

# Peripheral Equipment Installation

---

This chapter describes procedures for connecting peripheral equipment to a VCO/4K system.

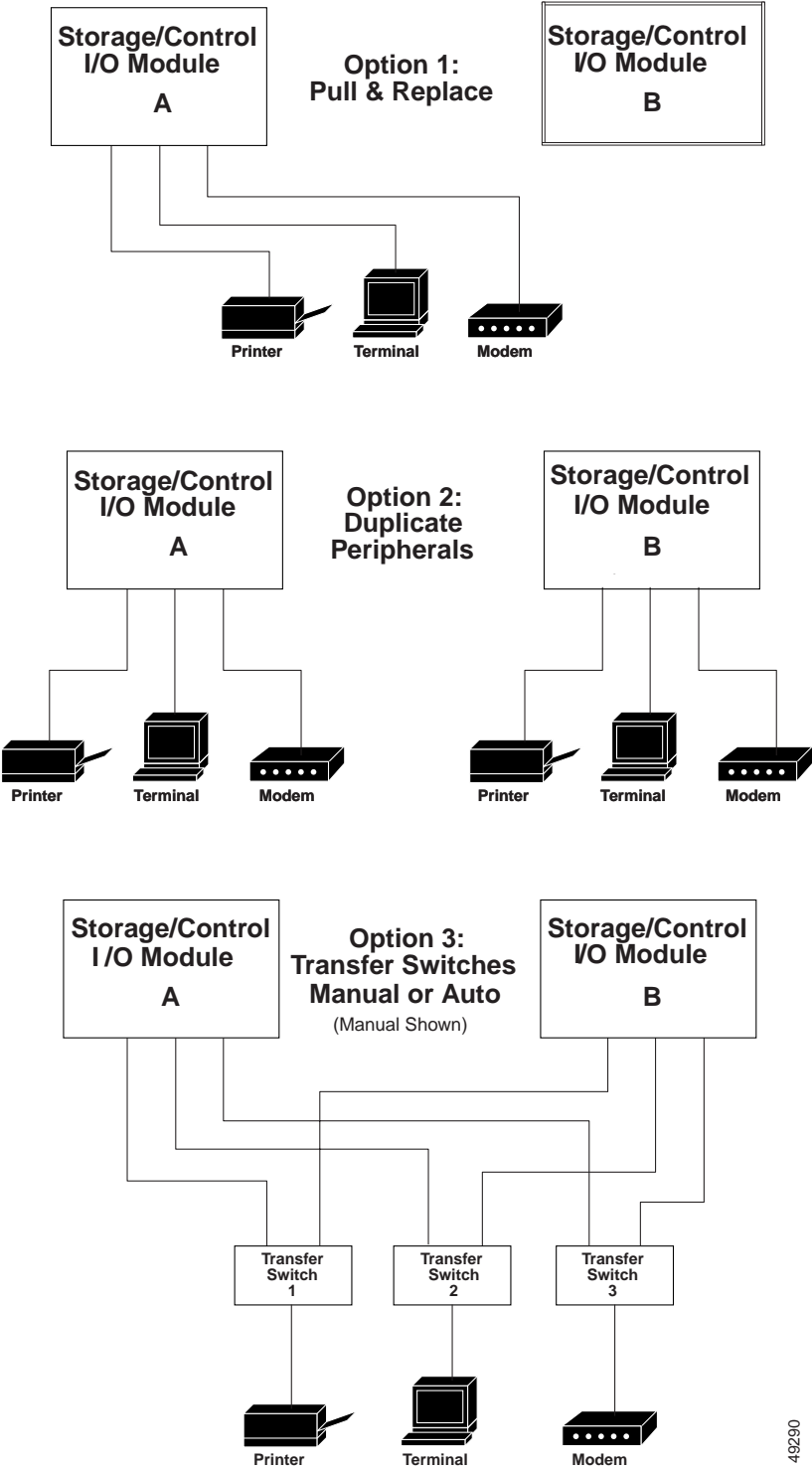
## Options for Connecting Peripheral Equipment

If your VCO/4K has redundant control (two Storage/Control I/O Modules), you have three options for connecting peripheral equipment:

- Manually move peripheral cable connections between one Storage/Control I/O Module and the other as necessary.
- Purchase two sets of peripheral equipment and connect one set to each Storage/Control I/O Module.
- Connect one set of peripheral equipment to both Storage/Control I/O Modules through either a manual or automatic A/B transfer switch.

