

InterChangeVS™ 3000 Series

VS3000U and VS3000S

Installation and Configuration Guide

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Introduction

Product Overview

The Control™ InterChangeVS™ 3000 virtual remote access server is a rack-mountable or stackable “network appliance” that connects via Ethernet to a host Windows NT® or Novell® NetWare® server and terminates four Basic Rate Interface (BRI) ISDN lines. Each ISDN line (“port”) consists of two 64 Kbps B channels and one 16 Kbps D channel: each B channel can be used independently, for up to eight simultaneous 64 Kbps connections, or the B channels can be bonded, for connections of up to 512 Kbps. This bandwidth, along with the flexible data compression schemes that are supported, makes the VS3000 ideal for site-to-site file transfers and graphics-intensive Internet/intranet applications.

Features

- Supports both ISDN Datalink Layer ITU-T Q.921 and ITU-T Q.931 D-channel signaling.
- Supports both North American (VS3000U) and international (VS3000S) users with the same product family and software.
- Provides the performance and features of a standalone remote access server with reduced implementation and operating costs.
- Automatic backup server switching ensures that ISDN services stay available even if the primary server goes down.
- “Hot-swapping” lets you take VS3000 units in or out of service without downing the server or interrupting other network services.
- VS-Link software gives you direct and immediate control of the VS3000, including monitoring and diagnostic functions.
- Full support for Windows NT RAS, Novell NetWare MultiProtocol Router™, and Novell NetWare Connect™ functionality.

ISDN Service Standards Supported

The VS3000U is designed for North American use and is compatible with most ISDN service standards, including:

- AT&T, National ISDN-1 (NI-1), 5ESS Custom, and EuroISDN
- Nortel, NI-1, DMS-100 Proprietary (NTI), and EuroISDN
- Siemens, NI-1, and EuroISDN

The VS3000S is designed for international use, or North American use when connected to an NT1 terminating unit, and is compatible with most international ISDN service standards, including:

- European EuroISDN (ETSI NET-3)
- AT&T, National ISDN-1 (NI-1), 5ESS Custom, and EuroISDN
- Nortel, NI-1, DMS-100 Proprietary (NTI), and EuroISDN
- Siemens, NI-1, and EuroISDN

Operating System Requirements

The InterChangeVS 3000 requires at least one network server* running one of the following operating systems:

- Windows NT (3.51 or 4.0) with Remote Access Service (RAS or RRAS).

Note: *The Windows NT 4.0 operating system is required to support Multilink PPP.*

- Citrix® WinFrame® (1.7 or later)
- Novell NetWare (3.12, 4.11, or IntranetWare™)

Note: *Contact Novell Inc. for information regarding Multilink PPP support for NetWare.*

- * *Two or more network servers are required in order to use the automatic backup server feature.*

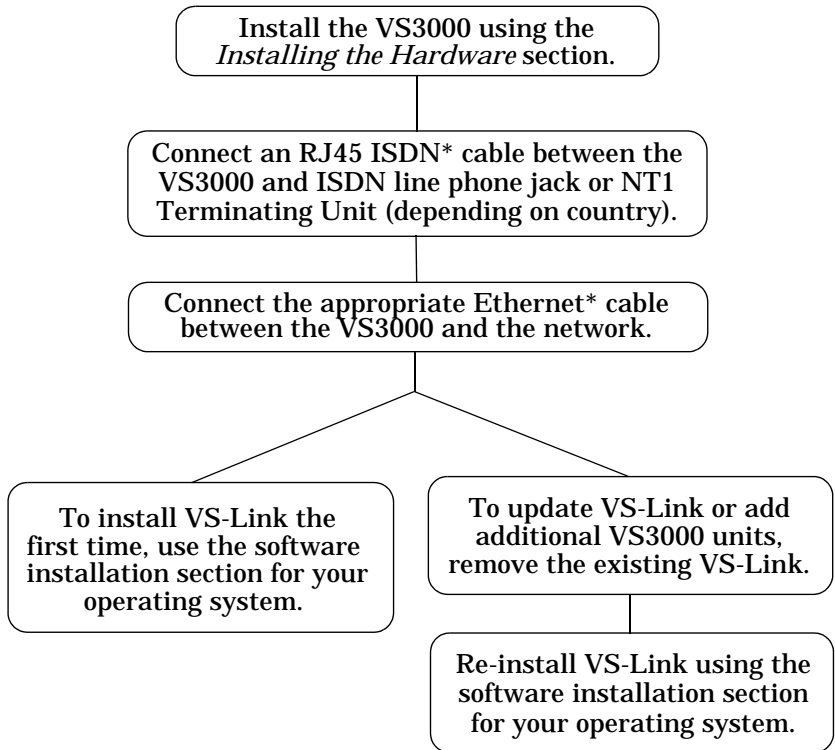
Connectivity Requirements

- One to four ISDN BRI telephone lines. (See *Working With The Phone Company*, elsewhere in this guide.)
- An Ethernet connection, either directly to a NIC card in the host server or to an Ethernet hub. (See *Installing the Hardware*, elsewhere in this guide.)

