Vanguard Managed Solutions

651/652 Models

650 Series Installation Manual

Notice

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Mansfield, Massachusetts 02048
(508) 261-4000

Proprietary Material

Product Declarations and Regulatory Information

For Regulatory Declarations regarding the following:

- CE Marking
- BZT Marking
- FCC, CISPR, and EN Classifications
- Industry Canada and CDC Notifications,

see Appendix B, “Software License and Regulatory Information”.

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This guide is current for Release 5.2 of the Vanguard Applications Ware. To comment on this manual, please send email to: **LGEN031@vanguardms.com** or use the Customer Response Card located in this guide.	

Internet Information

Additional company and product information can be found on our Internet Web page at:

http://www.vanguardms.com

Safety Warnings

The following is important safety information regarding the power supply, connecting ports, location of the socket outlet, and PSTN direct connection:

Hazardous Voltage

Warning

There is sufficient voltage in this unit to cause bodily harm. You must disconnect the power to this unit before servicing.

Warning

La tension électrique dans cet appareil est suffisante pour causer un préjudice physique. Vous devez débrancher l'alimentation électrique de cet appareil avant toute intervention.

Warning

Die Spannung in diesem Gerät ist hoch genug, um Körperschaden zu verursachen. Vor jeglicher Wartung ist das Gerät von der Stromversorgung zu trennen.

POTS Connection

Warning

This unit is intended for connection to a local telephone set only. Direct connection to a telephone network jack may result in a damage to the unit or an electric shock.

Warning

Cet appareil est destiné à être branché uniquement à un téléphone local. Une connexion directe à une prise de réseau téléphonique peut endommager l'appareil ou provoquer une électrocution.

Warning

Dieses Gerät darf nur an einen Telefonapparat selbst angeschlossen werden. Direktanschluß and das Telefonnetz kann zur Beschädigung des Gerätes oder zu elektrischem Schlag führen.

Power Supply

Warning

For use with Ault model no. SC300 and SW301.

Warning

A utiliser avec les modèles Ault n_ SC300 et SW301.

Warning

Zu Verwendung mit Ault Modell-Nr. SC300 bzw. SW301.

Connecting Ports

Caution

Ports that are capable of connecting to other apparatus are defined as Safety Extra Low Voltage (SELV). To ensure conformity with EN60950 - ensure that these ports are only connected to ports of the same type on other apparatus.

Warning

Les ports qui sont susceptibles d'être connectés à des équipements sont désignés comme TBTS. Pour garantir la conformité à la norme EN 60950, n'interconnecte ces ports qu'avec des ports du même type sur des autres matériels.

Warning

Anschlusse, die mit anderen Geraten verbindet werden konnen, sind als SELV beschrieben. Um Konformitat mit EN 60950 zu versichern, sichern Sie es, daß diese Anschlusse nur mit den des selben Type auf anderen Geraten verbindet werden.

Socket Outlet Installation

Caution

The socket outlet shall be installed near the equipment and shall be accessible.

Warning

Pour mettre hors tension l'appareil debrancher la prise électrique. La prise électrique doit être située a proximité de l'équipement et elle doit être d'accès facile.

Warning

Die Steckdose soll nahliegend der Einrichtung installiert werden und leicht erreichbar sein.

PSTN Direct Connection

Caution

Do not connect this unit directly to the PSTN. For proper isolation, use a Network Interface device meeting the requirements of EN41003.

Warning

Cet appareil ne doit pas être branché directement au PSTN. Un dispositif d'interface réseau répondant aux normes EN41003 doit être utilisé pour une isolation convenable.

Warnung

Dieses Gerät ist nicht direkt an das PSTN anzuschließen. Zur Gewährleistung sicherer Isolierung ist eine der EN41003 entsprechende Netzwerkschnittstellen-Verbindung zu verwenden.

Contents

Contents (continued)

Overview

Introduction

This manual describes features, hardware, specifications, and applications for the Vanguard 650 Series of products. This revision of the Manual is specific to the manual 651/653 and 652/654 models of the product.

For information on operating system software and configuration, see the Vanguard Documentation Kit.

Audience

This manual is intended for operators of Vanguard 650 Series products.

Software Revision Level

The 650 Series runs Release 5.0 and greater of the Network Access Series operating software. For software releases higher than 5.0, refer to the Software Release Notice for the software release to determine if it is applicable to the 650 Series.

Chapter Descriptions

The following table describes the contents of this manual.

This section...	*Describes...*
Chapter 1	the 650 Series of products, the shipment contents, hardware installation and cabling, and shows the power-up sequence for the 650 Series.
Chapter 2	accessing and navigating the control port of the 650 Series to verify or change parameters, to check statistics, or to boot the node.
Chapter 3	updating your operating software, and saving or restoring a supplied configuration file.
Appendix A	the physical and environmental specifications and power requirements for the 650 Series.
Appendix B	software license and regulatory information.

Special Notices

The following notices emphasize certain information in the manual. Each serves a special purpose and is displayed in the format shown:

Caution

Caution provides you with information that, if not followed, can result in damage to software, hardware, or data.

Mise en Garde

Un avertissement constitue le message le plus sérieux, indiquant que vous pouvez subir des blessures corporelles.

Vorsicht

Eine Warnung ist der ernsthafteste Hinweis auf Körperverletzungsgefahr.

Warning

Warning is the most serious notice, indicating that you can be physically hurt.

Avertissement

Un avertissement constitue le message le plus sérieux, indiquant que vous pouvez subir des blessures corporelles.

Warnung

Eine Warnung ist der ernsthafteste Hinweis auf Körperverletzungsgefahr.

Related Documentation

Vanguide ONS 5.2 CD-ROM

The Vanguide ONS 5.2 CD-ROM contains all Vanguard and 650 Series documentation. It also contains the Vanguard Operating Software images available at the time of release, and some pre-established configuration memory files (CMEMs) that are discussed later in this manual.

Other Documentation

The following documentation is provided on the Vanguide CD-ROM. It can also be ordered separately. To order an additional copy of the Vanguide CD-ROM, please contact a Vanguard Representative

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The following are trademarks or registered trademarks of their respective companies or organizations.

Product	*Company/Organization*
Crosstalk	Digital Communications Associates, Inc.
HyperTerminal	Hilgraeve, Inc.
ProComm	Datastorm Technologies, Inc.

Customer Information

Customer Questions

Customers who have questions about Vanguard Managed Solutions products or services should contact your VanguardMS representative or visit this website for product, sales, support, documentation, or training information:

http://www.vanguardms.com

Comments About This Manual

To help us improve our product documentation, please complete the comment card included with this manual and return it by fax to (508) 339-9592. If you prefer, provide your name, company, and telephone number, and someone in the documentation group will contact you to discuss your comments.

Customer Response Card

Vanguard Managed Solutions would like your help in improving its product documentation. Please complete and return this card by fax to (508) 339-6814; Attention: Product Documentation, to provide your feedback.

To discuss comments with a member of the documentation group, provide telephone information at the bottom of this page. **Thank you** for your help.

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Document Title: **650 Series Installation Manual**

Part Number: **T0021, Rev F**

Please rate this document for usability:

☐ Excellent ☐ Good ☐ Average ☐ Below Average ☐ Poor

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What information, if any, is missing from the document? _____

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Please identify any sections/concepts that are unclear or explained inadequately.

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Additional comments/suggestions. _____

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Telephone _____ Ext. _____ Best time to call_____

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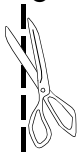


Chapter 1
Getting Started

Overview

Introduction

The Vanguard 650 Series, shown in Figure 1-1, is a low-cost, ISDN terminal adapter designed to address retail applications requiring D-packet support for Point Of Sale (POS), lottery, and alarm system protocols.

Figure 1-1. Vanguard 650 Series

In This Chapter

Configurations

The Vanguard 650 Series currently comes in four hardware configurations:

- 651 - Data only without internal modem or battery. This model comes with 2 serial ports and one ISDN U interface port.
- 652 -Data and Plain Old Telephone System (POTS). This model comes with (or without) battery backup, an internal modem, and is equipped with 2 serial ports, 2 POTS ports, and one ISDN U interface port.
- 653 - Data only without internal modem or battery. This model comes with 2 serial ports and one ISDN S/T Interface port.
- 654 - Data and Plain Old Telephone System (POTS). This model comes with (or without) battery backup, an internal modem, and is equipped with 2 serial ports, 2 POTS ports, and one ISDN S/T interface port.

What Is the 650?

Unlike a traditional ISDN Terminal Adaptor, the Vanguard 650 Series is known as an ISDN PAD (Packet Assembler/Disassembler). Although it has the same functionality as standard TA's for POTS support, it handles data differently. The 650 product has an internal X.25 switching PAD, and can route data traffic across the ISDN D packet channel. As a result, multiple applications can be supported on a single ISDN basic rate (2B+D) link while freeing up the two B channels for true voice, modem, or fax calls.

Supported Protocols

The Vanguard 650 Series of products provides full support for protocols such as SDLC, Bisync, Burroughs Poll Select, 2260, ALC, and 3201. (See the *Software Advisory Notice* for the currently shipping software release for a full list of supported protocols and features.) This product also provides support for local termination (Poll Spoofing), and switching.

Vanguard 650 Series Features

Standard Features

These products offer the following standard features:

- Small profile
- U or S/T ISDN Interfaces
- Full X.25 PAD and Switch support
- SNMP management and Telnet/X.28 control port support

CTP

Data Port 2, a DB25 connector configured as a DCE interface, is used as the CTP for configuration, reporting, and troubleshooting the 650 Series. To access the CTP you must configure your terminal emulation software to VT100, 9600 bps, 8 bit, no parity, 1 stop bit.

ISDN Service

The Vanguard 650 Series provides an Integrated Service Digital Network Basic Rate Interface (ISDN BRI) which, via a connector that supports both RJ11 (ISDN U) and RJ45 (ISDN S/T), offers access to ISDN networks. A substantial set of protocols are supported over ISDN.

Multiprotocol Support

Support includes SDLC, Bisync, X.25, Async, IP/IPX, and PPP, as well as many other serial protocols. Refer to the Software Release Notice which accompanied your unit for a complete listing of protocols supported by the Vanguard 650 Series.

Software Download

Chapter 3, Installing and Coldloading 650 Series Software, provides complete Vanguard 650 Series downloading and coldloading instructions.

RFC 877

RFC 877 encapsulation of IP datagrams over an X.25 network allows for interoperability of Front End Processors (FEPs) that support X.25 and IP traffic as well as router vendors supporting RFC 877/1356.

Sample Network Topology

Introduction

Figure 1-2 shows a sample network topology for the Vanguard 650 Series. This example, depicting a State Lottery network, shows the connection for the DMS-100 ISDN switch. The example assumes that the Lottery Terminal has a 202T four-wire interface communicating at 1800 or 2400 bps. If the interface required is V.24, then you would configure Port 3 and set the soft switch parameter in the Node Record to a value of NONE.

Note

Note that the remote 650D does not initiate calls in this example.

