Installation and Troubleshooting of Cubro Optical TAPs

APPLICATION NOTE

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Please refer to the latest version of this document on our website to ensure you have the most up-to-date information.

Purpose

This document provides installation instructions for Cubro Optical TAPs, explains typical use cases, and offers troubleshooting guidance.

Intended Audience

- Network planners
- Network engineers
- Field technicians

Optical TAPs - Portfolio

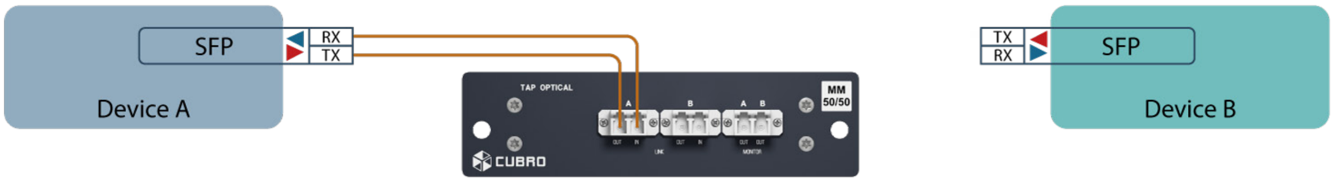
Optical TAPs	Description
CBR.OPTO-SR8	Optical 400G SR8 TAP, 2 Links & 4 Links 50/125µ; MPO16 connectors, 19" 1/3U height, splitting ratio 50/50
OPTOSLIM_4L	Optical TAP, 4 Links SM; LC connectors, 19" 1/3U height, splitting ratio 80/20; 50/50; 70/30
OPTOSLIM_8L	Optical TAP, 8 Links SM; LC connectors, 19" 1/3U height, splitting ratio 80/20; 50/50; 70/30
OPTOSLIM_4L-MTP	Optical TAP, 4 Links Singlemode LC; Monitor Ports MTP, 19" 1/3U height, splitting ratio 80/20; 50/50; 70/30
OPTOSLIM_8L-MTP	Optical TAP, 4 Links Singlemode LC; Monitor Ports MTP, 19" 1/3U height, splitting ratio 80/20; 50/50; 70/30
OPTO_1	Optical TAP, 1 Link SM/MM 1310/1550nm LC, 2 Monitor Ports LC; 1/3 19" rackmount housing, splitting ratio 80//20; 50/50; 70/30
OPTO_2	Optical TAP, 2 Links SM/MM 1310/1550nm LC, 4 Monitor Ports LC; 1/3 19" rackmount housing, splitting ratio 80/20
OPTO-MTP	MTP TAP, Singleport, Singlemode/Multimode, 19" 1/3U height
OPTO-MTP_2	MTP TAP, Dualport, Singlemode/Multimode, 19" 1/3U height
OPTO-MTP_4	MTP TAP, 4 Link, Singlemode/Multimode, 19" 1/3U height

Installation and Cabling

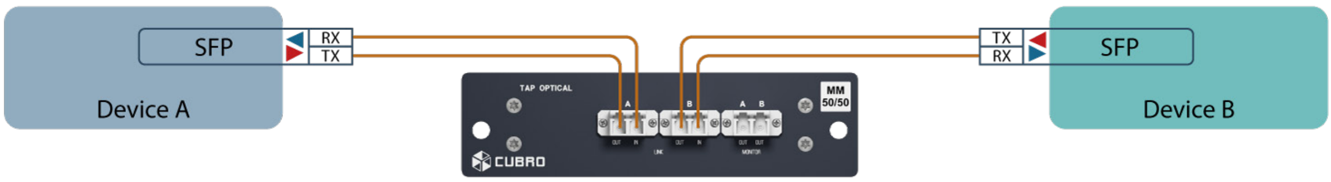
Optical TAPs are installed in-line between two communication devices.

Steps:

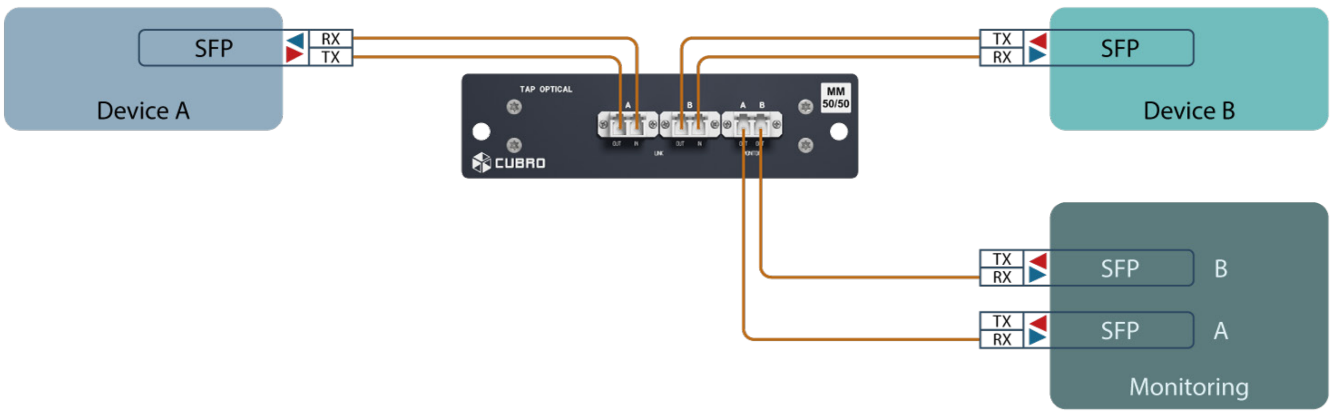
1. Disconnect the existing LC duplex cable from Device B (SFP port).
2. Connect the original cable to Port A of the TAP.



