3Com® Corporation

PathBuilder™ S21x Switch Installation Manual

Notice

5400 Bayfront Plaza
Santa Clara, CA 95052-8145
(408) 326-5000

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Manual is current for Release 5.2M.

Overview

Introduction

This manual covers features, hardware, installation, applications, and specifications for the PathBuilder S21x switch.

Audience

This manual is intended for users of the 3Com PathBuilder S21x switch.

Software Revision

This manual is current for Release 5.2M of the Operating Network Software (ONS).

Special Notices

The following notices emphasize certain information in the manual. 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.

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.

Vorsicht

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

Warning

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

Avertissement

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

Warnung

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How to Use This Manual

Follow these steps to use this manual to install your PathBuilder S21x switch.

1	Familiarize yourself with the PathBuilder S21x switch	See Chapter 1, About the PathBuilder S21x Switch
2	Install the PathBuilder S21x switch hardware	See Chapter 2, Installing the PathBuilder S21x Switch Hardware
3	Power up the PathBuilder S21x switch and access the control terminal port	See Chapter 3, Powering on the PathBuilder S21x Switch

Chapter Descriptions

This table briefly describes each chapter of this manual.

This section...	*Describes...*
Chapter 1, About the PathBuilder S21x Switch	the PathBuilder S21x switch.
Chapter 2, Installing the PathBuilder S21x Switch Hardware	the shipment contents, hardware installation and cabling for the PathBuilder S21x switch.
Chapter 3, Powering on the PathBuilder S21x Switch	the power up sequence and diagnostics, and how to access the control terminal port.
Appendix A, Specifications	the physical and environmental specifications and power requirements for the PathBuilder S21x switch.
Appendix B, PathBuilder S21x Switch Cabling	identification of all cabling and connections for the PathBuilder S21x switch.
Appendix C, Troubleshooting Your PathBuilder S21x Switch	actions you can take to correct problems you may encounter with your PathBuilder S21x switch.
Appendix D, Technical Support	technical support.

Related Documentation

Introduction	This section describes related documentation and where to obtain documentation.
Other Documentation	All documentation is provided on the PathBuilder S200 Series User Guides CD-ROM and the 3Com WWW site: **http://www.3com.com**
PathBuilder S200 Series User Guides CD-ROM	The PathBuilder S200 Series User Guides CD-ROM contains all PathBuilder S200 series switch documentation available at the time of release. The PathBuilder S200 Series User Guides CD-ROM is shipped with each PathBuilder S200 series switch product.
WWW	Check the 3Com WWW site for the latest documentation: **http://www.3com.com**

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Chapter 1
About the PathBuilder S21x Switch

Overview

Introduction

The 3Com PathBuilder S21x switch is a compact network access device for connecting LAN and serial devices to public and private networks services such as frame relay and X.25. The PathBuilder S21x switch is a desktop-size standalone device supporting up to two optional daughtercards, as shown in Figure 1-1. Using the optional daughtercards, the PathBuilder S21x switch offers a flexible and cost effective solution for transporting data, voice, and video across a network.

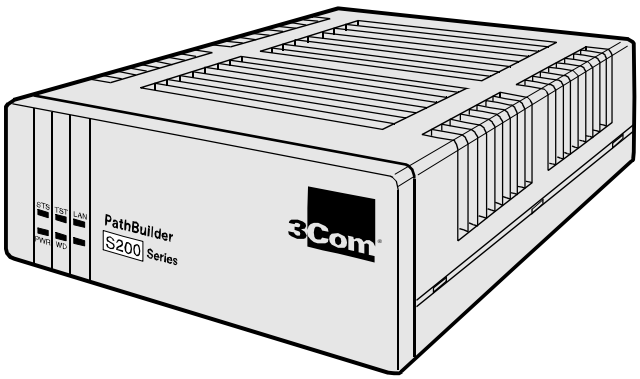


Figure 1-1. The PathBuilder S21x Switch

Features

Standard Features

The base PathBuilder S21x switch provides the following:

- External power supply
- Control Terminal Port (CTP) for local and remote configuration and management
- Ethernet interface (10BaseT)
- One Serial DIM Port
- Two daughtercard slots
- 2 MB FLASH and 4 MB DRAM

CTP Port

Port 4 can be used as a Control Terminal Port (CTP) for configuration, reporting, and troubleshooting the PathBuilder S21x switch. To set Port 4 as CTP, put the front panel dip switch 4 into the UP position. To access the CTP you must also configure your terminal or terminal emulation software, to VT100, 9600 bps, 8 bit, no parity, 1 stop bit.

Dual Daughtercard Slots

The PathBuilder S21x switch comes with two slots to support optional daughtercards. This permits easy future expansion of the product.

Operating Software

Operating software is compressed in FLASH memory and loaded into DRAM for operation. The PathBuilder S21x switch supports these Applications Ware packages:

- IP Applications Ware Package
- IP & IPX Applications Ware Package
- SNA Applications Ware Package
- Serial Protocol Applications Ware Package
- Multiservice Applications Ware Package
- Multimedia Applications Ware Package

See the *Software Release Notes* accompanying your PathBuilder S200 series switch unit for more information on the software available for the PathBuilder S21x switch.

Daughtercard Functionality

Introduction

The PathBuilder S21x switch is available with the optional components listed below factory-installed or as separate add-in daughtercards.

- Voice Relay Daughtercard
- Dual FXS Voice Relay Daughtercard
- RemoteVu Daughtercard
- DSU Daughtercard
- DIM Daughtercard
- DRAM SIMMs

Refer to the *PathBuilder S200 Series Switch Daughtercard Installation Manual* (T0020) for information on the installation of optional daughtercards.

Voice Relay Daughtercard

The PathBuilder S21x switch supports the Voice Relay Daughtercard. This daughtercard supports one voice channel, using either an analog FXS or FXO interface. Both interfaces use RJ11 connectors.

Dual FXS Voice Relay Daughtercard

The Dual FXS Voice Relay Daughtercard provides two FXS interface ports and support one voice channel each. The FXS port uses RJ45 connectors.

RemoteVu Daughtercard

The PathBuilder S21x switch supports video over Frame Relay using the RemoteVu daughtercard. The RemoteVu Daughtercard provides two BNC connector, video ports accepting NTSC, PAL or SECAM video signal standards and an RJ-45, RS232/485 camera control port used for Pan/Tilt/Zoom (PTZ) camera control.

DSU Daughtercard

The DSU daughtercard functionality suits an extended range of 56 kbps point-to- point DDS1 interfaces that conforms to AT&T 62310 or ANSI T1E1.4/91-006.

The DSU is FCC Part 68 registered.

Diagnostic loopbacks from the telephone company are supported; local diagnostics are activated from the CTP.

DIM Site Daughtercard	The DIM Site daughtercard provides optional V.24, V.35, V.36, or V.11 electrical interfaces through a DB25 physical connector.
DSU DIM	The PathBuilder S21x switch supports the DSU DIM.

Software Functionality

Introduction

Depending on the operating software AppsWare package and optional daughtercard installed the PathBuilder S21x switch can support the following functionality and services.

Frame Relay & X.25 Service

The PathBuilder S21x switch provides serial devices with economical Ethernet LAN access into public or private Frame Relay WAN. Where frame relay services are not yet available, the PathBuilder S21x switch can provide network access over X.25 services. When frame relay services becomes available, the PathBuilder S21x switch can be easily configured and integrated to support frame relay. This fast migration reduced network downtime and protects hardware investments.

RFC 877 and 1356

The PathBuilder S21x switch supports encapsulation of IP datagrams and other network layer protocols over X.25 as specified in RFC 877 and RFC 1356. This allows for interoperability with Front End Processors (FEPs) that support X.25 and IP traffic as well as router vendors supporting RFC 877/1356.

RFC 1490

The PathBuilder S21x switch supports encapsulation of multiple protocols over frame relay as specified by RFC 1490.

Multiprotocol Support

Support includes SDLC, Bisync, X.25, Async, IP/IPX, PPP, MLPPP, and Routing and Bridging, as well as many other serial protocols. Refer to the Software Release Notice which accompanied your unit for a complete listing of protocols supported by the PathBuilder S21x switch.