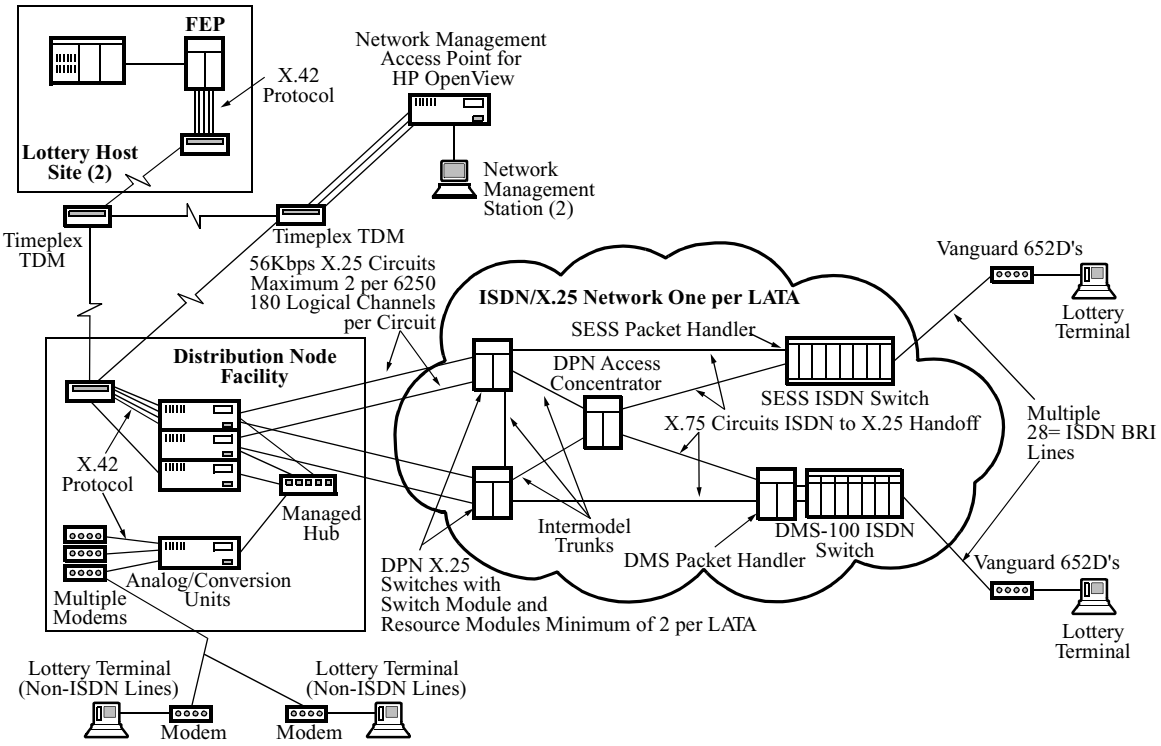


Figure 1-2. Sample 650 Network Topology

651/653 - Data Only

Introduction

The 651 and 653 are 68302 microprocessor based devices cable of transmitting data only. Both are shipped with 1MB of DRAM and 1.25MB of Flash memory, and have:

- an ISDN (RJ-45) connection; the 652 is a U interface and the 654 is S/T
- two serial data ports; one async/sync V.24 interface with a DB25 connector, one async/sync V.24 with an RJ45 connector.

External Designation	*Connector Type*	*Internal CTP Designation*
DATA 1	RJ45	Port 2
DATA 2	DB25	Port 3

Note

This RJ45 serial data port is also used to connect to the integral 202/212 (V.23/21) modem. Power is supplied via an external DC power supply.

652/654 POTS With/Without Battery Backup

Introduction

The 652 and 654 are 68302 microprocessor-based devices capable of transmitting data and voice. Both are shipped with 1MB of DRAM and 1.25MB of Flash memory, and have:

- an ISDN (RJ-45) connection; the 651 is a U interface and the 653 is S/T.
- two serial data ports; one async/sync V.24 interface with a DB25 connector, one async V.24 with an RJ45 connector.
- two POTS ports

Note

This RJ45 serial data port is also used to connect to the integral 202/212 (V.23/21) modem. Power is supplied via an external DC power supply.

External Designation	*Connector Type*	*Internal CTP Designation*
DATA 1	RJ45	Port 2
DATA 2	DB25	Port 3

652/654 With POTS Support

Introduction

The 652 and 654 offer the added feature of North American POTS (Plain Old Telephone System) support via 2 POTS port (RJ11) connections. This means your Vanguard 650 Series can handle both voice and data requirements from a single unit.

Types of Equipment Supported

You can connect the following equipment to 652/654 POTS ports:

- Standard DTMF
- Answering machine
- Modem
- Group 3 Facsimile machine

POTS Support Guidelines

- The 652/654 supports only good quality telephone equipment. Contact your local Vanguard sales representative for details on supported equipment.
- 652/654 POTS ports are intended for use with telephone equipment only. 652 POTS ports are not intended to drive existing house wiring for telephone service. They are intended for use with standard desktop telephone equipment, and should not be connected to publicly regulated analog lines.
- Each 652/654 POTS port supports a Ringer Equivalence (REN) of two. This means the total REN of telephone equipment connected to each port cannot exceed two. Standard telephone lines have a REN close to one. Modems, facsimile machines, and main powered telephones may have a REN of 0.2. Therefore, you can connect from two to four devices to each POTS port, depending on the type of telephone equipment you are operating.
- Each POTS port is connected to the other. The main line, marked as such on the backplane, is connected between pins 3 and 4, while the second line is connected between pins 2 and 5. This arrangement enables the connection of a two-line telephone or an extension of both ports with a single four-wire cable.

Note

Some modems and telephones may use pins 2 and 5 for purposes other than connecting to a second line. Make sure the telephone equipment connected to the POTS port is a two-lead cable.

652/654 With POTs and Battery Backup

Rechargeable Battery Pack

The 652 and 654 devices are also available with a 12 volt rechargeable battery backup pack. This pack consists of ten 1.2 volt NiCd battery cells in a metal carrier. This enables these units to support POTS and ISDN operation during power failures, for approximately 2.5 hours of normal telephone use. If both POTS ports are in continuous use during battery operation, the useful time drops to approximately 1.5 hours. Battery operating time (capacity) is also dependent on the temperature; battery capacity decreases as temperature increases.

Operation On Battery Backup

To reduce power consumption, during battery operation, the data and modem ports will not operate. When the battery is in operation, the power LED flashes.

The electric power plug, which connects to the external wall-mounted power supply, acts as a battery switch. When the power supply transformer is plugged in, the battery is connected to the circuit, and vice versa.

Recharging Battery Pack

A completely discharged battery pack takes about 14 to 16 hours to fully recharge. The charging circuit activates every time the unit powers up. After 16 hours of operation, the charging circuit reduces the current to the batteries to a trickle charge level to prevent overcharging.

Replacing Batteries

The batteries are shrink wrapped around a metal carrier, installed inside the unit on the Printed Circuit Board (PCB). A pair of wires connects the battery pack to a connector on the PCB. The connector is keyed to prevent inserting the connector the wrong way and reversing the order of the battery pack.

To replace the battery, perform the following steps:

Step	*Action*
1	Remove the unit's cover.
2	Remove the battery connection from the PCB.
3	Remove the screws on the bottom of unit that hold the battery pack in place.
4	Remove the battery pack.
5	Install a new battery pack by performing these steps in the reverse order.

Battery Disposal

Please contact the Rechargeable Battery Recycling Corporation (RBRC), at one of the following telephone numbers, for specific information on the safe disposal and/or recycling of rechargeable batteries.

- Individual Household Batteries:1-800-822-8837
- Retailers Disposal:1-770-984-0708

Storing the 652 With Battery Backup

When storing the 652 or 654, disconnect the power cord from the unit and the electrical outlet. The power cord acts as a battery switch. As long as the power cord is connected to the unit, the battery is connected to this circuit. Remove the plug from the unit to disconnect the battery from the circuit.

Note to Users of Other Network Access Products

There are a number of significant differences between the operation and functionality of 650 Series products and other Network Access products in the 65xx and Vanguard lines. These differences include the following:

- Operating software is divided into two distinct segments: base software and option images. This is discussed in detail in Chapter 3, Installing and Cold-loading 650 Series Software.
- TFTP functionality is partially enabled by Software Access Key (SAK). The SAK'd portion is the ability to perform a base software download via remote TFTP server.
- Flash-to-flash transfer is not operational on a 650 Series products.
- The system clock resets to a default value after a power failure.

Hardware

Introduction

This section describes Vanguard 650 Series hardware components.

651/653 Hardware Components

Vanguard 651 and 653 units include the following hardware components:

- A motherboard with 68302 processor
- An external power supply
- One ISDN U (651) or S/T (653) port with cable
- One CTP/Data Port

652/654 Hardware Components

Vanguard 652 and 654 units include the following hardware components:

- A motherboard with 68302 processor
- An external power supply
- One ISDN U (652) or S/T (654) port with cable
- Two POTS Ports
- One CTP/Data Port

Detailed 650 Series Front Panel

Introduction

The 650 front panel provides indicators that let you monitor your equipment.

Front Panel

Figure 1-3, and Figure 1-4 show the front panel of the 650.

