Vanguard 3400 Series
Installation Manual

Notice

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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. These limits are designed to provide reasonable protection against interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Changes or modifications not expressly approved by Vanguard Networks 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.

This is a Class A product. Operation of this equipment in a residential environment may cause radio interference, in which case the user may be required to take adequate measures to correct the interference at his/her own expense.

This product was verified under test conditions that included use of shielded DCE cable(s), and shielded Ethernet cables. Use of different cables will invalidate verification and increase the risk of causing interference to radio and TV reception.

You can obtain the proper cables from Vanguard Networks.

Telecommunications Regulations

Equipment that complies with Part 68 of the FCC rules includes a label or permanent marking on the printed circuit board that connects to the network that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total

RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (*e.g.*, 03 is a REN of 0.3).

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult a trained technician.

Equipment that meets the applicable Industry Canada Terminal Equipment Technical Specifications is conformed by the registration number. Equipment that complies with Industry rules includes a label or permanent marking on the printed circuit board that connects to the network. The abbreviation, IC, before the registration number signifies that the registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

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Manual is current for Release 7.3 of Vanguard Applications Ware.

To comment on this manual, please send e-mail to vntechsupport@vanguardnetworks.com

Contents

Contents (continued)

Appendix B

Overview

Introduction

This installation describes features, hardware, specifications, and applications for the Vanguard 3400 Series.

Note

For information on operating system software and configuration, see the *Vanguard Basic Configuration Manual* (Part Number T0113).

Audience

This manual is intended for people who install and operate the Vanguard 3400 Series.

How to Use This Manual

The following table describes the contents of this manual:

This Chapter	*Description*
Chapter 1	Vanguard 3400 Series' hardware and software features.
Chapter 2	Description of the Vanguard 3400 Series hardware features and components.
Chapter 3	Installing and replacing Vanguard 3400 Series hardware including cards and motherboard.
Chapter 4	Powerup procedures and software loading.
Appendix A	Product specifications.
Appendix B	FCC and Telephone Company procedures and requirements.

Special Notices

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

■Note

Note is used to emphasize any significant information.

Caution

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

Warning

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

Simplified Chinese

特别通告

以下通告强调指南中的某些信息。
每条信息均有一个特殊的目的并以如下格式显示:

■注解

注解用于强调任何重要的信息。

切记

切记提供您这类信息，如果不遵照信息的要求，可能导致软件、硬件或数据的损坏。

警告

警告是最严重的通告，表明您的身体可能被伤害。

Danish

Særlige overskrifter

Følgende overskrifter fremhæver nogle af oplysningerne i vejledningen. De tjener hvert et specifikt formål og vises i følgende format:

■Bemærk

Bemærk anvendes til at fremhæve vigtig information.

Forsigtig

Forsigtig understreger oplysninger, som, hvis de ikke bliver fulgt, kan føre til beskadigelse af software, hardware eller data.

Advarsel

Advarsel er den mest alvorlige overskrift, og tilkendegiver mulig personskade.

Dutch

Bijzondere vermeldingen

De volgende vermeldingen besteden extra aandacht aan bepaalde informatie in de handleiding. Elke vermelding heeft een eigen nut en wordt in de volgende opmaak weergegeven:

Opmerking
Een opmerking wordt gebruikt om belangrijke informatie te benadrukken.

Let op
Dit kopje geeft aan dat u de beschreven instructies moet volgen om schade aan de software, hardware of gegevens te vermijden.

Waarschuwing
Een waarschuwing is de belangrijkste vermelding. Indien u deze niet volgt, kan dit tot lichamelijke verwondingen leiden.

Finnish

Erityisilmoitukset

Seuraavat ilmoitukset korostavat tiettyjä oppaan tietoja. Kullakin on oma erikoistarkoituksensa ja ne esitetään seuraavassa muodossa:

Huomaa
Huomautusta käytetään korostamaan tärkeätä tietoa.

Vaara
Vaarailmoitus antaa tietoa, jonka huomiotta jättäminen voi johtaa ohjelmiston, laitteiston tai tietojen vahingoittumiseen.

Varoitus
Varoitus on kaikkein vakavin ilmoitus ja se kertoo mahdollisesta loukkaantumisriskistä.

French

Messages spéciaux

Les messages suivants mettent en valeur certaines informations dans le guide. Chacun d’eux remplit une fonction spéciale et est affiché dans le format indiqué :

Important
Important est utilisé pour souligner des informations critiques au sujet d’une procédure.

Mise en Garde
Une mise en garde vous fournit des informations qui, si elles ne sont pas observées, peuvent se traduire par des dommages pour le logiciel, le matériel ou les données.

Avertissement

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

German

Besondere Hinweise

Durch die folgenden Hinweise werden bestimmte Informationen in diesem Handbuch hervorgehoben. Jeder Hinweis dient einem bestimmten Zweck und wird im dargestellten Format angezeigt:

Wichtig
WICHTIG wird zur Betonung signifikanter Angaben zu Vorgehensweisen verwendet.

Vorsicht

Ein Vorsichtshinweis macht Sie darauf aufmerksam, daß Nichtbefolgung zu Software-, Hardware- oder Datenschäden führen kann.

Warnung

Eine Warnung weist Sie darauf hin, daß ernsthafte Körperverletzungsgefahr besteht.

Italian

Simboli speciali

I seguenti simboli, ciascuno con una speciale funzione, evidenziano determinate informazioni all'interno del manuale. Il formato è quello riportato qui di seguito.

Nota
Questo tipo di avvertimento viene utilizzato per evidenziare tutte le informazioni significative relative ad una procedura.

Attenzione

Questo tipo di avvertimento fornisce informazioni che, se non vengono seguite, possono provocare danni al software, all'hardware o ai dati.

Avvertenza

Questo tipo di avvertimento indica la presenza di condizioni di rischio che possono causare lesioni fisiche. Si tratta del simbolo più importante al quale prestare attenzione.

Japanese

特別表記

ガイド内では、以下の表記を使って特に注意する必要のある情報が提供されます。各表記にはそれぞれ目的があり、次の形式で表示されます。

■ 重要
重要な情報が記述されています。

注意

記述されている内容に従わない場合、ソフトウェア、ハードウェア、またはデータが壊れる可能性があります。

警告

最も重要な情報が記述されています。身体的な障害を被る可能性があります。

Korean

일러두기

이 설명서에는 사용자에게 특정한 내용을 강조하기 위해서 다음 내용이 포함되어 있습니다.

■참고
중요한 정보를 강조하는데 사용합니다.

주의

소프트웨어나 하드웨어, 또는 데이터를 손상시킬 수 있으므로 주의가 필요한 상황을 알립니다.

경고

사용자의 안전에 위험을 알리는 가장 심각한 수준의 경고입니다.

Norwegian

Spesielle merknader

Merknadstypene nedenfor representerer en bestemt type informasjon i håndboken. Hver merknadstype har en spesiell hensikt og vises på følgende format:

■**Merk**
Merk brukes for å fremheve viktig informasjon.

Forsiktig

Forsiktig gir deg informasjon om situasjoner som kan føre til skade på programvare, datamaskin eller data dersom den blir fulgt.

Advarsel

Advarsel er den mest alvorlige merknaden og indikerer at du kan bli fysisk skadet.

Portuguese/ Portugal

Avisos Especiais

Os avisos que se seguem realçam certas informações neste guia. Cada um deles serve um objectivo especial e é visualizado no formato apresentado:

Nota
Nota é utilizado para realçar qualquer informação importante.

Atenção

Atenção faculta-lhe informações que, se não forem cumpridas, poderão provocar danos no software, hardware ou nos dados.

Cuidado

Cuidado constitui o aviso mais grave, o qual indica que poderá ficar fisicamente ferido.

Spanish/Spain

Notificaciones especiales

Las siguientes notificaciones ponen énfasis sobre determinada información de la guía. Todas tienen un propósito especial y se muestran con el formato siguiente:

Nota
Las notas se utilizan para destacar determinada información de importancia.

Advertencia

Las advertencias le proporcionan información que debe seguirse, si no desea que el software, el hardware o los datos puedan verse dañados.

Aviso

Los avisos son las notificaciones de carácter más importante e indican la posibilidad de daños físicos para el usuario.

Swedish

Speciella beteckningar

Följande beteckningar betonar viss information i handboken. Var och en har ett speciellt syfte och visas i formatet nedan:

OBS!
OBS! används för att betona viktig information.

Viktigt

Viktigt ger dig information som, om den inte följs, kan resultera i skada i programvara, maskinvara eller data.

Varning

Varning är den mest allvarliga beteckningen och den indikerar att du kan skadas fysiskt.

Customer Information

Customer Questions

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

http://www.vanguardnetworks.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) 543-0237. 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 Networks would like your help in improving its product documentation. Please complete and return this card by fax to (508) 543-0237; Attention: Product Documentaton, 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.

Name _____

Company Name _____

Address _____

_____

_____

Document Title: Vanguard 3400 Series Installation Manual

Part Number:

Please rate this document for usability:

☐ Excellent ☐ Good ☐ Average ☐ Below Average ☐ Poor

What did you like about the document? _____

_____

_____

_____

_____

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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Cut Here

Additional comments/suggestions. _____

_____

_____

_____

_____

Telephone _____ Ext. _____ Best time to call _____

Chapter 1
About the Vanguard 3400 Series

Overview

Description

The Vanguard 3400 Series Standalone Routers, supporting up to two daughtercard slots, provide wide area network (WAN) access for service providers and enterprise applications.

Figure 1-1. Vanguard 3400 Series

For a detailed description of the Vanguard 3400 Series and its features, refer to the “Features” section on page 1-2.

For descriptions of the Vanguard 3400 Series Daughtercards and other hardware components, refer to the appropriate sections in Chapter 2, Hardware Description.

Features

Introduction

This section summarizes the features available with your Vanguard 3410/3410w/3460/3480. For descriptions of the software running on your Vanguard 3410/3410w/3460/3480, refer to the appropriate protocol document.

This table lists the hardware features of the Vanguard 3400 Series:

Hardware Features

Product *Target*	***VG 3410*** *Small Branch FSP Data Only*	***VG 3410w*** *Small Branch FS Data Only*	***VG 3460*** *Small Branch IPT Gateway*	***VG 3480*** *Small Branch IPT Gateway*
Memory	64 MB SDRAM	64 MB SDRAM	64 MB SDRAM	64 MB SDRAM
OnBoard Flash	16 MB	16 MB	16 MB	16 MB
Compact Flash	N	N	N	N
Form Factor	Modular	Modular	Modular	Modular
Daughter Card Slots	1	1	2	2
Mini PCI Card Slots	1	1	1	1
Ethernet Ports (Total)	2	2	2	5
10BaseT	--	--	--	--
10/100BT	2	2	2	5
10/100/1000BT	--	--	--	--
Serial Ports	1	3	4	4
MB Serial Ports	1 (RS232)	1 (Universal)	1 (Universal)	1 (Universal)
CTP	1x	1x	1x	1x
DC Serial Ports	0	2	3	3
V.90 Ports	0	1	2	2
DSU Ports	1	0	2	2
ISDN (S/T & U) Ports	0	0	2	2
FT1/FE1 Ports	0	0	0	0
T1/E1/PRI Ports	1	0	2 E1 PRI channel density limited to 46	2 E1 PRI channel density limited to 46
ATM Ports	N	N	N	N
DS3/E3	0	0	0	0
Digital Voice	N	N	N	N
T1/E1 Channels	0	0	0	0
T1/E1 Ports	0	0	0	0
Analog Voice Ports	0	0	8	8
FXS Ports	0	0	8	8
E&M Ports	0	0	4	4
FXO Ports	0	0	8	8
BRI-Voice Ports (ISDN)	0	0	2	2
Compression	N	N	N	N

Hardware Features *(continued)*

Product *Target*	***VG 3410*** *Small Branch FSP Data Only*	***VG 3410w*** *Small Branch FS Data Only*	***VG 3460*** *Small Branch IPT Gateway*	***VG 3480*** *Small Branch IPT Gateway*
Encryption	Y	Y	Y	Y
Performance (PPS) (LAN to WAN)	40k	40k	40k	40k
Applications Ware	Y	Y	Y	Y
S/W IP Sec VPN	Y Available in software bundles	Y Available in software bundles	Y	Y
Power (DC)	N	N	N	N
Redundant Power	N	N	N	N

For additional information about the rear panel ports and the daughtercards, refer to appropriate section in Chapter 2, Hardware Description.

For information about the physical specifications of the Vanguard 3400 Series, refer to Appendix A, Specifications.

Daughtercards

You can purchase daughtercards to expand the capability of your Vanguard 3400 Series.

Vanguard 3410/3410w/3460/3480 Daughtercard Matrix

Daughtercard		3400 Series Platform					
Description	Product Code	3410	3410W	3460		3480	
		DC Site 1	DC Site 1	DC Site 1	DC Site 2	DC Site 1	DC Site 2
2P-SDC (2-Port Serial)	1130-10004	---	Yes	Yes	Yes	Yes	Yes
56K DSU	68472	Yes	---	Yes	Yes	Yes	Yes
Dual E&M	65729	---	---	Yes	Yes	Yes	Yes
Dual FXS	68372	---	---	Yes	Yes	Yes	Yes
BRI Voice	68525	---	---	Yes	Yes	Yes	Yes
FT1 - 120 W	49666	Yes	---	Yes	Yes	Yes	Yes
FE1 - 75 W	49669	Yes	---	Yes	Yes	Yes	Yes
FE1 - 120 W	49716	Yes	---	Yes	Yes	Yes	Yes
FT1 - 120 W	1600-00001	Yes	---	Yes	Yes	Yes	Yes
FE1 - 75 W	1600-00075	Yes	---	Yes	Yes	Yes	Yes
FE1 - 120 W	1600-00120	Yes	---	Yes	Yes	Yes	Yes
FXS/FXO	80019	---	---	---	---	---	---
G.SHDSL	1152-10009	---	---	---	---	---	---
Quad FXO	1152-10035	---	---	Yes	Yes	Yes	Yes
Quad FXS	1152-10034	---	---	Yes	Yes	Yes	Yes
ISDN BRI S/T	68525	---	---	---	---	---	---
ISDN BRI S/T	1152-10005	---	---	Yes	Yes	Yes	Yes
ISDN BRI-U	68434	---	---	---	---	---	---
V.11 DCE (Serial)	49649	---	Yes	Yes	Yes	Yes	Yes
V.24 DCE (Serial)	46946	---	Yes	Yes	Yes	Yes	Yes
V.35 DCE (Serial)	49647	---	Yes	Yes	Yes	Yes	Yes
V.36 DCE (Serial)	49648	---	Yes	Yes	Yes	Yes	Yes
V.11 DTE (Serial)	49661	---	Yes	Yes	Yes	Yes	Yes
V.24 DTE (Serial)	49658	---	Yes	Yes	Yes	Yes	Yes
V.35 DTE (Serial)	49659	---	Yes	Yes	Yes	Yes	Yes
V.36 DTE (Serial)	49660	---	Yes	Yes	Yes	Yes	Yes
V.90 (Modem)	1152-10003	---	Yes	Yes	Yes	Yes	Yes
V.36 DTE (Serial)	49660	---	Yes	Yes	Yes	Yes	Yes
V.90 (Modem)	1152-10003	---	Yes	Yes	Yes	Yes	Yes

Note

If a table entry contains the value "Yes", the daughtercard type will be supported in the DC Site for that platform.

If a table entry contains the entry " --- ", the daughtercard type will not be supported in that DC Site of that platform.

