Formatter provides the following unique features:

- **Performance** - Optimized for minimum run-time overhead and maximum speed.
- **Transparency** - Fully transparent to the host application.
- **Capacity** - Up to 128 host screens per object, 16 terminal screens per host screen, and 32 input fields per terminal screen.
- **Simplicity** - Intuitive drag-and-drop interface for screen capture and formatting.
- **Flexibility** - Supports all Twin Client terminals.

This chapter describes how to set the emulation, capture the host application displays, and process them into formatter objects for download to the terminal.

Setting the Emulation

The first step in the formatting process is to set the emulation (VT, 3270, or 5250) in preparation for capturing the host application displays. Click on **Start**, **Programs**, **PowerNet**, and **Twin Client Manager**, and then the **Settings** menu, as shown below.
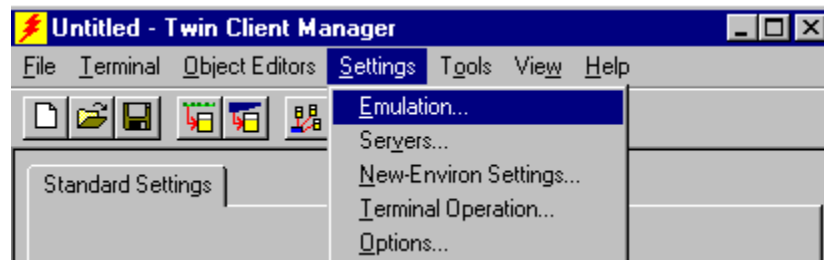
Click on **Emulation** and select an emulator from the list below.
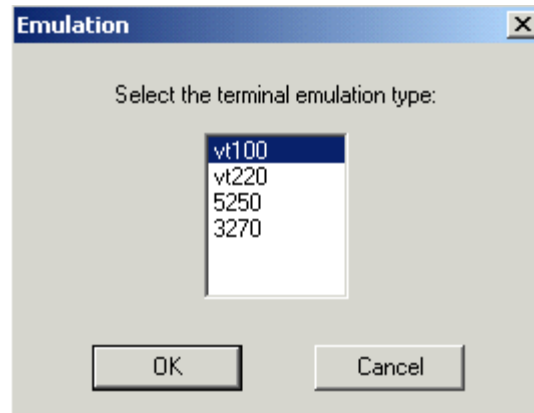
Then click on **OK** to return to the main PowerNet Twin Client menu.

Starting the Emulator

Start the emulator by clicking on the **Object Editors** menu and **Screen Capture**, as shown below.
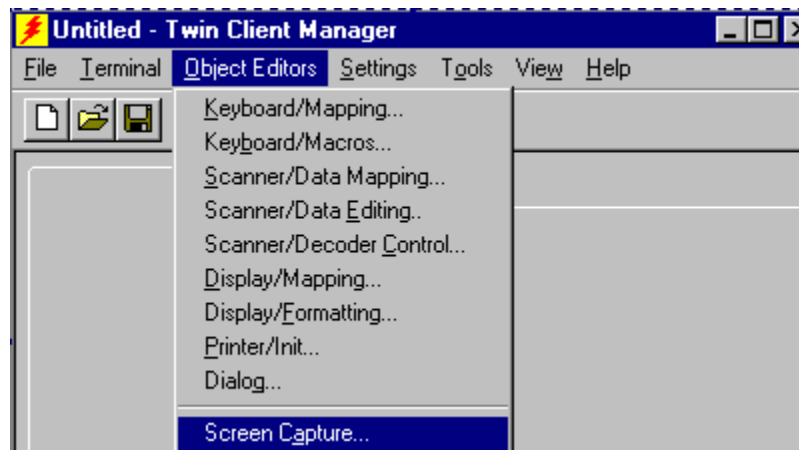
The emulation window is displayed. Click on the **Session** menu, and then click on **Session Settings**.

In the Session Settings menu, enter the Host IP address and port of the host system, and then Click on **OK** to return to the emulator main menu.

Note: The Host Port of 23 is standard for Telnet. However, for security reasons, the port number may be set to other values. Consult the local network administrator if a connection cannot be established on port 23.
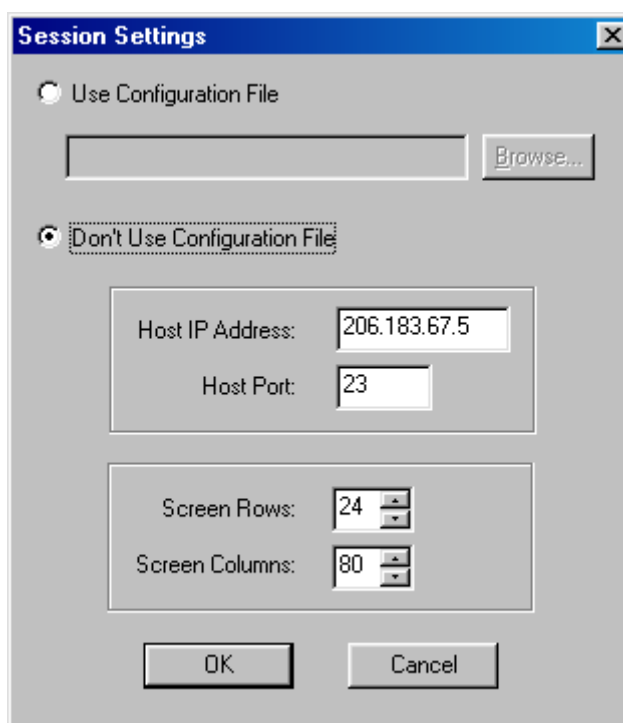
To start a Telnet session with the host, click on the toolbar icon, or click on the **Session** menu and then on **Connect**. In this example, the 5250 emulator is used and the host system is an IBM AS/400.
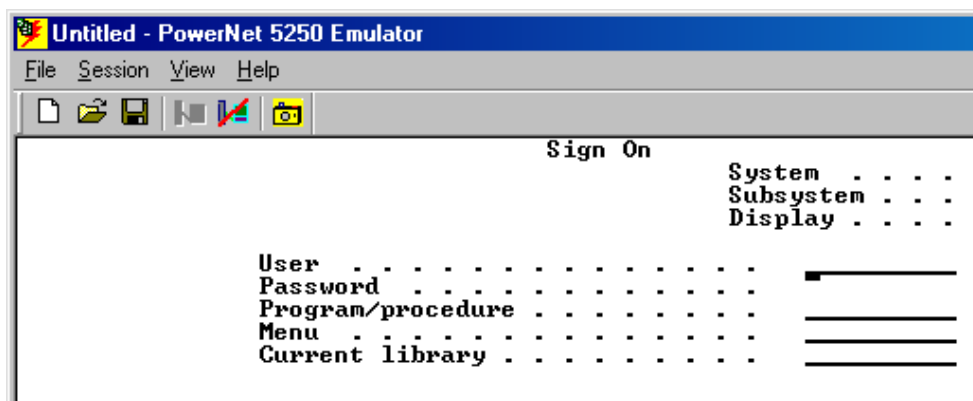
The host application displays are now ready to be captured.

Taking Snapshots

The host screens are captured by clicking on the 📷 toolbar icon while the desired screen is displayed. Alternately, click on **Session** and then **Snapshot**. The following pop-up indicates that the screen was captured.
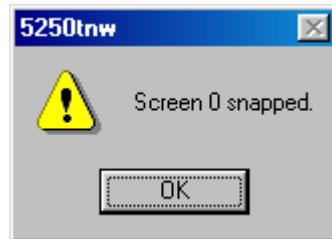
Click on **OK** and continue to navigate the host application, taking snapshots of the screens to be formatted.

Saving the Screen File

Save the snapshots at any time by clicking on the 💾 toolbar icon. Alternately, click on **File** and then **Save As**. The following window is displayed for entering the filename.
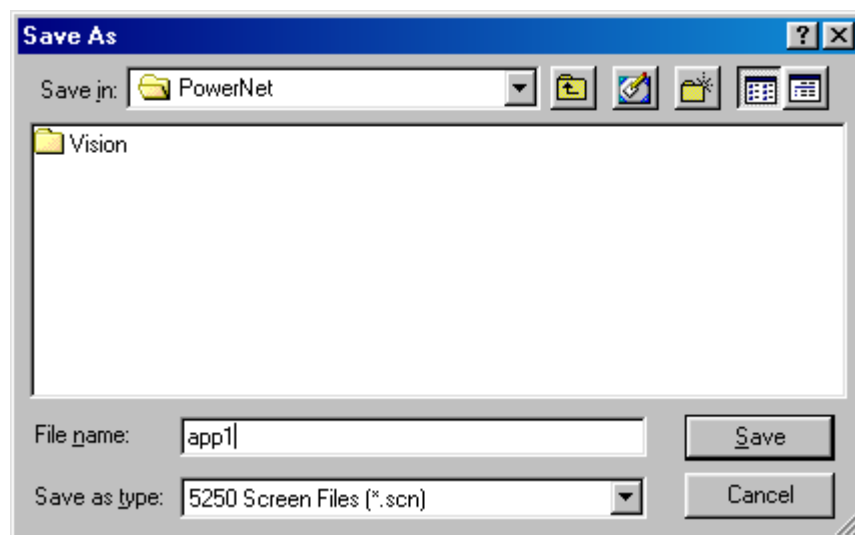
For this example, the filename is set to **app1**. Then click on the **Save** button to return to the emulator.

Exiting the Emulator

The Telnet session is ended by clicking on the ✏️ toolbar icon, or by clicking on **Session** and **Disconnect**. Return to the Twin Client Manager window to format the screens by clicking on the ✖ icon at the top right corner of the emulator, or by clicking on **File** and **Exit**.

Formatting

The screen file created in the previous sections can now be formatted. This section describes how to start the formatter, open a screen file, format the screens, save the formatted object, and finally to assign it to a configuration.

Starting the Formatter

The formatter is started from the Twin Client Manager menu. Start the Twin Client Manager by clicking on **Start**, **Programs**, **PowerNet**, and **Twin Client Manager**. Then click on **Object Editors**, as shown below.
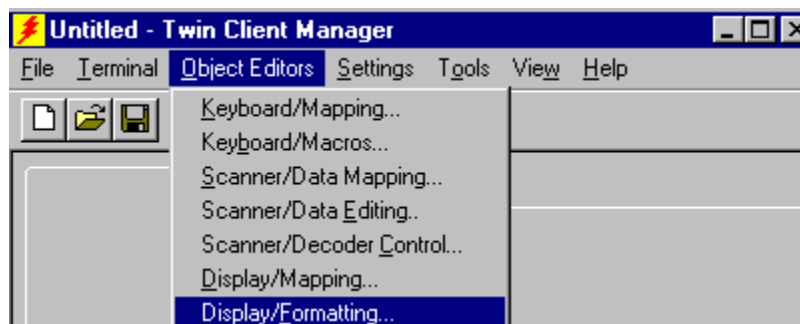
Click on the **Display/Formatting** option and the formatter window is displayed. To open the screen file, click on **File**.
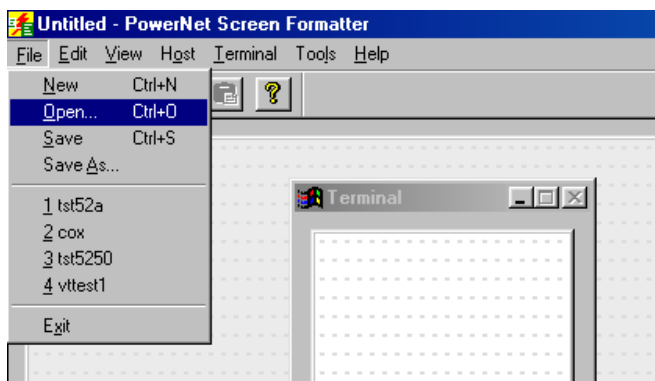
Then click on **Open**, and click on the screen filename.
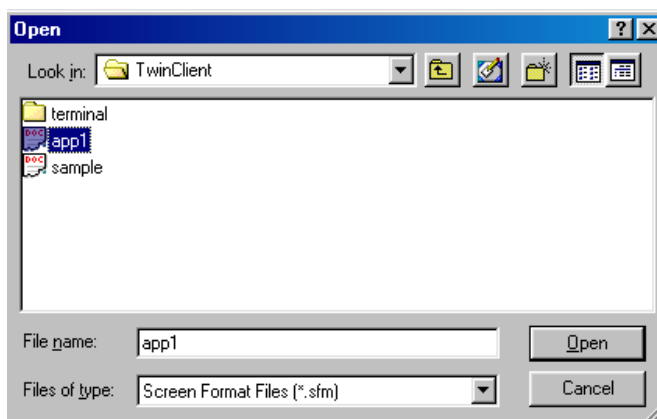
Then click on the **Open** button and the formatter window is displayed, including the first host display that was captured. The terminal display window, which is blank at this time since no formatting has taken place, is also shown.

Note: The **Terminal** display window floats on top of the host screen. If it needs to be moved, click on the title bar and drag it to a different area of the host screen.
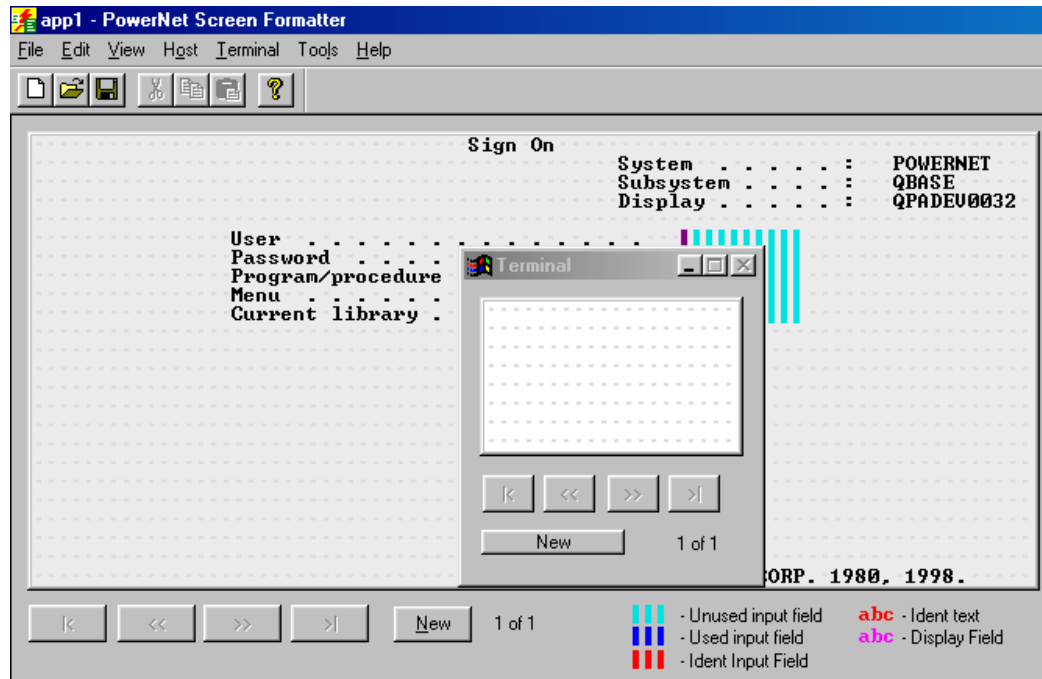
Setting Up the Formatter

The terminal display must be set to match the terminal for which the formatter object is to be created. Click on the **Tools** menu and then **Setup**.