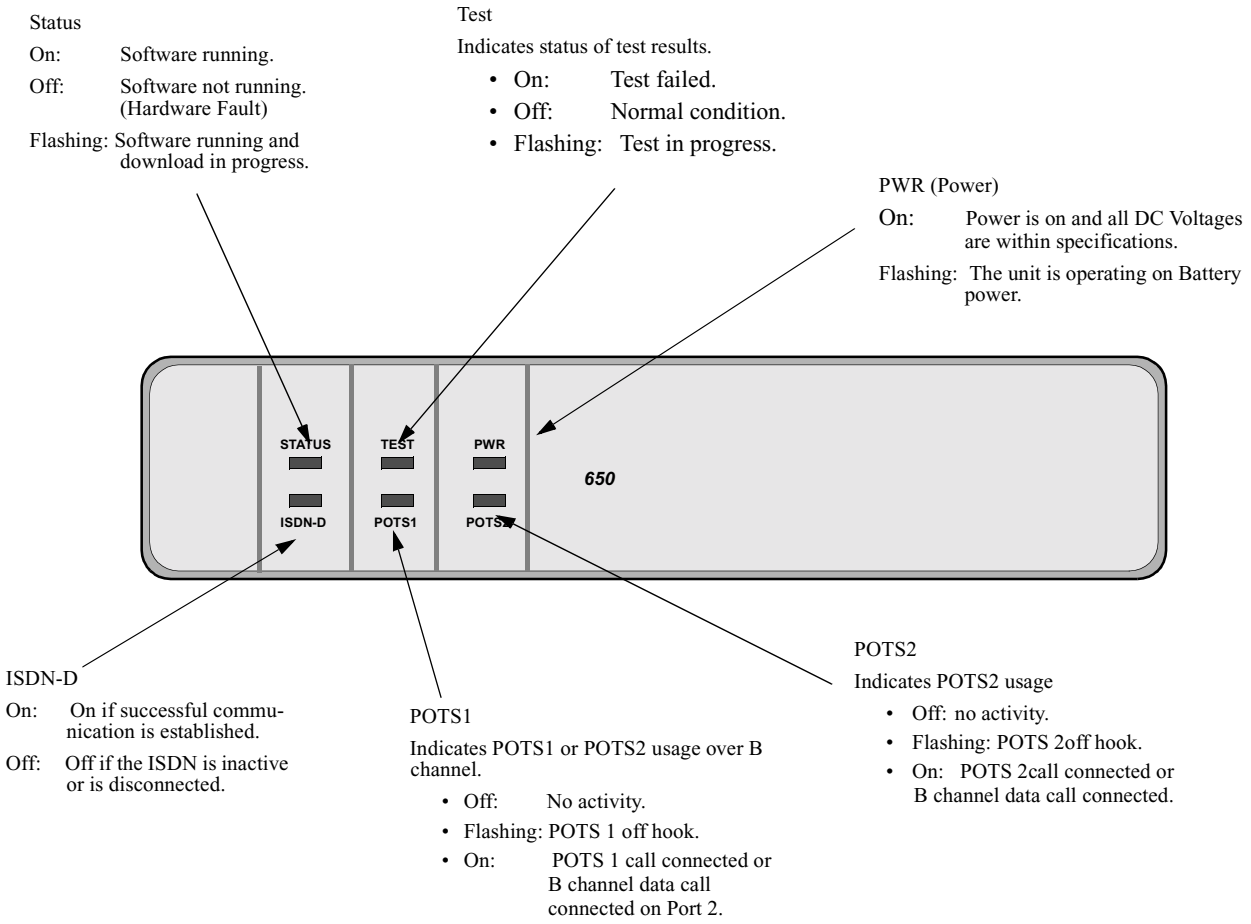


Figure 1-3. 650 Front Panel LED's

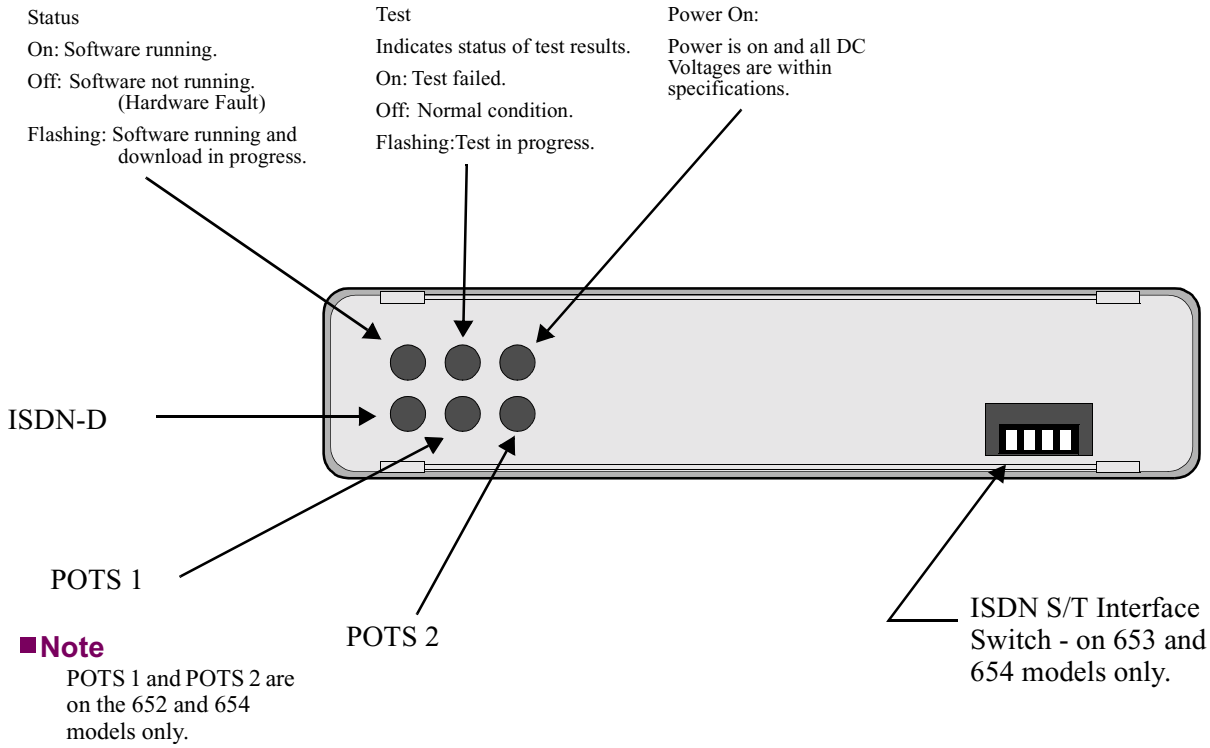


Figure 1-4. 650 Front Panel Switches

653/654 Front Panel DIP Switches

The four DIP switches on the front panel are defined below:

Switch Position	*Switch Name*	*Open /Down (1)*	*Closed/Up (0)*
1	ISDN S/T		100 Ohms
2	Not Used	- -	- -
3	Not Used	- -	- -
4	Not Used	- -	- -

Detailed 650 Series Rear Panel

650 Connectors

The 650 back panel provides the following network connectors.

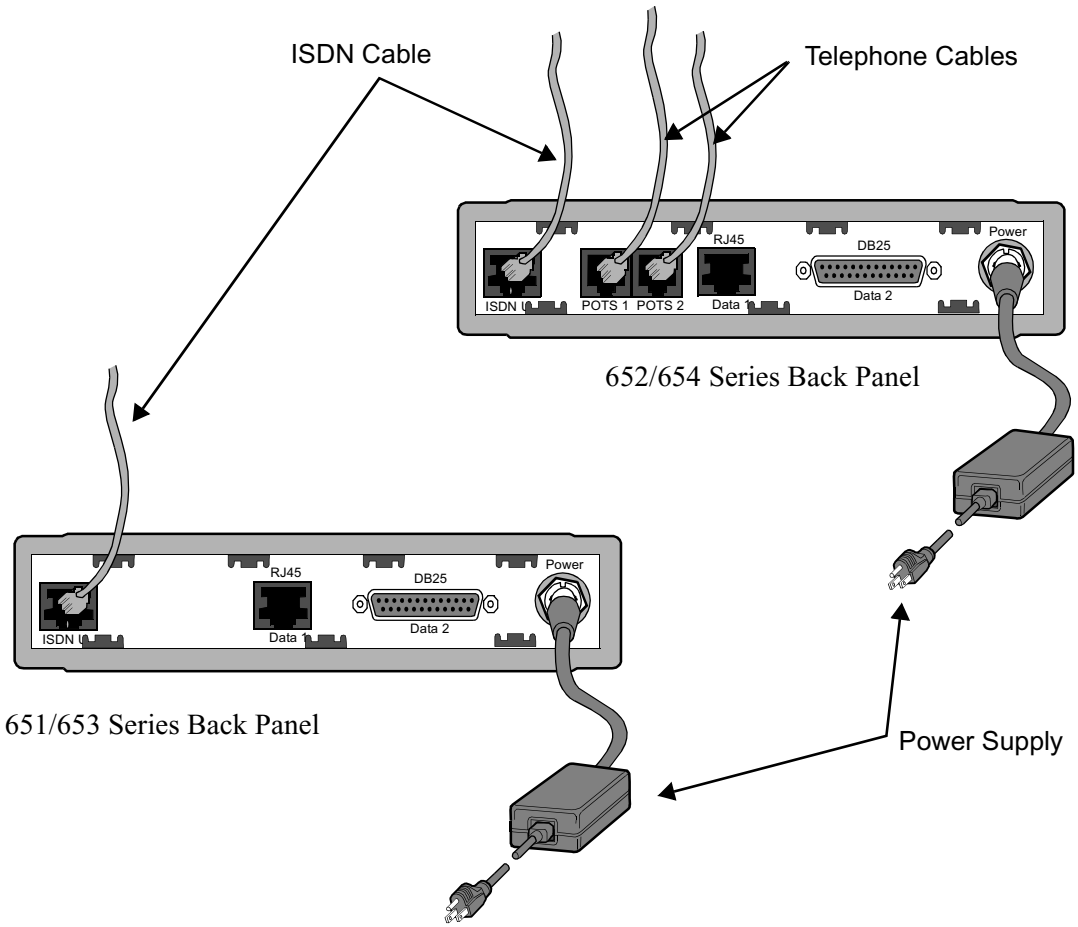


Figure 1-5. 650 Series Rear Panel Connectors

Software

Introduction

This section briefly describes the operating software for Vanguard 650 Series devices.

Operating Software

The operating software comes in three formats: Base, Boot, and Option. There are a variety of operating software images available for the Vanguard 650 Series. See the Software Release Notice accompanying your product for feature information on available operating software. See the "Installing Software" section in Chapter 3 for information on installing the operating software.

Optional Feature Software

Some options purchased for the Vanguard 650 Series require a Software Access Key (SAK). The SAK enables software options and, if you have purchased an option requiring it, the SAK will be identified on a SAK Acknowledgment Sheet, see Figure 2-1.

If you are required to enter a SAK refer to the following sections.

Enabling a SAK

When you purchase a software option, you receive a 20-character Software Authorization Key (SAK) to enable the option. The SAK corresponds to the serial number of your Vanguard 650 Series, so it cannot be used on any other node. To enter the SAK key:

Step	*Action*
1	Select Configure ->Software Key Table from the CTP Main menu.
2	At the Entry prompt, select a new entry. Make sure you do not overwrite existing SAK entries.
3	At the Key Value prompt, type in the 20-character code followed by a semicolon (**;**) to save the SAK.
4	Boot the node.

Examining a SAK

To view the software options installed on your Vanguard 650 Series, select the Software Option Statistics from the CTP Main menu. Figures 1-6 and 1-7 show typical software option screens for a 650.

```
Node: New  Address: (blank)   Date:  1-MAY-1997 Time:  0:00:00
 Software Option Stats                                 Page:  1 of  2

 Software Options                 maximum allowed      used
 ========================         ===============      ====
              LINK backup                    ANY       N/A
         FR DTE Interface                    ANY       N/A
              FLASH Enable                   ANY       N/A
       Transparent Bridge                    ANY       N/A
      Enhanced LAN Option                    ANY       N/A
         FR DCE Interface                    ANY       N/A
  Ethernet LLC Conversion                    ANY       N/A

 Unauthorized Ports:
      NONE

 Unauthorized Options:
      NONE
```

Figure 1-6. Software Option Statistics - Screen 1 of 2

```
Node: New    Address: (blank)  Date: 1-MAY-1997   Time:  00:00:007
Software Option Stats                                 Page:  2 of  2

 Summary of Custom Software Options:


     Code      Description
     =====     ============================================================
     00010     X25 DTE support Enabled.
```

Figure 1-7. Software Option Statistics - Screen 2 of 2

Chapter 2
Installing 650 Series Hardware

Overview

This chapter covers the installation of Vanguard 650 Series hardware and cables, and describes serial port characteristics and associated features.

In This Chapter

Topic — **See Page**

Follow These Steps

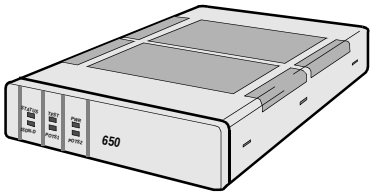
This table lists the steps you need to perform and shows you where to look for information on installing the Vanguard 650 Series:

Step	*To Perform This Action*	*See This Procedure*
1	Check the contents of the shipping package to make sure everything is included.	"Checking Your Shipment Contents" section on page 2-2
2	Choose a site for the 650 Series.	"Choosing a Site" section on page 2-3.
3	Connect cables for the 650 Series.	"Cabling the 650 Series" section on page 2-4.
4	Power up the 650 Series	"Powering Up the Vanguard 650 Series" section on page 2-7.

Checking Your Shipment Contents

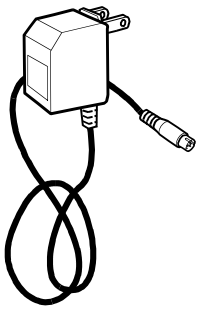
Introduction

The Vanguard 650 Series of products is packaged in shock-absorbent packing material. Inside your shipping carton, you should find the contents shown in Figure 2-1:



650 Series Unit

RJ11/RJ45 Telco Connection Cable for ISDN Connection



External Transformer

Note

The External Transformer may, or may not, be shipped with the product you order. Some Product Codes require that this transformer be ordered separately.

Figure 2-1. Vanguard 650 Series Shipment Contents

Note

If you plan to use a personal computer to configure 650 Series software, you may need to purchase a DB25 (female) to RJ45 (male) adapter for the serial port of your personal computer. An optional DB25 to RJ45 cable is available for accessing the Control Terminal Port.

Also note that 650 units currently ship with the external power supply as shown above. Future units will incorporate a wall-mount transformer. The future transformers will be country-specific. The transformer Product Codes are:

- 49602 Europe
- 49603 Australia
- 49604 Japan
- 49605 UK
- 49606 Domestic

Choosing a Site

Introduction

This section describes how to choose an appropriate site for your Vanguard 650 Series hardware.

