

...designed for perfect signals

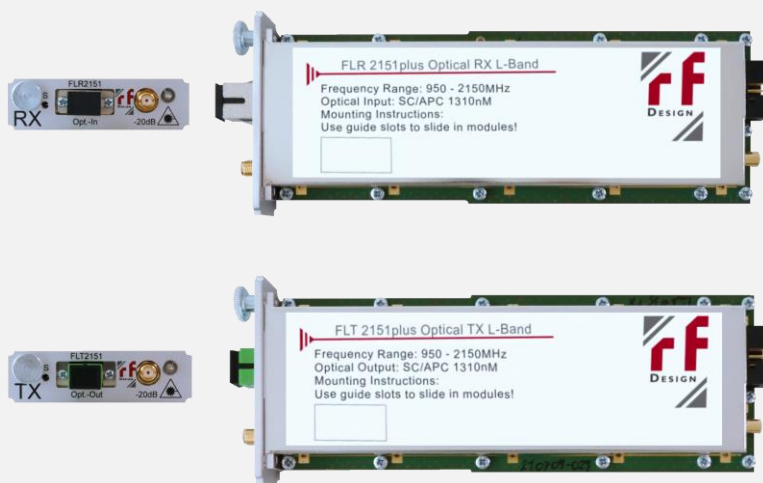
Outdoor RF-over-Fiber Systems (Non-redundant & redundant)

The FiberLinkplus-ODA system represents a compact and weatherproof modular type outdoor application RF-over-Fiber enclosure (IP65 specified) for versatile non-redundant as well as 1:1 and N+1 redundant optical transmission. The outdoor enclosure can be mounted close to the antenna and is made for flexible, high quality and secure optical transmission of RF signals (L-Band, extended L-Band and 10MHz) over a distance of up to 20km.

Corresponding modular type outdoor application chassis that can be put into the outdoor enclosure are equipped with a RF connector panel for the RF coax I/O ports, 1:1 redundant dual power-supply, a controller board (CPU/LPC) a fiber patch-panel/splice-tray and temperature controlled heating and cooling allowing operation in almost any environment.

The available chassis fitting into the outdoor enclosure can hold up to eight TX and/or RX Modules for standard non-redundant operation, up to 16 TX/RX modules for max. 8 x 1:1 redundant operation or max. 10 TX/RX modules for 2 x 4+1 redundant operation. In case of a 1:1 or N+1 redundant operation once an error for an TX or RX module happens the system will automatically activate the switch over to a back-up TX or RX module, assuring interruption free signal transmission at any time.

Additionally, the system comes with beneficial features such as laser/link monitoring, status LED's, -20dB measurement port at any TX/RX module, variable gain control, RF power monitoring, switchable LNB-supply (for non-redundant & 1:1 redundant versions), hot-swappable TX/RX modules and 1:1 redundant dual power supply.



The chassis variants suited for the outdoor enclosure are designed to allow mixed population with TX/RX modules within the same chassis, while the chassis are equipped with corresponding RF ports (50Ohm or 75Ohm), which are used either as input or output port as per the individual configuration.

This outdoor RF-over-Fiber system assures high quality optical transmission with superior RF performance and can be configured and monitored remotely via its Ethernet-Interface (WebGUI/ SNMP).

The FiberLinkplus-ODA system is a versatile, space and cost efficient outdoor optical transmission solutions and perfectly suited for Teleports, Satellite Earth Stations, Broadcasting and Cable/ IPTV operations.

