CWDM RF Over Fiber Link System

(2kHz ~ 3GHz, up to 18 channels over a single fiber, SM28 Fiber)

The RF over Fiber (RFOF) Link Series is designed for high-fidelity transmission of analog and digital RF signals up to 3 GHz over distances of up to 1 km. The system converts electrical RF signals into optical signals using a directly modulated laser at the transmitter. At the receiver, a high-linearity photodiode and low-noise amplifier convert the optical signal back into an RF signal, providing a transparent and high-performance data transmission channel. This series supports all 18 CWDM wavelengths specified by the ITU, ranging from 1271 nm to 1611 nm. When paired with a CWDM multiplexer, multiple independent channels can be transmitted over a single shared fiber link. Additionally, an optional bidirectional RF communication feature enables two-way transmission over a single fiber strand using adaptors. To enhance performance, low-noise RF amplifiers and optical amplifiers can be integrated to reduce the noise figure.

The system is housed in a network-ruggedized rack-mount case that includes four pluggable modules and 100-240 VAC power input. The design is highly flexible and scalable. This compact design is ideal for applications requiring cost effective and efficient multi-channel RF signal transport over fiber.

Features

- 0.01 ~ 3 GHz
- Up to 1 km
- Loss Compensation
- Analog or Digital
- Low Distortion
- Low Cost

Applications

- GSM Repeater
- CDMA Repeater
- WCDMA Repeater
- PHS Repeater
- Digital TV Repeater
- Broadcast Repeater

Specifications

Parameter	Min	Typical	Max	Unit
Optical Wavelength (CWDM ITU ±5nm)	1271		1611	nm
Optical Output Power	2	3	6	dBm
Optical Input Power	-16		-6	dBm
RF Frequency Range	0.002		3000	MHz
Flatness		4	6	dB
RF Output Power (@-10dBm optical input)			-30	dBm
Input RF Return Loss	10	12		dB
RF Input Power	-45	-40	-30	dBm
Noise (0dB RF gain, 0dB optical decrease)*	-90		-130	dBm/Hz
Link Gain		0		dB
Delay	60			ns
Fiber Type		SM28		
RF Impedance		50		Ω
RF Connector		SMA-F		
Power Consumption		2		W
Weight	0.5			kg
Operating Temperature	-20		50	°C
Storage Temperature	-45		85	°C

* Adding a low noise RF amplifier can reduce the noise figure by about 15dB

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P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

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Dimensions (mm)

- 1U Box houses 4 pluggable modules
- 2U Box house 8 pluggable module
- Each module house up to 6 transmitters or 6 receivers
- Each module house up to 3 transmitter/receiver pairs
- Each module house one 18 channel CWDM with LC connectors
- Each module house one 12 channel CWDM with SC connectors

Operation Instruction

- Connect the optical connector on the front
- Connect the RF connector on the front
- Connect AC power (110-240VA) using the accompanied power cord
- Turn on the power rock switch on the back panel
- The system should function smoothly
- Any issues, please email us

Application Notes

Fiber Core Alignment
Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness
Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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Ordering Information

	☐	☐	☐☐	☐	☐☐	☐☐	☐	☐
Prefix	**Type**	**Direction***	**Link Length**	**CWDM**	**Start Channel**	**End Channel**	**Fiber Connector**	**RF Connector**
CRFO-	Transmitter = T Receiver = R Tx/Rx Pair = P Special = 0	One Direction = 1 Bidirectional = 2	< 1km = 01 5km = 05	None = 0 12 channel = 1 18 channel = 2	See Table	See Table	FC/APC = 2 FC/UPC = 3 SC/APC = 4 SC/UPC = 5 LC/APC = A LC/UPC = U Special = 0	SMA = 1 N type = 2 Special = 0

Note:

* Bidirectional means two-way communications via a single fiber link.

No.	Wavelength (nm)	Wavelength Band
1	1271nm	O-Band
2	1291nm	O-Band
3	1311nm	O-Band
4	1331nm	O-Band
5	1351nm	O-Band
6	1371nm	E-Band
7	1391nm	E-Band
8	1411nm	E-Band
9	1431nm	E-Band
10	1451nm	E-Band
11	1471nm	S-Band
12	1491nm	S-Band
13	1511nm	S-Band
14	1531nm	C-Band
15	1551nm	C-Band
16	1571nm	L-Band
17	1591nm	L-Band
18	1611nm	L-Band

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