How to Choose a Site for the Vanguard 65x

Choose a site that is within an appropriate distance of a power source. Depending on your application, and the country in which the Vanguard 650 Series will operate, the power source must be a grounded 100 to 240 VAC outlet.

To avoid overheating the circuitry, never place anything on top of the unit. Also, leave at least 2 inches (5 cm) of clearance in front of the front panel, to allow you to see the unit's LEDs, and behind the unit for interfacing cable clearance, as shown in Figure 2-2.

The selected site should be free of accumulated dust and environmental extremes.

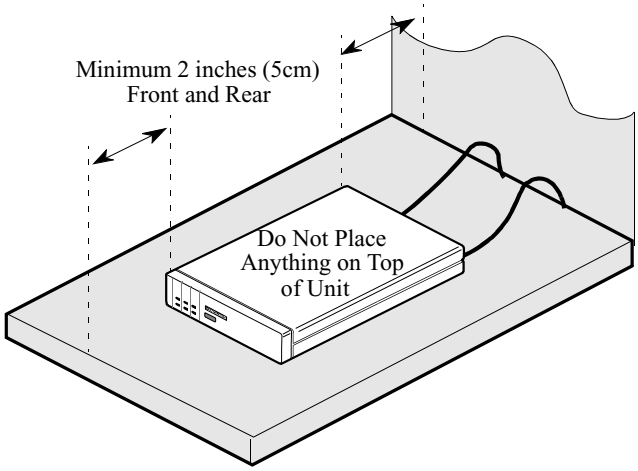


Figure 2-2. Proper Cable and Air Clearance

Cabling the 650 Series

Introduction

After you unpack the Vanguard 650 Series, you can connect the cables to complete the installation. Figure 2-3 illustrates the rear panel of the 652/654 with an ISDN (U or S/T) interface, and shows the locations to which the various cables must be connected. The 651 and 653 rear panels are the same, but without the two POTS ports.

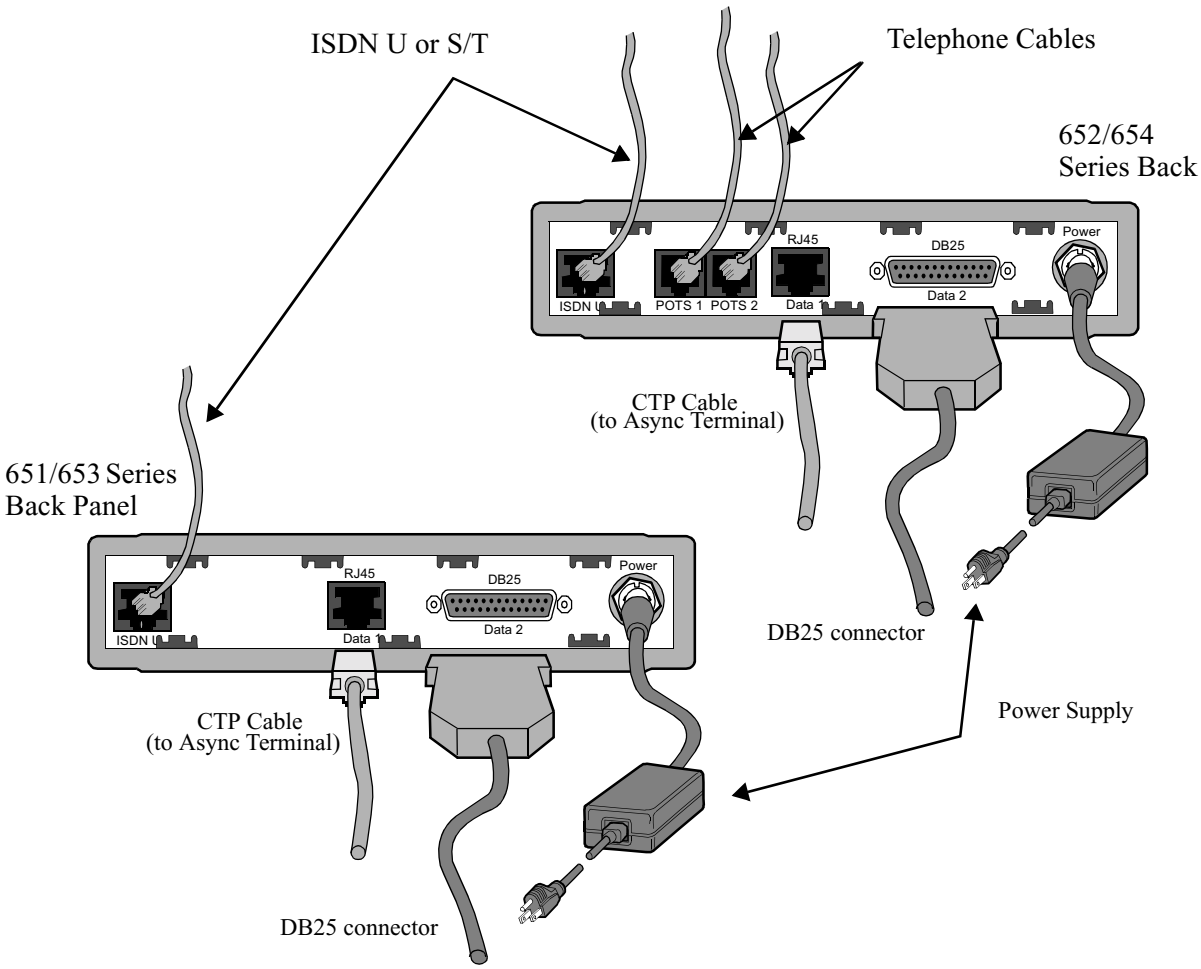


Figure 2-3. 650 Series Back Panel

Caution

All Vanguard 650 Series devices should be used in environments designed for computers and electronic equipment. In areas susceptible to lightning, take precautions to prevent damage to electronic equipment. Contact your telephone company, an electronic accessories vendor, or Hydro Electric operator for information on lightning protection equipment. Customers experiencing problems caused by surges from lightning have eliminated such problems by installing appropriate surge suppressors on power and data lines connected to Vanguard 650 Series devices.

Cable Clearance/ Air Circulation

To avoid overheating the unit's circuitry, you should never place anything on top of the unit. It is also recommended that you leave at least 1 inch (2.5 cm) of clearance in front of the front panel to allow you to see the unit's LEDs, and allow at least 2 inches (5 cm) in back of the unit for interfacing cable clearance.

ISDN Cable

An RJ-11 ISDN cable is supplied with your Vanguard 650 Series. The pinouts for the cable are given in the "ISDN Cable Description" section of Appendix A, Specifications. The cable is available for the U interface (RJ11) or the S/T interface (RJ45), and the part numbers for the cables are U:61766-02 and S/T:61545-01, respectively.

Data 1 and Data 2

The Data 1 port is an RJ45 connector that can be used for a partial EIA 232 or Async modem connection (on the 652/654) or a partial EIA 232 Sync/Async connection (on the 651/653).

The Data 2 port is a DB25 connector, which is an EIA 232 connection on both units. Data 2 is also used as the physical CTP interface connector to the PC, Macintosh, or workstation.

The pinouts for the cables used for Data 1 and Data 2 are given in the "Data 1 and Data 2 Cable Descriptions" of Appendix A, Specifications.

CTP Cable

Optional DB25 (male) to DB9 (male) OR RJ45 to DB25 cables, for access to the Control Terminal Port, are available. The serial ports on most personal computers require DB9 connectors.

Changing the Modem Strapping

The default setting for the modem strapping is in 4-wire mode. If you need to change the modem support from the default 4-wire position to the 2-wire mode, you must perform the following steps:

1) Locate the J10 strap on the modem card.

2) Remove the blue jumper by sliding it up, off of the pins that specify 4-wire mode (see Figure 2-4).

3) Carefully slide the jumper over the pins that specify 2-wire mode. The pins for 2-wire mode are to the left of the default 4-wire position when facing the card as oriented in the figure.

Figure 2-4 shows the strapping positions for 2-wire and 4-wire modes.

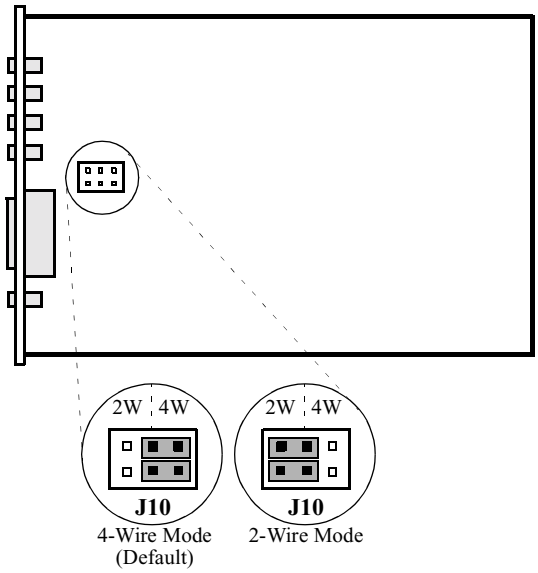


Figure 2-4. 4-Wire and 2-Wire Modem Strapping Positions

Powering Up the Vanguard 650 Series

Introduction

This section describes the sequence of events when you power up a Vanguard 650 Series device.

Powering Up

The Vanguard 650 Series does not have a power switch on the unit. Therefore, follow these steps to power on the Vanguard 650 Series:

Step	*Action*
1	Plug the small round DIN type connector of the power supply into the power socket on the Vanguard 650 Series back panel.
2	Connect the power cord into the power supply outlet.

Diagnosing Start-up Failures

The front LEDs on the 650 Series (Figure 1-3) will help you to follow the progress of the unit's power up. The following identifies the types of failures you may encounter.

Failure	*Description*	*Action*
Hardware Failure	If the TEST light turns on and remains on, one or more of the diagnostic tests have failed, indicating a hardware problem.	Contact Customer Support for possible repairs to your Vanguard 650 Series products.
Powerup Failure	If the STATUS light blinks continuously, at a constant rate, the software bundle in Flash memory is corrupted.	Perform a coldload of the software option bundle.

Removing the Top Cover and Front Panel

Before You Begin

Power down and disconnect the 650 Series before removing the top cover, front panel, or any components.

Cover and Front Panel Removal

Figure 2-5 shows you how to remove the top cover and front panel.