3. Use the same type of cable to connect Port B of the TAP to Device B.



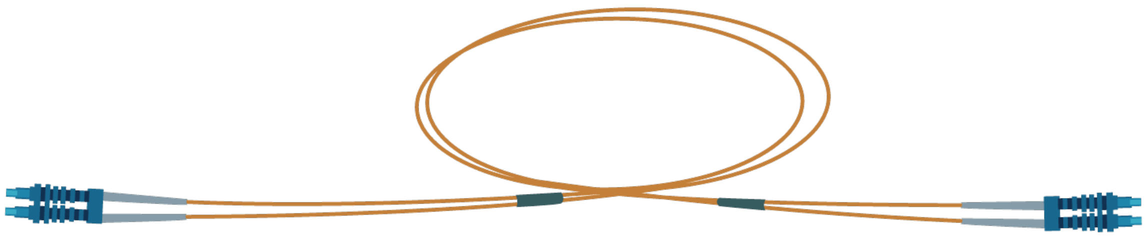
4. Connect your monitoring tool to monitor Port A and Port B.



Note: LC duplex connectors do not need to be disassembled. Original cables can stay intact.

Before and After Illustration

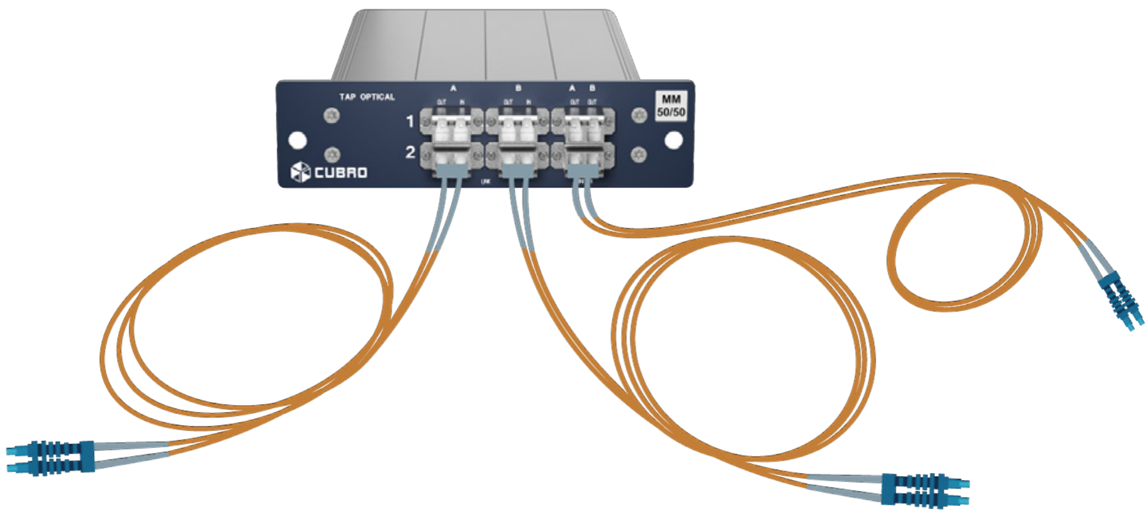
Before: Direct connection between Device A and Device B.



After: TAP is inserted between A and B with monitor ports available.

