Allied Telesyn

FORMULA 8200™

Fast Ethernet Fiber Workgroup Switch

Installation Guide

Table of Contents

Chapter 1
Switch Installation

This guide shows you how to install the FORMULA 8200 fiber switch from Allied Telesyn International Corp., shown in Figure 1 and Figure 2.

Slot for accelerator card

Expansion slot

AT-8208 F/SC

Slot for uplink card

Console port

Reset button, Power LED, and Status LED

Onboard module
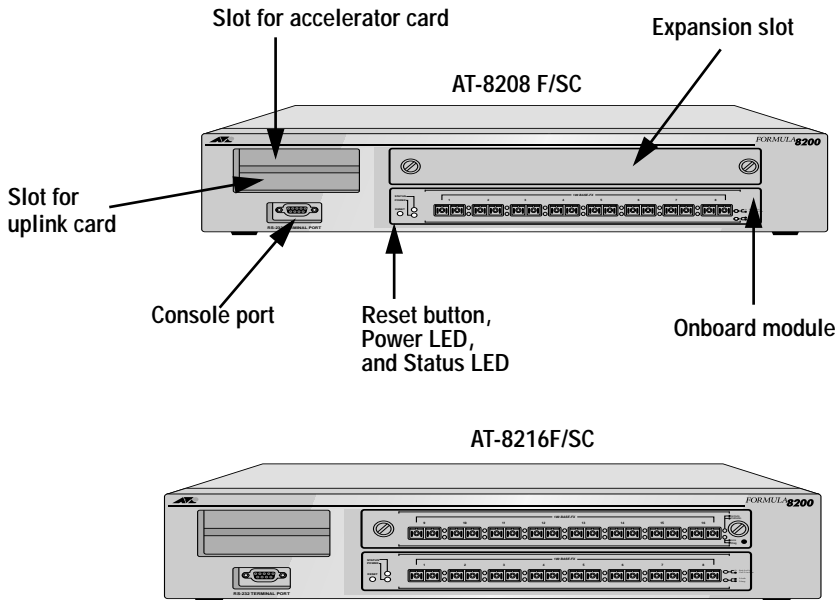
AT-8216F/SC

Figure 1: The FORMULA 8200 Fiber Switch Models (AT-8208F/SC and AT-8216F/SC)

Power switch
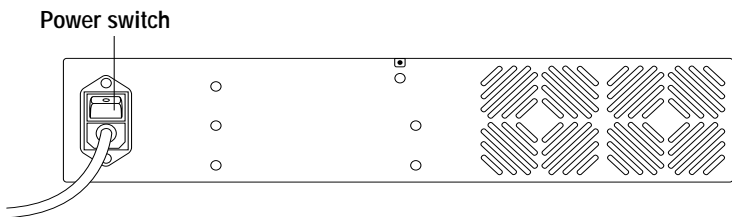
Figure 2: The FORMULA 8200 Rear Panel

Overview

The FORMULA 8200 includes the following hardware and software features:

❑ Eight or sixteen 100Base-FX, full duplex, dual SC fiber ports

❑ Flow control to autosense buffer limits on the transmit port

❑ Front panel LEDs that provide operating status and a **Reset** button for front panel control of switch

❑ RS-232 console port interface for local switch management or Telnet support for remote switch management

❑ Rack mount or table mount capabilities

❑ Support for multiple optional hardware and port configurations:

— 10/100Base-TX expansion ports
— OC3 ATM uplink card
— FDDI uplink card

❑ Virtual LAN (VLAN) support for up to 16 VLANs

❑ Virtual routing to provide switching between VLANs

❑ Loop detection using Spanning Tree Protocol (IEEE 802.1d)

❑ Port mirroring to allow monitoring of one's port activities from another port

❑ Support for RMON Groups 1,2,3, and 9

❑ Simple Network Management Protocol (SNMP) agent for Management Information Bases (MIB) II and a private enterprise MIB

❑ TFTP and Zmodem support for software upgrades and backup

Verifying Your Switch Package

Your FORMULA 8200 package consists of:

- ❏ One FORMULA 8200 fiber switch, either the 8-port AT-8208F/SC or the 16-port AT-8216F/SC

- ❏ Rackmounting kit that includes brackets and screws for the rackmounting option

- ❏ Four feet for the desktop mounting option

- ❏ AC power cord (U.S.A. only)

- ❏ This installation guide

If any of these components are damaged, contact your shipping carrier representative. If any components are missing, please phone the Allied Telesyn. Refer to Appendix D, "Where To Find Us," on page 23.

