



FDDI PCI Adapter
(english)



FDDI PCI Adapter Product Manual

English
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Product Registration: The registration card for your SysKonnnect product is contained in the "Register" directory on the CD ROM. (On the CD ROM start page, click button "Product Registration".)



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Chapter 1. Fundamentals

The SK-NET FDDI PCI adapters attach computers to 100 Mbps Fiber Distributed Data Interface (FDDI) networks using fiber-optic cable, S/UTP or UTP (category 5) copper cable. (STP is supported via a special *Impedance Matching Cable*.)

Product Features SK-NET FDDI PCI⁶⁴ /SK-NET FDDI PCI⁶⁴ SUN

- Support for Sun 64bit/66MHz PCI bus architectures
- Auto-sensing for 64bit/66MHz, 64bit/33MHz, 32bit/66MHz or 32bit/33MHz bus systems
- Auto-sensing 3.3 volt/5.0 volt bus operation
- FDDI/MIC, FDDI/SC or CDDI/RJ-45 connectors
- Single-attached (SAS) or dual-attached (DAS) units available
- Supports "Dual-Homing" (DAS versions)
- SNMP manageable
- Remote Boot via Open Firmware according to IEEE1275
- Supports Synchronous FDDI with SBA (Synchronous Bandwidth Allocation) and ESS (End Station Support)
- Fully software configured - no switches or jumpers
- Fully compliant with all FDDI specifications including SMT 7.3, ANSI MMF-PMD (Fiber) and ANSI TP-PMD (Copper)



Chapter 1. Fundamentals

Network card	Port configuration		Transmission Medium Plugs		
	Single-port-version (SAS)	Dual-port-version (DAS)	UTP/S-UTP	Fiber MIC	Fiber SC
FP ⁶⁴ (SK-5841)	■			■	
LP ⁶⁴ (SK-5843)	■				■
LP ⁶⁴ DAS (SK-5844)		■			■
UP ⁶⁴ (SK-5821)	■		■		
UP ⁶⁴ DAS (SK-5822)		■	■		
FP ⁶⁴ SUN (SK-5841S)	■			■	
LP ⁶⁴ SUN (SK-5843S)	■				■
LP ⁶⁴ DAS SUN (SK-5844S)		■			■
UP ⁶⁴ SUN (SK-5821S)	■		■		
UP ⁶⁴ DAS SUN (SK-5822S)		■	■		



Product Features SK-NET FDDI PCI

- Support for 32bit/33MHz PCI bus architectures
- FDDI/MIC, FDDI/SC or CDDI/RJ-45 connectors
- Single-attached (SAS) or dual-attached (DAS) units available
- Supports "Dual-Homing" (DAS versions)
- SNMP manageable
- Remote Boot via Open Firmware according to IEEE1275
- Supports Synchronous FDDI with SBA (Synchronous Bandwidth Allocation) and ESS (End Station Support)
- Fully software configured - no switches or jumpers
- Fully compliant with all FDDI specifications including SMT 7.3, ANSI MMF-PMD (Fiber) and ANSI TP-PMD (Copper)

Network card	Port configuration		Transmission Medium Plugs		
	Single-port-version (SAS)	Dual-port-version (DAS)	UTP/S-UTP	Fiber MIC	Fiber SC
FP (SK-5541)	■			■	
LP (SK-5543)	■				■
LP DAS (SK-5544)		■			■
UP (SK-5521)	■		■		
UP DAS (SK-5522)		■	■		



Attaching FDDI Adapters to Your Network

Comprehensive information on FDDI networking theory is given in the SK-NET FDDI Concentrator manual.

- A **SAS** adapter supports single attachment to a concentrator.
- A **DAS** adapter supports either dual attachment to the main ring path or dual homing to one or two FDDI concentrators. **Note: Due to better EMI characteristics, fiber-optic components are preferable for dual attachment to the main ring path.**

Note: When connecting FDDI adapters to the network, make sure that the adapter transceiver matches the concentrator transceiver e.g. both must be either fiber-optic or CDDI TP-PMD/MLT-3.

Connection Types

There are three basic connection types that can be mixed and matched in the same network.