Target Application Environments

Introduction

This section describes example applications for the PathBuilder S21x switch.

LAN and Legacy Protocol over Frame Relay

The PathBuilder S21x switch supports multiprotocol encapsulation of IP traffic and legacy serial protocols over frame relay as specified by RFC 1490. As shown in Figure 1-2, a SNA cluster controller connects to a serial port on the PathBuilder S21x switch and the Ethernet LAN connects to the 10BaseT Ethernet port. The PathBuilder S200 series switch is fully interoperable with third party routers via RFC 1490.

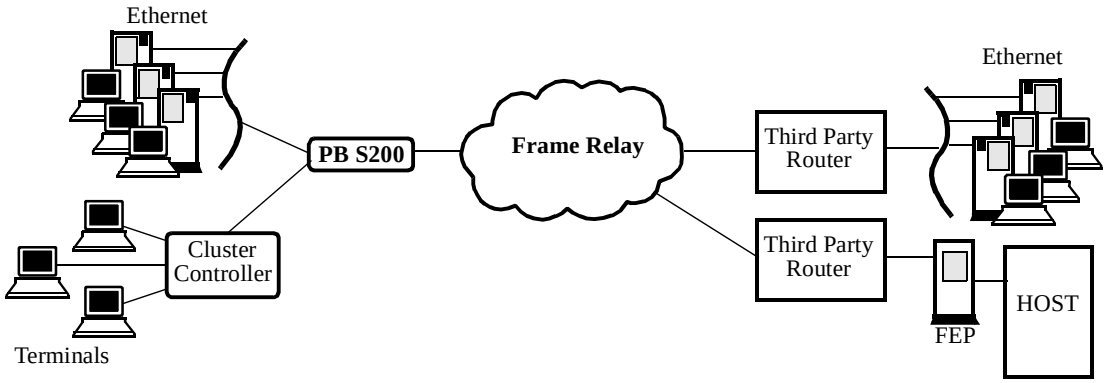


Figure 1-2. LAN and Legacy Protocol over Frame Relay

Video and Legacy Protocols over Frame Relay - Banking Application

As shown in Figure 1-3, the PathBuilder S21x switch can support encapsulation of video and legacy protocol over frame relay. This use of PathBuilder S21x switch suits banking applications such as Automated Bank Machines (ABMs). With Dial on Demand software feature enabled, the PathBuilder S21x switch initiates a connection only when there is data transfer, i.e. only for the duration of a bank transaction. The RemoteVu Daughtercard can capture video and send video streams to the central bank's security system.

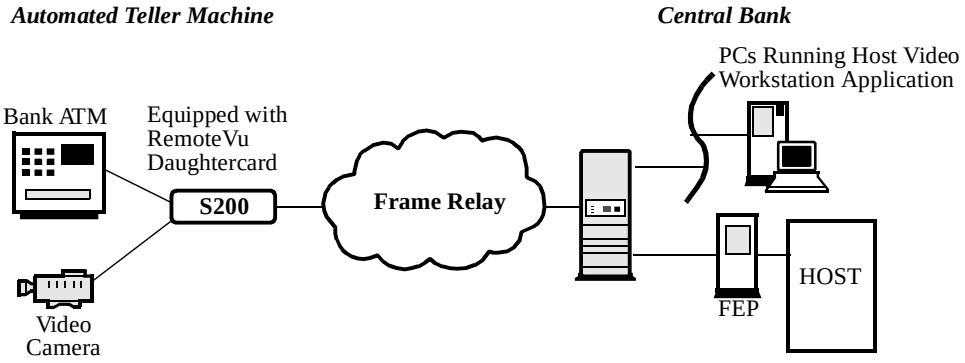


Figure 1-3. LAN and Legacy Protocol over Frame Relay

Branch Office to Central Office over Frame Relay

The PathBuilder S21x switch offers an ideal solution for branch office to central office connectivity over a private or public frame relay network as shown in Figure 1-4.

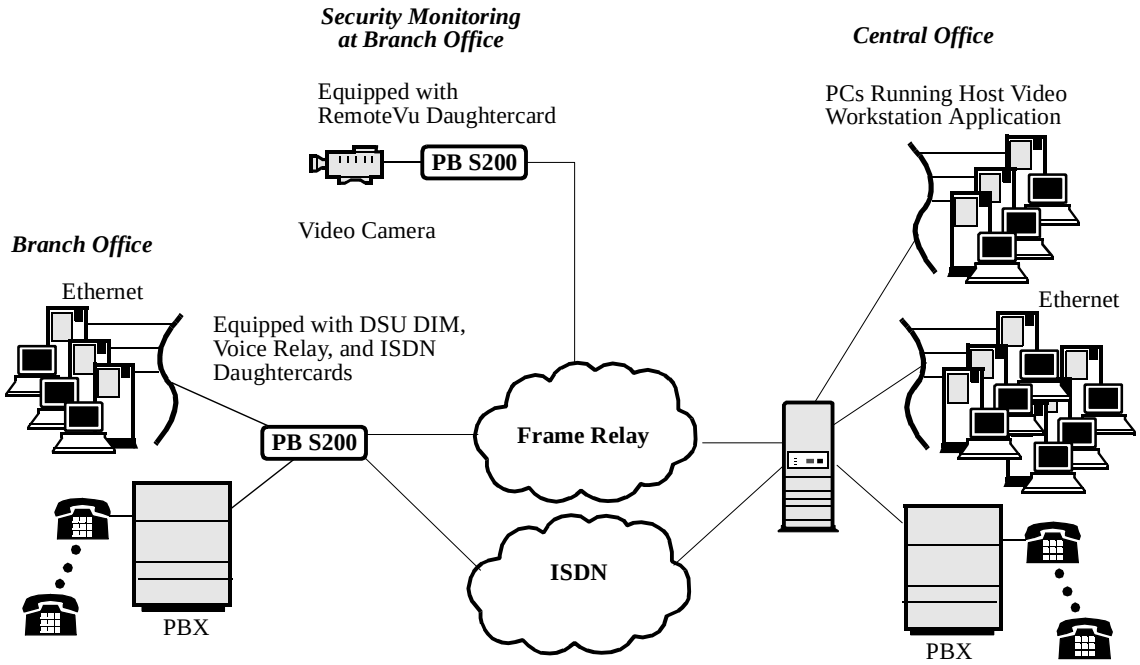


Figure 1-4. PathBuilder S21x switch supporting Voice and Video over Frame Relay

Application Type	Daughtercard Used	Application Description
Branch access to Central Office	DSU DIM and Voice Relay Daughtercards	The PathBuilder S21x switch supports voice, video and data traffic between the branch and central office over private or public frame relay network. The Voice Relay Daughtercard supports telephones, PBX, and faxes. Connect a telephone or PABX to one FXS port on the Voice Relay Daughtercard and all branch telephones have access to the central office PBX. This eliminates long distance telephone charges between the branch and central office.
Security Monitoring at Branch Office	RemoteVu and DSU Daughtercards	The PathBuilder S21x switch equipped with a RemoteVu Daughtercard provides security surveillance and remote monitoring of the branch office location from the central office. The RemoteVu Daughtercard packetizes video stream in IP and sends the data over the frame relay. Security personnel at the central office can control the branch office video camera from a PC running the Host Video Workstation application.

Chapter 2
Installing the PathBuilder S21x Switch Hardware

Overview

Introduction

This chapter covers the installation of PathBuilder S21x switch hardware.