Note: If, while reformatting host screens, you are able to create display fields larger than the selected screen size causing the reformatted screen not to appear on the terminal; Delete the terminal screen in question and reformat it, paying attention to the width of the RF terminal screen.
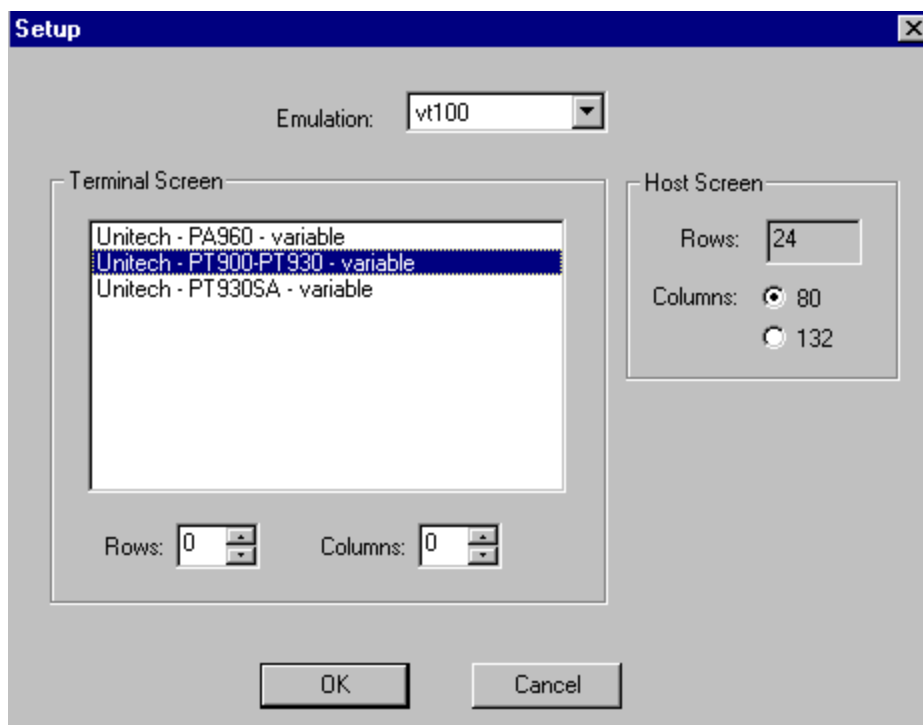
Click on the desired terminal display size, and also ensure that the host screen size is set correctly. Then click on **OK** to return to the formatter.

Adding Idents

Formatting requires that each host screen be *uniquely identified*. One way to do this is to highlight unique text on the host screen. (Click on the left side of the text and drag the mouse to the right.) Then click on the right mouse button, as shown below.
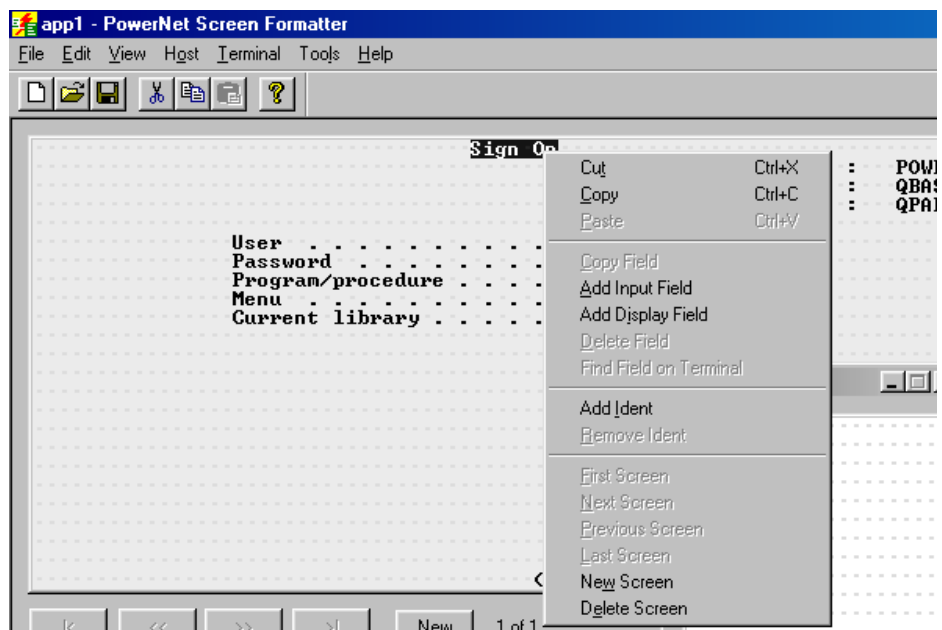
From the pull down menu, click on **Add Ident**. The highlighted field is now colored red on the host display, indicating that it is an Ident field. Up to 32 items can be highlighted on each host screen, so if a number of screens share similar features, they can be uniquely identified by adding more Idents. In the event that a group of host displays differ only by position of input fields, input fields can be used for Idents also.

Adding and Copying Display Text

Text can be added to the terminal display by clicking on the Terminal window, moving the cursor to the desired display position, and typing in the text (in this case, **Sign On Screen**) as shown below.

It is also useful to copy variable text from the host display to the terminal display. To do this, move the cursor to the desired position in the host display and hold down the mouse button while moving the cursor to the right. The text to be copied will be highlighted as shown by the **POWERNET** text copied below. Then drag the highlighted text to the desired position in the terminal display and release the mouse button.
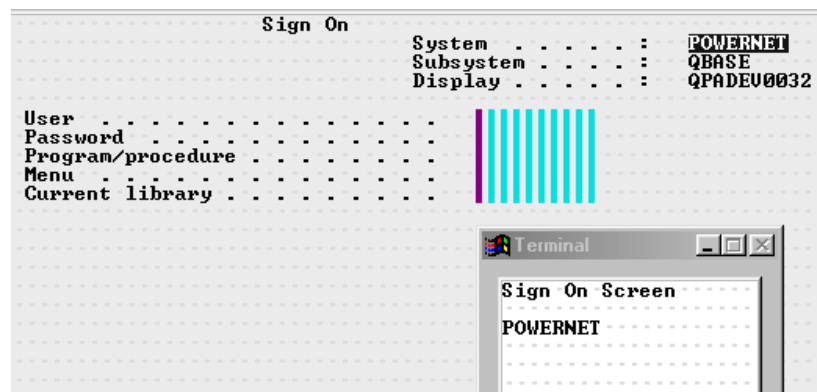
Copying Input Fields

Input fields are copied from the host display to the terminal display by the same method used to copy text. Click on the left side of the input field and drag the cursor to the right. The input field will be highlighted. Now click on the field again and drag it to the desired position in the **Terminal** display.

Adding Terminal Screens

New terminal screens are created by using the **New** button at the bottom of the Terminal display window. This is useful when more that one terminal screen is required to format the relevant data on the host screen. Up to 16 terminal displays can be associated with each formatted host display. These are called terminal *pages*, and the page that is displayed on the terminal at any point in time depends on the location of the host cursor position. The page to which the corresponding input field is formatted is the one displayed.

When multiple pages are present, the directional arrows are used to navigate through the pages.

Saving the Formatter Object

The formatter object is saved by clicking on the ⊞ toolbar icon, or by clicking on **File** and **Save**.

Assigning the Object to a Terminal Configuration

The formatter object is assigned to a terminal configuration by opening a terminal configuration in the Twin Client Manager, assigning the object to the Display Formatting Object, and saving the configuration.

To open a terminal configuration, click on **File** in the Twin Client Manager, as shown below.
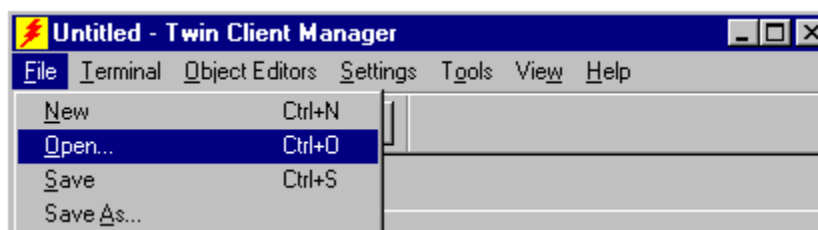
Then click on **Open**, and click on the desired terminal configuration.
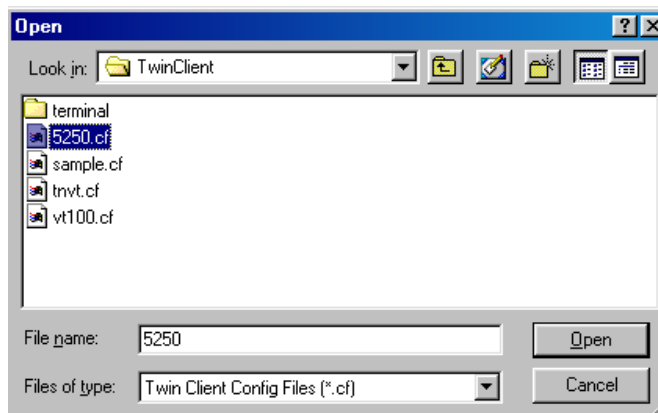
Then click on the advanced view Display tab, pull down the Display Formatter Object scrolling list box, and click on the object.
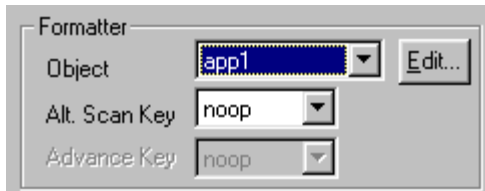
Save the newly modified terminal configuration using the 💾 toolbar icon, or click on
File and then **Save**. The new configuration, incorporating the formatter object, is updated
on the terminal, automatically, by booting the terminal.

Chapter 8 • Software Management

In addition to providing functions for the download of files to the terminal via the traditional serial connection, the Twin Client Manager also provides for the management of terminal software and configurations automatically over the wireless network.

This chapter describes the automated capability in detail. Additional manual operations involving serial download options are described at the end of this chapter.

Airloader Auto-Configuration

The software and supporting configuration files for all Twin Client terminals can be configured for automated management. The Airloader Auto-Configuration form is accessed from the Twin Client Manager **Tools** menu. Select **Airloader**.
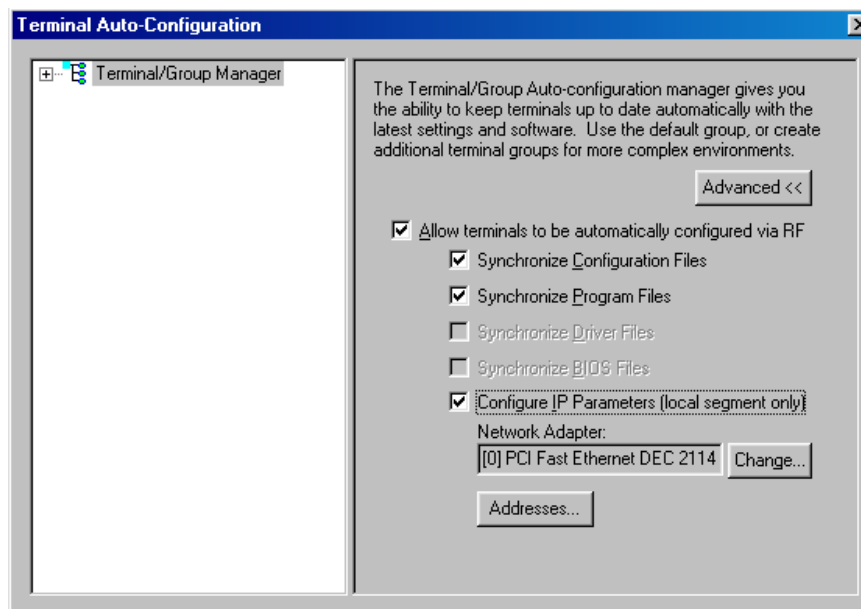
Note: If no options are displayed, click on the **Advanced<<** button.

Enabling Automatic Downloads

Click to put a check in the **Allow terminals to be automatically configured via RF** box to enable automatic downloading. In the event that another PC on the network is already configured and active, the following warning message is displayed.

RF Sync Manager

Unable to automatically configure terminals.
There is already another computer on this network
segment running the AirLoader server. [206.183.67.226]

OK
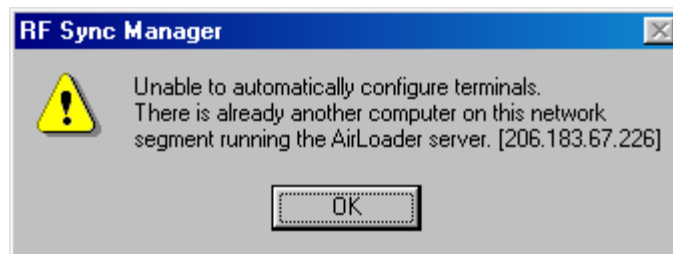
Synchronizing Configuration Files

Click to put a check in the Synchronize Configuration Files box to enable automatic synchronization of configuration files on the terminal. When the terminal is booted, its configuration files will be compared with the most recent on the PC. The terminal is updated automatically if it does not have the latest revision.

Synchronizing Program Files

Click to put a check in the Synchronize Program Files box to enable automatic synchronization of program files on the terminal. When the terminal is booted, its program files will be compared with the most recent on the PC. The terminal is updated automatically if it does not have the latest revision.

Automatic IP Address Assignment

New terminals will be assigned IP addresses automatically if the following box is checked.

☑ Configure IP Parameters (local segment only)
Network Adapter:
[0] PCI Fast Ethernet DEC 2114   Change...
Addresses...
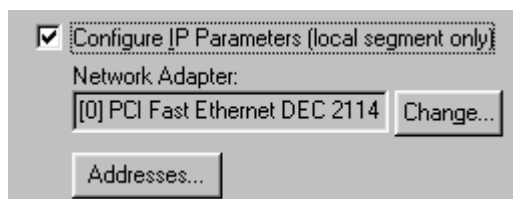
Note: Do not check this option if a DHCP server is configured to manage address assignments.