1. Dual Attachment to the Dual Ring

Class A devices can be connected directly to the FDDI dual ring. A device connected to both rings is said to be *dual attached* (DAS for stations, DAC for Concentrators). Since each ring has a transmit and a receive line, there are two transmit paths out of and two receive paths into the dual attached device. Due to the redundant data paths, dual attachment offers fault tolerance.

2. Single Attachment to a Concentrator

Class B devices connect point to point to a concentrator. This connection type is known as *single attached*. For single attached devices, the concentrator acts as the central hub. When SASs are connected to a single concentrator, the concentrator is said to be *non-attached* or *stand alone*. In this situation, the dual ring is collapsed into the concentrator.

3. Dual Homing

Dual homing is a connection type for a Class A device where it is connected to two M ports



(preferably different concentrators). The connection to one concentrator is the primary connection and is active; the connection to the second concentrator is for backup purposes and inactive. Since each connection to the concentrator has a send and a receive path, there are two transmit paths out of and two receive paths into the dual homed device. Due to the redundant data paths, dual attachment offers fault tolerance.

Concentrators which are connected to other concentrators building a tree below the dual ring are referred to as *cascaded*. Cascading applies to both single attached and dual homed concentrators.

Port Types (A, B, M and S)

The ports on the various FDDI devices are given logical names. There are four port types in FDDI: A, B, M (Master) and S (Slave).

Device Type	Ports (Qty)
DAS (Dual Attachment Station)	A & B (1 each)
DAC (Dual Attachment Concentrator)	A & B (1 each) M (1 or more)
SAS (Single Attachment Station)	S (1)
SAC (Single Attachment Concentrator)	S (1) M (1 or more)
Stand Alone Concentrator	M (multiple)

Port Usage in Dual Attached Connections

For a Class A device on the dual ring, the A port connects to the B port of the upstream neighbor and the B port connects to the A port of the downstream neighbor. This *daisy chaining* of devices continues around the ring.

For dual attached devices on the dual ring, the function of the A and B ports is described in the following table.



Dual Attached Device Port	Function
A	Primary Ring In Secondary Ring Out
B	Primary Ring Out Secondary Ring In

Port Usage in Single Attached Connections

On single attached devices, the S (Slave) port connects to an M (Master) port on the concentrator.

Port Usage in Dual Homed Connections

For dual homed Class A devices, the A port connects to an M port on one concentrator and the B port connects to an M port on a second (or the same) concentrator.

For dual homed devices, the function of the A and B ports is described in the table below.

Dual Homed Device Port	Function
A	Secondary Connection
B	Primary Connection

The Adapter Kit

The adapter kit consists of the following items:

- cardboard packaging, anti-static bag
- the adapter
- a plastic envelope containing the Driver CD-ROM and the *SysKonnnect Installation Guide*

If any item is missing or damaged, contact your authorized reseller.



Chapter 2. Connecting the Network Card to the Data Network

Notices

- You will find instructions for the mechanical installation of the adapter in your computer in the manual *SysKconnect Installation Guide*.
- General instructions for driver installation are contained in Chapter 3 of this documentation.
- **Follow the handling and safety instructions given in the *SysKconnect Installation Guide*.**

To complete the hardware installation, you need the following items:

- Cables (refer to the following table)
- An optical bypass switch, if appropriate

Port Type		Cables	Connectors	Correct Keying
SAS	Copper	One UTP (Cat. 5) or S/UTP cable	RJ-45	-
	MIC*	One fiber-optic cable	MIC	■
	SC**	Two fiber-optic cables	SC	-
DAS	Copper	Two UTP (Cat. 5) or S/UTP cables	RJ-45	-
	SC**	Four fiber-optic cables	SC	-

* MIC cabling systems generally use cables with two fiber-optic cores (SC cables: 1 core per cable).

** The two fiber-optic SC cables may be replaced with one duplex cable with dual connectors.



**Chapter 2. Connecting
the Network Card to the
Data Network**

To connect the computer to the network, attach an FDDI cable to each installed adapter.

Note (MIC only):

In a dual attachment configuration, the FDDI cable keyed A is always connected to the transceiver labeled A, and the cable keyed B is always connected to the transceiver labeled B. In a single attachment configuration, the cable and the transceiver have to be keyed S. (The MIC adapters are delivered without keying.)

The mechanical and electrical installation of the adapter is now complete.

Note: The adapter is only operational if a protocol driver is loaded. Refer to chapter 3 for instructions on loading the appropriate driver(s).