Prerequisites for Switch Installation

Before installing the FORMULA 8200, make sure your site meets the following requirements:

- ❏ Power: 90-264 VAC, 47-63 Hz, 3-6A

- ❏ Temperature: 0° ~ 40°C

- ❏ Humidity: 85% maximum relative humidity, noncondensing

Refer to Appendix A for a summary on product specifications.

Ventilation

The switch has an internal fan module. For the fan to function correctly, you must not block the ventilation openings which are located at the rear and the sides of the chassis.

Power

Power connections for each unit should be able to provide 120 VAC for North American models or 240 VAC for international models. It is advisable to use dedicated power circuits or power conditioners to supply power to the network devices. This aids in isolating network equipment from electrical power interference.

Location

Install the FORMULA 8200 on a sturdy, level surface in a ventilated area that is dust free and away from heat vents, warm air exhaust from other equipment, and direct sunlight. Avoid proximity to large electric motors or other electromagnetic equipment.

Refer to Appendix A, "Product Specifications for the FORMULA 8200 Switch," for a summary of installation specifications.

Installing the FORMULA 8200 on the Desktop

1. Set the switch on the flat surface. Allow at least 2 inches on the right side of the switch for proper ventilation and 5 inches in the back for power cord clearance.

2. Use the plastic screws provided to attach the four rubber feet to each marked location on the bottom of the chassis (Figure 3).

Figure 3: Installing the Rubber Feet

3. Attach the power cord to the back of the switch. Then attach the other end of the power cord to a grounded AC power outlet.

4. Proceed to the section, "Attaching a Console to the Switch."

Installing the FORMULA 8200 in the Rack

—————————————— Caution ——————————————

When mounting the switch in a rack, do not stack units directly on top of one another.

1. If the rubber feet are attached, remove them.

2. Attach the mounting brackets to the side of the switch using the M4 x 8 mm screws provided (Figure 4).

—————————————— Caution ——————————————

Use only the M4 x 8 mm screws provided. Longer screws may contact the internal components, damaging the unit.
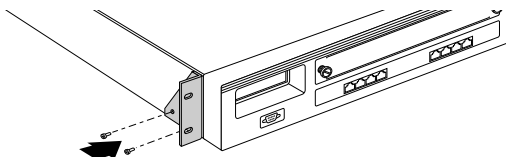
Figure 4: Attaching the Mounting Brackets

3. Align the holes in the mounting brackets to the holes in the rack (Figure 5) and secure with the screws provided.
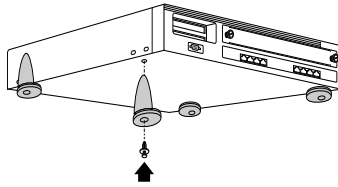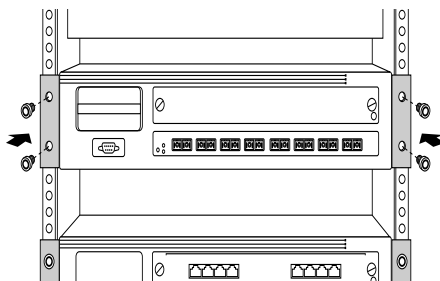

Figure 5: Rackmounting the Switch

4. Attach the power cord to the back of the switch. Then attach the other end of the power cord to a grounded AC power outlet.