FEATURES & BENEFITS

- ▶ Robust and weatherproof (IP65) enclosure/cabinet
- ▶ Allows population of max. 16 optical TX/RX modules (non-redundant, 1:1 and N+1 redundant operation)
- ▶ Variants with 1:1 redundant optical transmission
- ▶ Variants with N+1 redundant optical transmission
- ▶ Supporting L-Band 950 – 2150MHz, Extended L-Band 850 – 2450MHz and 10MHz
- ▶ Holds a pull-out fiber patch-panel with internal splice-tray
- ▶ Designed for direct antenna-mounting
- ▶ Applicable in nearly any environment
- ▶ Double walled mechanical with optimal air-flow
- ▶ Hot-swappable TX/RX modules

- ▶ Support of mixed TX/RX population
- ▶ Heating and cooling with temperature monitoring
- ▶ Variable gain control at each TX/RX module)
- ▶ RF power monitoring at each TX/RX module
- ▶ Switchable LNB-supply (for some versions)
- ▶ Status LED's at TX/RX modules
- ▶ -20dB measurement port at TX/RX modules
- ▶ Remote configuration & monitoring (WebGUI, SNMP)
- ▶ Laser, link, PSU & access status monitoring
- ▶ Excellent quality and superior RF performance
- ▶ 1:1 redundant dual power supply

TECHNICAL SPECIFICATIONS

ODA outdoor enclosure & RF-over-Fiber Chassis

Dimensions:	40 x 30 x 50cm high
Protection Rating:	IP65
Mounting:	Antenna base mount (via relevant mounting accessories)
Locking:	Lockable front door
Power Supply:	85 – 230V, 50/60Hz, dual 1:1 redundancy (hot-swappable)
Power Consumption:	<60W populated with 8 modules, <100W populated with 16 modules
Frequency Range:	950 – 2150MHz (L-Band) / 850 – 2450MHz (Extended L-Band), 10MHz
Available TX/RX Modules:	See 4 th page (order information)
TX/RX Module Capacity:	Max. 8 for non-redundant operation Max. 16 for 8 x 1:1 redundant operation Max. 10 for 2 x 4+1 redundant operation
RF Connectors I/O Ports @ Chassis:	50Ohm SMA(f), 75Ohm F(f) 50Ohm BNC(f)*, 75Ohm BNC(f)*
Internal Controller:	CPU/LPC board
Remote Configuration:	100MBit Ethernet interface (WebGUI, SNMPv2c)
Operating Temperature:	-20°C to 45°C
Storage Temperature:	-40°C to 80°C
Humidity:	90%, non-condensing
RoHS:	Compliant

**upon request only*

Link Specifications (L-Band 950 – 2150MHz & Extended L-Band 850 – 2450MHz)

Modulation Type:	Direct
F/O Diff. EFF:	0,15 to 0.17 W/A
Dynamic Range:	-100dBm to 0dBm
Max. Link Gain:	24dB ($\pm 1,0$ dB)
Gain Stability:	< $\pm 0,3$ dB
Group Delay Distortion:	<2ns
Nominal RF Input Level:	0dBm
Noise Figure:	<23dB
SFDR:	-107dB Hz typ.
RF Output Power:	+13dBm max.
IMA3 @ -10dBm:	< -70dBc
Input Power Dyn. Range:	-50 to +10dBm
Output IP3:	+30dBm
Output IP1:	+7dBm

10MHz Application

TX Module 10MHz FLT10*plus* and QTX10

Frequency Range:	10MHz
RF Output Connector:	Via Chassis RF I/O ports (50Ohm SMA, 75Ohm F)
Optical Output Connector:	SC/APC
Fiber Type:	Single mode 9/125
RF Input Power Level:	+15dBm max. (damage level)
Return Loss:	16dB min., 18dB typ.
Laser Type:	DFB with Isolator
Laser Class:	1M
Operating Wavelength:	1310nm $\pm$ 5nm
Optical Output Power:	+3dBm min.
Status LED's:	OK, Fail, Stand-By
Operating Temperature:	0°C to 45°C
Storage Temperature:	-10°C to 70°C
Humidity:	90%, non-condensing
RoHS:	Compliant

RX Module 10MHz FLR10*plus* and QRX10

Frequency Range:	10MHz
Optical Input Connector:	SC/APC
Fiber Type:	Single mode 9/125
RF Output Connector:	Via Chassis RF I/O ports (50Ohm SMA, BNC* or 75Ohm F, BNC*)
Optical Input Power Level:	-5dBm (min. optical sensitivity)
Return Loss:	16dB min., 18dB typ.
Operating Wavelength:	1310nm – 1560nm
RF Output Power:	+10dBm max.
Status LED's:	OK, Fail, Stand-By
Operating Temperature:	0°C to 45°C
Storage Temperature:	-10°C to 70°C
Humidity:	90%, non-condensing
RoHS:	Compliant

