



## FiberLink ODA RF-over-Fiber Outdoor application system

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in  
Germany

### GENERAL

The FiberLink-ODA system represents a compact and weatherproof (IP65 specified) modular-type outdoor application RF-over-Fiber outdoor enclosure system that can be populated with various optical TX/RX chassis allowing standard, 1:1 redundant as well as N+1 and/or N+2 redundant optical transmission. The system is designed to be mounted close to the antenna and made for flexible, high quality and secure optical transmission of RF signals (L-Band, IF\*, 10MHz\*) over a distance of up to 10km.

All our outdoor application chassis are equipped with a RF connector panel, 1:1 redundant dual power-supply (hot-swappable), a controller-board (CPU/LPC) and fiber patch-panel/splice-tray and temperature controlled heating and cooling allowing operation in almost any environment.

The system can hold up to 8 Transmit- or Receive Modules for standard operation also supporting various 1:1 as well as N+1 and N+2 redundant operation. The system furthermore features switchable LNB-supply (option), gain-control and RF-power monitoring as well as Laser/link monitoring.

This outdoor RF-over-Fiber system assures superior RF performance and stability and can be configured and monitored remotely via its Ethernet-interface (WebGUI/SNMP).

The FiberLink-ODA system is a versatile, space and cost efficient outdoor optical transmission solutions and perfectly suited for applications in Teleports, Satellite Earth Stations as well as Broadcast- and Broadband facilities.

*\*Upon request*

### FiberLink ODA (Outdoor cabinet)



### FEATURES & BENEFITS

- Robust and weatherproof (IP65) enclosure/cabinet
- Can be populated with up to 8 (active/hot-standby) optical TX/RX modules
- Variants for standard optical transmission
- Variants with 1+1 redundant optical transmission
- Variants with N+1 and/or N+1 redundant optical transmission
- L-Band, IF\* and 10MHz\* frequency-range
- Holds a pull-out fiber patch-panel with internal splice-tray
- Designed for direct antenna-mounting
- Applicable in nearly any environment
- Double walled mechanical concept ensures optimal air-flow
- Heating and cooling/ventilation with temperature monitoring
- Variable gain-adjustment & switchable LNB-supply\* (\*Option)
- Supports laser/link and RF power monitoring
- Easy control and configuration (WebGUI/SNMP)
- 1:1 redundant dual power-supply (hot-swappable)
- Excellent & high quality optical transmission characteristics
- Superior RF performance & signal quality

*\*Upon request*



## FiberLink ODA

### RF-over-Fiber Outdoor application system

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#### ORDER INFORMATION (ODA Chassis)

Outdoor Chassis Type	Description Application	Dimensions	Module capacity	RF I/O connector	Fiber patch-panel/splice-tray	Heating Cooling
FLC308-ODA	Outdoor application TX/RX chassis	40 x 30 x 50cm	Max. 8 TX/RX modules	8 x SMA or F	Yes	Yes
FLCRplus2041-ODA	Outdoor application TX/RX chassis (max. 2 x 4+1 redundant operation)	40 x 30 x 50cm	Max. 10 TX/RX modules (2 x 4 active, 2 x 1 hot-standby) for max. dual 4+1 redundant operation	8 x SMA or F	Yes	Yes
FLCRplus4011-ODA	Outdoor application TX/RX chassis (max. 4-way 1+1 redundant operation)	40 x 30 x 50cm	Max. 4 TX/RX modules (4 active, 4 hot-standby) for max. 4-way 1:1 redundant operation	8 x SMA or F	Yes	Yes
FLCR416-ODA	Outdoor application TX/RX chassis (max. 16-way 1+1 redundant operation)	40 x 30 x 50cm	Max. 16 TX/RX modules (8 active, 8 hot-standby) for max. 8-way 1:1 redundant operation	8 x SMA or F	Yes	Yes

#### TECHNICAL SPECIFICATIONS (ODA Chassis)

- **Dimensions/Weight:** 40 x 30 x 50cm high, approx. 22kgs.
- **Protection rating:** Ip65 specified
- **Mounting:** Antenna base-mount (via relevant mounting-accessories)
- **Power-supply:** 85...230V, 50/60Hz (1:1 redundant)
- **Power consumption:** 60W (FLCR308-ODA TX/RX chassis) fully loaded with 8 optical modules  
100W (FLCR416-ODA TX/RX chassis) fully loaded with 16 optical modules
- **Frequency ranges:** L-Band, IF\* & 10MHz\*
- **RF-connector panel:** 8 RF connectors @ TX/RX chassis 50Ohm SMA(f) or 75Ohm F(f)
- **Module capacity:** Max. 8 TX/RX modules Standard, 1:1, N+1, N+2

