Fiber Optical Analog Transmitter/ Receiver

0.5MHz – 1.25GHz, RF-over-Fiber Tx/Rx Pair with RF Fiber Break

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The RFOF Transmitter (Tx) and Receiver (Rx) pair is designed to transmit analog or digital RF signals over optical fiber, delivering a secure, low-loss, high-fidelity link between two locations. Optimized for high-security and critical infrastructure applications, the system ensures signal integrity across a broad frequency range of 1MHz to 2.5 GHz, with an exceptionally flat frequency response for analog signal transmission formats. An optional RF Fiber Break configuration supports unidirectional RF transmission over a single fiber, blocking return-path signals to enable true one-way communication. This feature enhances security and isolation, making it suitable for military-grade deployments. The system is plug-and-play, featuring compact, lightweight enclosures with wall-pluggable power supplies for rapid deployment and minimal setup. An optical power warning function is available on both the Tx and Rx units. The warning signal outputs have two formats of RS485 with a DB9 connection and PNP format: when a warning is triggered, +5V is actively sourced (current flows out) on the two designated output pins, allowing easy interface with external alarms or monitoring systems.

Features

- Excellent Linearity and Flatness
- 0.5MHz – 1.25GHz Working Bandwidth
- Wide Range of Optical Input Power
- Single-Mode Fiber
- Ultra Low Noise Technology
- Smaller Size and Easy to Install
- Built-In Filter
- Low Power Loss Design

Applications

- FTTH (Fiber To The Home) Networks

Specifications (Transmitter)

Parameter	Min	Typical	Max	Unit
Wavelength		1310 ± 20, 1550 ± 20		nm
Frequency range	3	60	1250	MHz
RF input level	72		82	dBuV
Flatness in band		±0.75		dB
Rf input resistance		50		ohm
Input reflection loss		≥ 16		dB
Link C/N		≥ 51		dB
Link C/CSO		≥ 60		dB
Link C/CTB		≥ 65		dB
AGC controlling range		±5		dB
MGC controlling	0		10	dB
Laser type		DFB laser		
Optical connector type		SC/APC		
Power Supply		DC 12 V/1 A		
Power Consumption		≤ 4		W

Specifications (Receiver)

Parameter		Min	Typical	Max	Unit
Operating wavelength		1100		1600	nm
Optical input power range	Analog	0		10	dBm
	Digital	0		15	
Frequency range		DC		2.5	GHz
Output level		60		80	BæV
Flatness			±1		dB
Slope			5 ± 2		dB
Return loss			16		dB
Noise figure			47.5		dB
CTB			≥ 65		dB
CSO			≥ 65		dB
MER			38		dB
Power Consumption			≥ 0.6		W
Test Conditions			60 CH (PAL-D), Pin -6dBm, 1 EDFA with noise figure 5dB, 25Km, Composite OMI 18.5%		
Output impedance			50		Ω
RF connector			F (female)		
Responsibility (@ 1550nm)			≥ 0.9		A/W
Optical Return Loss			≥ 55		dB

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

Rev 06/24/25

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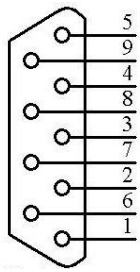
Mechanical Dimensions (mm)

Alarm Function (DB9 Pin Assignment)



Pin	Descriptions
1	NC
2	GND
3	+12VDC @150mA
4	TTL High (2.0-5.0V) for PD Alarm; Low (0-0.8V) for work
5	TTL High (2.0-5.0V) for LD Alarm; Low (0-0.8V) for work
6	NC
7	NC
8	NC
9	NC

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

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

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Ordering Information

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Prefix	**High Frequency**	**Low Frequency**	**Alarm ***	**Wavelength**	**TX/RX**	**Package**	**Directional ****	**Fiber Connector**
RFOF-	1.25GHz = 10 2.5GHz = 25 Special = 00	100MHz =1 10MHz =2 3MHz =3 0.5MHz =4	Non = 1 RS485 = 4 PNP = P Special = 0	1550nm = 1 1310nm = 3 1490nm = 4 Special = 0	Receiver = 1 Transmitter = 2 Pair = 3	Module = 1 Rack = 2 Special = 0	Unidirectional = 1 Bidirectional = 2	SC/UPC = 4 FC/APC = 2 FC/UPC = 3 SC/UPC = 5 LC/APC = A LC/UPC = U Special = 0

Note:

***** Alarm optical power below a set level for both transmitter and receiver

****** Bidirectional means two-way communications via a single fiber link. The price is double since it comprises two pairs of transceivers and receivers with WDM (different wavelength) or circulator (same wavelength) cable jumpers.

Red marked -- Special order

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.