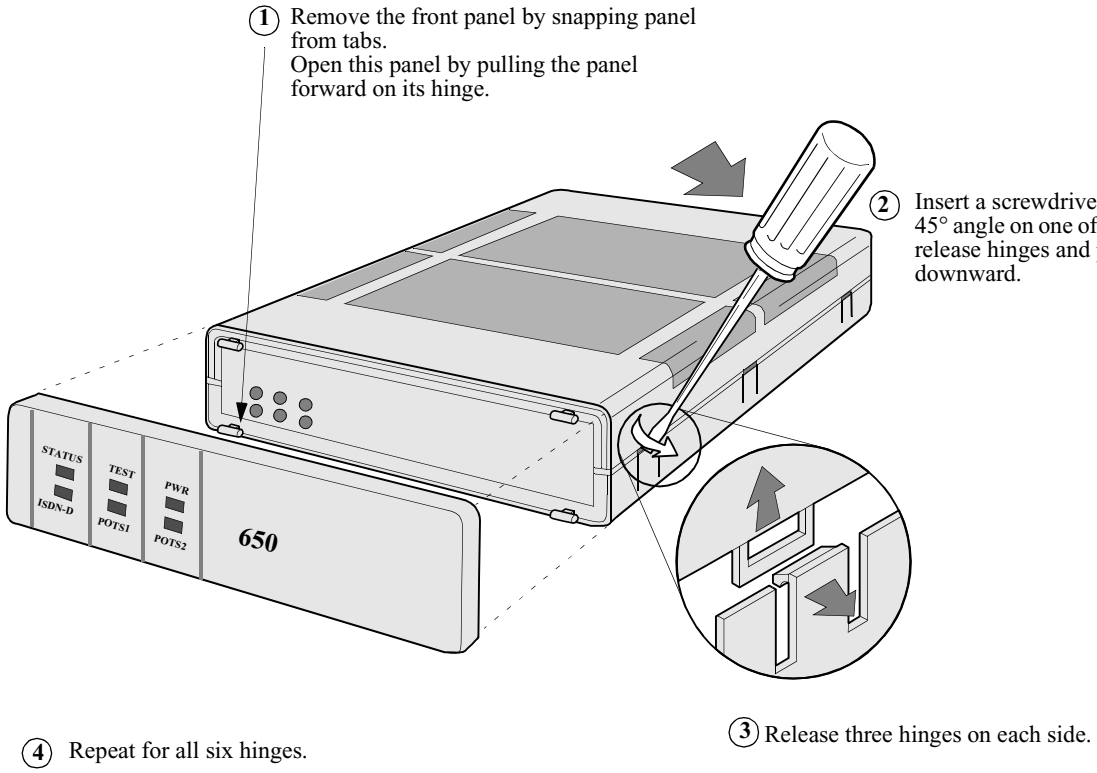


Figure 2-5. Opening the 650 Series

Chapter 3
Installing and Coldloading 650 Series Software

Overview

Introduction

This chapter describes how to install and coldload operating software and configuration memory files (CMEMs) for your 650 Series node. Please refer to the Software Installation and Coldloading Manual (T0028) and Software Builder Manual (T0030) for information on the use of the Vanguide Application Set and Software Builder to create custom images and install them into your 650 Series device.

Note

The procedures for software upgrade for a 650 Series product differs from that of other Network Access Products. Please read the following information carefully before initiating a software upgrade.

In This Chapter

Follow These Steps

This table lists the steps to perform and shows you where to look for information when installing operating software and CMEM files for your 650 Series device.

Step	*To Perform This Action*	*See This Procedure*
1	Obtain the operating software you want to install on the 650 Series.	"Where to Get Operating Software" on page 3.
2	Obtain the Configuration Memory (CMEM) file you want to install on the 650 Series.	"Where to Get Operating Software" on page 3.
3	Download the operating software and CMEM file to the 650 Series.	"Installing Software" on page 5.

650 Operating Software and Option Images

Introduction

There are three software segments to the 650 operating software:

- Base software
- Boot PROM
- Option images

Each of these segments can be independently downloaded, allowing you to change your option package without having to disrupt your base software. However, you must ensure that both the base software and option image are from the same software release. If they are not, only the base software will be loaded.

Base software provides the 650 Series device with the minimum set of operational code required to allow the device to become functional, i.e., ready to receive an option image. The option image provides the remaining functionality to make the unit fully operational.

Base Software

Base software names can range from image number 1 to 19, and option images can range from 20 to 89.

The base software segment contains the minimum software required to render the unit operational and able to receive an additional option image software via TFTP. Base software minimally contains the following functionality: X.25, Telnet, SIP, and a choice of the type of ISDN support you require (North American, European, or Asian).

The following base software is available for the 650 Series:

Image	*Filename*
5.0 North American ISDN	500i01.zip
5.0 European ISDN	500i02.zip
5.0 Asian ISDN	500i03.zip

Boot PROM

The following Boot PROM image is available for the 650 Series:

Boot PROM	*Filename*	*Description*
5.0	500i00.zip	This should not be required. Check the Software Release Notice for your software version for appropriate instructions.

Option Images

To accommodate a variety of customer applications, there are multiple software option images, with various supported protocols, available for the Vanguard 650 Series.

If your specific application requires a different option set than you currently have running, refer to the Software Release Notice accompanying your Vanguard 650 Series device to determine the software image that matches your specific needs.

Where to Get Operating Software

Where to Get Operating Software

If you have access to the Internet, go to this URL to obtain Vanguard 650 Series software images:

http://www.vanguardms.com

At this location, you will find the releases of software, associated software release notices, and other information concerning products and services.

Operating software is also available on the Vanguide 5.1 CD-ROM. Please contact your local service representative for updated information on the latest software version.

Operating Software File Formats

Operating software files on the Vanguide 5.1 CD-ROM and the World Wide Web adhere to the following file naming formats:

Software	*Filename*	*Description*
Base Software	500i01.xrc	where: • 500 = the software release number.(In this case the full release number is 5.0.) • i = identifies the file as a 650 software image • 01 = identifies the file as option #01. Base software names range from image number 1 to 19. • .xrc = identifies the file as a software image 500i01.zip is a compressed version of the file. **Note** The 650 Series is shipped with base software already installed. Therefore, you should only need to re- install this software when upgrading to a new release, or to replace corrupted base software.
Boot PROM	500i00.zip	Generally speaking, this should not be required. Check the Software Release Notice for your software version for appropriate instructions.

Software	Filename	Description (continued)
Option Image Name: 21 Reno	500i21.zip	• 500 = the software release number. • i = identifies the file as a 650 image • 21 = identifies the file as option #21. Option image file names range from image number 20 to 89 **Note** The 650 Series is shipped with a default option image installed. Therefore, you should only need to re-install an option image if changing the optional functionality or protocol support you require.

Installing Software

Introduction

This section describes software installation in the Vanguard 650 Series of products.

How To

The methods for installing software to your Vanguard 650 Series are:

- using a local coldload
- via a TFTP server
- using Software Loader
- using Software Builder

Note

Refer to the *Vanguard Software Builder Manual* (T0028) for specific information on the use of Builder. This manual can be found on the World Wide Web at:

http://www.vanguardms.com

When loading a new release of 650 operating software, always load the Base Software, and then the Option Software Image. Do not load the Boot PROM unless the software release notice applicable to the release you are using specifically instructs you to do so.

Note

You must have a copy of a software image provided from your local service representative, the World Wide Web, or the Vanguide 5.1 CD. Select the method of download and follow the appropriate procedure from this section.

Vanguide Application Set

If you are using a PC running the Windows® operating system (NT, 95, 3.1/3.11) with Vanguide 5.1 CD-ROM, Vanguide is the recommended means of installing operating software and image options in your 650 Series.

The Vanguide® Application Set provides an easy-to-use Graphical User Interface (GUI) for downloading operating software and image options, and uploading and downloading configuration memory for the 650 Series.

Vanguard Software Builder

The Vanguard Software Builder application lets you create custom software images for all products, to suit your network requirements.

Note

You can not create a Software Builder image for the 650 Series using pre-5.0 released software.

This application is only available on the Vanguide Plus 5.1 CD-ROM and operates under Windows® operating system (NT, 95, OS/2, 3.1/3.11, and SoftWindows 95).

With Vanguard Software Builder you can:

- Select specific software releases
- Customize a name and 2-digit number for the image options you want to create
- Follow a series of command prompts to select required features/protocols to be included in your images

Coldloading 650 Series Operating Software

Introduction

There are three methods for downloading new operating software to your Vanguard 650 Series: using a local coldload, via a TFTP server, or using the Software Loader on the Vanguide 5.1 CD-ROM.

When loading a new release of 650 operating software, always load the Base Software first and then the Option Software Image.

Coldloading Software

If you intend to download both base software and an optional image, we recommend that you download your Base software first.

Ensure that the software you wish to download resides on the software host that you are using, and obtain the filename. Connect the software host's modem serial port directly to the 650 node data port 2.

Note

Coldloading is a procedure used to load operating software via a physical connection between the PC, Macintosh, or workstation (software host) containing the coldload files and the 650 node.

Step	*Action*	*Response*
1	Access the control port and select Update Software from the main menu.	The Update Software menu appears.
2	Select Coldload.	The prompt Prepare for Coldload and Boot Node? (y/n): appears.
3	Enter **Y** to initiate the coldload procedure.	The node goes into coldload mode, which is indicated by the Status LED blinking at a steady rate.
4	Use your communications package (set to 8 bit, no parity, 9600 bps, 1 stop bit) to send the coldloader file in RAW ASCII mode. **Note** There are different coldloader files for different Vanguard 650 Series models. You must use the correct one. Vanguard 650 Series coldloader files use this naming convention: **c650isss.xrc** where ***sss*** indicates the speed. The speeds available are 9600, 19200, 57600, and 115200.	This takes approximately 10-15 seconds, and the status LED flashes irregularly. Once the coldloader file is loaded, the node is immediately ready for the next file (base software or option image). The status LED should be off.

Step	***Action***	***Response*** *(continued)*
5	Set your communications package to the same speed as the coldloader you just downloaded, and use RAW ASCII mode to send the desired image.	Depending on the image you are downloading, and the speed chosen, this takes 3-30 minutes to complete, and during the procedure the LED flashes regularly, depending upon the download speed. The node boots automatically at the end of the download procedure. If base software is loaded and operational, the node restarts with no further intervention. If base software is not present in the node, the 650 returns to coldload mode and waits to receive base software.
6	Set your communications package back to the previously configured speed, and reaccess the CTP.	The OK prompt appears, and your new software image is loaded.

Loading Software via TFTP Download

Introduction

Trivial File Transfer Protocol (TFTP) is the Internet standard protocol for file transfer. TFTP transfers software images without regard to content. It provides packet sequencing to ensure proper delivery order, and uses checksum to ensure data integrity.

Before You Begin

If you are using TFTP to download either Base or Boot PROM, software, you must have purchased the factory installed SAK for this feature. If you are using TFTP to download an option image, this SAK is not required. Refer to the "Enabling a SAK" section in *Getting Started* for additional information.

If you intend to TFTP download both base software and an optional image, we suggests that you download your optional image first.

Note

The software download operation is not destructive to the current operating software until the new software image begins loading (i.e., it does not immediately corrupt the Flash memory). This means that, if the download is interrupted for any reason, the node can return to its present operating condition.

Ensure that the software you wish to download resides on the TFTP server, and obtain the filename. Also obtain the IP address of the server. PING the node to verify that you have IP connectivity between the TFTP server and the 650 node.

Step	*Action*	*Response*
1	Access the control port, and select Update Software from the Main menu.	The Update Software menu appears.

Step	***Action***	***Response*** *(continued)*
2	Select TFTP.	If your node is ready for TFTP download, the following message appears: **Optional Software Images are DISABLED. The node is ready for TFTP transfer.** The prompt "Network Load an Image? (y/n):" appears. You can then proceed to step 3. If your node is NOT ready for TFTP download, the following message appears: **Optional software Images must be DISABLED.** **A node boot is required.** **Disable and Boot? (y/n):** Respond to the question by pressing the Y key. After this, the node with automatically reboot, and you must return to step 1.
3	Enter Y to begin the download of either base software or an image option. Enter N, and proceed to step 7, if you are enabling an option image.	The prompt Enter File Name: appears.
4	Enter the name of the file you wish to load on your 650.	The IP address: prompt appears.
5	Enter the IP address of the TFTP server.	The prompt Ready to initiate TFTP transfer (y/n): appears.
6	Enter Y to begin transfer of the software.	The 650 automatically reboots when the base software download is complete. A reboot is not needed if you are loading an option image. Then, return to step 1 to either load an option image or enable an image that was previously loaded.
7	Enter Y, when prompted with Enable Optional Software Images? (y/n): to enable your option image.	The node automatically reboots, and the new option image is enabled.

Downloading Software Using the Software Loader

Introduction

The Software Loader is part of the Vanguide Application Set and is available on the Vanguide 5.1 CD.

