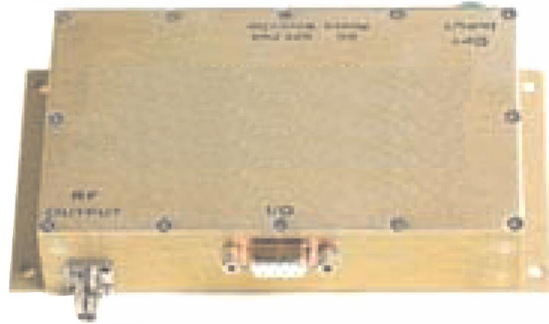


Optical Fiber Link, 1 - 12 GHz RF Over Fiber, I-FLRF12... Series

I-FLRF12...series is an ultra-wideband fiber-optic link that provides a low noise, high performance, optical transport of radar signals, satcom bands, EW/ECM signals and other remoting applications between 1 to 12 GHz. Transmitter uses a low noise DFB laser with temperature compensation at 1550 nm.



APPLICATIONS

- SIGINT/COMINT
- Electronic Warfare (EW)/ECM
- Wideband RF Transmission
- C-Band, X-Band SATCOM
- Antenna Remoting
- Radar Telemetry
- Electronic Warfare (EW)/ECM

FIBER OPTIC LINK FEATURES

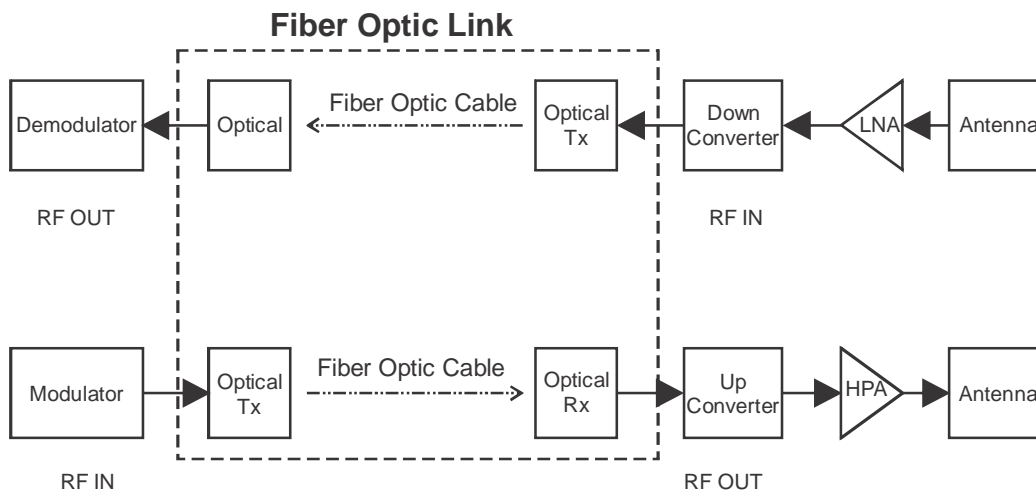
- Low loss – enables very long lengths with minimal degradation of carrier-to-noise. Loss is far lower than RF transmission over coax.
- No electrical interference, signal is not affected by radiated interference.
- Non-conductive - provides electrical isolation.
- Lower cost compared to coaxial cable over long distances
- Fiber optic cables are smaller in diameter, flexible and lightweight

FIBER OPTIC LINK FEATURES

- Wideband operation: 1 – 12 GHz
- Optical Loss Budget 8 dB / 15Km
- Available as compact plug-in modules that can be fitted in 19 inch racks
- Also available as racks mounted solutions with pre-fitted modules and power supplies
- RF input connectors : 50Ω SMA

MATERIALS USED

- Imported DFB laser based transmitters for low noise and spectral purity
- Choice of fiber optic cables both for indoor and outdoor with waterproofing, rodent protection etc.
- Imported cables from reputed mfg. like Corning, Rosenberger or equivalent



While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

Optical Fiber Optic Link Specifications

Optical Loss Budget	8 dB / 15 Km; 3 dB / 2 Km
OPTICAL	
Laser	DFB (low noise & high spectral purity)
Operating Wavelength	1550 nm ± 5 nm
RF Channel	
Frequency	1 – 12 GHz
VWSR (max)	2 : 1
Max RF Input	18 dBm
General	
Power Supply	RX : + 8 to + 24 VDC TX : +8 VDC – 24 VDC
Optical Connectors	FC/APC, SC/APC
RF Connectors	50Ω SMA(F)
Operating Temperature	-40°C to +70°C
Storage Temperature	-55°C to +85°C