5. Proceed to the section, "Attaching a Console to the Switch."

Attaching a Console to the Switch

You need the following equipment:

❑ A terminal or TTY-compatible terminal, or a portable computer with a serial port and the ability to emulate a VT100 terminal

❑ A UL-listed null modem RS232 cable with a female DB9 connector for the console port on the switch and with a connector on the other end that is appropriate for your computer or terminal

1. Set the terminal protocol as follows:

   — 9600 baud
   — No parity
   — 8 bits
   — 1 stop bit
   — Window terminal emulation option set to **No**
   — Terminal preferences: **Function**, **Arrow**, and **Control** keys active

2. Connect the terminal (or a computer in terminal-emulation mode) to the switch's console port using the RS232 cable. Then turn on the terminal.

3. Proceed to the section, "Powering Up and Initializing the Switch."

Powering Up and Initializing the Switch

Power on the switch.

The switch goes through a power-on self test (POST) to verify that all components are functioning properly. The console displays messages similar to the following screen:

──────────── Note ────────────
Report any error messages to Allied Telesyn's Technical Support department. Refer to Appendix D, "Where To Find Us," for contact information.

Post begins ──

Component tests ──

Firmware loads ──

System info ──

Vendor info ──

```
Boot POST in progress...

PROM version: 1.0.10

Sizing DRAM (value displayed is bank size or error
code)...
DRAM now configured into a contiguous block:
    Address: ............. 0xa0000000 - 0xa07ffffc
Running DRAM test...
Initializing 4650 icache and dcache...
Initializing PIG chip...
Initializing PMIU chips...
.
.
.
Boot POST complete, passing control to firmware...

Loading /flash/firmware...Starting at 0x80010000...

Firmware version 1.4.0

Date= 11/7/97 time= 11:34:27
Restore configuration for system
IP address = 0.0.0.0
Number of ports = 16
Configuration changed
srm_init success

          Allied Telesyn International Corp.
   Copyright@ 1997 Allied Telesyn All rights reserved.

Switch Init Success

Login:
```
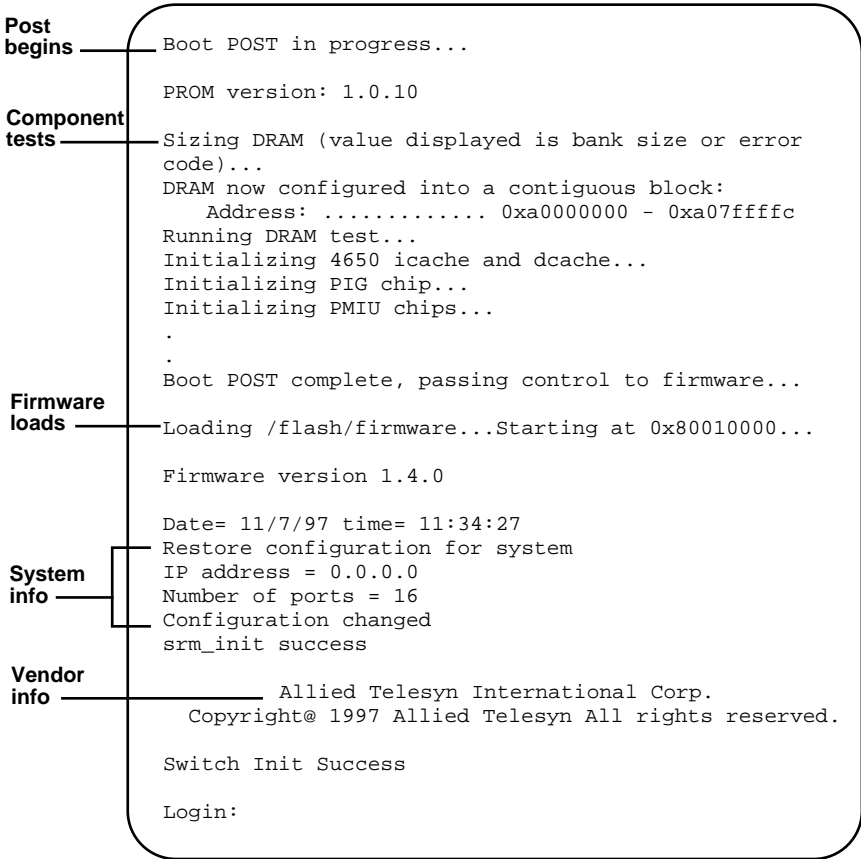
Figure 6: FORMULA 8200 POST Messages