Chapter 3. Installing Protocol Drivers from the CD-ROM

Installing Network Drivers (Protocol Drivers)

The protocol drivers are located in the appropriate product directory on the CD-ROM. This directory is organized into a number of subdirectories for the various operating systems. For instructions on how to install the drivers please read the relevant *Readme* files. These files are available as ASCII text and in HTML format. Any last-minute changes are documented in the Release Notes and on the SysKonnnect driver site on the Internet.

To install a driver please follow the instructions in the relevant Readme files. Once you have installed the driver, remember to check that the **network connection is functioning correctly**.

Viewing Readme Files with an Internet Browser

If you have an Internet browser (or any other HTML viewer) installed on your computer we recommend you use it to view the instructions for installing the drivers.

1. Insert the installation CD-ROM in your CD-ROM drive.
2. If, as is usually the case, the Windows Autorun function is activated (or a similar function in another operating system) the browser will be automatically launched. You will see the welcome screen for the installation CD-ROM. If this is not the case, you will have to run the *start.htm* file manually from your CD-ROM drive.
3. From the list of various directories, go to the SK-NET FDDI product family, and from there to the operating system for which you want to install the network card. Here you will find instructions on how to install the driver.



Viewing Readme Files Using a Text Viewer or Editor

The Readme files have the extension `.txt`, the filename itself is the name of the driver.

To find the text files:

1. Insert the installation CD-ROM in your CD-ROM drive and go to the appropriate product directory.
2. Go to the subdirectory of the operating system for which you want to install the driver.
3. Open the appropriate text file.

Checking the Network Port

Once the driver is installed and loaded, the adapter is ready for use. The operational state is indicated via LEDs.

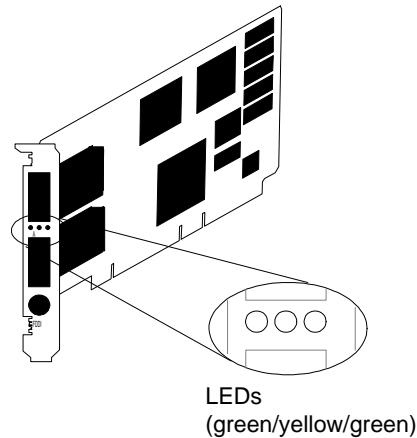


Figure 1. Location of the LEDs (dual link)

SAS Adapters

Green	Yellow	Explanation
off	off	Driver not loaded, adapter not operational.
off	on	Station management code is running, adapter is not connected to the network (for example, cable is disconnected).
on	off	Adapter is ready for use (connected to network and operational).

DAS Adapters

Green (left)	Yellow	Green (right)	Explanation
off	off	off	Driver not loaded, adapter not operational.
off	on	off	Station management code is running, adapter is not connected to the network (for example, cable is disconnected).
on	off	off	Adapter active on port B.
off	off	on	Adapter active on port A .
on	off	on	Adapter is ready for use (connected to network and operational), station connected to the FDDI dual ring.



Chapter 4. Troubleshooting

Test the Adapter

NOTE: The diagnostic program for the adapter is a DOS-based utility. Therefore, you must have installed the adapter in a computer operating (also) in an MS-DOS environment.

There are two ways to test the adapter:

- A test with loopback covering all devices including the transceiver.
- A test without loopback covering all devices except the transceiver.

Note: For the transceiver tests, the following prerequisites apply:

Adapter type		Plugs	Connector(s)
SAS	Copper	One wrap plug	RJ-45
	MIC	One wrap plug	MIC
	SC	One wrap plug	SC
DAS	Copper	Two wrap plugs	RJ-45
	SC	Two wrap plugs	SC

To test the adapter, follow these steps:

1. If the adapter is already installed in a computer without DOS operating system, please remove the adapter as described in your computer documentation.
2. Install the adapter in a computer operating in an *MS-DOS* environment. Follow the instructions described in the *SysKonnnect Installation Guide*.