Follow These Steps

This table lists the steps you need to perform and shows you where to look for information on installing the PathBuilder S21x switch:

Step	*To Perform This Action*	*See This Procedure*
1	Check the contents of the shipping package to make sure everything is included.	"Checking Your Shipment Contents" section on page 2-2.
2	Choose a site for the PathBuilder S21x switch.	"Choosing a Site" section on page 2-3.
3	Connect cables for the PathBuilder S21x switch.	"Cabling the PathBuilder S21x Switch" section on page 2-5.
4	Set the front panel dip switches if required.	"Front Panel Dip Switches" section on page 2-10
5	Installing Optional Daughtercard.	"Installing Optional Daughtercards" section on page 2-11
6	Installing or Removing the Lithium Battery	"Installing or Removing the Lithium Battery" section on page 2-12

Warning

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

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

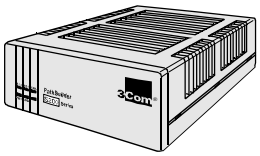
Anschlusse, die mit anderen Geraten verbindet werden konnen, sind als SELV beschrieben. Um Konformitat mit EN 60950 zu versichern, sichern Sie es, daß diese Anschlusse nur mit den des selben Type auf anderen Geraten verbindet werden.

Checking Your Shipment Contents

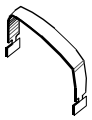
List of Contents

Before you install the PathBuilder S21x switch hardware, make sure your shipment contents are complete. Inside your shipping carton, you should find the contents shown in Figure 2-1.

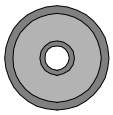
PathBuilder S21x Installation Manual



Pathbuilder S21x switch

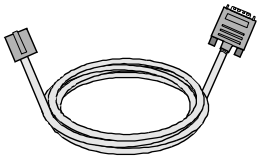


DIM Extraction Tool

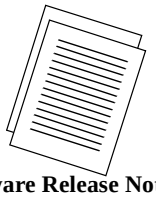


PathBuilder S200 Series User Guides CD-ROM

External Power Supply and Cable



RJ45 to DB25 CTP Cable



Software Release Notice

Figure 2-1. PathBuilder S21x Switch Shipment Contents

In Case of Damage or Missing Parts

If the equipment is damaged, contact the shipper. If you have additional concerns about damaged or missing parts, contact your nearest 3Com representative.

Choosing a Site

Introduction

This section describes how to choose a site for the PathBuilder S21x switch.

Choosing a Site

Choose a site within an appropriate distance of a power source. The selected site should be free of accumulated dust and environmental extremes.

Caution

All PathBuilder S200 series switch products 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. If you experience problems caused by surges from lightning, install appropriately rated surge suppressors on power and data lines connected to your PathBuilder S200 series switch.

Mise en Garde

Tous les produits PathBuilder S200 series switch doivent être utilisés dans des environnements conçus pour les ordinateurs et équipements électroniques. Dans les zones sujettes à la foudre, prenez soin de protéger l'équipement électronique contre tout dommage. Contactez votre compagnie de téléphone ou un vendeur d'accessoires électroniques pour de plus amples informations sur les équipements de protection contre la foudre. Si vous avez des problèmes engendrés par des surtensions dues à la foudre, installez des protections contre les surintensités appropriées sur les lignes d'alimentation et de données connectées à votre produit PathBuilder S200 series switch.

Vorsicht

Alle PathBuilder S200 Series Switch-Produkte sollten in für Computer und elektronische Geräte geeigneten Umgebungen verwendet werden. In durch Blitzschlag gefährdeten Gebieten sollten Vorsichtsmaßnahmen zum Schutz von elektronischen Geräten ergriffen werden. Informationen über Schutzeinrichtungen gegen Blitzschlaggefahr erhalten Sie von Ihrer Telefongesellschaft oder vom Einzelhandel für Elektrozubehör. Wenn Sie durch Blitzeinwirkung verursachte Spannungsstörungen feststellen, installieren Sie einen ausreichend abgesicherten Spannungsableiter an den Strom- und Datenleitungen, die mit dem PathBuilder S200 Series Switch-Produkt verbunden sind.

Power Source

Depending on your application and the country in which the PathBuilder S21x switch will operate, a power source must be a grounded 100 to 240 VAC outlet.

Cable Clearance/ Air Circulation

Allow at least 12 inches (30.5 cm) in back of the unit for interfacing cable clearance and air circulation, as shown in Figure 2-2.

Caution

To avoid overheating the unit's circuitry, you should never place anything on top of the unit, within 1 inch (2.5 cm) of the ventilation slots on the front panel, or within 12 inches (30.5 cm) of the back of the unit.

Mise en Garde

Afin d'éviter toute surchauffe des circuits de l'unité, ne placez aucun objet sur l'unité à moins de 2,5 cm (1 pouce) des conduits de ventilation du panneau avant et à moins de 30,5 cm (12 pouces) de l'arrière de l'unité.

Vorsicht

Zur Vermeidung einer Überhitzung der Geräteschaltkreise sollten Sie keine Gegenstände auf dem Gerät plazieren. Zu den Entlüftungsöffnungen der Vorderabdeckung sollte ein Abstand von 2,5 cm und zur Rückseite des Gerätes von 30,5 cm eingehalten werden.

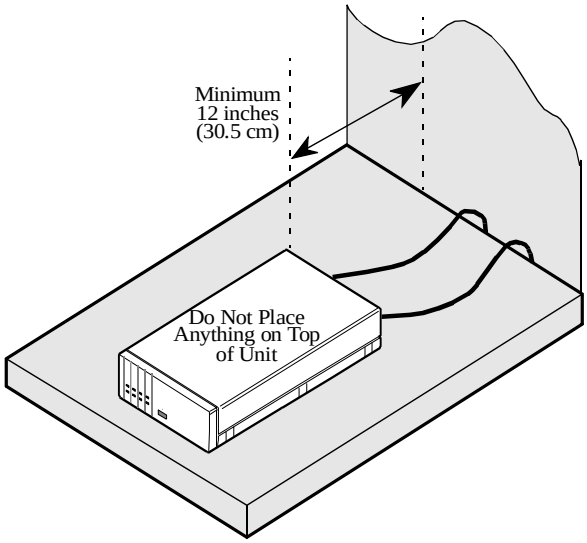


Figure 2-2. Proper Cable and Air Clearance

Cabling the PathBuilder S21x Switch

Introduction

After unpacking the PathBuilder S21x switch, you can connect the cables to complete the hardware installation.

PathBuilder S21x Switch Rear Panel

Figure 2-3 illustrates the rear panel of the PathBuilder S21x switch, optional daughtercards, and the locations of cables that must be connected.

Caution

Connectors showing this symbol must not be connected to Published Switched Telephone Networks (PSTN).

Mise en Garde

Les connecteurs marqués de ce symbole ne doivent pas être connectés au réseau téléphonique commuté public (RTCP).

Vorsicht

Stecker mit diesem Symbol dürfen nicht an das öffentliche Telefonnetz (PSTN) angeschlossen werden.