4.   Observe the LEDs for normal switch operation (Figure 7 and Table 1).
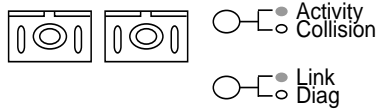
Figure 7: Close-Up of the FX Port LEDs

Table 1:   FORMULA 8200 FX LED States

LED	Description
Status	**Flashing green** means the system-wide operation is normal.
	Solid green means the switch is locked up and you probably cannot log in. Reboot the switch.
	Flashing amber means the switch is completing a DRAM test during a power on self test (POST); otherwise, there may be problems. Reboot. If the LED state does not change, contact Allied Telesyn's Technical Support.
	Solid amber means the switch is still functioning, but with problems. Try to solve the problems; otherwise, reboot.
Power	**Solid green** means power is applied and operation is normal.
	Off means there is no power to the switch. Check the power cord and power source. Turn off and on. Replace the switch if LED remains unlit.
Port LED: Activity	**Flashing** or **solid green** means the port is receiving or transmitting traffic.
	Off means there is no traffic. This LED state does not indicate a problem.
Port LED: Collision	This LED is always **off**. It is not supported on the FORMULA 8200 fiber switch because collisions do not occur on full duplex FX ports.
Port LED: Link	**Solid green** means the cable's link status is good.
	Off means there is no link; **flashing** means there is a link problem. Verify cable and port speed supported on end device (FX ports are 100Mbps full duplex only).
Diag	This LED is normally **off**. This LED is reserved for factory use.

At initial startup, the switch operates at the default parameters listed in Table 2. If you want to change these settings, refer to the *FORMULA 8200 User's Guide* available from Allied Telesyn's website at **www.alliedtelesyn.com/manuals.htm** for detailed procedures on how to:

— Set the switch's IP address, subnet mask, and gateway address
— Change the default login and password for security reasons
— Verify the Ethernet port configuration

Table 2: Default Fiber Switch's Parameters

Parameter	Default Value
System login	admin
System password	switch
Admin Status	Enabled
IP Address	0.0.0.0
IP Subnet Mask Address	0.0.0.0
Default Gateway Address	0.0.0.0
Spanning Tree Protocol	Enabled
Port Path Cost	10
Port Priority	128
Half or Full Duplex	Full duplex on FX ports
Port Speed	100 Mbps on FX ports
Autonegotiation	Off; not applicable to FX ports
Spanning Tree Priority	32768
Active Aging Time	300 seconds
Hello Time	2 seconds
IP RIP Mode	Silent
VLAN	All ports to a default VLAN #1
Console	9600, 8, N, 1

5. Log in at the prompt:

    — Log in as **admin**.
    — Enter the default password, **switch**.

6. Enter **SYSTEM/SHOW** and verify the firmware and IP information.
    Make sure the firmware version displayed on the screen matches the
    version of the *Release Notes* and the *User's Guide* you will be
    downloading from Allied Telesyn's website (described later on
    page 11).

    If you want to configure the IP parameters (IP address, subnet mask,
    and gateway address), use the **BOOT/IP/CONFIG** command.

    ─────────────────────────── Note ───────────────────────────
    You must enter a unique IP address for the switch if you plan to
    manage the switch via Telnet or SNMP.
    ──

7. Enter **ETHERNET/SHOW/PORT** to verify your port configuration.
    The following screen shows the initial configuration for the
    FORMULA 8200 with 8 FX ports:

```
/ETHERNET/SHOW> port

Physical Port#      Autoneg     Speed        Duplex
==============      =======     =====        ======
1                   off         100MBPS      FULL
2                   off         100MBPS      FULL
3                   off         100MBPS      FULL
4                   off         100MBPS      FULL
5                   off         100MBPS      FULL
6                   off         100MBPS      FULL
7                   off         100MBPS      FULL
8                   off         100MBPS      FULL
```

─────────────────────────── Note ───────────────────────────
You cannot change the port settings on the display.
──

Connecting Devices to the Fiber Ports

Connect the switch to any equipment that conforms to IEEE 802.3u standard, such as Ethernet networking devices, workstations, servers, other full duplex switches, or bridges that support 100Base FX.

