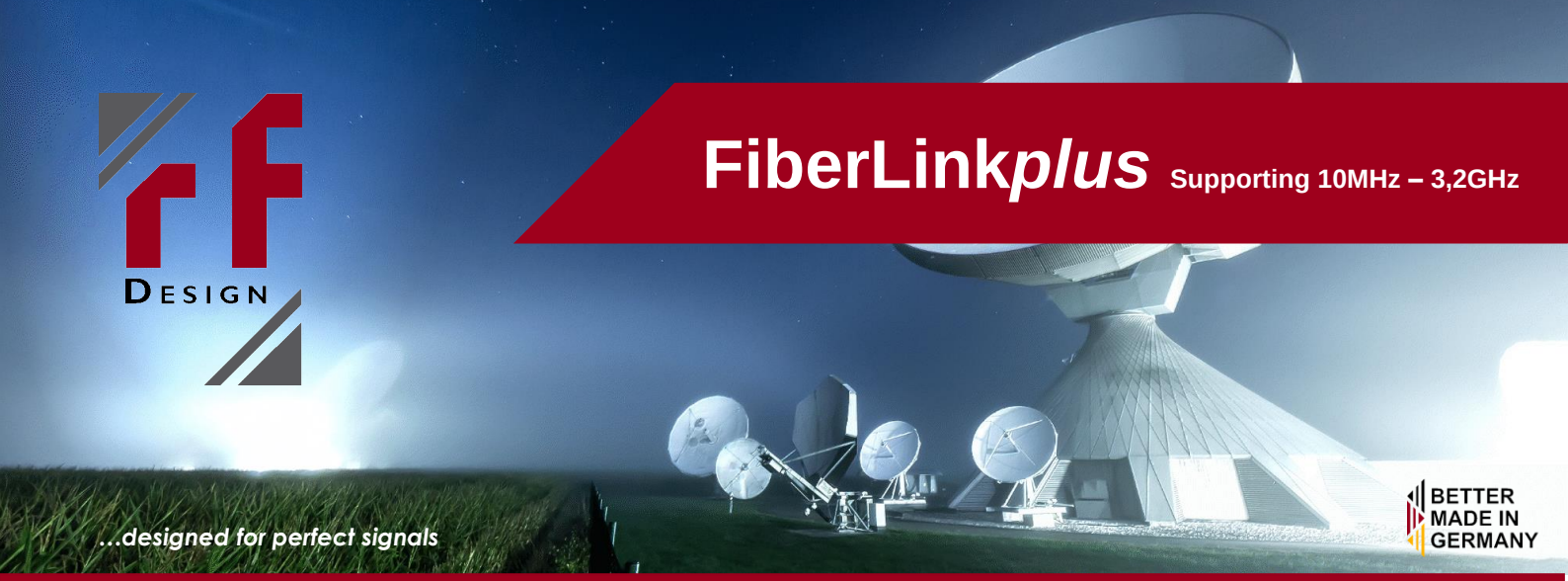

FiberLink*plus* Supporting 10MHz – 3,2GHz

RF-over-Fiber System (Non redundant)

The FiberLink*plus* RF-over-Fiber system for non-redundant optical transmission of RF signals is available in sizes of 1RU/19" and 3RU/19" rack mount design. It is perfectly suited for flexible and high quality optical transmission of up to 16 RF signals (10MHz, IF, L-Band, Extended L-Band and broadband) over a distance of up to 20 km.

The 1RU/19" chassis variants hold up to 4 optical TX/RX modules while the 3RU/19" chassis can be populated with up to 16 TX/RX modules.

All available chassis 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.

Additionally, this non-redundant RF-over-Fiber system comes with beneficial features such as Laser/Link monitoring, status LED´s at any TX/RX module, variable gain control, RF power monitoring, switchable LNB-supply, hot-swappable TX/RX modules and 1:1 redundant dual power supply.

Configuration and monitoring is possible via the front-panel LC-Display or 5,7" touchscreen while remote configuration is available via its Ethernet-Interface (WebGUI, SNMP).