Software Support

The Vanguard 3410/3460 requires Release 7.0 or greater software. The Vanguard 3480 requires Release 7.2 or greater software. The 3410w requires Release 7.3 or greater software.

You can obtain Applications Ware Packages that can be tailored to your specific needs. Vanguard Networks Applications Ware packages are divided into licenses available for Vanguard Networks products. These licenses include the following packages:

- IPSAFE
- SNA+
- Multiservice (MS)

Optional licenses include:

- Security
- Voice Applications Ware
- Advanced Voice Applications

For details about the contents of the license upgrade packages and how they can be obtained, refer to the latest *Software Release Notice*.

Note

A license refers to both a legal document that allows you to use features and to the software that contains those features. For license features, please consult the software matrix or call your sales representative."

V/anguard 3400 Series Licenses

LICENSE	*3410/3410w*	*3460*	*3480*
Base			
IP Safe	X	X	X
SNA+	X	X	X
MS	X	X	X
Upgrade License			
Voice		X	X
Security	X	X	X
Advance Voice		X	X

Applications

Introduction

This section illustrates some typical applications of the Vanguard 3410/3460/3480.

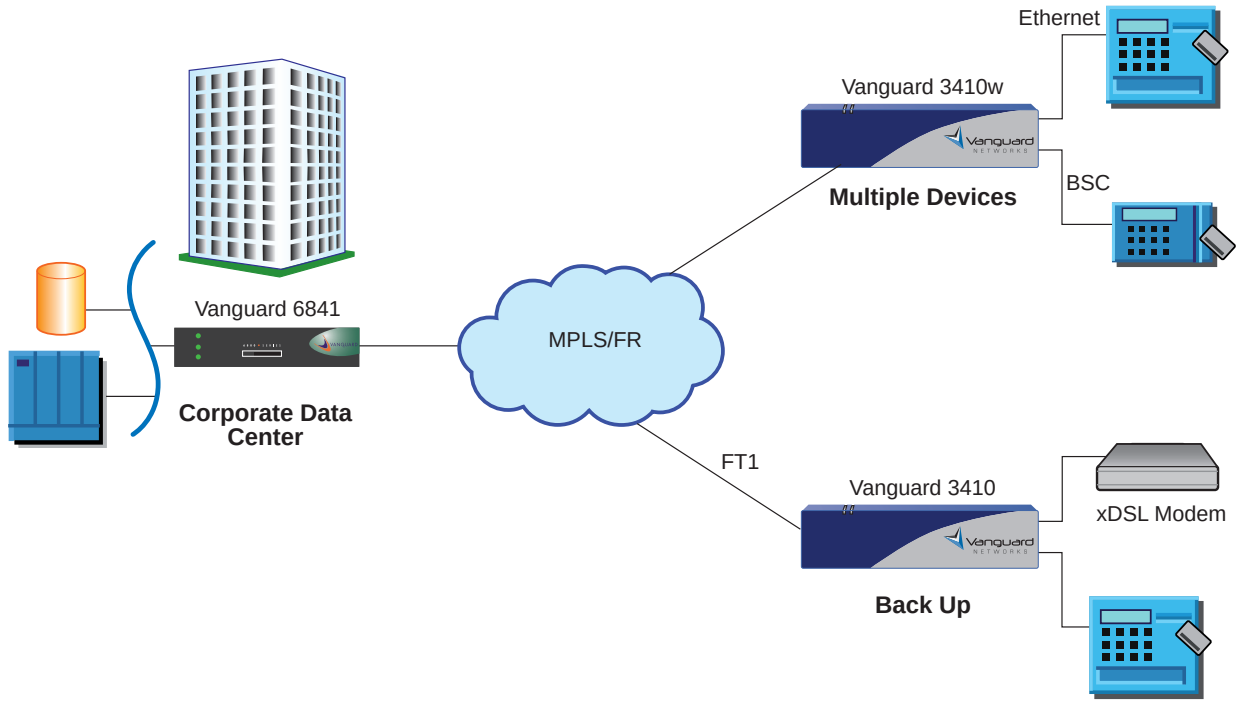


Figure 1-2. ATM/Small Bank Branch Application

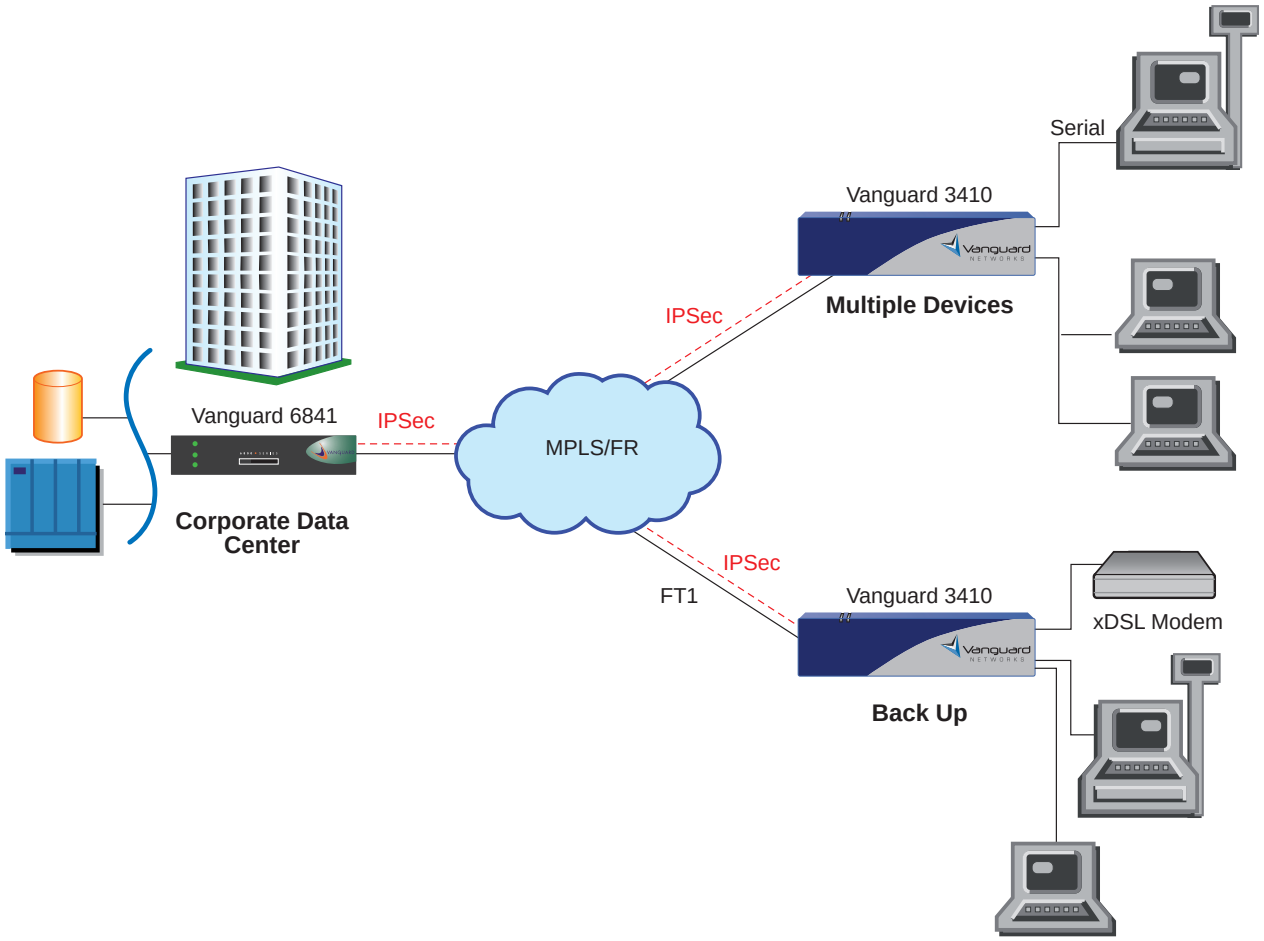


Figure 1-3. Retail Transaction Application

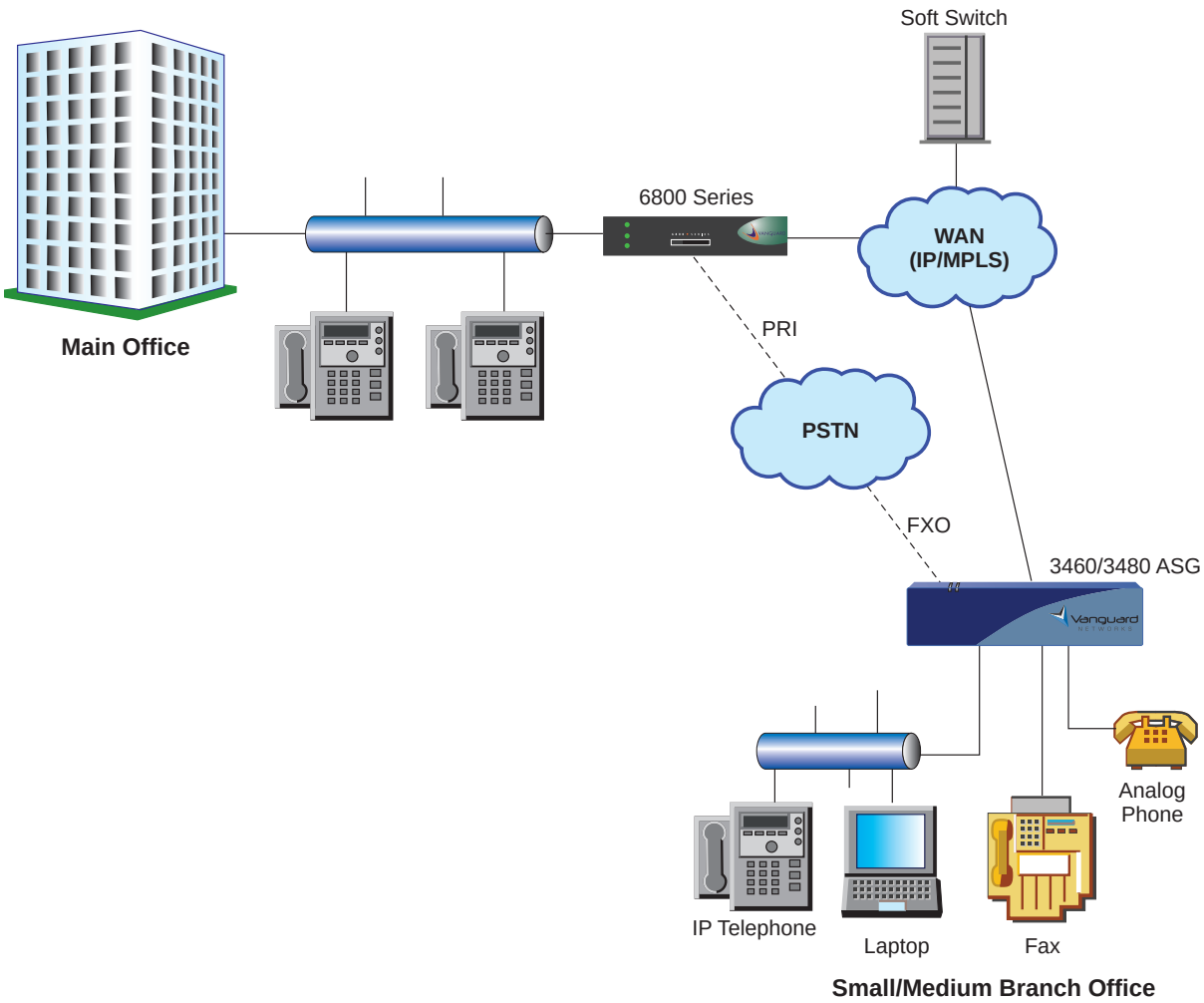


Figure 1-4. Hosted, SIP-based IP Telephony Application for Small/ Medium Branch Offices

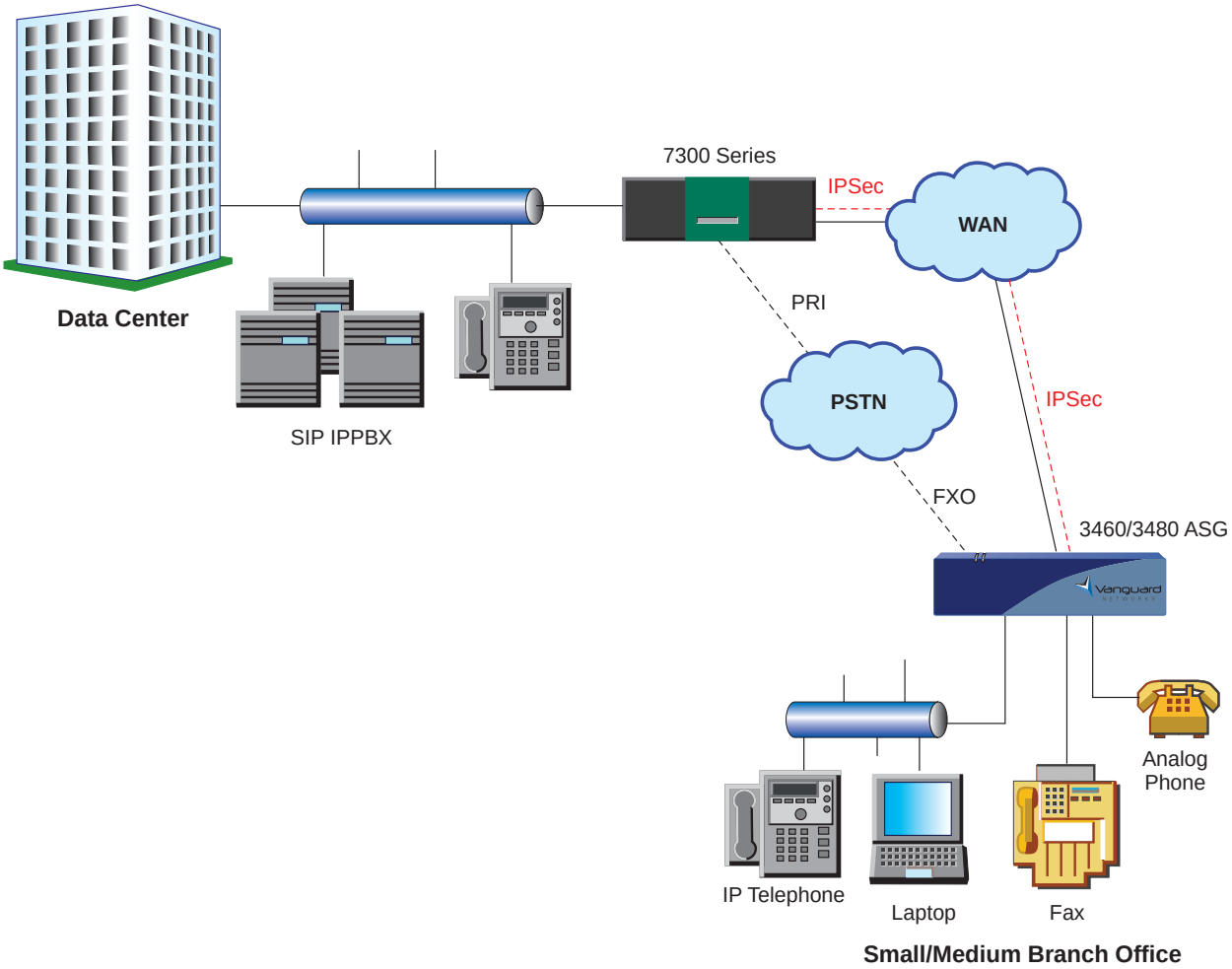


Figure 1-5. SIP IPPBX-based, Centralized Telephony Application for Small/Medium Branch Offices

