

...designed for perfect signals

## Modular Quad RF-over-Fiber System

The QLinkplus system is a modular, compact and field expandable Quad RF-over-Fiber system. The outdoor enclosure and the indoor 1RU/19" rack mount chassis can each be populated with max. 4 optical TX and/or RX modules, also supporting mixed TX/RX population for secure and high-quality optical transmission of RF signals over a distance of up to 20km.

The system comes with beneficial features such as variable gain-control, RF power monitoring, laser/link monitoring, switchable LNB-supply and 1:1 redundant dual power supply. A 10MHz reference signal can be injected at the indoor chassis and is transmitted via an optical link to the outdoor chassis.

The QLinkplus system supports local configuration and monitoring via front panel LC-Display/keypads and remote monitoring and configuration via Ethernet-Interface (WebGUI, SNMP). Remote management is supported for the overall QLinkplus Quad RF-over-Fiber system while each of populated TX and/or RX modules can be configured and monitored individually as well.

The QLinkplus system is a versatile, space and cost efficient outdoor to indoor optical transmission solutions perfectly suited for satellite uplink and downlink applications in Teleports, Satellite Earth Stations, VSAT hubs/terminals as well as Broadcast- and Broadband facilities.



## FEATURES & BENEFITS

### QLinkplus Outdoor System

- ▶ Robust and weatherproof IP65 enclosure
- ▶ Direct mounting to antenna mast
- ▶ Max. 4 TX/RX modules and one 10MHz module
- ▶ Modular and field expandable
- ▶ Supports mixed TX/RX population
- ▶ Variable gain control

- ▶ RF power monitoring (@ TX & RX modules)
- ▶ LNB-supply 13/15/18V, 22kHz, 450mA max (@ TX module)
- ▶ Local and remote configuration & monitoring (WebGUI, SNMP)
- ▶ Laser, link, PSU & access status monitoring
- ▶ 1:1 redundant dual power supply
- ▶ Waterproof Connectors for all external cables

### QLink Indoor System

- ▶ Space saving 1RU/19" rack mount design
- ▶ Max. 4 TX/RX modules and one 10MHz module
- ▶ Modular and field expandable
- ▶ Supports mixed TX/RX population
- ▶ 10MHz external reference signal port
- ▶ Variable gain control

- ▶ RF power monitoring (@ TX & RX modules)
- ▶ Status LED's for TX/RX modules
- ▶ Local & remote configuration & monitoring (WebGUI, SNMP)
- ▶ Laser, link, PSU & access status monitoring
- ▶ 1:1 redundant dual power supply

