Bypass Application with Cubro Packetmaster

Universal Bypass Application

The Cubro Bypass Application is a superior way to provide a fail-safe access port for an in-line monitoring appliance such as an intrusion prevention system (IPS), firewall or WAN optimization device.

With the latest software release, all Cubro Packetmaster have the ability to work as a bypass switch including heartbeat functionality. The Cubro Bypass solution supports data rates from 1 to 100 Gbit.

In combination with our optical and Base-T switches, we can provide a flexible and price optimized bypass solution from 10 Mbit to 100 Gbit including the capability to switch from active to standby unit.

Cubro Optical Bypass switch multi mode 4 fiber pairs

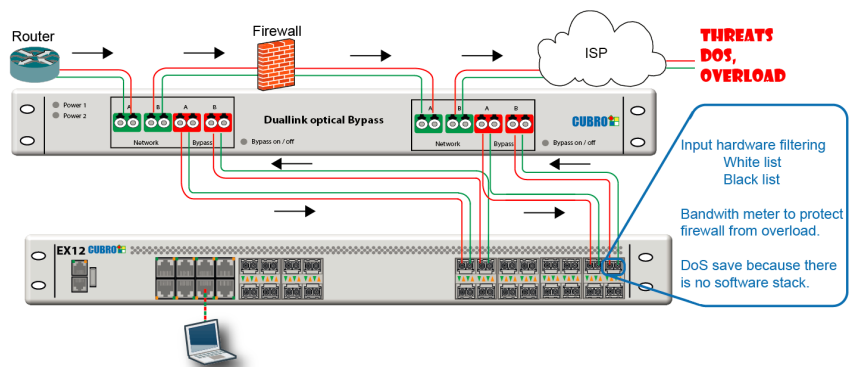Cubro Optical Bypass switch single mode 1 fiber pair

Cubro Packetmaster EX 20400

Cubro Packetmaster EX 12

The Cubro Bypass solution is available in two versions – either with a Layer1 bypass switch or as Layer 2 solution.

Features

Flexible concept

Protection Switch and Bypass Switch are separated units, this offers more flexibility in the case of changing network configuration.

Easy expandable

Depending on the number of ports on the Bypass Switch it can support more than one bypass device.

Multi Link support

Multilink support with different bandwidth is also available on most units.

Spare unit integration

Because of the big amount of ports it is also possible to switch in case of emergency to a spare unit.

Monitoring output option

Each solution is also supporting additional monitoring outputs to troubleshoot the device

Benefits

Reuse of existing Packetmaster Units (software upgrade is required)

Flexible heartbeat traffic to match network requirements

Easily expandable to multiple links

Best price - performance relation

Fast link recovery time
The recovery time depends on the interface speed and the bandwidth. In most cases it is less than 5 ms.

Detection time typically less than 30 ms

Ultra low delay lower of less than 1 µs

The Cubro Bypass solution is an easy to use application with the Cubro Packetmaster.

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Layer1 solution:

In this case a Packetmaster and a Layer1 switch are working together. As seen in the picture the traffic is passed through the Layer1 switch with nearly no delay (1) and then forwarded to the Packetmaster.(2)
The Packetmaster adds the heartbeat traffic (3). The heartbeat traffic can be modified to allow compatibility in each environment such as VLAN, MPLS, VXLAN …

This heartbeat traffic is now passing the monitored device (4) and is sent back via the layer 1 switch (5) to the Packetmaster.

The Packetmaster receives the heartbeat traffic and knows the device is working (6,7). In the case the heartbeat is missing for a certain time (configurable) the bypass is activated. The activation can not only bypass the failing device but could also re-rout the traffic to a standby device.