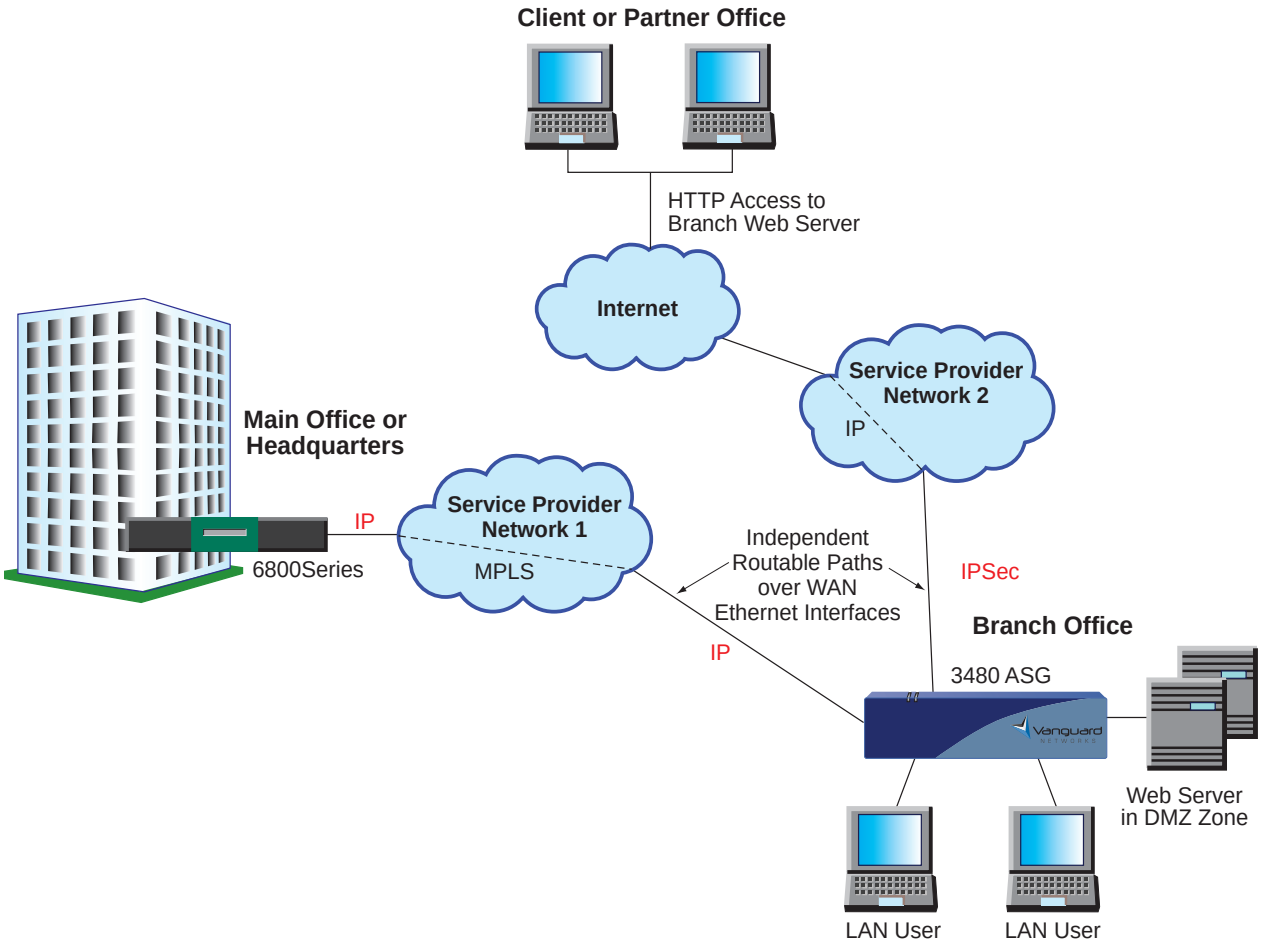


Figure 1-6. IP-based WAN Data Access for Small/Medium Branch Offices Using Multiple WAN Routable Interfaces

Chapter 2
Hardware Description

Overview

Introduction

This chapter describes the Vanguard 3400 Series.

- Enclosure
- Motherboard
- Vanguard Daughtercards
- Vanguard Modules

Enclosure

Introduction

This section describes the components of the Vanguard 3400 Series enclosure.

Enclosure

The Vanguard 3400 Series models are standalone units with an external 110/220 VAC power supply that can be used either on a desktop or installed on a rack shelf.

The enclosures contain a motherboard, (optional) daughtercards, and optional mini PCI modules.

Front Panel

The front panel of the Vanguard 3400 Series (see Figure 2-1) has two LEDs that provide node status. For a description of the LEDs refer to the "Powering Up Your Vanguard 3400 Series" section in Chapter 4.

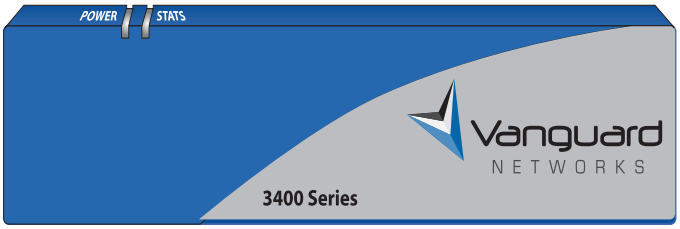


Figure 2-1. Vanguard 3400 Series Front Panel

Rear Panel

Figure 2-2 shows the Vanguard 3400 Series rear panels. The available ports on the rear panel for the various 3400 models are listed in the table below.

Port	3410/3410w	3460	3480
Serial Port 1 Async	Yes	Yes	Yes
Serial Port 1 Sync	Yes	Yes	Yes
CTP Port 4	Yes	Yes	Yes
Routed Ethernet Port 23	Yes	Yes	Yes
Routed Ethernet Port 24	Yes	Yes	---
Switched Ethernet Port 24	---	---	Yes
Switched Ethernet Port 25	---	---	Yes
Switched Ethernet Port 26	---	---	Yes
Switched Ethernet Port 27	---	---	Yes
Daughtercard Site Port 7	Yes	Yes	Yes
Daughtercard Site Port 10	---	Yes	Yes

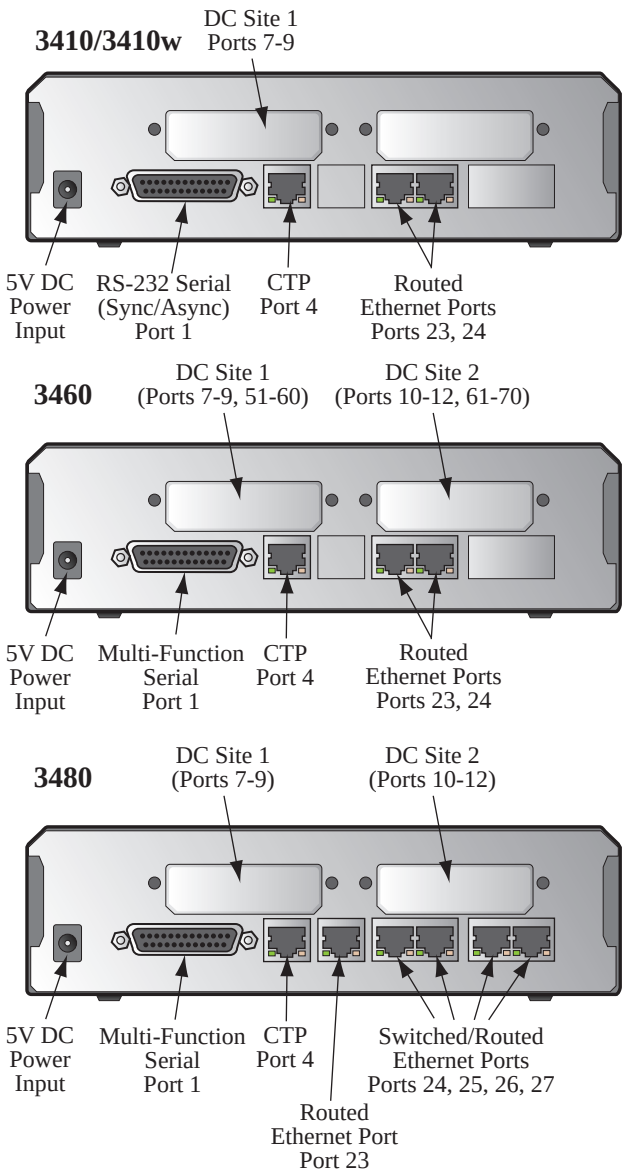


Figure 2-2. Vanguard 3400 Series Rear Panels

■Note

For information about cabling, refer to the "Cabling Your Vanguard 3400 Series" section in Chapter 3.

Caution

Do not connect Ports 4, 23, 24 25, 26, or 27 to the Public Communications Network.

Serial Numbers

The Hardware Serial Number indicates the version of hardware in your unit. The serial number label is located on the rear panel of the Vanguard 3400 Series.

Refer to the serial number when contacting your Vanguard Networks Service Representatives.

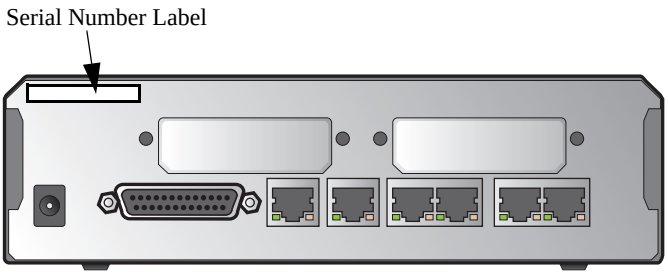


Figure 2-3. Vanguard 3400 Series Serial Number Label Location

Motherboard

General Description

The Vanguard 3400 Series motherboard contains 16 MB flash and 64 MB of SDRAM memory. It uses the MPC8270 CPU operated in single MPC 8270 mode. Additionally, the motherboard supports the following:

- One or two daughtercards, depending on which model you have (see daughtercard matrix on page 2-9 for model-specific support)
- One Serial Port. Depending on which model you have this is either a Multi-Protocol interface (UDIMM or software configurable for V.11/X.21, V.24/RS232, V.35, or V.36) or a RS232 only interface configured as DCE.
- Up to two 10/100 Base T auto-sensing Ethernet ports. (Refer to rear panel matrix on page 2-2 for support by model)
- One CTP port
- One 4-port Ethernet Switch (refer to rear panel matrix on page 2-2 for support by model)
- Two Front Panel green LEDS; Power and Status
- Connector for external 5V power supply
- Encryption PCI Mezzanine card
- Real Time Clock Battery
- Cooling Fan (3460/3480 only)

Refer to Figure 2-4, Figure 2-6, and Figure 2-7 for the location of the motherboard components for the 3410, 3410w, 3460, and 3480 respectively.