This professional RF-over-Fiber system stands for perfect RF performance as well as stable signal distribution and is perfectly suited for Teleports, Satellite Earth Stations, Broadcasting and Cable/IPTV operations.

FEATURES & BENEFITS

- Versatile and flexible RF-over-Fiber system
- Supporting 10MHz, IF 40 – 200MHz, L-Band 950 – 2150MHz, Extended L-Band 850 – 2450MHz and Broadband 3,2GHz
- 1RU/19" rack mount chassis for max. 4 TX or RX modules
- 3RU/19" rack mount chassis for max. 16 TX or RX modules
- Hot-swappable TX/RX modules
- Support of mixed TX/RX population
- Variable gain-control at each TX/RX module
- RF power monitoring at each TX/RX module
- Switchable LNB-supply
- Status LED´s for each TX/RX module
- Easy local & remote configuration & monitoring
- Laser, link, PSU & access status monitoring
- Excellent quality and superior RF performance
- 1:1 redundant dual power supply

AVAILABLE MODULES

- 10MHz Application: FLT10/FLR10
- 40MHz – 200MHz IF Application: FLT251/FLR251
- 950MHz – 2150MHz L-Band Application: FLT2150/FLR2150 & FLT2151/FLR2151
- 850MHz – 2450MHz Ext. L-Band Application: FLT2450/FLR2450 & FLT2451/FLR2451
- 50MHz – 3200MHz Broadband Application: FLT3251/FLR3251

TECHNICAL SPECIFICATIONS

1RU/19” and 3RU/19” Chassis

Dimensions:	1RU/19” (260mm deep) or 3RU/19” (300mm deep)
Power Supply:	85 – 265V, 50/60Hz, dual 1:1 redundancy (hot-swappable)
Power Consumption:	<10W (1RU/19”), <600W (3RU/19”)
Frequency Range:	10 – 3200MHz
TX/RX Configurations:	See 7th page (order information)
TX/RX Module Capacity:	Max. 4 slots @ 1RU/19” chassis Max. 16 slots @ 3RU/19” chassis
RF Connectors @ Chassis:	50Ohm SMA(f) or 75Ohm F(f)
Local Configuration:	LC-Display/keypads or 5.7” colored touchscreen display
Remote Configuration:	Ethernet (WebGUI, SNMPv2c)
LNB Bypass:	Yes
Operating Temperature:	0°C to 45°C
Storage Temperature:	-10°C to 70°C
Humidity:	90%, non-condensing
RoHS:	Compliant

Link Specifications (IF 200MHz, 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:	-50dBm to 0dBm
Max. Link Gain:	24dB (±1,0dB)
Gain Stability:	< ±0,3dB
Group Delay Distortion:	<2ns
Nominal RF Input Level:	-20dBm
Noise Figure:	< 24dB
SFDR:	-107dB Hz typ.
RF Output Power:	+10dBm max.
IMA3 @ -10dBm:	< -50dBc

Link Specifications Broadband (50 – 3200MHz)

Modulation Type:	Direct
F/O Diff. EFF:	0,15 to 0.17 W/A
Dynamic Range:	-50dBm to 0dBm
Max. Link Gain:	24dB (±1,0dB)
Gain Stability:	< ±0,3dB
Group Delay Distortion:	<2ns
Nominal RF Input Level:	-20dBm
Noise Figure:	< 24dB
SFDR:	-101dB Hz typ.
IMA3 @ -10dBm:	< -50dBc
Output IP3:	+15dBm
Output IP1:	+3dBm

10MHz Application

TX Module 10MHz FLT10*plus*

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:	25dB typ.
Laser Type:	DFB with Isolator
Laser Class:	1M
Operating Wavelength:	1310nm ±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*

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:	25dB 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

40MHz – 200MHz Application

TX Module IF 40 – 200MHz FLT251*plus*

Frequency Range:	40 – 200MHz (IF)
RF Input Connector:	Via Chassis RF I/O ports (50Ohm SMA, 75Ohm F)
Measurement Port:	Frontside -20dB
Optical Output Connector:	SC/APC
Fiber Type:	Single mode 9/125
RF Input Power Level:	+16dBm max. (damage level)
Frequency Response:	±0,5dB max.
Return Loss:	25dB typ.
OIP3:	+28dBm
SFDR:	< -105dB/Hz
Noise Figure:	12dB
Laser Type:	DFB with Isolator, 35dB Isolation
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
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 IF 40 – 200MHz FLR251*plus*