1. Remove the dust caps only from the FX ports you intend to use.

    ─────────────────────── Caution ───────────────────────
    Always leave the dust caps on unused ports to protect the fiber ports from dust.
    ──

2. Connect devices to the ports, **one at a time** (Figure 8).
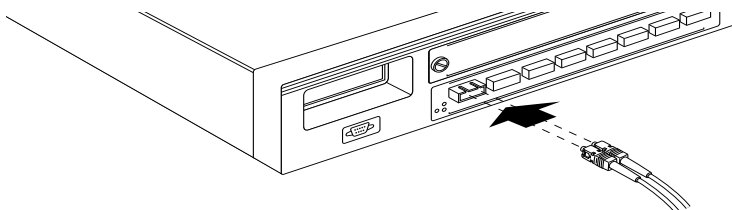

Figure 8: Attaching Fiber Cables to the FX Ports

    Dual SC cable connectors are keyed so you can insert them only one way. If your cable is not keyed, note that the Receive cable is on the right and the Transmit cable is on the left.

3. Verify the correct link and status condition for every port-to-device connection before proceeding to the next connection. See Table 1 for a description of port LED activity.

4. Attach additional networking cables as appropriate.

Where to Go Next

Go to Allied Telesyn's website at **www.alliedtelesyn.com/manuals.htm** and download the following documents:

❑ *FORMULA 8200 User's Guide* for the commands to configure and monitor the switch

❑ *FORMULA 8200 Software Release Notes* for the latest information on your switch software version

Sample Networking Applications

Workgroup LAN Switching Example

Router   100 Mbps   100 Mbps

FORMULA 8200

Server
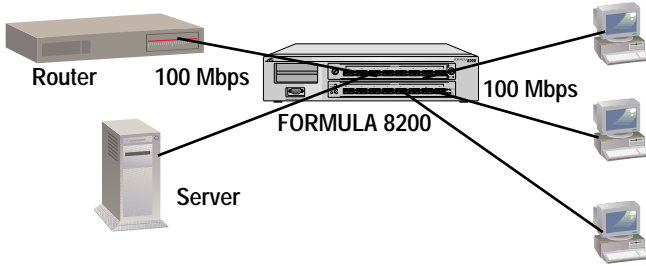
Backbone LAN Switching Example

100 Mbps   Server

100 Mbps

FORMULA 8200   10/100 Mbps

Switch
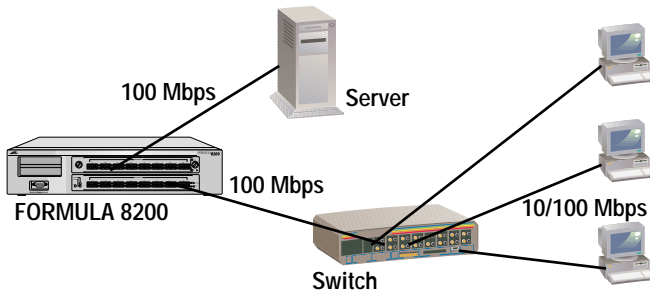
Optional ATM Backbone Connectivity Example

155 Mbps

FORMULA 8200   ATM Switch

155 Mbps

100 Mbps

FORMULA 8200
(TX ports)   10/100 Mbps

Servers
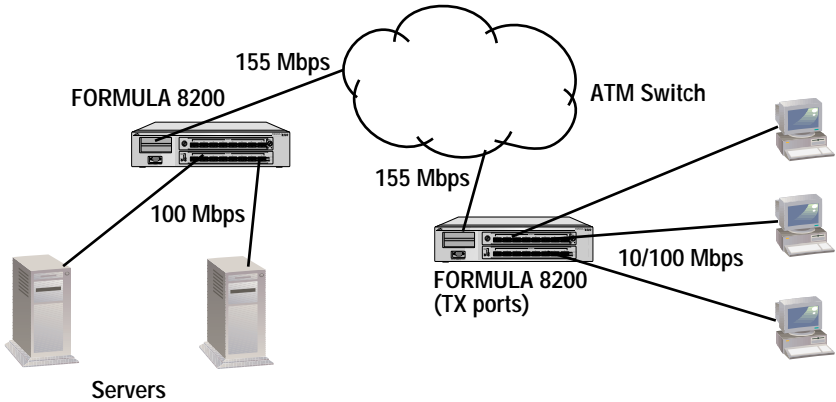
Chapter 2
Troubleshooting

This chapter provides information on isolating and resolving problems with FORMULA 8200 operation.