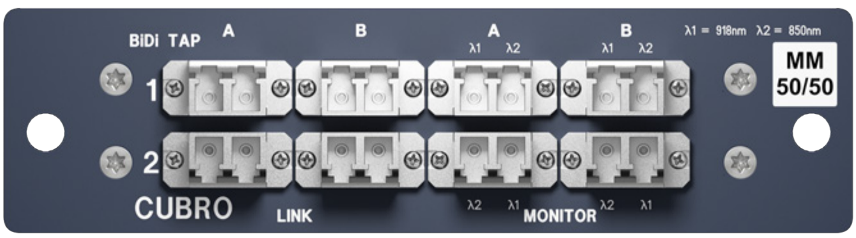
ARROW IMAGE

Original cable can be reused



Same cable type

1-Link Optical TAP Overview



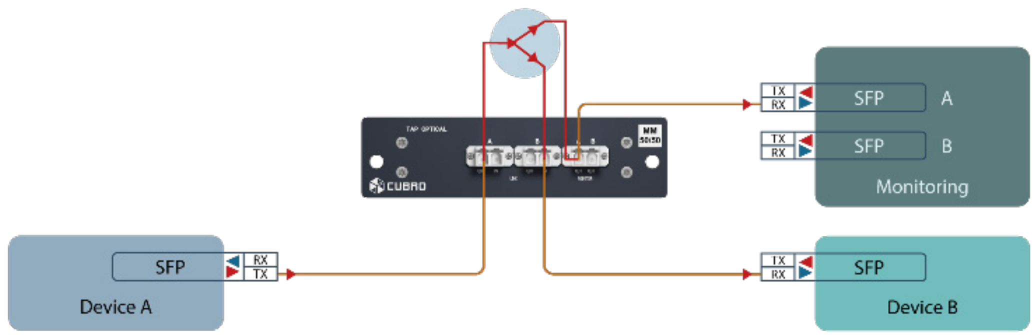
1-Link Optical TAP

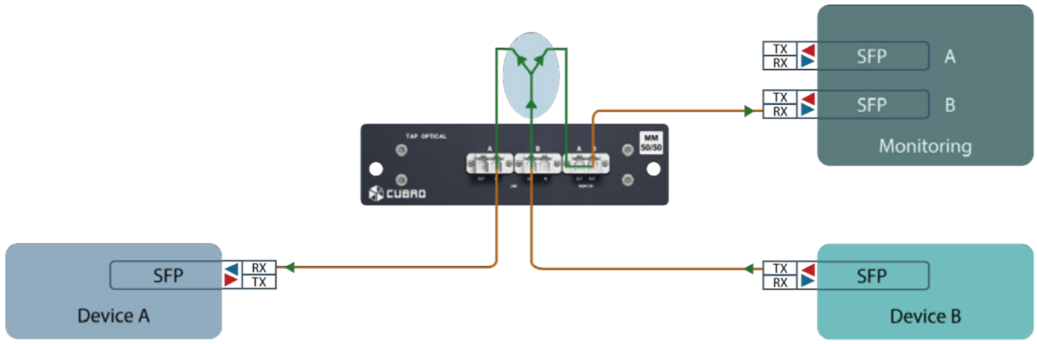
Bandwidth support: 100 Mbps (FX) to 100 Gbps

Available in:

- Multi-mode: 50/50 splitting ratio
- Single mode: 80/20 splitting ratio
- Modular version: For 19“ frame systems

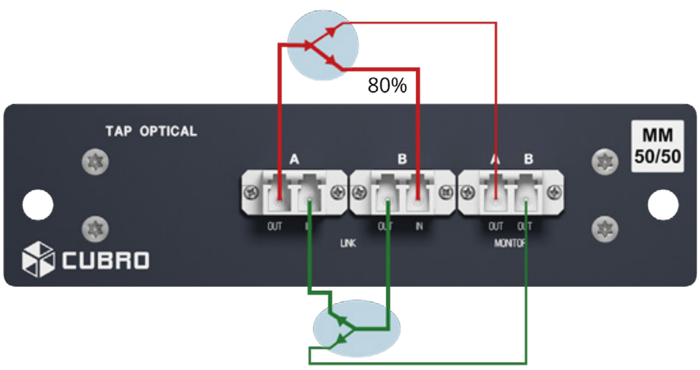
Signal Paths:





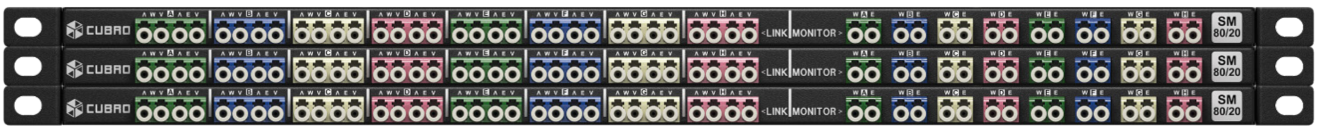
Internal Signal Paths

LINK IN A are split to LINK OUT B + MONITOR A
LINK IN B are split to LINK OUT A + MONITOR B