Figure 2-1 shows the three options.

Figure 2-1 Peripheral Equipment Interconnection Options for a Redundant System



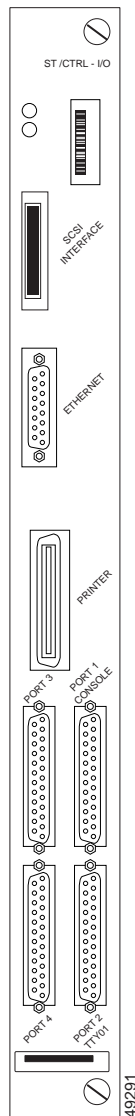
48290

# Installing the Master Console

System administrators use the master console screens to create and maintain the database, and perform diagnostic and maintenance procedures. This section describes how to connect the console to the system. The VCO/4K requires a video display terminal (VDT) with VT220/320 emulation as a master console. Cisco Systems supports the following terminals: VT220/320, WYSE Technology WY-185, and WYSE Technology WY-185ES.

The console connects directly to a dedicated serial port (Port 1 Console) on the Storage/Control I/O Module via an EIA/TIA-232 cable (see Figure 2-2).

**Figure 2-2** Storage/Control I/O Module Peripheral Port Assignments



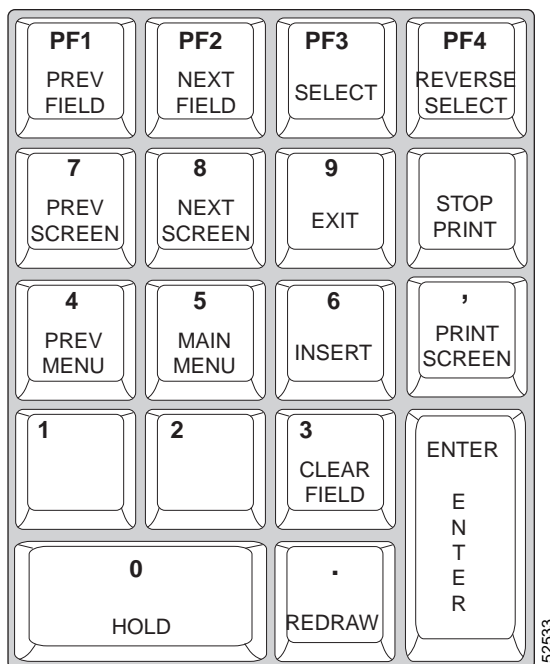
Use the following steps to install the master console.



**Note** If you already have a VDT, go to Step 5.

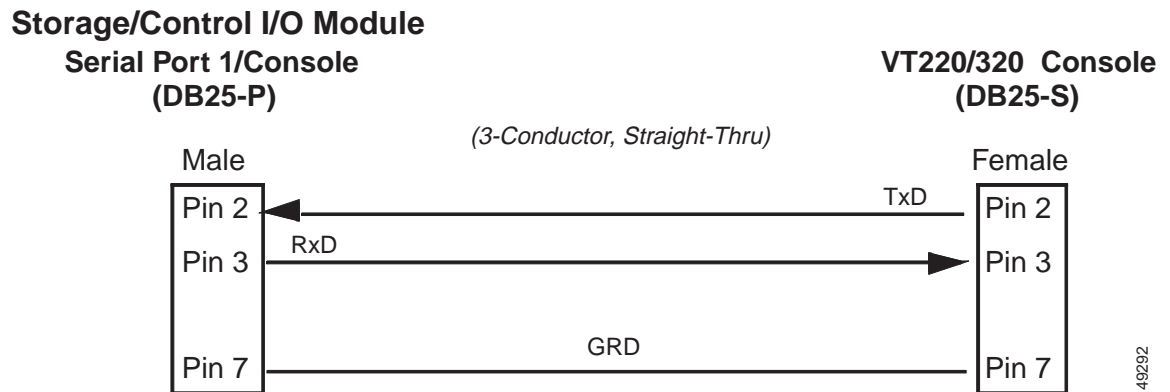
- Step 1** Unpack the VDT from its OEM carton and inspect for shipping damage.
- Step 2** Position the VDT components on a suitable surface within cable length from the VCO/4K system.
- Step 3** Follow the OEM instructions for connecting the keyboard to the VDT.
- Step 4** Perform any additional installation steps indicated by the OEM instructions. These may include installing the legend strip on the keyboard or placing peel-and-stick keypad labels on the appropriate keys. Your keypad should match the keypad shown in Figure 2-3.