To set the addresses, click on the **Addresses** button to access the Segment Address Assignments dialog box, as shown in the following figure.
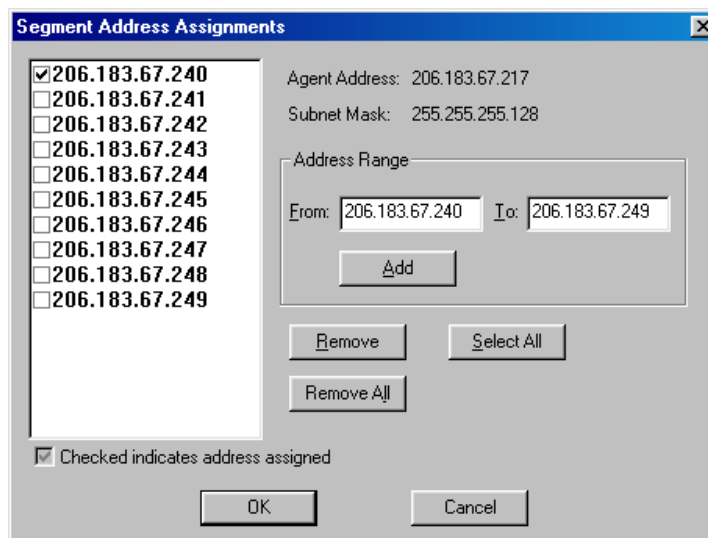
Enter the desired range in the **From** and **To** boxes as shown above, and then click on **Add**.

Creating New Groups

New groups, with different configurations, can be created by clicking on **Terminal/Group Manager**, and then clicking the right mouse button as shown below.

After the new group has been created, the group settings option becomes available for change, as shown below.
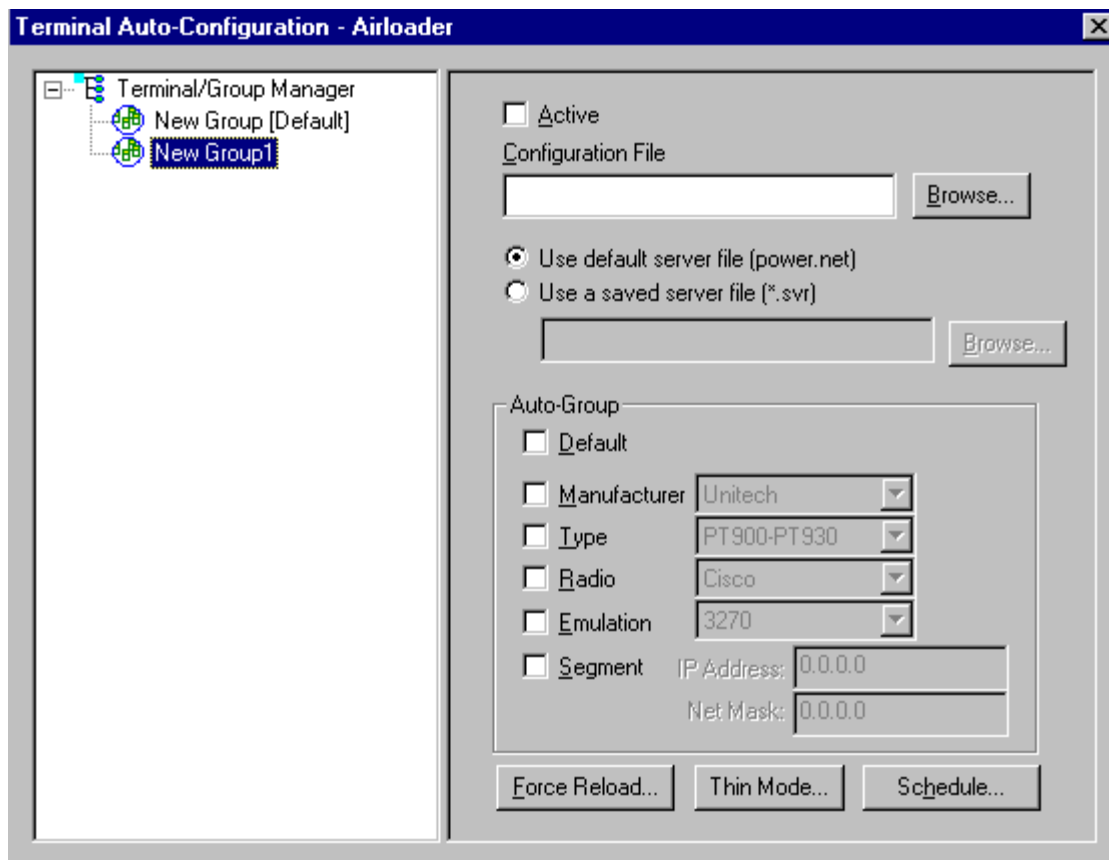
After the Configuration File and all of the other parameters have been set, the group is made active by clicking on the **Active** check box.
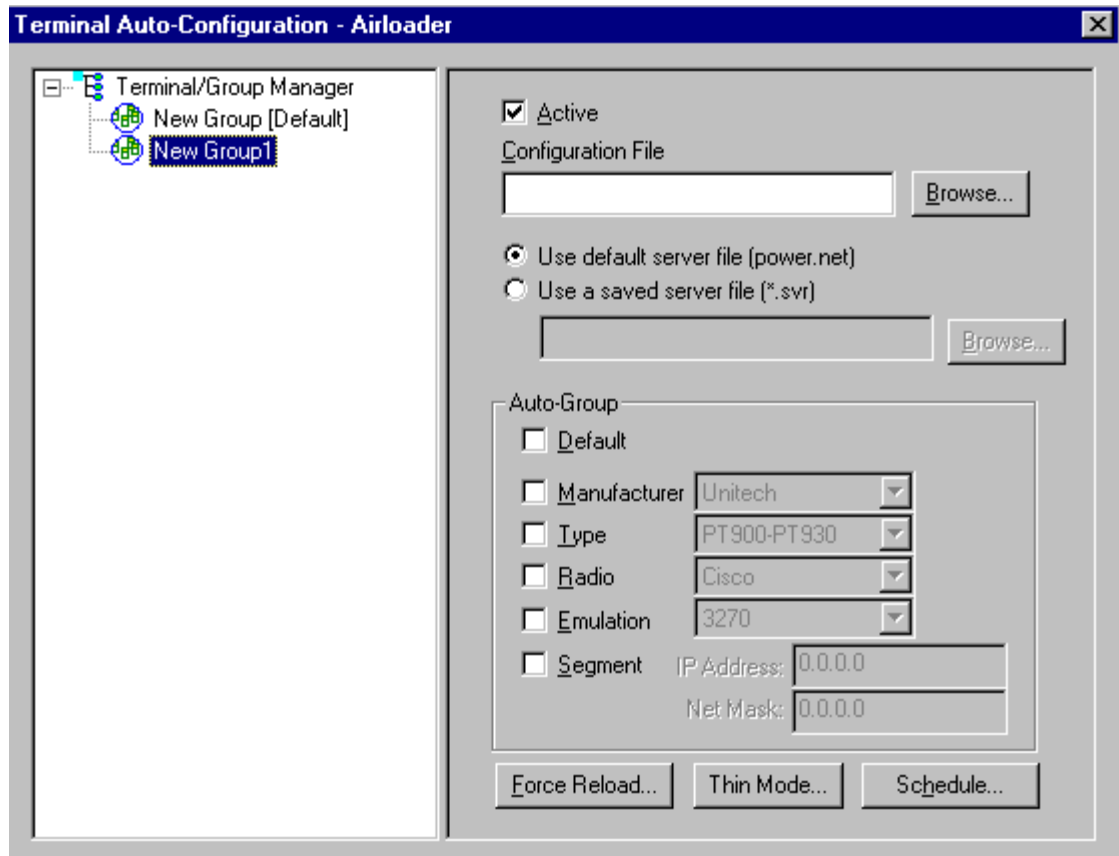
Clicking on the **Thin Mode** button will cause all terminals in this group that are currently running in thick mode to be switched to thin mode the next time Airloader is run on the terminal.

Click on the **Sc<u>h</u>edule** button to view a dialog box for scheduling an automatic Airloader update.
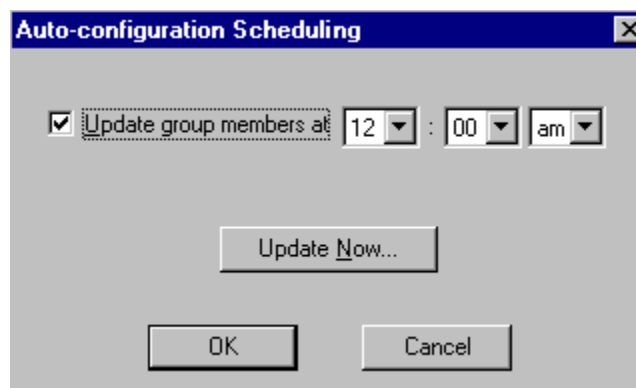
Select the desired time and click on **OK**. Click on Update Now and the Airloader "push" capability controls terminals from this end.

Setting the Segment

Checking the **Segment** button restricts a terminal group to a range of IP addresses. The IP Address can be any valid address on the segment, as it is used only to identify the segment. The setting of the Net Mask can be used to restrict the range. This feature is useful for segregating terminal groups by location.

Setting Force Reload

Clicking on the **Force Reload** button forces all terminals within a group to be automatically updated. The following warning message appears.
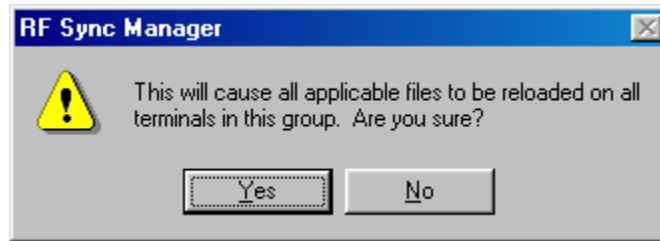
Click on the **Yes** button to force the reload.

Setting the Default Terminal Group

New terminals that have not yet been assigned to any group are initially assigned to the default group in effect when they are booted.
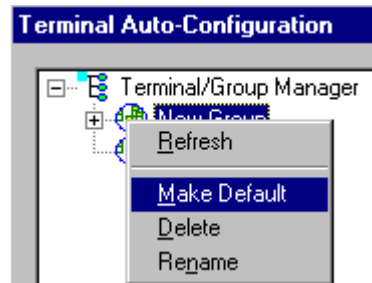
Any group can be made the default group by clicking on the group, and then clicking on the right mouse button. Then click on the **Make Default** option.

Reassigning Terminals

After a terminal has been configured and assigned to the default group, it can be reassigned to a new group by clicking on the terminal icon as shown below.
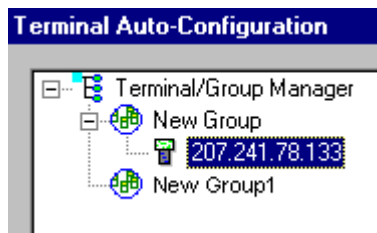
Then, holding the mouse button down, drag the terminal icon to the desired group as shown next.
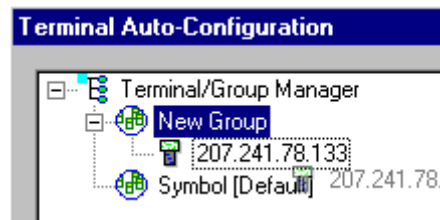
Release the mouse button, which reassigns the terminal.
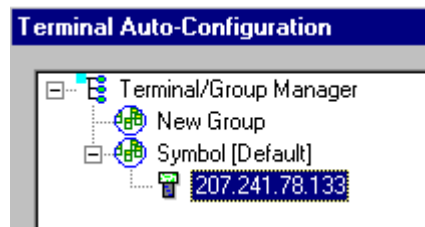
The next time the terminal is rebooted, it will be reconfigured as defined in the group specification.

Mobile Device Manager (MDM) Features

Under **Tools** in Twin Client Manager are the **Screen Watcher**, **Terminal Messenger**, and **RF Monitor** features.

Note: The terminal may or may not be able to utilize the **Screen Watcher** or **Terminal Messenger** features depending on its Authorization codes.
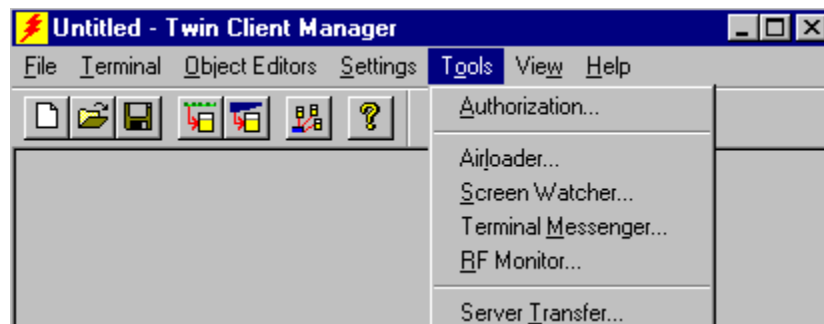
Select **Screen Watcher**, enter the terminal's IP address, and click on **OK**.

Screen Watcher

Enter the IP Address of the Terminal:

[OK]   [Cancel]
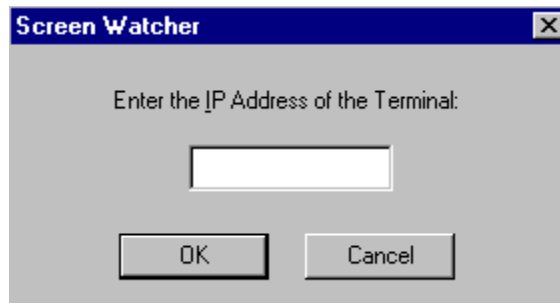
A screen will appear with a display resembling the terminal screen.

206.183.67.226

[Font...] Status: Connecting...
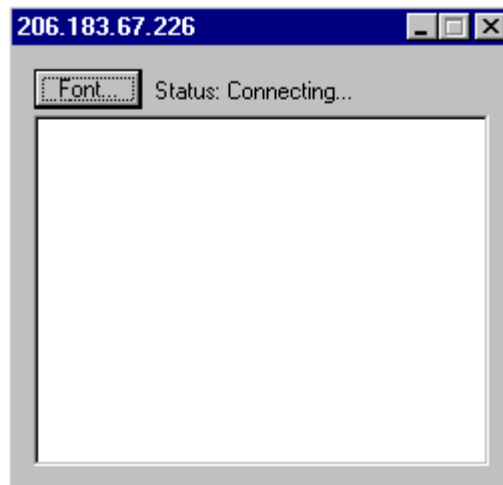
Clicking on the **Font** button on the upper left brings up a screen in which you can modify the font settings, as shown below.

