

S.I. TECH

Card Cage (Signal Distribution System)

03/19/24

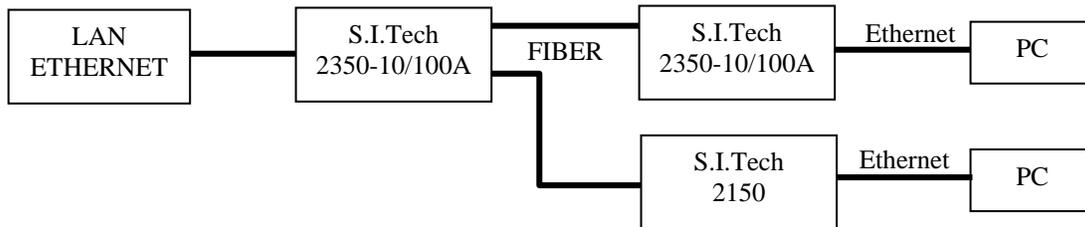
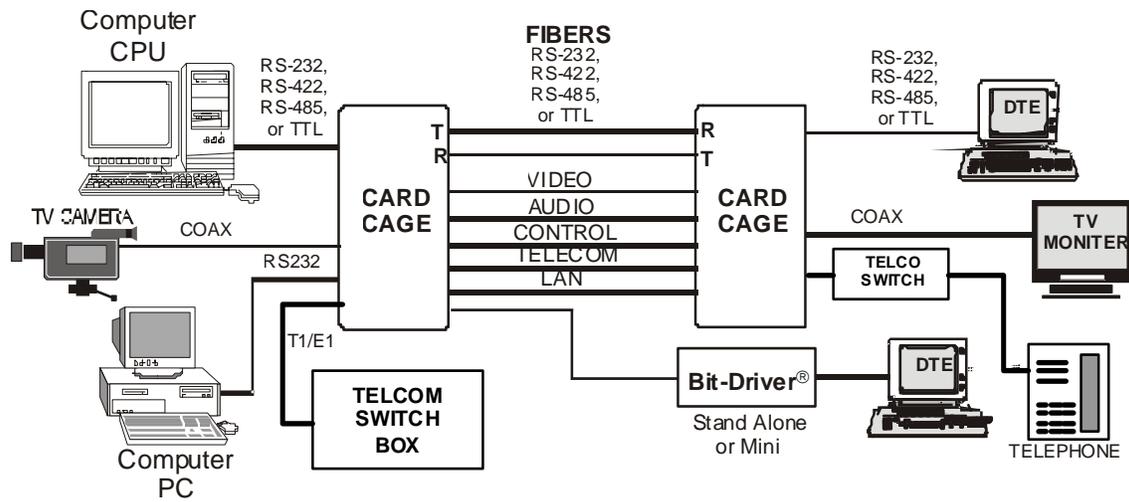


Series 3001 Rack

USA & International Headquarters
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SIGNAL DISTRIBUTION SYSTEMS

SIGNAL DISTRIBUTION SYSTEMS



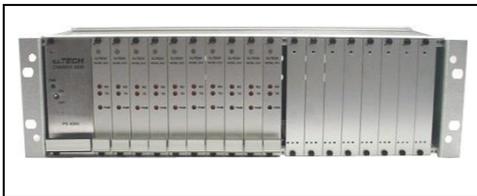
SIGNAL DISTRIBUTION SYSTEMS

SERIES 1000 NON-MUXED



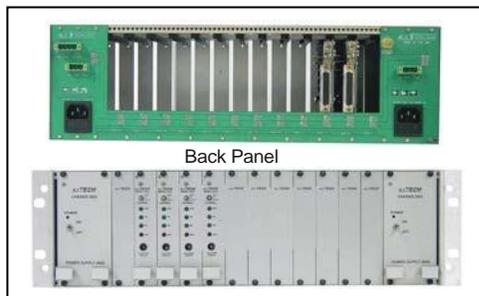
- ❑ Card cage to mount in standard 19 inch rack to support various Bit-Driver® products
- ❑ Designed to hold up to 12 Eurocard size interface cards plus 2 power supply cards
- ❑ Supports Video, Analog, TTL, RS232, RS422, and MIL-188-114 Bit-Drivers®. See individual categories for card details
- ❑ Overall height 7 inches, overall depth 15 inches
- ❑ Configuration is Point to Point
- ❑ 110 VAC or 230 VAC Input Power

SERIES 3000



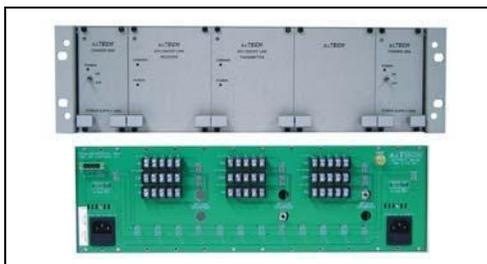
- ❑ Card cage to mount in standard 19 inch rack to support various Bit-Driver® products
- ❑ Model 3000 A is 9 inches deep and 4.5 inches tall to accommodate up to 16 Eurocard size cards plus 2 power supplies
- ❑ Model 3000 B is 12 inches deep and 4.5 inches tall to accommodate up to 16 American Standard Size cards plus 2 power supplies
- ❑ Supports RS232, RS422, RS485, Video, and several proprietary configuration Bit-Drivers®. See individual categories for card details – Point to Point Configuration
- ❑ 110 VAC or 230 VAC Input Power

MODEL 3001*



- ❑ Card cage to mount in standard 19" rack to support various Bit driver products such as RS232/T1/E1/Ethernet/Video various power supplies.
- ❑ 3001 rack holds a total of 12 Eurocard size cards with 1 or 2 power supplies. Cards can be mix or match.
- ❑ All connectors on back of rack for easy access
- ❑ Power supply with alarm for failure
- ❑ Power – 110/230VAC or 48VDC

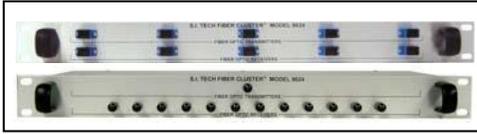
MODEL 3000 AESFOT*



- ❑ The model 3000 AESFOT card cage is special designed to allow the use of fiber optics for ON/OFF control in a rack. Each individual Bit-Driver card is fully compatible with stand-alone Bit-Drivers.
- ❑ 2311 – ON/OFF Link Transmitter
- ❑ 2312 – ON/OFF Link Receiver