**Figure 2-3** Digit Keypad Labels



- Step 5** Connect the AC line cord from the VDT to a general service AC receptacle.
- Step 6** Connect a serial cable (EIA/TIA-232) to the serial communication port on the VDT. Figure 2-4 shows which pins in the cable connector carry the signals.

Figure 2-4 Master Console EIA/TIA-232 Cable Diagram



You can use a 25-conductor, straight-through cable to connect a system console to the Storage/Control I/O Module. However, only the conductors shown in Figure 2-4 are used.

If you are connecting the system console to redundant Storage/Control I/O Modules through a transfer switch, go to the “Installing a Manual Transfer Switch” section on page 2-7 (for manual switch) or to the “Installing Automatic External A/B Transfer Switches Units (ASU)” section on page 2-9 (for automatic switch).

- Step 7** Connect the serial cable (EIA/TIA-232) connector to the port labeled **Port 1 Console** on the back panel of the Storage/Control I/O Module.
- Step 8** To connect a duplicate console to a redundant Storage/Control I/O Module, repeat Step 1 to Step 7.

## Installing the System Printer

The system printer produces a hard copy of the database and system log file error and status messages. Administrators can print system reports with the system print utilities.

The VCO/4K system printer must be a parallel printer with a Centronics-type interface. Cisco recommends using a dot-matrix printer with a pin or tractor feed option that accepts continuous feed paper. The default report generation format is 8 1/2 inches by 11 inches (21.6 cm by 27.9 cm).

To install a system printer, follow these steps:

- Step 1** Unpack the printer from its OEM carton and inspect it for shipping damage. Remove all packing materials from inside the printer.
- Step 2** Position the printer on a suitable surface within cable length from the VCO/4K system.
- Step 3** Connect the AC line cord from the printer to a general service AC receptacle.
- Step 4** Connect a parallel cable to the interface port on the printer.
- A Centronics-to-Centronics cable is available from Cisco to connect the parallel printer interface on the Storage/Control I/O Module.
- Step 5** Connect the parallel cable to the port labeled **Printer** on the back of the Storage/Control I/O Module. See Figure 2-2.

- Step 6** To connect a duplicate system printer to a redundant Storage/Control I/O Module, repeat Step 1 to Step 5.

## Installing the Remote Maintenance Modem

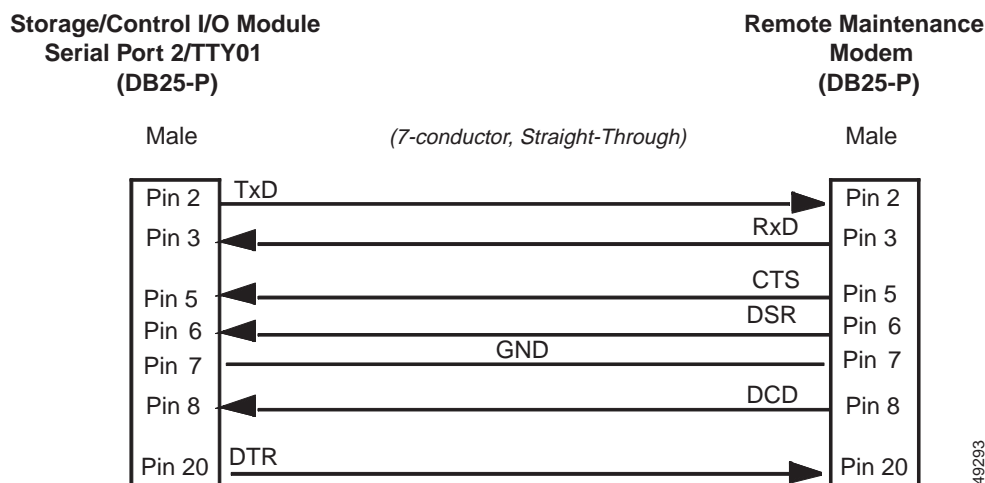
You can use a serial modem for remote maintenance of a VCO/4K system. Cisco Systems Technical Support can also communicate with the system through a serial modem connection and perform diagnostic inquiries about system operation.