Font

Font:
Courier New

Font style:
Regular

Size:
14

Courier
Courier New
Fixedsys
Lucida Console
MS Gothic
Terminal

Regular
Italic
Bold
Bold Italic

14
16
18
20
22
24
26

[OK]
[Cancel]

Effects
☐ Strikeout
☐ Underline
Color:
Black

Sample

AaBbYyZz

Script:
Western
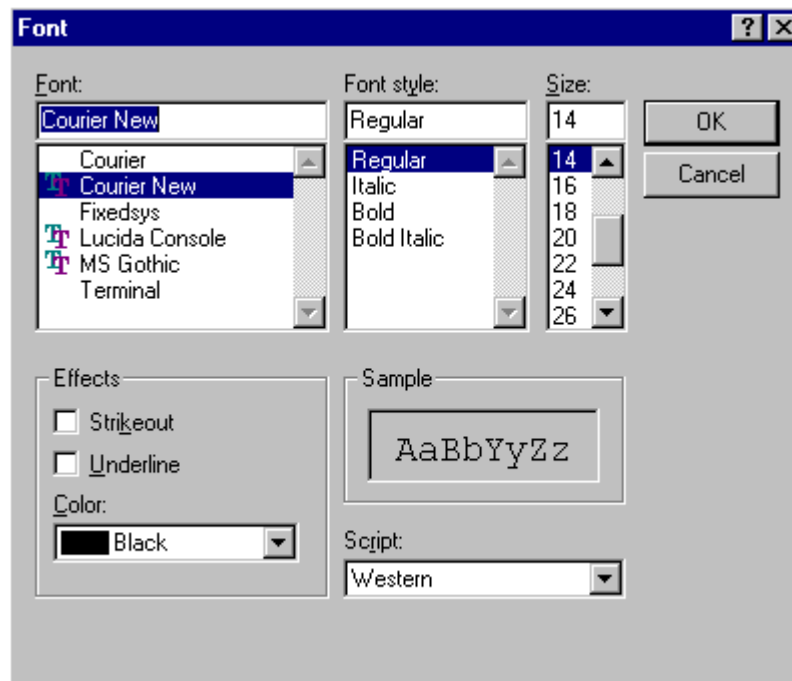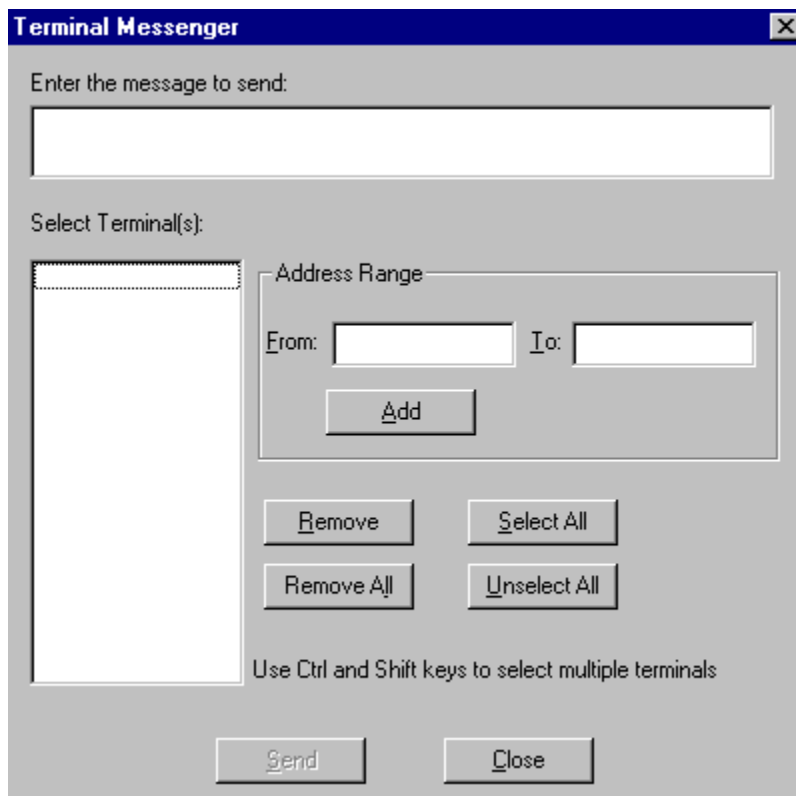
Select **Terminal Messenger** from the **Tools** menu.

You may enter an Address Range in the **From** and **To** boxes on this screen. Click on **Add** when finished.

Enter a message to send in the space provided, select the terminal to receive this message by clicking on it in the **Select Terminal(s)** column, and click on the **Send** button to send the message of your choice to the terminal of your choice.

See the example of the Terminal Messenger screen below.

To remove a terminal from the list of terminals receiving your message, click on the terminal number in the **Select Terminal(s)** column, and click on the **Remove** button. Click on the appropriate button, **Remove All**, **Select All**, or **Unselect All**, to remove all terminals, select all terminals, or unselect all terminals from the **Select Terminal(s)** list.

Note: Use the **Ctrl** and **Shift** keys to select multiple terminals.

Click on the **Close** button when finished.

Select **RF Monitor** from the **Tools** menu.
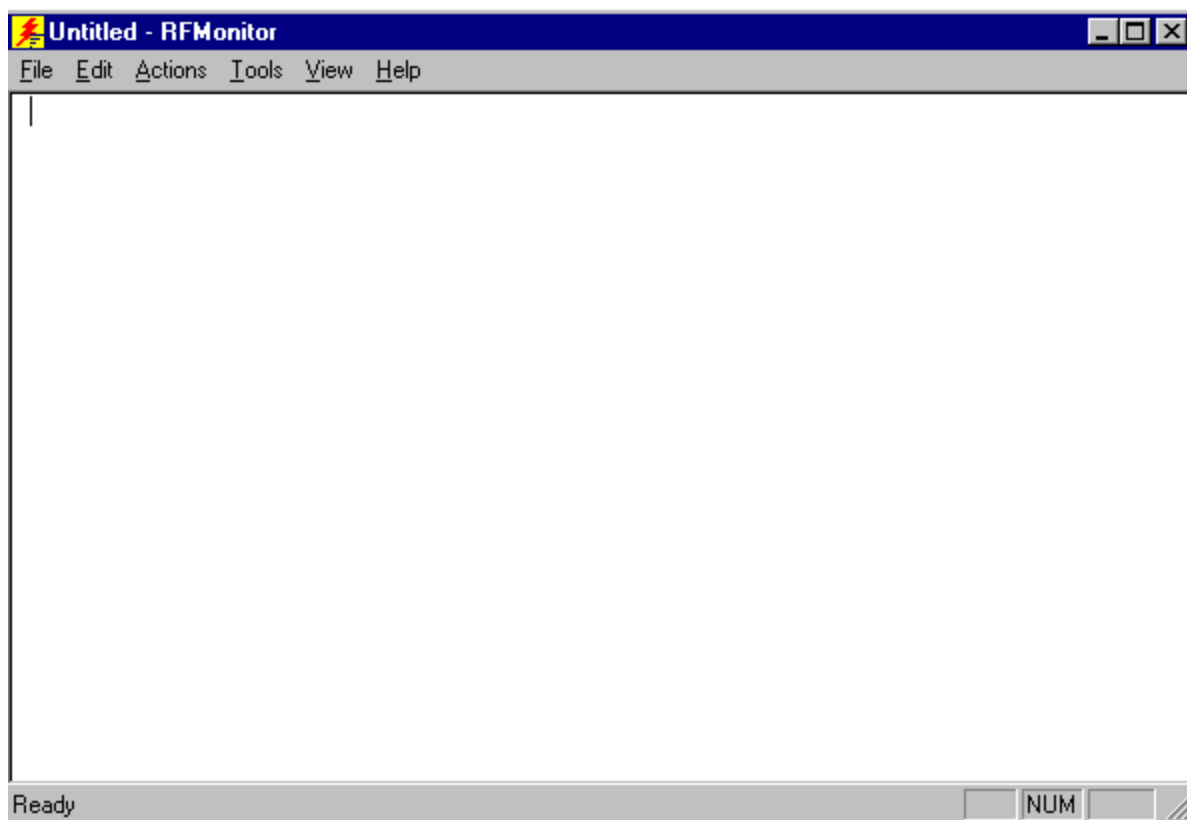
RF Monitor is an "Over The Air" diagnostic tool. It is used to collect diagnostic trace information from RF terminals running PowerNet Twin Client software.

It runs on a Windows PC and will send a command to the RF terminal to start tracing. The terminal, when it receives this command, will start sending the trace information over the RF link to the PC that issued the command. This will be written to a file on this PC that can be sent to us for analysis.

Click on **File** to **Select Terminal** or to **Exit.**
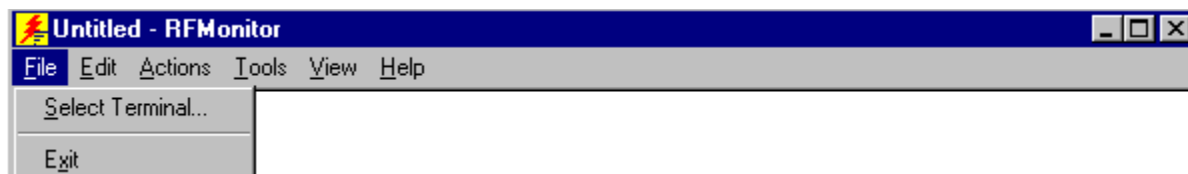
Choosing **Select Terminal** allows you to view a log of the terminal's activity. Enter the Terminal IP address and Terminal IP Port, and click on **OK**.
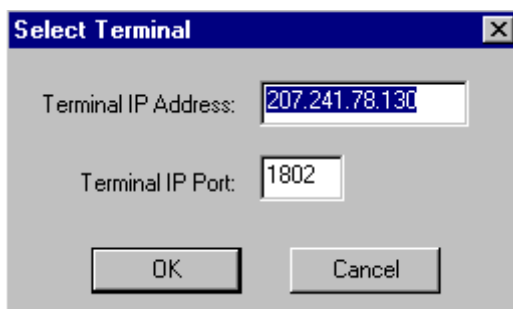
Click on **Edit**. Select **Find** and/or **Find Next** to search for pieces of information in your log, or select **Clear** to clear the search.
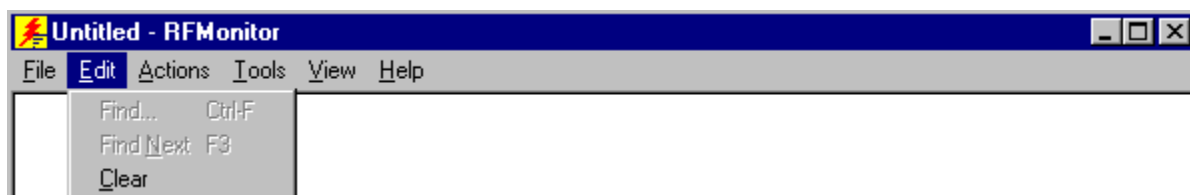
Click on **Actions** to select **Start Monitor** or **Stop Monitor**.
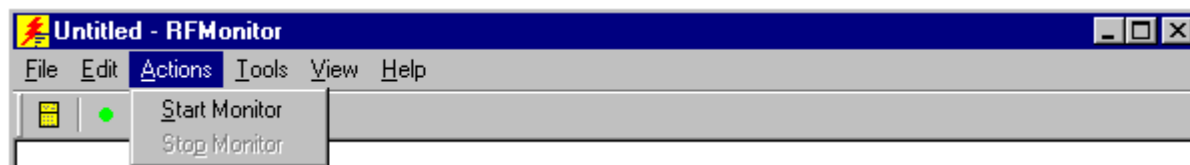
Click on **Tools** to choose **Set Debug Levels** or **Settings**.
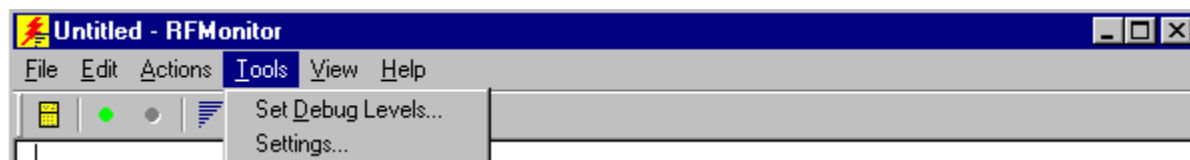
The options in **Set Debug Levels** are shown below.
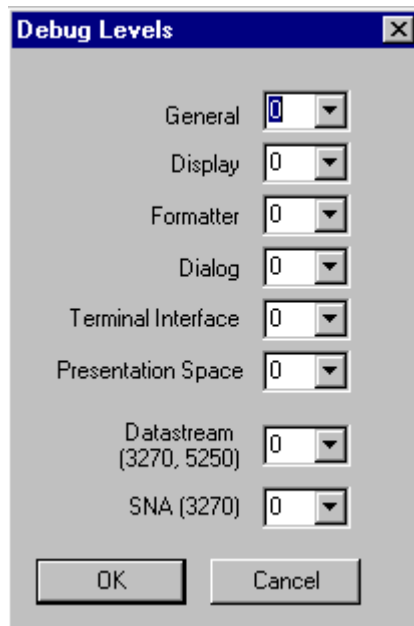
The maximum log file size can be set under Settings.
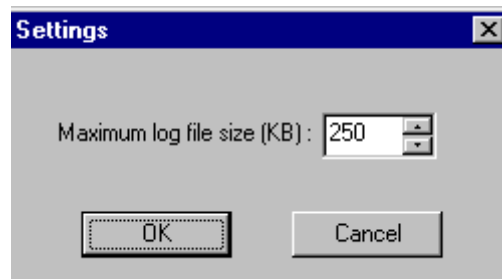
Click on **View** to show or hide the Toolbar and the Status Bar.
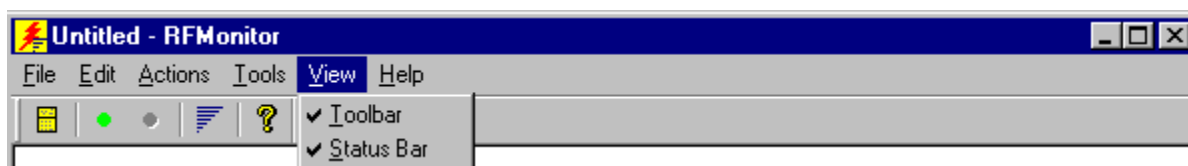
This is the Toolbar. It is found near the top of the screen.

This is the Status Bar. It is found at the bottom of the screen.