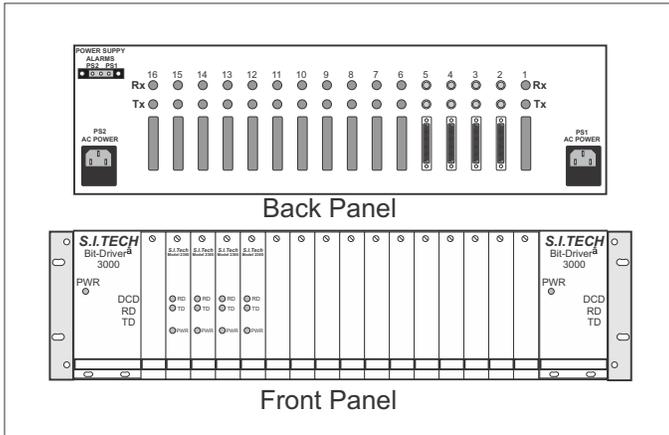
FIBER CLUSTER®

9024



- ❑ 4 to 24 Port Passive Optical Star to distribute signals up to 24 workstations
- ❑ Totally Passive Optical Network
- ❑ 19" Rack Mountable
- ❑ Bi-directional or unidirectional

Fiber Optic or Metallic Bit-Driver^â Card Cage



S.I.Tech Model 3000 Card Cage is a unique concept that allows the use of fiber optic Bit-Drivers^â, asynchronous, in a single rack. Each individual Bit-Driver card is fully compatible with stand-alone Bit-Drivers. For performance specifications, see stand-alone model shown in the product chart below.

A total of 16 cards can be used in the 3000 Card Cage along with a power supply. The rack power supply has AC or DC power with failure alarm built-in. Optionally, a redundant power supply can be added.

Each modem is equipped with a status indicator for Transmit Data (TXD), Receive Data (RXD), Data Carrier Detect (DCD), and a multiple DCD indicator for modems in a digital multi-drop configuration.

Operation Mode: Asynchronous or Synchronous; fiber optic ; simplex or full duplex; individual cards compatible with stand-alone Bit-Drivers^â

Input/Output Interface: See table

Transmission Line

Interface: ST or SMA fiber optics, Balanced two-pair metallic circuit

Transmission Distance: Up to 20,000 ft., fiber optics matched to customer requirements upto 5 miles (8 Km)

Operating Temperature: 0 °C to 50 °C

Power Supply: 110 or 230 VAC, 50 or 60 Hz option, or 24 to 72 VDC option, redundant power supply option. UL, CSA, and IEC listed

19"(48.3 cm) Metal

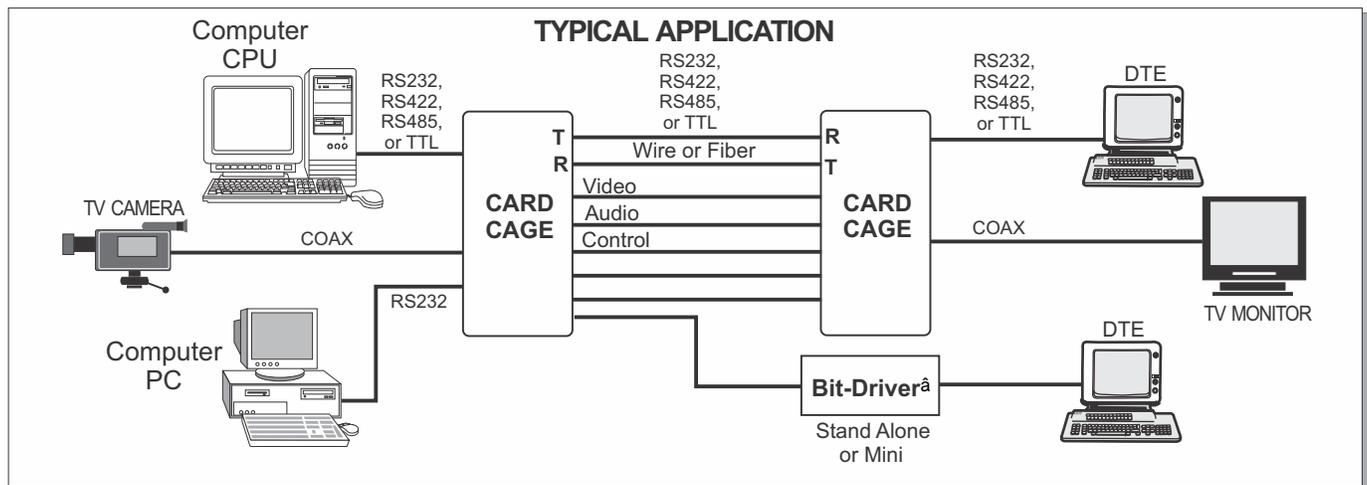
16 Slot Card Cage Size: A) 9" deep x 2" to 4.5" height adjustable, Eurocard (23 x 5 to 11.4 cm)
 B) 12" deep x 2" to 4.5" height adjustable, American Standard (30.5 x 5 to 11.4 cm)

BIT-DRIVER^â CARD CHOICES

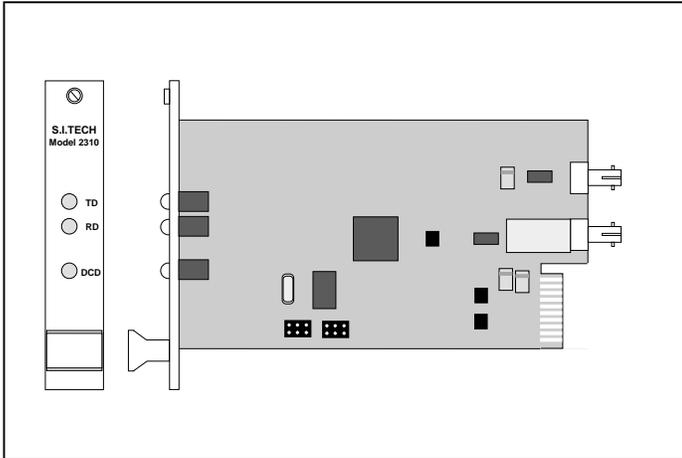
Model #	Description	Rack #	Card Size	Stand-Alone Model #
2305A	RS-232 Asynchronous	A	E	2005 (2505-mini)
2310	RS-485 Async. - JCI	A	E	2110-mini
2316	RS485 Asynchronous	A	E	2616
2322	RS-422 Asynchronous	A	E	2012 (2106-mini)
2336	IBM Twinax to Fiber	B or A	AS or E	2836
2345	RS-485 Async. - JCI	A	E	2110-mini
2353	ARCNET to Fiber	B or A	AS or E	2853
2360	RS-232 Async	A	E	2560
2361	RS-422 Async	A	E	2561
2362	RS-485 Async	A	E	2562
2370	IBM Coax to Fiber	B or A	AS or E	2870
2376	RS-422 Asynchronous	A	E	2176-mini
2385	RS-485 Asynchronous	A	E	2110-mini