How to Specify Part Numbers for Fiber Optic Links

I-FLRF12 - **XX** C - **YY** M - **D** - **H** - **CCC** - 00

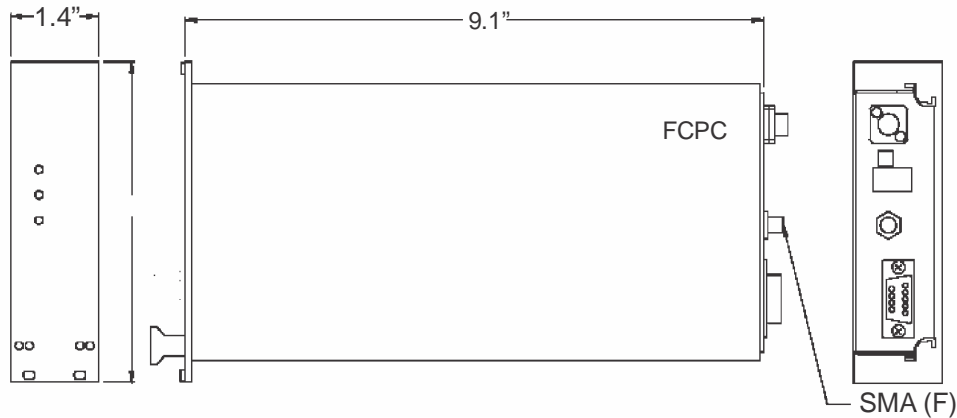
XX	2 digit channel Code	2 Channels = 02; 4 Channels = 04 ; 12 = 12 channels
YY	2 digit code for mode	9S = 9/125um singlemode (Note : Only single-mode available)
D	Distance	500 meters = 500 ; 1500 meters = 1.5KM
H	Mounting	1 = 1U Size for 19" rack ; 2 = Flange Mount
CCC	Cable Class	Tactical = 065; Riser = 120 ; Outdoor Unarmoured = 160 ; Outdoor Armoured = 160A

Example : 2 channel tactical link, 1 Km distance, 1 – 12 GHz will have part number I-FLRF12-02C-9SM-1KM-1-065-00

Shown trademarks are property of their respective owners.

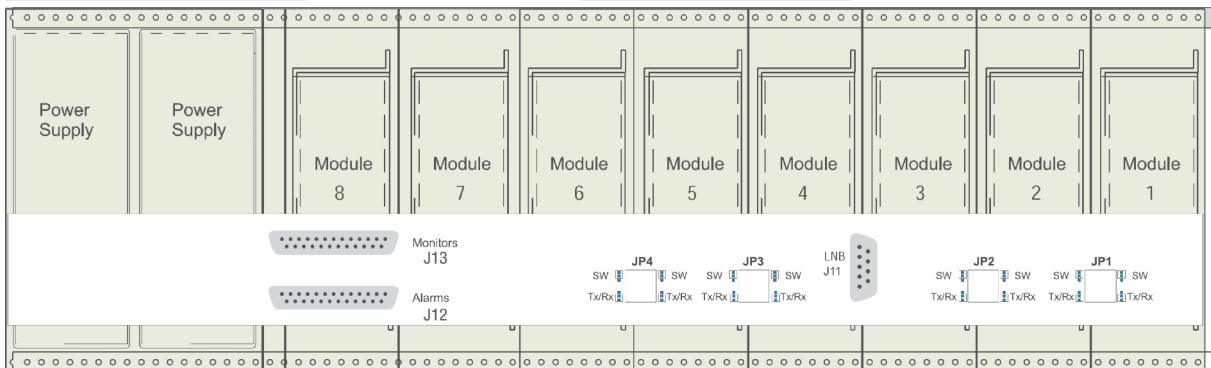
While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

Mechanical Details of Transmitter/Receiver Plug-in Modules



- The transmitters and receivers are available as plug-in modules that fit into standard 3U 19inch racks. In this case customer has to provide 15 Vdc or 5Vdc to operate the modules
- In addition we can also supply these along with 3U 19inch racks.
- Racks can be fitted with 2 hot-swappable power supplies