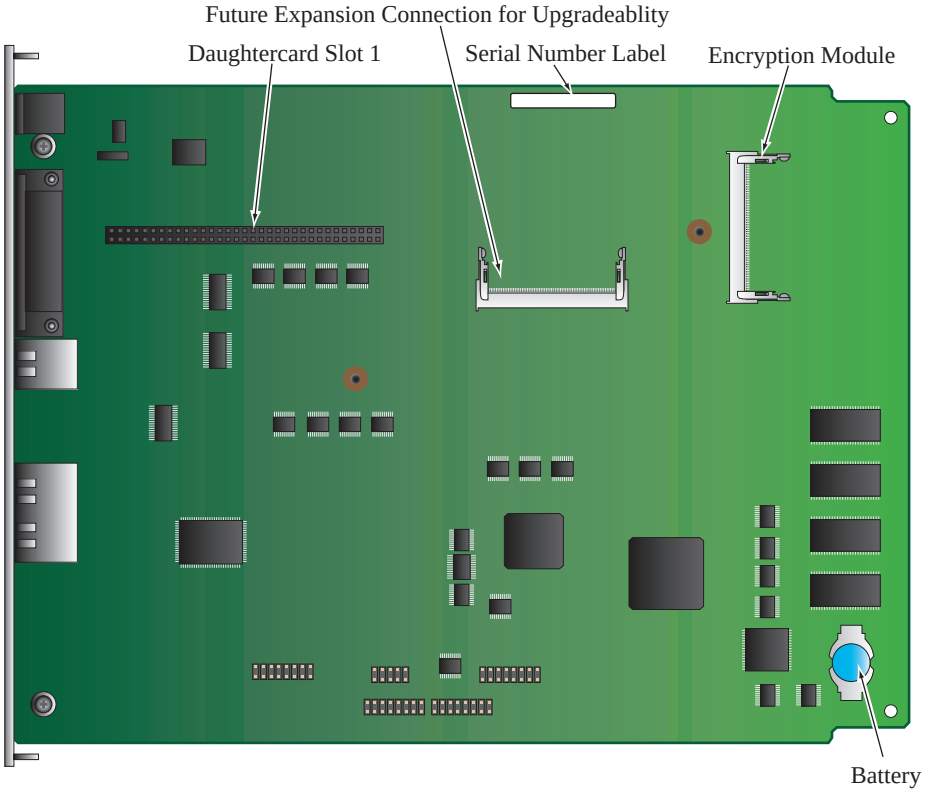


Figure 2-4. Vanguard 3410 Series Motherboard

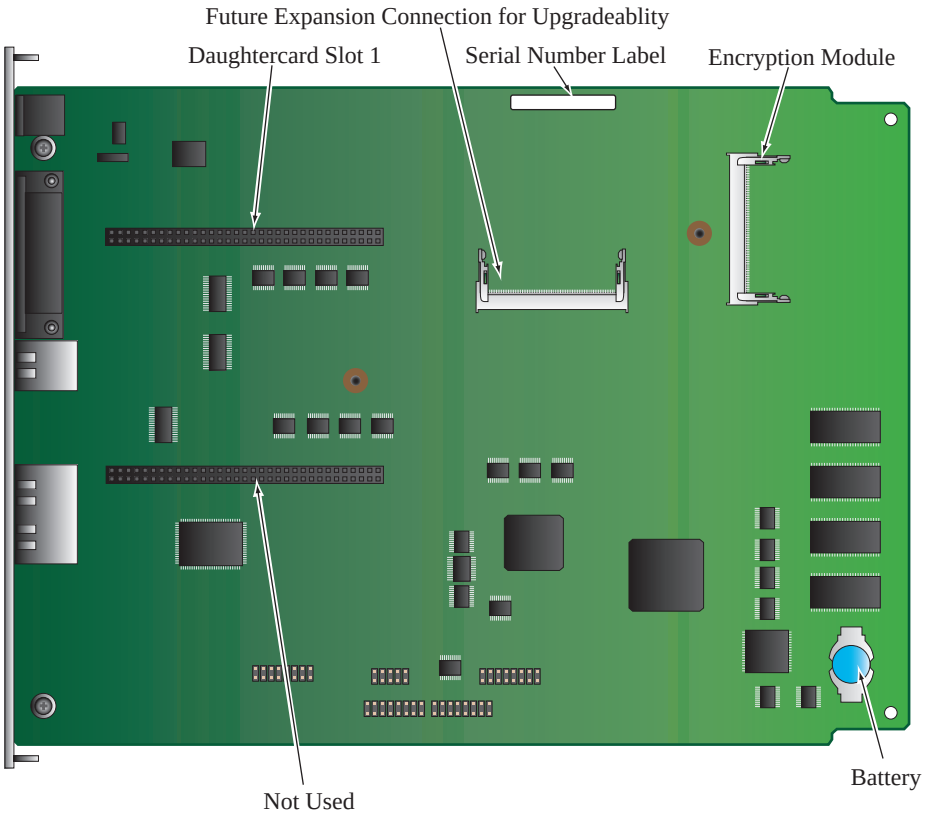


Figure 2-5. Vanguard 3410w Series Motherboard

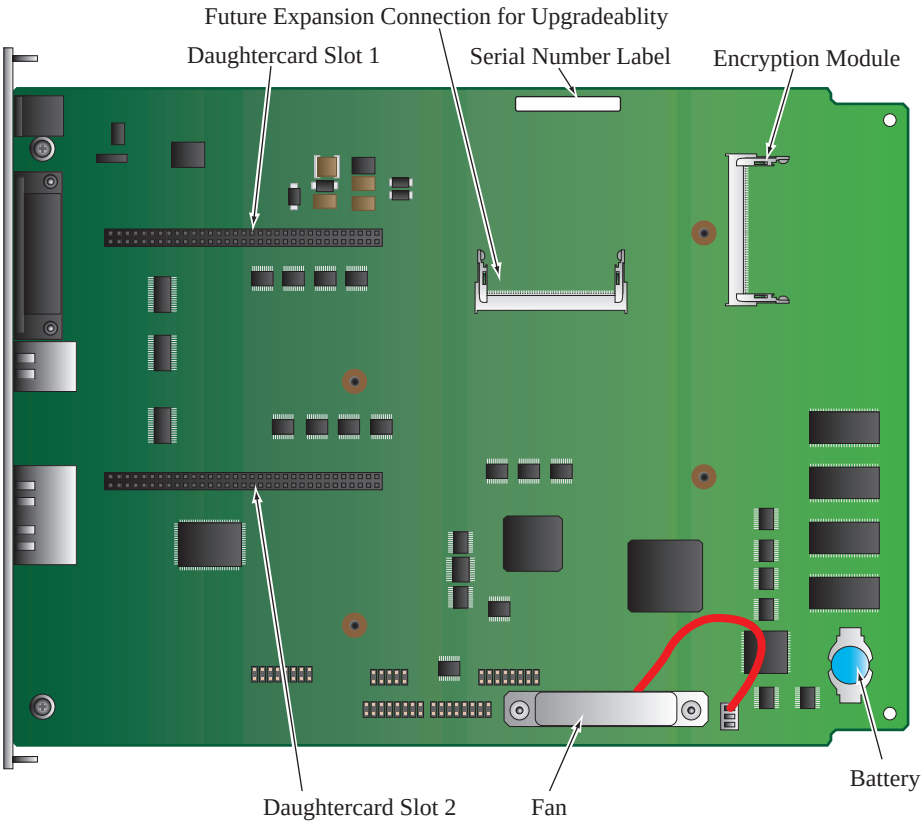


Figure 2-6. Vanguard 3460 Series Motherboard

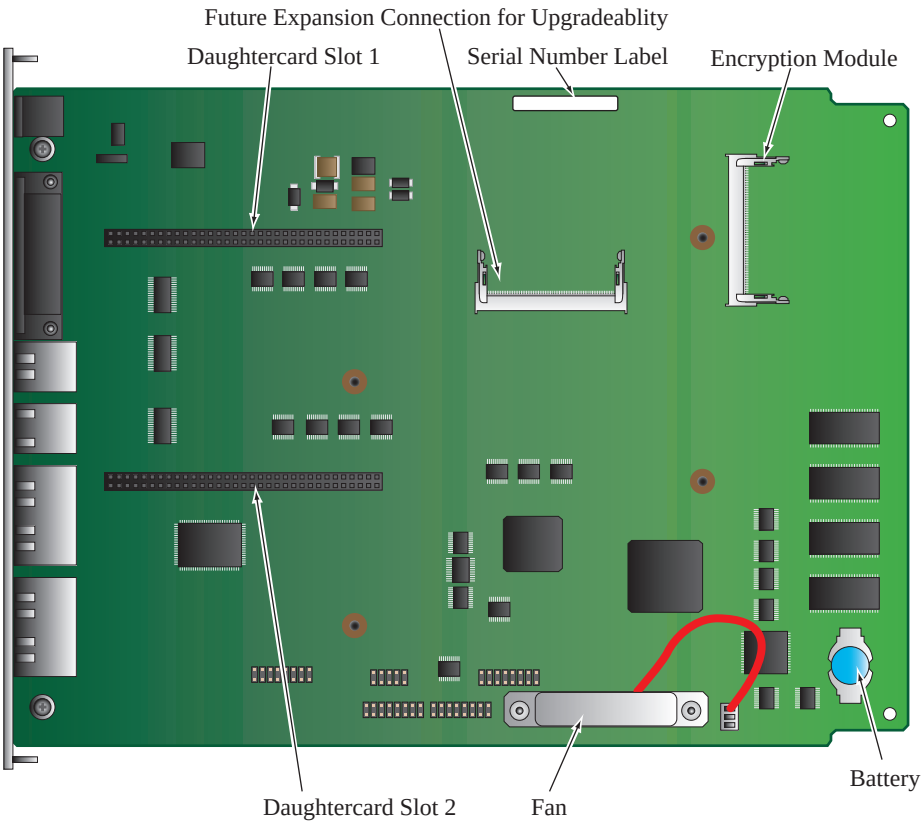


Figure 2-7. Vanguard 3480 Series Motherboard

Accessing the Motherboard

To access the motherboard components you must remove the motherboard from the enclosure.

- For information about removing and installing the motherboard refer to the “Accessing the Motherboard” section in Chapter 3.
- For information about removing or installing motherboard components, refer to the “Modifying Your Vanguard 3400 Series” section in Chapter 3.

Vanguard Networks Daughtercards

Supported Daughtercards

The table below identifies the daughtercards supported by each 3400 series model, as well as any daughtercard slot restrictions that may apply.

Vanguard 3410/3410w/3460/3480 Daughtercard Matrix

Daughtercard		3400 Series Platform					
Description	Product Code	3410	3410W	3460		3480	
		DC Site 1	DC Site 1	DC Site 1	DC Site 2	DC Site 1	DC Site 2
2P-SDC (2-Port Serial)	1130-10004	---	Yes	Yes	Yes	Yes	Yes
56K DSU	68472	Yes	---	Yes	Yes	Yes	Yes
Dual E&M	65729	---	---	Yes	Yes	Yes	Yes
Dual FXS	68372	---	---	Yes	Yes	Yes	Yes
BRI Voice	68525	---	---	Yes	Yes	Yes	Yes
FT1 - 120 W	49666	Yes	---	Yes	Yes	Yes	Yes
FE1 - 75 W	49669	Yes	---	Yes	Yes	Yes	Yes
FE1 - 120 W	49716	Yes	---	Yes	Yes	Yes	Yes
FT1 - 120 W	1600-00001	Yes	---	Yes	Yes	Yes	Yes
FE1 - 75 W	1600-00075	Yes	---	Yes	Yes	Yes	Yes
FE1 - 120 W	1600-00120	Yes	---	Yes	Yes	Yes	Yes
FXS/FXO	80019	---	---	---	---	---	---
G.SHDSL	1152-10009	---	---	---	---	---	---
Quad FXO	1152-10035	---	---	Yes	Yes	Yes	Yes
Quad FXS	1152-10034	---	---	Yes	Yes	Yes	Yes
ISDN BRI S/T	68525	---	---	---	---	---	---
ISDN BRI S/T	1152-10005	---	---	Yes	Yes	Yes	Yes
ISDN BRI-U	68434	---	---	---	---	---	---
V.11 DCE (Serial)	49649	---	Yes	Yes	Yes	Yes	Yes
V.24 DCE (Serial)	46946	---	Yes	Yes	Yes	Yes	Yes
V.35 DCE (Serial)	49647	---	Yes	Yes	Yes	Yes	Yes
V.36 DCE (Serial)	49648	---	Yes	Yes	Yes	Yes	Yes
V.11 DTE (Serial)	49661	---	Yes	Yes	Yes	Yes	Yes
V.24 DTE (Serial)	49658	---	Yes	Yes	Yes	Yes	Yes
V.35 DTE (Serial)	49659	---	Yes	Yes	Yes	Yes	Yes
V.36 DTE (Serial)	49660	---	Yes	Yes	Yes	Yes	Yes
V.90 (Modem)	1152-10003	---	Yes	Yes	Yes	Yes	Yes
V.36 DTE (Serial)	49660	---	Yes	Yes	Yes	Yes	Yes
V.90 (Modem)	1152-10003	---	Yes	Yes	Yes	Yes	Yes

Note

If a table entry contains the value "Yes", the daughtercard type will be supported in the DC Site for that platform.

If a table entry contains the entry " --- ", the daughtercard type will not be supported in that DC Site of that platform

Daughtercard Compatibility

Older Vanguard Networks Daughtercards do not fit into the Vanguard 3400 Series. You can only use the newer daughtercards which are identified by a dimple as shown in Figure 2-8. If the dimple is not present, do not attempt to use the Daughtercard in the Vanguard 3400 Series.

Also, when installing a Vanguard Networks Daughtercard into a 3400 Series, you must use the shorter two-sided header. The taller header is used with other Vanguard Networks units.

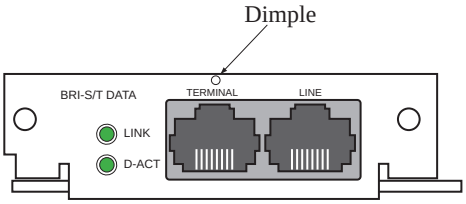


Figure 2-8. New Vanguard 3400 Series Daughtercard Example

Caution

If you attempt to force an older Vanguard Networks Daughtercard into a Vanguard 3400 Series, the equipment will be damaged.

If you have an older Vanguard Networks Daughtercard and would like to use it in a Vanguard 3400 Series, contact your service representative about having the card reworked.

56K DSU/CSU Daughtercard

The 56K DSU Daughtercard provides an RJ48S connector and can support speeds of 56 kbps (synchronous). It conforms to AT&T 62310 point-to-point and multipoint, and to ANSI T1/E1.4/91-006 56 kbps. The card supports the following capabilities:

- Internal/external clocking
- Internal/external loopback
- 4-wire line driver operation

The card also supports multidrop DSUs when either of these conditions exist:

- If a MARK Idle protocol is used (such as MX25).
- If the Telco uses an OR'ed or Data Contention is used to mix individual DRU drops.

Figure 2-9 shows the 56K DSU/CSU Daughtercard connector as it appears on the back panel.

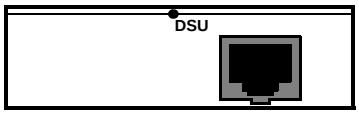


Figure 2-9. 56K DSU/CSU Daughtercard Connector

4-Port Voice FXS Daughtercard

The Vanguard Quad FXS Daughter Card is supported on the Vanguard 3460/3480. The 4-Port Voice FXS Daughtercard has four RJ11 connectors for four FXS Ports.

Figure 2-10 shows the 4-Port Voice FXS Daughtercard connectors as they appear on the back panel.

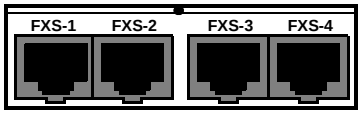


Figure 2-10. FXS Daughtercard

4-Port Voice FXO Daughtercard

The Vanguard Quad FXO Daughter Card is supported on the Vanguard 3460/3480. The 4-Port Voice FXO Daughtercard has four RJ11 connectors for four FXO Ports.

Figure 2-11 shows the 4-Port Voice FXO Daughtercard connectors as they appear on the back panel.

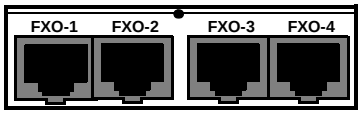


Figure 2-11. FXO Daughtercard

FT1/FE1 Daughtercards

The FT1/FE1 Daughtercards allow a Vanguard 3410/3460/3480 to transfer data over a T1 or E1 network. The daughtercards support full and fractional, channelized, T1 or E1, and PRI ISDN speeds.

- The FE1 Daughtercard provides line rates 2.048 Mbps and data rates of n x 64 kbps (where n is 1 to 31) per channel.
- The FT1 Daughtercard provides line rates 1.544 Mbps and data rates of n x 64 kbps (where n is 1 to 24) per channel.

Figure 2-12 shows the FT1 and the FE1 Daughtercard connectors as they appear on the back panels. The FT1 Daughtercard has a single RJ48C connector while the FE1 Daughtercard has two BNC connectors along with one RJ48C connector.

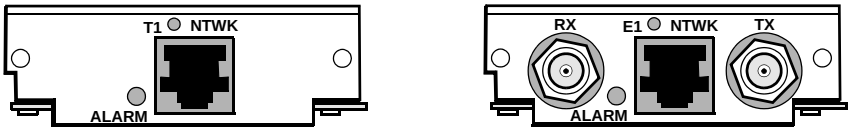


Figure 2-12. FT1 and FE1 Daughtercard Connectors

Note

The FE1 Daughtercard comes with this label which specifies that the E1 interface complies with the Australian requirements ACA TS 016 - 1997 for connection to E1 SELV services. Also the E1 interface meets the IEC950 specifications for TNV1.

Dual E&M Daughtercard

The Dual E&M Daughtercard has two E&M interfaces. The ports use RJ11 connectors.

Figure 2-13 shows the Dual E&M Daughtercard connectors as they appear on the back panel.

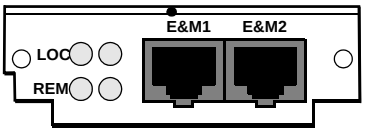


Figure 2-13. Dual E&M Daughtercard Connectors

V.90 Modem Daughtercard

The V.90 modem daughtercard provides Async PPP dial back-up for a customers' applications or can be used for Async dial connections such as remote CTP access. The V.90 uses a dual RJ-11 for connection to central offices, PBXs or telephone systems.

Figure 2-14 shows the rear panel connectors on the V.90 modem daughtercard. For installation instructions, refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).

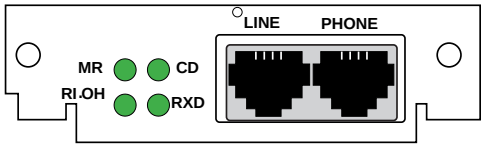


Figure 2-14. V.90 Modem Daughtercard Connectors

2-Port Serial Data Card

The 2-Port serial data card has two Sync/Async Universal Serial DCE ports (V.11/X.21, V.24/RS232, V.35, or V.36). These ports are independent of each other and require a Y-cable which provides two DB25 ports. The required Y-cable is supplied with the card or can be ordered separately.

Note

A cable adapter is required to use current Vanguard Networks Adapter Cables when running V.11/X.21, V.35, or V.36. (See "Cable Adapters and Special Cables" section on page 3-8)

To emulate a DTE port, the special cables listed below are also required.

- For V.11/X.21, use 51176 DCE-DTE cable adapter and 1152-10022 V.11/X.21 cable adapter
- For V.24/RS232, use 80110 (or equivalent)

- For V.35 or V.36, use 51177 DCE-DTE cable adapter and 1152-10021 V.35/V36 cable adapter

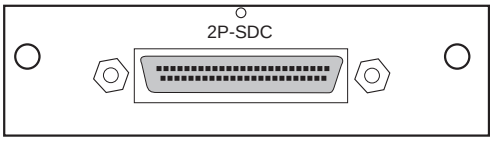


Figure 2-15. 2-Port Serial Daughtercard Connector

DIM Daughtercard

This card supports a single V.11/X.21, V.24/RS232, V.35, or V.36 DIM (Digital Interface Module) and can be set as either a DTE or DCE.