Installation Overview

The following figure illustrates the InterChangeVS 3000 hardware and software installation procedure.

Note: *The following procedure assumes that the ISDN line is already installed and operational. See the Working with the Phone Company section for more information.*



* *While ISDN and Ethernet cables may appear to be identical, they are not interchangeable. Make sure you are using the correct cable(s) in the correct locations.*

Backup Server Overview

Both the Windows NT and Novell versions of VS-Link support automatic backup server switching. If you have more than one NT or Novell server on a network, you can configure one server as the *primary* server for the VS3000, and one or more other servers as *backup* servers for the same VS3000.

Once configured, primary-to-backup server switching is automatic. In the event that the primary server goes offline, the backup server waits the amount of time you specified during setup. If the primary server does not come back online in that time, the backup server automatically resets the VS3000 (in the process terminating any calls in progress), then reloads the VS3000 using the configuration information stored on the backup server and restores ISDN service.

Backup Server Configuration and Hierarchy

To configure backup server operation, you must install the VS-Link software on the primary server and on every server that may be used as a backup server. Then, when you configure the software on a given server, you follow these steps:

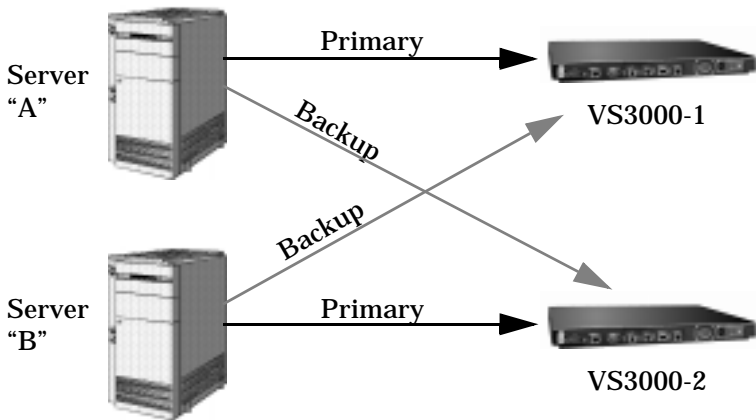
1. Select the specific VS3000 to be controlled by this server.
2. Select whether this server is the primary or backup server for the selected VS3000.
3. If a backup server, select the amount of time the server waits (Recover Time in Windows NT, Polling Time in Novell) before taking over from the primary server.

Each VS3000 must have one and only one primary server, but it can have multiple backup servers. Thus, by configuring each potential backup server with a different recover time, you can establish a hierarchy that determines which backup server to go to, and when.

Distributing the Workload

Note that primary/backup server configuration is set for *each* VS3000 on the network individually. This means that a given server can be the primary server for some of the VS3000 units on the network, and the backup server for others.

For example, in the following illustration, server “A” is the primary server for VS3000-1 and the backup server for VS3000-2, while server “B” is the primary server for VS3000-2 and the backup server for VS3000-1. Thus, the normal workload is distributed between the two servers, but if one of them goes down, the other takes over support of both VS3000 units.



Note: *VS-Link for Novell can support four VS3000 units (either primary, backup, or mixed) per Novell server. VS-Link for Windows NT can support thirty-two VS3000 units per NT server.*

Returning Control to the Primary Server

When the primary server comes back online after a service outage, backup-to-primary switching is not automatic. Instead, you must go to the primary server and perform a manual procedure to reassert control over the VS3000.

On Windows NT networks, access the **ISDN Monitor** program and use the **Reset** option.

On Novell networks, load the `vs3kcfg.nlm` utility and use the **Primary, Force Load** option.

Software or Document Updates

For information that is not in this *Guide*, see **README** and/or **Help** files on the installation media. In particular, the Windows NT version of VS-Link and the Windows NT ISDN Monitor program include significant online help.

Control manuals and other documents are available in electronic form on the Control web site. Driver software updates can be downloaded at no charge from the Control ftp site. Always check the web and ftp sites to make sure that you have the current driver and documentation.

The current released version of the software is stored in the **VS3000** directory. If a newer version has reached the beta testing stage, it can be found in the **BETA** directory. Beta software is made available on an **“as-is”** basis and users of beta software assume all risks and liabilities relating thereto.

Note: *Downloadable driver software files are stored in either zipped (filename.zip) or self-extracting zip (filename.exe) format. You must extract the zipped files before installing a downloaded file. For more information, see the appropriate section for your network operating system.*

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Working with the Phone Company

This section discusses ordering the ISDN line and collecting information needed for software installation

Ordering the ISDN Line

For your ISDN installation to go smoothly, use the table below to record information from your service provider.

Note: For North American installations, your ISDN line should follow the NIUF generic U package (unless it is cost-prohibitive). This package is often referred to as Easy ISDN or EZ-ISDN1. In some cases, this service is also referred to as Basic Rate (2B+D) ISDN service. With 2B+D, make sure that you order the version that has EKTS (electronic key touch service) disabled or that it does not include EKTS (such as, ring indicator).