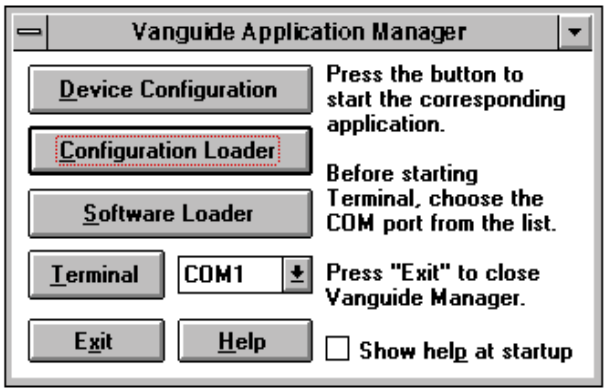
Follow These Steps

This table identifies the steps to download CMEM files into a Vanguard 650 Series device.

Access the Vanguide Application Manager

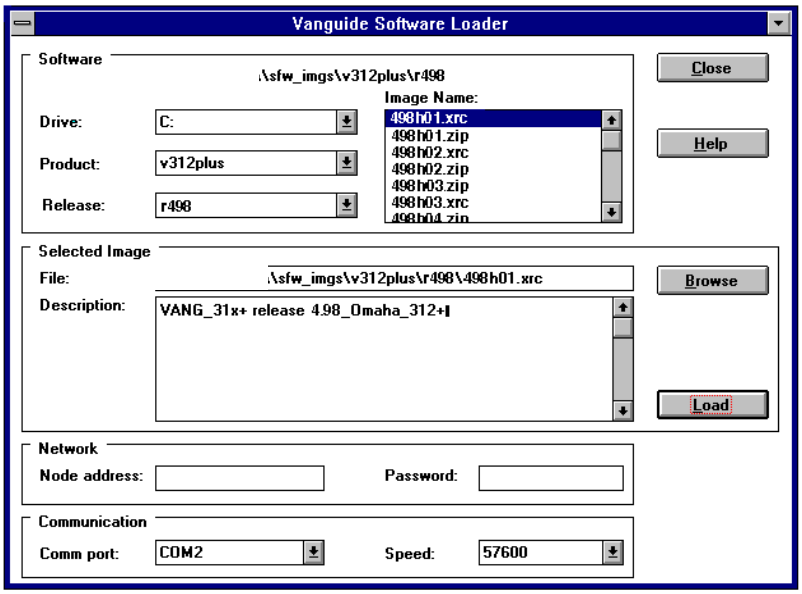
Vanguide Application Manager

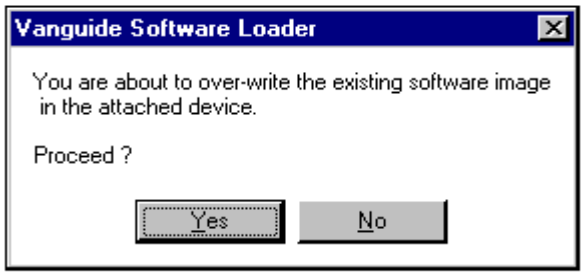
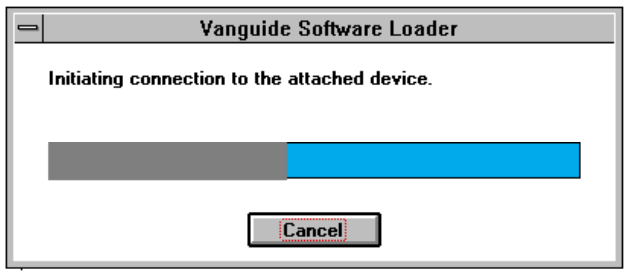
Follow these steps to access the Vanguide Application Manager:

Step	*Action*
1	Cable a personal computer containing the Vanguide application to the CTP port of your 650 Series device to establish a physical connection.
2	Launch Vanguide from the Program group.
3	Click on the Vanguide Application Manager icon. The Vanguide Application Manager window appears (Figure 3-1).  ***Figure 3-1. Vanguide Application Manager Window*** Once the Application Manager window is displayed you can start device configuration, launch the Configuration Loader or Software Loader.

Vanguard Software Loader

Follow these steps to use the Vanguard Software Loader:

Step	Action
1	Click on the Software Loader button. The Software Loader window appears.  ***Figure 3-2. Software Loader Window*** **Note** The Description box in Figure 3-2 describes the software image of a selected filename.
2	From the Drive control, choose the disk drive that contains the operating software images (Vanguide 5.1 CD-ROM).
3	From the Product control, choose the type of 650 Series you are loading. This identifies the attached device.
4	From the Release control, choose the software release to download. This identifies the software image file downloaded to the 650 Series.
5	Choose the software file to download from the Image Name dialog box.
6	Choose the COM port connected to the 650 Series CTP port.
7	From the Speed pulldown menu, choose the speed at which to download files. **Note** To download at speeds greater than 19 kbps, your COM port must support transfers at high speeds. Refer to online Help for more details.

Step	Action (continued)
8	Click the **Load** button. The Software Loader prompts you to verify the download operation.  ***Figure 3-3. Software Loader Verification Dialog Box***
9	Click **Yes** to download the selected software image file to the 650 Series device. A Status box (Figure 3-4) is displayed.  ***Figure 3-4. Software Loader Status Box*** Or: Click **No** to cancel the download operation.

Software Loader Error

The error message box shown in Figure 3-5 appears if the application cannot detect the attached device. The application may be unable to detect the attached device for one of two reasons: incorrect connections, or the device is already in the coldload mode.

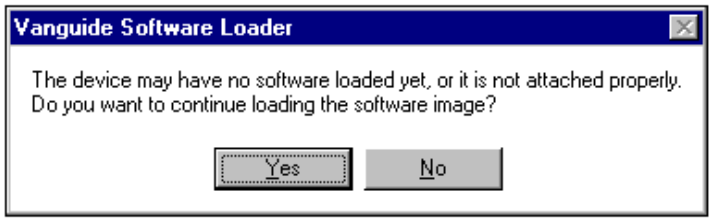


Figure 3-5. Vanguard Software Loader Error Message Box

If you receive the error message box, perform one of these steps:

- Check connections for the communication port you selected and restart the process, or
- Verify that the status LED is flashing on the device and click Y proceed.

Downloading Configuration Memory (CMEM)

Vanguard Configuration Loader

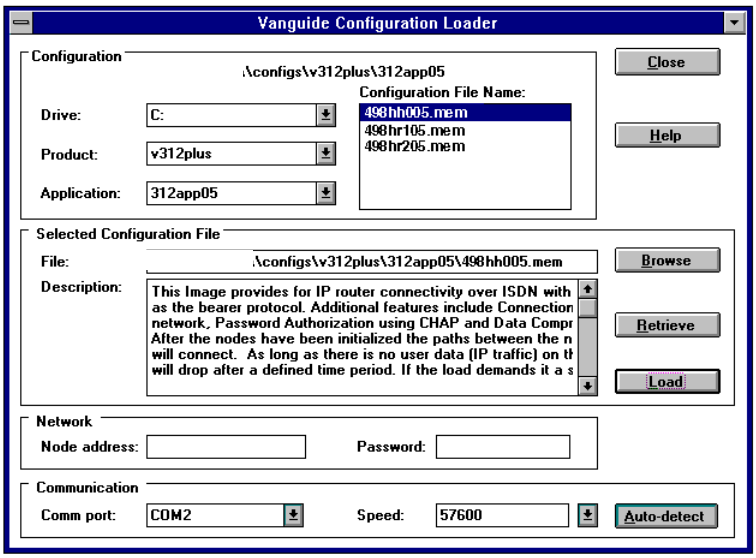
Use the Vanguard Configuration Loader to quickly and easily download a preprogrammed CMEM file to your Vanguard 650 Series.

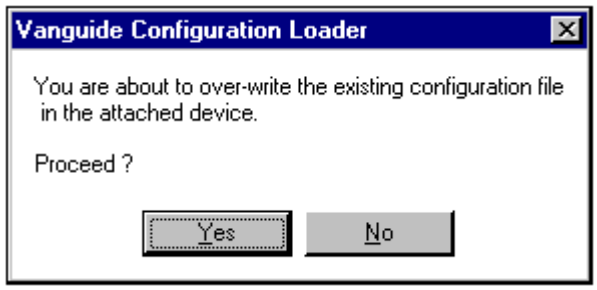
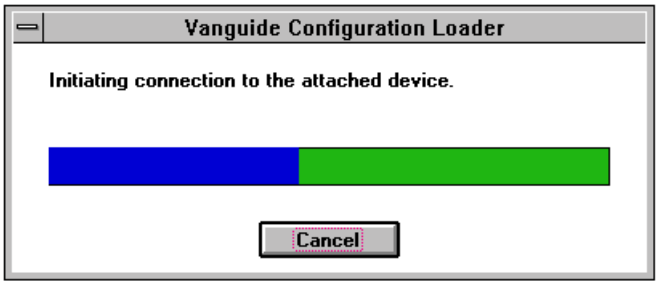
Configuration Loader also lets you retrieve CMEM files from a Vanguard 650 Series device and save them as backups on a local disk. Refer to the Configuration Loader online Help for details on saving and restoring CMEM files.

The Configuration Loader automatically performs a node boot after downloading a CMEM file to a Vanguard 650 Series device to implement the new CMEM.

Vanguard Configuration Loader

This table contains the steps to use the Vanguard Configuration Loader.

Step	*Action*
1	Click Configuration Loader, from the Vanguide Application Manager window. The Configuration Loader window appears (Figure 3-6).  ***Figure 3-6. Configuration Loader Window***
2	From the Drive control, choose the CD-ROM drive that contains the preprogrammed CMEMs residing on the Vanguide 5.1 CD-ROM.
3	From the Product control, choose the type of 650 Series you are loading with CMEM. This identifies the type of 650 Series device attached to the PC.
4	From the Application control, choose the Application set to download. This identifies the CMEM file that downloads to the 650 Series.
5	Choose the CMEM file from the Configuration File Name box.
6	Choose the COM port connected to the 650 Series device.
7	Choose **Auto-Detect** to set the speed at which to download the file.

Step	*Action (continued)*
8	Click the **Load** button. The Configuration Loader prompts you to verify the download.  ***Figure 3-7. Configuration Loader Verification Dialog Box***
9	Click Yes to download the selected CMEM file to the 650 Series device. A status window (Figure 3-8) is displayed.  Or: Click No to cancel the download operation.

Configuration Loader Error Message

The error message box shown in Figure 3-8 appears if the application cannot detect the attached device. The application may be unable to detect the attached device because of incorrect connections.

If the error message box appears, check the connections for the communication port you selected and re-start the process.

Figure 3-8. Vanguard Configuration Loader Error Dialog Box

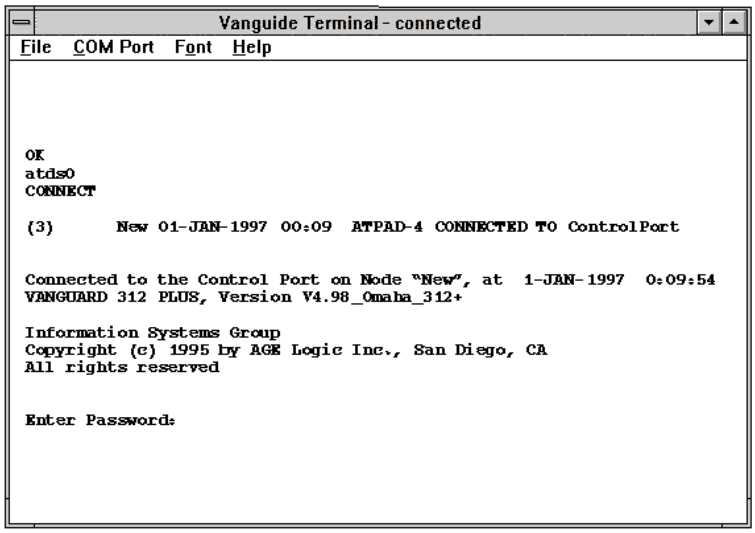
Vanguide Terminal

Overview

The Vanguide Terminal (Figure 3-9) is a terminal emulator for communicating with Vanguard devices using the CTP port. It supports basic ANSI/VT100 terminal emulations, ignoring all escape characters for these sequences.