The layer 1 switch is only needed in the theoretical case that the Packetmaster fails. It then bypasses the Packetmaster. The Packetmaster sends keep alive messages over the management port to the management port of the bypass switch and in the case the Packetmaster is down the Layer 1 switch bypasses the Packetmaster to save the link.
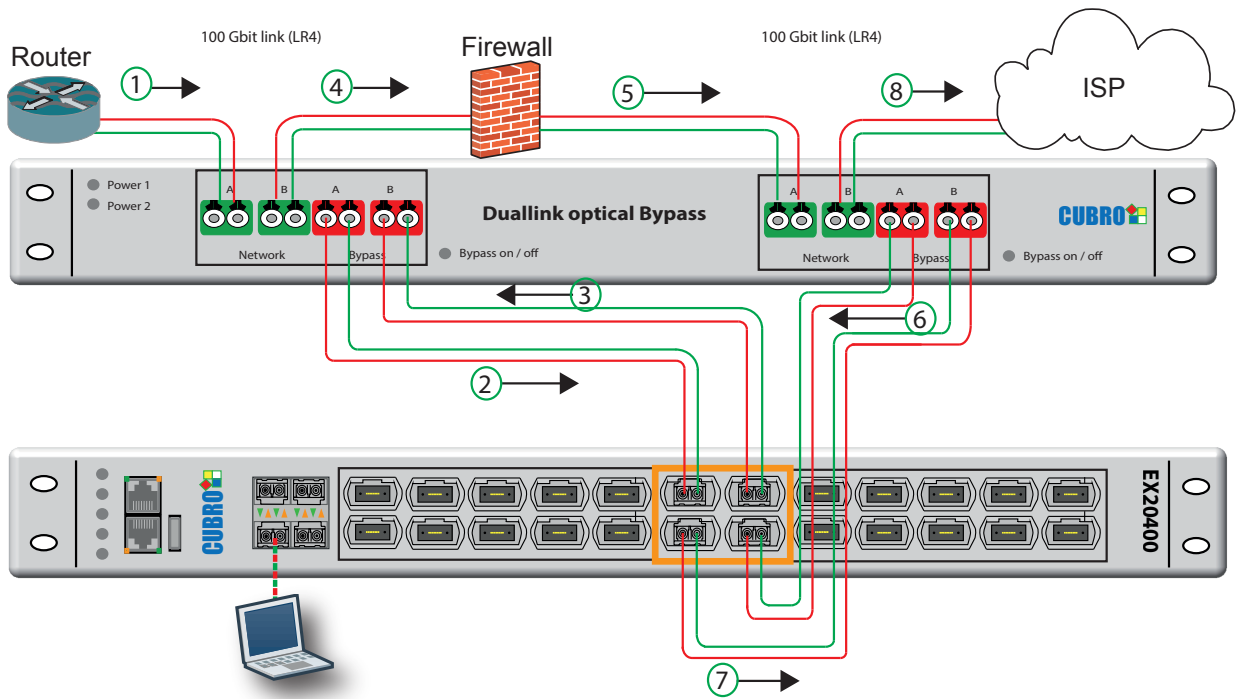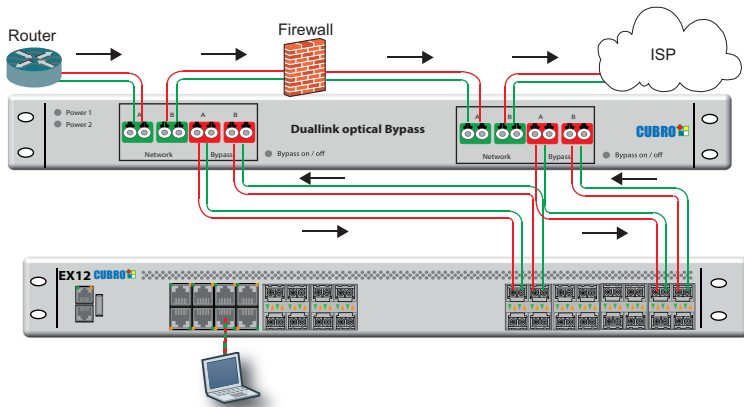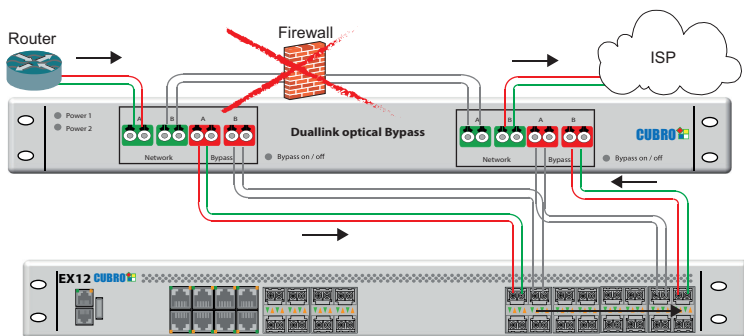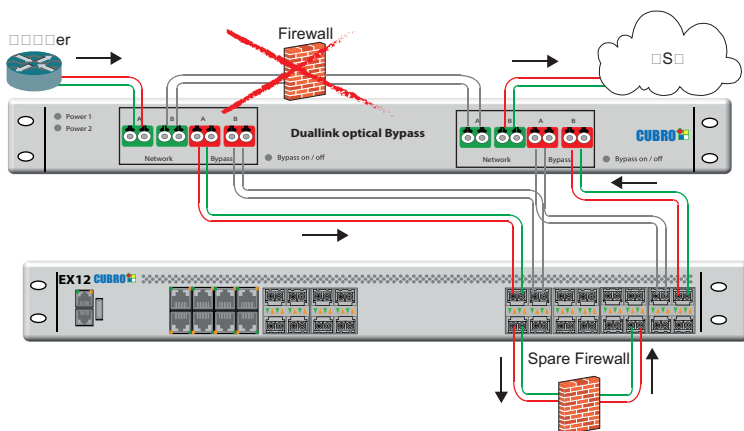
Layer1 solution: With Packetmaster EX12