Click on **About RF Monitor** under **Help** to view version number information. Click on **About Twin Client Manager** under **Help** in the main menu to view the following screen.
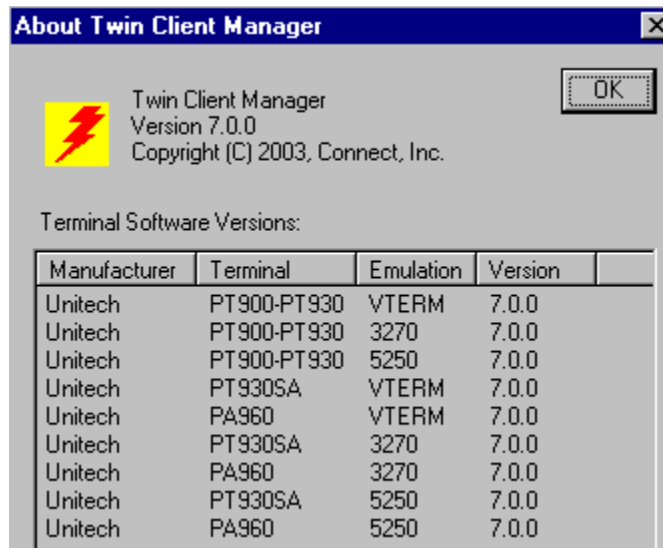
RF Monitor is a very small program and does not even require installation. Just place it in a directory on your PC and create a shortcut to run it. It will run on all versions of Windows except V3.1 and Windows 95.

1. Move RF Monitor to a Windows PC with Network access to the RF terminal.

2. Run RF Monitor. (Create a shortcut or do a **Start/Run**.)

3. From the pull down menu, select **File/Select Terminal**.

4. Key in the RF terminal IP address and leave the port at 1802.
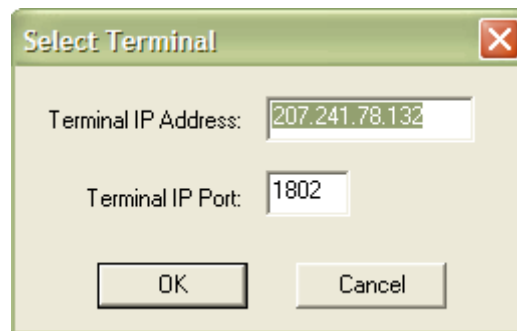
5. From the pull down menu, select **Tools/Set Debug Levels**. Set all levels to 9 except Datastream and SNA.
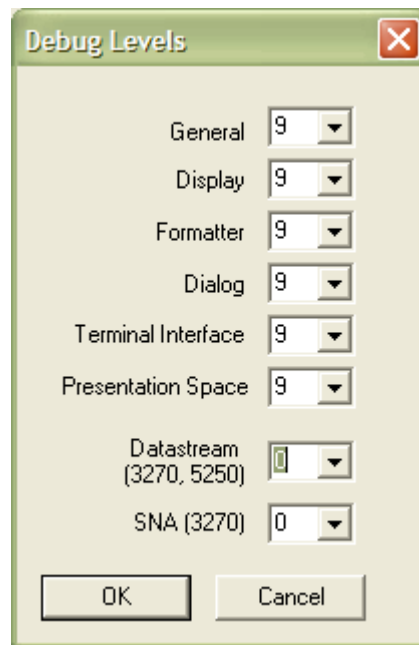
6. With the RF terminal sitting at the **Press Any Key** prompt, select **Actions/Start Monitor**.

7. Press a key on the RF terminal to open a session, and you should see trace data in the RF Monitor window. When done, end the trace and the file will be named **tnxxx.yyy.log** (where **xxx.yyy** is the last 2 octets of the RF terminal's IP address) in the directory in which RF Monitor was running.

```
tn78.132.log - RFMonitor
File  Actions  Tools  View  Help

08/11 11:57:55.000      0ms Log Started.
08/11 11:57:55.000     50ms BEGIN 5250 6.5.0 IBM-5291-1 TN  E:\tnvt.cf
08/11 11:57:55.000    280ms TN_key=078.132< 0 vars (0)
08/11 11:57:55.000     50ms Dialog File: ''
08/11 11:57:55.000      0ms Dialog ''
08/11 11:57:57.000   1760ms Connected To: 207.241.78.5
08/11 11:57:57.000     60ms tip_snd: 2 bytes
51 00                                          Q.
08/11 11:57:57.000     50ms tip_rcv: 14 bytes
51 36 38 30 30 34 36 36 2E 33 2E 36 10 15      Q6800466.3.6..
08/11 11:57:57.000     60ms tip_setup: model 6800 key 46 rev 630
08/11 11:57:57.000    160ms tip_snd: 137 bytes
5A 02 35 31 5A 02 41 31 5A 05 42 31 30 38 30 5A    Z.51Z.A1Z.B1080Z
02 44 30 5A 05 46 33 32 34 30 5A 02 47 30 5A 02    .D0Z.F3240Z.G0Z.
49 04 5A 02 4D 31 5A 02 4E 30 5A 09 50 34 2C 33    I.Z.M1Z.N0Z.P4,3
32 2C 31 38 30 5A 02 51 31 5A 02 52 30 59 02 42    2,180Z.Q1Z.R0Y.B
01 59 02 43 00 59 02 45 01 59 02 46 00 59 02 4A    .Y.C.Y.E.Y.F.Y.J
00 59 02 49 01 58 03 42 00 00 58 02 46 0A 58 02    .Y.I.X.B..X.F.X.
47 00 58 08 48 65 6E 67 6C 69 73 68 5A 02 56 0A    G.X.HenglishZ.V.
5A 11 48 31 2C 31 35 30 2C 32 30 34 38 2C 33 30    Z.H1,150,2048,30

Ready
```

Common Problems with RF Monitor

- **The trace won't start.**

  RF Monitor uses UDP to send commands to the RF device. On busy networks, UDP packets are not always delivered. The terminal can miss the command to start the trace. Below are some things that can be useful.

  a. Ping the RF terminal from the PC used before starting RF Monitor. (This seems to "open" a path to the terminal.)

  b. Start the Monitor with the terminal at the **Press Any Key** prompt. (While the terminal is at this prompt, it is not doing much and has a better chance of hearing the start trace command.)

- **I don't understand what this trace means.**

  The trace that this tool collects is engineering-level information. It allows an end user to collect information that can be analyzed by Connect engineering.

  It will generally be requested by Connect support to help diagnose a reported problem.

  To be able to read and understand these completely, you need to have an understanding of:

a. Emulation protocols (IBM 5250, IBM 3270, DEC VT200, etc.)
b. PowerNet Twin Client products
c. RF Network concepts
d. Wired network concepts
e. Telnet sessions
f. TCP/IP

They are text files that can be read with any editor or viewer and can be useful to end users and integrators, even if they may not have all the requirements above.

- **I have an intermittent problem and it could happen on any one of my 100 terminals. RF Monitor only does one terminal at a time. What can I do?**

RF Monitor is not the right diagnostic tool for this type of problem. PowerNet products have another diagnostic tool that can be used called the "Diagnostic Server".

This tool can be set up to run trace diagnostics on up to 300 terminals at the same time. This tool will be provided as needed for systems under PowerNet support agreement OR by T&M when they are not covered.

It also includes the service of a PowerNet support engineer.

Server Transfer is another feature. From the **Tools** menu, select **Server Transfer**.
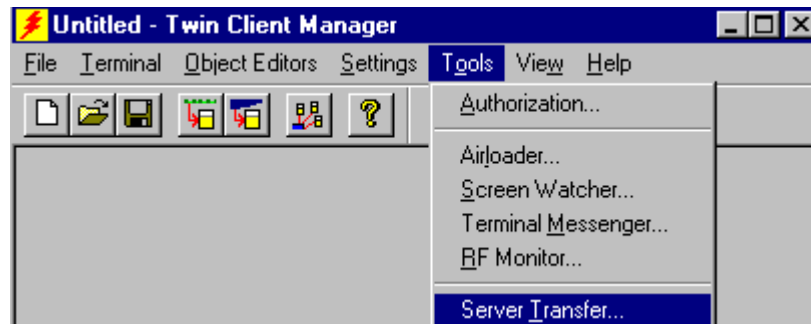
The FTP Settings screen appears.
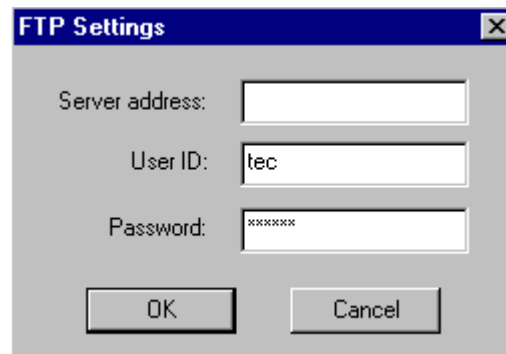
To send object editor and configuration files from Windows to your Linux box, enter your server address, and click on **OK**.

Sending Program and Configuration Files to the Terminal

1. Boot the terminal.

2. On the PC, select **Send Program Files to Terminal** from the **Terminal** menu in Twin Client Manager.
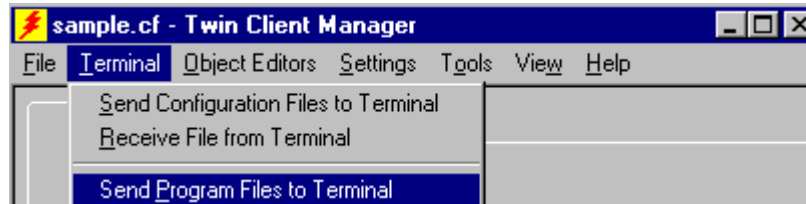
The following screen will appear.
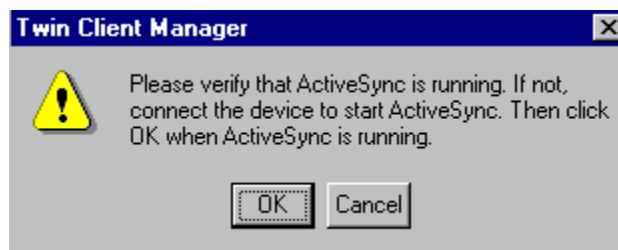
3. Click on **OK**.

The following screen will appear.

4. Click on **OK**.

5. On the PC, choose **Send Configuration Files to Terminal** from the **Terminal** menu in Twin Client Manager.
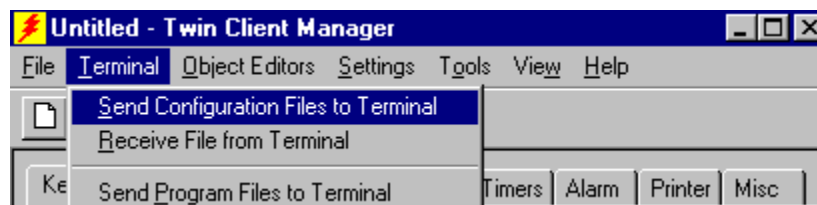
You will see the following screen.

Twin Client Manager   ⊠

⚠ Would you also like to load the configuration files?

[Yes]   [No]   [Cancel]

6. Choose **Yes**.

Twin Client Manager   ⊠

⚠ Please verify that ActiveSync is running. If not, connect the device to start ActiveSync. Then click OK when ActiveSync is running.

[OK]   [Cancel]

7. Click on **OK**.

The following screen will appear.

Twin Client Manager   ⊠

⚠ Transfer Complete.

[OK]
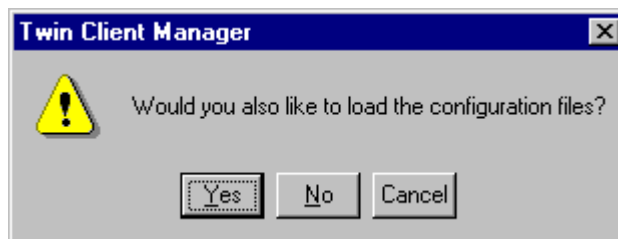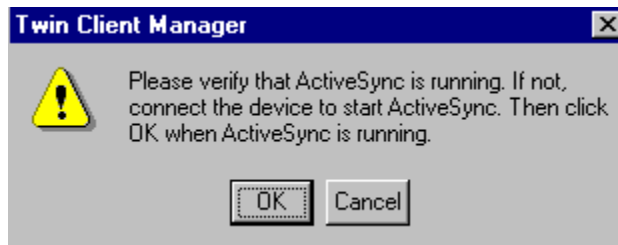
8. Click on **OK**.
9. On the terminal, click on **Start**, **Programs**, **File Explorer**, and **Windows**.
10. Select the **Aironet Client Utility** icon.
11. Enter the SSID, etc.
12. Click on **OK**.
13. Click on **Start**, **Settings**, and **Control Panel**.
14. Select the **Network** icon and choose on the **Properties** tab.
15. Set the **IP Address**, **Subnet Mask**, and **Default Gateway**, and click on **OK**.
16. Click on **Start**, **Programs**, **TwinClient**, and **AirloaderSetup**.
17. Make sure that the **Run AirLoad** checkbox is checked or unchecked, as desired.
18. Click on **OK**.
19. Warm boot the terminal.

Under **Terminal**, you may select **Receive File from Terminal**.
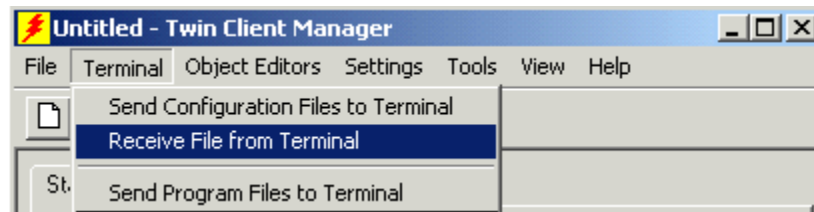
Enter the path and file name to receive from the terminal in the Upload File dialog box.
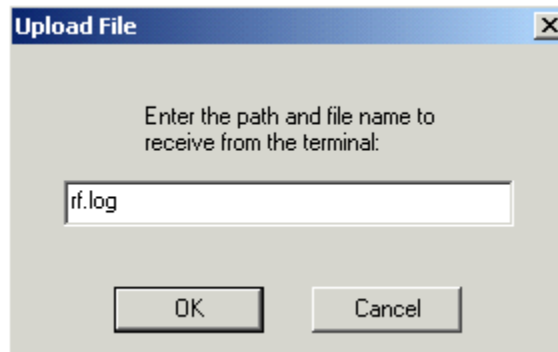
The default file is "rf.log". Click on **OK**.

This page is intentionally blank.