Card Size: AS - American Standard 4.5" X 10" (11.4 X 25.4 cm),
 E - Eurocard 3.9" X 6.8" (9.9 X 17.3 cm)
 Mother Board Model #3500: Different mother boards are required depending upon cards chosen
 #3520: Used only with 2310 Bit-Driver
 Power Supply Model #4000: A - 110 VAC 60 Hz, B - 230 VAC 50 Hz, C - 48 VDC

*Meets or exceeds FCC requirements of Class A, Part 15 Computing Device Standard.
 Specifications subject to change without notice.*



Optical Asynchronous Bit-Driver[®] Point to Point



Features:

- 0 to 56 Kbps asynchronous half duplex operation
- 6600 ft. (2 Km) distance capability
- 0 ° C to + 50 ° C operating range
- ST connector receptacle (SMA option)
- Designed to work with Johnson Controls System and with S.I.Tech Model 2110
- To be used with bussed motherboard 3520, power supply 4000, and series 3000 rack

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
10 SM**	1.0	7000	23000

* High power option available

** Single Mode 1300 nm option

*Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.*

Operation Mode: Asynchronous, half duplex RS-485

Input/Output Interface: Asynchronous at 0 to 56 Kbps (data rate must be set at factory)

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)

Transmission Distance: 6600 ft. (2 Km)

Optical Power into a 50 Micron

Core Optical Fiber: 5 microwatts, 10 dB power budget @ 880 nanometers (High power option)

Receiver Sensitivity: 250 nanowatts at less than 10⁻⁹ bit error rate

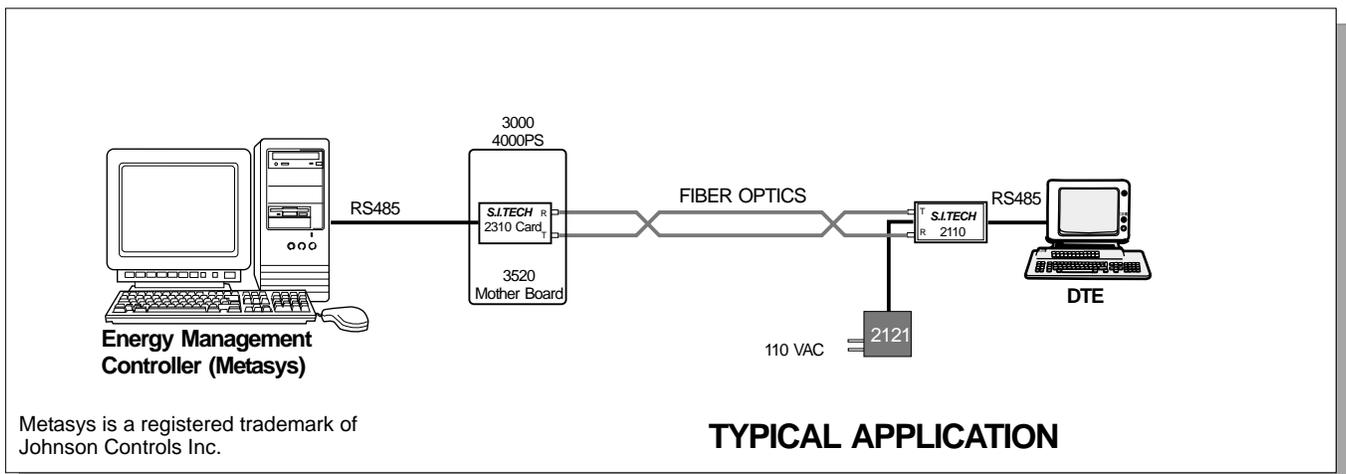
Operating Temperature: 0 °C to 50 °C

Enclosure: 19" rack

Card Size: Eurocard 3.9" x 6.8" (9.9 x 7.3 cm)

Weight: 0.5 lb (200 grams)

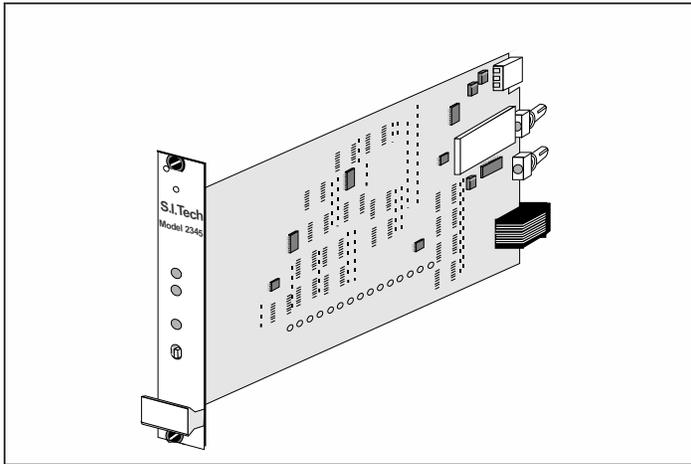
Termination: Last device on RS-485 bus should be terminated



Metasys is a registered trademark of Johnson Controls Inc.