Record the following information as supplied by your ISDN service provider. In most cases, this information should be posted at the demark location.

Table 1. ISDN Software Installation Information

Description	Value
ISDN Installation Type (for example, EZ-ISDN1)	<input type="radio"/> EZ-ISDN1 <input type="radio"/> 2B+D (without EKTS) <input type="radio"/> Other _____
ISDN Line Type	<input type="radio"/> BRI
ISDN Help Desk Phone Number	
Circuit ID	
Switch Vendor (hardware type)	<input type="radio"/> ATT 5ESS <input type="radio"/> Nortel DMS-100 <input type="radio"/> Siemens (EuroISDN)
Network Type (software)	<input type="radio"/> National ISDN1 (NI-1) <input type="radio"/> ATT Custom <input type="radio"/> DMS-100 Proprietary (NI-1) <input type="radio"/> EuroISDN (NET3)

Table 1. ISDN Software Installation Information (Continued)

		Description		Value
		Windows NT	Novell	
Port 1	Primary SPID*	SPID* 1		
	Primary Directory Number**	Directory Number** 1		
	Secondary SPID	SPID 2		
	Secondary Directory Number	Directory Number 2		
Port 2	Primary SPID	SPID 3		
	Primary Directory Number	Directory Number 3		
	Secondary SPID	SPID 4		
	Secondary Directory Number	Directory Number4		
Port 3	Primary SPID	SPID 5		
	Primary Directory Number	Directory Number 5		
	Secondary SPID	SPID 6		
	Secondary Directory Number	Directory Number 6		
Port 4	Primary SPID	SPID 7		
	Primary Directory Number	Directory Number 7		
	Secondary SPID	SPID 8		
	Secondary Directory Number	Directory 8		

* *The SPID (Service Provide Identifier) is an up-to-14-digit number resembling a telephone number and consisting of the SPID, SPID suffix, and TID. In some cases, your phone company may also provide you with an ISDN sub-address for each SPID. SPIDs are required for North American installations only.*

** *The Directory Number (also known as the ISDN directory number or ISDN address) is the 7-digit "local phone number" portion of the SPID.*

Installing the Hardware

Hardware Installation Overview

Perform the following steps to install and configure your VS3000:

- Connect up to four VS3000 ISDN ports to the ISDN lines.
- Connect the appropriate Ethernet cable between your server or hub and the VS3000.
- Install the VS-Link software (discussed in the appropriate software installation section).

Identifying VS3000 Models

There are at present two versions of the VS3000: the VS3000U, for North American use, and the VS3000S, for international use (or North American use with an NT1 terminating unit).

If you are unsure of which version of the VS3000 you have, check the Network Address (MAC) label on the back on the unit. The network address is coded as follows:

VS3000U	00 C0 4E 01 xxxx	North America
VS3000S	00 C0 4E 03 xxxx	International

FCC Notice (Consumer Instructions)

1. This equipment complies with Part 68 of the Federal Communications Commission Rules. On the outside of the equipment is a label containing the FCC registration number. The information must be provided to the telephone company:

FCC Registration Number: 5EVUSA-24608-DE-N
FIC: 021S5
SIC: 6.0 N
USOC Jack: RJ49C

2. FCC-compliant cables are provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 Compliant. See the *Building the Cable* section for details.

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 is not 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.
4. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.
5. If experiencing trouble with the InterChangeVS-3000U, please contact Control Corporation, at (612) 631-7654. If the equipment is causing harm to the network, the telephone company may request you to remove the equipment from the network until the problem is resolved.
6. No repairs are to be made by you. Repairs are to be made only by Control or its licensees. Unauthorized repairs void registration and warranty.
7. This equipment cannot be used for public coin service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

Safety Precautions

Avoid contact with electrical current by using the following guidelines:

- Never install telephone jacks in wet locations unless that jack is specifically designed for wet locations.
- Use caution when installing or modifying telephone lines.
- Use a screwdriver and other tools with insulated handles.
- Do not place telephone wiring or connections in any conduit, outlet or junction box containing electrical wiring.

Note: *Do not work on your telephone wiring at all if you wear a pacemaker. Telephone lines carry electrical current.*

Installation of inside wire may bring you close to electrical wire, conduit, terminals and other electrical facilities. Extreme caution must be used to avoid electrical shock from such facilities. You must avoid contact with all such facilities.

- Telephone wiring must be at least 6 feet from bare power wiring or lightning rods and associated wires, and at least 6 inches from other wire (antenna wires, doorbell wires, wires from transformers to neon signs), steam or hot water pipes, and heating ducts.

- Do not place a jack where it would allow a person to use the telephone while in a bathtub, shower, swimming pool, or similar hazardous location.
- Protectors and grounding wire placed by the service provider must not be connected to, removed, or modified by the customer.

Warning: Do not touch telephone wiring if lightning is present!

Installing the VS3000

Use the following procedure to connect the VS3000 to your network.

