

Unidirectional Programmable 4.0GHz RF over Fiber System (B5, B6)



Generic photo used for illustration purpose only. See RFoF 4GHz Unidirectional sub-system modules drawings in page #2.

RFOptic's multi-channel unidirectional programmable RFoF system provides RF performance that is superior to coaxial cable interface. The system is composed of two identical terminals that are connected to each other by single mode fibers (SMF). The system is tailored to the 5G cellular band and covers the entire 0.5GHz to 4.0GHz bandwidth. The system can be delivered with two configurations; where each enclosure contains two RFoF transmitters (Tx) and two RFoF receivers (Rx). The double system is offered with four RFoF Tx units and four RFoF Rx units. All the transmitters use the same 1310nm optical wavelength (or 1550nm transmitters) to transmit the RF signal to the corresponding receivers in an identical second enclosure (see page #3 B5 and B6 systems). This flexibility of configuration and the sub-system remote management and control functionality through HTML/REST/SNMP interface allow the system to handle very different application requirements.

Key Features:

- Integrated and flexible multi-channel unidirectional RFoF sub- systems.
- Full support for the 0.5GHz to 4.0GHz bandwidth; Optional: RFoF system operating up to 6.0GHz.
- Excellent linearity, gain flatness, and gain control.
- Programmable RF and Optical performance.
- Built-in end-to-end diagnostics reduces installation and maintenance time.
- Integrated RF power sensors.
- Reduced gain variation over temperature option.
- Remote management and control via HTML/REST/SNMP interface

Both enclosures are Tx and Rx RFoF terminal units. Each of these include LNAs and variable attenuators which can be used to customize the Noise Figure, Input P1dB, and IP3 over wide range of values. For special applications requiring temperature stability operation, a unique optional temperature compensation algorithm supports ± 0.5 dB over 100°C variation of the ambient temperature. The RFoF link has excellent gain flatness with 0.5dB gain adjustment and tracking between different links.

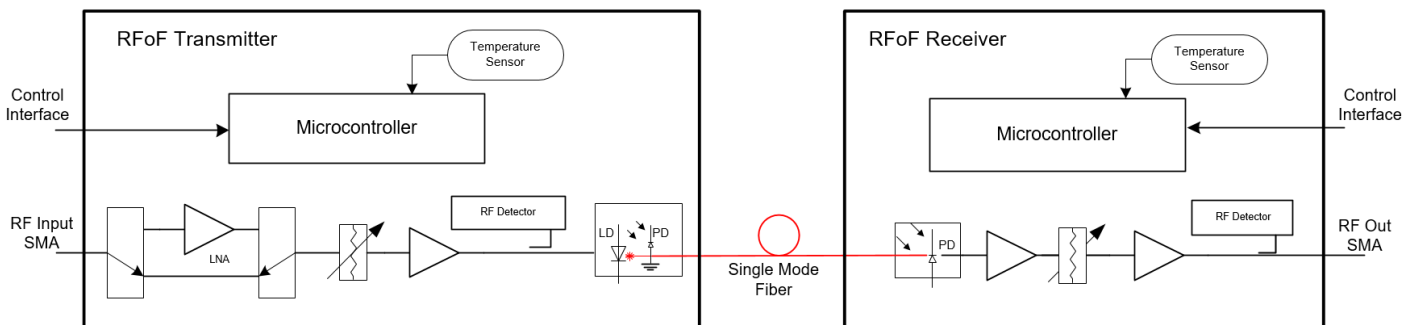
Configuration:

- Two configurations in 19" 1U Indoor enclosure
- Two RFoF Tx 1310 nm units and two Rx units
- Four RFoF 1310 nm Tx units and Four Rx units
- Four RFoF 1310 nm Tx units and Four Rx units
- Outdoor Configuration is available
- Option: Mix of 1310 and 1550nm Tx transmitters

Applications:

- 5G test sites
- DAS
- Distributed Antenna

Each of the signals is transmitted over an RFoF programmable link. A simplified block diagram of such a link is shown below.



Multi-Channel Unidirectional Programmable 4.0GHz RF over Fiber System Specifications B6 Configuration

RF Performance ^[1]	Unit	Specification (typical)	
		LNA Off	LNA ON
Frequency Range	MHz	500 - 4000	500 - 4000
Nominal Link Gain (adjustable) ^[2]	dB	14	45
Input Power Range	dBm	(-60) – (0)	(-60) – (0)
Tx/Rx Attenuators 0 to 31dB, 0.5 step	dB	0.5	0.5
Gain Flatness	dB	±2	±2
Input P1dBc ^[3]	dBm	-2	-33
Noise Figure ^[3]	dB	25	5
Calculated SFDR ^[3]	dB/Hz ^{2/3}	105	98
Max Input Return Loss	dB	-12	-12
Max Output Return Loss	dB	-12	-12
Maximum Input No damage	dBm	+20	+20
Input / Output impedance	Ohm	50	50
Optical and Electrical			
Laser diode wavelength ^[4]	µm	1.31	
System Monitor & Control	-	HTML/REST/SNMP	
Optical Power	mw	3	
Power	-	110/220 VAC	
Mechanical and Environmental Parameters			
19" 1U Enclosure dimensions	mm	445(W)* 476(L)*44(H)	
Number of Unidirectional links	-	2 Tx and 2 Rx / 4 Tx and 4 Rx	
RF Input/Output Connectors	-	SMA	
Optical Connectors ^[5]	-	LC/UPC	
Power Connectors	-	HP Socket	
Data Connector	-	RJ-45	
Operating temperature	°C	-20 to +70	
Storage temperature	°C	-40 to +85	

[1] The specifications are for 4.0GHz RfOF link with short fiber patch.