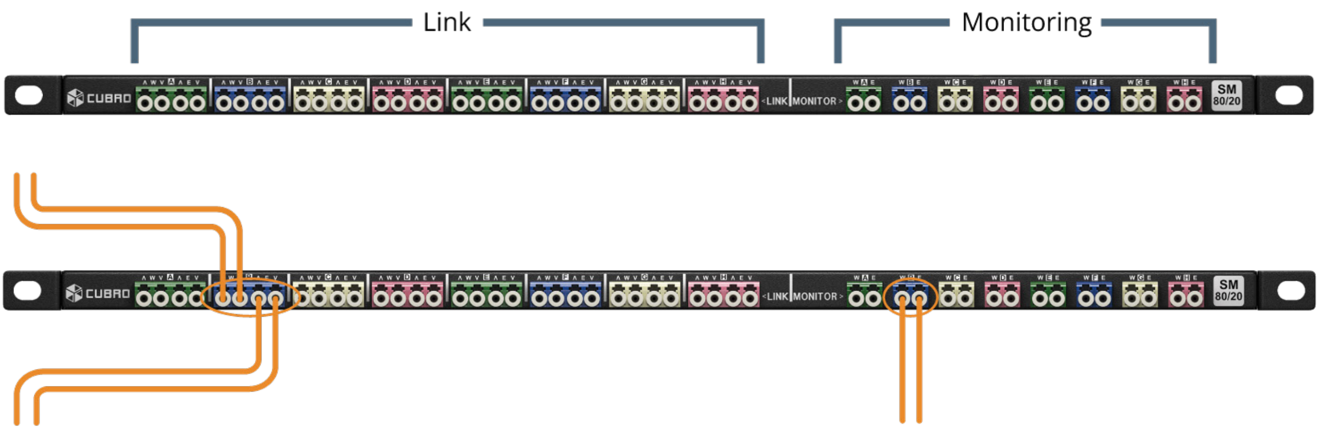


Optical Slim TAP Overview

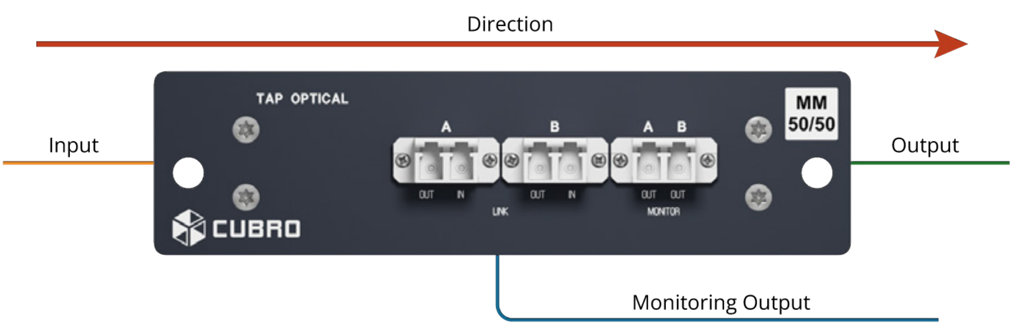
- 19” rack-mount, 1/3U size
- Available in 4-link and 8-link versions
- Single mode (SM) or multimode (MM) options
- Colour-coded connectors for simplified cabling
- Splitting ratios:
  > SM: 80/20 (other ratios on request)
  > MM: 50/50 (other ratios on request)



Space-efficient: Up to 24 links in just 1U



Optical Power Considerations



Ratio	Input	Output	Monitoring
90/10	-9 dBm	-9,46 dBm	-19,00 dBm
80/20	-9 dBm	-9,97 dBm	-15,99 dBm
70/30	-9 dBm	-10,55 dBm	-14,23 dBm
60/40	-9 dBm	-11,22 dBm	-12,99 dBm
50/50	-9 dBm	-12,01 dBm	-12,01 dBm

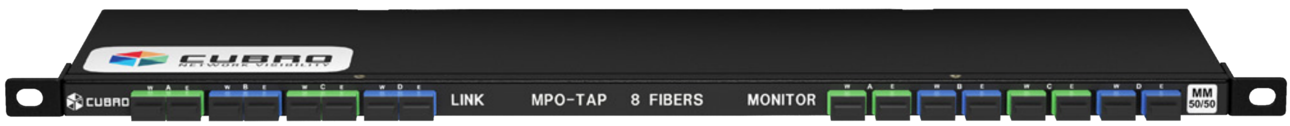
Typical SFP Data	Max Power	Min Power	Sensitivity
MM 850 nm SFP 1 Gbit	-3 dBm	-9 dBm	-23 dBm
SM 1310 nm SFP 1 Gbit	-3 dBm	-9 dBm	-18 dBm
MM 850 nm SFP+ 10 Gbit	-1 dBm	-6,5 dBm	-11,5 dBm
SM 1310 nm SFP+ 10 Gbit	+0,5 dBm	-8,2dBm	-14,4 dBm
MM 850 nm QSFP 40 Gbit	+1,0 dBm	-7,6 dBm	-9,5 dBm
SM 1310 nm QSFP 40 Gbit	+2,3 dBm	-7,0 dBm	-13,4 dBm
MM 850 nm QSFP 100 Gbit	-1,0 dBm	-6,5 dBm	-8,6 dBm
SM 1310 nm QSFP 100 Gbit	+4,0 dBm	-4,3 dBm	-10,6 dBm

Two reference tables are available to help estimate the optical budget. Keep in mind:

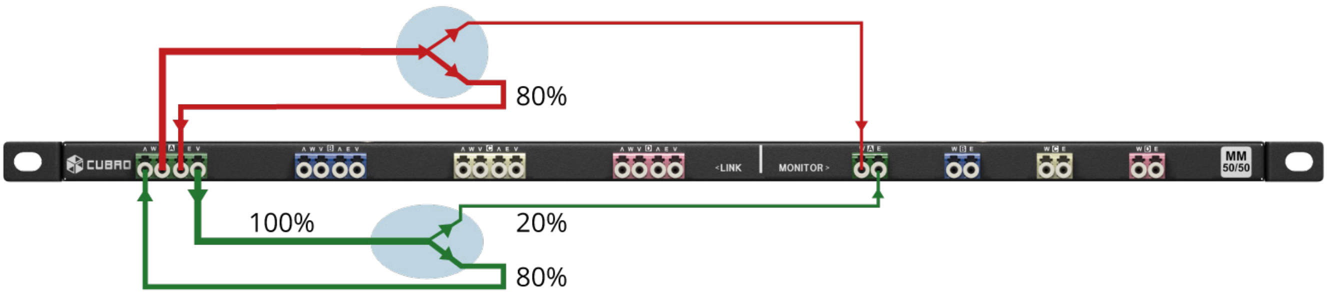
- Actual SFP output power may vary between vendors.
- Cable attenuation and connector loss must be included in calculations.
- It's strongly recommended to measure power using an optical power meter.

Optical TAPs are unidirectional - monitor ports only receive traffic, they do not transmit.

Internal Signal Paths - Optoslim TAP



> Signal from Link W (in) are split to Link E (out) + Monitor W
> Signal from Link E (in) are split to Link W (out) + Monitor E



Troubleshooting Tools & Methods

Recommended tools:

- Visual Fault Locator (visible light source, e.g., red light at 635–650 nm)
- Optical Power Meter
- LED/Laser source (matching link wavelength)

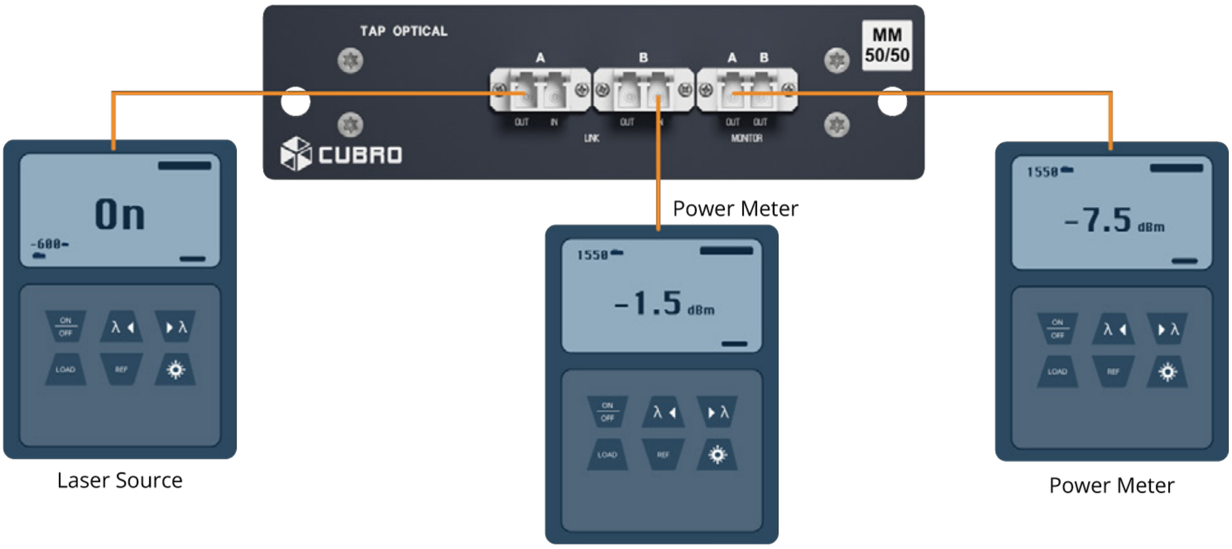
Method 1: Troubleshooting with Visual Light Source

1. Connect visible light source to Link IN A
2. Observe red light at Link OUT B and Monitor A
3. Repeat for side B

Note: Red light (typically 635 nm or 650 nm) does not split according to the specified splitting ratio because it falls outside the optical operating window of the splitter. As a result, for example, a 50/50 multimode TAP may show noticeable differences in light intensity between the output ports.

Method 2: Troubleshooting using an Optical Loss Test Set (OLTS)

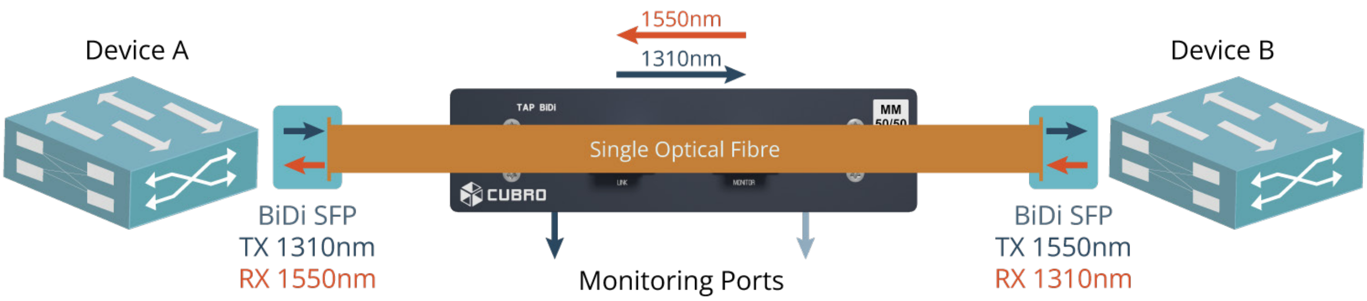
1. Connect LED or laser source to Link IN A
2. Measure output at Link OUT B and Monitor A using a power meter
3. Repeat the same for side B