TYPICAL APPLICATION

Optical Asynchronous Bit-Driver[®] Point to Point



Features:

- 9.6 Kbps asynchronous half duplex operation
- 6600 ft. (2 Km) distance capability
- 0 °C to + 50 °C operating range
- ST connector receptacle (SMA option)
- Designed to work with Johnson Controls System and with S.I. Tech Model 2110

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
10**	1.0	7000	23000

* High power option available

** Single Mode - 1300 nm option (Order 2345-SM)

Operation Mode: Asynchronous, half duplex RS-485 (8-pin RJ-45)

Input/Output Interface: Asynchronous at 9.6 Kbps

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)

Transmission Distance: See distance chart

Optical Power into a 50 Micron

Core Optical Fiber: 5 microwatts, 10 dB power budget @ 820 nanometers (High power option & 1300nm option)

Receiver Sensitivity: 250 nanowatts at less than 10⁻⁹ bit error rate

Operating Temperature: 0 °C to 50 °C

Enclosure: 19" rack

Card Size: Eurocard 3.9" x 6.8" (9.9 x 7.3 cm)

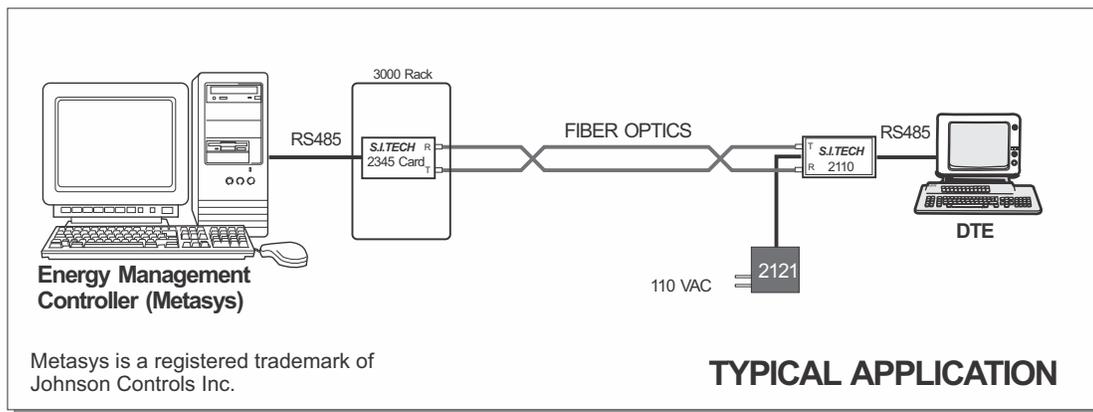
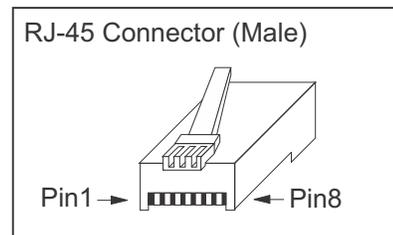
Weight: 0.5 lbs (200 grams)

Termination: A switch is provided to terminate RS-485 line

RS - 485 PINS UTILIZED BY 2345 CARD RJ-45 CONNECTOR (FEMALE)

Pin No.	Description	Symbol
1	No Connection	N/C
2	No Connection	N/C
3	No Connection	N/C
4	Data (Negative)	D -
5	Data (Positive)	D +
6	No Connection	N/C
7	Ground	GND
8	No Connection	N/C

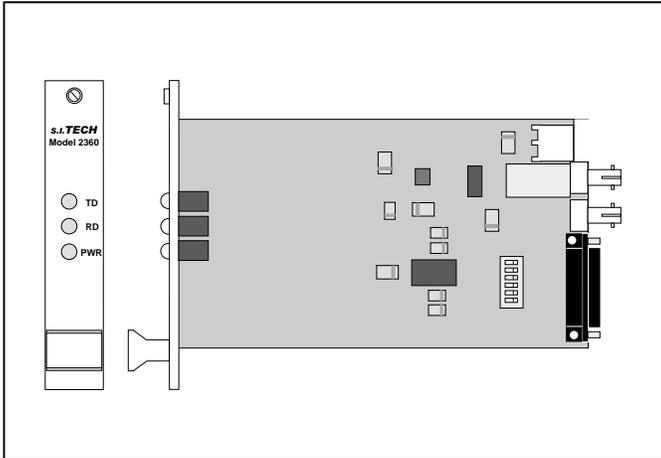
*Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.*



Metasys is a registered trademark of Johnson Controls Inc.

TYPICAL APPLICATION

Optical Asynchronous Bit-Driver® Point to Point



Features:

- Up to 115 Kbps asynchronous operation on fiber optic cable, simplex or full duplex operation with handshaking
- 2 full duplex control signals
- See distance chart
- -40 °C to +80 °C operating range (-20 to +60 °C SM)
- Metal ST connector receptacle (SMA option)
- LED indicators for transmit and receive data and Power
- Female RS-232C (V.24) connectors
- Complies with IEEE C37.90.1
- IEC 801 Surge Protection

RS - 232 CONNECTOR PINS UTILIZED BY 2360 CARD (FEMALE)

Pin No.	EIA DESIG.	Description	Symbol	DTE	DCE
1	AA	Protective Ground	Chassis Ground		↔
2	BA	Transmitted Data	TXD	→	
3	BB	Received Data	RXD		←
4	CA	Request to Send	RTS	→	
5	CB	Clear to Send	CTS		←
6	CC	Data Set Ready	DSR	→	
7	AB	Signal Ground	Sig. Gnd.	↔	
20	CD	Data Terminal Ready	DTR		→

Operation Mode: Asynchronous, simplex or full duplex

Input/Output Interface: RS-232-C, asynchronous with 2 control lines

Transmission Line Interface: Metal ST connector is standard for interfacing with fiber optic cable (SMA option)

Transmission Distance: See Chart

Optical Power into a 50 Micron

Core Optical Fiber: 30 microwatts, 10 dB power budget* @ 820 nanometers
*(High power & 1300nm options)

Receiver Sensitivity: 3 microwatts at less than 10⁻⁹ bit error rate

Operating Temperature: -40 °C to +80 °C (-20 to +60 °C SM)

Enclosure: 19" rack holds 16 cards

Card Size: Eurocard 3.9" x 6.8" (9.9 x 7.3 cm)

Weight: 0.5 lb (200 grams)