## TECHNICAL SPECIFICATIONS

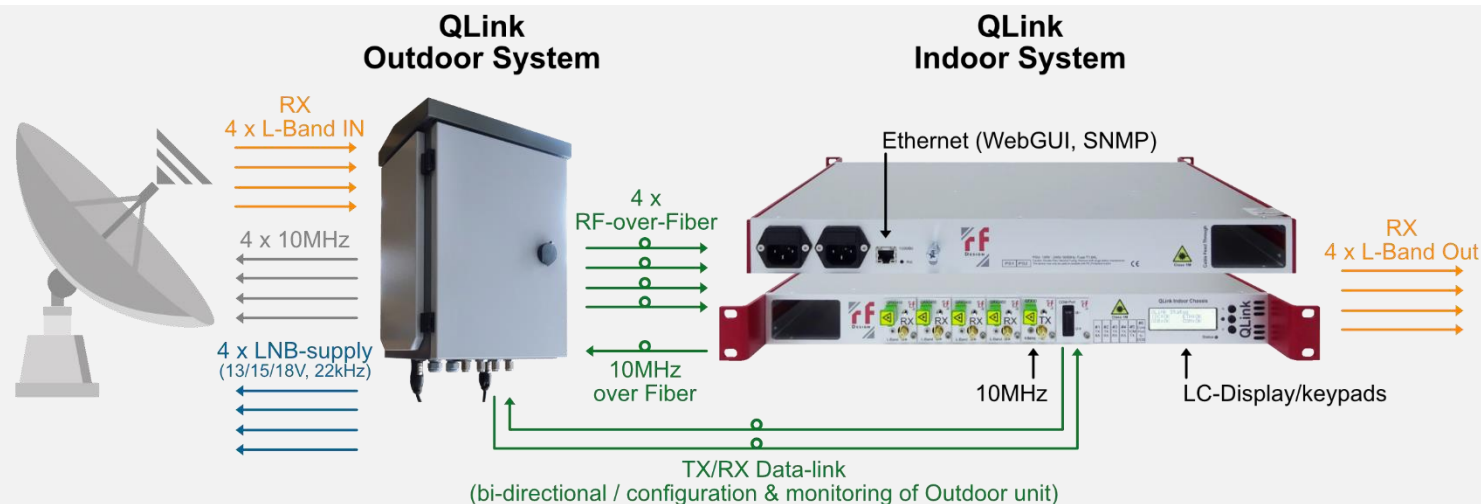
### QLinkplus Outdoor Box ODB4-50N

|                               |                                                                            |
|-------------------------------|----------------------------------------------------------------------------|
| <b>Dimensions:</b>            | 43 x 30 x 22 cm, Antenna mast-mount (includes mast-mount clamps)           |
| <b>Protection Rating:</b>     | IP65 specified                                                             |
| <b>Power Supply:</b>          | 85 – 265V, 50/60Hz, 1:1 redundant (via Neutrik Waterproof Connector), <20W |
| <b>Frequency Range:</b>       | 850 – 2450MHz (extended L-Band)                                            |
| <b>10MHz Reference:</b>       | Via 10MHz RX module (10MHz supplied from Indoor Chassis)                   |
| <b>RF Connectors:</b>         | 4 x 50Ohm N(f) – Internal TX/RX Modules with 50Ohm SMA(f)                  |
| <b>TX/RX Module Capacity:</b> | Max. 4 Extended L-Band TX/RX modules, 1 x 10MHz module                     |
| <b>TX/RX Monitoring:</b>      | RF power monitoring, laser/link monitoring                                 |
| <b>Local Configuration:</b>   | Front panel LC-Display/keypads                                             |
| <b>Remote Configuration:</b>  | Via QLink Indoor Chassis (data-link connection)                            |
| <b>Status Monitoring:</b>     | Green/Red Status LED                                                       |
| <b>Operating Temperature:</b> | -30°C to 55°C                                                              |
| <b>Storage Temperature:</b>   | -30°C to 70°C                                                              |
| <b>Humidity:</b>              | 90%, non-condensing                                                        |
| <b>RoHS:</b>                  | Compliant                                                                  |

### QLink Indoor Chassis IDC4S

|                               |                                                                                          |
|-------------------------------|------------------------------------------------------------------------------------------|
| <b>Dimensions:</b>            | 1RU/19" rack mount, 260mm deep                                                           |
| <b>Power Supply:</b>          | 85 – 265V, 50/60Hz, 1:1 redundant (hot-swappable), <20W                                  |
| <b>Frequency Range:</b>       | 850 – 2450MHz (extended L-Band)                                                          |
| <b>10MHz Reference:</b>       | 10MHz external reference signal port SMA(f) 50Ohm, TX via 1310nm DFB Laser +3dBm, SC/APC |
| <b>RF Connectors L-Band:</b>  | 50Ohm SMA(f) / 50Ohm BNC(f)*, 75Ohm F(f)*, 75Ohm BNC(f)*                                 |
| <b>TX/RX Module Capacity:</b> | Max. 4 Extended L-Band TX/RX modules, 1 x 10MHz module                                   |
| <b>TX/RX Monitoring:</b>      | RF power monitoring, laser/link monitoring                                               |
| <b>Local Configuration:</b>   | Front panel LC-Display/keypads                                                           |
| <b>Remote Configuration:</b>  | 100MBit Ethernet-Interface (WebGUI, SNMPv2c)                                             |
| <b>Operating Temperature:</b> | 0°C to 45°C                                                                              |
| <b>Storage Temperature:</b>   | -10°C to 70°C                                                                            |
| <b>Humidity:</b>              | 90%, non-condensing                                                                      |
| <b>RoHS:</b>                  | Compliant                                                                                |