The modem is connected to the PSTN through a business line to the local central office (CO). The CO line is terminated on an RJ-11 modular jack located near the modem. Cisco does not recommend routing the modem through a PBX circuit.

To install a remote maintenance modem, follow these steps:

- Step 1** Unpack the modem from its OEM carton and inspect it for shipping damage.
- Step 2** Position the modem within cable length from the VCO/4K system and line cord distance from the RJ-11 or RJ-45 modular jack.
- Step 3** Connect the power pack to a general service AC receptacle. Plug the DC power cord into the rear of the modem chassis.
- Step 4** Set the modem to operate according to the parameters defined in the VCO/4K system database. Refer to the modem OEM manual for more information about setting the modem parameters.
- Step 5** Connect a serial cable (EIA/TIA-232) to the serial communication port on the modem. Figure 2-5 shows which pins in the cable connector carry the signals.

**Figure 2-5 Remote Maintenance Modem Cable Diagram**



- Step 6** Connect the serial (EIA/TIA-232) cable connector to the port labeled Port 2 TTY01 on the back of the Storage/Control I/O Module (see Figure 2-2).

- Step 7** To connect a duplicate remote maintenance modem to a redundant Storage/Control I/O Module, repeat Step 1 to Step 6.
- 

## Routing Peripheral Equipment Through Transfer Switches

Using a transfer switch to route one set of peripheral equipment to two Storage/Control I/O Modules has the following advantages:

- Eliminates the need to manually switch cables from one Storage/Control I/O Module to the other.
- Spares the expense of purchasing a second set of peripheral equipment.

A master console, system printer, and remote maintenance modem can be routed through manual or automatic transfer switches to primary and redundant Storage/Control I/O Modules.

## Installing a Manual Transfer Switch

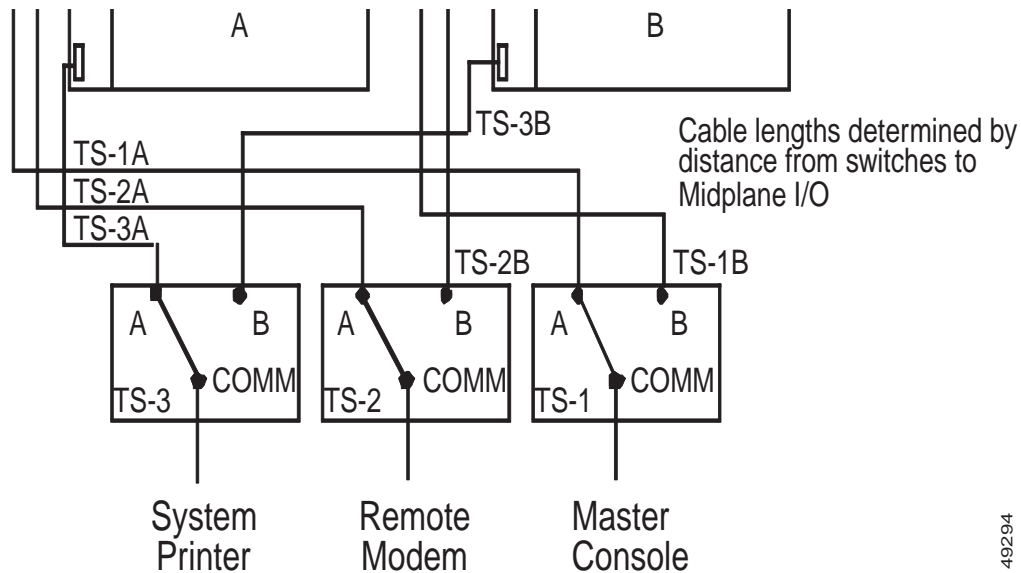
A manual, two-way, serial port transfer switch enables you to switch one EIA/TIA-232 input to either of two outputs. In VCO/4K applications, an A/B transfer switch that is capable of switching all 25 EIA/TIA-232 pins is required between each master console, system printer, and remote maintenance modem and redundant Storage/Control I/O Modules (one A/B switch per peripheral).

