

InterChangeVS™ 2000 V.34 North America

Hardware Installation Card

Product Overview

The InterChangeVS 2000 is an analog multimodem virtual server that can be stacked or mounted in a rack. This VS2000 contains eight 33.6K bps modem ports.

VS2000 features include:

- Eight RJ11 modem ports ready to connect to your phone lines
- Diagnostic LEDs

VS-Link software provides the following features, which are discussed in the *VS2000 VS-Link Installation and Configuration Guide*:

- Backup server
- “Hot-swapping”
- Individual modem reset capability
- Terminal program (WCOM32)
- Port Monitor program (PORTMON)

See the *VS2000 VS-Link™ Installation and Configuration Guide* for information about installing the software for this product and for reference information for the AT command set.

Installing VS2000 Hardware

Use the following procedure to connect the VS2000.

1. Record the model and serial numbers of the VS2000.

Serial Number*	VS2000 Network Address*
	00 C0 4E

* Identification tags are located on the back panel. You can write this information on the blank sticker shipped with the VS2000.

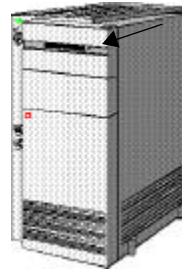
2. Optionally, mount the VS2000 into the rack using the enclosed mounting brackets. The unit is designed to install in the rack with the front or back of the unit facing the front of the rack.

Warning: If mounting the VS2000 into a rack mount unit, make sure the rack is not top heavy.

3. Connect the cable from the appropriate Ethernet connection (10Base-T or AUI) on the VS2000 to your server or Ethernet hub.

Note: If connecting the VS2000 directly to the server, an **Ethernet crossover** cable is required.

Server Running VS-Link



Ethernet Connection to Server or Ethernet Hub



Note:

4. Connect the power cord.
5. Go to the **Power-On Diagnostics** discussion.

Power-On Diagnostics

When you switch a VS2000 on, it performs a self-diagnostic. The results are displayed via the LED lights on the back panel. If the unit is working correctly, the following events should take place:

1. Turn the power switch to the On position.
2. All LEDs should light up briefly, to show that they are working.
3. Both 10Base-T lights should remain lit after the port LEDs go out, while the unit establishes the Ethernet connection and polarity.
4. If using 10Base-T cabling, the lower LED remains lit to indicate that the Ethernet connection is established and polarity is correct.
5. The Port 2 LED begins flashing, to indicate that the VS2000 is waiting for the server to initiate VS-Link communications.

Note: The following steps only occur after you have installed the VS-Link software. Use the VS2000 VS-Link Installation and Configuration Guide for software installation information.

After installing the software, turn off the VS2000 and verify the full diagnostics sequence.

6. The upper 10Base-T LED flashes briefly, as the server acquires control of the VS2000.
7. The port LEDs begin flashing in a “sweeping” sequence, to indicate that the unit is operating normally.

Note: See the following tables if you are not seeing the LED sweeping sequence activity.

LED	Light	10Base-T LED Description
Upper	Flashes Briefly	During the power on cycle (first few seconds after the power is turned on), this LED flashes briefly to display link polarity on the 10Base-T connection.
Upper	Flashing	The light flashes briefly during transmissions as a general indicator of activity.
Lower	On	VS2000 is correctly attached to the LAN by the RJ45 10Base-T connector.
Lower	Off	VS2000 is not connected to the LAN properly or it is connected to the AUI port.

Note: If using an AUI connection to the server, you can determine proper polarity by using an AUI to 10Base-T converter box.

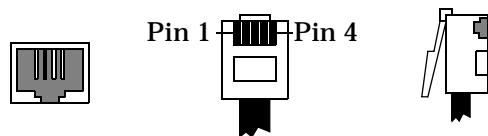
Indicator	Ports 1 through 8 LED Description
Flash Briefly	All LEDs light briefly during the power-on sequence and then turn off.
1 LED Lit*	RAM self-test failure or mainboard error.
2 LEDs Lit*	Ethernet hardware initialization failure.
3 LEDs Lit*	A hardware self-test failure.
4 LEDs Lit*	A flash memory configuration error.
All Flashing/ Individual Flashing	All LEDs on for about 0.5 seconds then one or more individual port LEDs on for about 0.5 seconds indicates that the individual port or ports, whose LED is flashing, encountered a problem during port/modem initialization.