Example of Fully Fitted Rack Mounted Transmitters & Receivers



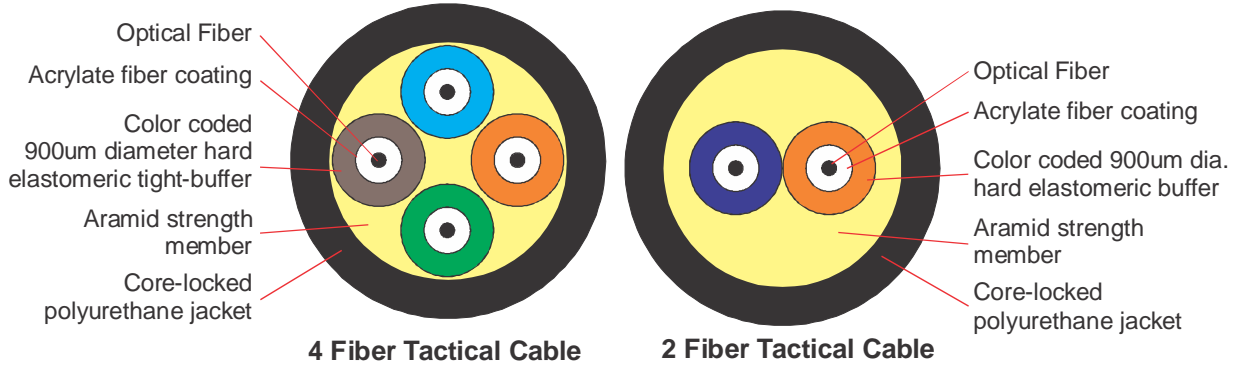
Options Available

- **Plug-in Modules :** These can be directly plugged into customer 3U, 19inch racks
- **19 inch 3U Racks:** We can package the modules into 19inch racks to give a complete solution
- **Hot Swappable Power Supplies:** Can be provided in the 19inch racks

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

MILITARY TACTICAL CABLE SPECIFICATIONS



Specifications for Military Tactical Cables

No of Fiber	Mode	Core/Cladding (um)	Cable Dia. mm	Weight kg/km	Tensile Load Max (N)		Bend Radius Min (cm)		Attenuation Min (dB/Km)		
					Install.	Oper.	Install	Oper.	850nm	1300nm	1550nm
2	Single	9/125	5	23	1800	600	8	4	-	0.5	0.5
4	Single	9/125	5.5	28	1800	600	8.8	4.4	-	0.5	0.5
2	Multi	62.5/125	5	23	1800	600	8	4	3.5	1.5	-
4	Multi	62.5/125	5.5	28	1800	600	8.8	4.4	3.5	1.5	-

Environmental Specifications for Military Tactical Cables

Storage Temperature Range	-70 to +85°C
Operating Temperature Range	-55 to +85°C
Crush Resistance (MIL-85045/EIA-455-41)	440 N/cm
Impact Resistance (MIL-85045/EIA-455-25)	200 Impacts
Cyclic Flexing (MIL-85045/EIA-455-104)	2000 cycles, min.
Knot Force (MIL-85045/EIA-455-87)	500 N test force
Thermal Shock (MIL-85045/EIA-455-71)	-57 to +85°C
Temperature/Humidity (MIL-85045/EIA-455-5)	95%

Specifications of Indoor Fiber Optic Cables

No. of Fibres in cable	2	4
Jacket diameter (mm)	4.8	4.8
Weight (kg/km)	18	25
Operating Tensile load (N)	400	400
Min Bend Radius (mm)	100	100
Crush Resistance (N)	300	300

Specifications are subject to change without notice

Shown trademarks are property of their respective owners.

