

5100 Series

IF Fiber Optic Links

SATCOM



The 5100-Series fiber-optic inter-facility links (IFLs) are a high performance, cost-effective alternative to coaxial cable for 10 MHz to 200 MHz IF \satellite communications applications.

Emcore's fiber-optic IFLs, function as transparent links between satellite antennas and Network Operations Centers (NOC). These IFLs eliminate the limitations of copper systems by enabling longer transmission distance while retaining the highest level of signal quality

In addition, Emcore's fiber optics provide several other significant network advantages, including simplified network design, ease of installation, and immunity from EMI/RFI and lightning. They are available either in a flange-mount package for outdoor applications or as a plug-in for integration with Emcore's System 10000 rack-mount chassis.

Features

- 10 MHz – 200 MHz
- Up to eight plug-in cards per 3u chassis
- Up to four flange-mount modules per 1u chassis
- 50 ohm and 75 ohm BNC Options
- Affordable replacement for coaxial systems

Applications

- TVRO
- Broadcast
- Earth Stations
- Headends
- VSAT
- GPS
- Radios

Performance Highlights

	Minimum	Typical	Maximum	Units
Wavelength	-	1310	-	nm
Transmitter Optical Output Power	-	0	-	dBm
Receiver Optical Input Power	-	-12	-	dBm
Link Gain @ 1 dB optical loss				
Standard	-	0	-	dB
High	-	15	-	
Temperature Range				
Flange Mount	-40	-	+65	°C
Rack Mount	0	-	+50	°C
Frequency Range	10	-	200	MHz

See following pages for complete specifications and conditions.

Package Options

	Transmitter	Receiver
Rack Mount ¹	10357A	10457A
Flange Mount	3120A	4120A

1. Rack mount package for System 10000 platform only

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Condition	Min	Max	Units
Operating Temperature Range Flange-mount Rack-mount	T_{OP}	-	-40 0	+65 +50	°C °C
Storage Temperature Flange-mount Rack-mount	T_{STG}	-	-40 -40	+85 +85	°C °C
DC Voltage	-	-	-	24	VDC
DC Current (Transmitter)	-	+12VDC	250	-	mA
DC Current (Receiver)	-	+12VDC	200	-	mA

Electrical / Optical Characteristics

Parameter	Symbol	Condition	Min	Type	Max	Units
Wavelength (Transmitter)	-	-	1290	-	1340	nm
Optical Output Power (Transmitter)	-	-	-	1	-	mW
dc Responsivity (Receiver)	-	-	0.75	-	-	A/W
Fiber	-	Corning SMF-28 or equivalent	-	-	-	-
Connector	-	FC/APC Tight Fit, (Seikoh Giken or equivalent)	-	-	-	-
Connector Return Loss	-	-	60	-	-	dB

RF Characteristics, Tx

Parameter	Performance		
Tx Gain Option	-	Std.	-102 (low)
Tx Gain (TG) - 50 Ohm	-	-9.50 dB	-24.50 dB
Tx Gain (TG) - 75 Ohm	-	-7.75 dB	-22.75 dB
Noise figure, max	-	41 dB	26 dB
Input IP3, min.	-20° C -40° C	+0.0 dBm -3.0 dBm	+15.0 dBm +12.0 dBm
Input 1 dB compression, typical	-20° C -40° C	≥ -10dBm ≥ -13 dBm	≥ +5 dBm ≥ +2 dBm
Gain vs. temp. (typ.)	-	0.07 dB/°C	0.06 dB/°C
Max RF input (Tx)	-	+7 dBm	-8dBm
Amplitude flatness 10 - 200 MHz any 40 MHz		± 0.5 dB ± 0.25 dB	
VSWR	Input	1.5:1	
Input Impedance	-	75 Ohm BNC, (50 Ohm BNC, option -101)	

RF Characteristics, Rx

Parameter	Performance		
Rx gain option	-	Std.	-102 (high)
Rx Gain (RG) - 50Ohm	-	+14.00 dB	+29.00 dB
Rx Gain (RG) - 75 Ohm	-	+12.25 dB	+27.25 dB
Gain vs. temp. (typ.)	-	0.25 dB/°C	0.40 dB/°C
Amplitude flatness 10 - 200 MHz any 40 MHz		± 0.25 dB ± 0.125 dB	
VSWR	Output	1.5:1	
Output Impedance	-	75 Ohm BNC, (50 Ohm BNC, option -101)	