L-Band and Extended L-Band Application

TX Module (L-Band 950 – 2150MHz & Extended L-Band 850 – 2450MHz), FLT2150, FLT2151, FLT2450, FLT2451

Frequency Range:	950 – 2150MHz (L-Band) & 850 – 2450MHz (extended L-Band)
RF Input Connector:	Via Chassis RF I/O ports
Measurement Port:	Frontside -20dB (only FLT2151 and FLT2451)
Optical Output Connector:	SC/APC
Fiber Type:	Single mode 9/125
RF Input Power Level:	+16dBm max. (damage level)
Input RF Signal Operational Range:	-60 to -10 dBm or better
Frequency Response:	±0,5dB typ., ±1,0dB max., ±0,25dB@ any 36MHz Window
Return Loss:	12dB min., 14dB typ.
OIP3:	+20dBm
SFDR:	< -102dB/Hz
CNR:	< -45dB in any 36MHz Window
Noise Figure:	12dB
Laser Type:	DFB with Isolator
Laser Class:	1M
Operating Wavelength:	1310nm ±5nm
Optical Output Power:	+3dBm min.
Variable Gain Control:	-12dB to +12dB (1dB steps); -16 to +8dB in 1:1 Configuration; -13 to +11dB in N+M Configuration, Manual Gain Control (MGC), Automatic Gain Control (AGC)
Delay Group Variation:	Maximum 2ns over the entire band, maximum 1ns over any 36 MHz range
Switchable LNB-Supply:	13/15/18VDC, 22kHz tone, 450mA max (current monitoring)
RF Power Monitoring:	70dB dynamic range
Status LED's:	OK, Fail, Stand-By
Operating Temperature:	0°C to 45°C
Storage Temperature:	-10°C to 70°C
Humidity:	90%, non-condensing
RoHS:	Compliant

RX Module (L-Band 950 – 2150MHz & Extended L-Band 850 – 2450MHz), FLR2150, FLR2151, FLR2450, FLR2451

Frequency Range:	950 – 2150MHz (L-Band) & 850 – 2450MHz (extended L-Band)
Optical Input Connector:	SC/APC
Measurement Port:	Frontside -20dB (only FLR2151 and FLR2451)
Fiber Type:	Single mode 9/125
RF Output Connector:	Via Chassis RF I/O ports (50Ohm SMA, 75Ohm F)
Optical Input Power Level:	-5dBm (min. optical sensitivity)
Frequency Response:	±0,5dB typ., ±1,0dB max.
Return Loss:	12dB min., 14dB typ.
OIP3:	+20dBm
SFDR:	< -102dB/Hz
Noise Figure:	12dB
Operating Wavelength:	1310nm – 1560nm
RF Output Power:	+5dBm max.
Variable Gain Control:	0dB to +24dB (1dB steps); 0 to +12dB in 1:1 Configuration; 0 to +23dB in N+M Configuration
RF Power Monitoring:	70dB dynamic range
Status LED's:	OK, Fail, Stand-By
Operating Temperature:	0°C to 45°C
Storage Temperature:	-10°C to 70°C
Humidity:	90%, non-condensing
RoHS:	Compliant