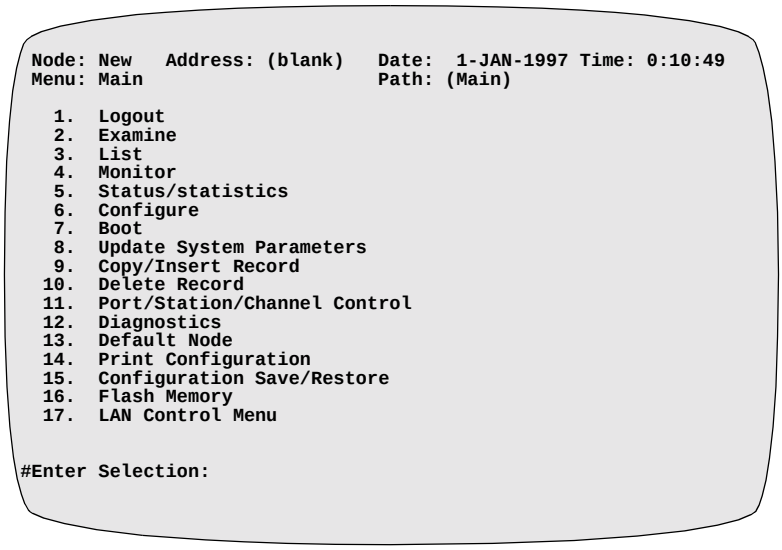
How To Use Vanguide Terminal

Follow these steps to connect to a 650 Series CTP using the Vanguide Terminal utility.

Step	*Action*
1	Cable your 650 Series to a personal computer running the Vanguide application, as shown in "Cabling the 650 Series" on page 4.
2	From the Windows Program Manager, open the Vanguide Application Manager icon.
3	Make sure your Communications port is set correctly.
4	Choose Vanguide Terminal. The Vanguide Terminal window appears (Figure 3-9).
5	Press the Return key until the OK prompt appears. This means your PC is connected to the 650 Series. If no OK prompt appears, check the physical connection between the 650 Series and your personal computer.
6	Enter **ATDS0** and press Return. The Control Terminal Port screen appears (Figure 3-9).  ***Figure 3-9. Example of Vanguide Terminal Window***

Using the CTP Main Menu

Follow these steps to use the CTP Main menu.

Step	Action
1	Press Return at the Password prompt. The CTP Main menu appears, as shown in Figure 3-10.  ***Figure 3-10. Control Port Main Menu***
2	You can begin modifying CMEM file from this menu. The Enter Selection: prompt, appearing at the bottom of the screen, accepts a number corresponding to the choices available in the particular menu. (For example, to log out from the CTP, enter the corresponding number for Logout at the Enter Selection prompt).

Linking Software Images Using Software Builder

Introduction

The Software Builder is only available from the Vanguide Plus 5.1 CD-ROM. Refer to the documentation supplied with that product for additional information or contact your Vanguard Managed Solutions Customer Service Representative.

Selecting a Predesigned Configuration

Introduction

The Vanguard 650 Series must be configured to your specific application to function properly. To help you with this activity, several pre-set configuration memory files (CMEMs) have been developed which will likely meet your needs. You will find these configurations, along with a detailed description of the application they were designed to address, on the Vanguide 5.1 CD-ROM that was shipped with your Vanguard 650 Series.

Saving and Restoring CMEMs

The Vanguard 650 Series lets you save and restore a node's configuration memory (CMEM). Saving a configuration retains a copy of your configuration on a PC disk so you can retrieve it later, should you need to restore it. A configuration is restored when it is retrieved from a PC disk and placed into a node's CMEM. Restoration of a CMEM is typically used for error recovery.

This table shows the two methods for saving and restoring CMEMs.

To Use . . .	*See . . .*
using the CTP (Kermit or TFTP)	See "Saving and Restoring Configurations Using Kermit" on page 21 and "Saving and Restoring Configurations Using TFTP" on page 23
using Vanguide®, which is supplied on the Vanguide 5.1 CD-ROM	See "Selecting a Predesigned Configuration" on page 19.

Selecting a Predesigned Configurations Using the CTP

When to Save/ Restore

When a configuration is restored, the configuration in CMEM is overwritten, except for Software Authorization Keys (SAKs) and Customer Software Keys (CSKs). Follow these rules:

- Assign each configuration a unique name so there is no confusion about which is the correct configuration file for a node. Note that CMEM names are automatically assigned using the following naming convention: "NodeName.mem" where NodeName is the configured name of the node that appears in the node record. The default NodeName for the Vanguard 650 Series is "New."
- Save CMEM contents before performing a software upgrade to avoid losing a configuration you may later need.
- The configuration that is restored is not implemented until you boot the node using the Node Boot command.

Initiating Save/ Restore Operations Using the CTP

The Save/Restore command is available from the Main menu

Figure 3-11 shows the Configuration Save/Restore menu.

```
Node: New    Address: (blank)   Date: 18-MAR-1997  Time:  13:20:39
Menu: Configuration Save/Restore                   Path: (Main.15)

   1.  KERMIT Save Configuration
   2.  KERMIT Restore Configuration
   3.  TFTP Save Configuration
   4.  TFTP Restore Configuration









#Enter Selection:
```

Figure 3-11. Configuration Save/Restore Menu

Methods of Saving/ Restoring

You can save or restore CMEM contents using:

- A computer running Kermit via a commercial communications package
- A TFTP (Trivial File Transfer Protocol) server over a LAN connection

Saving and Restoring Configurations Using Kermit

Introduction

You can save and restore CMEM contents to a PC or Mac running terminal emulation from a communications program such as Crosstalk, ProComm, or HyperTerminal for Windows 95. These programs support the Kermit file transfer protocol.

Note

If the node is currently in "TFTP Ready" state (i.e., option images are disabled), Kermit is not operational. You must enable the option image to use the Kermit transfer.

Before You Begin

You need to access the CTP as described in the "Using the CTP Main Menu" on page 17.

Saving Configurations Using Kermit

This table describes how to save a configuration using Kermit.

Step	*Action*	*Result*
1	Access the control port, and from the Main menu, select Configuration Save/Restore.	The Configuration Save/Restore menu appears.
2	From the Configuration Save/ Restore menu, select KERMIT Save Configuration.	Characters such as S~*@_#W appear at the prompt.
3	Depending on the installed communications program, the steps for using Kermit may vary. Follow the directions to receive a file using Kermit.	After approximately 20 to 30 seconds, you will receive the following message: **Send complete.** A file (NodeName.mem) is created on your PC. NodeName is the configured name of your node that appears in the node record.
	If...	***Then...***
	The transfer failed because too much time elapsed.	Try again.
	The transfer failed due to communications program problems.	Refer to the communications program documentation for additional information.

Restoring Configurations Using Kermit

This table describes how to restore a configuration using Kermit.

Step	Action	Result
1	Access the control port, and from the Main menu, select Configuration Save/Restore.	The Configuration Save/Restore menu appears.
2	From the Configuration Save/ Restore menu, select KERMIT Restore Configuration.	Characters such as # N3 appear at the prompt.
3	Select the name of the CMEM from the PC's disk that you wish to restore.	
4	Depending on the communications program installed, the steps for using Kermit may vary. Follow the directions to receive a file using Kermit.	After approximately 20 to 30 seconds, you will receive the following message: **Receive complete: File stored successfully.**
	If...	***Then...***
	The transfer failed because too much time elapsed.	Try again.
	The transfer failed due to communications program problems.	Refer to the communications program documentation for additional information.
5	Warm boot the node to implement the configuration that was transferred.	

Saving and Restoring Configurations Using TFTP

Introduction

TFTP can also be used to transfer CMEMs from a server to the 650 Series node.

Before You Begin

Ensure that the configuration you wish to download resides on the TFTP server, and obtain the filename. Also obtain the IP address of the server. PING the TFTP server to verify that you have IP connectivity between the TFTP server and the 650 node.

Saving Configurations Using TFTP

This table describes how to save a configuration using TFTP.

Step	*Action*	*Result*
1	Access the control port, and from the Main menu, select Configuration Save/Restore.	The Configuration Save/Restore menu appears.
2	Select TFTP Save Configuration from the Configuration Save/ Restore menu.	The Enter file name: prompt appears.
3	Enter the name of the configuration file to which you wish to save. The default file name is NODENAME.MEM.	The Enter IP address: prompt appears.
4	Enter the IP address of the TFTP server.	The Ready to initiate TFTP transfer?: prompt appears.
5	Enter Y to start the transfer.	The transfer begins. If it is successful, the message **Operation Successful.** appears. If the transfer fails, the message **Local Transfer Failure.** appears. You can then retry the operation.

Restoring Configurations Using TFTP

This table describes how to restore a configuration using TFTP

Step	Action	Result
1	Access the control port, and from the Main menu, select Configuration Save/Restore	The Configuration Save/Restore menu appears.
2	Select TFTP restore Configuration from the Configuration Save/ Restore menu.	The Enter file name: prompt appears.
3	Enter the name of the configuration file you wish to restore.	The Enter IP address: prompt appears.
4	Enter the IP address of the TFTP server.	The Ready to initiate TFTP transfer?: prompt appears.
5	Enter Y to start the transfer.	The transfer begins. If it is successful, the message **Operation Successful.** appears. If the transfer fails, the message **Local Transfer Failure.** appears.
6	Perform a warm boot to activate the new CMEM.	

Appendix A
Specifications

Overview

This section describes the physical and environmental product specifications, power requirements, and cable specifications for the Vanguard 650 Series of products.

In This Appendix

Product Specifications

Hardware

The Vanguard 650 Series of products feature these hardware components:

- 68302 microprocessor
- 1 Mbytes DRAM
- 1.25 Mbytes of FLASH memory

Environmental

These environmental conditions are required:

- Operating temperature: 32° to approximately 95°F maximum (0° to 35°C maximum)
- Storage temperature: -40° to +158°F (-40° to +70°C)
- Relative humidity: 5% to 95% (noncondensing)

Electromagnetic Compatibility

The Vanguard 650 Series of products adhere to the following standards:

- FCC Part 15, Class A
- CISPR and EN55022, Class A
- AS/NZS3548
- EN50082-1

Power Requirements

The Vanguard 650 Series of products typically have these power requirements:

- 100 to 240 VAC nominal at 47 to 63 Hz
- 10 watts

Power Supply Description

The Vanguard 650 Series of products are powered by an external DC power supply.

Safety

The Vanguard 650 Series of products meet these safety standards:

- CSA 950
- UL Listed per UL 1950
- EN60950

Physical

The Vanguard 650 Series of products have the following measurements:

- Height: 1.6 in. (4 cm)
- Length: 6.7 in. (17 cm)
- Width: 9.5 in. (24.5 cm)
- Weight: 1.8 lb (3.96 kg)

ISDN Cable Description

Introduction

Each Vanguard 650 Series product ships with an ISDN RJ11 connection cable. One end of the cable attaches directly to the 650, and the other end connects to the service provider's outlet.

The connector pins are numbered from left to right as indicated below:

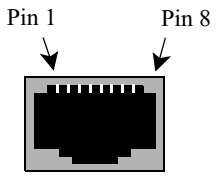


Figure A-1. RJ11/RJ45 Connector Pin Numbering

Note

The connector can accept either an RJ11 or RJ45 connector. If you are using an RJ11, pin 1 and pin 8 are not used.