Normal function:

Without active bypass, traffic is passing Layer1 switch and Packetmaster
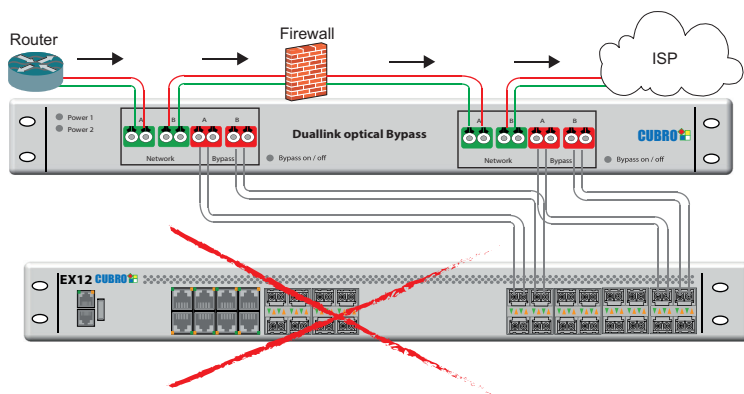
Device fail situation:

Traffic is passing Layer1 switch and the Packetmaster bypasses the faulty device.

Device fail situation:

Traffic is passing Layer1 switch and the Packetmaster re-routes the traffic to the spare device, in our example a firewall.
This application works only if there are enough empty ports available on the Packetmaster.
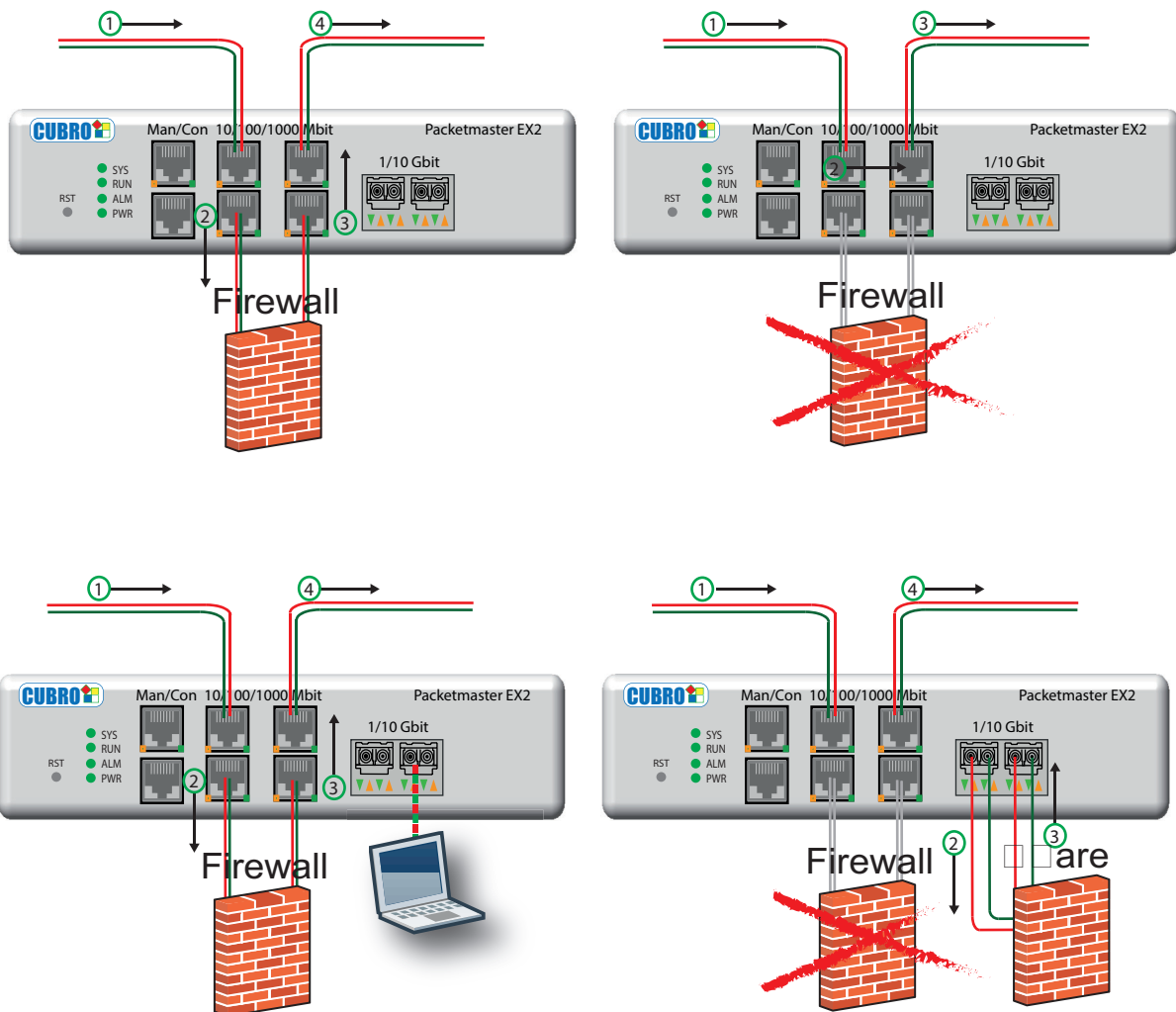
Packetmaster fail situation:

In the theoretical case the Packetmaster is offline the Layer1 switch is bypassing the Packetmaster.

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Layer2 solution:

In this case there is no Layer 1 switch used, only the Packetmaster does the bypass feature. As seen in the picture the traffic is passed through the Packetmaster - in this example an EX2 (1). The Packetmaster adds the heartbeat traffic (2). The heartbeat traffic is configurable in order to match different requirements like VLAN, MPLS, VXLAN, …

The Packetmaster receives this heartbeat traffic (3) and knows that the device is working (4). In the case the heartbeat is missing for a certain time (configurable) the bypass is activated.

Cubro optical bypass switch

The Cubro bypass for 40 & 100 Gbit multimode a link is realized with a mems optical switch per link 16 switches are uses, this 16 switches are combined to one module.

The switching mechanism offers the reliability of a solid state device. The optical switch is a latched version, this means it needs only power during switching. Even when power fails the optical switch stays in the programmed state.

normal mode

Bypassed device

bypass mode

Bypassed device

mems optical switch
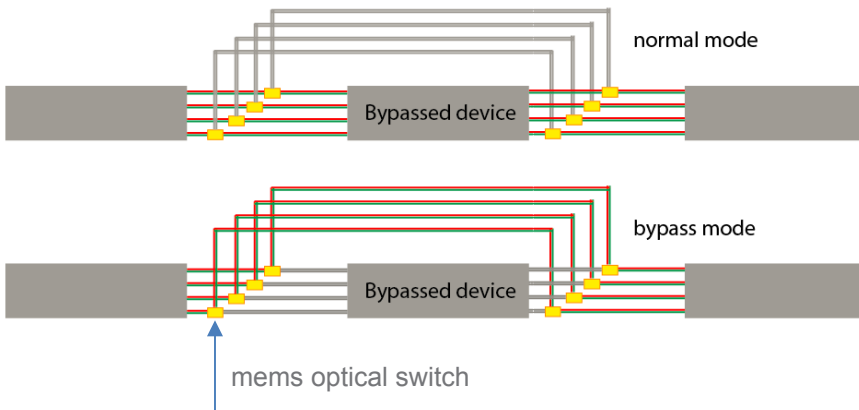
A 100 Gig link multi-mode 850 nm is typically realized with 4 fibre pairs, each of them is transporting 25 Gbit/sec. The connector of the QSFP28 or CFP2 is a MTP/MTO connector with 8 fibre's.

CFP2 or QSFP28   CFP2 or QSFP28
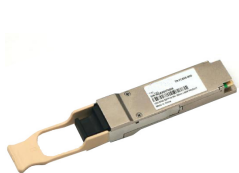
QSFP28   MTP Connector   CFP2

Functions

Port

40 & 100 Gbit MTP (12) connector

Layer 1 switching with nearly no delay (2 ps)

Easy use and operation

LED Indicators

LEDs on the front panel indicate power link and activity status.