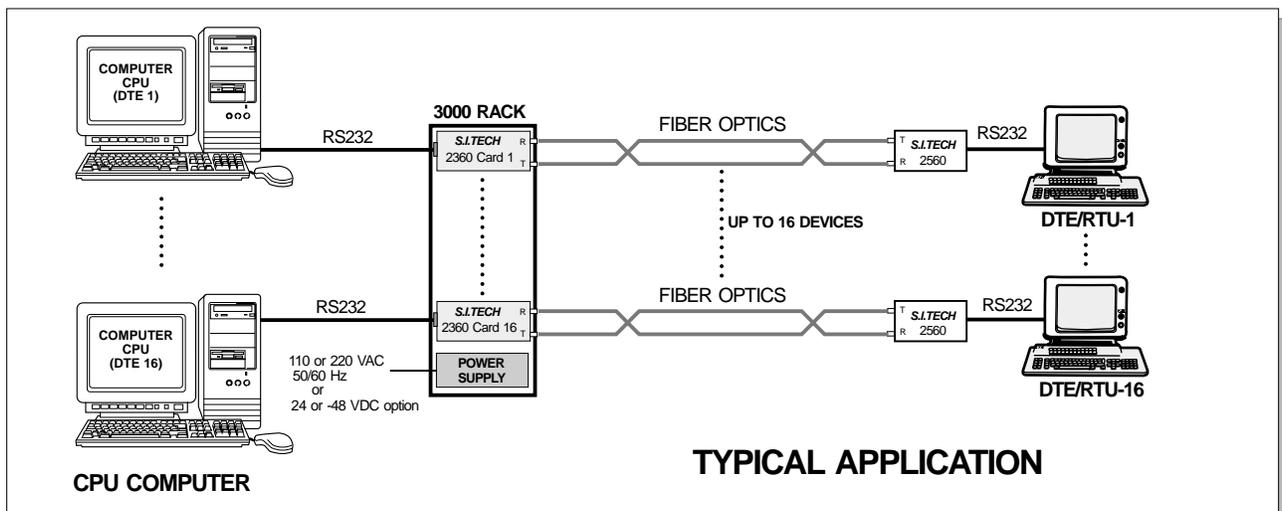
Mini Version: S.I.Tech # 2560

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/Km	Distance* Meters	Distance* Feet
50	3.0	2000	6600
62.5	4.0	2000	6600
10 SM	1.0	5000	16000

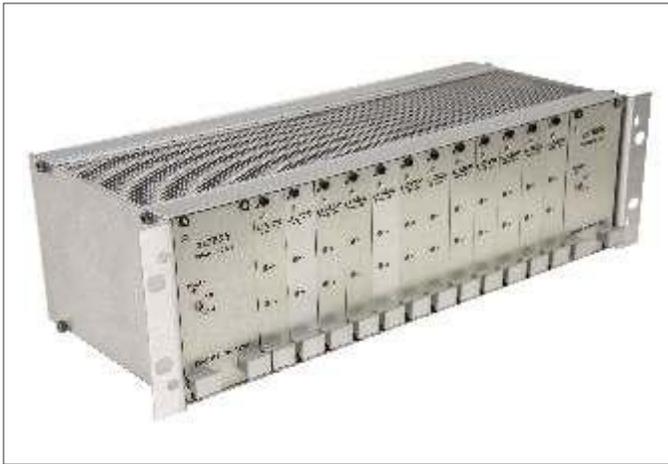
* High power option available. SM - Single Mode option (1300nm)
Optical unit connection: Connect the optical transmission line to the T and R receptacles. Note which cable channel goes to T or R by noting cable imprint. On the other end, reverse the connection.

*Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.*



TYPICAL APPLICATION

Fiber Optic Card Cage



S.I.Tech Model 3001 Card Cage is a unique concept that allows the use of various RS232, E1/T1, or Ethernet fiber optic Bit-Drivers^â in a single rack. Each individual Bit-Driver card is fully compatible with stand-alone Bit-Drivers. For performance specifications, see stand-alone model shown in the product chart below.

A total of 12 cards can be used in the 3001 Card Cage along with 1 or 2 power supplies. The rack power supply DC power has "No output" alarm. Optionally, a redundant power supply can be added. AC power supplies are optional.

Each modem is equipped with a status indicator for Transmit Data (TXD), Receive Data (RXD), Fiber Link Detector indicator. Alarm contacts from modems are wired in parallel to common connector. Alarm contacts from power supplies are wired in parallel to common connector.

Operation Mode: Asynchronous simplex or full duplex; individual cards compatible with stand-alone Bit-Drivers^â

Input/Output Interface: See table

Transmission Distance: Fiber optics matched to customer requirements up to 10 Km (6 miles)

Operating Temperature: 0°C to 50°C

Power Supply: 48 VDC, 110/230VAC UL, CSA, and IEC listed, 50W max. Redundant PS optional

19"(48.3 cm) Metal

12 Slot Card Cage Size: 8.0D X 5.25H X 17.2W in (20.3 X 13.34 X 43.7 cm)

*Meets or exceeds FCC requirements of Class A, Part 15 Computing Device Standard.
Specifications subject to change without notice.*

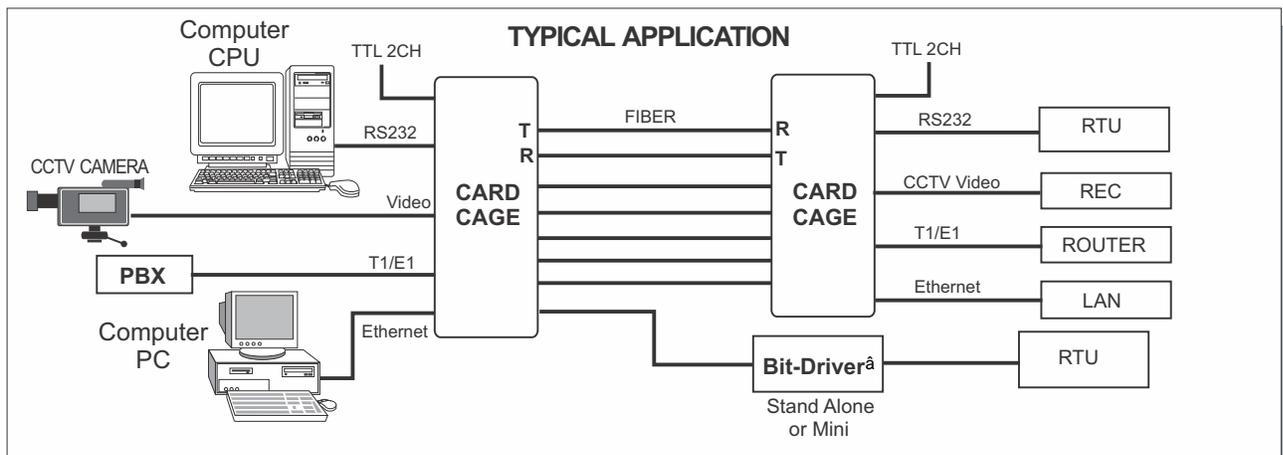
CCTV video cards are 1 or 2 CH. TR or REC or 1 TR and 1 REC CH.