ORDER INFORMATION

ODA outdoor enclosure / RF-over-Fiber Chassis

Chassis Type	Type-No.:	Short Description	Size	Capacity TX/RX slots	Max. Links	RF coax I/O connectors
FLC-ODA308 <i>plus</i> -50S FLC-ODA308 <i>plus</i> -75F FLC-ODA308 <i>plus</i> -50B* FLC-ODA308 <i>plus</i> -75B*	9000904 9001065 on request on request	ODA modular TX/RX chassis, IP65, 8 TX/RX slots, 8 RF coax I/O connector panel, Fiber patch-panel/splice-tray, Heating/Cooling, remote configuration via Ethernet-Interface (WebGUI, SNMP), 1:1 redundant dual power supply	40x30x50cm	8	8	8 x 50Ohm SMA(f) 8 x 75Ohm F(f) 8 x 50Ohm BNC(f)* 8 x 75Ohm BNC(f)*
FLCR-ODA0241 <i>plus</i> -50S FLCR-ODA0241 <i>plus</i> -75F FLCR-ODA0241 <i>plus</i> -50B* FLCR-ODA0241 <i>plus</i> -75B*	9000709 on request on request on request	ODA modular TX/RX chassis, IP65, 10 TX/RX slots, max. 2 x 4+1 TX/RX redundancy, 8 RF coax I/O connector panel, Fiber patch-panel/splice-tray, Heating/Cooling, remote configuration via Ethernet-Interface (WebGUI, SNMP), 1:1 redundant dual power supply	40x30x50cm	10 2 x 4+1 redundancy	8	8 x 50Ohm SMA(f) 8 x 75Ohm F(f) 8 x 50Ohm BNC(f)* 8 x 75Ohm BNC(f)*
FLCR-ODA0811 <i>plus</i> -50S FLCR-ODA0811 <i>plus</i> -75F FLCR-ODA0811 <i>plus</i> -50B* FLCR-ODA0811 <i>plus</i> -75B*	9000674 9001276 on request on request	ODA TX/RX chassis, IP65, 16 TX/RX slots, max. 8 x 1:1 TX/RX redundancy, 8 RF coax I/O connector panel, Fiber patch-panel/splice-tray, Heating/Cooling, remote configuration via Ethernet-Interface (WebGUI, SNMP), 1:1 redundant dual power supply	40x30x50cm	16 8 x 1:1 redundancy	8	8 x 50Ohm SMA(f) 8 x 75Ohm F(f) 8 x 50Ohm BNC(f)* 8 x 75Ohm BNC(f)*

*upon request

TX & RX Modules

Module Type	Type-No.:	Short Description	Optical I/O connector	Frequency range
FLT2151 <i>plus</i>	9001077	Optical Transmitter TX Module, L-Band 950 – 2150MHz, RF coax Input via FLC(R) chassis RF coax I/O panel, Optical Output SC/APC, variable gain-control, switchable LNB-supply*, RF power monitoring, front panel measurement port -20dB	SC/APC	950 – 2150MHz
FLR2151 <i>plus</i>	9001078	Optical Receiver RX Module, L-Band 950 – 2150MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain-control, RF power monitoring, front panel measurement port -20dB	SC/APC	950 – 2150MHz
FLT2451 <i>plus</i>	9001080	Optical Transmitter TX Module, extended L-Band 850 – 2450MHz, RF coax Input via FLC(R) chassis RF coax I/O panel, Optical Output SC/APC, variable gain-control, switchable LNB-supply*, RF power monitoring, front panel measurement port -20dB	SC/APC	850 – 2450MHz
FLR2451 <i>plus</i>	9001081	Optical Receiver RX Module, extended L-Band 850 – 2450MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain-control, RF power monitoring, front panel measurement port -20dB	SC/APC	850 – 2450MHz
FLT10 <i>plus</i>	9001090	Optical TX Module 10MHz, RF coax Input via FLC(R) chassis RF coax I/O panel, Optical Output SC/APC, front panel measurement port -20dB	SC/APC	10MHz
FLR10 <i>plus</i>	9001091	Optical RX Module 10MHz, RF coax Output via FLC(R) chassis RF coax I/O panel, Optical Output SC/APC, front panel measurement port -20dB	SC/APC	10MHz

*only for non-redundant & 1:1 redundant versions

OPTIONS

Type	Type-No.:	Short Description
FLCR-10MHz-11 Option	9001305	10MHz link option, 1:1 redundant 10MHz link operation, for FLCR-ODA0811plus outdoor enclosure and FLCR41611plus 4RU/19" rack mount indoor chassis, optical TX (QTX10) and/or RX (QRX19) modules not included

**only for non-redundant & 1:1 redundant versions*