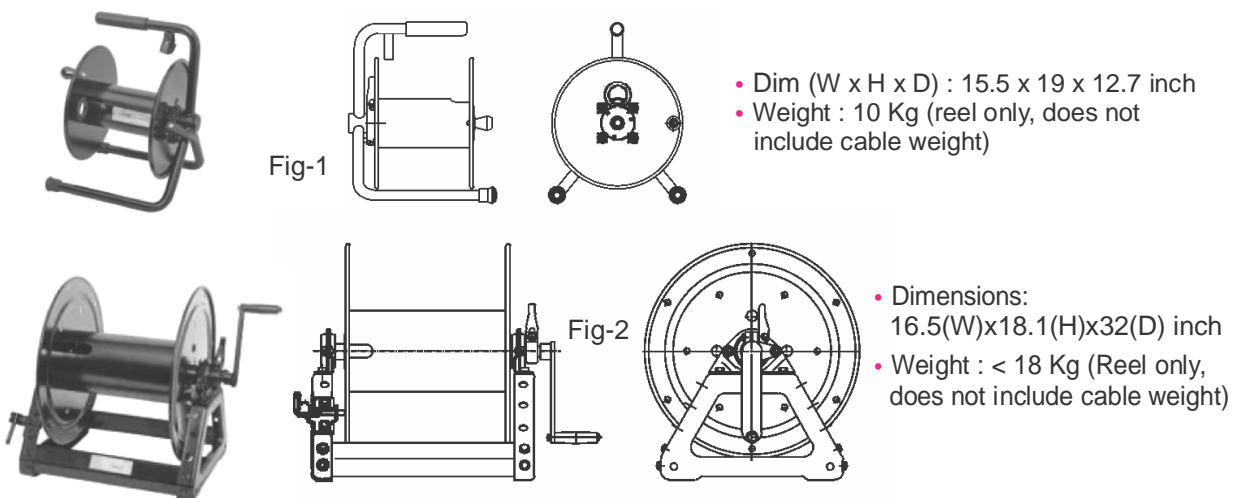
While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

Wideband RF Over Fiber Links

- 2 fiber link assumes that 2 Tx/Rx pairs available – 1 on each side.
- 4 fibers assume total 4 Tx/Rx pairs are available – 2 on each side for 2 simultaneous RF channels.

P/N for FO Ethernet Link	Freq. GHz	Mount	Mode	Fib.	No. of Tx/Rx Pairs	Cable Drum	Len. Meter
1 GHz – 12 GHz RF-Over-Fiber Link : Indoor Cable							
I-FLRF12-02C-9SM-10M-1-R120-00	1 - 12	1U for 19"	SM 9/125	2	2	-	10
I-FLRF12-02C-9SM-25M-1-R120-00	1 - 12	1U for 19"	SM 9/125	2	2	-	25
I-FLRF12-04C-9SM-10M-1-R120-00	1 - 12	1U for 19"	SM 9/125	4	4	-	10
I-FLRF12-04C-9SM-25M-1-R120-00	1 - 12	1U for 19"	SM 9/125	4	4	-	25
1 GHz – 12 GHz RF-Over-Fiber Link : Military Tactical Cables							
I-FLRF12-02C-9SM-300M-1-065-00-R	1 - 12	1U for 19"	SM 9/125	2	2	Fig 1	300
I-FLRF12-02C-9SM-500M-1-065-00-R	1 - 12	1U for 19"	SM 9/125	2	2	Fig 2	500
I-FLRF12-02C-9SM-700M-1-065-00-R	1 - 12	1U for 19"	SM 9/125	2	2	Fig 2	700
I-FLRF12-02C-9SM-1KM-1-065-00-R	1 - 12	1U for 19"	SM 9/125	2	2	Fig 2	1KM
I-FLRF12-02C-9SM-1.5KM-1-065-00-R	1 - 12	1U for 19"	SM 9/125	2	2	Fig 2	1.5KM
I-FLRF12-02C-9SM-2KM-1-065-00-R	1 - 12	1U for 19"	SM 9/125	2	2	Fig 2	2KM
I-FLRF12-02C-9SM-3KM-1-065-00-R	1 - 12	1U for 19"	SM 9/125	2	2	Fig 2	3KM
I-FLRF12-04C-9SM-300M-1-065-00-R	1 - 12	1U for 19"	SM 9/125	4	4	Fig 1	300
I-FLRF12-04C-9SM-500M-1-065-00-R	1 - 12	1U for 19"	SM 9/125	4	4	Fig 2	500
I-FLRF12-04C-9SM-700M-1-065-00-R	1 - 12	1U for 19"	SM 9/125	4	4	Fig 2	700
I-FLRF12-04C-9SM-1KM-1-065-00-R	1 - 12	1U for 19"	SM 9/125	4	4	Fig 2	1KM
I-FLRF12-04C-9SM-2KM-1-065-00-R	1 - 12	1U for 19"	SM 9/125	4	4	Fig 2	2KM
I-FLRF12-04C-9SM-3KM-1-065-00-R	1 - 12	1U for 19"	SM 9/125	4	4	Fig 2	3KM