Frequency Range:	40 – 200MHz (IF)
Optical Input Connector:	SC/APC
Measurement Port:	Frontside -20dB
Fiber Type:	Single mode 9/125
RF Output Connector:	Via Chassis RF I/O ports (50Ohm SMA, 75Ohm F)
Optical Input Power Level:	-10dBm (min. optical sensitivity)
Frequency Response:	±0,5dB max.
Return Loss:	20dB typ.
OIP3:	+28dBm
SFDR:	< -105dB/Hz
Noise Figure:	12dB
Operating Wavelength:	1310nm – 1560nm
RF Output Power:	+10dBm max.
Variable Gain Control:	0dB to +20dB (1dB steps) ; 0 to +16dB in 1:1 Configuration ; 0 to +19dB 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

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:	15dB 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:	16dB 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 +20dB 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

Broadband Application

TX Module Broadband (50 – 3200MHz), FLT3251

Frequency Range:	50 – 3200MHz
RF Input Connector:	Via Chassis RF I/O ports (50Ohm SMA, others on request)
Measurement Port:	Frontside -20dB
Optical Output Connector:	SC/APC
Fiber Type:	Single mode 9/125
RF Input Power Level:	+10dBm max. (damage level)
Frequency Response:	50MHz – 850MHz ±0,5dB typ., ±1,0dB max. 850MHz – 2450MHz ±1,0dB typ., ±1,5dB max. 2450MHz – 3200MHz ±1,5dB typ., ±2,0dB max.
Return Loss:	14dB typ.
OIP3:	+25dBm
SFDR:	< -101dB/Hz
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
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 Broadband (50 – 3200MHz), FLR3251

Frequency Range:	50 – 3200MHz
Optical Input Connector:	SC/APC
Measurement Port:	Frontside -20dB
Fiber Type:	Single mode 9/125
RF Output Connector:	Via Chassis RF I/O ports (50Ohm SMA, others on request)
Optical Input Power Level:	~ -10dBm (min. optical sensitivity)
Frequency Response:	50MHz – 850MHz ±0,5dB typ., ±1,0dB max. 850MHz – 2450MHz ±1,0dB typ., ±1,5dB max. 2450MHz – 3200MHz ±1,5dB typ., ±2,0dB max.
Return Loss:	16dB typ.
OIP3:	+27dBm
SFDR:	< -101dB/Hz
Noise Figure:	12dB
Operating Wavelength:	1310nm – 1560nm
RF Output Power:	+10dBm max.
Variable Gain Control:	0dB to +16dB (1dB steps); 0 to +12dB in 1:1 Configuration; 0 to +15dB in N+M Configuration
RF Power Monitoring:	70dB dynamic range
Status LED´s:	OK, Fail
Operating Temperature:	0°C to 45°C
Storage Temperature:	-10°C to 70°C
Humidity:	90%, non-condensing
RoHS:	Compliant

ORDER INFORMATION

Chassis

Type	Type-No.:	Short Description	Chassis Size	Capacity TX/RX Slots	Max. Links	RF Coax I/O Connectors
FLC1120*plus*-50S FLC1120*plus*-75F	9000953 on request	1RU/19" rackmount modular TX/RX chassis, 2 TX/RX slots, 2 RF coax I/O´s, local configuration via LC-Display/keypads, remote configuration via Ethernet-Interface (WebGUI, SNMP), 1:1 redundant dual power supply	1RU/19”	2	2	2 x 50Ohm SMA(f) 2 x 75Ohm F(f)
FLC1140*plus*-50S FLC1140*plus*-75F	9001111 9000978	1RU/19" rackmount modular TX/RX chassis, 4 TX/RX slots, 4 RF coax I/O´s, local configuration via LC-Display/keypads, remote configuration via Ethernet-Interface (WebGUI, SNMP), 1:1 redundant dual power supply	1RU/19”	4	4	2 x 50Ohm SMA(f) 2 x 75Ohm F(f)
FLC3160*plus*-50S FLC3160*plus*-75F	9000909 9000946	3RU/19" rackmount modular TX/RX chassis, 16 TX/RX slots, 16 RF coax I/O´s, local configuration via touchscreen display, remote configuration via Ethernet-Interface (WebGUI, SNMP), 1:1 redundant dual power supply	3RU/19”	16	16	16 x 50Ohm SMA(f) 16 x 75Ohm F(f)