1. Write down the serial number and Network (MAC) of the virtual server in the event that you need to call technical support.

Note: You can use the blank, peel-off sticker that was shipped with the VS3000.

Table 2. Model and Serial Numbers

Serial Number*	Network (MAC) Address*
	00 C0 4E ____ ____

* The identification tag is located on the rear of the VS3000 unit.

2. Optionally, mount the VS3000 into the rack using the enclosed mounting brackets or mount the rubber feet.

Warning: If mounting the VS3000 into a rack mount unit, make sure that the rack is not top heavy.

- a. Attach the L brackets to the VS3000 using the screws supplied with the unit.



- b. Attach the L brackets into your rack.



OR

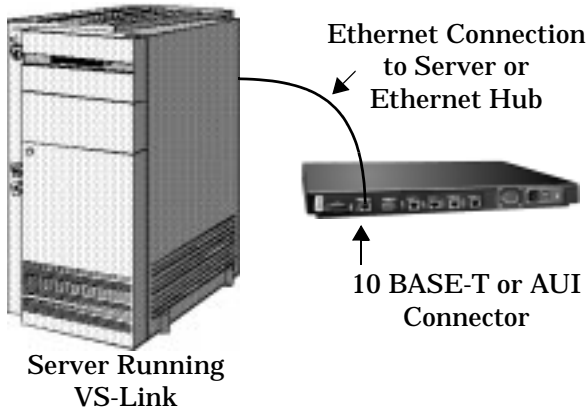
- Attach the adhesive feet to the depressions on the bottom of the VS3000.

Note: You can mount the VS3000 facing forward or to the rear depending on your needs. Make sure that you do not obstruct the cooling fan.

3. Connect an Ethernet cable from the appropriate Ethernet connection (10Base-T or AUI) on the VS3000 to your server or Ethernet hub.

Note: The Ethernet cable is not supplied by Comtrol. Depending on the model of VS3000 you have purchased, Comtrol supplies one or more ISDN cables. While Ethernet and ISDN cables may appear to be identical, they are not interchangeable, and an ISDN cable will not work if used in place of an Ethernet cable.

Note: If connecting directly to the server, an Ethernet adapter (NIC card) is required. This is not supplied by Comtrol.



Note: If you need information about connectors or pinouts, see the Cabling section.

Warning: Turn the power switch on the VS3000 virtual server OFF (0).

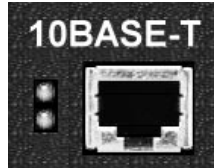
4. Connect the ISDN cable(s) shipped with the VS3000 between the ISDN ports and ISDN line phone jacks or NT1 termination units.

Note: The VS3000 diagnostics require that PORT 1 have an active ISDN line connected. Make sure that you keep track of which line goes into which PORT. The associated SPID numbers are not interchangeable.

5. Connect the power cable to the unit and plug it into a power source.

Note: All VS3000 models include autoswitching power supplies. You may need to select the appropriate power cable for your location, but the VS3000 automatically senses and switches to the correct line voltage and cycle frequency.

6. Turn the VS3000 power switch to the on (1) position and watch the LED lights (on the back/front of the VS3000) for the following activity during the self-diagnostic power up sequence.
 - a. All of the LEDs flash on for one second and then off, to indicate that the LEDs work.
 - b. If using a 10Base-T Ethernet connection, the lower LED remains lit to indicate that you have link polarity on the connection.



Note: Check the link polarity at the hub to make sure that there is Ethernet polarity at both ends of the Ethernet cable.

If the lower LED is off, then the unit is not connected to a LAN system or it is connected by the AUI port. If using an AUI connection to the server, you can determine whether the line is working by using an AUI to 10Base-T convertor box.

- c. The D channel LEDs flash in sequence from port to port during a test of ISDN components and verification of the ISDN lines. This takes about 30 seconds.



- d. All of the LEDs turn off for a moment.

Note: If all of the LED lights on any particular port flash on and off several times in sequence (B1, B2, and D) before the next step, there may be a problem with the ISDN line or the hardware for that port. It indicates that the ISDN hardware could not synchronize with the central office (CO).

- e. The B1 LED on PORT 1 flashes to indicate that it is waiting for a control program (VS-Link) to download.

- f. Use the following table to determine the problem if Steps a through f did not occur.

Table 3. LED Display for Fatal Errors

LEDs Lit	Description
PORT 1: B1	Indicates a RAM self-test failure or other mainboard error. Implemented at primary BOOT level prior to dependency on RAM.
PORT 1: B1 & B2	Ethernet Controller hardware initialization failure. Implemented at secondary BOOT level during normal initialization.

- 7. Go to the appropriate *VS-Link Installation* section for your operating system.

Replacing Units in Service (“Hot-Swapping”)

In the event that a VS3000 needs to be removed from service, it is possible to replace it with another VS3000 without taking down the network server.

For more information, including step-by-step instructions, see the section titled “Replacing Units in Service” in the chapter of this guide relating to your network operating system.