TAP Ratio	Attenuation	
	Output	Monitor
90/10	1 dB	10.5 dB
80/20	1.5 dB	7.5 dB
70/30	2 dB	5.7 dB
60/40	2.7 dB	4.5 dB
50/50	3.5 dB	3.5 dB

Note: Excess attenuation usually results from dirty or damaged connectors of TAP or patchcord. Clean both connector sides and check with Fiber Inspection Microscope to optimize attenuation.

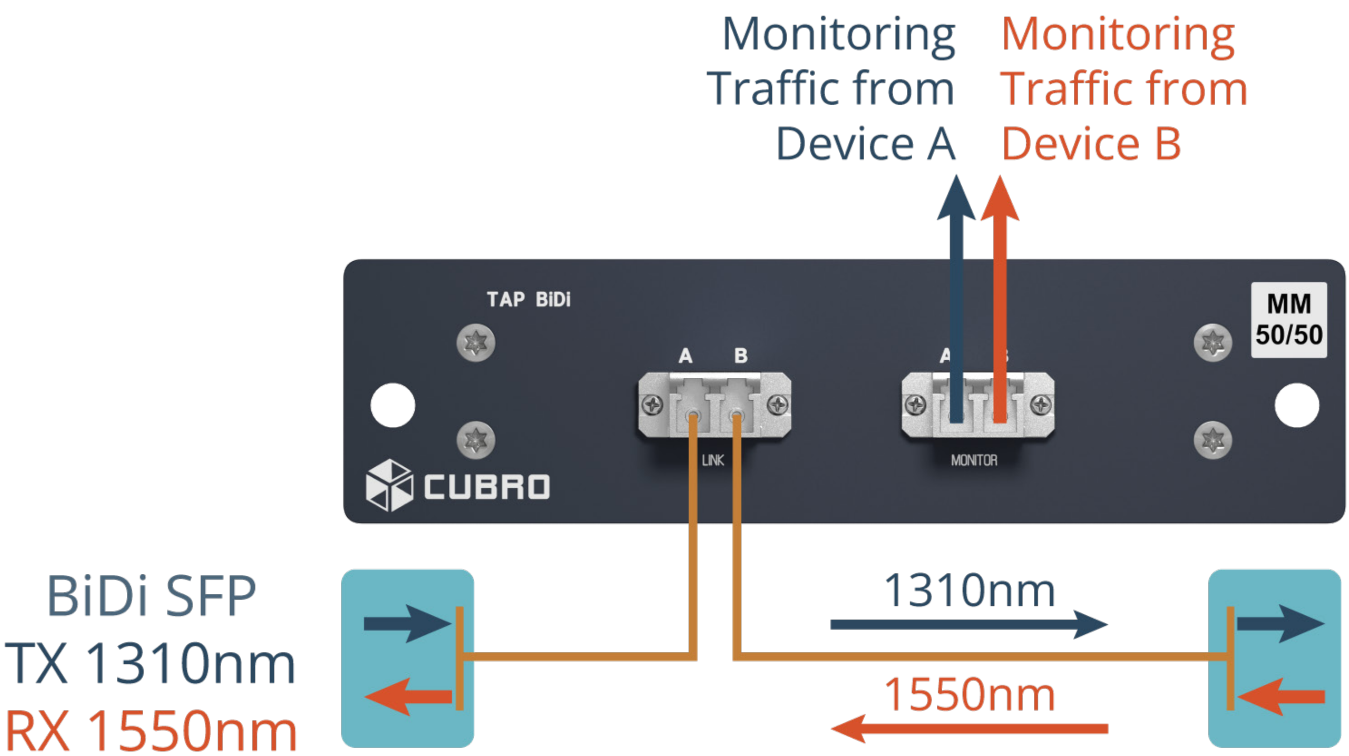
BIDI Optical TAPs



- Passive and secure
- Supports bidirectional wavelengths:
  - 1310/1550 nm
  - 1310/1490 nm
  - 1490/1550 nm
- 19" frame supports up to 3 modules
- Monitor ports can be aggregated