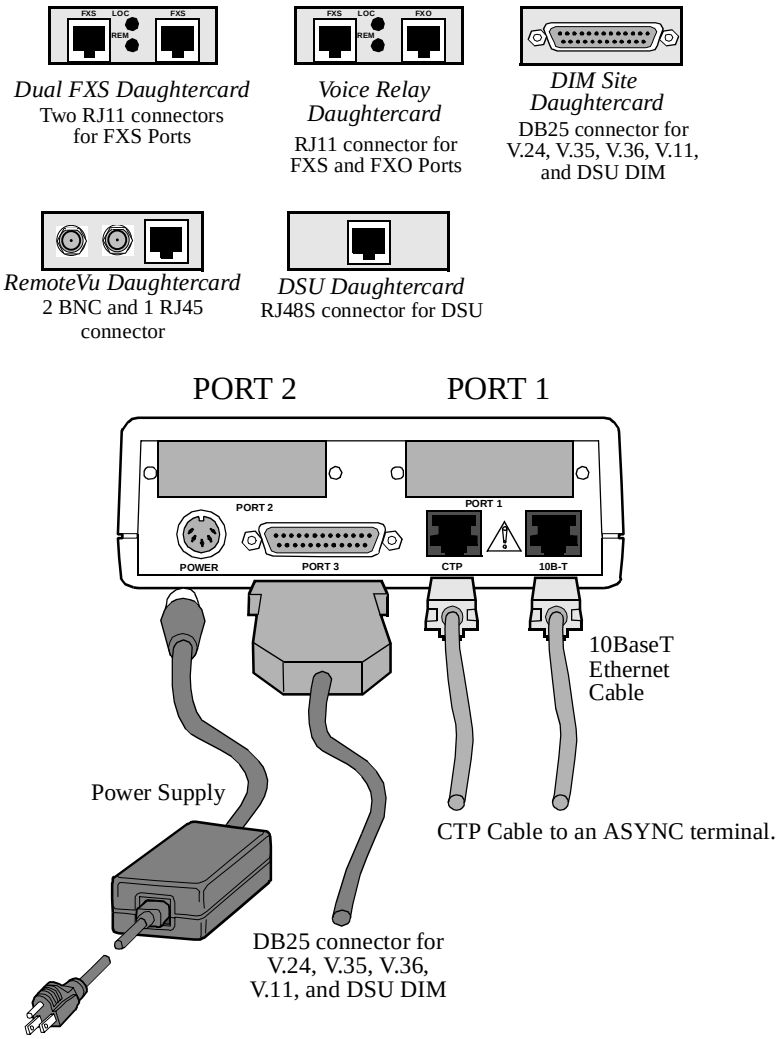


Figure 2-3. PathBuilder S21x Switch Rear Panel and Cable Connections

Cables

Introduction

This section describes cables required to connect to the PathBuilder S21x switch.

Port Characteristics and Cable Requirements

The table below lists the port characteristics, connector and cable requirements.

Port	*Connector*	*Interface*	*Cable Required*	*Speed*	*DCE/DTE*
1	DB25	DIM Site Daughtercard V.11, V.24, V.35, V.36	DB25-to-DB25 Cable	V.11, V.35 and V.36 - Max. sync speed 2 mpbs V.24 - Max. sync speed 80 kpbs, Max async speed 115.2 kbps	Selectable
		DIM Site Daughtercard DSU DIM	DSU/EIM Cable Assembly and Lease Line Telco Cable shipped with Integral DSU only	DSU - 56 kbps	DTE DSU
	RJ48S	DSU Daughtercard	DSU Telco Cable shipped with DSU Daughtercard	DSU -56 kbps	DTE DSU
	RJ11	Voice Relay Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	RJ45	S/T Daughtercard	RJ45-to-RJ45 Cable	Either 56 or 64 kbps for each B Channel and 9.6 kbps for the D Channel	N/A
	BNC video connector	RemoteVu Daughtercard	BNC-to-BNC Cable		
	RJ45 connector	RemoteVu Daughtercard	RJ45-to-RJ45 Cable		
	RJ45	Dual FXS Daughtercard	RJ45-to-RJ45 Cable		

Port	Connector	Interface	Cable Required	Speed	DCE/DTE
2	DB25	DIM Site Daughtercard V.11, V.24, V.35, V.36	DB25-to-DB25 Cable	V.11, V.35 and V.36 - Max. sync speed 2 mpbs V.24 - Max. sync speed 80 kpbs, Max async speed 115.2 kbps	Selectable
		DIM Site Daughtercard DSU DIM	DSU/EIM Cable Assembly and Lease Line Telco Cable shipped with Integral DSU only	DSU - 56 kbps	DTE DSU
	RJ48S	DSU Daughtercard	DSU Telco Cable shipped with DSU Daughtercard	DSU -56 kbps	DTE DSU
	RJ11	Voice Relay Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	BNC video connectors	RemoteVu Daughtercard	BNC-to-BNC Cable		
	RJ45 connector	RemoteVu Daughtercard	RJ45-to-RJ45 Cable		
	RJ45	Dual FXS Daughtercard	RJ45-to-RJ45 Cable		
3	DB25	V.11, V.24, V.35, V.36 DIM	DB25-to-DB25 Cable	V.11, V.35 and V.36 - Max. sync speed 2 mpbs V.24 - Max. sync speed 80 kpbs, Max async speed 115.2 kbps	Selectable
		Integral DSU DIM	DSU/EIM Cable Assembly and Lease Line Telco Cable shipped with Integral DSU only	DSU - 56 kbps	
4	RJ45	CTP Port	RJ45-to-DB25 CTP Cable shipped with PathBuilder S200 series switch unit	Max. async speed 115.2 kbps	DCE

Port	Connector	Interface	Cable Required	Speed	DCE/DTE
LAN	RJ45	10BaseT	10BaseT Cross-over cable or standard UTP cable (RJ45-to-RJ45)	10Mbps	

Cable and Connector Pinouts

For more information on cable and connector pinouts, refer to Appendix B, PathBuilder S21x Switch Cabling or to the Daughtercard Installation Guide for information on the optional daughtercards.

Control Terminal Port Cable

Use an RJ45 (male) to DB25 (female) cable that comes with the PathBuilder S21x switch to connect to the Control Terminal Port (CTP). The PathBuilder S21x switch defaults this port to 9.6 kbps, 8 bits, no parity, 1 stop bit.

Note

If you plan to use a personal computer to configure the PathBuilder S21x switch, you may need to purchase a DB25 (male) to DB9 (female) adapter for the serial port of your personal computer. The serial ports on most personal computers require DB9 connectors.

10BaseT Ethernet Cable

Follow these guidelines for 10BaseT cable connections:

- If you are connecting to a 10BaseT Hub, use a standard UTP cable (RJ45 to RJ45).
- If you are connecting directly to a personal computer or Workstation LAN card, use the 10BaseT crossover cable shipped with your PathBuilder S21x switch.

Interface	Connector
U interface (North America)	RJ11
S/T interface (Europe)	RJ45

Front Panel Dip Switches

Introduction

This section describes the front panel dip switches on the PathBuilder S21x switch.

Front Panel Switches

Figure 2-4 illustrates the switches found behind the front panel of the PathBuilder S21x switch.

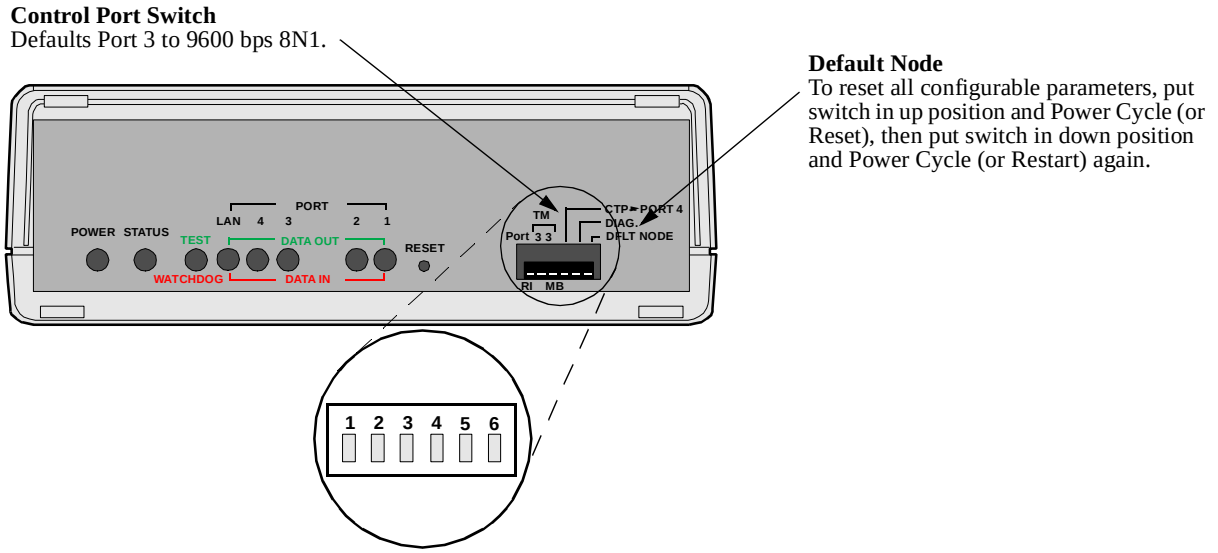


Figure 2-4. PathBuilder S21x Switch Front Panel Switches

Front Panel DIP Switch Setting

The six DIP switches on the front panel are defined as follows:

Switch Posn.	Switch Name	Down	Up
1	RI/TM	Pin 22 - Ring Indicator	DCE Test Mode Input
2	MB/TM	Pin 22 - Make Busy	DTE Test Mode Input
3	N/A	N/A	N/A
4	CTP-Port 4	Normal operation	Configure Port 4 as PAD port
5	DIAG	Normal operation	Execute diagnostics
6	DFLT-NODE	Normal operation	Reset CMEM configuration

Installing Optional Daughtercards

Optional Daughtercards

The PathBuilder S21x switch supports the following optional daughtercards:

- Voice Relay Daughtercard
- Dual FXS Voice Relay Daughtercard
- RemoteVu Daughtercard
- DSU Daughtercard
- DIM Site Daughtercard
- Motherboard DIM Option
- DRAM SIMM Option

These daughtercards can be installed either in the factory or on-site. Refer to the *PathBuilder S200 Series Daughtercard Installation Guide* (Part Number T0020) for complete daughtercard installation instructions.