Link Characteristics, 1 dB Optical

Parameter	L-Band Performance			
Link Gain	-	Std.	Low	High
50 Ohm (At 25° C), min.	-	-0.00 dB	-15.00 dB	+15.00 dB
75 Ohm (At 25° C), min.	-	-0.00 dB	-15.00 dB	+15.00 dB
Gain vs. temp. (typ.)	-	0.06 dB/°C		0.03 dB/°C
Amplitude flatness 10 - 200 MHz any 40 MHz		± 0.75 dB ± 0.375 dB		

Device Resistance and Voltage for Rx Optical Power and DC Electrical Power Monitor Outputs

(See Figures 1 and 2)

Version	Voltage	Resistance
Rx	10V	825 Ω
Tx	6.5	432 Ω

Device Resistance and Voltage for Rx Optical Power and DC Electrical Power Monitor Outputs

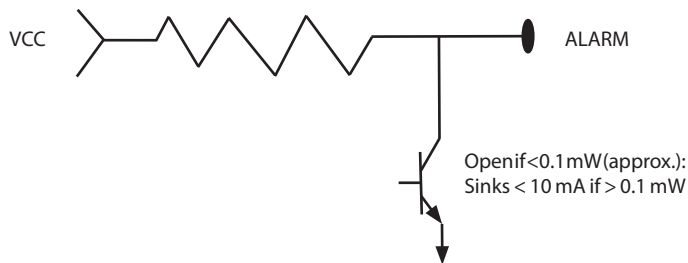


Figure 1. Receiver Electrical Schematic for Power Alarm



Figure 2. Schematic for DC Power Monitor (Flange Mount Units Only)

DC Voltage

Rack Mount Package

Input Voltage	12 V ¹	15 V ¹	18 V ¹	24 V ¹
Tx	170 mA	135 mA	115 mA	85 mA
Rx	150 mA	120 mA	100 mA	75 mA

1. Ripple and noise: 100 mVp-p > 100 kHz; 200 mVp-p < 100 kHz

Flange Mount Package

Lead Color	Tx	Rx
	Red	+12 to +24 volts
Brown	Not used	Low optical power alarm
Orange	DC power monitor	DC power monitor
Yellow	Not Used	Photodiode current monitor 1V/mA
Black	GND	GND

Pin Information

Rack Mount Package: Used with the 10990A 3u Rack Mount Chassis)

Plug-in-D-Sub	Tx Plug-in	Rx Plug-in
1 ²	+15 volts	+15 volts
2	nc	nc
3	nc	nc
4	GND	GND
5	GND	GND
6 ³	nc	Photodiode current Monitor. (1 V/mA)
7 ³	nc	Low optical power alarm
8 ³	nc	nc
9 ³	nc	nc

2. Powered from 10901G, or equivalent power supply
3. Accessible via connector on back panel of 10990A chassis

Ordering Code Definitions - Tx

Option	Option Availability		Option Description	Standard Configuration
	Flange Mount	Plug-in		
-101	X	X	50 Ω BNC, female	75 Ω BNC, female
-102	X	X	Tx: Single-stage IF Pre-amp	Tx: Two-stage IF Pre-amp

Ordering Code Definitions - Rx

Option	Option Availability		Option Description	Standard Configuration
	Flange Mount	Plug-in		
-101	X	X	50 Ω BNC, female	75 Ω BNC, female
-102	X	X	Rx: Two-stage IF Post-amp.	Rx: Single-stage amp

Mounting Options

Part / Number Model	Description	Capacity
1260-001-001	NEMA enclosure (12" x 12" x 4")	Up to 2 flange-mount modules
1261-001-001	1U 19" rack mount chassis (1.75" x 19" x 18")	Up to 4 flange-mount modules
1261-002-001	1U 19" rack mount chassis & internal power supply	Up to 4 flange-mount modules
10990A 10901G 10901G	3U 19" rack mount chassis 3U, plug-in power supply (90-260 VAC input) 3U, auxiliary plug-in power supply (90-260 VAC input)	Up to 8 plug-in modules

Laser Safety

Class IIIb Laser Product

FDA/CDRH Class IIIb laser product. All IF and L-band transmitter versions are Class IIIb laser products per CDRH, 21 CFR 1040 Laser Safety requirements. All versions are Class 3B laser products per IEC [®] 60825-1:1993. The device has been classified with the FDA under an accession number to be determined.