The transfer switches can be purchased from several supply houses and are available for desktop and rack-mount installations. In addition to the transfer switches, you need six additional cables to connect the six outputs from the transfer switches directly to redundant Storage/Control I/O Modules. The distance from the transfer switches to the Combined Controller determines the length of the six cables.

To install manual transfer switches, follow these steps:

- Step 1** Mount the transfer switches in a convenient location. The location is determined by the transfer switch housing and available mounting space on or near the VCO/4K system. Figure 2-6 shows the manual transfer switch connections.

Figure 2-6 Manual Transfer Switch Connections



49294

- Step 2** Connect the cable from the master console to the input of Transfer Switch 1 (TS-1). Cables from the transfer switch to the master console should be labeled TS-1A and TS-1B.
- Step 3** Connect the cable from the remote maintenance modem to the input of Transfer Switch 2. Cables from the transfer switch to the remote maintenance modem should be labeled TS-2A and TS-2B.
- Step 4** Connect the cable from the system printer to the input of Transfer Switch 3. Cables from the transfer switch should be TS-3A and TS-3B.



**Note** You must use a Centronics-to-DB-25 cable between the transfer switch and system printer. Use a male DB-25-to-Centronics cable from the transfer switch to the VCO/4K system.

- Step 5** Route the cables from the Port A outputs of Transfer Switches 1, 2, and 3 (**TS-1A, TS-2A, and TS-3A**) to the connectors on the Storage/Control I/O Module. Connect the cables as shown in Table 2-1.

Table 2-1 Transfer Switch Cable Connections

Peripheral Device	Cable Label	Connector Name
System Console	TS-1A	Port 1 Console
Modem	TS-2A	Port 2 TTY01
System Printer	TS-3A	Printer

- Step 6** Route the cables from the Port B outputs of Transfer Switches 1, 2, and 3 (**TS-1B, TS-2B, and TS-3B**) to the connectors on the redundant Storage/Control I/O Module. Connect the cables as shown in Table 2-1.
- Step 7** Secure cable connectors to the receptacles on the transfer switches as required.
- Step 8** Set all transfer switches to Port A to complete the installation process. For convenient reference, label the front panel of the transfer switches master console (**TS-1**), remote maintenance modem (**TS-2**), and system printer (**TS-3**).



## Installing Automatic External A/B Transfer Switches Units (ASU)



### Note

The following installation procedures apply to the External EIA/TIA-232 A/B Switch and External A/B Switch Drive Cable, available from Cisco Systems.

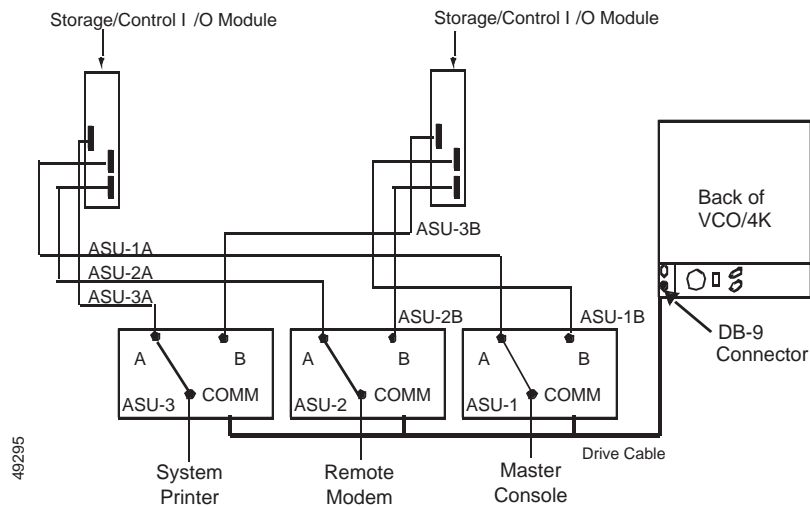
The ASU switches Pins 2 through 25 between Port A and Port B on a signal from the Alarm Arbiter Card (AAC). One ASU is required for each peripheral device that you need to switch. The peripheral devices (VDT, printer or remote maintenance modem) are cabled to the common port (COM port) of the switch unit.