Chapter 4.
Troubleshooting

3. If the adapter is connected to the network, remove the FDDI cable(s) (plugs) from the transceiver(s). If applicable, remove the process plug(s) from the transceiver(s). If you want to perform the test without loopback, skip to instruction No.5 of this list.
4. Insert the wrap plug(s) into the transceiver(s).
5. Boot with DOS and wait until the operating system is loaded and the DOS prompt is displayed on the screen.
6. If you are not able to initiate DOS or if the DOS prompt does not appear, check your configuration.
7. Insert the Driver Installation CD-ROM (which was delivered with the adapter) in your CD-ROM drive and change to the path *SK-55xx/Diag* or *SK-58xx/Diag* on the CD-ROM.
8. Type **SKFPDIAG** and press the Enter key.
9. When the Main Menu of the diagnostic program is displayed, select **Diagnostics** to perform the test without loopback or **Diagnostics with Loopback** to perform the test with loopback

Several tests are performed. This will take 1 to 4 minutes. After all the tests are passed, a message is displayed.



Chapter 4.
Troubleshooting

```

Diagnostics v5.00 (19980417)                                00:00:01:02
SysKconnect FDDI-PCI Adapter SK-5844 (SK-NET FDDI-LP64 DAS)  DAS, no bypass
Output none
Media Original PMD    Connector LCF-MIC SC type HW-Rev 12  VIO 3.3 V
IO Port 0xE000 Mem.  FB000000 Slot 1 IRQ 11  CLS 8 Lat.20 FEPROM inact.
MAC-Addr 00-00-54-40-ed-1b DEV 4000 VEND 1148 SUB DEV 5841 SUB VEND 1148
Bus Clock <=33 MHz Slot Size 32bit                Volt. 4.928 V Temp. 43 °C

```

<pre> Main Menu Exit Diagnostics Diag with Loopback Flash PROM VPD Data </pre>	<pre> Board register check.....passed Onboard time checkpassed Onboard memory check.....passed DMA engine check.....passed LAN interface check.....passed Throughput Test.....passed *** All tests passed successfully *** Measuring DMA speed DMA speed: 75.5657 MB/s *** DMA speed measured successfully *** Press any key to continue </pre>
--	---

Figure 2. Typical Message Screen of the Diagnostic Program

If an error occurs, follow the instructions given in the message displayed on the screen. Please check configuration and run the test again.
Press any key to continue.



Display VPD Data

Vital Product Data (VPD) is the electronic inventory data stored in the PROM of the NIC. At the moment, the data can only be read from this PROM. It can be accessed via the diagnostic program.

To read VPD data:

1. Select the item *VPD data* from the main menu of the diagnostic program. (Refer to the previous paragraphs to start the diagnostic program, if applicable).
2. From the sub-menu, select the item *Display VPD Data*. A screen similar to the following figure is displayed.

```
<Display VPD Data: <Enter> to exit, <Pg Up>/<Pg Down> to scroll>
Product Name
  SysKconnect FDDI Adapter SK-5844S (SK-NET FDDI-LP64 DAS SUN)

VPD Read only Area:      1 bytes unused
Board Part Number (PN):  SK-5844S
Engineering Level (EC):  Rev. 2.0
Manufacturer ID (MN):    SysKconnect
Serial Number (SN):      LUD20S8470001
Extended Capability      (CP):  0x01, 0x10, 0x01cc

VPD Read /Write Area:    121 bytes available
Asset Tag Identifier     (YA):  < Keyword not available>
First Error Log Msg.    (VF):  < Keyword not available>
Last Error Log Msg.     (VL):  < Keyword not available>
```

Figure 3. Typical VPD Data
Screen

3. Press the Enter key to return to the main menu of the diagnostic program.

If a Test Fails...