Figure 2-16 shows the DIM Daughtercard connector as it appears on the back panel.

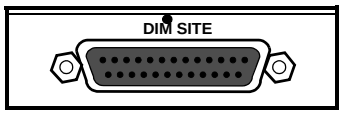


Figure 2-16. DIM Daughtercard Connector

ISDN BRI-U Daughtercard

This card provides 2B+D Channel through an ISDN BRI U interface. It conforms to ANSI T1.601 1992 (2B1Q), is LAPD:ITU Q.921 compliant, and supports the following:

- Integral X.31
- Q.931 dial support
- NI1, 5ESS, DMS-100 switch types
- D Channel Packet Mode
- Leased Circuit Services (I Interface)
- Japan High-Speed Digital

Figure 2-17 shows the ISDN BRI-U Daughtercard connector as it appears on the back panel.

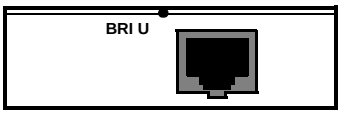


Figure 2-17. ISDN BRI-U Daughtercard Connector

ISDN BRI Voice Daughtercard

This card provides 2B+D Channel through a BRI S/T interface. It conforms to ITU I.430, is LAPD:ITU Q.921 compliant, and supports:

- Integral X.31
- ITU-T Q.931 (EURO IDSN) - ETSI switch type to connect to PBXs and public networks.
- ECMA 143 - QSIG Basic Service to connect to PBXs over private line.
- ECMA 165 - QSIG Generic Functions for Support of PBX Supplementary

Services.

- ITU-T G.711A (A-law) and G.711U (μ-law) interface voice encoding.
- ITU-T G.723, G729, and Vanguard Networks proprietary CVSELP packet voice compression.

Figure 2-18 shows the ISDN BRI Voice Daughtercard connectors as they appear on the back panel.

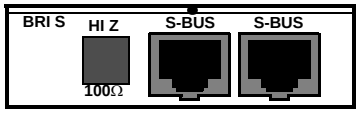


Figure 2-18. ISDN BRI Voice Daughtercard Connectors

2-Port Voice FXS Daughtercard

The 2-Port Voice FXS Daughtercard has two RJ11 connectors for two FXS Ports. The two ports can be used simultaneously and each port supports one voice channel.

Figure 2-19 shows the 2 Port Voice FXS Daughtercard connectors as they appear on the back panel.

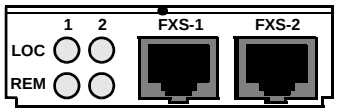


Figure 2-19. 2-Port Voice FXS Daughtercard Connectors

Enhanced ISDN BRI-S/T Daughtercard

This card provides 2B+D Channel through a BRI S/T interface. It conforms to ITU I.430, is LAPD:ITU Q.921 compliant, and supports:

- Integral X.31
- Q.931 dial support
- NI1, 5ESS, DMS-100, ETSI, Euro Numeris switch types
- D Channel Packet Mode
- Leased Circuit Services (I Interface)
- Permanent B for German Monopol support or Japan High-Speed Digital

Figure 2-20 shows the ISDN BRI-S/T Daughtercard connectors as they appear on the back panel.

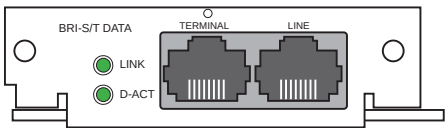


Figure 2-20. Enhanced BRI-S/T Daughtercard Connectors

Modules

The Vanguard 3400 Series can support an optional Encryption Module. The Vanguard 3400 Series Encryption Module provides DES/3DES/AES hardware accelerated encryption. For information on installing or removing this module, refer to the "Installing and Removing the Encryption PCI Mezzanine Card" section in Chapter 3.

Chapter 3
Installation and Replacement

Overview

Introduction

This chapter provides instructions for the following tasks:

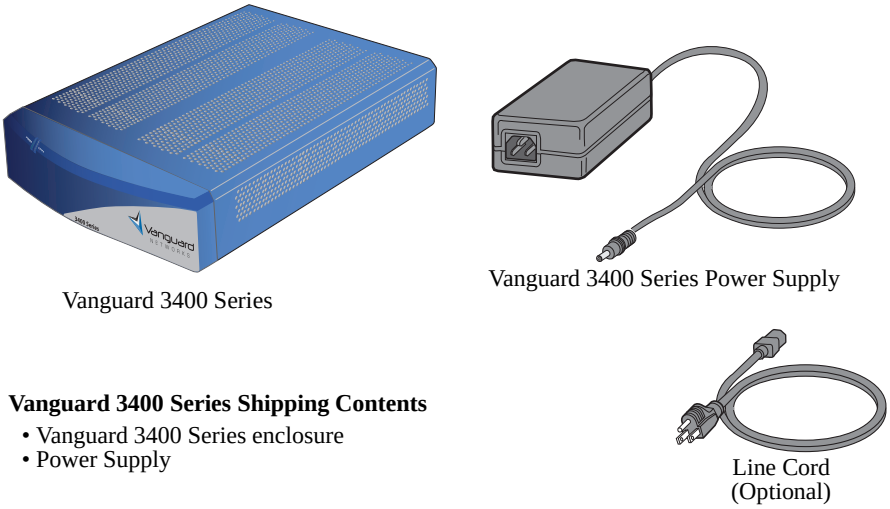
- Checking Your Shipment Contents.
- Installing the Vanguard 3400 Series.
- Cabling the Vanguard 3400 Series.
- Modifying Your Vanguard 3400 Series.

Checking Your Shipment Contents

List of Contents

Before you install the Vanguard 3400 Series, make sure your shipment contents are complete.

The Vanguard 3400 Series is packaged in shock-absorbent packing material. Inside your shipping carton, you should find the contents shown in Figure 3-1.



Vanguard 3400 Series Shipping Contents

- Vanguard 3400 Series enclosure
- Power Supply

Figure 3-1. Vanguard 3400 Series Shipping Contents

Installing The Vanguard 3400 Series

Introduction

This section explains how to install the Vanguard 3400 Series. It consists of these sections:

- Selecting and preparing the installation site.
- Installation.
- Thermal considerations.
- Cabling.

After the Vanguard 3400 Series is installed and cabled, go to Chapter 4, Powering Up Your Vanguard 3400 Series for instructions for powering-up the unit.

Installation

How to Choose a Site

Before you install the Vanguard 3400 Series, select a site for the device.

Choose a site that is within an appropriate distance of a power source. Depending on your application, and the country in which the Vanguard 3400 Series is to operate, the power source must be a grounded 110 to 220 Vac outlet.

Leave at least 2 inches (5 cm) of clearance in front of the front panel, to allow you to see the front panel LEDs, and 6-inches behind the unit for cable clearances (see Figure 3-2). For proper ventilation, leave 2 inches (5 cm) of clearance on the sides.

The site should be free of accumulated dust and environmental extremes. Refer to Appendix A, Specifications for details.

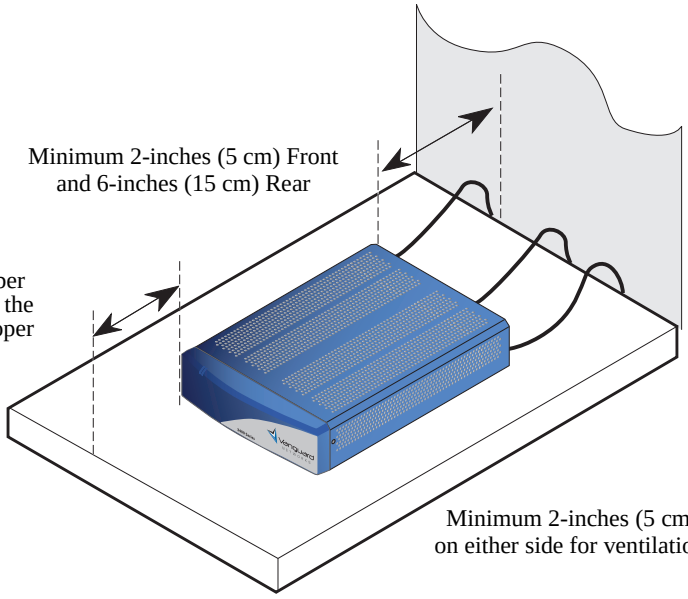


Figure 3-2. Proper Cable and Air Clearance

Caution

Vanguard 3400 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 or an electronic accessories vendor 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.

Installation

Complete these steps to install the unit:

Step	*Action*
1	Unpack the Vanguard 3400 Series, and inspect the unit to ensure you have all the components.
2	Install any daughtercards that you need to add to the unit, as necessary.
3	Be sure that the four rubber feet are on the bottom of the enclosure.
4	Attach the power cord and cables to the rear panel. Refer to the "Cabling Your Vanguard 3400 Series" section on page 3-7 for cabling information. **Note** Cable Adapters are required when installing the Vanguard 3400 Series into an existing site that already has Vanguard Networks high-speed (V.11/X.21, V.35, or V.36) Adapter Cables. (See "Cable Adapters and Special Cables" section on page 3-8)
5	Place the enclosure in the selected site, and power unit on. Do not block the chassis vents.
6	Ensure that the ambient temperature is within the temperature range specified in Appendix A.

Note

You can stack as many as three Vanguard 3400 Series units on top of each other.

Caution

Do not place items weighing more than 20 pounds (9 kg) on top of a Vanguard 3400 Series enclosure.

Thermal Considerations

Introduction

This section explains some of the heat and temperature factors that can affect your Vanguard 3400 Series.

Temperature

After the unit is running, check the ambient air temperature. Make sure it does not exceed the operating temperature limits specified in Appendix A.

Other conditions that could impact internal temperature of the Vanguard 3400 Series include:

- Blocked vents
- Insufficient clearance around the unit
- Fan (if this unit is provided with one) is not working properly
- Rubber feet (4) not installed on bottom of chassis

Cabling Your Vanguard 3400 Series

Introduction

This section provides information to help you cable your Vanguard 3400 Series.

Caution

Before connecting cables to the motherboard or daughtercard ports, be sure that the screws holding the motherboard in place are installed. Otherwise, the motherboard could loosen under the weight of the cables and cause damage to the equipment. Also use proper cable strain relief to prevent damage due to excessive cable weight.

Rear Panel Port Numbering

Figure 3-3 shows the port numbering on the Vanguard 3400 Series rear panels.

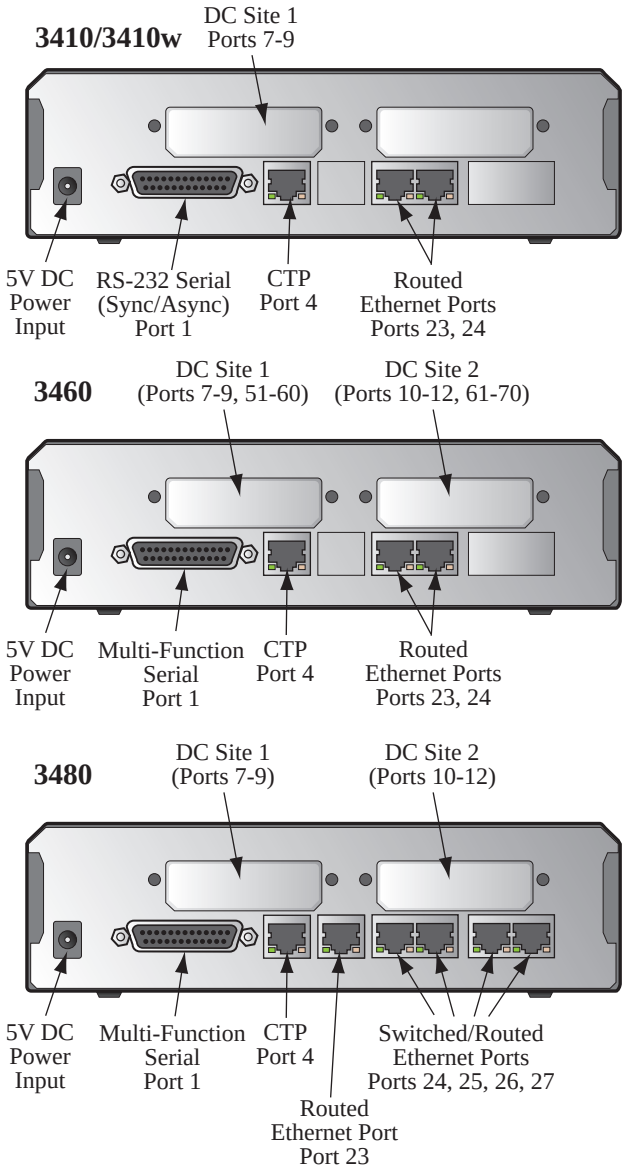


Figure 3-3. Vanguard 3400 Series Rear Panel Port Numbers

Caution

Do not connect the Ports 4, 23, 24, 25, 26, or 27 to the Public Communications Network.

Note

When installing a daughtercard with only one port, the port number is 7 or 10 (depending on the location of the card).

Rear Panel Ports

There are up to seven physical ports on the Vanguard 3400 Series rear panel. Some physical port numbers may vary from model to model.

Port 1

Port 1 is either a Universal Serial Port (DB25 connector) which can be configured to support V.11/X.21, V.24/RS232, V.35 and V.36 DCE, or an RS232 only interface.

Note

Cable Adapters are required when using V.11/X.21, V.35, or V.36.

Cable Adapters and Special Cables

To emulate a high speed DTE interface V.11/X.21, V.35, or V.36 on any 3400 Series Universal Serial Port requires the use of a Cable Adapter (Figure 3-4) and special cables.

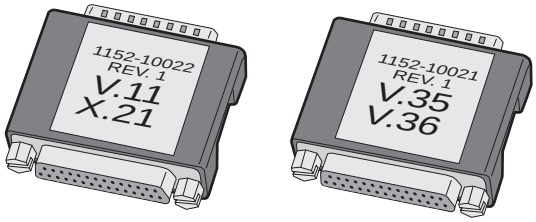


Figure 3-4. Cable Adapters

The table below provides a description with part numbers of the Cable Adapter and special cables. The paragraphs that follow provide more detailed information and pinouts.

3400 Series Motherboard Port 1 and 2-Port Serial Data Card Interface

Cabling Interface Type	*Y-Cable (one per 2-PSDC)*	*Cable Adapter (one per port)*	*DCE-DTE crossover Cable (one per port)*	*Adapter Cable (one per port)*
Motherboard Port 1				
V.24/RS232 DCE	N/A	N/A	N/A	80113 15' DB25M-DB25F
V.24/RS232 DTE	N/A	N/A	80110 3' DB25M-DB25M or 80109 15' DB25M-DB25M	N/A
V.35 or V.36 DCE	N/A	1152-10021 DB25M-DB25F	N/A	92104 7' DB25M-M34F
V.35 or V.36 DTE	N/A	1152-10021 DB25M-DB25F	51177 1' DB25M-DB25F	91917 7' DB25M-M34M
V.11/X.21 DCE	N/A	1152-10022 DB25M-DB25F	N/A	92089 7' DB25M-DB15F
V.11/X.21 DTE	N/A	1152-10022 DB25M-DB25F	51176 1' DB25M-DB25F	91918 7' DB25M-DB15M
2-Port Serial Data Card				
V.24/RS232 DCE	62026-01 DB50M-two DB25Fs	N/A	N/A	80113 15' DB25M-DB25F
V.24/RS232 DTE	62026-01 DB50M-two DB25Fs	N/A	80110 3' DB25M-DB25M or 80109 15' DB25M-DB25M	N/A
V.35 or V.36 DCE	62026-01 DB50M-two DB25Fs	1152-10021 DB25M-DB25F	N/A	92104 7' DB25M-M34F
V.35 or V.36 DTE	62026-01 DB50M-two DB25Fs	1152-10021 DB25M-DB25F	51177 1' DB25M-DB25F	91917 7' DB25M-M34M
V.11/X.21 DCE	62026-01 DB50M-two DB25Fs	1152-10022 DB25M-DB25F	N/A	92089 7' DB25M-DB15F
V.11/X.21 DTE	62026-01 DB50M-two DB25Fs	1152-10022 DB25M-DB25F	51176 1' DB25M-DB25F	91918 7' DB25M-DB15M

Vanguard 3400 Series V.11/X.21 Cable Adapter

Listed below is the pinout of the Cable Adapter that enables the use of existing V.11/X.21 serial cables on Port 1of the 3400 Series platform. The part number is 1152-10022

Note

This adapter is also intended to be used in conjunction with the Y-Cable for the 2-Port Serial Data Card.

