FSOC Fade-Tolerant Modem

qBeam's Free Space Optical Communications (FSOC) modem supports terrestrial optical communications at GigE, 2.5 GigE, and 10 GigE speeds when coupled with a compatible optical telescope. Space-to-ground links could also be supported if a compatible modem where to be flown in space.

The FSOC modem includes sophisticated forward error correction (FEC) and optional atmospheric fade mitigation via blind packet repetition to improve link performance and support longer distances.

The user client interface is via a standard RJ45 connection (GigE) or SFP+ connection (2.5 & 10GigE).

The modem can be paired in the same chassis with an optional Avalanche Photo Diode (APD) receiver module (for MM operation) or a single-stage or dual-stage EDFA pre-amp (for SM operation) to boost the Rx signal prior to demodulation by the modem.

Combined FSOC Modem and APD

Features

- Robust FEC implementation optimized for FSOC links
- Layer-2 bridge device (no routing)
- Internal VOA to limit link saturation
- Optional fade-tolerant mode (GigE & 2.5GigE) provides atmospheric link-fading mitigation using blind packet repetition (user settable delay up to 100 ms)
- APD module accepts MMF or SMF (FC/UPC or LC/UPC)
- EDFA pre-amp accepts SMF input (FC/UPC or LC/UPC)
- Available in 1U rack-mount chassis or compact unit measuring 7.25" x 8" x 1.75" (modem only)
- Power: 110-220V/50-60Hz

System Performance

- Full Duplex GigE connectivity at >900 Mbps user rate
- Full Duplex 2.5GigE link at >2,250 Mbps user rate
- Fade Tolerant FEC mode (FT-FEC) (survives up to 90ms fades every 200ms (GigE and 2.5 GigE)
- FEC only mode link latency: < 1 ms
  FT-FEC mode link latency: repetition delay + ~1 ms
- FEC mode improves APD sensitivity by ~4dB
- APD sensitivity of –38 dBm (GigE w/FEC) at 10^{-11} BER
- Dimensions: 1U rack mount (19" x 14.5" x 1.75")
- Operating temperature range: 0°C — 50°C

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