Six additional cables are required to connect the six outputs from the switches to redundant Storage/Control I/O Modules. The distance from the switches to the Storage/Control I/O Modules determines the length of the six cables.

To install automatic transfer switch units, follow these steps:

- Step 1** Mount the transfer switches in a convenient location. The location is determined by the transfer switch housing and the length of the drive cable. Figure 2-7 shows the automatic transfer switch unit connections.

**Figure 2-7 Automatic Switching Unit Connections**



- Step 2** Connect the cable from the system console to the COMM Port of ASU-1. Cables from the transfer switch to the Storage/Control I/O Module (Port A and Port B) should be labeled ASU-1A and ASU-1B.



**Note** All port connections to the ASUs require male DB-25 connectors.

- Step 3** Connect the cable from the remote maintenance modem to the COMM of ASU2. Cables from the transfer switch to the Storage/Control I/O Module should be labeled ASU-2A and ASU-2B.

- Step 4** Connect the cable from the system printer to the COMM of ASU-3. Cables from the transfer switch to the Storage/Control I/O Module should be labeled ASU-3A and ASU-3B.



**Note** You must use a Centronics-to-DB-25 cable between the transfer switch and system printer. Use a Centronics-to-DB-25 cable from the transfer switch to the VCO/4K system.

- Step 5** Route the cables from the Port A outputs of ASU-1A, ASU-2A, and ASU-3A to the connectors on the Storage/Control I/O Module. Connect the cables as shown in Table 2-2.

**Table 2-2 Automatic Switch Unit (ASU) Side A Cable Connections**

Peripheral Device	Cable Label	Connector Name Storage/Control I/O Module Slots 3 and 4
System Console	ASU-1A	Port 1 Console
Modem	ASU-2A	Port 2 TTY01
System Printer	ASU-3A	System Printer

- Step 6** Route the cables from the Port B outputs of ASU-1B, ASU-2B, and ASU-3B to the connectors on the redundant Storage/Control I/O Module. Connect the cables as shown in Table 2-3.

**Table 2-3 Automatic Switch Unit (ASU) Side B Cable Connections**

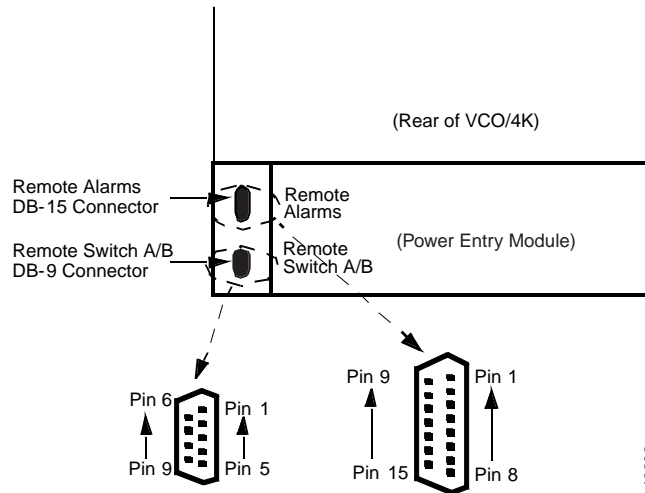
Peripheral Device	Cable Label	Connector Name Storage/Control I/O Module Slots 5 and 6
System Console	ASU-1B	Port 1 Console
Modem	ASU-2B	Port 2 TTY01
System Printer	ASU-3B	System Printer

- Step 7** Secure cables to the receptacles on the transfer switches as required.
- Step 8** Connect the 9-pin, D-subminiature connectors (**J2**, **J3**, and **J4**) of the A/B Switch Drive Cable to the receptacles on the rear of each ASU.
- Step 9** Route the cable from the ASUs to the DB-9 connector located at the lower left side on the back of the VCO/4K system.
- Step 10** Plug the line cord from each ASU into a 110 VAC, 60-Hz outlet.
- Step 11** Set the Select switch on the front panel of each ASU to the **AUTO** position.