Primary and Backup Servers

Both the Windows NT and Novell versions of the VS-Link software support primary and backup servers. That is, if you have multiple servers on a network, one server is designated as the *primary* server for a given VS3000, and one or more other servers can be designated as *backup* servers for the same VS3000. In the event that the primary server goes offline, the backup server automatically takes over control of the VS3000 and restores ISDN service.

For more information on setting up primary and backup servers, see the chapter of this guide relating to your network operating system.

Notes:

- Each VS3000 must have one and only one primary server.
- Each VS3000 can have several backup servers, and you can use the *recover time* (NT) or *polling time* (Novell) to establish a hierarchy for selecting which backup server to go to and in which order.
- The same server can be the primary server for some VS3000 units and the backup server for other VS3000 units on the same network.

VS3000 Specifications

Hardware Operating Conditions

The following table illustrates InterChangeVS 3000 operating conditions.

Table 4. VS3000 Operating Conditions

Condition	Value
Heat output	36.8 BTU/Hr
Air temperature: System on System off	0 to 40°C -20 to 85°C
Altitude	0 to 10,000 feet
Mean Time between Failures	9.7 years
Humidity (non-condensing): System on System off	8% to 80% 20% to 80%

Hardware Specifications

The following table illustrates the specifications.

Table 5. VS3000 Specifications

Topic	Specification
ISDN lines/VS3000	From 1 to 4
Baud Rate	Up to 512 Kbps
Line Voltage	100 - 240 VAC
Current Consumption	90 mA (at 120 VAC)
Power Consumption	10.8 W
Ethernet Host Interface	10Base-T or AUI
Dimensions (without feet)	16.75" x 11" x 1.75" (without brackets)
Weight	5 lbs

Electromagnetic Compliance

The following tables illustrate electromagnetic Compliance for the VS3000U (“U” interface) and VS3000S (“S/T” interface).

Table 6. VS3000U Electromagnetic Compliance

Topic	Specification
Canadian EMC requirements	Yes
FCC Class A certification	Yes
FCC Part 68 certification	Yes
UL and CUL Recognized	Yes
Surge protection	Meets standard ISDN requirements.

Table 7. VS3000S Electromagnetic Compliance

Topic	Specification
EU ISDN Compliance: I-CTR 3 (94/797/EC)	Yes
Emissions: EN55022 Class A	Yes
Immunity: EN50082 (801-2 ESD, 801-3 RF, and 801-4 FT)	Yes
Safety: EN60950	Yes
FCC Class A certification	Yes
Surge protection	Meets standard ISDN requirements.

Power Supply Requirements

All VS3000 models include an auto-switching power supply that automatically senses the line voltage and cycle rate and sets itself accordingly. No manual switching is required. However, depending on the model you purchase you may receive one or more AC power cords, and it may be necessary to determine and select the appropriate power cord for use in your area.

Building Cables

This section contains information on how to build VS3000 cables.

Note: ISDN and Ethernet cables may appear to be identical, but they are not interchangeable. Ethernet cables may in some cases work in place of ISDN cables, but ISDN cables will not work for Ethernet. Depending on the model of VS3000 you purchase, you may receive one or more ISDN cables with the unit. **DO NOT** attempt to use one of these cables as an Ethernet cable.

ISDN Cable Specifications

If building your own ISDN cables, make sure that you use Category 3 (or better), unshielded twisted-pair cable.

ISDN (Port) Connector Pinouts

Use the following table and figures for pinout information for the RJ45 connectors on the VS3000.

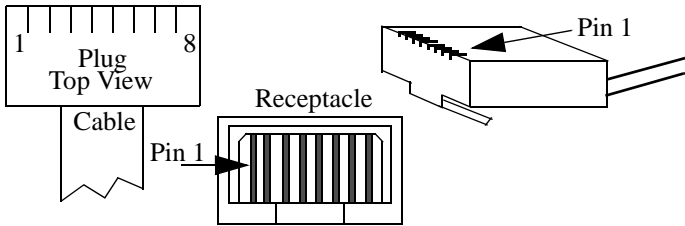


Table 8. ISDN Port RJ45 Connector Pinouts

Pins	VS3000U	VS3000S	NT1 Signals
1 and 2	Not Used	Not Used	Not Used
3	Not Used	Tx+	Rx+
4	U Connection	Rx+	Tx+
5	U Connection	Rx-	Tx-
6	Not Used	Tx-	Rx-
7 and 8	Not Used	Not Used	Not Used

Ethernet Cable Specifications

For Ethernet, use an unshielded twisted-pair (UTP) cable with a maximum length of 100 meters or approximately 328 feet. The following table illustrates UTP cable specifications.