V.11/X.21 Cable Adapter Pinout

P1	P2
1	1
2	2
3	3
4	4
5	5
6	NC
7	7
8	8
9	9
10	20
11	6
12	22
13	13
14	NC
15	15
16	16
17	17
18	18
19	14
20	NC
21	21
22	NC
23	23
24	24
25	25

Vanguard 3400 Series V.35/V.36 Cable Adapter

Listed below is the pinout of the Cable Adapter that enables the use of existing V.35 and V.36 serial cables on port 1 of the 3400 Series platform. The part number is 1152-10021

Note

This adapter is also intended to be used in conjunction with the Y-Cable for the 2-Port Serial Data Card.

V.35/V.36 Cable Adapter Pinout

P1	P2
1	1
2	2

V.35/V.36 Cable Adapter Pinout *(continued)*

P1	P2
3	3
4	4
5	5
6	6
7	7
8	8
9	18
10	10
11	11
12	22
13	13
14	NC
15	15
16	16
17	17
18	NC
19	14
20	20
21	21
22	NC
23	23
24	24
25	25

Special Cables

The special cables required to emulate a high speed DTE interface V.11/X.21, V.35, or V.36 on any 3400 Series Universal Serial Port are listed in the table below for port 1 as well as any 2-Port Serial Data Card:

Vanguard 3400 Series Special Cables

Part Number	Description
51176	1’ V.11/X.21 DCE–DTE Adapter Cable
51177	1’ V.35 or V.36 DCE–DTE Adapter Cable

Vanguard 3400 Series Adapter Cables

Part Number Modified from Product Code	Description
80113	15’ DB25M–DB25F Straight Cable, V.24/RS232
92089	7’ DB25M–DB15F Custom Cable, V.11/X.21
91918	7’ DB25M–DB15M Custom Cable, V.11/X.21
92104	7’ DB25M–V.35F Custom Cable, V.35 or V.36
91917	7’ DB25M–M34M Custom Cable, V.35 or V.36

These tables describe the DB25 connector pinouts for port 1 and any 2-Port Serial Data Card ports:

DB25 V.24 Pinouts (DCE)

Pin	ITU Circuit	I/O	Signal Name
1	---	-----	Protective Ground
2	103	INPUT	Transmitted data
3	104	OUTPUT	Received data
4	105	INPUT	Request To Send
5	106	OUTPUT	Clear To Send
6	107	OUTPUT	Data Set Ready
7	102	-----	Signal Ground
8	109	OUTPUT	Data Carrier Detect
14	---	INPUT	Data Restraint Out
15	114	OUTPUT	Transmitted Clock
16	---	-----	N/C
17	115	OUTPUT	Received Clock
18	---	INPUT	External Rx Clock
20	108/2	INPUT	Data Terminal Ready
21	---	-----	N/C
22	125	OUTPUT	Ring Indicator
24	113	INPUT	External Tx Clock
25	142	INPUT	Make Busy

DB25 V.35/V.36 Pinouts

Note

For port 1 and any 2-Port Serial Data Card after the 1152-10021 Cable Adapter is installed.

Pin	Signal	DCE Position
1	GND	-------
2	TXD A	IN
3	RXD A	OUT
4	RTS	IN
5	CTS	OUT
6	DSR	OUT
7	SIG GND	-------
8	DCD	OUT
14	TXD B	IN
15	TXC A	OUT
16	RXD B	OUT
17	RXC A	OUT
18	RXC B	OUT
20	DTR	IN
21	TXC B	OUT
22	ETXC B	IN
24	ETXC A	IN
25 (V.36 only)	TM	NC

DB25 V.11/X.21 Pinouts

Note

For port 1 and any 2-Port Serial Data Card after the 1152-10022 Cable Adapter is installed.

Pin	Signal	DCE Position
1	GND	-------
2	TXD A	IN
3	RXD A	OUT
4	RTS A	IN
6	DCD B	OUT
7	SIG GND	-------
8	DCD A	OUT
14	TXD B	IN
15	TXC A	OUT

DB25 V.11/X.21 Pinouts *(continued)*

Note

For port 1 and any 2-Port Serial Data Card after the 1152-10022 Cable Adapter is installed.

Pin	Signal	DCE Position
16	RXD B	OUT
20	RTS B	IN
21	TXC B	OUT
22	ETXC B	IN
24	ETXC A	IN

Port 4

This port has an RJ-45 connector. Use Port 4 as the CTP for communicating with, configuring, monitoring, and for coldloading the node. Figure 3-5 shows the pin numbers for port 4.

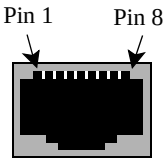


Figure 3-5. Port 4 Pin Numbers

This table shows the pinouts for RJ-45 connectors for port 4:

Pin Number	Port 4 (CTP)	
	Signal	DCE
1	RTS	Input
2	DTR	Input
3	RXD	Output
4	DCD	Output
5	GND	-------
6	TXD	Input
7	DSR	Output
8	CTS	Output

Note

Use Port 4 only with low speed asynchronous protocols. Running asynchronous protocols at speeds greater than 19.2 kbps may degrade node performance.

Port 23 and Port 24

This table shows the pinouts for the RJ45 Ethernet connector for Port 23 and Port 24 when functioning as a routed Ethernet port.

Pin	Signal
1	Transmit Positive
2	Transmit Negative
3	Receive Data Positive
4	Not Used
5	Not Used
6	Receive Data Negative
7	Not Used
8	Not Used

Ports 24, 25, 26 and 27

This table shows the pinouts for the RJ45 connector for Switched Ethernet Ports 24 (when functioning as a switched Ethernet port), 25, 26, 27

Pin	Signal
1	Receive Data Positive
2	Receive Data Negative
3	Transmit Data Positive
4	Not Used
5	Not Used
6	Transmit Data Negative
7	Not Used
8	Not Used

Cabling Daughtercards

For instructions on cabling your standard Vanguard Daughtercards, refer to the Vanguard *Daughtercard Installation Guide* (Part Number T0020).

Cabling 2-Port Serial Card

The 2-Port Serial Card comes with one Y-Cable Adapter as shown in Figure 3-6. They allow the connector on the rear of the 2-Port Serial Card to support two ports.

Note

The Cable Adapter (Figure 3-4) is required on all Universal Serial Ports (motherboard and 2-Port Serial Data Card) to use existing Vanguard Networks Adapter Cables when running high-speed V.11/X.21, V.35, or V.36.

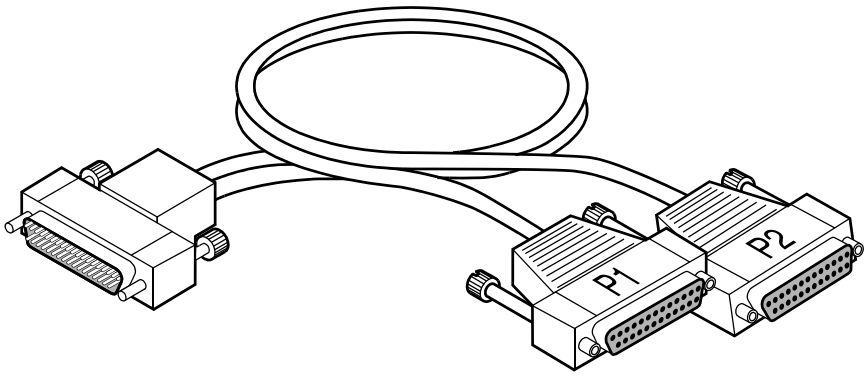


Figure 3-6. 2-Port Serial Card Y-Cable (P/N 62026-01)

Modifying Your Vanguard 3400 Series

Introduction

You can modify your Vanguard 3400 Series by adding or replacing daughtercards or mini-PCI modules. This section explains how to make these modifications.

Daughtercards

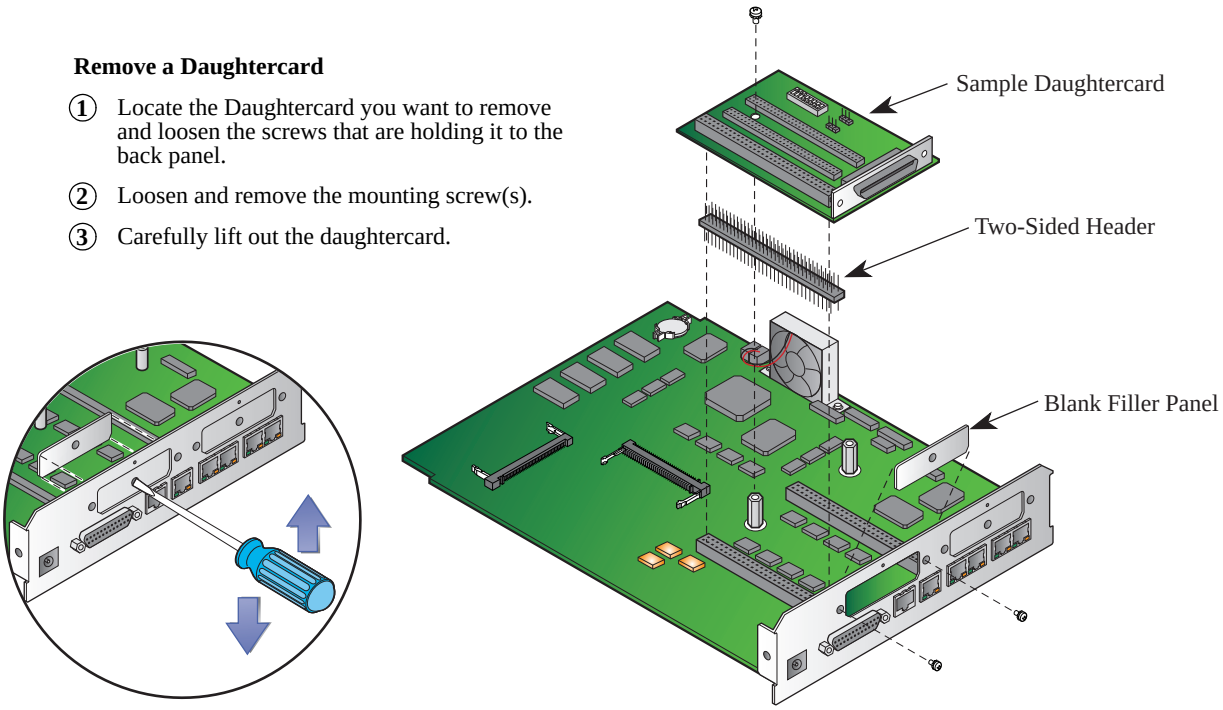
You can install up to two Vanguard Networks Daughtercards in the Vanguard 3400 Series.

- For information about installing a standard Vanguard Daughtercard, refer to the sample daughtercard installation illustration in Figure 3-7 or the Vanguard *Daughtercard Installation Guide* (Part Number T0020).

When installing a Vanguard Daughtercard into a 3400 Series, you must use the shorter two-sided header. The taller header is used with other Vanguard units.

Remove a Daughtercard

1. Locate the Daughtercard you want to remove and loosen the screws that are holding it to the back panel.
2. Loosen and remove the mounting screw(s).
3. Carefully lift out the daughtercard.



Install a Daughtercard

1. Locate the slot where you want to install the Daughtercard and remove the filler panel by loosening the screws.

Note

If original Blank Panel is installed, insert a screwdriver into the slot at the center (as shown in inset) of the filler panel and work the screwdriver up and down to loosen the panel. Detach the filler panel from the tabs at each end and remove.

2. Carefully position the Daughtercard over the connector. Press down firmly so the daughtercard connector seats properly with the motherboard connector.
3. Secure the Daughtercard with the mounting screws on the back panel.

   CAUTION: Ensure that daughtercard connector pins are properly aligned with the corresponding motherboard connector to prevent damage to the card when power is applied.

Figure 3-7. Sample Daughtercard Installation

Accessing the Motherboard

Introduction

This section explains how to access the motherboard for the Vanguard 3400 Series. It also identifies the location of the key motherboard components.

Before replacing modules, fans, batteries, or daughtercards, you must access the Vanguard 3400 Series motherboard.

Instructions for the 3400 Series

Figure 3-8 shows how to remove and install the Vanguard 3400 Series motherboard. Figure 3-9 shows the location of the components on the motherboard.

Warning

To prevent injury and damage to the equipment, power down the unit and disconnect the power cord before you remove or install the motherboard.

Avertissement

Pour éviter toute blessure ou endommagement de l'équipement, éteignez l'unité et déconnectez le cordon d'alimentation avant d'enlever ou d'installer la carte mère.

Warnung

Um persönliche Verletzungen und Schäden am Gerät zu verhindern, schalten Sie das Gerät ab, und ziehen Sie den Netzstecker aus, bevor Sie die Hauptplatine entfernen oder installieren.

Caution

Use care when handling and placing the motherboard on a surface. There are components on the bottom of the motherboard that can be damaged.

Caution

Some components used in the 3400 Series are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

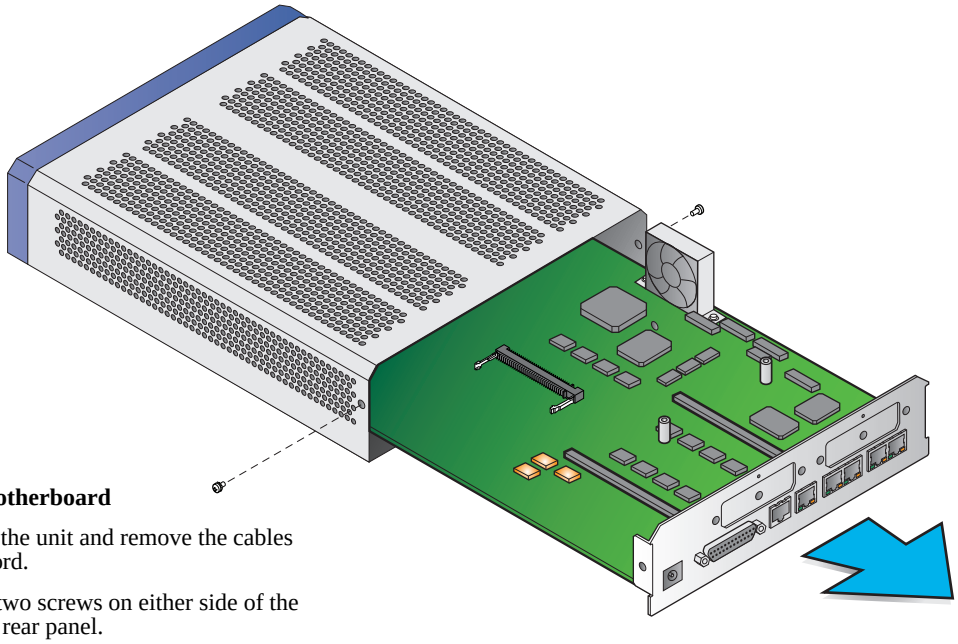
Certains composants du 3400 Series sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 3400 Series verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

Caution

When handling any components or cards, use ESD protection.