ISDN Rear Panel Connector Pinouts

This table shows the pinouts for the RJ45 ISDN U and S/T Daughtercard.

Pin #	*U Card*		*S/T Card*	
	Name	*Function*	*Name*	*Function*
1	Battery Status	No connection	PS 3 +	No connection
2	Battery Status	No connection	PS 3 -	No connection
3	---	No connection	TE NT +	TE to NT pair, no power connection
4	Signal	U interface tip or ring	NT TE +	NT to TE pair, no power connection
5	Signal	U interface tip or ring	NT TE -	NT to TE pair, no power connection
6	---	No connection	TE NT -	TE to NT pair, no power connection
7	Power-ing	No connection	PS 2 -	No connection
8	Power-ing	No connection	PS 2 +	No connection

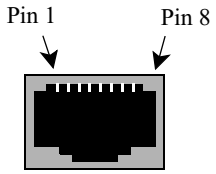
Data 1 and Data 2 Cable Descriptions

Introduction

Each Vanguard 650 Series product has two Data connectors located at the rear of the unit. One of these connectors, labeled Data 1, is an RJ45, and the other connector, labeled Data 2, is a DB25 female.

Data 1 (RJ45) Port Cable Pinout

The connector pins of the Data 1 port are numbered from left to right as indicated in the following diagram:



Data 1 (RJ45) Port EIA-232 Cable Pinout

For the 651/653 product, this port can be used to connect an EIA-232 device, using the following pinout for the RJ45 jack:

	Interface Signal Name	
Pin #	***EIA***	***ITU-T V.24***
1	TxD	103
2	Signal Ground	102
3	TxC	114
4	RTS	105
5	RxC	115
6	DTR	108
7	RxD	104
8	CTS	106

Note

You can use the DB25 to RJ45 cable (part number 68361) to access the sync port.

Data 1 (RJ45) Port Modem Cable Pinout (652 Only)

For the 652/654 product, this port can be used to connect either a modem device, or an asynchronous EIA-232 DCE device. The following table shows the pinout for the modem and async functions:

Pin #	Modem Signal	
	4-Wire	2-Wire
3	Analog Transmit	---
4	Analog Receive	Analog Transmit/Receive
5	Analog Receive	Analog Transmit/Receive
6	Analog Transmit	---

	Interface Signal Name	
Pin #	EIA	ITU-T V.24
1	TxD	103
2	Signal Ground	102
7	RxD	104
8	CTS	106

Note

You can also use the DB25 to RJ45 cable (part number 68362) to access the async port.

RJ45 to DB25 Cable Pinout

If you are connecting an EIA-232 device to this port, for either the 651 or 652 units, the DB25 connector for the other end of your cable must correspond to the following pinout:

Note

You can order this RJ45 (EIA-232) to DB25 cable as an option when you order your 650 Series unit.

The following table lists the pinouts for the model 651/653 cable (part number 68361):

RJ45 Pin #	Interface Signal Name	DB25 Pin #
1	TxD	2
2	Signal Ground	7
3	TxC	15
4	RTS	4
5	RxC	17
6	DTR	20

RJ45 Pin #	*Interface Signal Name*	*DB25 Pin #*
7	RxD	3
8	CTS	5

The following table lists the pinouts for the model 652 cable (part number 68362):

RJ45 Pin #	*Interface Signal Name*	*DB25 Pin #*
1	TxD	2
2	Signal Ground	7
3	***Modem Signal***	No Connection
4	***Modem Signal***	No Connection
5	***Modem Signal***	No Connection
6	***Modem Signal***	No Connection
7	RxD	3
8	CTS	5

Data 2 (DB25) Pinout

This table shows the cable pinout for the DB25 DCE connector:

	Interface Signal Name	
Pin #	**EIA**	**ITU-T V.24**
1	Shield	
2	TxD	103
3	RxD	104
4	RTS	105
5	CTS	106
6	DSR	107
7	Signal Ground	102
8	DCD	108
9		
10		
11		
12		
13		
14	Data Res.	
15	TxC	114
16		117
17	RxC	115
18	LL/ERxC	141
19		
20	DTR	108
21	RL	140
22	RI	125
23		
24	ETxC	113
25	MB	

Appendix B
Software License and Regulatory Information

In This Appendix

This section contains the software license statement and regulatory declarations for the Vanguard 650 Series of products.

Vanguard 650 Series Homologation

The following CE markings and German federal approvals presently apply to the Vanguard 650 Series of products. French DRG approval is pending and will soon be supported.

Software License Terms and Conditions

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Vanguard Managed Solutions

575 West Street

Mansfield, MA 02048

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Product Declarations and Regulatory Information

Introduction

The following sections provide information about standards compliance.

Product Declarations and Regulatory Information

The following sections provide information about standards compliance, safety statements, and ISDN Type Approvals.

CE Marking

One of the marks in the following diagram appears on each of the 650 products that are ISDN compatible, and the statement that follows explains its significance.

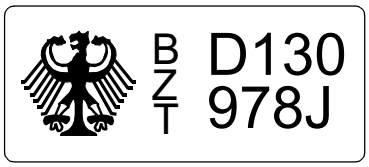
This product is CE marked to indicate compliance with the following European Directives.

- 73/23/EEC Low Voltage Directive (Safety)
- 91/263/EEC Terminal Directive
- 89/336/EEC EMC Directive

The number 168 in the CE mark indicates the Notified Body granting the approval under AA607367 and AA607368 (BABT).

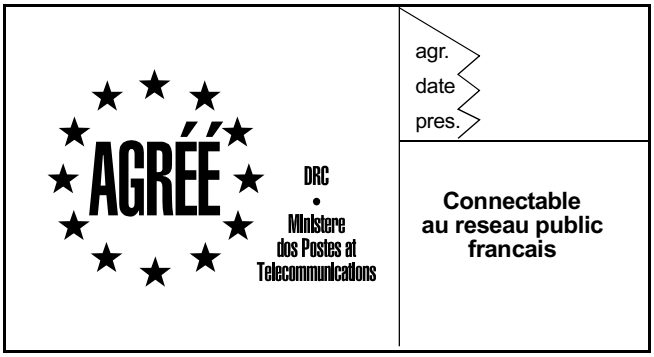
German Federal Approvals Office

ISDN carries the approval mark of the German Federal Approvals Office for Telecommunications. The approval mark shows the national emblem, the letters BZT (the Federal Approvals Office letters), and the type approval number (D130978J) that indicates the type of approval given.



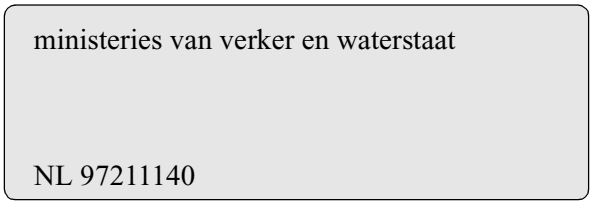
French DRG Approval

ISDN will soon also carry the DRG approval mark of the French Ministère des Postes et Télécommunications. Currently, approval is pending. The approval mark indicates that ISDN is approved for connection to the French Euro-Numeris (VN4+) ISDN network service. The label appears on the bottom of your 650, and shows the approval number.



Netherlands Approval

ISDN also carries the approval mark of the Ministerie Van Verkeer En Waterstaat. This indicates that ISDN is approved for connection to the Netherlands D-Packet ISDN network service. The label appears on the bottom of your 650, and shows approval number NL 97211140.



Radio Frequency Interference Regulations

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules, CISPR22, EN55022, and AS/NZ3548. These limits are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Changes or modifications not expressly approved by Vanguard Managed Solutions could void the user's authority to operate the equipment.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to take adequate measures to correct the interference at his/her own expense.

This product was FCC verified under test conditions that included use of shielded data terminal equipment (DTE) cables. Use of different cables will invalidate FCC verification and increase the risk of causing interference to radio and TV reception.

You can obtain the proper cables from Vanguard Managed Solutions.

Industry Canada

The following information includes the Industry Canada statement regarding ISDN equipment use.

The Industry Canada label identifies certified equipment. Certification number 109 7785 A means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Warning

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notification of Canadian Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Safety Warnings

Warning

The earth to this apparatus is safety critical and must be maintained at all times for compliance with EN60950. The apparatus must be connected to an earthed wall socket outlet. The optional battery backup fitted in the apparatus is for use only under power fail conditions, the unit should not be used as a stand alone product with no connection to a socket outlet.

This device is for use with an approved earthed power transformer, available only from Vanguard Managed Solutions.

Avertissement

La liaison à la terre de cet appareil est essentielle à la sécurité et doit être maintenue à tout moment pour assurer la conformité à la norme EN60950. Cet appareil doit être branché à une prise murale reliée à la terre. La batterie de secours qui est installée en option dans l'appareil ne doit être utilisée que dans les cas de panne de courant, et l'appareil ne doit pas être utilisé comme un produit autonome sans être branché à une prise secteur.

Cet appareil doit être utilisé avec un transformateur électrique relié à la terre homologué, disponible uniquement auprès de Vanguard Managed Solutions.

Warnung

Ordnungsgemäße Erdung dieses Gerätes ist sicherheitsbedingt unerläßlich und ist im Einklang mit EN60950 stets zu gewährleisten. Das Gerät ist an eine geerdete Wandsteckdose anzuschließen. Die wahlweise im Gerät vorgesehene Pufferbatterie dient ausschließlich der Verwendung bei Stromausfall und nicht zum netzunabhängigen, unzulässigen Betrieb des Gerätes.

Diese Vorrichtung ist mit einem zugelassenen, geerdeten und nur von Vanguard Managed Solutions erhältlichen Leistungstransformator zu verwenden.

Introduction

The following sections apply to U.S.A. customers only. Non-U.S.A. customers with questions or concerns regarding return procedures should contact their Vanguard Managed Solutions subsidiary or distributor.

Equipment Return Procedures

If you have questions about equipment return procedures, on-site service or unit exchange service call the Vanguard Managed Solutions Technical Support Center at (800) 544-0062 for advice and assistance.

In Case of Damage

If the equipment is damaged in transit, contact the shipper.

If you have additional concerns in case of failure, about missing parts, or to return equipment, contact your nearest Vanguard Managed Solutions representative.

For Locations	*Contact...*
Inside the United States	Vanguard Managed Solutions 575 West Street Mansfield, MA 02048-1193 1-800-544-0062 .
Outside the United States	the nearest VanguardMS distributor. For a listing of our Sales and Service Offices, visit our Web site at: **http://www.vanguardms.com/**

Expiration of Lease

To return equipment upon expiration of a lease agreement, contact the Vanguard Managed Solutions Customer Operations Center at (800) 544-0062 for return authorization and instructions. You will be asked to provide the following information:

- Product name and description
- Serial number
- Customer order number
- Reason for return

Factory Repair

To return equipment for factory repair, call the Vanguard Managed Solutions Technical Support Center at (800) 544-0062, for return authorization and instructions. When you call, you will be given a Return Material Authorization (RMA) control number. Mark this number clearly on the shipping container for ease of identification and faster service. The RMA control number provides a convenient tracking reference for both parties. Please have the following information available for each piece of equipment you return:

- Product name and description
- Serial number
- Failure symptoms

Packaging Guidelines for Equipment Return

Data communications equipment or parts that are to be returned to Vanguard Managed Solutions for any reason must be properly packaged to prevent damage in shipment and handling.

If the original packing material and shipping container are available, reuse these items to return equipment. If these items are not available, it is your responsibility to package the contents in a manner that protects the equipment from damage during normal shipping and handling. Responsibility for damage to equipment during We can provide you with specific packaging instructions upon request.

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