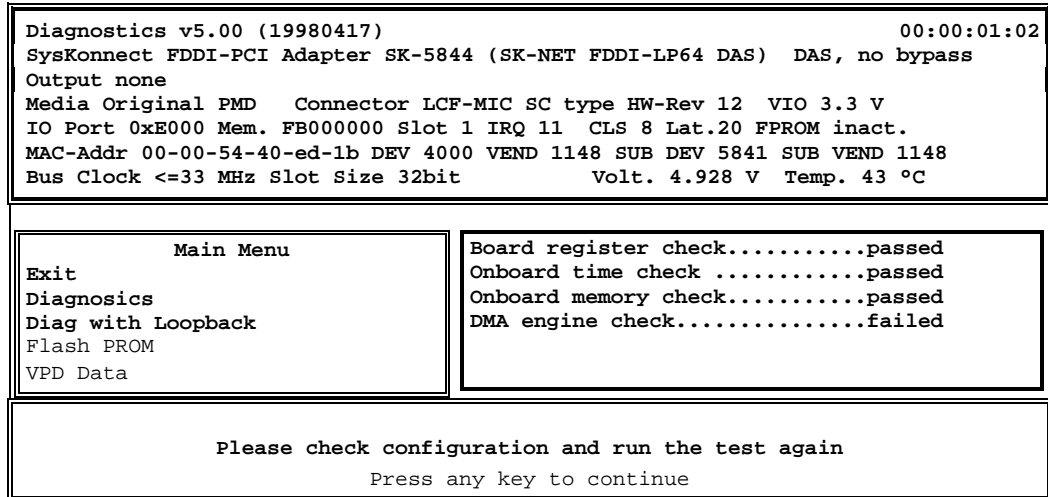


Figure 4. Typical Error Message Screen of the Diagnostic Program

If an error message instructs you to re-seat the adapter, follow the procedure listed below:
Turn off the computer.

1. Remove the computer cover.
2. Make sure that the adapter is correctly seated. You do not have to remove the adapter. Just lift the adapter so that the adapter connector and the connector on the system board are clear of each other. Press firmly on the adapter until it is seated correctly. Verify that you have followed the corresponding instructions given in the *SysKnect Installation Guide*.
3. Repeat the diagnostic test.



Chapter 4.
Troubleshooting

4. If the problem persists, contact your authorized reseller or SysKonnnect Technical Support. For information regarding the repair procedure for SysKonnnect products or the return of defective products, please refer to the *SysKonnnect Installation Guide*.
5. To quit the Diagnostics Program, select *Exit* in the Main Menu.
6. If applicable, remove the wrap plug. Reconnect the adapter to the network.
7. (Fiber only:) If you do not intend to connect the system to the FDDI network right now, **reinsert the process plug** into the optical transceiver. The process plug will protect the optical transceiver from dust accumulation.