Ethernet networks tend to be fairly simple, but they can still have problems that take time to resolve. The most common problems are associated with the actual network cabling.

If you have problems with a newly established network (initial setup), the trouble is most likely related to cabling or addressing. If the network has been operational for an extended period and is now beginning to have problems, the trouble is probably related to recent additions or changes to the network, or configuration settings on your switch.

─────────────────── Note ───────────────────
If you have trouble performing any of the steps in this chapter, or if you have questions not covered in this manual, contact Allied Telesyn's Technical Support Department. See Appendix D, "Where To Find Us," for contact information.
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Areas to Check

The following pages describe the areas to check when troubleshooting the switch:

❑ LED status

❑ IP Addressing

❑ Network cabling

Checking LED Status

The switch has system LEDs (Status and Power), located on the front panel, that indicate the switch's overall operational status. For the location of these LEDs, see the encircled area in Figure 9.
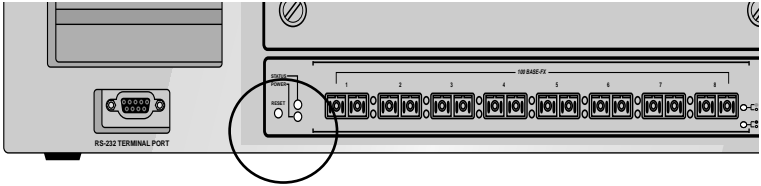

Figure 9: Switch System LEDs

Additionally, each FX port has a set of LEDs to the right. For a closeup view of the FX LEDs, see Figure 10.
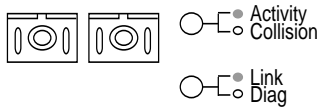
Figure 10: FX Port LEDs

Table 3 describes how these LEDs report on the switch and ports' status, and what you need to do in case of a problem.

Table 3: LED States and Recommended Action

LED	Description and Action Required
Status	**Flashing green** means the switch's system-wide operations are normal.
	Solid green means the switch software is locked up and you probably cannot log in. Reboot the switch.
	Flashing amber means the switch is completing a DRAM test during a power on self test (POST); otherwise, there may be problems. Reboot. If the LED state does not change, contact Allied Telesyn's Technical Support.
	Solid amber means the switch is still functioning, but with problems. Try to determine the cause of the problem without rebooting the switch. If all else fails, reboot.

Table 3: LED States and Recommended Action (Continued)

LED	Description and Action Required
Power	**Solid green** means power is applied and the switch is functioning normally. No action is required.
	Off means there is no power to the switch. Check the power plug and the state of the on/off switch in the back of the unit. If On, turn it off, wait a few seconds, and turn it on. If LED remains unlit, replace the switch.
Port LED: Activity	**Flashing or solid green** means the port is receiving or transmitting traffic. No action is required.
	Off means there is no traffic. This state does not indicate any problem on that port. No action is required.
Port LED: Collision	This LED is always **Off**. It is not supported on the FORMULA 8200 fiber switch because collisions do not occur on full duplex FX ports. No action is required.
Port LED: Link	**Solid green** means the cable's link status is good.
	Off means there is no link; **flashing** means there is a link problem. Verify cable and port speed supported on end device (FX ports are 100Mbps full duplex only).
Port LED: Diag	This LED is normally **off**. This LED is reserved for factory use.

IP Addresses

The FORMULA 8200 has a factory-assigned unique MAC address but does not have a default IP address. If you are managing the switch from a console, an IP address is not required. However, if you are managing the switch over the network (via SNMP or Telnet), the switch must have a valid IP address.