#### System access & configuration

- **Internal controller board:** CPU/LPC board
- **Remote configuration:** 100MBit Ethernet-Interf. (WebGUI, SNMPv2C) via optical Ethernet over-Fiber SFP interface
- **Monitoring of:** Internal heating/cooling temperature monitored
- **TX/RX module monitoring:** RF power monitoring laser/link monitoring
- **LNB-supply:** LNB supply monitoring
- **Power-supply monitoring:** For both psu modules

#### Environmental conditions

- **Operating temperature:** -20C°...60C°
- **Storage temperature:** -40C°...80C°
- **Humidity:** 90% non-condensing

#### ORDER INFORMATION (Optical TX & RX modules)

Type name TX/RX modules	Description	Frequency range	Optical connector
FLTXLplus (Chassis type: FLC308-ODA & FLCRplus2041/4011-ODA) FLTXL-R (Chassis type: FLCR416-ODA)	Transmit modules	L-Band (950...2150MHz)	E2000 / SC/APC
FLTXIplus* (Chassis type: FLC308-ODA & FLCRplus2041/4011-ODA) FLTXI-R (Chassis type: FLCR416-ODA)	Transmit module	IF (40...200MHz)	E2000 / SC/APC
FLTX10Mplus* (Chassis type: FLC308-ODA & FLCRplus2041/4011-ODA) FLTX10M-R* (Chassis type: FLCR416-ODA)	Transmit module	10MHz	E2000 / SC/APC
FLRXLplus (Chassis type: FLC308-ODA & FLCRplus2041/4011-ODA) FLRXL-R (Chassis type: FLCR416-ODA)	Receive module	L-Band (950...2150MHz)	E2000 / SC/APC
FLRXIplus* (Chassis type: FLC308-ODA & FLCRplus2041/4011-ODA) FLRXL-R (Chassis type: FLCR416-ODA)	Receive module	IF (40...200MHz)	E2000 / SC/APC
FLRXLplus* (Chassis type: FLC308-ODA & FLCRplus2041/4011-ODA) FLRXL-R* (Chassis type: FLCR416-ODA)	Receive module	10MHz	E2000 / SC/APC

\*Upon request

➤ See next pages for TX/RX module specifications



## FiberLink ODA Optical TX (Transmit) & RX (Receive) modules

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### APPLICABLE FOR ODA CHASSIS TYPE

FLC308-ODA	Outdoor application TX/RX chassis	Max. 8 TX/RX modules
FLCRplus2041-ODA	Outdoor application TX/RX chassis (max. 2 x 4+1 redundant operation)	Max. 10 TX/RX modules (2 x 4 active, 2 x 1 hot-standby) for max. dual 4+1 redundant operation
FLCRplus4011-ODA	Outdoor application TX/RX chassis (max. 4 x 1:1 redundant operation)	Max. 8 TX/RX modules (4 active, 4 hot-standby)

#### FLTXIplus Optical Transmitter IF (\*upon request)

#### FLTX10Mplus Optical Transmitter 10MHZ\* (\*upon request)

➤ Frequency range:	40...200MHz (FLTXI-R) 10MHz (FLTX10M-R)
➤ RF Input connector:	via Chassis RF I/O ports
➤ RF Input level:	0dBm max. 10dBm max. (FLTX10M-R)
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	18dB (Δ VSWR: 1:1.29)
➤ Optical Output connectors:	E2000 or SC/APC
➤ Operating wavelength:	1310nm
➤ Optical power:	+5dBm
➤ Ip1:	+6dBm
➤ Port matching:	all ports 18dB
➤ Gain adjustment*:	-15...+15dB* (*not f. 10MHz)
➤ RF power monitoring:	60dB
➤ Status LED's:	OK, Fail, Stand-by
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant

#### FLTXLplus Optical Transmitter L-Band

➤ Frequency range:	950...2150MHZ
➤ RF Input connector:	via Chassis RF I/O ports
➤ RF Input level:	0dBm max.
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	16dB (Δ VSWR: 1:1.38)
➤ Optical Output connectors:	E2000 or SC/APC
➤ Operating wavelength:	1310nm
➤ Optical power:	+5dBm
➤ Gain adjustment:	-15...+15dB
➤ RF power monitoring:	70dB
➤ Status LED's:	OK, Fail, Stand-by
➤ LNB supply:	13/15/18V, 22kHz, 400mA
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant

#### FLRXIplus Optical Receiver IF (\*upon request)

#### FLRX10Mplus Optical Receiver 10MHZ\* (\*upon request)

➤ Frequency range:	40...200MHz (FLRXI-R) 10MHz (FLRX10M-R)
➤ Optical Input connectors:	E 2000 or SC/APC
➤ Operating wavelength:	1310 - 1560nm
➤ Optical Input level:	0dBm max.
➤ RF Output connector:	via Chassis RF I/O ports
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	18dB (Δ VSWR: 1:1.29)
➤ Gain adjustment*:	-15...+15dB* (*not f. 10MHz)
➤ RF power monitoring:	60dB
➤ Status LED's:	OK, Fail, Stand-by
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant

#### FLRXLplus Optical Receiver L-Band

➤ Frequency range:	950...2150MHZ
➤ Optical Input connectors:	E 2000 or SC/APC
➤ Operating wavelength:	1310 - 1560nm
➤ Optical Input level:	+10dBm max.
➤ RF Output connectors:	via Chassis RF I/O ports
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	16dB (Δ VSWR: 1:1.38)
➤ Gain adjustment:	-15...+15dB
➤ RF power monitoring:	70dB
➤ Status LED's:	OK, Fail, Stand-by
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant

#### Link Specifications (10MHz & IF modules)

➤ IMA3 @ -10dBm @ 0dB Gain:	< -66dBc
➤ IP1:	+10dBm
➤ Noise Figure:	< 23dB
➤ Spurious free dynamic range:	109dBm/Hz
➤ RF output power:	+10dBm max.

#### Link Specifications (L-Band modules)

➤ IMA3 @ -10dBm:	< -60Bc
➤ IP1:	+15dBm
➤ Noise Figure:	< 20dB
➤ Spurious free dynamic range:	106dBm/Hz
➤ RF output power:	+10dBm max.



## FiberLink ODA

Optical TX (Transmit) & RX (Receive) modules

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### APPLICABLE FOR ODA CHASSIS TYPE

FLC416R-ODA	Outdoor application TX/RX chassis (max. 8-way 1+1 redundant operation)	Max. 16 TX/RX modules (8 active, 8 hot-standby)
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#### FLTXI-R Optical Transmitter IF

#### FLTX10M-R Optical Transmitter 10MHZ\* (\*upon request)

➤ Frequency range:	40...200MHz (FLTXI-R) 10MHz (FLTX10M-R)
➤ RF Input connector:	via Chassis RF I/O ports
➤ RF Input level:	0dBm max. 10dBm max. (FLTX10M-R)
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	18dB (Δ VSWR: 1:1.29)
➤ Optical Output connectors:	E2000 or SC/APC
➤ Operating wavelength:	1310nm
➤ Optical power:	+5dBm
➤ Ip1:	+6dBm
➤ Port matching:	all ports 18dB
➤ Gain adjustment*:	-15...+15dB* (*not for 10MHz)
➤ RF power monitoring:	60dB
➤ Status LED's:	OK, Fail, Stand-by
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant

#### FLTXL-R Optical Transmitter L-Band

➤ Frequency range:	950...2150MHz
➤ RF Input connector:	via Chassis RF I/O ports
➤ RF Input level:	0dBm max.
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	16dB (Δ VSWR: 1:1.38)
➤ Optical Output connectors:	E2000 or SC/APC
➤ Operating wavelength:	1310nm
➤ Optical power:	+5dBm
➤ Gain adjustment:	-15...+15dB
➤ RF power monitoring:	70dB
➤ Status LED's:	OK, Fail, Stand-by
➤ LNB supply:	13/15/18V, 22kHz, 400mA
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant

#### FLRXI-R Optical Receiver IF

#### FLRX10M-R Optical Receiver 10MHZ\* (\*upon request)

➤ Frequency range:	40...200MHz (FLRXI-R) 10MHz (FLRX10M-R)
➤ Optical Input connectors:	E 2000 or SC/APC
➤ Operating wavelength:	1310 - 1560nm
➤ Optical Input level:	0dBm max.
➤ RF Output connector:	via Chassis RF I/O ports
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	18dB (Δ VSWR: 1:1.29)
➤ Gain adjustment*:	-15...+15dB* (*not for 10MHz)
➤ RF power monitoring:	60dB
➤ Status LED's:	OK, Fail, Stand-by
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant
➤ IMA3 @ -10dBm @ 0dB Gain:	< -66dBc
➤ IP1:	+10dBm
➤ Noise Figure:	< 23dB
➤ Spurious free dynamic range:	109dBm/Hz
➤ RF output power:	+10dBm max.

#### FLRXL-R Optical Receiver L-Band

➤ Frequency range:	950...2150MHz
➤ Optical Input connectors:	E 2000 or SC/APC
➤ Operating wavelength:	1310 - 1560nm
➤ Optical Input level:	+10dBm max.
➤ RF Output connectors:	via Chassis RF I/O ports
➤ Frequency response:	±0,5dB typ./ ±1,0dB max.
➤ Return loss:	16dB (Δ VSWR: 1:1.38)
➤ Gain adjustment:	-15...+15dB
➤ RF power monitoring:	70dB
➤ Status LED's:	OK, Fail, Stand-by
➤ Operating temperature:	0...45°C
➤ Storage temperature:	-10°C...70°C
➤ Humidity:	90% non-condensing
➤ RoHS:	Compliant
➤ IMA3 @ -10dBm:	< -60Bc
➤ IP1:	+15dBm
➤ Noise Figure:	< 20dB
➤ Spurious free dynamic range:	106dBm/Hz
➤ RF output power:	+10dBm max.