Chapter 9 • Character Sets

ISO 8859-1 Character Set

Description	Char	Dec	Hex
non-breaking space		160	A0
inverted exclamation	¡	161	A1
cent sign	¢	162	A2
pound sterling	£	163	A3
general currency sign	¤	164	A4
yen sign	¥	165	A5
broken vertical bar	¦	166	A6
section sign	§	167	A7
umlaut (dieresis)	¨	168	A8
copyright	©	169	A9
feminine ordinal	ª	170	AA
left angle quote, guillemot left	«	171	AB
not sign	¬	172	AC
soft hyphen	-	173	AD
registered trademark	®	174	AE
macron accent	¯	175	AF
degree sign	°	176	B0
plus or minus	±	177	B1
superscript two	²	178	B2
superscript three	³	179	B3
acute accent	´	180	B4
microsign	µ	181	B5

Description	Char	Dec	Hex
paragraph sign	¶	182	B6
middle dot	·	183	B7
cedilla	¸	184	B8
superscript one	¹	185	B9
masculine ordinal	º	186	BA
right angle quote, guillemot right	»	187	BB
fraction one-fourth	¼	188	BC
fraction one-half	½	189	BD
fraction three-fourths	¾	190	BE
inverted question mark	¿	191	BF
capital A, grave accent	À	192	C0
capital A, acute accent	Á	193	C1
capital A, circumflex accent	Â	194	C2
capital A, tilde	Ã	195	C3
capital A, dieresis or umlaut mark	Ä	196	C4
capital A, ring	Å	197	C5
capital AE diphthong (ligature)	Æ	198	C6
capital C, cedilla	Ç	199	C7
capital E, grave accent	È	200	C8
capital E, acute accent	É	201	C9
capital E, circumflex accent	Ê	202	CA
capital E, dieresis or umlaut mark	Ë	203	CB
capital I, grave accent	Ì	204	CC
capital I, acute accent	Í	205	CD
capital I, circumflex accent	Î	206	CE
capital I, dieresis or umlaut mark	Ï	207	CF
capital Eth, Icelandic	Ð	208	D0
capital N, tilde	Ñ	209	D1
capital O, grave accent	Ò	210	D2

Description	Char	Dec	Hex
capital O, acute accent	Ó	211	D3
capital O, circumflex accent	Ô	212	D4
capital O, tilde	Õ	213	D5
capital O, dieresis or umlaut mark	Ö	214	D6
multiply sign	×	215	D7
capital O, slash	Ø	216	D8
capital U, grave accent	Ù	217	D9
capital U, acute accent	Ú	218	DA
capital U, circumflex accent	Û	219	DB
capital U, dieresis or umlaut mark	Ü	220	DC
capital Y, acute accent	Ý	221	DD
capital THORN, Icelandic	Þ	222	DE
small sharp s, German (sz ligature)	ß	223	DF
small A, grave accent	à	224	E0
small A, acute accent	á	225	E1
small A, circumflex accent	â	226	E2
small A, tilde	ã	227	E3
small A, dieresis or umlaut mark	ä	228	E4
small A, ring	å	229	E5
small AE diphthong (ligature)	æ	230	E6
small C, cedilla	ç	231	E7
small E, grave accent	è	232	E8
small E, acute accent	é	233	E9
small E, circumflex accent	ê	234	EA
small E, dieresis or umlaut mark	ë	235	EB
small I, grave accent	ì	236	EC
small I, acute accent	í	237	ED
small I, circumflex accent	î	238	EE
small I, dieresis or umlaut mark	ï	239	EF

Description	Char	Dec	Hex
small Eth, Icelandic	ð	240	F0
small N, tilde	ñ	241	F1
small O, grave accent	ò	242	F2
small O, acute accent	ó	243	F3
small O, circumflex accent	ô	244	F4
small O, tilde	õ	245	F5
small O, dieresis or umlaut mark	ö	246	F6
division sign	÷	247	F7
small O, slash	ø	248	F8
small U, grave accent	ù	249	F9
small U, acute accent	ú	250	FA
small U, circumflex accent	û	251	FB
small U, dieresis or umlaut mark	ü	252	FC
small Y, acute accent	ý	253	FD
small THORN, Icelandic	þ	254	FE
small Y, dieresis or umlaut mark	ÿ	255	FF

ASCII Character Set

Decimal and Hexadecimal Values

	Dec	Hex		Dec	Hex		Dec	Hex		Dec	Hex
NUL	0	00	**SP**	32	20	@	64	40	`	96	60
SOH	1	01	**!**	33	21	**A**	65	41	**a**	97	61
STX	2	02	**"**	34	22	**B**	66	42	**b**	98	62
ETX	3	03	**#**	35	23	**C**	67	43	**c**	99	63
EOT	4	04	**$**	36	24	**D**	68	44	**d**	100	64
ENQ	5	05	**%**	37	25	**E**	69	45	**e**	101	65
ACK	6	06	**&**	38	26	**F**	70	46	**f**	102	66
BEL	7	07	**´**	39	27	**G**	71	47	**g**	103	67
BS	8	08	**(**	40	28	**H**	72	48	**h**	104	68
HT	9	09	**)**	41	29	**I**	73	49	**i**	105	69
NL	10	0A	*****	42	2A	**J**	74	4A	**j**	106	6A
VT	11	0B	**+**	43	2B	**K**	75	4B	**k**	107	6B
NP	12	0C	**,**	44	2C	**L**	76	4C	**l**	108	6C
CR	13	0D	**-**	45	2D	**M**	77	4D	**m**	109	6D
SO	14	0E	**.**	46	2E	**N**	78	4E	**n**	110	6E
SI	15	0F	**/**	47	2F	**O**	79	4F	**o**	111	6F
DLE	16	10	**0**	48	30	**P**	80	50	**p**	112	70
DC1	17	11	**1**	49	31	**Q**	81	51	**q**	113	71
DC2	18	12	**2**	50	32	**R**	82	52	**r**	114	72
DC3	19	13	**3**	51	33	**S**	83	53	**s**	115	73
DC4	20	14	**4**	52	34	**T**	84	54	**t**	116	74
NAK	21	15	**5**	54	35	**U**	85	55	**u**	117	75
SYN	22	16	**6**	54	36	**V**	86	56	**v**	118	76
ETB	23	17	**7**	55	37	**W**	87	57	**w**	119	77
CAN	24	18	**8**	56	38	**X**	88	58	**x**	120	78
EM	25	19	**9**	57	39	**Y**	89	59	**y**	121	79
SUB	26	1A	**:**	58	3A	**Z**	90	5A	**z**	122	7A
ESC	27	1B	**;**	59	3B	**[**	91	5B	**{**	123	7B
FS	28	1C	**<**	60	3C	****	92	5C	**|**	124	7C
GS	29	1D	**=**	61	3D	**]**	93	5D	**}**	125	7D
RS	30	1E	**>**	62	3E	**^**	94	5E	**~**	126	7E
US	31	1F	**?**	63	3F	**_**	95	5F	**DEL**	127	7F

ASCII Character Set

Octal Values

	Oct		Oct		Oct		Oct
NUL	000	**SP**	040	@	100	`	140
SOH	001	**!**	041	**A**	101	**a**	141
STX	002	**"**	042	**B**	102	**b**	142
ETX	003	**#**	043	**C**	103	**c**	143
EOT	004	**$**	044	**D**	104	**d**	144
ENQ	005	**%**	045	**E**	105	**e**	145
ACK	006	**&**	046	**F**	106	**f**	146
BEL	007	**´**	047	**G**	107	**g**	147
BS	010	**(**	050	**H**	110	**h**	150
HT	011	**)**	051	**I**	111	**i**	151
NL	012	*****	052	**J**	112	**j**	152
VT	013	**+**	053	**K**	113	**k**	153
NP	014	**,**	054	**L**	114	**l**	154
CR	015	**-**	055	**M**	115	**m**	155
SO	016	**.**	056	**N**	116	**n**	156
SI	017	**/**	057	**O**	117	**o**	157
DLE	020	**0**	060	**P**	120	**p**	160
DC1	021	**1**	061	**Q**	121	**q**	161
DC2	022	**2**	062	**R**	122	**r**	162
DC3	023	**3**	063	**S**	123	**s**	163
DC4	024	**4**	064	**T**	124	**t**	164
NAK	025	**5**	065	**U**	125	**u**	165
SYN	026	**6**	066	**V**	126	**v**	166
ETB	027	**7**	067	**W**	127	**w**	167
CAN	030	**8**	070	**X**	130	**x**	170
EM	031	**9**	071	**Y**	131	**y**	171
SUB	032	**:**	072	**Z**	132	**z**	172
ESC	033	**;**	073	**[**	133	**{**	173
FS	034	**<**	074	****	134	**|**	174
GS	035	**=**	075	**]**	135	**}**	175
RS	036	**>**	076	**^**	136	**~**	176
US	037	**?**	077	**_**	137	**DEL**	177

Chapter 10 • Keypad Configuration

This chapter describes the PowerNet key assignments applied to Unitech terminals used in Twin Client advanced mode. The figures and tables identify the key assignments by terminal model and emulation.

Adhesive decals that reflect the configurations described in this chapter are available for Unitech terminals in each of the emulations (3270, 5250, and VT).

Keypad Figures

The keypad figures in this section are designed to be of use without color. The convention for describing the effect of modifier keys is as follows:
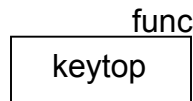
func

keytop

KEYTOP refers to the characters printed on the top of the key by the manufacturer. In this example, the FUNC key is the modifier.

In the example figure above, the keystroke generated in the un-modified state is an **0**. The programmable function key **backlight** is generated by pressing the FUNC modifier key before pressing the **0** key, illustrated below.

backlight

0
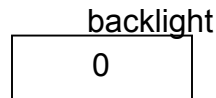
To select the Twin Client Keyboard, follow these instructions.
1. Click on **Start**, **Settings**, and **Control Panel**.
2. Select the **Input Panel**.
3. Choose **TwinClient kbd** from the drop down menu.
4. Choose **OK**.

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10

Esc	1	2	3	4	5	6	7	8	9	0	-	=	⇐

Tab	q	w	e	r	t	y	u	i	o	p	[	]

CAP	a	s	d	f	g	h	i	k	l	;	'

Shift	z	x	c	v	b	n	m	,	.	/	↵

CTL	áŭ	`	\		↓	↑	←	→

Standard	Function	Special

Lowercase Character Standard Keyboard Mode

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10

Esc	!	@	#	$	%	^	&	*	(	)	_	+	Del

Tab	Q	W	E	R	T	Y	U	I	O	P	{	}

CAP	A	S	D	F	G	H	J	K	L	:	"

Shift	Z	X	C	V	B	N	M	<	>	?	↵

CTL	áὔ	~	|		↓	↑	←	→

Standard	Function	Special

Uppercase Character Standard Keyboard Mode

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10

Esc	¿	¡	œ	¢	£	¥	§	°	±	µ	-	=	←
Tab	à	á	â	ã	ä	å	æ	ç	ð	ñ	[	]	
CAP	è	é	ê	ë	ì	í	î	ï	Þ	š	'		
Shift	ò	ó	ô	õ	ö	ù	ú	û	ü	/	↵		
CTL	áǔ	ý	ÿ					↓	↑	←	→		

Standard	Function	Special

Lowercase International Symbol Keyboard Mode

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10

Esc	¿	¡	Œ	¢	£	¥	§	°	±	µ	-	+	Del

Tab	À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	{	}

CAP	È	É	Ê	Ë	Ì	Í	Î	Ï	þ	Š	"

Shift	Ò	Ó	Ô	Õ	Ö	Ù	Ú	Û	Ü	?	↵

CTL	áŭ	Ý	Ÿ		↓	↑	←	→

Standard	Function	Special

Uppercase International Symbol Keyboard Mode

func   (|)

darken				
tab	1	2	3	up
bksp	4	5	6	down (lighten)
0 (bklite)	7	8	9	enter
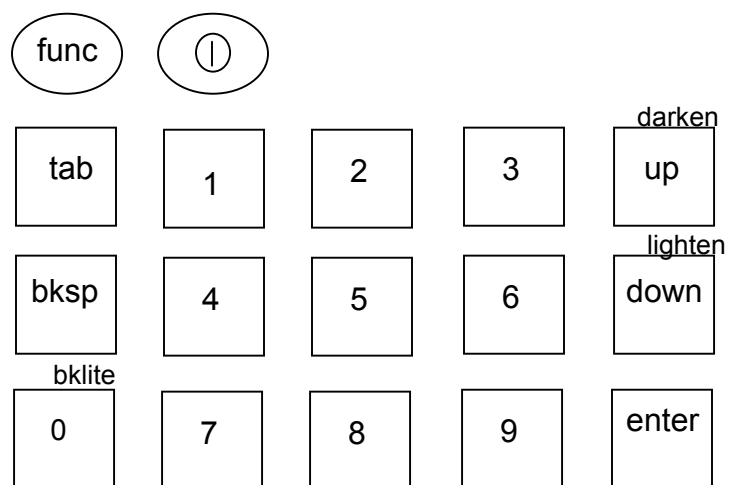
Numeric Keyboard
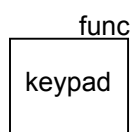
func
keypad

PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8
PF9	PF10	PF11	PF12	PF13	PF1	PF15	PF16
PF17	PF18	PF19	PF20	PF2	PF2	PF23	PF24

Standard	Function	Special

Function Keys

Home	Insert	Top	Bottom
PA1	PA2	PA3	special
Standard	Function		

VT100

Home	Reset	EEOF	Clear	Sysreq

PA1	PA2	PA3	special

Standard	Function	Special
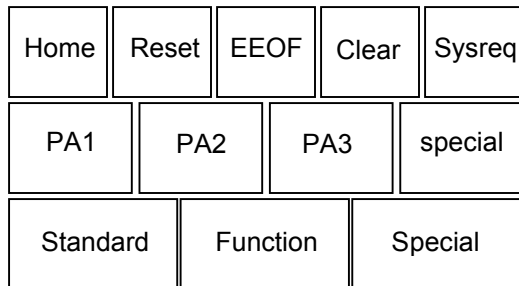
3270

Help	Attn	Sysreq	Fexit	Fplus	Fminus
Home	EEOF	Reset	Del	Clear	Insert
Rolldn	Rollup	Print	Dup	FM	special
Standard		Function		Special	

5250

Unitech Terminal Keypad Tables

The keypad tables in this section are organized by terminal model, keypad configuration, and emulation. The key values represent the default keypad assignments applied to the terminal in Twin Client advanced mode.

Table entries that are blank indicate the key is not assigned, or not relevant to the emulation.