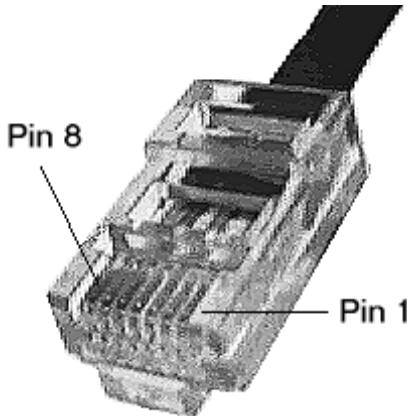
Table 9. Ethernet Cabling Specifications

Cable	Specification
Type	100% UTP with two pairs
Maximum length	100 meters or 328 feet
Minimum length	0.6 meters or 23 feet

Ethernet 10Base-T Connector Pinout

Table 10. Ethernet Port RJ45 Connector Pinouts

Pins	VS3000 10Base-T
1	TxD+
2	TxD-
3	RxD+
4 and 5	Not Used
6	RxD-
7 and 8	Not Used

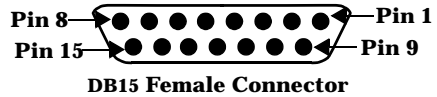


Ethernet AUI Connector Pinout

This section shows an illustration of the female, high-density DB15 connector and a listing of its different signals.

Table 11. Ethernet Port DB15 Connector Pinouts

Pin	Signals
1	GND
2	CI1+
3	DO+
4	DGND
5	DI+
6	DGND
7	Not Connected
8	DGND
9	CI-
10	DO-
11	DGND
12	DI-
13	+12V
14	DGND
15	Not Connected



Remote Connector

The DB9 port labeled “Remote” is reserved for Comtrol Corporation repair and maintenance use. No user-accessible signals are present on this port.

Troubleshooting

This section discusses the following topics:

- Isolating and resolving problems
- Understanding the LED displays
- Obtaining software and/or document updates
- Placing a call to Control Technical Support

Problem Resolution Checklist

If installation fails or the VS3000 does not operate as expected, try the following before calling the Control technical support line:

- Check for proper cable connections. In particular, check to make sure that you have an *Ethernet* cable on the Ethernet port and *ISDN* cables on the ISDN ports. The two types of cables are easy to swap by accident.
- Turn the VS3000 on and off and watch for errors on the LEDs using the *Understanding the LEDs* subsections. (These are found on the following pages.)
- Check the VS-Link software to make sure that the Network Address (MAC) in the software matches the Network Address on the VS3000.
- Verify that you have the correct model (VS3000U or VS3000S) for your locale. The VS3000U is for North American use only. The VS3000S is for international use, but requires an NT1 terminating unit. For more information see *Installing the Hardware*.
- If you are operating in a multiple-server environment, check to make sure that you are controlling the VS3000 from its *primary* server, that there is only *one* primary server assigned to this particular VS3000, and that no backup server has pre-empted the primary server.

Note: *Backup-to-primary switching is not automatic. Once a backup server takes over control of a VS3000, you must follow a manual procedure to restore control to the primary server. This procedure differs depending on your network operating system. See the chapter for your operating system for more information.*

- If you are operating in a multiple-server environment and a backup server has taken over control of the VS3000, check (if possible) to make sure the backup server has the same Port, SPID, Directory Number, and MAC configuration as the primary server.
- If this is a Windows NT installation, use the **ISDN Monitor** program to trace and log the messages being passed between the NT server and the VS3000. Use the *ISDN Cause Codes* section of this manual to interpret the results. Also note that other error messages may be displayed in the **Event Log**.
- If this is a Novell installation, use the **vs3kcfg.nlm** utility to trace and log the messages between passed between the server and the VS3000. Use the *ISDN Cause Codes* section of this manual to interpret the results. Also note that other error messages may be displayed in the **Console Log**.
- If you have more than one VS3000, follow the *Replacing Units in Service* procedure for your operating system to “hot-swap” VS3000 units. If this corrects the problem, the VS3000 you have removed from service may be defective or need repair.
- When all else fails, remove and reinstall the VS-Link software.

Understanding the Ethernet LEDs

The following table describes Ethernet LED activity for the VS3000.

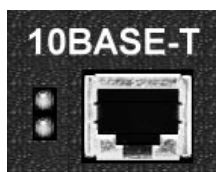


Table 12. Ethernet LED Descriptions

LED	Indicator	Description
10Base-T (Upper)	Flashing	Flashes briefly during transmissions from the unit as a general indicator of activity.
10Base-T (Lower)	On	VS3000 is correctly attached to the LAN by the RJ45 10Base-T connector.
10Base-T (Lower)	Off	Connected to the AUI connector or the 10Base-T connection is not connected to the LAN properly.

Understanding the Port LEDs

The following table describes PORT LED activity after:

- VS-Link is installed and configured.
- Operating system configuration is completed for the VS3000.



Table 13. Port LED Descriptions

Port LEDs	Status	Description
B1 or B2	Off	Normal standby state - no calls pending or established.
	Flashing	B1 or B2 selected for a call, but not yet connected. A call has been initiated and the CO has assigned the B1 or B2 channel as the channel that the call will connect on. If the call connects normally, this state may not even be seen because the connection happens so fast.
	On	Call connected on B1 or B2.
D	Off	Line disconnected or failed. Bad Line; layer 1 not up. This can occur if the VS3000 is not connected to the CO, or if there are hardware or software problems preventing synchronization with the CO.
	Flashing	Equipment failed or not configured properly. Bad SPID; layer 1 is activated, but Layer 2 is not up yet. Layer 2 is the LAPD layer that ensures a reliable data path to the CO. In Layer 2 there is polling going on between the CO and hardware all the time. This state could indicate configuration problems.
	On	Normal activity. The VS3000 is ready for use; layer 1 and 2 are up. In this state, both B channels are available for use.