BIT-DRIVER^â CARD CHOICES

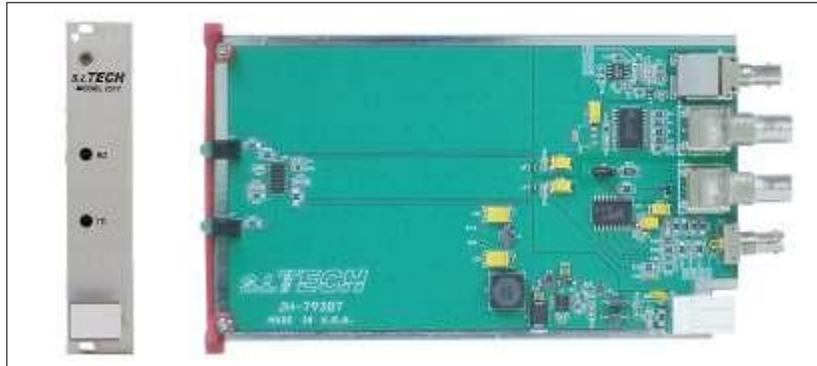
Model #	Description	Card Size	Stand-Alone Model #
2317	TTL to Fiber	E	2817
2332	RS232 Async/Sync	E	2036
2360	RS232 ASYNC	E	2560
2361	RS422 Async	E	2561
2362	RS485 Async	E	2562
2365	GIGIBit Ethernet	E	2160
2379	CCTV Video TR 2 CH	E	2809 or 2509
2379-1	CCTV Video TR 1 CH	E	
2380	CCTV Video REC 2 CH	E	2810
2380-1	CCTV Video REC 1 CH	E	
2381	CCTV Video TR/REC 1CH	E	
2391	E1 to Fiber	E	2891
2390	T1 to Fiber	E	2890 or 2896
2350-10/100A	10/100Mbps Ethernet	E	2150 10/100A
2351	Industrial Ethernet	E	2151
2815-T-SM-WDM	TTL Card TR	E	2815
2815-R-SM-WDM	TTL Card REC	E	2815
4001 A	110VAC Power Supply	E	
4001 B	230VAC Power Supply	E	
4001 C	48VDC Power Supply	E	

E - Eurocard 3.9" X 6.8" (9.9 X 17.3 cm)

Mother Board Model #3501: Different Mother Board are Required Depending upon Cards Selected.



TTL to Fiber Optic Transmitter/Receiver



Optical Receive
Optical Transmit

Optical Receiver
TTL Out
TTL In
Optical Transmitter
Power

SYSTEM

Transmission: Up to 6500 ft. (2 Km) with suitable graded index fiber optic cable or 10 Km using single mode fiber

Typical Bit Error Rate: Better than 10^{-9}

ELECTRICAL SIGNAL INPUT/OUTPUT FOR TRANSMITTER AND RECEIVER

Format: TTL

Connector: BNC

Data Rate: Up to 50 Mbps

Input Impedance: TTL levels 10 KW or 75W*

Output Impedance: TTL levels into 50W

Input Power: 10-32 V 1W Max.
Optional 5VDC 1W

*Jumper J4
Position 1: 75W(Default)
Position 3: 10 KW

OPTICAL TRANSMITTER

Power: 30 microwatts (-15 dBm) into 62.5 micron fiber

Wavelength: 820 nanometers (1300nm or 1550nm option)

Emitter Type: LED

Optical Connector: ST

OPTICAL RECEIVER

Wavelength: 820 nm (1300 & 1550 nm option)

Minimum Sensitivity: (BER $\leq 10^{-9}$) 3 microwatt (-25 dBm) @ 820 nanometers

Maximum Sensitivity: 10 microwatts

Optical Connector: ST

Operating Temperature: 0 °C to 50 °C (optional extended temp for multimode)

Size: 3.9" X 6.8" (9.9 X 17.3cm) Eurocard

*Meets FCC requirements of Class A, Part 15 Computing Devices Standard.
Specifications subject to change without notice.*



TRANSMISSION LINE INTERFACE

Operating distance is dependent upon optical fiber core diameter and the cable's optical attenuation. The table below indicates three cables that may be used at any data rate. These cables are available in connectorized assemblies to meet the exact configuration of your application.

S.I.Tech offers complete links including fiber optic cable, connectors, cable assemblies, and Bit-Drivers^â.

Operating Distance for Fiber Optic Cable

Fiber Size (Microns)	Attenuation (dB/Km)			Distance (Meters)			Distance (Feet)		
	Wavelength (nm)			Wavelength (nm)			Wavelength (nm)		
	850	1300	1550	850	1300	1550	850	1300	1550
50	3.0	1.0	-	2000	6000	-	6600	20000	-
62.5	4.0	1.0	-	2000	6000	-	6600	20000	-
10 SM*	-	0.35	0.25	-	10000	12000	-	33000	40000

* Single mode (1300 and 1550 nm) option

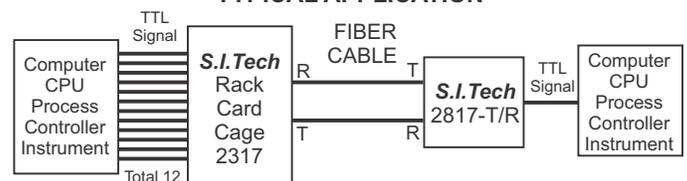
Optical unit connection: Connect the optical transmission line to the T and R receptacles. Note which cable channel goes to T or R by noting cable imprint. On the other end, reverse the connection.

RELATED PRODUCTS

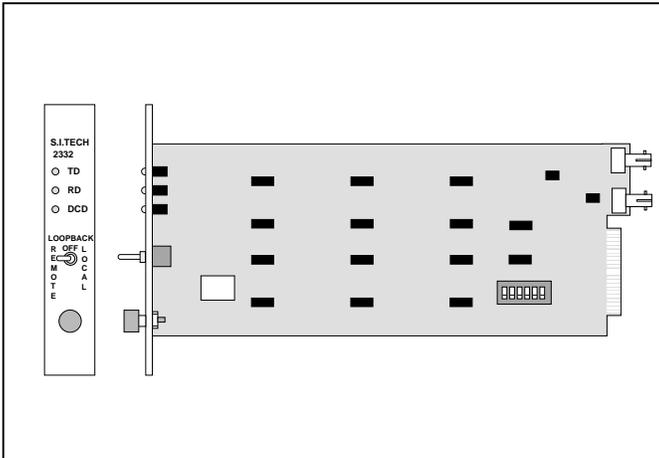
Model Numbers

2317	TTL to Fiber, Transmitter/Receiver, Multimode, ST Connector
2317-SM	TTL to Fiber, Transmitter/Receiver, Single mode, ST Connector
2817	TTL to Fiber, Transmitter/Receiver, Multimode, ST Connector
2817-SM	TTL to Fiber, Transmitter/Receiver, Single mode, ST Connector
2817-T	TTL to Fiber, Transmitter, Multimode, ST Connector
2817-R	TTL to Fiber, Receiver, Multimode, ST Connector
2817-T-SM	TTL to Fiber, Transmitter, Single mode, ST Connector, 1300nm
2817-R-SM	TTL to Fiber, Receiver, Single mode, ST Connector, 1300nm