Key	VT	3270	5250
a	<a>	<a>	<a>
b	<b>	<b>	<b>
c	<c>	<c>	<c>
d	<d>	<d>	<d>
e	<e>	<e>	<e>
f	<f>	<f>	<f>
g	<g>	<g>	<g>
h	<h>	<h>	<h>
i	<i>	<i>	<i>
j	<j>	<j>	<j>
k	<k>	<k>	<k>
l	<l>	<l>	<l>
m	<m>	<m>	<m>
n	<n>	<n>	<n>
o	<o>	<o>	<o>
p	<p>	<p>	<p>
q	<q>	<q>	<q>
r	<r>	<r>	<r>
s	<s>	<s>	<s>
t	<t>	<t>	<t>
u	<u>	<u>	<u>
v	<v>	<v>	<v>
w	<w>	<w>	<w>
x	<x>	<x>	<x>
y	<y>	<y>	<y>
z	<z>	<z>	<z>
A	<Shift><a>	<Shift><a>	<Shift><a>
B	<Shift><b>	<Shift><b>	<Shift><b>
C	<Shift><c>	<Shift><c>	<Shift><c>
D	<Shift><d>	<Shift><d>	<Shift><d>
E	<Shift><e>	<Shift><e>	<Shift><e>
F	<Shift><f>	<Shift><f>	<Shift><f>
G	<Shift><g>	<Shift><g>	<Shift><g>
H	<Shift><h>	<Shift><h>	<Shift><h>
I	<Shift><i>	<Shift><i>	<Shift><i>
J	<Shift><j>	<Shift><j>	<Shift><j>
K	<Shift><k>	<Shift><k>	<Shift><k>
L	<Shift><l>	<Shift><l>	<Shift><l>
M	<Shift><m>	<Shift><m>	<Shift><m>
N	<Shift><n>	<Shift><n>	<Shift><n>
O	<Shift><o>	<Shift><o>	<Shift><o>
P	<Shift><p>	<Shift><p>	<Shift><p>
Q	<Shift><q>	<Shift><q>	<Shift><q>
R	<Shift><r>	<Shift><r>	<Shift><r>
S	<Shift><s>	<Shift><s>	<Shift><s>
T	<Shift><t>	<Shift><t>	<Shift><t>
U	<Shift><u>	<Shift><u>	<Shift><u>
V	<Shift><v>	<Shift><v>	<Shift><v>
W	<Shift><w>	<Shift><w>	<Shift><w>

X	<Shift><x>	<Shift><x>	<Shift><x>
Y	<Shift><y>	<Shift><y>	<Shift><y>
Z	<Shift><z>	<Shift><z>	<Shift><z>
1	<1>	<1>	<1>
2	<2>	<2>	<2>
3	<3>	<3>	<3>
4	<4>	<4>	<4>
5	<5>	<5>	<5>
6	<6>	<6>	<6>
7	<7>	<7>	<7>
8	<8>	<8>	<8>
9	<9>	<9>	<9>
0	<0>	<0>	<0>
! exclamation	<Shift><1>	<Shift><1>	<Shift><1>
@ at sign	<Shift><2>	<Shift><2>	<Shift><2>
# pound	<Shift><3>	<Shift><3>	<Shift><3>
$ dollar	<Shift><4>	<Shift><4>	<Shift><4>
% percent	<Shift><5>	<Shift><5>	<Shift><5>
^ carat	<Shift><6>	<Shift><6>	<Shift><6>
& ampersand	<Shift><7>	<Shift><7>	<Shift><7>
* asterisk	<Shift><8>	<Shift><8>	<Shift><8>
(left parenthesis	<Shift><9>	<Shift><9>	<Shift><9>
) right parenthesis	<Shift><0>	<Shift><0>	<Shift><0>
F1	<F1>	<F1>	<F1>
F2	<F2>	<F2>	<F2>
F3	<F3>	<F3>	<F3>
F4	<F4>	<F4>	<F4>
F5	<F5>	<F5>	<F5>
F6	<F6>	<F6>	<F6>
F7	<F7>	<F7>	<F7>
F8	<F8>	<F8>	<F8>
F9	<F9>	<F9>	<F9>
F10	<F10>	<F10>	<F10>
F11	<F11>	<F11>	<F11>
F12	<F12>	<F12>	<F12>
F13	<F13>	<F13>	<F13>
F14	<F14>	<F14>	<F14>
F15	<F15>	<F15>	<F15>
F16	<F16>	<F16>	<F16>
F17	<F17>	<F17>	<F17>
F18	<F18>	<F18>	<F18>
F19	<F19>	<F19>	<F19>
F20	<F20>	<F20>	<F20>
F21	<F21>	<F21>	<F21>
F22	<F22>	<F22>	<F22>
F23	<F23>	<F23>	<F23>
F24	<F24>	<F24>	<F24>
Bksp	<Bksp>	<Bksp>	<Bksp>
Del	<Del>	<Del>	<Del>
Tab	<Tab>	<Tab>	<Tab>
Space	<Space>	<Space>	<Space>
Enter	<Enter>	<Enter>	<Enter>
Up	<Up>	<Up>	<Up>
Down	<Down>	<Down>	<Down>
Left	<Left>	<Left>	<Left>
Right	<Right>	<Right>	<Right>
Darken	<Func><Up>	<Func><Up>	<Func><Up>
Lighten	<Func><Down>	<Func><Down>	<Func><Down>
Backlight	<Func><0>	<Func><0>	<Func><0>
View up	<Shift><UP>	<Shift><Up>	<Shift><Up>
View down	<Shift><Down>	<Shift><Down>	<Shift><Down>
View left	<Shift><Left>	<Shift><Left>	<Shift><Left>
View right	<Shift><Right>	<Shift><Right>	<Shift><Right>
{ left brace	<Shift><[>	<Shift><[>	<Shift><[>
} right brace	<Shift><]>	<Shift><]>	<Shift><]>

| broken vertical bar	\<Shift>\<\\>	\<Shift>\<\\>	\<Shift>\<\\>
_ underscore	\<Shift><->	\<Shift><->	\<Shift><->
+ addition	\<Shift><=>	\<Shift><=>	\<Shift><=>
< less than	\<Shift><,>	\<Shift><,>	\<Shift><,>
> greater than	\<Shift><.>	\<Shift><.>	\<Shift><.>
? question	\<Shift></>	\<Shift></>	\<Shift></>
: colon	\<Shift><;>	\<Shift><;>	\<Shift><;>
" quotation	\<Shift><'>	\<Shift><'>	\<Shift><'>
~ tilde	\<Shift><`>	\<Shift><`>	\<Shift><`>
- hyphen	<->	<->	<->
= equal	<=>	<=>	<=>
[left bracket	<[>	<[>	<[>
] right bracket	<]>	<]>	<]>
**** backward slash	<\\>	<\\>	<\\>
; semicolon	<;>	<;>	<;>
' apostrophe	<'>	<'>	<'>
, comma	<,>	<,>	<,>
. period	<.>	<.>	<.>
/ forward slash	</>	</>	</>
` grave accent	<`>	<`>	<`>
Attn	---	---	\<attn>
Bottom	\<Bottom>	---	---
Clear	---	\<Clear>	\<Clear>
Del	---	---	\<Del>
Dup	---	---	\<Dup>
EEOF	---	\<EEOF>	\<EEOF>
FM	---	---	\<FM>
Fexit	----	----	\<Fexit>
Fminus	----	----	\<Fminus>
Fplus	----	----	\<Fplus>
Help	---	---	\<Help>
Home	\<Home>	\<Home>	\<Home>
Insert	\<Insert>	---	\<Insert>
PA1	\<PA1>	\<PA1>	---
PA2	\<PA2>	\<PA2>	---
PA3	\<PA3>	\<PA3>	---
Print	---	---	\<Print>
Sys req	---	\<Sys req>	\<Sys req>
Reset	---	\<Reset>	\<Reset>
Roll Down	---	---	\<Roll Down>
Roll Up	---	---	\< Roll Up>
Top	\<Top>	---	---

International Symbols			
Key	**VT100**	**3270**	**5250**
¿	<¿>	<¿>	<¿>
¡	<¡>	<¡>	<¡>
Œ	<Œ>	<Œ>	<Œ>
¢	<¢>	<¢>	<¢>
£	<£>	<£>	<£>
¥	<¥>	<¥>	<¥>
§	<§>	<§>	<§>
°	<°>	<°>	<°>
±	<±>	<±>	<±>
µ	<µ>	<µ>	<µ>
À	<À>	<À>	<À>
Á	<Á>	<Á>	<Á>
Â	<Â>	<Â>	<Â>
Ã	<Ã>	<Ã>	<Ã>
Ä	<Ä>	<Ä>	<Ä>
Å	<Å>	<Å>	<Å>
Æ	<Æ>	<Æ>	<Æ>
Ç	<Ç>	<Ç>	<Ç>
Đ	<Đ>	<Đ>	<Đ>
Ñ	<Ñ>	<Ñ>	<Ñ>
È	<È>	<È>	<È>
É	<É>	<É>	<É>
Ê	<Ê>	<Ê>	<Ê>
Ë	<Ë>	<Ë>	<Ë>
Ì	<Ì>	<Ì>	<Ì>
Í	<Í>	<Í>	<Í>
Î	<Î>	<Î>	<Î>
Ï	<Ï>	<Ï>	<Ï>
Þ	<Þ>	<Þ>	<Þ>
Š	<Š>	<Š>	<Š>
Ò	<Ò>	<Ò>	<Ò>

Ó	<Ó>	<Ó>	<Ó>
Ô	<Ô>	<Ô>	<Ô>
Õ	<Õ>	<Õ>	<Õ>
Ö	<Ö>	<Ö>	<Ö>
Ù	<Ù>	<Ù>	<Ù>
Ú	<Ú>	<Ú>	<Ú>
Û	<Û>	<Û>	<Û>
Ü	<Ü>	<Ü>	<Ü>
Ý	<Ý>	<Ý>	<Ý>
Ÿ	<Ÿ>	<Ÿ>	<Ÿ>
œ	<œ>	<œ>	<œ>
ß	<ß>	<ß>	<ß>
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Chapter 11 • Error Message Resolution Guide

Twin Client Error Message Resolution Guide

Message	Reason	Solution	Reference Tech Note
ENTRY TOO LONG;	Trying to key beyond the field size.	Ensure that you are entering input into the correct field.	---
ALPHABETIC ONLY;	Trying to key a character that is not alphabetic.	Ensure that you are entering input into the correct field.	---
MINUS NOT VALID;	Trying to key a Minus sign.	Ensure that you are entering input into the correct field.	---
DECIMAL NOT VALID;	Trying to key a Decimal (period).	Ensure that you are entering input into the correct field.	---
ALPHANUMERIC ONLY;	Trying to key characters other than Alphabetic and numeric.	Ensure that you are entering input into the correct field.	---
NUMERIC ONLY;	Trying to key characters other than numeric.	Ensure that you are entering input into the correct field.	---
ENTRY TOO SHORT;	Trying to exit the field before it is filled.	Ensure that you are entering input into the correct field.	---

Message	Reason	Solution	Reference Tech Note
INVALID KEY;	The key pressed is not valid.	Ensure that you are entering input into the correct field.	---
MUST CLEAR FIELD;	Trying to enter data in a field that must be cleared first.	Ensure that you are entering input into the correct field.	---
SCAN NOT ALLOWED;	Trying to scan into a key only field.	Ensure that you are entering input into the correct field.	---
KEY NOT ALLOWED;	Trying to key into a scan only field.	Ensure that you are entering input into the correct field.	---
ENTRY TOO SHORT;	Trying to exit the field before it is filled.	Ensure that you are entering input into the correct field.	---
RECOVERABLE ERROR;	Encountered an error from which you can continue.	Verify that your configuration settings for the hardware being used, usually a printer and cable issue.	---
UNRECOVERABLE ERROR;	Encountered an error from which you can NOT continue.	Verify that your Network settings are correct and you are in the correct mode using the correct Port.	T1113, T1114, T1161, T1171, T1187 and T1194
FUNCTION: \n\nFILE: \nLINE: \nCODE;	Encountered an error from which you can NOT continue.	Notify Connect over the web incident reporting system.	---
Press any key\nFor More Details...;	Press Enter for more information.	Advisory message.	---
Press any key;	Press a key to continue.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Connection ERROR.\nREBOOT MOBILE UNIT;	Could not Connect.	Verify that your Network settings are correct and you are in the correct mode using the correct Port.	T1113, T1114, T1161, T1171, T1187 and T1194
Disconnect ERROR.\nREBOOT MOBILE UNIT;	Could not Disconnect.	Verify that your Network settings are correct and you are in the correct mode using the correct Port.	T1113, T1114, T1161, T1171, T1187 and T1194
RF Send ERROR.\nREBOOT MOBILE UNIT;	Could not Send.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
RF Receive ERROR.\nREBOOT MOBILE UNIT;	Could not Receive.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
RF Check ERROR.\nREBOOT MOBILE UNIT;	Could not run the RF Survey.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
RF Timeout ERROR.\nREBOOT MOBILE UNIT;	Have been trying to contact the host for the radio timeout period (2 minutes default).	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
REBOOT MOBILE UNIT;	Reboot the Mobile Unit do to loss of connection.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Retry (Y/N)?;	Try again.	Try to send or receive again, or perhaps ensure that the printer is cabled to the Mobile Unit and is on.	---

Message	Reason	Solution	Reference Tech Note
TIMEOUT\n\nSending Data;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
TIMEOUT\n\nReceiving Data;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Host Received Data\nAwaiting App Reply!;	Mobile Unit has sent and received an acknowledgement from the IP stack and is waiting for the application to return data.	Most likely a host or network issue. Troubleshoot the customer's environment. Probable causes are Database record locking, application program failure, Host failure or network failure.	T1113, T1114, T1161, T1171, T1187 and T1194
* WAITING TO SEND *;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
TCP Error Reading\nMAC Address.\nREBOOT MOBILE UNIT;	Could not obtain the Mac Address from the Mobile Unit.	Possible hardware, driver or stack problem Contact the Mobile Unit manufacturer.	---
Invalid TIP Command;	Bad internal protocol.	Notify Connect over the web incident reporting system.	---
Session Ended\nBy User or Host;	User, Host, application or network has ended the session.	If the user did not end the session, most likely host or network issues. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Server Packet Error;	Bad Protocol detected.	Usually a result of bad cabling, power or faulty transceiver. Also, will receive this if the Mobile Unit is in the wrong mode for Server operation.	---