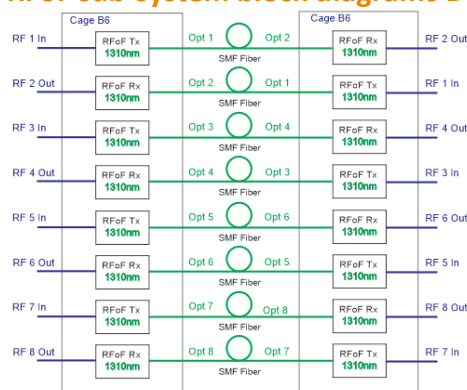
[2] The link Gain and IP1dB can be adjusted by the Tx Attenuator using the user software.

[3] Noise Figure and Input P1 dB are measured at 2.0GHz and can be adjusted by using the Tx Attenuator and 'LNA Off/On'.

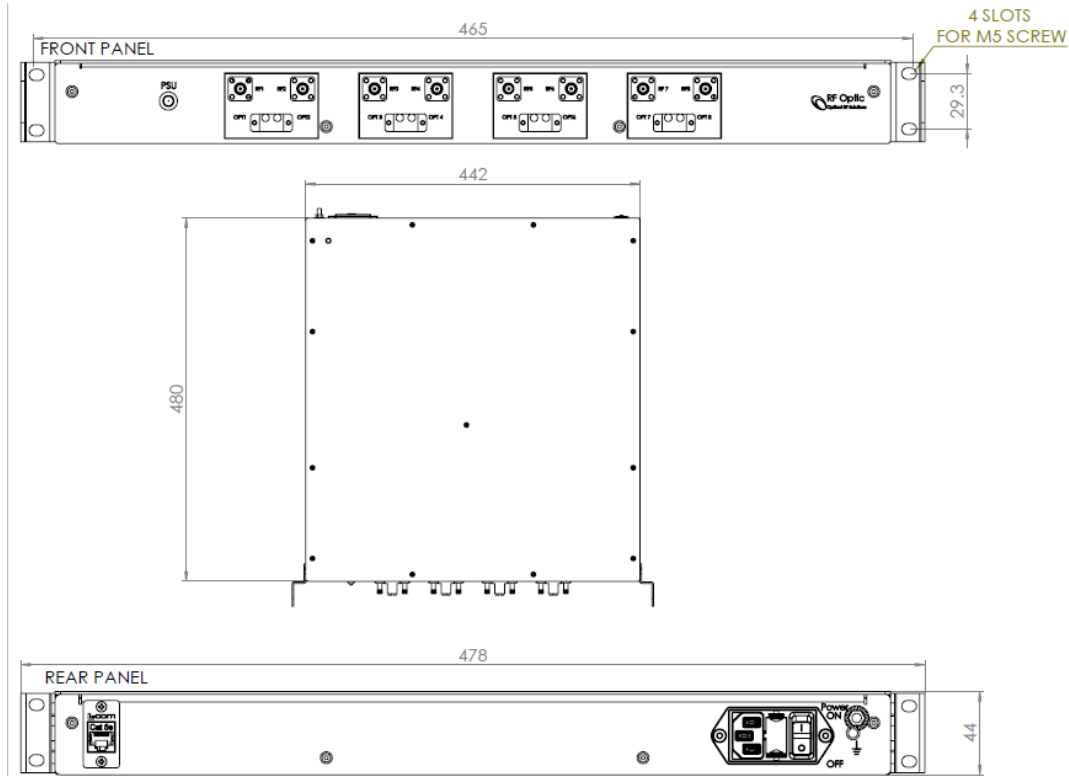
[4] Optional: 1.55 µm wavelength of the transmitter.

[5] Optional: FC/APC or SC/APC.

Multi-channel 8 channel RfOF sub-system block diagrams B6 Configuration



19" 1U enclosure drawings



Ordering Information:

For specific configuration, define the following:

1. Enclosure type – 19" 1U Generic
2. Upper Frequency - 4.0GHz
3. Number of Unidirectional links - 4
4. Communication type - HTML
5. Power - 220 VAC
6. Optical connectors - LC/UPC
7. RF connectors – SMA

ERP P/N	Marketing P/N	Description
SYSA00340	RFoFc-I1SL2T2RIHNA04B5	19" 1U Enclosure with 4*RFoF 4GHz unidirectional 1550nm Tx/Rx units, SMA, LC/UPC, HTML
SYSA00343	RFoFc-I1SL4T4RIHNA04B6	19" 1U Enclosure with 4*RFoF 4GHz unidirectional 1310nm Tx/Rx units, SMA, LC/UPC, HTML