Obtaining Software and Document Updates

For information that is not in this guide, see **README** and/or **Help** files on the installation media. In particular, the Windows NT version of VS-Link and the Windows NT ISDN Monitor program include significant online help.

Control manuals are available in electronic form on the Control web site. VS-Link software and manual updates can be downloaded at no charge from the Control ftp site. Always check the web and ftp sites to make sure that you have the current software and documentation.

The current released version of the software is stored in the **VS3000** directory. If a newer version has reached the beta testing stage, it can be found in the **BETA** directory. Beta software is made available on an “**as-is**” basis and users of beta software assume all risks and liabilities relating thereto.

Note: *Downloadable driver software files are stored in either zipped (filename.zip) or self-extracting zip (filename.exe) format. You must extract the zipped files and create an installation diskette before installing a downloaded file. For more information, see the appropriate section for your network operating system.*

Placing a Support Call

Before you call Control technical support, please have the following information available. (Much of this information should already be in the **ISDN Software Installation Information** table in the *Working With The Phone Company* section of this guide.)

Table 14. Support Call Information

Item	Value
Operating System type and release number	
VS-Link release number	
Computer make and model	
ISDN Installation Type	<ul style="list-style-type: none">o EZ-ISDN1o 2B+D (without EKTS)o Other _____
ISDN Line Type	<ul style="list-style-type: none">o BRI
ISDN Help Desk Phone Number	
Circuit ID	

Table 14. Support Call Information

Item		Value	
Switch Vendor (hardware type)		<ul style="list-style-type: none"> o ATT 5ESS o Nortel DMS-100 o Siemens (EuroISDN) 	
Network Type (software)		<ul style="list-style-type: none"> o National ISDN1 (NI-1) o ATT Custom o DMS-100 Proprietary (NI-1) o EuroISDN (NET3) 	
Windows NT	Novell		
Port 1	Primary SPID*	SPID 1*	
	Primary Directory Number**	Directory Number** 1	
	Secondary SPID	SPID 2	
	Secondary Directory Number	Directory Number 2	
Port 2	Primary SPID	SPID 3	
	Primary Directory Number	Directory Number 3	
	Secondary SPID	SPID 4	
	Secondary Directory Number	Directory Number 4	
Port 3	Primary SPID	SPID 5	
	Primary Directory Number	Directory Number 5	
	Secondary SPID	SPID 6	
	Secondary Directory Number	Directory Number 6	
Port 4	Primary SPID	SPID 7	
	Primary Directory Number	Directory Number 7	
	Secondary SPID	SPID 8	
	Secondary Directory Number	Directory Number 8	

- * *The SPID (Service Provide Identifier) is an up-to-14-digit number resembling a telephone number and consisting of the SPID, SPID suffix, and TID. In some cases, your phone company may also provide you with an ISDN sub-address for each SPID. SPIDs are required for North American installations only.*
- ** *The Directory Number (also known as the ISDN directory number or ISDN address) is the 7-digit "local phone number" portion of the SPID.*

After you have gathered this information, contact Control:

Control Corporate Headquarters

Internet URL: **www.comtrol.com**

email: **support@comtrol.com**

FTP site: **ftp.comtrol.com**

FAX: (612) 631-8117

Phone: (612) 631-7654

Control Europe

Internet URL: **www.comtrol.co.uk**

email: **support@comtrol.co.uk**

FAX: +44 (0) 1 869-323-211

Phone: +44 (0) 1 869-323-220

Notices

This section contains information about the following topics:

- Part 15 FCC
- RFI & CISPR-22
- Canadian guidelines
- Underwriters Laboratory
- Safety issues
- Return Procedures (Canada)

Radio Frequency Interference (RFI) (FCC 15.105)

The InterChangeVS 3000U virtual server has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules.

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. 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 and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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 for help.

Radio Frequency Interference (RFI) (CISPR-22)

The InterChangeVS 3000S virtual server has been tested and found to comply with the limits for Class A digital devices. These limits are designed to provide reasonable protection against harmful interference in a residential 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. 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 and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and the 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 for help.
-

Labeling Requirements (FCC 15.19)

The virtual servers comply with part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
 - This device must accept any interference received, including interference that may cause undesired operation.
-

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Control Corporation may void the user's authority to operate this equipment.

Cables (FCC 15.27)

This equipment is certified for Class A operation when used with unshielded cables.

InterChangeVS 3000U - Canada

The InterChangeVS 3000U virtual server connects directly to off-premise Common Carrier facilities using the two-wire ISDN "U" interface.