Assign a unique IP address to the switch by using the **BOOT/IP/CONFIG** command. See the *FORMULA 8200 User's Guide*, available from **www.alliedtelesyn.com/manuals.htm**, for more details.

Cabling

The fiber media adapter for the 100Base-FX port uses only multimode 62.5/125 micron, 1300 nm fiber cable. The 100Base-FX media adapter is not supported on single-mode fiber. All fiber port connections use dual SC connectors.

Appendix A

Product Specifications for the FORMULA 8200 Switch

Network Protocol	Fast Ethernet
Standards Supported	IEEE 802.1d
	IEEE 802.3u, 100Base-X
Data Rate	100 Mbps multimode fiber
Hardware Architecture	
Processor	MIPS 4650
Processor DRAM	8 Mbytes
Flash memory	2 Mbytes
Physical Specifications	
Dimensions	3.5"H x 17" W x 18"D (8.97 x 43.6 x 46.2 cm)
Weight	19 lbs (8.6 kg)
Electrical Specifications	
Input line frequency	47-63 Hz
Input current	3-6 Amps
Input voltage	90-264 VAC, auto-selectable
Environmental Specifications	
Operating temperature	0˚ to 40˚ C (32˚ to 104˚ F)
Storage temperature	–20˚ to 60˚ C (–18˚ to 148˚ F)
Operating humidity	85% maximum relative humidity, noncondensing
Storage humidity	95% maximum relative humidity, noncondensing
Operating altitude	0 to 10,000 ft.

Electromagnetic Immunity

RF susceptibility	**EN61000, Level 4/3**
Electrostatic discharge (ESO)	**EN61000, Level 4/2**
Electric Fast Transitions	**EN61000, Level 4/4**

Electromagnetic Emissions   FCC Class A digital devices
En 55 022 Class A
VCCI Class 2 ITE

Safety Agency Approvals   UL/cUL Listed (UL1950)
CSA Accepted
TUV Licensed (IEC950-A2, 1993)
Meets CE Conformity Standards (CE on file)

Appendix B
Technical Support Fax Order

Name _____

Company _____

Address _____

City _____ State/Province _____

Zip/Postal Code _____ Country _____

Phone _____ Fax _____

Incident Summary

Model number of Allied Telesyn product I am using _____

Network software products I am using _____

_____

Brief summary of problem _____

_____

Conditions (list the steps that led up to the problem) _____

_____

_____ _____

Detailed description (use separate sheet, if necessary)

_____

_____ _____

_____

When completed, fax this sheet to the appropriate Allied Telesyn office. Fax numbers can be found on page 23.

Appendix C

FORMULA 8200 Fiber Switch Installation Guide Feedback

Please tell us what additional information you would like to see discussed in the guide. If there are topics you would like information on that were not covered in the guide, please photocopy this page, answer the questions and fax or mail this form back to Allied Telesyn International Corp. The mailing address and fax number are at the bottom of the page. Your comments are valuable when we plan future revisions of the guide.

I found the following the most valuable _____

_____

_____

_____

_____

I would like the following more developed _____

_____

_____

_____

_____

I would find the guide more useful if _____

_____

_____

_____

Please fax or mail your feedback. Fax to 1-425-481-3790. Or mail to:
Allied Telesyn Technical Communications Department
19015 North Creek Parkway
Bothell, WA 98011 USA