TYPICAL APPLICATION



Optical Async/Sync Bit-Driver[®] Point to Point



Features:

- 2.4, 4.8, 9.6, 19.2 Kbps
- Synchronous, simplex, or full duplex operation
- 6600 ft. (2Km) distance capability
- 0 °C to + 50 °C operating range
- ST connector receptacle (SMA option)
- Designed to work with S.I.Tech 2503/2232 RS232 Bit-Driver
- Requires 3001

OPERATING DISTANCE FOR FIBER OPTIC CABLE

Fiber Size (Microns)	Attenuation dB/km	Distance Meters*	Distance Feet*
50	3.0	2000	6600
62.5	4.0	2000	6600
100	5.0	2000	6600
10	1.0 **	7000	23000

* High power option available

** Single Mode 1300 nm option

Operation Mode: Synchronous, simplex, or full duplex

Input/Output Interface: RS-232, DB25 Female, Synchronous 2.4, 4.8, 9.6, and 19.2 Kbps.

Transmission Line Interface: ST connector is standard for interfacing with fiber optic cable (SMA option)

Transmission Distance: 6600 ft. (2 km)

Optical Power into a 50 Micron

Core Optical Fiber: 5 microwatts, 10 dB power budget @ 880 nanometers (High power option)

Receiver Sensitivity: 250 nanowatts at less than 10⁻⁹ bit error rate

Operating Temperature: 0 °C to 50 °C

Enclosure: 19" rack holds 16 cards

Card Size: Eurocard

Weight: 0.5 lb (200 grams)

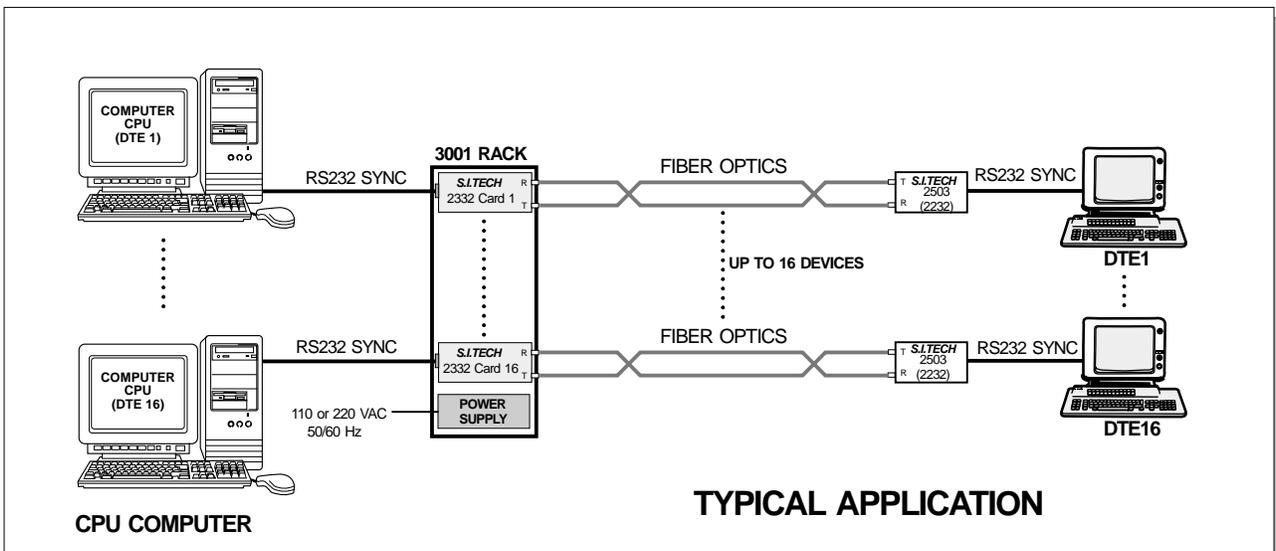
RS - 232 PINS UTILIZED BY 2332 CARD DB25 CONNECTOR (FEMALE)

Pin No.	Description	EIA
1	Protective Ground	AA
2	Transmitted Data	BA To Bit-Driver
3	Received Data	BB From Bit-Driver
4*	Request to Send	CA To Bit-Driver
5	Clear to Send	CB From Bit-Driver
7	Signal Ground	AB
8	Data Carrier Detect	CF From Bit-Driver

* Optional signal not required for normal operation.

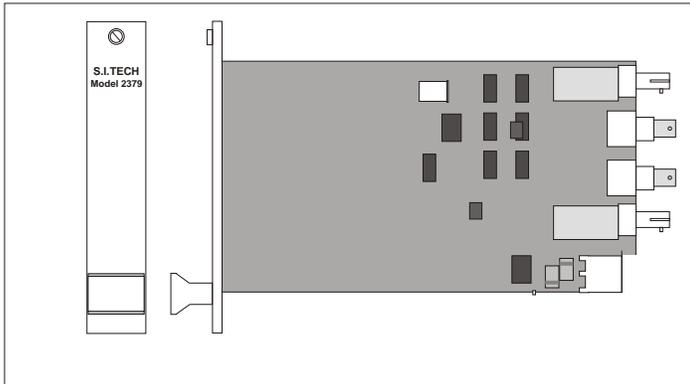
Meets FCC requirements of Class A, Part 15 Computing Devices Standard.

Specifications subject to change without notice.