Before installing the VS3000U, you 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 case, the buildings inside wiring associated with a single line individual server may be extended by

means of a certified connector assembly (telephone extension card). 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 be aware 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.

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

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out in the interference-causing equipment standard entitled: "Digital Apparatus," ICES-003 of Industry Canada.

InterChangeVS 3000S - Canada

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out in the interference-causing equipment standard entitled: "Digital Apparatus," ICES-003 of Industry Canada.

The InterChangeVS 3000S virtual server is intended to be connected to the ISDN "S" or "T bus, and not directly to any off-premise Common Carrier facilities. As a result of this restriction, the InterChangeVS 3000S is exempt from certification under the Canadian DOC CP-03, Part VI as per DOC CP-01 Issue 7, Section 4.15.2.

When connecting the InterChangeVS 3000S virtual server to the network, avoid contact with the telecommunications lead wire. Grasp the insulated part of the jack, and do not contact the back of the circuit board. Telephone wiring can carry dangerous voltages from electrical faults or lightning.

The InterChangeVS 3000S virtual server is equipped with a standard 8-pin RJ45 jack for connection to the ISDN network. If you need to add wiring to your facility, refer to the National ISDN Users Forum document NIUF 433-94 ISDN Wiring and Powering Guidelines (Residence and Small Business).

Note: *The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational, and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements documents. The*

Department does not guarantee the equipment will operate to the user's satisfaction.

Underwriters Laboratory

The VS3000 is Underwriters Laboratory "UL" listed.

Important Safety Information

To avoid contact with electrical current:

- Never install electrical wiring during an electrical storm.
- Never install telephone jacks in wet locations unless that jack is specifically designed for wet locations.
- Use caution when installing or modifying telephone lines.
- Use a screwdriver and other tools with insulated handles.
- You and those around you should wear safety glasses or goggles.
- Do not place telephone wiring or connections in any conduit, outlet or junction box containing electrical wiring.

Note: *Do not work on your telephone wiring at all if you wear a pacemaker. Telephone lines carry electrical current.*

Installation of inside wire may bring you close to electrical wire, conduit, terminals and other electrical facilities. Extreme caution must be used to avoid electrical shock from such facilities. You must avoid contact with all such facilities.

- Telephone wiring must be at least 6 feet from bare power wiring or lightning rods and associated wires, and at least 6 inches from other wire (antenna wires, doorbell wires, wires from transformers to neon signs), steam or hot water pipes, and heating ducts.
- Before working with existing inside wiring, check all electrical outlets for a square telephone dial light transformer and unplug it from the electrical outlet. Failure to unplug all telephone transformers can cause electrical shock.
- Do not place a jack where it would allow a person to use the telephone while in a bathtub, shower, swimming pool, or similar hazardous location.
- Protectors and grounding wire placed by the service provider must not be connected to, removed, or modified by the customer.

Warning: *Do not touch un-insulated telephone wiring if lightning is present!*

External Wiring

Any external communications wiring you may install needs to be constructed to all relevant electrical codes. In the United States this is the National Electrical Code Article 800. Contact a licensed electrician for details.

The InterChangeVS 3000 virtual server is equipped with one standard 8-pin RJ45 cable for connection to the ISDN jack; check with your service provider if you need pinout information.

Return Procedures

To qualify for the warranty, the original purchaser must follow the procedure outlined below:

1. Control must be notified in writing within thirty (30) days of the date that the defect is discovered or contacted for an RMA number. Control will then issue a Return Material Authorization (RMA) Number which the purchaser must include with all correspondence and display on the outside of the shipping container when returning the card.
2. All Control cards must be shipped freight and insurance prepaid, in the original shipping container, or in a container providing equal or better protection, with the Return Material Authorization (RMA) Number displayed on the outside of the container in a prominent manner.
3. A written description of the defect together with a copy of your receipt or other proof of purchase, and the name of the dealer which sold you the Control product, must be shipped with the card. All defects must be reproducible at the Control repair center to qualify for the limited warranty. Ship the card to the appropriate shipping address:

Control Corporation
Distribution/Repair
1791 Buerkle Circle
White Bear Lake, MN 55110

or

Gandacar Consulting, Limited
189 Lake Avenue East
Carlton Place, Ontario Canada
K7C 1J7
Phone: 800-563-5102

Control will return a card which qualifies under this warranty freight and insurance prepaid. Control will repair or replace the cards that do not qualify under the terms of this warranty at the

option of the purchaser, in which case the purchaser will pay the cost of repair or replacement, and return freight and insurance.

This limited warranty is in lieu of all other warranties and conditions expressed, implied or statutory including merchantability, fitness for purpose, non-infringement, course of dealing, trade or performance and all other liabilities of Control all of which are hereby disclaimed.

In no event will Control be liable for damages, including lost profits, lost savings or other special, punitive, incidental, or consequential damages arising out of the use of or inability to use the Control card, even if Control or an authorized dealer has been advised of the possibility of such damages, or for any claim by any other party. This warranty gives you specific legal rights and you may also have other rights that vary from state to state (U.S.) or in your home country.

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