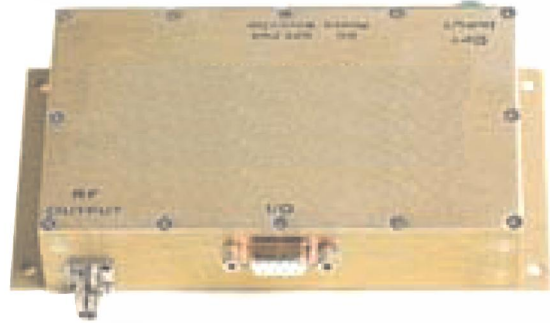
Note : Custom RF over fiber optic links as per application demands are available. Customizations include variations in length, channels, RF frequency range, mounting options etc.



Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

I-FLRF18...series is an ultra-wideband fiber-optic link that provides a low noise, high performance, optical transport of radar signals, satcom bands, EW/ECM signals and other remoting applications between 0.5 to 18 GHz. Transmitter uses a low noise DFB laser with temperature compensation at 1550 nm.



APPLICATIONS

- SIGINT/COMINT
- Electronic Warfare (EW)/ECM
- Wideband RF Transmission
- Ku- Band SATCOM
- Antenna Remoting
- Radar Telemetry
- Electronic Warfare (EW)/ECM

FIBER OPTIC LINK FEATURES

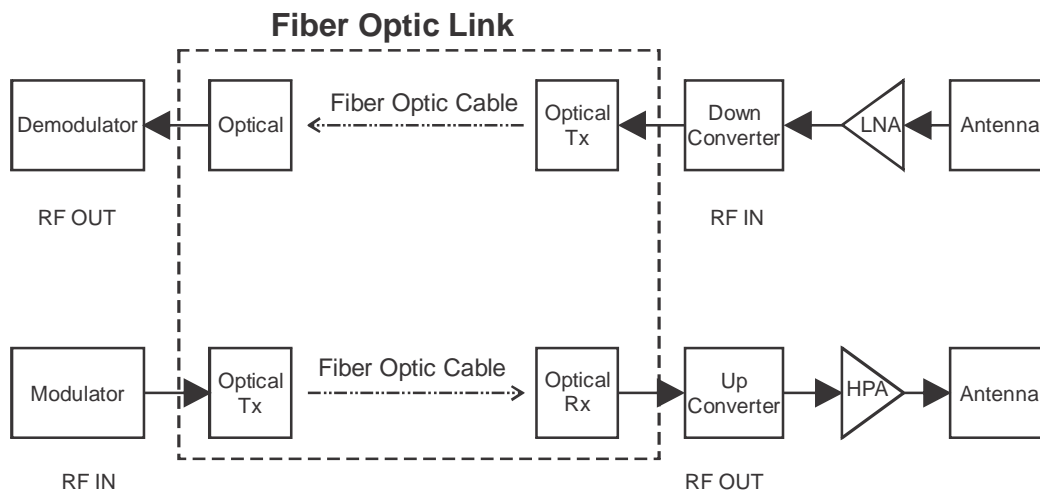
- Low loss – enables very long lengths with minimal degradation of carrier-to-noise. Loss is far lower than RF transmission over coax.
- No electrical interference, signal is not affected by radiated interference.
- Non-conductive - provides electrical isolation.
- Lower cost compared to coaxial cable over long distances
- Fiber optic cables are smaller in diameter, flexible and lightweight

FIBER OPTIC LINK FEATURES

- Wideband operation: 0.5 – 18 GHz
- Optical Loss Budget 8 dB / 15Km
- Available as compact plug-in modules that can be fitted in 19 inch racks
- Also available as racks mounted solutions with pre-fitted modules and power supplies
- RF input connectors : 50Ω SMA