Rugged 19" Housing

The Unit is delivered in a ruggedized 19" 1U housing with precise connector labeling on the front panel.

Different Power Versions

48 VDC or 230 VAC in single and dual power supply versions available.

Optic Parameters:

Wavelength	850 nm
Insertion Loss	1 - 2 dB
Crosstalk	75 dB
Return loss	55 dB
Polarisation Dependent Loss	0.03 dB
Switching Time	ms 0.4
Durability cycles	No Wear

Options to activate the bypass:

1) manually via SSH or HTTP
2) power fail
3) smart detection of the bypassed device

Managment:

HTTP,SSH

The Cubro optical switch is a reliable device, designed for highspeed and lossless packet switching.

Cubro optical bypass switch

Functions

The Cubro bypass for 1,10 & 100 Gbit singlemode a link is realized with a mems optical switch per link 4 switches are uses, this 4 switches are combined to one module.

The switching mechanism offers the reliability of a solid state device. The optical switch is a latched version, this means it needs only power during switching. Even when power fails the optical switch stays in the programmed state.

normal mode

Bypassed device

bypass mode

Bypassed device

mems optical switch

A 100 Gig link single mode 1310 nm is typically realized with 1 fibre pair, with 4 wavelenght each of them is transporting 25 Gbit/sec. The connector of the QSFP28 or CFP2 is LC connector with 2 fibre's.

CFP2 or QSFP28 ——————————— CFP2 or QSFP28

Modulators
VOA
Detectors

QSFP28   CFP2

Port

1,10 & 100 Gbit LC connector

Layer 1 switching with nearly no delay (2 ps)

Easy use and operation

LED Indicators

LEDs on the front panel indicate power link and activity status.

Rugged 19" Housing

The Unit is delivered in a ruggedized 19" 1U housing with precise connector labeling on the front panel.

Different Power Versions

48 VDC or 230 VAC in single and dual power supply versions available.

Optic Parameters:

Wavelength	1260 - 1700 nm
Insertion Loss	1 - 2 dB
Crosstalk	75 dB
Return loss	55 dB
Polarisation Dependent Loss	0.03 dB
Switching Time	ms 0.4
Durability cycles	No Wear

Options to activate the bypass:

1) manually via SSH or HTTP
2) power fail
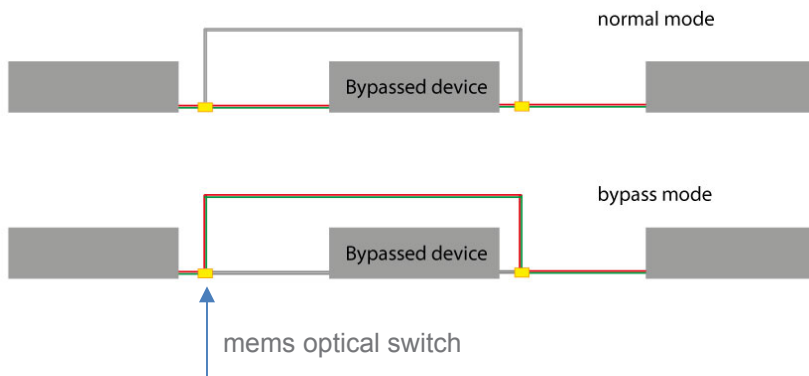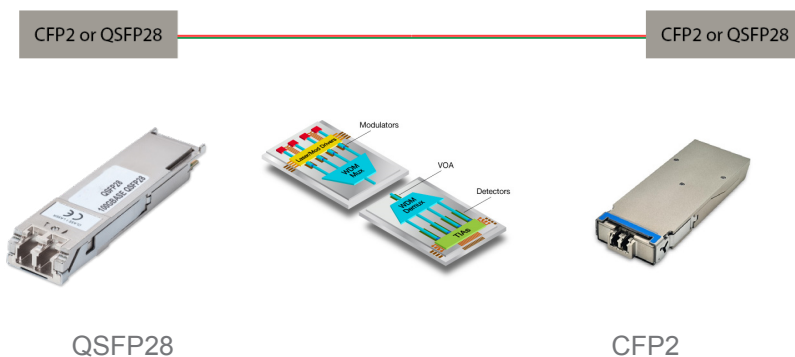3) smart detection of the bypassed device

Managment:

HTTP,SSH

The Cubro optical switch is a reliable device, designed for highspeed and lossless packet switching.