# Remote Alarm and Remote A/B Switch connectors

The DB-15 external alarm connector is located in the rear of the VCO/4K, next to the power entry module; it is labeled Remote Alarms. The DB-9 remote A/B switch connector is located below the remote alarm connector; it is labeled Remote Switch A/B. See **Figure 2-8**.

**Figure 2-8 Remote Alarm and A/B Switch Connectors**



## Remote Alarm Connector

Contacts are rated for 0.5 amp @ 24 VDC or 25 VAC (maximum).



**Caution**

Alarm contacts are not rated to handle excessive current. Do not directly connect high current devices (for example, sirens, 110 VAC lamps or bells) to the alarm contacts.

Table 2-4 lists the pin signals for the remote alarm connector.

**Table 2-4 Remote Alarm Connector Pinout**

Pin	Signal
1	major common
2	minor common
3	aux1 closed
4	aux2 closed
5	major open
6	minor open
7	aux2 common
8	not used
9	major common

**Table 2-4 Remote Alarm Connector Pinout (continued)**

Pin	Signal
10	minor common
11	aux1 open
12	major closed
13	minor closed
14	aux1 common
15	aux2 open

## Remote A/B Switch Connector

Table 2-5 contains the pin signals for the remote A/B switch connector.

**Table 2-5 Remote A/B Switch Connector Pinout**

Pin	Signal
1	ssel TTL level low = A-side is active high = B-side is active
2-4	not used
5	ground
6-9	not used

## Host and SNMP Communication Links

Ethernet communications software provided with the VCO/4K supports TCP/IP communications between the VCO/4K and one or more host computers. Host-controlled applications use SNMP and/or the Cisco VCO/4K host API to communicate with the VCO/4K over the Ethernet connection. The VCO/4K Ethernet communications software supports a single physical link with multiple logical software connections (sockets). For more information concerning software aspects of VCO/4K Ethernet communications, refer to the following documents:

- *Cisco VCO/4K Software Installation Guide*
- *Cisco VCO/4K Ethernet Guide*



### Note

The VCO/4K system is limited to communication within a single Ethernet LAN. It cannot act as an Ethernet gateway, nor can it route messages through an Ethernet gateway.

The hardware connection for Ethernet communications is facilitated by a DB-15 port on the VCO/4K Storage/Control I/O Module. (See Figure 2-2.) The DB-15 port provides a connection for a thickwire cable to an Ethernet transceiver.

Table 2-6 lists the DB-15 connector pinouts.

**Table 2-6 DB-15 Connector Pinouts**

Pin	Signal	Signal Name
2	C+	Collision + (Input)
3	T+	Transmit + (Output)
5	R+	Receive + (Input)
6	GND	Ground
9	C-	Collision - (Input)
10	T-	Transmit - (Output)
12	R-	Receive - (Input)
13	+12VF	+12 VDC Power

Cisco recommends that you use an attachment unit interface (AUI) cable between the DB-15 connector and the network transceiver. The transceiver converts the thickwire connection to thinwire or twisted pair which can then be routed to the network architecture used by your supporting host applications. Your Ethernet network determines the transceiver type. Cisco does not provide cables, transceivers, and other link components for the VCO/4K system.

## EIA/TIA-232 Serial Connection Wiring Practices

The following describes wiring practices for serial EIA/TIA-232 connections to the Storage/Control I/O Module in each VCO/4K system controller:

- For all cabling between the host computer and the VCO/4K system, use shielded cable and connectors. Cisco recommends a minimum conductor size of 24 AWG. Route cables away from sources of electromagnetic (EMI) and radio frequency interference (RFI). Secure cables in such a manner as to prevent inadvertent physical damage caused by passersby or by other equipment.
- EIA/TIA-232 specifies a maximum cable length of 50 feet (15.24 meters). However, distances of up to 150 feet (46 meters) are readily supported when shielded cabling is used.
- Connections on the VCO/4K end of the cable require DB-25P male connectors. Connector requirements on the host end are dictated by the I/O connections at the host.

Refer to the *Cisco VCO/4K System Administrator's Guide* for information about defining host links.

## General Serial Cable/Port Characteristics

The pinouts of each serial EIA/TIA-232 DB-25 connector on the Storage/Control I/O Module are shown in Table 2-7. The signals supported by each connector are similar.