Removing the Motherboard

1. Power down the unit and remove the cables and power cord.
2. Remove the two screws on either side of the motherboard rear panel.
3. Pull motherboard out of chassis by grabbing the bottom edge of rear panel and carefully sliding it out of chassis.
4. Place the motherboard on a clean flat surface.

Installing the Motherboard

1. Carefully slide the motherboard into the card guides within the chassis opening, then push the motherboard into the enclosure.
2. Install and tighten screws on both sides of the rear panel. *Be sure the screws are snug*.
3. Reconnect the cables and power cord and power up the unit.

Figure 3-8. Vanguard 3400 Series Motherboard Removal and Replacement

Motherboard Components

Figure 3-9, Figure 3-11, and Figure 3-12 show the components on a Vanguard 3400 Series motherboard.

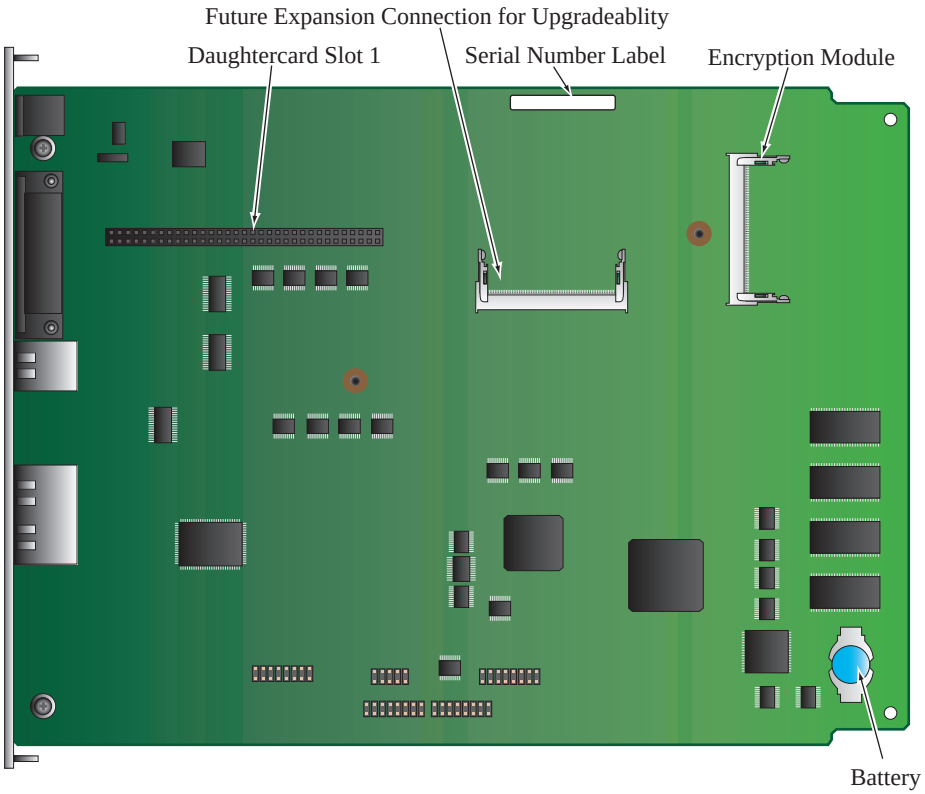


Figure 3-9. Location of the 3410 Motherboard Components

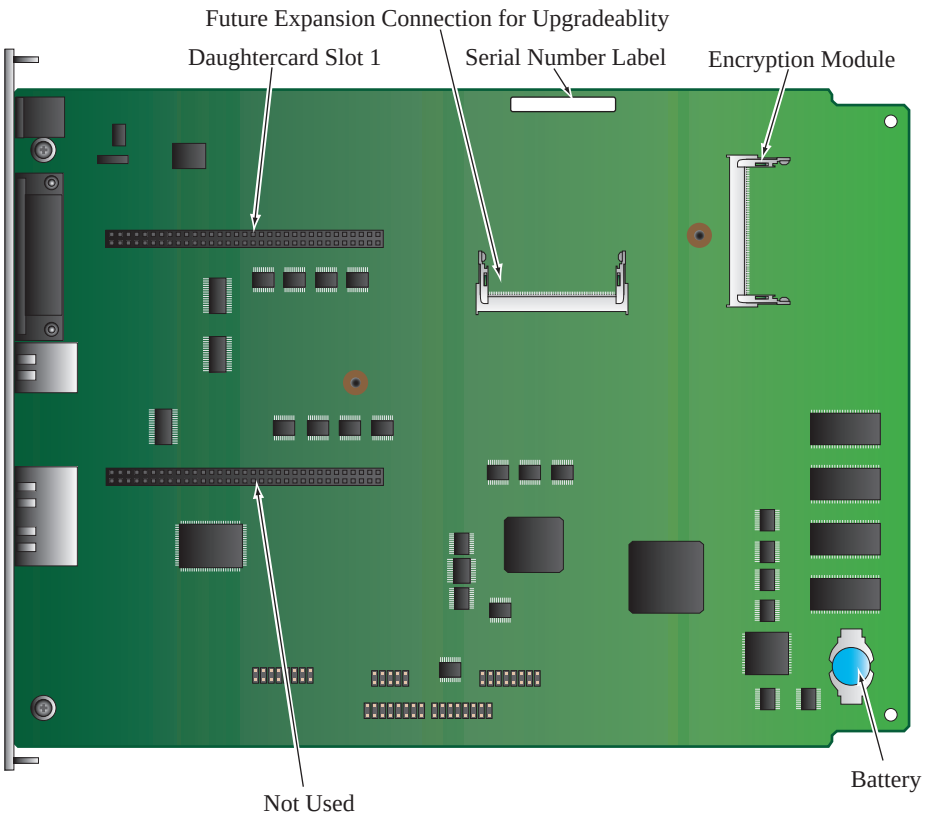


Figure 3-10. Location of the 3410w Motherboard Components

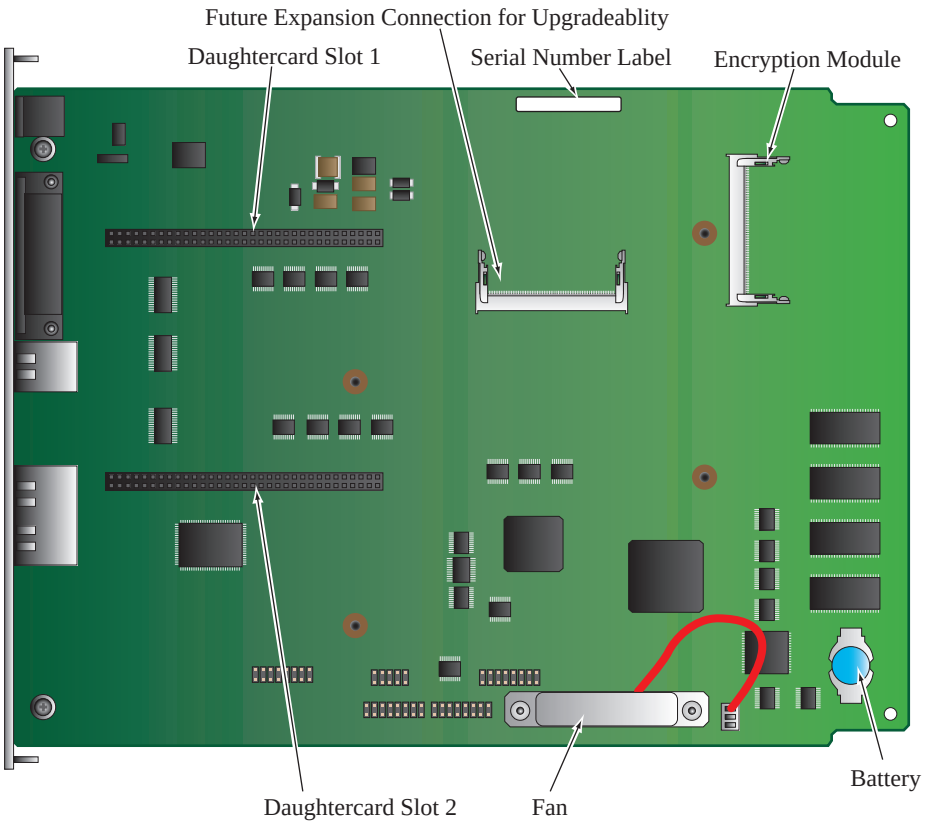


Figure 3-11. Location of the 3460 Motherboard Components

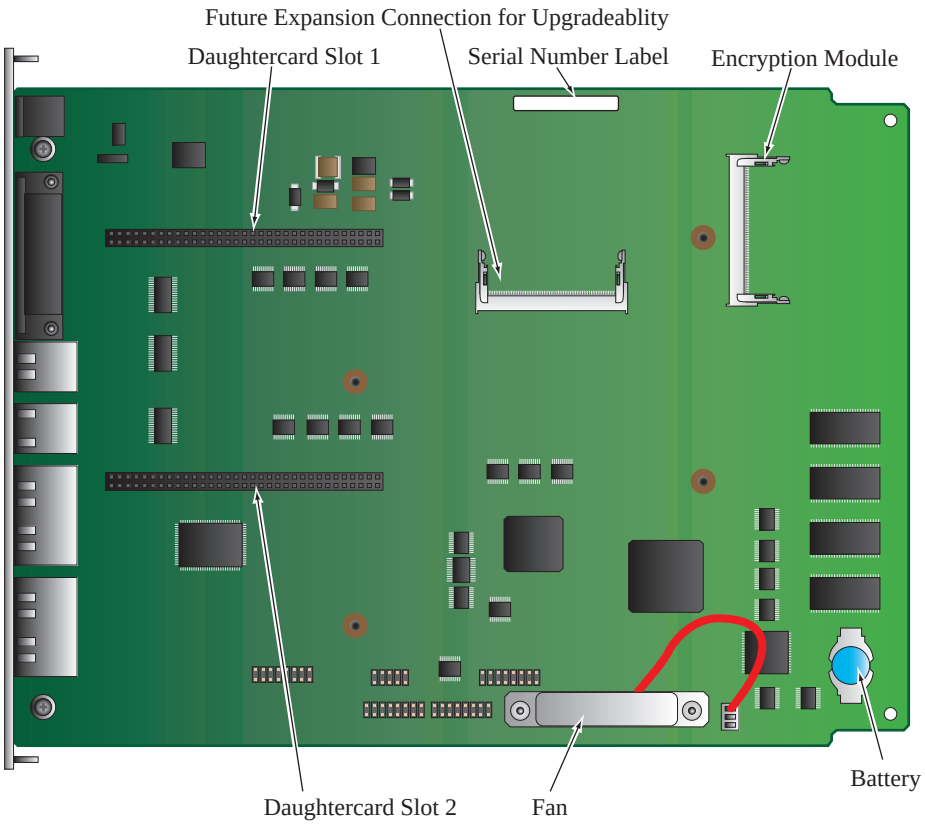


Figure 3-12. Location of the 3480 Motherboard Components

Installing and Removing the Encryption PCI Mezzanine Card

Introduction

The Encryption PCI Mezzanine card is an option and may have been installed on the motherboard at the factory. If not, you can install or replace the card.

This section explains how to:

- Add and remove Encryption PCI Mezzanine Card.

For instructions for removing the motherboard, refer to the “Accessing the Motherboard” section on page 3-18.

Adding or Removing Encryption PCI Mezzanine Card

Figure 3-13 shows how to add or remove an Encryption PCI Mezzanine Card. Refer to Figure 3-9, Figure 3-11, or Figure 3-12for the location of the Encryption PCI Mezzanine Card.

For instructions for removing the motherboard, refer to the “Accessing the Motherboard” section on page 3-18.

Caution

Some components used in the 3400 Series are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

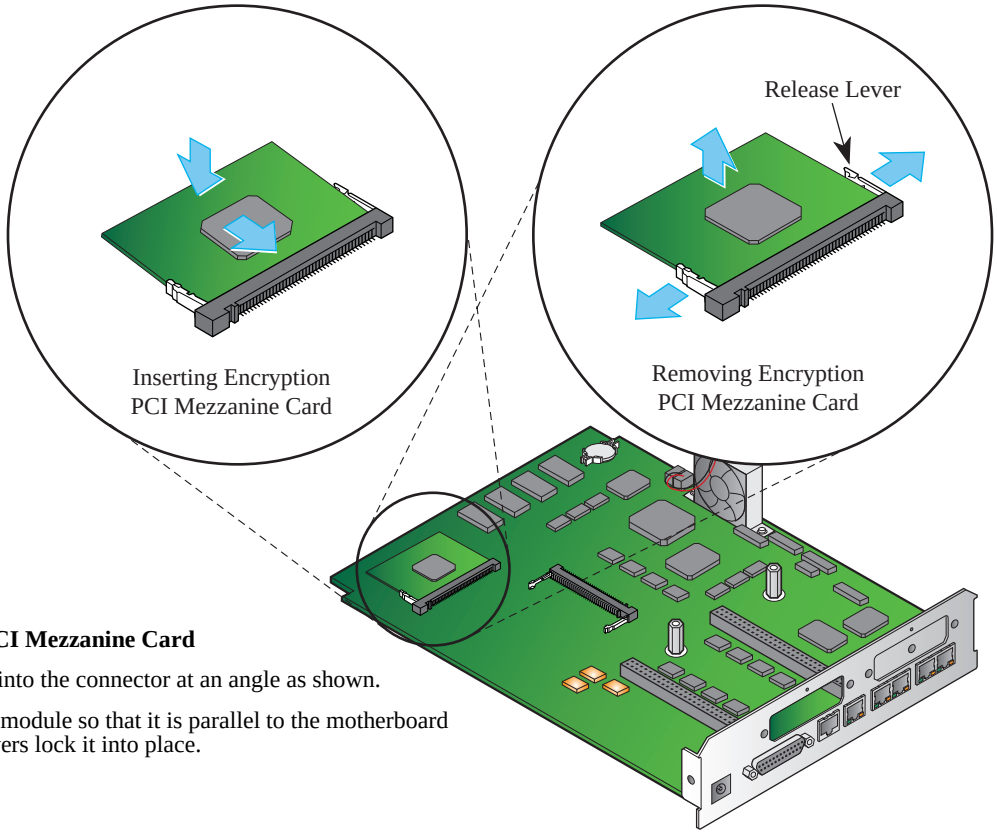
Certains composants du 3400 Series sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 3400 Series verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

Note

The location of the Encryption PCI Mezzanine Card is indicated on the motherboard as shown in Figure 3-9.



Adding Encryption PCI Mezzanine Card

1. Insert the module into the connector at an angle as shown.
2. Push down on the module so that it is parallel to the motherboard and the release levers lock it into place.

Removing Encryption PCI Mezzanine Card

1. Pull outward on the release levers at the side of the card, to allow the module to be removed from the connector.
2. Raise the leading edge of module so that it is at an angle to the motherboard and remove it from the connector.

Figure 3-13. Encryption PCI Mezzanine Card Installation/Replacement

Installing/Removing the Lithium Battery

Introduction

Vanguard 3400 Series uses a lithium battery on the motherboard to maintain the node's realtime clock. The battery is not used to store the configuration memory.

This section explains how to replace the battery.