### Functional Diagram 4 x TX and 4 x RX



## TECHNICAL SPECIFICATIONS

### QLink TX Module QTX2450-50S/-75F

|                                  |                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------|
| <b>Frequency Range:</b>          | 850 – 2450MHz (extended L-Band)                                                   |
| <b>10MHz Reference:</b>          | Injected in RF-Input (coming from 10MHz Link from Indoor Chassis)                 |
| <b>Optical Output Connector:</b> | SC/APC                                                                            |
| <b>RF Input Power Level:</b>     | +10dBm max. (damage level)                                                        |
| <b>Frequency Response:</b>       | ±0,5dB typ., ±1,0dB max.                                                          |
| <b>RF-Input Connector:</b>       | 50Ohm SMA(f) or 75Ohm F(f) (75Ohm F(f) at ODB4 needs 75Ohm Cabling Option)        |
| <b>Return Loss:</b>              | 14dB typ.                                                                         |
| <b>Laser Type:</b>               | DFB with Isolator                                                                 |
| <b>Laser Class:</b>              | 1M                                                                                |
| <b>Operating Wavelength:</b>     | 1310nm ±5nm                                                                       |
| <b>Optical Output Power:</b>     | +3dBm min. (other settings upon request)                                          |
| <b>SFDR:</b>                     | -107dB/Hz typ.                                                                    |
| <b>Variable Gain Control:</b>    | -10dB to +10dB (1dB steps)                                                        |
| <b>Switchable LNB-Supply:</b>    | 13/15/18VDC, 22kHz tone, 450mA max (current monitoring)                           |
| <b>RF Power Monitoring:</b>      | 60dB dynamic range                                                                |
| <b>Operating Temperature:</b>    | -10°C to 45°C standard, -30°C to 55°C when operating within QLinkplus Outdoor Box |
| <b>Storage Temperature:</b>      | -10°C to 70°C standard, -30°C to 70°C when operating within QLinkplus Outdoor Box |
| <b>Humidity:</b>                 | 90%, non-condensing                                                               |
| <b>RoHS:</b>                     | Compliant                                                                         |

### QLink RX Module QTR2450-50S/-75F

|                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|
| <b>Frequency Range:</b>           | 850 – 2450MHz (extended L-Band)                                                   |
| <b>Optical Input Connector:</b>   | SC/APC                                                                            |
| <b>Optical Input Power Level:</b> | -10dBm (min. optical sensitivity), +10dBm max. (damage level)                     |
| <b>Frequency Response:</b>        | ±0,5dB typ., ±1,0dB max.                                                          |
| <b>RF Output Connector:</b>       | 50Ohm SMA(f) or 75Ohm F(f) (75Ohm F(f) only for Indoor Chassis use)               |
| <b>Return Loss:</b>               | 14dB typ.                                                                         |
| <b>Operating Wavelength:</b>      | 1300nm – 1560nm                                                                   |
| <b>RF Output Power:</b>           | +5dBm max. (+10dBm max. damage level)                                             |
| <b>SFDR:</b>                      | -107dB/Hz typ.                                                                    |
| <b>Variable Gain Control:</b>     | 0 to +20dB (1dB steps)                                                            |
| <b>RF Power Monitoring:</b>       | 60dB dynamic range                                                                |
| <b>Operating Temperature:</b>     | -10°C to 45°C standard, -30°C to 55°C when operating within QLinkplus Outdoor Box |
| <b>Storage Temperature:</b>       | -10°C to 70°C standard, -30°C to 70°C when operating within QLinkplus Outdoor Box |
| <b>Humidity:</b>                  | 90%, non-condensing                                                               |
| <b>RoHS:</b>                      | Compliant                                                                         |