TX & RX Module 10MHz

Type	Type-No.:	Short Description	Optical I/O Connector	Frequency Range
FLT10*plus*	9001090	Optical Transmitter TX-Module, 10MHz, RF coax Input via FLC(R) chassis RF coax I/O panel, Optical Output SC/APC	SC/APC	10MHz
FLR10*plus*	9001091	Optical Receiver RX-Module, 10MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel	SC/APC	10MHz

TX & RX Module IF 40 – 200MHz

Type	Type-No.:	Short Description	Optical I/O Connector	Frequency Range
FLT251*plus*	9000914	Optical Transmitter TX-Module, 40 – 200MHz, 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, frontside measurement port -20dB	SC/APC	40 – 200MHz
FLR251*plus*	9000915	Optical Receiver RX-Module, 40 – 200MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain control, RF power monitoring, frontside measurement port -20dB	SC/APC	40 – 200MHz

TX & RX Module L-Band 950 – 2150MHz

Type	Type-No.:	Short Description	Optical I/O Connector	Frequency Range
FLT2150*plus*	9000887	Optical Transmitter TX-Module, 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	SC/APC	950 – 2150MHz
FLR2150*plus*	9000888	Optical Receiver RX-Module, 950 – 2150MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain control, RF power monitoring	SC/APC	950 – 2150MHz

TX & RX Module L-Band 950 – 2150MHz with frontside measurement port -20dB

Type	Type-No.:	Short Description	Optical I/O Connector	Frequency Range
FLT2151*plus*	9001077	Optical Transmitter TX-Module, 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, frontside measurement port -20dB	SC/APC	950 – 2150MHz
FLR2151*plus*	9001078	Optical Receiver RX-Module, 950 – 2150MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain control, RF power monitoring, frontside measurement port -20dB	SC/APC	950 – 2150MHz

TX & RX Module Extended L-Band 850 – 2450MHz

Type	Type-No.:	Short Description	Optical I/O Connector	Frequency Range
FLT2450*plus*	9000886	Optical Transmitter TX-Module, 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	SC/APC	850 – 2450MHz
FLR2450*plus*	9000885	Optical Receiver RX-Module, 850 – 2450MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain control, RF power monitoring	SC/APC	850 – 2450MHz

TX & RX Module Extended L-Band 850 – 2450MHz with frontside measurement port -20dB

Type	Type-No.:	Short Description	Optical I/O Connector	Frequency Range
FLT2451*plus*	9001080	Optical Transmitter TX-Module, 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, frontside measurement port -20dB	SC/APC	850 – 2450MHz
FLR2451*plus*	9001085	Optical Receiver RX-Module, 850 – 2450MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain control, RF power monitoring, frontside measurement port -20dB	SC/APC	850 – 2450MHz

TX & RX Module Broadband 50MHz – 3200MHz

Type	Type-No.:	Short Description	Optical I/O Connector	Frequency Range
FLT3251*plus*	9001098	Optical Transmitter TX-Module, 50 – 3200MHz, RF coax Input via FLC(R) chassis RF coax I/O panel, Optical Output SC/APC, variable gain control, RF power monitoring, frontside measurement port -20dB	SC/APC	50 – 3200MHz
FLR3251*plus*	9001097	Optical Receiver RX-Module, 50 – 3200MHz, Optical Input SC/APC, RF coax Output via FLC(R) chassis RF coax I/O panel, variable gain control, RF power monitoring, frontside measurement port -20dB	SC/APC	50 – 3200MHz

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