Caution

On-site installation of these optional daughtercards should be undertaken by trained service technicians.

Mise en Garde

L'installation de ces cartes fille optionnelles doit être effectuée par des techniciens expérimentés.

Vorsicht

Die Installation vor Ort dieser optionalen Zusatzkarten sollte von geschulten Kundendiensttechnikern durchgeführt werden.

Installing or Removing the Lithium Battery

Introduction

This section explains how to replace the real time battery. The PathBuilder S21x switch uses a lithium battery on the motherboard to maintain the node's real-time clock. The battery is not used to store the configuration memory.

You need to install a battery under the following conditions:

- before the battery runs down

Warning

Only qualified service personnel should perform the procedure described in this section. If the battery is installed incorrectly, it could explode after the PathBuilder S200 series switch 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 PathBuilder S200 series switch 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 PathBuilder S200 Series Switch-Produkts explodieren und das Gerät beschädigen.

Note

After installing the battery, set the PathBuilder S21x switch'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 CR2032 only. 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 2-6 to replace the battery.

Removing the Top Cover

Refer to Figure 2-5 when removing the top cover and front panel and follow these steps:

Step	Action
1	Open front panel door by using a downward motion to pull it toward you and off.
2	Insert a flat-head screwdriver in the slot above each of the six snap hinges on the sides of the unit and push downward. The hinges snap out toward you.
3	Repeat Steps 1 and 2 for the remaining hinges.
4	Lift off the top cover.

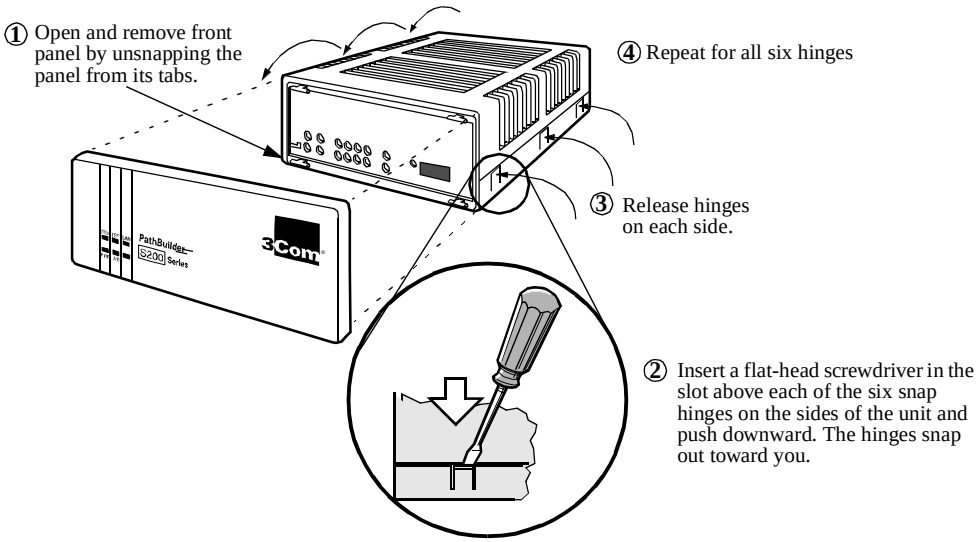


Figure 2-5. Removing Top Cover and Front Panel on PathBuilder S21x Switch

Removing/ Installing the Battery

Figure 2-6 shows how to install and replace the battery.

To remove the battery:

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

To install the battery:

Place the battery in the holder, with the positive (+) side up, and press down until the retaining tabs click into place.

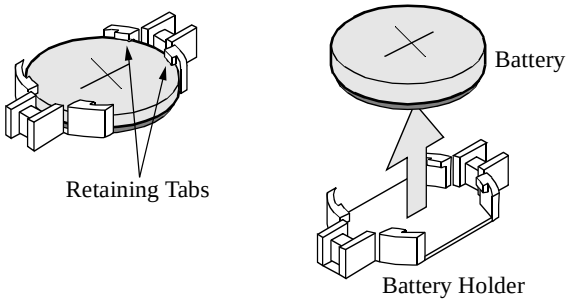


Figure 2-6. Replacing the Battery

Chapter 3
Powering on the PathBuilder S21x Switch

Overview

Introduction

This chapter describes

- powering up the PathBuilder S21x switch
- interpreting LED display for power up diagnostics
- accessing the CTP

Powering On The PathBuilder S21x Switch

Introduction

This section describes the sequence of events when you power up the PathBuilder S21x switch.

Powering On the PathBuilder S21x Switch

The PathBuilder S21x switch does not have a power switch on the unit. Follow these steps to power on the PathBuilder S21x switch:

Step	*Action*
1	Plug the DC output cable of the power supply into the power socket on the PathBuilder S21x switch back panel.
2	Connect the power cord to the power supply outlet.

Warning

When powering down the unit, you should always unplug the power cord at the power supply outlet. Do not remove the power cord from the back of the unit.

Avertissement

Lors de l'arrêt de l'unité, débranchez toujours le cordon d'alimentation du bloc d'alimentation. Ne le débranchez pas de l'arrière de l'unité.

Warnung

Nach dem Abschalten des Gerätes sollten Sie immer den Netzstecker des Gerätes aus der Steckdose ziehen. Entfernen Sie nicht das Netzkabel von der Geräterückseite.

Warning

Hazardous voltage from the telecommunications network may be accessible on un-earthed units. Disconnect all telecommunications cables before removing the main lead from the power supply.

Avertissement

Des tensions dangereuses provenant des réseaux de télécommunication peuvent être présentes sur des unités qui ne sont pas reliées à la terre. Déconnectez tous les câbles de télécommunication avant de retirer le câble de secteur du bloc d'alimentation.

Warnung

An nicht geerdeten Geräten können gefährliche Spannungen vom Telekommunikationsnetz anliegen. Trennen Sie alle Kabelverbindungen zum Telekommunikationsnetz, bevor Sie das Hauptnetzkabel aus der Steckdose ziehen.

Powerup Diagnostics

Introduction

This section describes diagnostics that run automatically when you power up the PathBuilder S21x switch.

Front Cover LEDs

The three front cover LEDs on the PathBuilder S21x switch help you follow the progress of the unit's powerup. Figure 3-7 shows the front cover.