**Table 2-7 EIA/TIA-232 DB-25 Serial Connector Pinouts, Ports 1, 2, 3, and 4**

Pin	Signal Name	Signal Description
2	TxD	Transmit Data
3	RxD	Receive Data
4	RTS <sup>1</sup>	Request to Send
5	CTS <sup>1</sup>	Clear To Send
6	DSR <sup>1</sup>	Data Set Ready
7	GND	Signal Ground
8	DCD <sup>1 2</sup>	Data Carrier Detect
15	TxC <sup>3</sup>	Transmit Clock
17	RxC <sup>3</sup>	Receive Clock
20	DTR <sup>1</sup>	Data Terminal Ready
24	TxC <sup>3</sup>	Transmit Clock

1. Modem support only
2. Not used by serial Port 1
3. Supported on serial Port 4 only

Jumpers on Serial Ports 1 and 2 on the Storage/Control I/O Module allow these ports to be configured as modem (DCE) terminations for connection to a terminal or as terminal (DTE) terminations for connection to a modem.

The factory default settings for the Storage/Control I/O Module support the following cable configurations:

- Straight-through cables connecting the VCO/4K system to a modem (DTE to DCE)
- Crossover (null modem) cables connecting the VCO/4K system to a terminal (DTE to DTE)

If other cable configurations or terminations are required, the jumper settings on the CPU card must be modified. Refer to the *Cisco VCO/4K Card Technical Descriptions* for more information about jumper settings.

Figure 2-9 shows straight-through cable wiring.

Figure 2-9 Straight-Through Cable Wiring Diagram

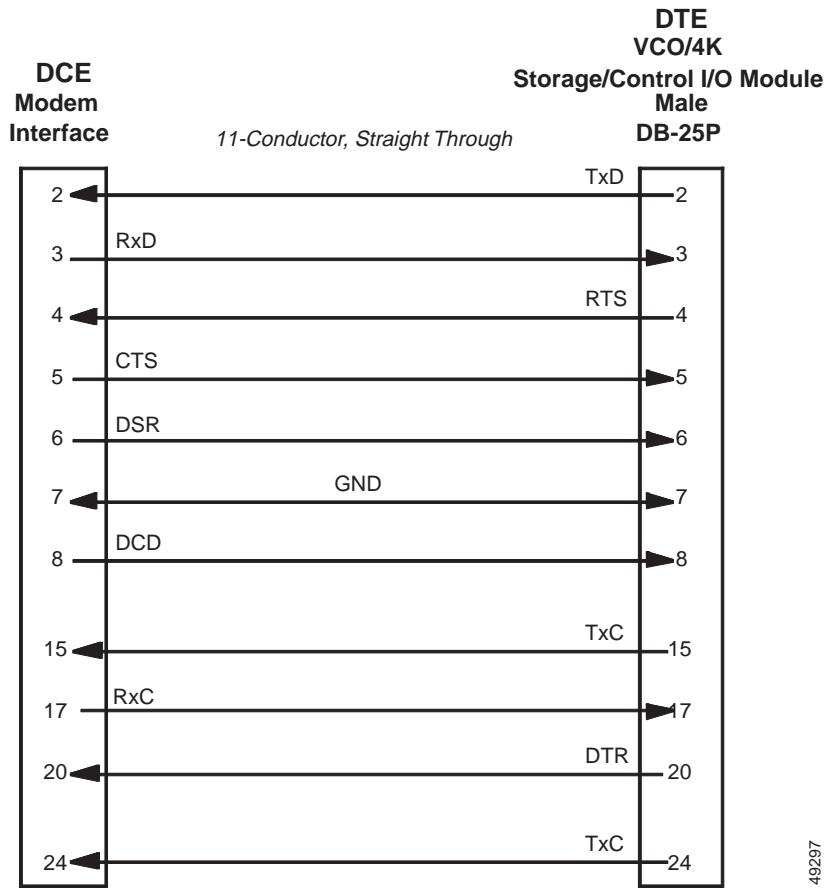


Figure 2-10 shows crossover, null modem cable wiring.

Figure 2-10 Crossover (Null Modem) Cable Wiring Diagram

