

Duplex Spatial Multiplexer/Demultiplexer for Multi-Mode Optical Fiber Links

Transforms one multi-mode fiber link into 4 independent high-capacity channels without any additional fiber deployment

Increases the reach of conventional multi-mode fiber links up to 10 km [6.2 mi] at 4 x 10+ Gb/s

AROONA-SMUX offers a flexible and low-cost solution to expand the capacity of existing multi-mode fiber links in Local Area Networks.

Using mode-group multiplexing over 4 optical channels, Cailabs' unique **Multi-Plane Light Conversion*** technology transforms a single conventional multi-mode fiber link into 4 independent channels, equivalent to 4 single-mode fiber links.

By overcoming modal dispersion, reach for high transmission rates is **increased by as much as 10 km [6.2 mi]**. This enables duplex transmission up to **4 x 10+ Gb/s** in only one pair of standard multi-mode fibers (OM) at a single wavelength.

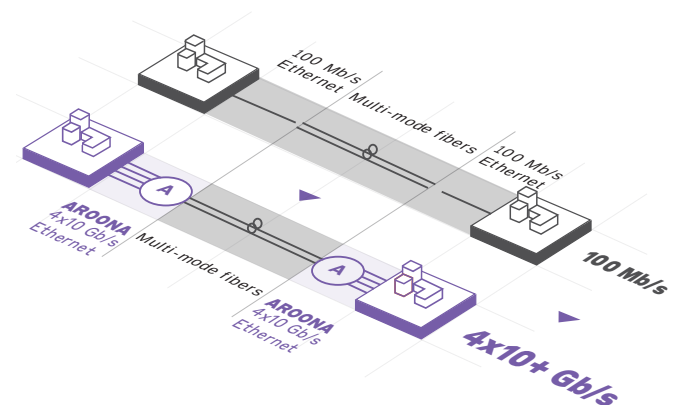
AROONA-SMUX is a passive device and transparent to communication protocol. It operates with commercial single-mode transceivers at 1550 nm and achieves high transmission rates without additional optical fiber deployment. It offers a capacity increase without a hassle and for a low cost.

Typical use case

Let us consider a 300m [0.2 mi] link at 100 Mb/s over dual OM2 fibers between two buildings on a campus. Increasing data rate to 1 Gb/s can be achieved by upgrading active components such as switches and transceivers. However, an upgrade to 10 Gb/s is limited by the bandwidth of the OM2 fibers.

Increasing the data rate to 10 Gb/s typically requires the deployment of new fibers.

AROONA-SMUX solution increases the capacity of the link up to 4 x 10+ Gb/s without long, complex and expensive fiber deployment. **AROONA-SMUX** is also compatible with WDM technologies, providing easy and seamless high-capacity scaling of the network while ensuring LAN infrastructure durability.



*Multi-Plane Light Conversion (MPLC) by Cailabs: U.S. Pat No 9,250,454 - Japanese patent n° 5990544

Technical specifications

PARAMETER	AROONA-SMUX-800	AROONA-SMUX-2000+
Operating wavelength	C-band (around 1550 nm)	
Reach	< 800 m [0.5 mi]	Up to 10 km [6.2 mi]
Number of channels*	up to 4*	
System capacity	10 Mb/s to 50 Gb/s per channel Independent data rate over each channel	
Multiplexer insertion loss	< 4 dB (typical: 2.5 dB)	
Channel isolation	> 15 dB	
Communication protocol	Transparent to standard protocols (Ethernet, Fiber Channel, SDH, etc.)	
Compatible transceivers	Any type of single-mode transceiver (Rx PIN) Format: SFP, SFP+, XFP, GBIC, XENPACK, X2 Recommended specifications: 1000BASE-EX, 10GBASE-ER	

* subject to complexity of the link

Physical characteristics

PARAMETER	VALUE
Fiber type	62.5/125 µm (OM1) or 50/125 µm (OM2 / OM3 / OM4)
Multiplexer input / Demultiplexer output	Duplex LC/UPC connector
Multiplexer output / Demultiplexer input	Unconnectorized MMF fiber to be spliced
Operating temperature	+5°C to +40°C (EN 300 019-2-3)
Housing size	H: 44 mm x L: 486 mm x P: 250 mm Rack 19" 1U