**ORDER INFORMATION (Bundle Configuration, fully assembled RFoFiber Systems)**

| Type*                 | Type-No.: | Outdoor TX Enclosure IP65<br>QLink-ODE-50N | Indoor chassis 1RU/19" rack mount<br>QLink-IDC4 |
|-----------------------|-----------|--------------------------------------------|-------------------------------------------------|
| QLink O1R-I1T         | 9001203   | 1 x RX Extended L-Band                     | 1 x TX Extended L-Band                          |
| QLink O1T1R-I1R1T     | 9001204   | 1 x TX, 1 x RX Extended L-Band             | 1 x RX, 1 x TX Extended L-Band                  |
| QLink O1T1R-I1R1T-75  | 9001205   | 1 x TX, 1 x RX Extended L-Band             | 1 x RX, 1 x TX Extended L-Band, 75Ohm F(f)      |
| QLink O1T-I1R         | 9001206   | 1 x TX Extended L-Band                     | 1 x RX Extended L-Band                          |
| QLink O2R-I2T         | 9001207   | 2 x RX Extended L-Band                     | 2 x TX Extended L-Band                          |
| QLink O2T1R-I2R1T     | 9001208   | 2 x TX, 1 x RX Extended L-Band             | 2 x RX, 1 x TX Extended L-Band                  |
| QLink O2T2R-I2T2R     | 9001209   | 2 x TX, 2 x RX Extended L-Band             | 2 x RX, 2 x TX Extended L-Band                  |
| QLink O2T2R-I2T2R-75F | 9001335   | 2 x TX, 2 x RX Extended L-Band             | 2 x RX, 2 x TX Extended L-Band, 75Ohm F(f)      |
| QLink O2T-I2R         | 9001210   | 2 x TX Extended L-Band                     | 2 x RX Extended L-Band                          |
| QLink O2T-I2R-75F     | 9001211   | 2 x TX Extended L-Band                     | 2 x RX Extended L-Band, 75Ohm F(f)              |
| QLink O4R-I4T         | 9001212   | 4 x RX Extended L-Band                     | 4 x TX Extended L-Band                          |
| QLink O4T-I4R         | 9001213   | 4 x TX Extended L-Band                     | 4 x RX Extended L-Band                          |

*\*Other configuration variants available upon request*
**QLinkplus Outdoor Enclosure and Indoor Chassis**

| Type                  | Type-No.: | Short Description                                                                                                                                                                                                                         | Possible Modules<br>swappable                                                                                     | Max. Qty.<br>Links | RF Coax<br>I/O Connectors                          |
|-----------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------|
| QLink-ODB4plus-50N    | 9001450   | Quad Outdoor TX enclosure IP65<br>▶ Max. 4 x TX/RX extended L-Band<br>▶ 1 x TX or RX 10MHz module<br>▶ 4 x RF coax I/O's<br>▶ Remote configuration via data link<br>▶ 1:1 redundant dual power supply<br>▶ Including mast-mount clamps    | n x QTX2450-50S<br>n x QRX2450-50S<br>1 x QLink QRX10 or<br>1 x QLink QRT10                                       | 4                  | 50Ohm N(f)<br><br>75Ohm F(f)<br>only on request    |
| QLink-ODB4-24V-Option | 9001271   | ▶ 24V / 4A Power Box External for<br>DC supply e.g. to BUC                                                                                                                                                                                |                                                                                                                   |                    |                                                    |
| QLink-ODB4-48V-Option | 9001272   | ▶ 48V / 2A Power Box External for<br>DC supply e.g. to BUC                                                                                                                                                                                |                                                                                                                   |                    |                                                    |
| QLink-IDC4            | 9001216   | Indoor Chassis<br>▶ Max. 4 x TX/RX extended L-Band<br>▶ 1 x TX or RX 10MHz module<br>▶ 1RU/19" rack mount<br>▶ LC-Display/keypads<br>▶ Remote Interface to ODB4<br>▶ Ethernet-Interf. (WebGUI, SNMP)<br>▶ 1:1 redundant dual power supply | n x QTX2450-50S<br>n x QRX2450-50S<br>n x QTX2450-75F<br>n x QRX2450-75F<br>1 x QLink QRX10 or<br>1 x QLink QRT10 | 4                  | 50Ohm SMA(f)<br>75Ohm F(f)<br>Depends on<br>module |