MATERIALS USED

- Imported DFB laser based transmitters for low noise and spectral purity
- Choice of fiber optic cables both for indoor and outdoor with waterproofing, rodent protection etc.
- Imported cables from reputed mfg. like Corning, Rosenberger or equivalent



Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

Optical Fiber Optic Link Specifications

Optical Loss Budget	8 dB / 15 Km; 3 dB / 2 Km
OPTICAL	
Laser	DFB (low noise & high spectral purity)
Operating Wavelength	1550 nm ± 5 nm
RF Channel	
Frequency	500 MHz – 18 GHz
VWSR (max)	2 : 1
Max RF Input	18 dBm
General	
Power Supply	RX : + 8 to + 24 Vdc 350 mA max. TX : +15 VDC 100mA max, +15 VDC 100 mA max, +5 VDC 1.5 mA max & -5 VDC 0.4 mA max
Optical Connectors	FC/APC, SC/APC
RF Connectors	50Ω SMA(F)
Operating Temperature	-40°C to +70°C
Storage Temperature	-55°C to +85°C

How to Specify Part Numbers for Fiber Optic Links

I-FLRF18 - **XX** C - **YY** M - **D** - **H** - **CCC** - 00

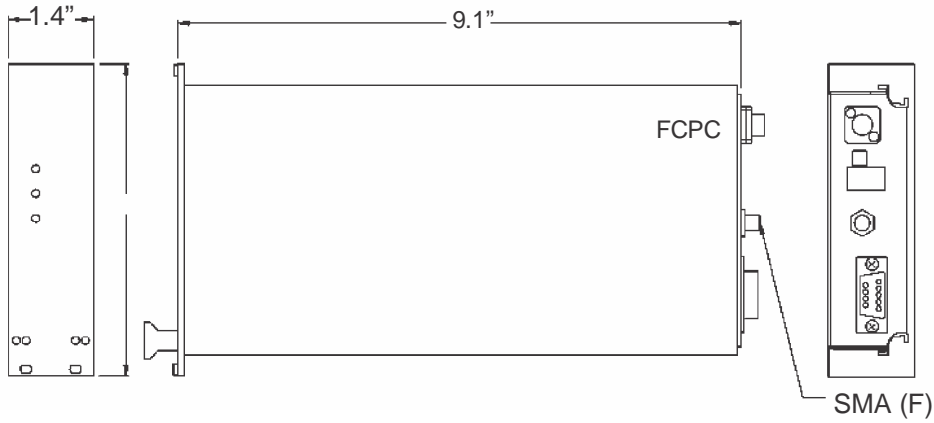
XX	2 digit channel Code	2 Channels = 02; 4 Channels = 04 ; 12 = 12 channels
YY	2 digit code for mode	9S = 9/125um singlemode (Note : Only single-mode available)
D	Distance	500 meters = 500 ; 1500 meters = 1.5KM
H	Mounting	1 = 1U Size for 19" rack ; 2 = Flange Mount
CCC	Cable Class	Tactical = 065; Riser = 120 ; Outdoor Unarmoured = 160 ; Outdoor Armoured = 160A

Example : 2 channel tactical link, 1 Km distance, 0.5 – 18 GHz will have part number I-FLRF18-02C-9SM-1KM-1-065-00

Shown trademarks are property of their respective owners.

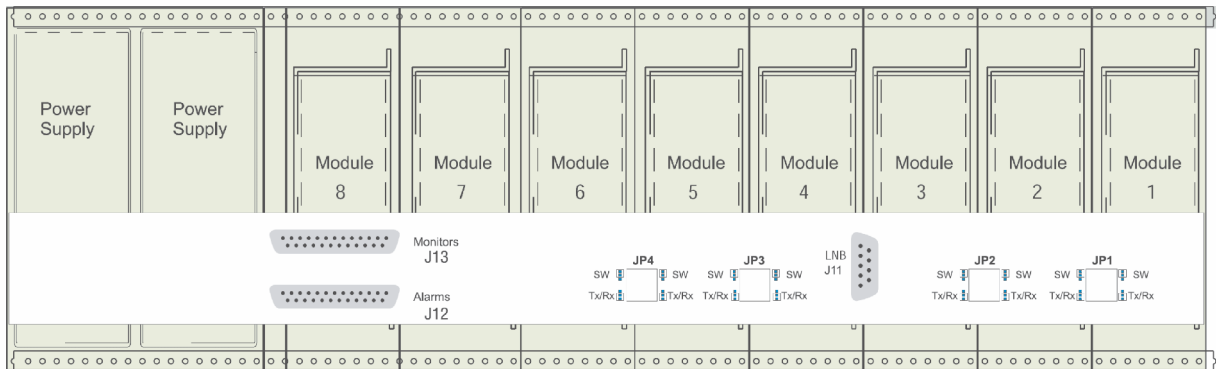
While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