Appendix D
Where To Find Us

For Technical Support or Service		
Location	Phone	Fax
Americas United States, Canada, Mexico, Central America, South America	1 (800) 428-4835	1 (425) 481-3790
Asia Singapore, Taiwan, Thailand, Malaysia, Indonesia, Korea, Philippines, China, India	(+65) 3815-613	(+65) 3833-830
Australia Australia, New Zealand	(612) 416-0619	(612) 416-9764
France France, Belgium, Luxembourg, The Netherlands, Middle East, Africa	(+33) 1-60-92-15-32	(+33) 1-69-28-37-49
Germany Germany, Switzerland, Austria, Eastern Europe	(+49) 30-435-900-126	(+49) 30-435-70-650
Hong Kong	(+852) 2-529-4111	(+852) 2 529-7661
Italy Italy, Spain, Portugal, Greece, Turkey, Israel	(+39) 2-416047	(+39) 2-419282
Japan	(+81) 3-3443-5640	(+81) 3-3443-2443
United Kingdom United Kingdom, Denmark, Norway, Sweden, Finland, Iceland	(+44) 1-235-442560	(+44) 1-235-442490
Technical Bulletin Board Service	1 (425) 483-7979	
Technical Support E-mail Address	TS1@alliedtelesyn.com	
CompuServe	Go ALLIED	
World Wide Web	http://www.alliedtelesyn.com	
FTP Server	Address: ftp.alliedtelesyn.com [lowercase letters] Login: anonymous [lowercase letters] Password: your e-mail address [requested by the server at login]	

For Information Regarding Allied Telesyn International	
Allied Telesyn International 19015 North Creek Parkway Bothell, WA 98011 Tel: 1 (425) 487-8880 Fax: 1 (425) 489-9191	**Allied Telesyn International** 950 Kifer Road Sunnyvale, CA 94086 Tel: 1 (800) 424-4284 (USA and Canada) Fax: 1 (408) 736-0100

For Sales Information

Australia	United States

Lindfield, NSW
Tel: (612) 416-0619, Fax: (612) 416-9764

Canada

Rexdale, Ontario
Tel: (416) 675-6738, Fax: (416) 675-0057

Richmond, British Columbia
Tel: (604) 244-0678, Fax: (604) 270-3644

England

Abingdon, Oxon
Tel: (+44) 1235-442500, Fax: (+44) 1235-442590

France

Les Ulis
Tel: (+33) 1-60921525, Fax: (+33) 169-28-37-49

Germany

Berlin
Tel: (+49) 30-435-90-00, Fax: (+49) 30-435-706-50

Freising
Tel: (+49) 8161-9906-0, Fax: (+49) 8161-9906-22

Hong Kong

Mongkok
Tel: (+852) 2-529-4111, Fax: (+852) 2-529-7661

Italy

Milano
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Japan

Machida-shi, Tokyo
Tel: (+81) 427-21-8141, Fax: (+81) 427-21-8848

Yodogawa-ku, Osaka
Tel: (+81) 6-391-6310, Fax: (+81) 6-391-6325

Singapore

Tel: (+65) 383-3832, Fax: (+65) 383-3830

Scottsdale, AZ
Tel: (602) 423-7087 Fax: (602) 423-7088

Los Angeles, CA
Tel: (310) 412-8684, Fax: (310) 412-8685

Mission Viejo, CA
Tel: (714) 699-0628, Fax: (714) 699-0276

San Diego, CA
Tel: (619) 279-3899, Fax: (619) 279-3897

Santa Ana, CA
Tel: (714) 838-0434, Fax: (714) 838-9721

Clearwater, FL
Tel: (813) 726-0022, Fax: (813) 726-0234

Norcross, GA
Tel: (770) 448-7214, Fax: (770) 448-2600

Reading, MA
Tel & Fax: (617) 944-3492

Eden Prairie, MN
Tel: (612) 829-7506, Fax: (612) 903-5284

St. Louis, MO
Tel: (314) 894-6160, Fax: (314) 894-3773

Dover, NH
Tel: (603) 743-3010, Fax: (603) 743-6327

Plaistow, NH
Tel: (603) 382-0815, Fax: (603) 382-0818

Portsmouth, NH
Tel: (603) 431-6461, Fax: (603) 431-1649

Morrisville, NC
Tel: (919) 468-0831, Fax: (919) 468-0829

Lake Oswego, OR
Tel: (503) 699-3130, Fax: (503) 636-6575

Austin, TX
Tel: (512) 261-6378, Fax: (512) 261-6379

Dallas, TX
Tel: (214) 365-9471, Fax: (214) 365-9472

San Antonio, TX
Tel: (210) 646-8744

Vienna, VA
Tel: (703) 506-0196, Fax: (703) 506-1986