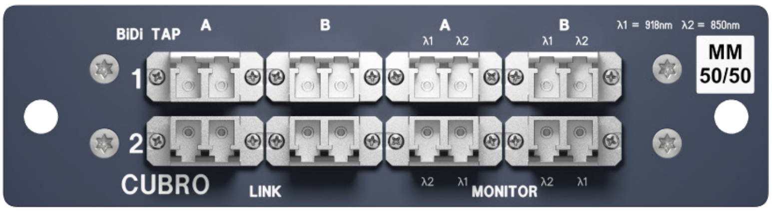
BIDI TAP Application

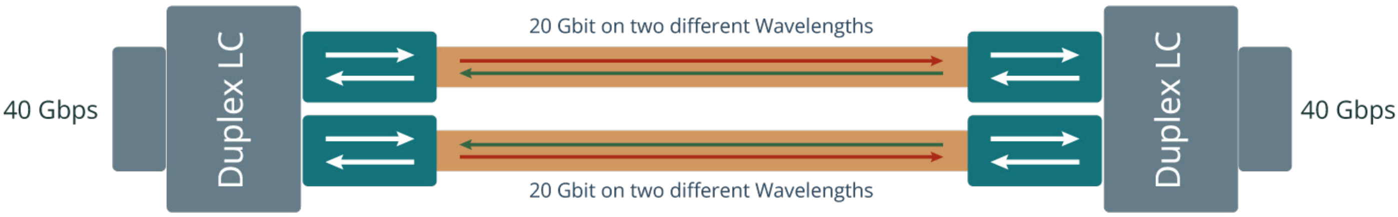
- Transparent
- Passive

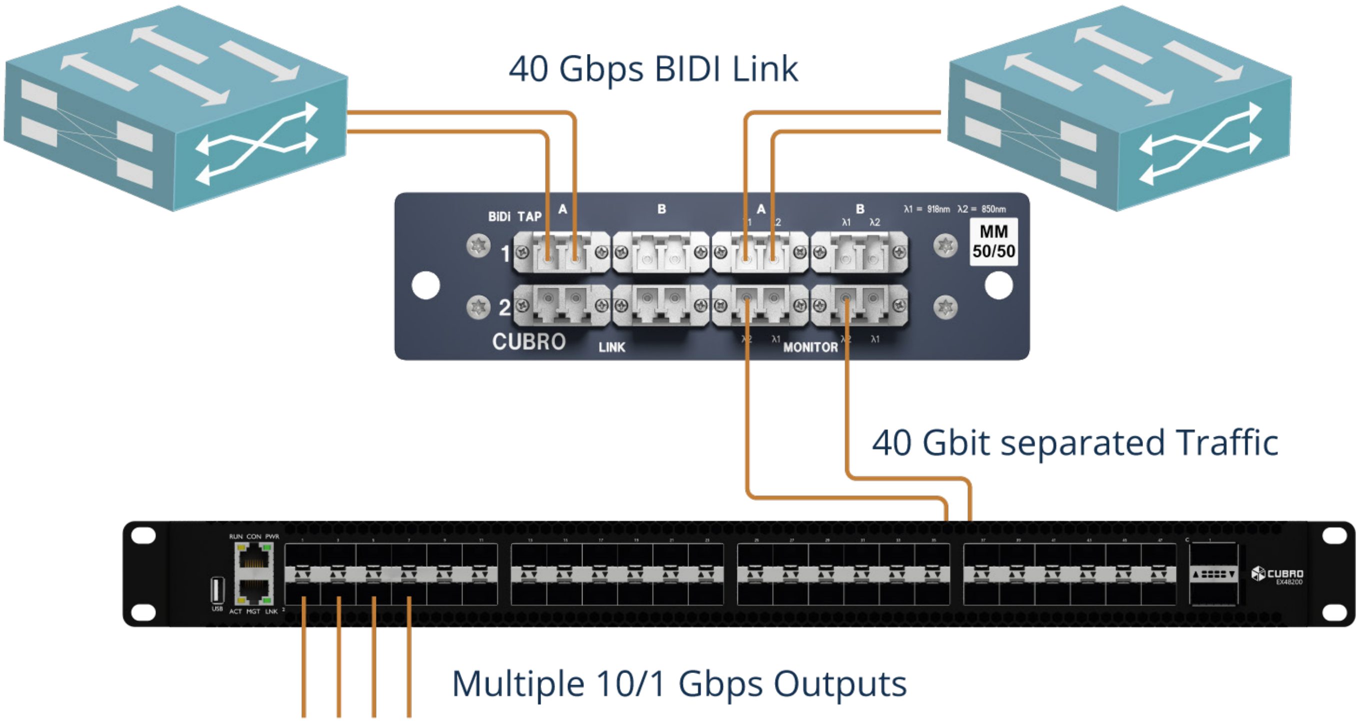


Cisco BIDI TAP: Application Example

- Fully transparent TAP for bidirectional links
- Passive — does not affect link operation
- Allows traffic separation for analysis