Message	Reason	Solution	Reference Tech Note
Error receiving host\nlist from Server;	Bad Protocol detected.	Usually a result of bad cabling, power or faulty transceiver. Also, will receive this if the Mobile Unit is in the wrong mode for Server operation.	---
Unexpected Server\ndata received;	Bad Protocol detected.	Usually a result of bad cabling, power or faulty transceiver. Also, will receive this if the Mobile Unit is in the wrong mode for Server operation.	---
Error starting\nhost application;	Connected to the server but can not connect to the distant end.	Configure the server handler to access the host application.	---
Select Host or App;	Need to choose your Host/application destination.	User selection required.	---
Connecting...;	Attempting to connect to the Host/application.	Advisory message.	---
TCP Error\nReading IP Address\nREBOOT MOBILE UNIT;	Mobile Unit missing Network IP information.	Configure the Mobile Unit with the correct network IP information.	---
Printer start error;	Could not initialize the printer.	Cable or power issue with the printer.	---
Battery too low\nto print;	Not enough power to print.	Replace the battery with a fully recharged battery.	---
Paper Feed Error\nFix Then Hit Enter;	Paper in the printer is not ready.	Replace the paper or rethread the paper in the printer.	---
Printer Error\nPrint Ended;	Can not print.	Check cable, battery, communication settings and paper in the printer.	---

Message	Reason	Solution	Reference Tech Note
User Count Exceeded.\n Session Ended;	Possible authorization issue.	Verify that you have the correct number of licenses for the number of Mobile Units you are using.	---
Primary Unavailable\nTrying Alternate;	First Host IP address not available trying the remaining addresses in the Host list.	Verify the host address.	---
APMAC.DAT Error\nSession Ended;	Access point Media Access Control error.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
MUIP.DAT Error\nSession Ended;	Mobile Unit IP Error.	Most likely a Mobile Unit network setting issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Missing Subnet IP\nSession Ended;	Mobile Unit IP Netmask Error.	Most likely a Mobile Unit network setting issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Error Opening File;	File is missing.	Verify that the configuration files are on the Mobile Unit. Or perhaps there is a hardware failure.	---
Telnet API\nnot found;	Program files are missing.	Reload program files.	---
Battery Low Warning\n\nReplace Battery Soon;	Not enough power to operate the Mobile Unit.	Replace the battery with a fully recharged battery.	---
No Host List.\nPress any key\nTo Edit Host IP's;	Have not configured your target hosts.	Configure the target host IP addresses.	---
Unable to Allocate\nFont Memory;	Mobile Unit does not have enough memory to load the fonts.	Reduce the fonts in use or expand the memory in the Mobile Unit.	---

Message	Reason	Solution	Reference Tech Note
Font Loading Error;	Could not load the font.	Ensure that the font is available to load.	---
Printer Not Ready\nPress R to Retry\nC to Cancel Print;	Can not print.	Check cable, battery, communication settings and paper in the printer.	---
Mobile Unit in\nDemonstration Mode\nfor TwinClient;	Running in demo mode.	Purchase a license from Connect.	---
Connected to Host;	Successful connection to the target Host.	Advisory message.	---
Telnet Mode not\nsupported on\nthis Mobile Unit;	This Mobile Unit must be used with a Connect Server.	Order a Connect Server.	---
Telnet Setup files\nnot found. Reload\nfiles then switch;	Customer specific configuration files are missing.	Load the configuration files into the Mobile Unit from Twin Client Manager.	---
Switched Client to\nTelnet Direct Mode;	Mobile Unit running in Telnet mode direct to the target Host.	Advisory message.	---
Switched Client to\nServer Based Mode;	Mobile Unit running through a Connect server in thin mode usually at port 1800.	Advisory message.	---
Port 23 is only\nallowed in Telnet Mode;	Can not set the port to 23 in Server mode. Port 23 is the standard Telnet port.	Advisory message.	---
Not Enough Memory\nTo Run;	Mobile Unit does not have the capacity to run the program do to memory restrictions.	Expand the Mobile Unit memory.	---
Press any key;	Press a key to continue.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
TwinClient Telnet;	Prompt.	Advisory message.	---
TwinClient Server;	Prompt.	Advisory message.	---
TwinClient TN3270;	Prompt.	Advisory message.	---
TwinClient TN5250;	Prompt.	Advisory message.	---
TwinClient TNVT;	Prompt.	Advisory message.	---
(c) 1991-2006 Connect;	Prompt.	Advisory message.	---
Edit Menu Options;	Menu Title.	Advisory message.	---
Edit Mobile Unit IP;	Menu Option.	Advisory message.	---
Edit Server/Host IPs;	Menu Option.	Advisory message.	---
Edit Radio Option;	Menu Option.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Edit License Key;	Menu Option.	Advisory message.	---
Run Site Survey;	Menu Option.	Advisory message.	---
Switch Client Modes;	Menu Option.	Advisory message.	---
Run TwinClient;	Menu Option.	Advisory message.	---
Exit to OS;	Menu Option.	Advisory message.	---
Printer may not be\nplugged in or\nturned on!;	Can not print.	Check cable, battery, communication settings and paper in the printer.	---
OUT OF RANGE OF BASE;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
CONNECT SERIAL CABLE;	Serial cable not connected to the Mobile Unit.	Check cable, battery and communication settings for the Mobile Unit.	---
REMOVE SERIAL CABLE;	Remove serial cable from to the Mobile Unit.	Check cable, battery and communication settings for the Mobile Unit.	---
PLACE IN CRADLE;	Place the Mobile Unit in the cradle.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
REMOVE FROM CRADLE;	Remove Mobile Unit from the cradle.	Advisory message.	---
ACQUIRING CRADLE BUS;	Attempting to access the cradle through the serial port you have configured.	Advisory message.	---
Printer Out\nOf Range;	Printer out of the coverage area.	Most likely a range, access point or radio issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Connection Refused\nBy Host;	You connected to the target host but the host disconnected you.	Verify that the configuration file has the correct Mobile Unit type and New environment variable set. Fallback to the Connect Default to verify the connection.	---
Connection Timed Out;	You connected to the host but did not logon in the appropriate time so the host disconnected you.	Modify the Host parameters for login.	---
Connection Failed\nHost Not Responding;	Could not connect to the Host.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Connection Failed\nHost Unreachable;	Could not connect to the Host.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Mobile Unit Out\nOf Range, Unable\nTo Transmit;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Mobile Unit Out\nOf Range, Unable\nTo Receive;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	---

Message	Reason	Solution	Reference Tech Note
Printer Not\nResponding;	Can not print.	Check cable, battery, communication settings and paper in the printer.	---
Printer Out\nOf Range;	Printer out of the coverage area.	Most likely a range, access point or radio issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Print Complete;	Prompt.	Advisory message.	---
Reprint (Y/N)?;	Yes or No prompt for a reprint.	Advisory message.	---
WARNING;	Prompt.	Advisory message.	---
Turning power off\nduring a session\nwill cause the\nprogram to restart;	This Mobile Unit will disconnect the session if powered off.	Mobile Unit manufacturer limitation. Advisory message.	---
Are you sure (y/n)?;	Yes or No prompt for a confirmation.	Advisory message.	---
You Sure? (YyNn);	Yes or No prompt for a confirmation.	Advisory message.	---
Domain Name Server\nNot Set;	DOMAIN NAME SERVER not configured.	Configure the Mobile Unit with the correct network IP information.	---
Domain Name Server\nQuery Memory Error;	Memory error on the Mobile Unit	Expand the Mobile Unit memory or return the Mobile Unit for repair.	---

Message	Reason	Solution	Reference Tech Note
Domain Name Server\nQuery Sending Error;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Domain Name Server\nQuery Receive Error;	Mobile Unit out of the coverage area.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Domain Name Server\nUnavailable;	Could not connect to the DOMAIN NAME SERVER.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Error loading\nparameter file;	Could not load the parameter file.	Reload the correct configuration files.	---
Could not open\ntelnet interface;	Could not Telnet.	Reload the program files.	---
Could not set\mtelnet options;	Could not use the Telnet configuration.	Reload the correct configuration files.	---
Setup file\nsetting mismatch\nReload Setup;	Emulation program selected is not compatible with the configuration file on the Mobile Unit.	Remove the emulation and configuration files. Run clear Telnet on the Mobile Unit then reload the Mobile Unit with the proper emulation and configuration files.	---
Display formatting\ntoo large for\ncurrent screen;	Mobile Unit does not have enough memory to run your configured reformatted screens.	Expand the Mobile Unit memory or order a server from Connect.	---
Mobile Unit\ninitialization error;	Mobile Unit problem.	Return the Mobile Unit to the manufacturer for repair.	---

Message	Reason	Solution	Reference Tech Note
Host/App/Network\nclosed the session;	Customer's environment disconnected the Mobile Unit session.	Most likely a range, access point, radio, host or network issue. Troubleshoot the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Disconnecting...;	Prompt.	Advisory message.	---
Scan Barcode;	Bar code scanning test.	Advisory message.	---
Enter Setup\nPassword;	Prompt.	Advisory message.	---
Enter Profile \nPassword;	Prompt.	Advisory message.	---
Host IP;	Host IP address prompt.	Enter target host IP address.	---
Host Name;	Host name prompt.	Enter target host Name.	---
Port;	Host IP port required.	Enter 23 for Telnet or 1800 for a Connect Server. Could also be a different number depending on the customer's environment.	T1113, T1114, T1161, T1171, T1187 and T1194
Mobile Unit Type;	Prompt.	Advisory message.	---
WARNING: This will \nend any\ncurrent session;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Continue (Y/N)?;	Prompt.	Advisory message.	---
HOST ENTRY;	Prompt.	Advisory message.	---
VT(100/220) Setup;	Prompt.	Advisory message.	---
Mobile Unit Info;	Prompt.	Advisory message.	---
Emulation Setup;	Prompt.	Advisory message.	---
ANSI Setup;	Prompt.	Advisory message.	---
Miscellaneous Setup;	Prompt.	Advisory message.	---
Mobile Unit Type;	Prompt.	Advisory message.	---
Control Codes;	Prompt.	Advisory message.	---
Local Echo;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
<BK SP> Sends;	Prompt.	Advisory message.	---
New Line Mode;	Prompt.	Advisory message.	---
Insert Mode;	Prompt.	Advisory message.	---
Autowrap Mode;	Prompt.	Advisory message.	---
Cursor;	Prompt.	Advisory message.	---
EMULATION SETUP;	Prompt.	Advisory message.	---
Mobile Unit Type;	Prompt.	Advisory message.	---
Local Echo;	Prompt.	Advisory message.	---
Map Underline;	Prompt.	Advisory message.	---
Break Key;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
ANSI Setup;	Prompt.	Advisory message.	---
Control Codes;	Prompt.	Advisory message.	---
Backspace Key;	Prompt.	Advisory message.	---
MISCELLANEOUS SETUP;	Prompt.	Advisory message.	---
Test Options;	Prompt.	Advisory message.	---
Login Options;	Prompt.	Advisory message.	---
TEST OPTIONS;	Prompt.	Advisory message.	---
Printer Test;	Prompt.	Advisory message.	---
Scan Code Test;	Prompt.	Advisory message.	---
LOGIN OPTIONS;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
User Name;	Prompt.	Advisory message.	---
User Password;	Prompt.	Advisory message.	---
ON;	Prompt.	Advisory message.	---
OFF;	Prompt.	Advisory message.	---
Map;	Prompt.	Advisory message.	---
Don't Map;	Prompt.	Advisory message.	---
Enable Break;	Prompt.	Advisory message.	---
Disable Break;	Prompt.	Advisory message.	---
7 bit;	Prompt.	Advisory message.	---
8 bit;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Send Delete;	Prompt.	Advisory message.	---
Send Backspace;	Prompt.	Advisory message.	---
Mobile Unit Setup;	Prompt.	Advisory message.	---
Scanner Options;	Prompt.	Advisory message.	---
Program Options;	Prompt.	Advisory message.	---
Special Options;	Prompt.	Advisory message.	---
Beeper Options;	Prompt.	Advisory message.	---
Exit to DOS;	Prompt.	Advisory message.	---
Backlight Time;	Prompt.	Advisory message.	---
Enter Key Action;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Reset Options;	Prompt.	Advisory message.	---
Font Size;	Prompt.	Advisory message.	---
Portable Printer;	Prompt.	Advisory message.	---
Reprint Option;	Prompt.	Advisory message.	---
Data IDs;	Prompt.	Advisory message.	---
Internal/External;	Prompt.	Advisory message.	---
Modify Beeps;	Prompt.	Advisory message.	---
Message Beeps;	Prompt.	Advisory message.	---
Scan Identifier;	Prompt.	Advisory message.	---
AID Scan Setup;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Long Scans;	Prompt.	Advisory message.	---
Scan Send;	Prompt.	Advisory message.	---
Yes;	Prompt.	Advisory message.	---
No;	Prompt.	Advisory message.	---
Normal;	Prompt.	Advisory message.	---
Double Wide;	Prompt.	Advisory message.	---
Double High;	Prompt.	Advisory message.	---
Double High and Wide;	Prompt.	Advisory message.	---
Errors Only;	Prompt.	Advisory message.	---
Automatic;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
All Messages;	Prompt.	Advisory message.	---
Reject;	Prompt.	Advisory message.	---
Truncate;	Prompt.	Advisory message.	---
Split;	Prompt.	Advisory message.	---
Do Not Send;	Prompt.	Advisory message.	---
Always Send;	Prompt.	Advisory message.	---
Last Field Only;	Prompt.	Advisory message.	---
Internal;	Prompt.	Advisory message.	---
External;	Prompt.	Advisory message.	---
none;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
monarch;	Prompt.	Advisory message.	---
pddumb;	Prompt.	Advisory message.	---
comtec;	Prompt.	Advisory message.	---
rascal;	Prompt.	Advisory message.	---
codewriter;	Prompt.	Advisory message.	---
comtec(S);	Prompt.	Advisory message.	---
User Name;	Prompt.	Advisory message.	---
Password;	Prompt.	Advisory message.	---
Frequency: Hz;	Prompt.	Advisory message.	---
Duration: ms;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Delay: ms;	Prompt.	Advisory message.	---
Select Scanner;	Prompt.	Advisory message.	---
Setup Scanner;	Prompt.	Advisory message.	---
Scan Test;	Prompt.	Advisory message.	---
Scan Operation;	Prompt.	Advisory message.	---
Laser;	Prompt.	Advisory message.	---
Contact/Pulse;	Prompt.	Advisory message.	---
Contact/No Pulse;	Prompt.	Advisory message.	---
Auto/Pulse;	Prompt.	Advisory message.	---
Auto/No Pulse;	Prompt.	Advisory message.	---

Message	Reason	Solution	Reference Tech Note
Wand Simulation;	Prompt.	Advisory message.	---
VT100;	Prompt.	Advisory message.	---
VT220;	Prompt.	Advisory message.	---
SETUP;	Prompt.	Advisory message.	---
Mobile Unit IP/Radio;	Prompt.	Advisory message.	---
Host List;	Prompt.	Advisory message.	---
NULL;	Prompt.	Advisory message.	---