Warning

Only qualified service personnel should perform the procedure described in this section. If the battery is installed incorrectly, it could explode after the Vanguard product is powered up, damaging the unit.

Avertissement

Seules des personnes qualifiées peuvent mettre en pratique les procédures décrites dans cette section. Si la batterie n'est pas correctement installée, elle risque d'exploser après la mise en marche du produit Vanguard et d'endommager l'unité.

Warnung

Die in diesem Abschnitt aufgeführten Vorgänge sollten ausschließlich von qualifiziertem Servicepersonal durchgeführt werden. Wenn die Batterie unsachgemäß installiert wird, kann sie nach dem Einschalten des Vanguard-Produkts explodieren und das Gerät beschädigen.

Note

After installing the battery, set the Vanguard 3400 Series's date and time. This is done via the CTP in the Update System Parameter menu.

Battery Type

Replace the lithium battery with lithium coin cell type CR1225 or its equivalent. These can be obtained where watch batteries are sold.

Battery Disposal

Dispose of the battery in compliance with applicable local regulations.

Routine Battery Replacement

The lithium battery should be replaced every two years. Follow the instructions in Figure 3-14 to replace the battery.

Before Removing/ Installing the Battery

Before you remove or install the battery, you must access the Vanguard 3400 Series motherboard as described in the “Accessing the Motherboard” section on page 3-18.

Once you can see the motherboard, locate the battery as shown in Figure 3-14.

Removing/ Installing the Battery

Figure 3-14 shows how to install and replace the battery.

To remove the battery

Using your fingers, push the retaining tabs upwards and pry the battery out of the holder.

To install the battery

Place the battery in the holder with the positive (+) side up,.

Note

When done, replace the motherboard as explained in the “Accessing the Motherboard” section on page 3-18.

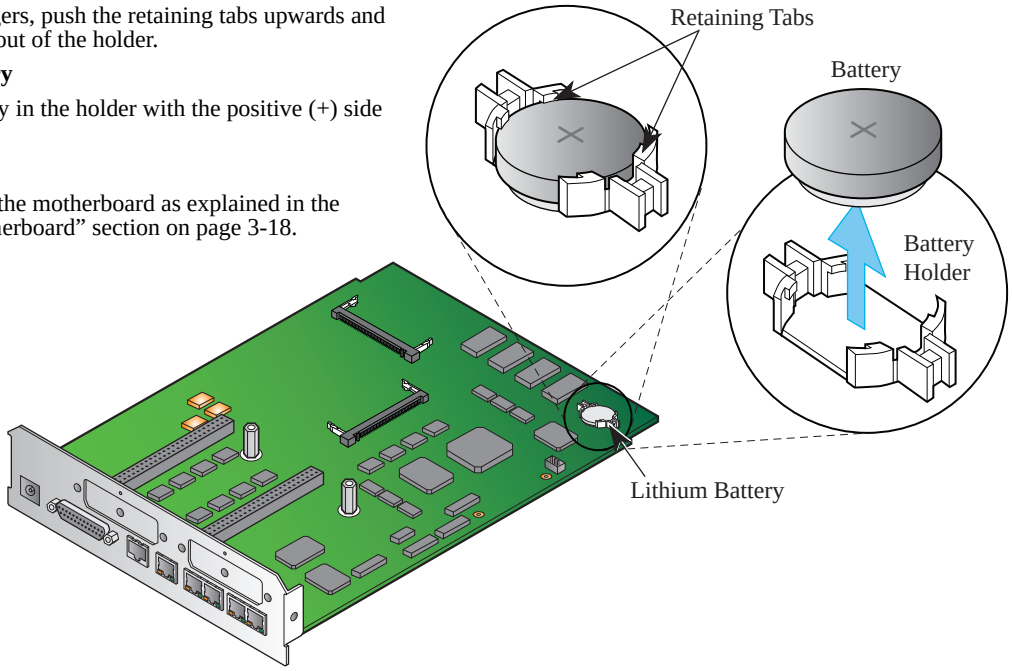


Figure 3-14. Replacing the Battery

Chapter 4
Powering Up Your Vanguard 3400 Series

Overview

Introduction

This chapter explains how to:

- Power up your Vanguard 3400 Series.
- Ensure that the unit powered up correctly and is up and running by reading the front panel LEDs.
- Load the Vanguard 3400 Series software.

Power Up Procedure

Introduction

This section explains how to power up the Vanguard 3400 Series.

Procedure

Follow these steps to power up your Vanguard 3400 Series.

Step	Action
1	Ensure that all the cards are fully inserted and secure.
2	Ensure that the AC power cord is plugged in.
3	Ensure the front panel power LED is on.

To power down the Vanguard 3400 Series, unplug the power supply AC power cord from the power receptacle.

LEDs

Figure 4-1 shows the Vanguard 3400 Series LEDs and the table that follows describes them.

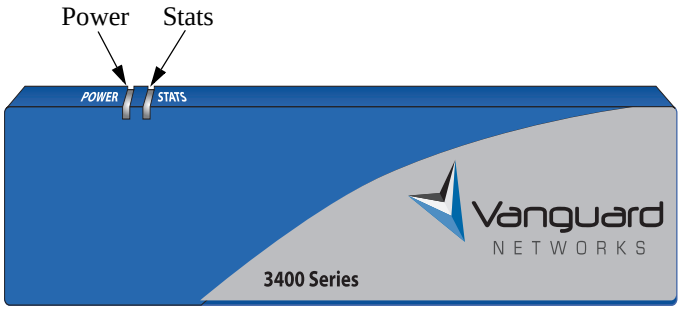


Figure 4-1. Vanguard 3400 Series LEDs

LED	Description	3400 Series System State			
		Initial PowerON	Diagnostics Executing	SW Loading	Operational Status
Power	Power OK	On	On	On	On
Stats	Diagnostics/SW Loading	On	Off	Blinking	On

Loading the Software

Introduction

This section briefly describes how to load the software into your Vanguard 3400 Series.

Note

After the software has been loaded, refer to the appropriate user document to configure and use the different software options.

Operating Software

The operating software is compressed in FLASH and loaded into SDRAM for execution. There are a variety of operating software feature sets available for the Vanguard 3400 Series.

Note

See the Software Installation and Download Guide (Part Number T0028) for information on installing the operating software.

Optional Software

You can obtain Applications Ware Packages that can be tailored to your specific needs. The Applications Ware licenses available for Vanguard products are:

- IPSAFE
- SNA+
- Multiservice (MS)

Optional licenses include:

- Security
- Voice Applications Ware
- Advanced Voice Applications

Note

For details about the contents of the license upgrade packages and how they can be obtained, refer to the latest *Software Release Notice*. A license refers to both a legal document that allows a customer to use features and to the software that contains the features.

Appendix A
Specifications

Overview

Introduction

This appendix describes the physical and electrical specifications for the Vanguard 3400 Series.

Dimensions

Figure A-1 shows the exterior dimensions of the Vanguard 3400 Series.

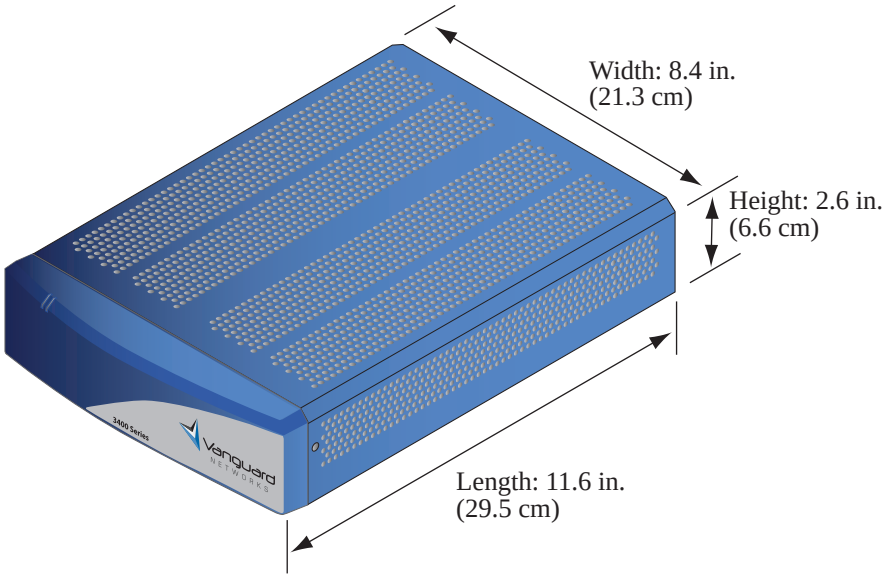


Figure A-1. Vanguard 3400 Series Exterior Dimensions

Weight

The Vanguard 3400 Series/ weights are listed below:

Vanguard	***Weight***
3400 Series with two daughtercards installed.	8 lbs

Environment

Operating temperature: 32° to 98° F (0° to 40° C)

Storage temperature: -40° to 158° F (-40° to 70° C)

Relative humidity: 5% to 90% (non-condensing)

Power Requirements	Input voltage: 5 VDC Nom. Input current: 3400 Series: 4 A Max. Maximum input power consumption: 3400 Series: 20 W

Appendix B
Software License and Regulatory Information

Overview

Introduction

This appendix provides information about the following:

- FCC Part 68 and Telephone Company Procedures and Requirements
- Product Declarations and Regulatory Information

FCC Part 68 and Telephone Company Procedures and Requirements for DSU, T1, and ISDN Interfaces

Before You Begin

Before a Vanguard 3400 Series can be connected to the network, you must do the following:

- Provide the local telephone company with the equipment's registration number.
- Order the proper connections

How to Order Connections

To order the proper connections, provide the telephone company with the following information:

- Interface type
- Required USOC jack connector number
- Service code
- Facility interface codes

Interface Type	*USOC Jack Connector*	*Service Code*	*Facility Interface Code*
56-kbps digital interface	RJ48S	6.0F	04DU5-56
ISDN U Interface	RJ49C	6.0Y	02lS5
ISDN S/T Interface	--------	6.0F	02lS5
Fractional T1 Interface	RJ48C	6.0F	04DU9-BN 04DU9-2SN

Troubleshooting Your Connection

If any of your equipment is not operating correctly, immediately remove it from the telephone line before damaging the network. If the telephone company is aware of the problem, they may temporarily disconnect your service. Whenever possible, the telephone company notifies you in advance of the disconnection.

If advance notice is not feasible, you are notified as soon as possible. Once notified, you can correct the problem. If necessary, it is your right to file a complaint with the FCC.

Customer-Provided Telephone Equipment

FCC regulations and telephone company procedures prohibit connection of customer-provided equipment to telephone company-provided coin service (central office-implemented systems). Connection to party lines is subject to state tariffs.

Occasionally, the telephone company may make changes in their equipment, operations, or procedures. If these changes can affect your equipment or service, the telephone company provides written notice so that you can make the necessary changes to maintain uninterrupted service.

Contact your telephone company if you have any questions about your telephone line.

In some circumstances, the telephone company may ask you for information about the equipment that is connected to the telephone line. Within the United States (at the request of the telephone company), you should provide your equipment's FCC registration number. This number is located on the unit's label on the bottom of the unit.

Product Declarations and Regulatory Information

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

Warnings And Cautions

The following special notices apply to all equipment handling procedures in this installation guide.

Warning

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

Avertissement

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.

Warnung

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.

CE Marking

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

CE

Figure B-1. CE Mark

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

- 73/23/EECLow Voltage Directive (Safety)
- 1999/5/EC Radio & Telecom Terminal Equipment (R&TTE)
- 89/336/EECEMC Directive

Copies of the full Declaration of Conformity are available at the following URL:

http://www.vanguardnetworks.com/

Declarations of Conformity

English

Declaration of Conformity:

Hereby, Vanguard Networks declares that this Vanguard Router is in compliance with the requirement and other relevant provisions of Directive 1999/5/EC.

Danish

Konformitetserklæring:
Hermed erklærer Vanguard Networks at indestående Vanguard Router er i overensstemmelse med de grundlæggende krav og de relevante punkter i direktiv 1999/5/EF.

Dutch

Verklaring van overeenstemming:
Hierbij verklaart Vanguard Networks dat diens Vanguard Router voldoet aan de basisvereisten en andere relevante voorwaarden van EG-richtlijn 1999/5/EG.

Finnish

Vaatimustenmukaisuusvakuutus:
Vanguard Networks vakuuttaa täten, että Vanguard Router on direktiivin 1999/5/EC keskeisten vaatimusten ja sen muiden tätä koskevien säännösten mukainen

French

Déclaration de conformité :
Par la présente, Vanguard Networks déclare que ce routeur Vanguard est conforme aux conditions essentielles et à toute autre modalité pertinente de la Directive 1999/5/CE.

German

Konformitätserklärung:
Hiermit erklärt Vanguard Networks dass der Vanguard Router die grundlegenden Anforderungen und sonstige maßgebliche Bestimmungen der Richtlinie 1999/5/EG erfüllt.

Greek

Δήλωση Συμμόρφωσης:
Δια του παρόντος, η εταιρεία Vanguard Networks δηλώνει ότι η παρούσα συσκευή (δρομολογητής) Vanguard Router πληροί τις βασικές απαιτήσεις και άλλες βασικές προϋποθέσεις της Οδηγίας 1999/5/ΕΚ.

Italian

Dichiarazione di conformità:

Con la presente Vanguard Networks dichiara che il router Vanguard soddisfa i requisiti essenzial e le altre disposizioni pertinenti della direttiva 1999/5/CE.

Portuguese

Declaração de Conformidade:

Através da presente, a Vanguard Networks declara que este encaminhador Vanguard se encontra em conformidade com os requisitos essenciais e outras disposições relevantes da Directiva 1999/5/CE.

Spanish

Declaración de conformidad:

Por la presente declaración, Vanguard Networks declara que este encaminador Vanguard cumpl los requisitos esenciales y otras cláusulas importantes de la directiva 1999/5/CE.

Swedish

Överensstämmelseförklaring:

Vanguard Networks förklarar härmed att denna Vanguardrouter överensstämmer med de väsentliga kraven och övriga relevanta stadganden i direktiv 1999/5/EG.

Industry Canada

The following information includes the Industry Canada statement regarding ISDN and T1 equipment use.

The Industry Canada label identifies certified equipment. This certification 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 might be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions might 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, could 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 can be particularly important in rural areas.

Caution

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

Mise en Garde

Les utilisateurs ne doivent pas établir de telles connexions eux-mêmes. Ils doivent contacter une personne compétente ou un électricien.

Vorsicht

Benutzer sollten nicht versuchen, diese Verbindung selbst herzustellen, sondern dazu die zuständige Aufsichtsbehörde für Elektroinstallationen bzw. einen Elektroinstallateur kontaktieren.

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.

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, CISPR 22 and EN 55022. These limits are designed to provide reasonable protection against interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician to help.

Changes or modifications not expressly approved by Vanguard Networks 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.

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

You can obtain the proper cables from Vanguard Networks.

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 Networks subsidiary or distributor.

Equipment Return Procedures

If you have questions about equipment return procedures, on-site service or unit exchange service call the Vanguard Networks 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 Networks representative.

For Locations	*Contact...*
Inside the United States	Vanguard Networks 25 Forbes Boulevard Foxboro, MA 02035 Phone (508) 964-6200.
Outside the United States	the nearest Vanguard Networks distributor. For a listing of our Sales and Service Offices, visit our Web site at: **http://www.vanguardnetworks.com/**

Expiration of Lease

To return equipment upon expiration of a lease agreement, contact the Vanguard Networks Support 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 Networks 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 Networks 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 transit must be resolved between you and the carrier. Vanguard Networks can provide you with specific packaging instructions upon request.

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