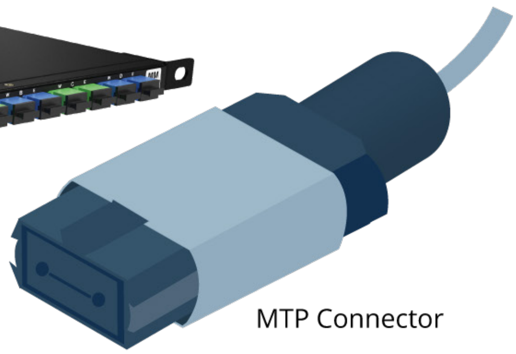




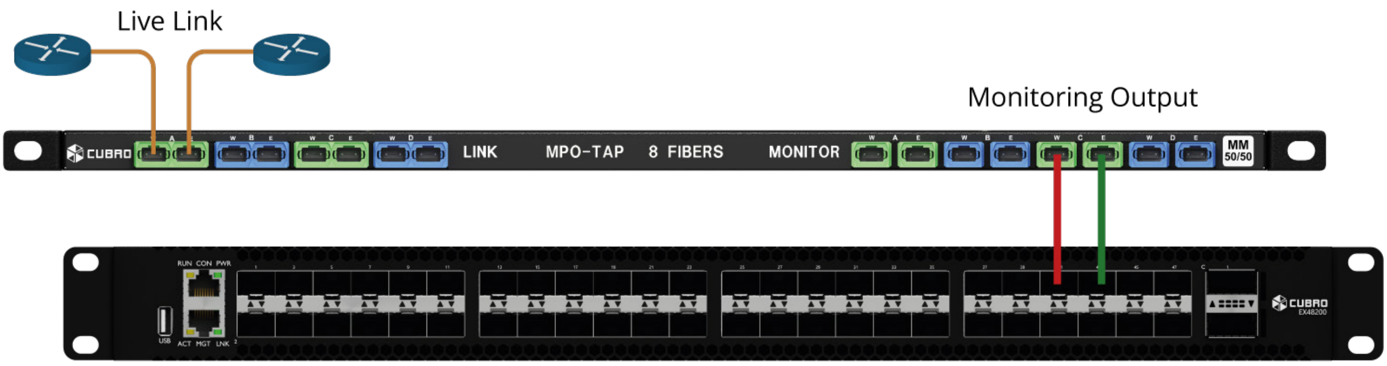
MTP Optical TAP

Designed to tap **40G and 100G** links using QSFP/QSFP28 modules:

- Available in single-mode and multi-mode
- MTP/MPO connector (8 fibers)
- Each fibre pair carries 25 Gbps (100 Gbps = 4 pairs)

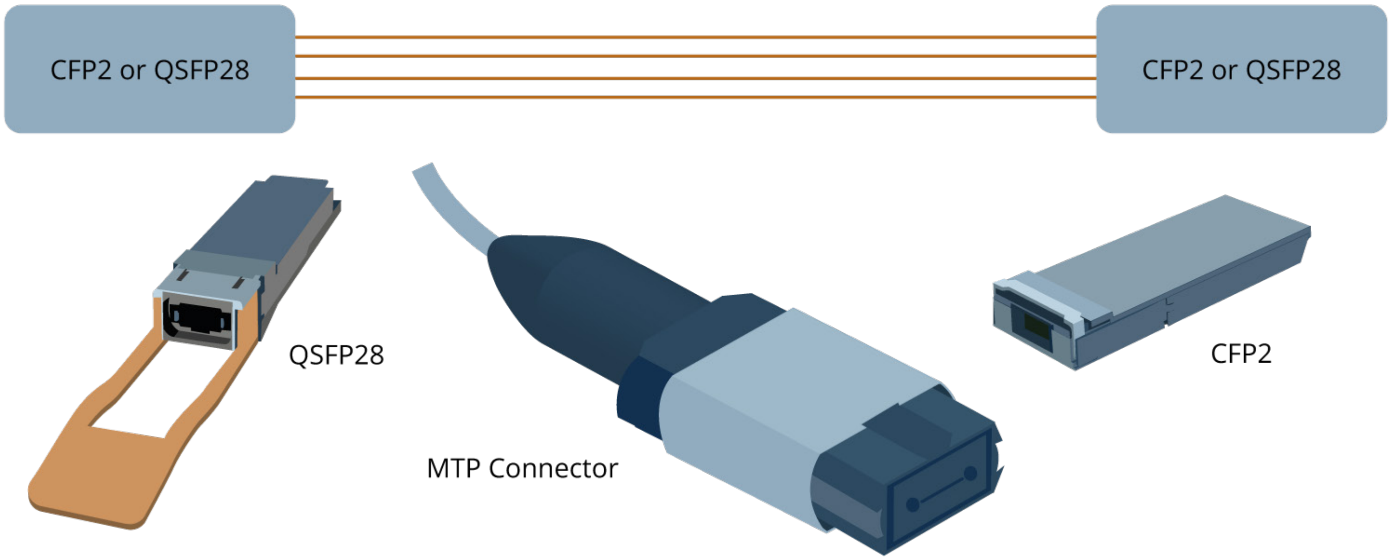


MTP Connector



100 Gbit Multimode (SR) Solution

A 100 Gbit multimode link operating at 850 nm is typically implemented using four fibre pairs, with each pair carrying 25 Gbit/sec. The optical interface, such as QSFP28 or CFP2, uses a MTP/MPO connector with 8 fibers (4 transmit and 4 receive).



Conclusion

Cubro Optical TAPs are robust, passive devices designed for secure and reliable traffic visibility. Proper installation and troubleshooting using the correct tools ensure uninterrupted service and accurate monitoring.