Mechanical Details of Transmitter/Receiver Plug-in Modules



- The transmitters and receivers are available as plug-in modules that fit into standard 3U 19inch racks. In this case customer has to provide 15 Vdc or 5Vdc to operate the modules
- In addition we can also supply these along with 3U 19inch racks.
- Racks can be fitted with 2 hot-swappable power supplies

Example of Fully Fitted Rack Mounted Transmitters & Receivers



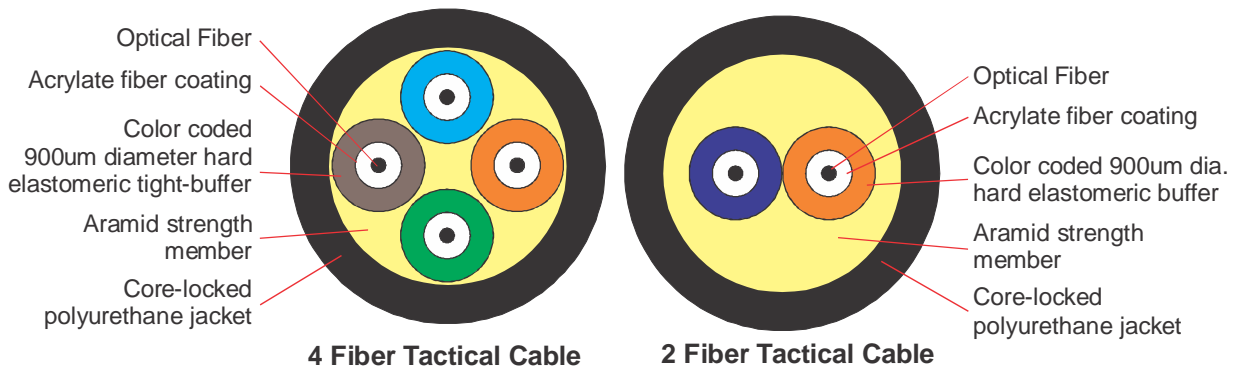
Options Available

- **Plug-in Modules** : These can be directly plugged into customer 3U, 19inch racks
- **19 inch 3U Racks**: We can package the modules into 19inch racks to give a complete solution
- **Hot Swappable Power Supplies**: Can be provided in the 19inch racks

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

MILITARY TACTICAL CABLE SPECIFICATIONS



Specifications for Military Tactical Cables

No of Fiber	Mode	Core/Cladding (um)	Cable Dia. mm	Weight kg/km	Tensile Load Max (N)		Bend Radius Min (cm)		Attenuation Min (dB/Km)		
					Install.	Oper.	Install	Oper.	850nm	1300nm	1550nm
2	Single	9/125	5	23	1800	600	8	4	-	0.5	0.5
4	Single	9/125	5.5	28	1800	600	8.8	4.4	-	0.5	0.5
2	Multi	62.5/125	5	23	1800	600	8	4	3.5	1.5	-
4	Multi	62.5/125	5.5	28	1800	600	8.8	4.4	3.5	1.5	-

Environmental Specifications for Military Tactical Cables

Storage Temperature Range	-70 to +85°C
Operating Temperature Range	-55 to +85°C
Crush Resistance (MIL-85045/EIA-455-41)	440 N/cm
Impact Resistance (MIL-85045/EIA-455-25)	200 Impacts
Cyclic Flexing (MIL-85045/EIA-455-104)	2000 cycles, min.
Knot Force (MIL-85045/EIA-455-87)	500 N test force
Thermal Shock (MIL-85045/EIA-455-71)	-57 to +85°C
Temperature/Humidity (MIL-85045/EIA-455-5)	95%

Specifications of Indoor Fiber Optic Cables

No. of Fibres in cable	2	4
Jacket diameter (mm)	4.8	4.8
Weight (kg/km)	18	25
Operating Tensile load (N)	400	400
Min Bend Radius (mm)	100	100
Crush Resistance (N)	300	300

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

Wideband RF Over Fiber Links

- 2 fiber link assumes that 2 Tx/Rx pairs available – 1 on each side.
- 4 fibers assume total 4 Tx/Rx pairs are available – 2 on each side for 2 simultaneous RF channels.