TYPICAL APPLICATION

Video Transmitter - 2CH. 3001 Chassis PC Board



Operation Mode: CCTV video - color or black and white, 2 CH Transmitter

System Bandwidth: 10 Hz to 15 MHz

Transmitter Input Impedance: 75 ohms, BNC bulkhead jack

Input Voltage: 1 Volt rms

Receiver Adjustment Range: 40:1

Linearity: 1 percent typical

Output Load Impedance: 75 ohms

Operating Wavelength*: 820 nanometers (1300 nm options)

Optical Connectors: ST receptacle

Operating Temperature: 0 °C to 50 °C

Enclosure: 19" Rack holds 12 cards

Card Size: Eurocard 3.9" X 6.8" (9.9 X 17.3 cm)

Weight: 0.4 lbs. (182 Grams)

Input Power: 110/220 VAC 50/60 Hz

Notes: 19" Rack 3001 - 110/230 VAC Power Supply 4001

UL Approved

* 1300 nanometers is an option for 5 Km or longer system

Related Products

Model Numbers

2810	1 Ch. Receiver, Multimode, 110VAC, ST
2810-SM	1 Ch. Receiver, Single mode, 110VAC, ST
2810-V	1 Ch. Receiver, Multimode, 220VAC, ST
2380	2 Ch. Receiver, Multimode
2380-SM	2 Ch. Receiver, Single mode
2380-1	1 Ch. Receiver, Multimode

Operating Distance for Fiber Optic Cable

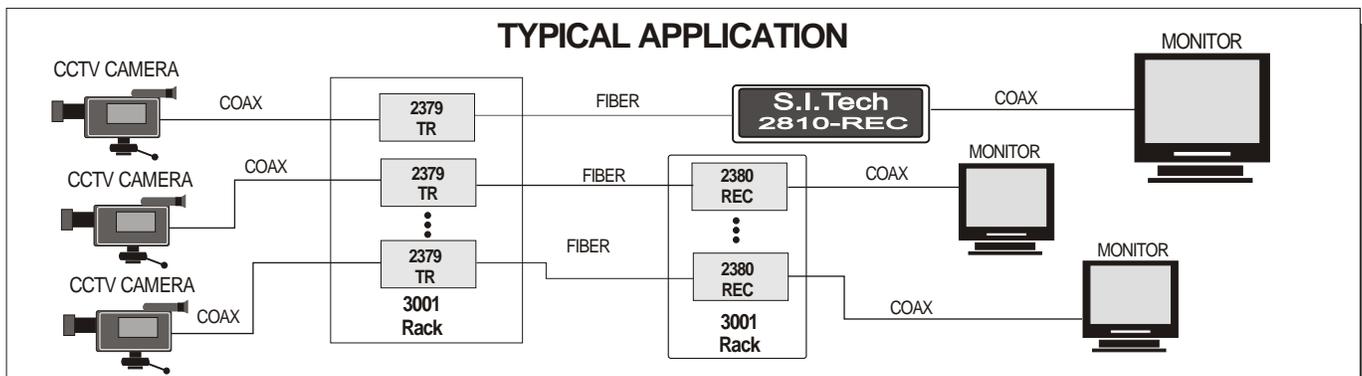
Fiber Size (Microns)	Attenuation dB/Km	Maximum Feet/Meters**
62.5	4.0	6600/2000
50	3.0	6600/2000
10 SM	0.35	33000/10000

SM - Single mode (1300 or 1550 nm option)

** Short lengths of some fiber types can overload the receiver. Longer distance can be used if less bandwidth or higher noise is acceptable.

Typical power budget is 10dB.

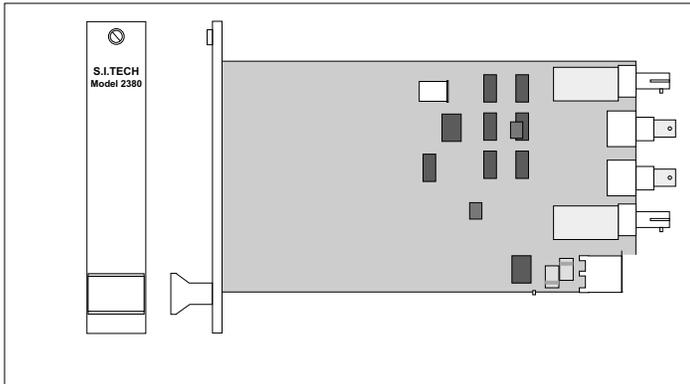
Specifications subject to change without notice.



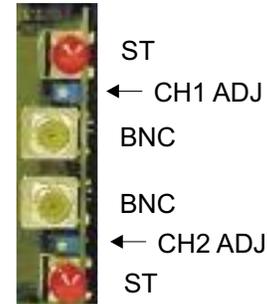
Model 2380



Video Receiver - 2CH. 3001 Chassis PC Board



S.I.Tech 2380 Fiber Optic Receiver Adjustments



Note: Adjust (ADJ) gain in receiver CH1 and CH2 preamp for desired output (clips at 2 Vpp with 75 ohm load 4 Vpp open circuit)

Operation Mode: CCTV video - color or black and white, 2 CH Receiver

System Bandwidth: 10 Hz to 15 MHz

Transmitter Input Impedance: 75 ohms, BNC bulkhead jack

Input Voltage: 1 Volt rms

Receiver Adjustment Range: 40:1

Linearity: 1 percent typical

Output Load Impedance: 75 ohms

Operating Wavelength*: 820 nanometers (1300 nm options)

Optical Connectors: ST receptacle

Operating Temperature: 0 °C to 50 °C

Enclosure: 19" Rack holds 12 cards

Card Size: Eurocard 3.9" X 6.8" (9.9 X 17.3 cm)

Weight: 0.4 lbs. (182 Grams)

Input Power: 110/220 VAC 50/60 Hz

Notes: 19" Rack 3001 - 110/230 VAC Power Supply 4001

UL Approved

* 1300 nanometers is an option for 5 Km or longer system

Related Products

Model Numbers

2809	1 Ch. Transmitter, Multimode, 110VAC, ST
2809-2	2 Ch. Transmitter, Multimode, 110VAC, ST
2809-SM	1 Ch. Transmitter, Single mode, 110VAC, ST
2809-2-SM	2 Ch. Transmitter, Single mode, 110VAC, ST
2809-V	1 Ch. Transmitter, Multimode, 220VAC, ST
2379	2 Ch. Transmitter, Multimode
2379-SM	2 Ch. Transmitter, Single mode

Operating Distance for Fiber Optic Cable

Fiber Size (Microns)	Attenuation dB/Km	Maximum Feet/Meters**
62.5	4.0	6600/2000
50	3.0	6600/2000
10 SM	0.35	33000/10000

SM - Single mode (1300 or 1550 nm option)

** Short lengths of some fiber types can overload the receiver. Longer distance can be used if less bandwidth or higher noise is acceptable. Typical power budget is 10dB.

Specifications subject to change without notice.