**QLink Optical TX/RX Modules**

| Type                                                                                                                                                                                | Type-No.: | Short Description                                                                                                                                                                                                                    | Optical I/O Connector | RF-Connector |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------|
| QTX10-50S<br>10MHz TX                                                                                                                                                               | 9001220   | Optical 10MHz TX module for QLink series, RF input 50Ohm SMA(f), Optical Output SC/PC                                                                                                                                                | SC/APC                | 50Ohm SMA(f) |
| QRX10-50S<br>10MHz RX                                                                                                                                                               | 9001219   | Optical 10MHz RX module for QLink series, Optical input SC/APC, RF output 50Ohm SMA(f)                                                                                                                                               | SC/APC                | 50Ohm SMA(f) |
| QTX2450-50S<br>Ext. L-Band TX                                                                                                                                                       | 9001223   | Optical TX module for QLink series, extended L-Band 850 – 2450MHz, RF input 50Ohm SMA(f), Optical Output SC/PC, variable gain control, switchable LNB-supply, RF power monitoring                                                    | SC/APC                | 75Ohm F(f)   |
| QTX2450-75F<br>Ext. L-Band TX                                                                                                                                                       | 9001217   | Optical TX module for QLink series, extended L-Band 850 – 2450MHz, RF input 75Ohm F(f), Optical Output SC/PC, variable gain control, switchable LNB-supply, RF power monitoring                                                      | SC/APC                | 50Ohm SMA(f) |
| QRX2450-50S<br>Ext. L-Band RX                                                                                                                                                       | 9001224   | Optical RX module for QLink series, extended L-Band 850 – 2450MHz, Optical Input SC/PC, RF output 50Ohm SMA(f), variable gain control, RF power monitoring                                                                           | SC/APC                | 75Ohm F(f)   |
| QRX2450-75F<br>Ext. L-Band RX                                                                                                                                                       | 9001218   | Optical RX module for QLink series, extended L-Band 850...2450MHz, Optical Input SC/PC, RF output 75Ohm F(f), variable gain control, RF power monitoring                                                                             | SC/APC                | 50Ohm SMA(f) |
| QRX-TTL-50S*                                                                                                                                                                        | 9001310   | RX Module TTL Logic Levels on I/O, Unmodulated IRIG-B Transport, 1PPS Transport (1PPM also supported), Clock Rates up to 20 MHz, Optimization for Duty Cycle, Distortion (DCD), - 20°C to +70°C Operating Temperature Range, 1310 nm | SC/APC                | 50Ohm SMA(f) |
| QTX-TTL-50S*                                                                                                                                                                        | 9001309   | TX Module TTL Logic Levels on I/O, Unmodulated IRIG-B Transport, 1PPS Transport (1PPM also supported), Clock Rates up to 20 MHz, Optimization for Duty Cycle, Distortion (DCD), - 20°C to +70°C Operating Temperature Range, 1310 nm | SC/APC                | 50Ohm SMA(f) |
| QTX2450-50S-HP Ext. L-Band TX                                                                                                                                                       | 9001307   | Optical TX module for QLink series, extended L-Band 850 – 2450MHz, RF input 50Ohm SMA(f), Optical Output SC/PC, variable gain control, high power input +20dBm max., RF power monitoring                                             | SC/APC                | 50Ohm SMA(f) |
| *Only available for IDC4 Chassis, not for QLink-ODB4plus-50N; Populated instead COM Module.<br>For communication via fiber external Ethernet LAN/FO Converter is required for IDC4. |           |                                                                                                                                                                                                                                      |                       |              |
| LAN over Fiber<br>TXRX1Gbit                                                                                                                                                         | 9001308   | 1RU 19" chassis, Converts 1Gbit TX/RX Ethernet/LAN to fiber.<br>PSU85-230VAC                                                                                                                                                         | SC/APC                | RJ45         |