P/N for FO Ethernet Link	Freq. GHz	Mount	Mode	Fib.	No. of Tx/Rx Pairs	Cable Drum	Len. Meter
0.5 GHz – 18 GHz RF-Over-Fiber Link : Indoor Cable							
I-FLRF18-02C-9SM-10M-1-R120-00	0.5 - 18	1U for 19"	SM 9/125	2	2	-	10
I-FLRF18-02C-9SM-25M-1-R120-00	0.5 - 18	1U for 19"	SM 9/125	2	2	-	25
I-FLRF18-04C-9SM-10M-1-R120-00	0.5 - 18	1U for 19"	SM 9/125	4	4	-	10
I-FLRF18-04C-9SM-25M-1-R120-00	0.5 - 18	1U for 19"	SM 9/125	4	4	-	25
0.5 GHz – 18 GHz RF-Over-Fiber Link : Military Tactical Cables							
I-FLRF18-02C-9SM-300M-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	2	2	Fig 1	300
I-FLRF18-02C-9SM-500M-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	2	2	Fig 2	500
I-FLRF18-02C-9SM-700M-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	2	2	Fig 2	700
I-FLRF18-02C-9SM-1KM-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	2	2	Fig 2	1KM
I-FLRF18-02C-9SM-1.5KM-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	2	2	Fig 2	1.5KM
I-FLRF18-02C-9SM-2KM-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	2	2	Fig 2	2KM
I-FLRF18-02C-9SM-3KM-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	2	2	Fig 2	3KM
I-FLRF18-04C-9SM-300M-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	4	4	Fig 1	300
I-FLRF18-04C-9SM-500M-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	4	4	Fig 2	500
I-FLRF18-04C-9SM-700M-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	4	4	Fig 2	700
I-FLRF18-04C-9SM-1KM-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	4	4	Fig 2	1KM
I-FLRF18-04C-9SM-2KM-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	4	4	Fig 2	2KM
I-FLRF18-04C-9SM-3KM-1-065-00-R	0.5 - 18	1U for 19"	SM 9/125	4	4	Fig 2	3KM

Note : Custom RF over fiber optic links as per application demands are available. Customizations include variations in length, channels, RF frequency range, mounting options etc.

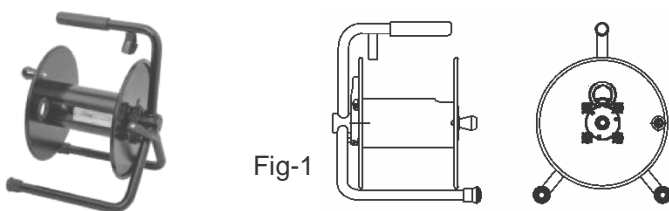


Fig-1

- Dim (W x H x D) : 15.5 x 19 x 12.7 inch
- Weight : 10 Kg (reel only, does not include cable weight)

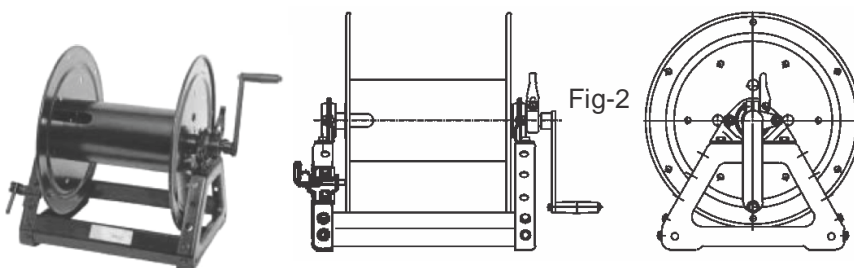


Fig-2

- Dimensions: 16.5(W)x18.1(H)x32(D) inch
- Weight : < 18 Kg (Reel only, does not include cable weight)

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.