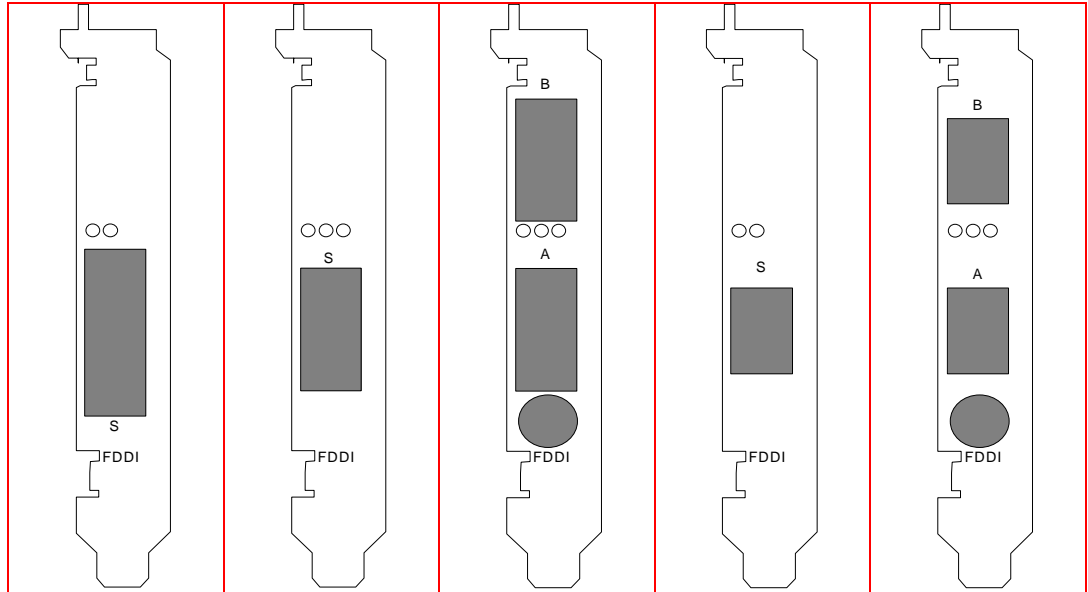


Appendix A. Technical Specifications

Network interface standard	IEEE 802.1p, IEEE 802.1q, IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab		
Bus interface	SK-55xx: PCI-Bus 32 bit/33 MHz SK-58xx/ SK-58xxS: PCI-Bus 64 bit/66 MHz 3.3 V / 5 V, PCI Hot Plug compatible		
LAN controller	AMD Supernet 3 chipset		
RAM	128 KB static CMOS		
VPD memory	512 Byte (PCI VPD Data)		
Flash memory	128 KB (Expansion Boot ROM)		
Power management	Advanced Power Management compatible		
Safety standards	CSA, CE, UL		
EMC standards	CE, FCC Class B		
Warranty	5 years		
Power usage	SAS	ca. 1.7 A @5 V typ;.	ca. 2.6 A @ 5 V max
	DAS	ca. 2.5 A @5 V typ ;	ca. 3.4 A @ 5 V max
Dimensions (max.)	189 mm x 126 mm		
Temperature range	Transport	-20°C... +60°C	
	Storage	+1°C... +60°C	
	Operation	+10°C... +50°C	
Humidity	Transport	10%... 80%	
	Storage	10%... 90%	
	Operation	30%... 80%	



Appendix B. How to Identify your Network Card Type



SK-NET FDDI-	FP/ FP ⁶⁴ / FP ⁶⁴ SUN	LP/ LP ⁶⁴ / LP ⁶⁴ SUN	LP DAS/ LP ⁶⁴ DAS/ LP ⁶⁴ DAS SUN	UP/ UP ⁶⁴ / UP ⁶⁴ SUN	UP DAS/ UP ⁶⁴ DAS/ UP ⁶⁴ DAS SUN
Model SK-	5541/5841/5841S	5543/5843/5843S	5544/5844/5844S	5521/5821/5821S	5522/5822/5822S
Ports	1 MIC	1 SC Duplex	2 SC Duplex, 1 opt. Bypass	1 RJ-45	2 RJ-45, 1 opt. Bypass



Appendix C. Electromagnetic Compatibility, EN 55022/FCC

The conformity was proved using the following equipment:

System	PCI/ISA
Computer	HP Vectra VL4 5/100 S/N FR62661336; FCC ID: HPSVECTRAVL5
Keyboard	HP product number C3754A #ABD, S/N E03633LXGR, FCC ID: CIGE03614
Mouse	HP product number C3751B, S/N LZB61213594, FCC ID: DZL210582
Monitor	SNI Monitor product number MCM 1551 (N), S/N 735911, FCC ID: A3LCSU 597
Printer	HP Deskjet 600 product number C2184A, S/N ES64U140VT, FCC ID: B94C2184X
Modem	Hayes Accura 228 V.34+FAX product number 5901US, Version 7.20 S/N A57759013811, FCC ID: BFJ5901US



Appendix C. Interface Pin Assignments

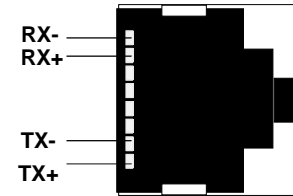
RJ-45 Receptacle

Unshielded Twisted Pair Port Pinouts (Port Type A, B, M and S)

The TP-PMD UTP standard uses RJ-45 connectors and receptacles. The table below summarizes the port pinouts. **Note: Category 5 UTP cables for FDDI require 1 ↔ 7 and 2 ↔ 8 crossovers.**

Figure 5. RJ-45 Pinout
(front view)

RJ-45 Contact	Signal
1	Transmit (Tx+)
2	Transmit (Tx-)
7	Receive (Rx+)
8	Receive (Rx-)



Optical Bypass Switch Receptacle

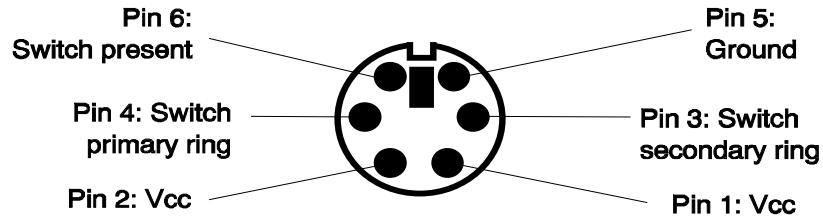


Figure 6. Optical Bypass
Interface Pinout (front view)





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