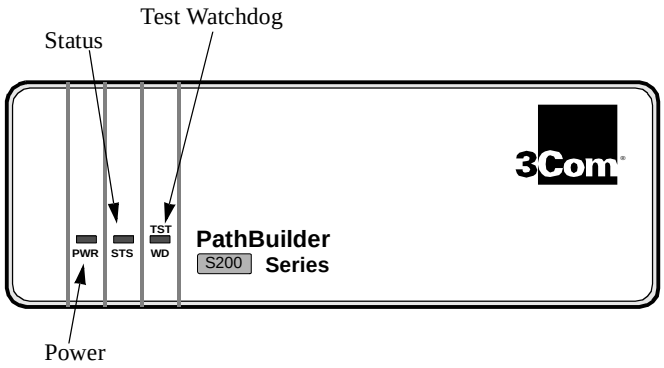


Figure 3-7. Front Panel of the PathBuilder S21x Switch

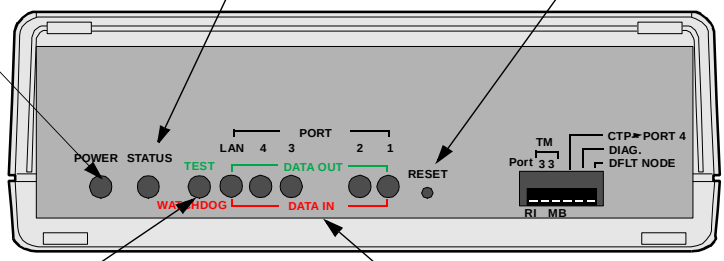
Detailed Front Panel LEDs

Figure 3-8 illustrates the detailed front panel LEDs located behind the front cover.

Power On - GREEN
Power is on and all DC Voltages are within specifications.

Status - GREEN
On: Software Running
Off: Software Not Running (Hardware Fault)
Flashing (Slow):Software Download in Progress

Reset
Resets (restarts) the unit.



Watchdog -GREEN
On: Hardware or software failure. Press Reset or Power Cycle to clear LED.
Off: Processor OK.

Test - RED
Indicates status of test results.
On: Test Failed
Off: Normal Condition
Flashing:Test in Progress

Data In - RED
On: Data Entering Port = SPACE
Off: Data Entering Port = MARK

Data Out - GREEN
On: Data Leaving Port = SPACE
Off: Data Leaving Port = MARK

Figure 3-8. Detailed Front Panel LEDs

Power Up Sequence

When the PathBuilder S21x switch power cord is plugged into the power supply outlet, you will see the following powerup sequence:

Stage	when...	...this indicates
1	POWER (GREEN) lights turns on.	PathBuilder S200 series switch is receiving power.
2	TEST (GREEN) comes on and blinks five times	Diagnostics executes for 30 seconds.
3	STATUS (GREEN) comes on and blinks at slow rate. TEST/WATCHDOG (ORANGE) light also remain on.	Indicates software is being downloaded from FLASH.
4	STATUS (GREEN) light stays off for up to 10 seconds, then turns green.	Software is initializing your system configuration.

Hardware Failure

If the TEST light turns on and remains on, one or more of the diagnostic tests have failed, indicating there is a hardware problem. Contact 3Com for possible repairs to your PathBuilder S21x switch.

Diagnostic Failure

If the TEST light does not blink at all, but the Status light is on, the diagnostic software image is corrupted. Perform a download of the software option bundle.

Powerup Failure

If the STATUS light blinks continuously, at a constant rate, the software bundle in Flash memory is corrupted. Perform a cold load of the software option bundle. See the *Software Installation and Coldloading Manual* (Part No. T0028) for more information.

Accessing the Control Terminal Port

Introduction

Once you have powered on the PathBuilder S21x switch, you can access the Control Terminal Port from the PC or terminal attached to the CTP port.

Note

This section does not provide all information about accessing the CTP. For more information on accessing and using the CTP refer to the *Basic Configuration Manual* (Part Number T0113).

Procedure

Follow these steps to access the PathBuilder S21x switch CTP Main menu:

Note

This procedure assumes that a PC or terminal is connected to the PathBuilder S21x switch using the CTP access cable.

Step	*Action*
1	Set your terminal, or terminal emulation software, to VT100, 9600 bps, 8 bit, no parity, 1 stop bit.
2	Type **<CR>** until either an asterisk (*) or the OK prompt appears.
3	When you see OK, type **atds0 <CR>**. When you see the asterisk (*) type **.ctp**. The CTP banner will appear. If this banner does not appear, verify that these steps have been followed correctly.
4	Type **<CR>** at the password prompt, if no password has been set.

CTP Access Via Remote Telnet

Another way to connect to the CTP, after the node is configured and operational, is to access remotely via your established IP network by telneting into the node from an IP network-based personal computer or workstation. You can connect to the CTP by entering **atds0 <CR>** after the PathBuilder S21x switch outputs the OK prompt.

CTP Access Via Remote X.25 or Frame Relay Network

If the PathBuilder S21x switch is operating in an X.25 network, or if Frame Relay Annex-G is used to connect with other 3Com PathBuilder S200 series switches, you can access the PathBuilder S200 series switch CTP remotely by making a Switched Virtual Circuit (SVC) call to the node and specifying subaddress 98.

Appendix A
Specifications

Specifications

Introduction

This section describes the physical and environmental specifications and power requirements for the PathBuilder S21x switch product.

Hardware

PathBuilder S21x switch products feature the following:

- 68360 processor
- 4 Mbytes DRAM (expandable to 8 or 12 Mbytes)
- 10Base T Ethernet
- Async Control Port
- 2.0 Mbytes of FLASH memory
- 2 optional daughtercard ports
- 1 configurable DIM port

Software

The PathBuilder S21x switch supports these software applications ware:

- IP Applications Ware Package
- IP & IPX ApplicationsWare Package
- SNA Applications Ware Package
- Serial Protocol Applications Ware Package
- Multiservice Applications Ware Package
- Multimedia Applications Ware Package

Environmental

The following environmental conditions are required:

- Operating temperature: 32° to 104°F maximum (0° to 40°C maximum)
- Storage temperature: -22° to +158°F (-30° to +70°C)
- Relative humidity: 5% to 95% (noncondensing)

Electromagnetic Compatibility

PathBuilder S21x switch products adhere to the following:

- FCC Part 15, Class B
- CISPR 22 and EN 55022, Class B
- AS 3548, Class B
- EN 50082-1

Power Requirements

PathBuilder S21x switch typically has the following power requirements:

- 100 to 240 VAC nominal at 47 to 63 Hz
- 32 watts input power (64 VA)
- maximum input current 0.7 amps

Power Supply Description

PathBuilder S21x switch products are powered by a switch mode power supply with 22.5 watts maximum output power.

Safety

PathBuilder S21x switch meets the following safety standards:

- EN60950
- CSA 950
- UL Listed per UL 1950

Physical

PathBuilder S21x switch has the following measurements:

- Height: 2.75 in. (6.7 cm)
- Length: 6.7 in. (17 cm)
- Width: 9.5 in. (24.5 cm)
- Weight: 2.2 lb (1.0 kg)

Appendix B
PathBuilder S21x Switch Cabling

Overview

Introduction

This Appendix identifies the cables and pinout requirements for the PathBuilder S21x switch. The following cables are described in this appendix:

- CTP Access Cable
- Dual FXS Voice Relay Cable
- 10BaseT Crossover Cable
- RemoteVu Video Cables
- DSU Daughtercard Cable
- V.35/V.36 Cable
- V.11 Cable
- V.24 Cable

Daughtercard Cable Information

Cables for optional daughtercards are shipped with the daughtercards. If your PathBuilder S21x switch is shipped with pre-installed daughtercards you will receive the cables. For daughtercard installation and more cable information, please refer to the *PathBuilder S200 Series Daughtercard Installation Guide* (Part Number, T0020).

Ordering Cables

To order cables please contact a 3Com representative. In addition to the cables listed above the following cables can be ordered:

- DB25 Male to M34 Female cable
- DB25 Male to M34 Male cable

CTP Access Cable

CTP Cable Connector and Pinout

Use the supplied RJ45/DB25 cable to connect to the CTP Port (Port 4) and perform CTP operations such as coldloading software images into a PathBuilder S21x switch.