* The LEDs light up for a about a minute and then the hardware resets and the same cycle repeats.

Modem Cables

The VS2000 modem ports use standard telephone-type unshielded twisted-pair cables with RJ11 modular connectors. These cables can be purchased anywhere commercial or consumer telephone products are sold.

If you choose to build your own cables, use the following information:



The connector pinouts are as shown below:

Pins	RJ11 Connector Signals
1	Not used
2	Ring
3	Tip
4	Not used

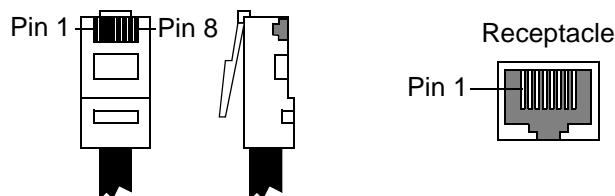
When building cables, use Category 3 (or better) unshielded wiring.

Ethernet Crossover Cable

If you are connecting from the VS2000 10Base-T connector directly to the NIC card in the server, you need a crossover cable, wired as follows:

Table 1. Ethernet Crossover Cable

Pin	Connects to Pin
1	3
2	6
3	1
6	2



Remote Connector

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

Operating Conditions

This table illustrates VS2000 operating conditions:

Environmental Condition	Value
Air temperature: System on System off	0 to 40°C -20 to 85°C
Altitude	0 to 10,000 feet
Humidity (non-condensing): System on System off	8% to 80% 20% to 80%

Electromagnetic Compliance

This table lists electromagnetic compliance certifications:

Electromagnetic Compliance	Status
Canadian EMC requirements	Yes
FCC Class A certification	Yes
FCC Part 68 certification	Yes
Ringer Equivalency Number	0.8B
UL Listed	Yes
Surge protection	ESD surge protection exceeding 20 KV

Hardware Specifications

The following table illustrates hardware specifications:

Topic	Hardware Specifications
Modems/VS2000	8
Number of VS2000/server	Dependent on operating system
Telco connector	RJ11
Baud rate	33.6K bps (Maximum)
Device driver control: Data bits Parity Stop bits	7 or 8 Odd, Even, None 1 or 2
Heat output	81.84 BTU/Hr
Mean time between failures	7 years
Power consumption	24 W
Current consumption	200 mA (at 120 VAC)
Line voltage	100 - 240 VAC
Ethernet host interface	AUI or 10Base-T (10 MB/sec)
Weight	5 lbs
Dimensions (without feet or brackets)	16.75" x 11" x 1.75"

Safety Notices

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. Avoid contact with electrical current by following these guidelines:

- Use 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.*

- 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.

CAUTION: *Do not touch telephone wiring during lightning!*

FCC Notices

Radio Frequency Interference (RFI) (FCC 15.105)

The VS2000 has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the Federal Communications Commission rules.

The VS2000 generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this card, 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, you are encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance 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 VS2000 complies 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 Comtrol 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.

FCC Part 68 Notice

1. This equipment complies with Part 68 of FCC rules. On the bottom panel of the unit is a label containing the FCC registration number, ringer equivalence number, and the USOC jack code.
2. The VS2000 uses FCC compliant modular plugs, it is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is FCC Part 68 compliant.
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 you 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 the 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 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. If so, contact Comtrol Corporation at 651-631-7654.

6. No repairs are to be made by you. Repairs are to be made only by Comtrol or its licensees. Unauthorized repairs void the warranty and the registration.
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.)

VS2000 - Canada

The VS2000 connects directly to off-premises Common Carrier facilities using the standard two-wire telephone connection. In some cases, the building's inside wiring associated with a single line individual server may be extended by means of a certified connector assembly (telephone extension card).

NOTICE: *The Industry Canada label identifies certified equipment. This certification means the equipment meets telecommunications network protective, operational, and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). 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. 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 coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

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

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

NOTICE: *The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices, subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.*

This digital apparatus meets 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.

When connecting the VS2000 to the telephone service, 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.

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.

Canada - Return Center

In Canada, contact the following Return Center:

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

Technical Support

If you need technical support, contact Comtrol using one of the following methods.

- email: support@comtrol.com
- FAX: (651) 631-8117
- Phone: (651) 631-7654
- FTP Site: <ftp://ftp.comtrol.com>
- Web Site: <http://www.comtrol.com>

Comtrol has a staff of technical support representatives to help you.

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