This product complies with 21 CFR 1040.10 and 1040.11.

Wavelength = 1310 nm

Maximum power = 30 mW

Product is not shipped with a power supply.

Caution: Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.

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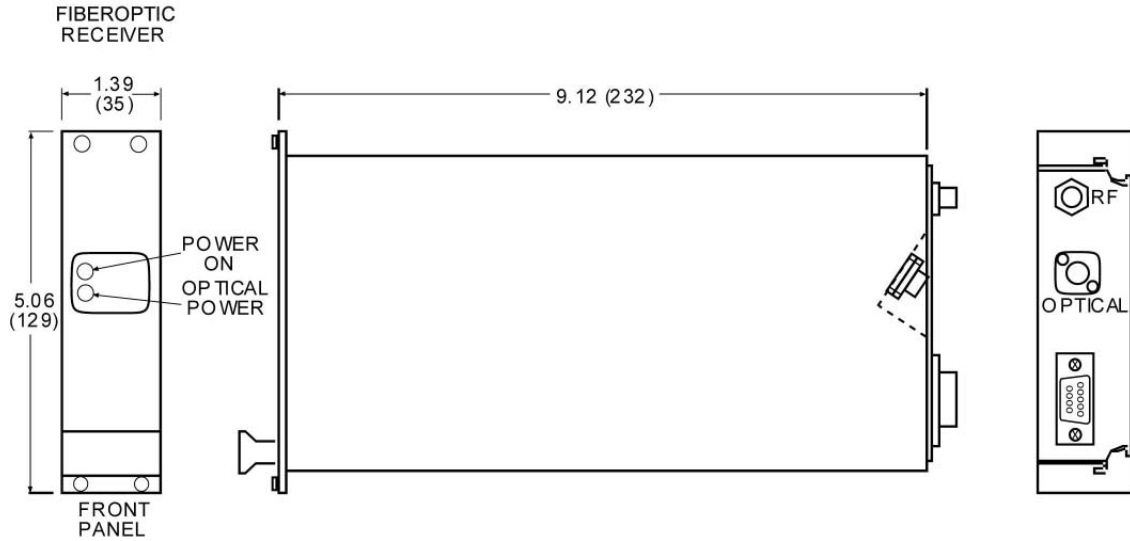
IF Fiber Optic Links



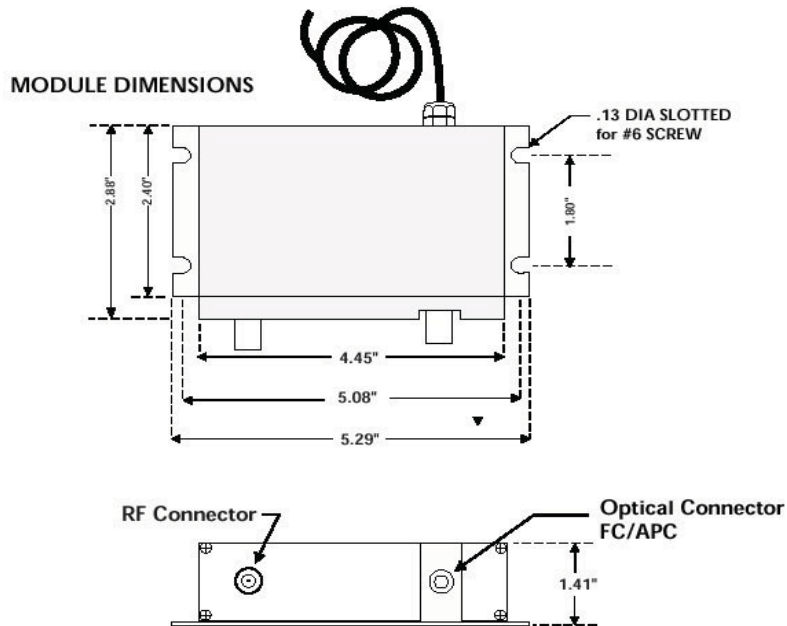
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Rack Mount Package

Receiver package depicted below. Transmitter plug-in has only "Power On" indicator LED.



Flange Mount Package



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