Port 4 is a DCE. This table identifies the pinout for this RJ-45 connector:

RJ45 Pin	*Signal*	*Pin Connection on DB25F Adapter*
1 (not connected)	Request To Send (RTS)	4
2	DTE Ready (DTR)	20
3	Received Data (RXD)	3
4 (not connected)	Data Carrier Detect (DCD)	8
5	Signal Ground	7
6	Transmitted Data (TXD)	2
7	Data Set Ready (DSR)	6
8 (not connected)	Clear To Send (CTS)	5

Voice Relay Cable

Specification

The voice relay cable shipped with the Voice Relay Daughtercard has the following specification:

- Connectors: RJ11 to RJ11 Cable
- Color: Gray

Connector Pinout

The RJ11 connectors for the FXO and FXS port have the following pinout:

Pin No.	FXS		FXO	
	Name	Function	Name	Function
1		N/A		N/A
2		N/A	Aux B	External Handset
3	Loop B		Line B	
4	Loop A		Line A	
5		N/A	Aux A	External Handset
6		N/A		N/A

Warning!

The FXS Interface should only be connected to an analog telephone handset and/or fax machine.

Warning!

The FXO Interface should only be connected to an analog PBX line.

Warning!

The PathBuilder S200 series switch Voice Relay daughtercard has not been certified for use in a PSTN.

Dual FXS Voice Relay Cable

Specification

The voice relay cable shipped with the Dual FXS Voice Relay Daughtercard has the following specification:

- Connectors: RJ45 to RJ45 Cable
- Color: Gray

Connector Pinout

The RJ45 FXS port have the following pinout:

Pin No.	*FXS*	
	Name	*Function*
1		N/A
2		N/A
3	Loop B	
4	Loop A	
5		N/A
6		N/A

Warning!

The FXS Interface should only be connected to an analog telephone handset and/or fax machine.

10BaseT Crossover Cable

Specifications

The 10BaseT cable shipped with the PathBuilder S21x switch has the following specifications:

- Cable Type: Category 3 or better
- Connectors: RJ45 to RJ45
- Color: Gray
- Part Number: 61798-01

Connector Pinout

Four of the pins are used, as shown below:

Pin	*Pin*
1	3
2	6
3	1
6	2

The connector pins are numbered indicated in the following diagram:

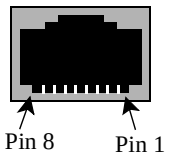


Figure B-1. RJ45 Pinout

RemoteVu Video Cables

Introduction

The RemoteVu Daughtercard requires the following cables:

- RJ45-to-RJ45 Camera Interface Cable
- BNC-to-BNC Cable

RJ-45 Connector - Camera Interface Connector Pinout

This table describes the RJ-45 connector - camera interface connector:

Pin	*Function*
1	EIA-232 data input
2	EIA-232 data output
3	EIA-485/422 positive data output
4	EIA-485/422 negative data output
5	EIA-485/422 negative data input
6	EIA-485/422 positive data input
7	+12V (current available = 50 mA)
8	Ground

DSU Daughtercard Cable

DSU Daughtercard Cable Pinout

The following table shows the pinouts for the RJ48S connector:

Pin	Signal Function
1	TX - TIP
2	TX - RING
3	RX - TIP
4	RX -RING

V.35/V.36 Cable

V.35/V.36 DCE Cable Pinout

The following table shows the DCE pinouts forV.35 and V.36 cables.

Pin	Function/Signal Name
1	SHIELD/FRAME GROUND
2	TRANSMITTED DATA A
3	RECEIVED DATA A
4	REQUEST TO SEND
5	CLEAR TO SEND
6	DATA SET READY
7	SIGNAL GROUND
8	DATA CARRIER DETECT
13	TRANSMIT CLOCK B
14	TRANSMITTED DATA B
15	TRANSMIT CLOCK A
16	RECEIVED DATA B
17	RECEIVE CLOCK A
18	RECEIVE CLOCK B
19	RECEIVE CLOCK B
20	DATA TERMINAL READY
21	TRANSMIT CLOCK B
22	EXTERNAL TRANSMIT CLOCK B
24	EXTERNAL TRANSMIT CLOCK A
25	(No Connection)

V.35/V.36 DTE Cable Pinout

The following table shows the DTE pinouts forV.35 and V.36 cables.

Pin	Function/Signal Name
1	SHIELD/FRAME GROUND
2	TRANSMITTED DATA A
3	RECEIVED DATA A
4	REQUEST TO SEND
5	CLEAR TO SEND
6	DATA SET READY
7	SIGNAL GROUND
8	DATA CARRIER DETECT
13	TRANSMIT CLOCK B
14	TRANSMITTED DATA B
15	TRANSMIT CLOCK A
16	RECEIVED DATA B
17	RECEIVE CLOCK A
18	RECEIVE CLOCK B
19	RECEIVE CLOCK B
20	DATA TERMINAL READY
21	TRANSMIT CLOCK B
22	EXTERNAL TRANSMIT CLOCK B
24	EXTERNAL TRANSMIT CLOCK A
25	TEST MODE (V.36 ONLY).

V.11 Cable

V.11 DCE Cable

The following table shows the DCE pinouts for the V.11 cable.

Pin	V.11	Function/Signal Name
1		SHIELD/FRAME GROUND
2	T (A)	TRANSMITTED DATA A
3	R (A)	RECEIVED DATA A
4	C (A)	CONTROL A
6	I (B)	INDICATION B
7		SIGNAL GROUND
8	I (A)	INDICATION A
13	S (B)	TRANSMIT CLOCK B
14	T (B)	TRANSMITTED DATA B
15	S (A)	TRANSMIT CLOCK A
16	R (B)	RECEIVED DATA B
17	*	RECEIVE CLOCK A
18	*	RECEIVE CLOCK B
19	*	RECEIVE CLOCK B
20	C (B)	CONTROL B
21	S(B)	TRANSMIT CLOCK B
22	X (B)	EXTERNAL TRANSMIT CLOCK B
24	X (A)	EXTERNAL TRANSMIT CLOCK A
*These V.11 signals are not used in the X.21 standard.		

V.11 DTE Cable

The following table shows the DTE pinouts for the V.11 cable.

Pin	Function/Signal Name
1	SHIELD/FRAME GROUND
2	TRANSMITTED DATA A
3	RECEIVED DATA A
4	CONTROL A
6	INDICATION B
7	SIGNAL GROUND
8	INDICATION A
13	TRANSMIT CLOCK B
14	TRANSMITTED DATA B
15	TRANSMIT CLOCK A
16	RECEIVED DATA B
17	RECEIVE CLOCK A
18	RECEIVE CLOCK B
19	RECEIVE CLOCK B
20	CONTROL B
21	TRANSMIT CLOCK B
22	EXTERNAL TRANSMIT CLOCK B
24	EXTERNAL TRANSMIT CLOCK A

V.24 Cable

V.24 DCE Cable

The following table shows the DCE pinouts for the V.24 cable. These pins are assigned double functions in the V.24 cable:

- Pin 15: Outputs TRANSMIT CLOCK if the port is configured for internal clocks. Otherwise it acts as a V.54 Loop 3 signal when connected to a modem.
- Pin 22: Used as the Ring Indicator output if the port is configured to emulate a dial modem. For this to work properly, the RI/TM switch of the port must be set to RI. When the RI/TM switch is set to TM, this pin acts as an input, and the TM output from the attached modem (pin 25 on the modem) comes into the 6500 on this pin.

Pin	*Function/Signal Name*
1	Shield/Frame Ground
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	Signal Ground
8	DCD
14	DATA RESTRAINT
15	TRANSMIT CLOCK or V.54 Loop 3 *
16	STANDBY INDICATOR
17	RECEIVE CLOCK
18	EXTERNAL RECEIVE CLOCK
20	DTR
21	V.54 Loop 2
22	RI/TM *
24	EXTERNAL TRANSMIT CLOCK
25	TEST MODE

V.24 DTE Cable

The following table shows the DTE pinouts for the V.24 cable.

Pin	Function/Signal Name
1	Shield/Frame Ground
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	Signal Ground
8	DCD
14	DATA RESTRAINT
15	TRANSMIT CLOCK
16	STANDBY INDICATOR
17	RECEIVE CLOCK
18	EXTERNAL RECEIVE CLOCK or V.54 Loop 3 *
20	DTR
21	V.54 Loop 2
22	(No Connection)
24	EXTERNAL TRANSMIT CLOCK
25	MAKE BUSY

Appendix C
Troubleshooting Your PathBuilder S21x Switch

In This Appendix

Introduction

This appendix describes some of the actions you can take to correct problems you may be having with your PathBuilder S21x switch.

While Setting Up Your Configuration

Introduction

This section describes the ways you can use to isolate problems that you may encounter while setting up a PathBuilder S21x switch to pass IP traffic over PPP links. For discussion purposes, the following network configuration (shown in Figure C-1) is assumed.

Note

The configuration of the local PathBuilder S21x switch and the number to call can be obtained by defaulting the node—selecting "Default Node" from the CTP's Main menu.

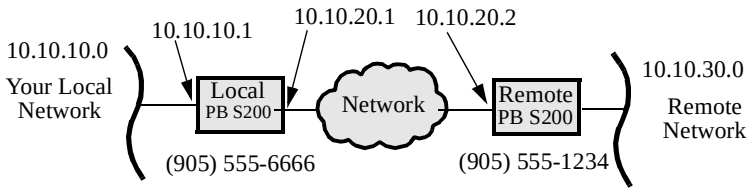


Figure C-1. Network Configuration

Note

The IP addresses used in this configuration example are for illustration purposes only. You must obtain registered IP addresses from your network administrator or your Internet Service provider, and configure them in your PathBuilder S21x switch before connecting to the Internet or Intranet.

Checking the Physical Connection

Use these procedures to check your PathBuilder S200 series switch connection and interface:

Step	Action
1	Ensure that the STS LED is ON to confirm that power is connected and that the unit is working. (Other LEDs may be ON or blink occasionally.)
2	If the STS LED flashes continuously for more than 30 seconds after the power is applied, the software image in the flash is corrupted and the node is waiting for software to be coldloaded. Refer to the Software *Installation and Coldloading Manual* for more infromation on cold-loading software.
3	If you are connected to the control port using an async terminal, (9600 bps, 8 bits, no parity), type "AT <CR>" and confirm that the Path-Builder S200 series switch outputs "OK." Then log into the CTP.

Pinging the Local LAN Interface

From the workstation or PC connected to the same local LAN segment that the PathBuilder S21x switch is connected to, ping the LAN interface of the PathBuilder S200 series switch ("ping 10.10.10.1"). The LAN LED should flash whenever a Ping packet is received.

If the LAN LED does not flash, check the configuration of the PC and the LAN connection and do the following:

Step	Action
1	Check the IP address and IP address mask of your PC or workstation, making sure that they are set to valid address and mask appropriate for your local subnetwork. (In the above example, the IP address of the PC must be set between 10.10.10.2 and 10.10.10.254) and the address mask must be set to 255.255.255.0).
2	Check the statistics of the LAN port (port 5) of the local node, making sure that the "Carrier" says "Present". If the "Carrier" field displays "Lost", there is a problem with your LAN connection and you should do the following: • If you are using a BNC connection between your workstation/PC and the PathBuilder S21x switch, make sure that you put in the 50 Ω termination resistors at both ends of the line. • If you are connecting your LAN using the 10BaseT and a 10BaseT Hub, check the display at the Hub to ensure that the connection between PathBuilder S21x switch and the Hub is correct. (Most Hubs have LEDs that stay ON when the carrier is detected). • Change the RJ45 twisted pair cable between PathBuilder S200 series switch and your Hub as it may be damaged. A straight-through 10BaseT cable is generally required between PathBuilder S21x switch and a 10BaseT Hub. If there is only a single PC or workstation connecting to the PathBuilder S200 series switch, and you are not using a 10BaseT Hub, ensure that you have used the RJ45 crossover cable, shipped with your PathBuilder S21x switch, to connect between the PC and the PathBuilder S200 series switch.

If the LAN LED does flash, but there is no ping response, do the following:

Step	Action
1	From the CTP, check the statistics of the LAN port (Port 5) (select menu option Statistics, and select port 5) while sending ping packets.
2	Confirm that the Rx Frame Count, in the Data Summary, increases as the ping packet arrives.
3	Check the Tx Frame Count field in the Data Summary part of the LAN port statistics. If the field increases for every ping packet it receives, the LAN and the configuration should be working.

Step	Action
4	If the RX Frame count increases, but the Tx Frame Count does not, the problem is most likely due to misconfiguration in the IP router Interface #1. Make sure that the IP addresses and IP address mask (select menu option Router -> IP Interfaces -> Interface 1) are set properly.

Pinging the Local WAN Interface

Once you are successful in getting ping responses from the local LAN interface, you can proceed to ping the local WAN interface ("ping 10.10.20.1" in the example). If there is no response, then check the following:

Step	Action
1	Confirm that the IP interfaces (either 5 or 6) of the WAN link that you are trying to ping are configured for Enable. (Select menu item Router->Configure Interface States.)
2	Confirm that the IP address and IP address mask of the WAN interface you are pinging are configured properly.

Appendix D
Technical Support

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3ComFacts℠ automated fax service

World Wide Web Site

Access the latest networking information on the 3Com Corporation World Wide Web site by entering the URL into your Internet browser:

http://www.3com.com/

This service provides access to online support information such as technical documentation and software library, as well as support options ranging from technical education to maintenance and professional services.

3Com FTP Site

Download drivers, patches, and software, across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com (or 192.156.136.12)**
- Username: **anonymous**
- Password: **<your Internet e-mail address>**

Note

A user name and password are not needed with Web browser software such as Netscape Navigator and Internet Explorer.

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	*Data Rate*	*Telephone Number*
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 14,400 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 3345 7266
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 28,800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 56 Kbps. To access the 3Com BBS using ISDN, use the following number:

1 408 654 2703

3ComFacts Automated Fax Service

The 3ComFacts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, please call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Below is a list of worldwide technical telephone support numbers:

Country	*Telephone Number*	*Country*	*Telephone Number*
Asia Pacific Rim			
Australia	1 800 678 515	P.R. of China	10800 61 00137 or
Hong Kong	800 933 486		021 6350 1590
India	61 2 9937 5085	Singapore	800 6161 463
Indonesia	001 800 61 009	S. Korea	
Japan	0031 61 6439	From anywhere in S. Korea:	82 2 3455 6455
Malaysia	1800 801 777	From Seoul:	00798 611 2230
New Zealand	0800 446 398	Taiwan, R.O.C.	0080 611 261
Pakistan	61 2 9937 5085	Thailand	001 800 611 2000
Philippines	1235 61 266 2602		
Europe			
From anywhere in Europe, call:	+31 (0)30 6029900 phone +31 (0)30 6029999 fax		
From the following European countries, you may use the toll-free numbers:			
Austria	06 607468	Netherlands	0800 0227788
Belgium	0800 71429	Norway	800 11376
Denmark	800 17309	Poland	0800 3111206
Finland	0800 113153	Portugal	05 05313416
France	0800 917959	South Africa	0800 995014
Germany	0130 821502	Spain	900 983125
Hungary	00800 12813	Sweden	020 795482
Ireland	1 800 553117	Switzerland	0800 55 3072
Israel	177 3103794	U.K.	0800 966197
Italy	1678 79489		
Latin America			
Argentina	541 312 3266	Colombia	571 629 4847
Brazil	55 11 523 2725, ext. 422	Mexico	01 800 849 2273
North America	1 800 NET 3Com (1 800 638 3266)		

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	*Telephone Number*	*Fax Number*
Asia, Pacific Rim	65 543 6342	65 543 6348
Europe, South Africa, and Middle East	011 44 1442 435860	011 44 1442 435718
From the following European countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria	06 607468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0130 821502	
Hungary	00800 12813	
Ireland	1800553117	
Israel	177 3103794	
Italy	1678 79489	
Netherlands	0800 0227788	
Norway	800 11376	
Poland	00800 3111206	
Portugal	05 05313416	
South Africa	0800 995014	
Spain	900 983125	
Sweden	020 795482	
Switzerland	0800 55 3072	
U.K.	0800 966197	
Latin America	1 408 326 2927	1 408 764 6883
U.S.A. and Canada	1 800 876 3266, option 2	1 408 764 7120

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