



TMX-440X

Transponder and Muxponder Modules

The TMX-440X Transponders and Muxponders deploy as removable sleds in the SABER-4400 coherent Optical Edge platform..

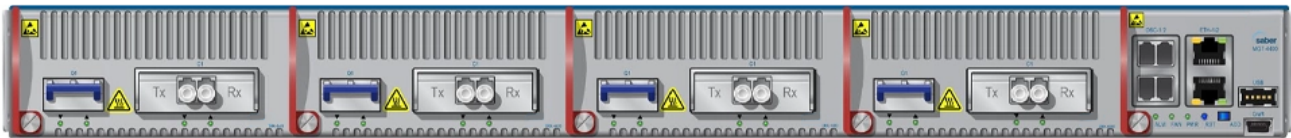
Features & Benefits

- + Flexible family of sleds for SABER-4400 platform
- + Removable, one-slot and two-slot sleds
- + Transponder and multi-client port Muxponder options
- + Hardened, extended temperature range (ETR) options
- + 100G to 400G Coherent DWDM line speeds
- + 100G to 400G client speeds
- + Client and line protection options
- + Operate with Path Protection Modules (PPM)
- + Selection of software-programmable pluggable options
- + CFP2 and QSFP-DD coherent DWDM line options

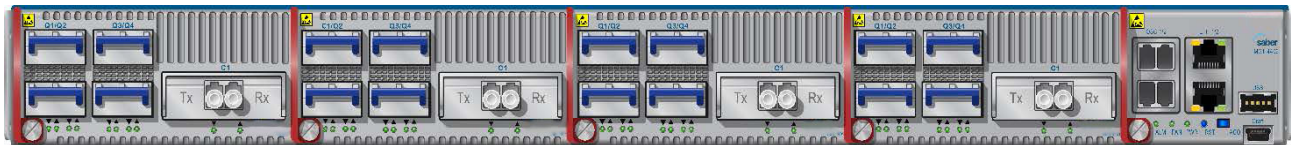
These compact sleds are an ideal “pay-as-you-grow” DWDM transport solution for 10G to 400G services. The family includes one-to-one Transponders for 100G to 400G circuits, as well as Muxponders for combining multiple client interfaces from 10G to 200G onto a single 100G to 400G or dual-protected line coherent tunable DWDM interface. Coherent pluggable line optics include both CFP2 and QSFP-DD with software-programmable modulation formats that can operate in multiple line modes. Full client and line performance monitoring is provided for clear service demarcation, fault localization and SLA assurance.

Both line and client protection are available depending on the sled and coherent optical module used. Many of the sleds are hardened and support extended temperature range. Like all sleds in the SABER family, the TMX-440X family can be managed at the element level using Zhone graphical shelf manager, and at an end-to-end network level using Zhone Xtreme. SNMP and NETCONF/YANG are available for third-party control. Data configuration is based upon openROADM data models.

TMX-440X
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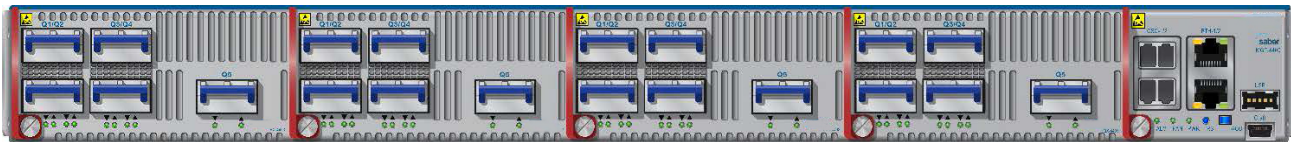
SABER-4400 with 4 TMX-4400 modules



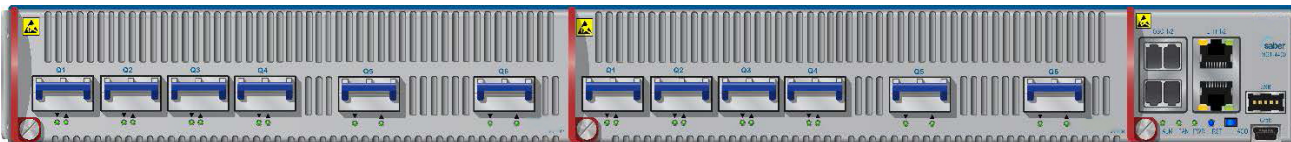
SABER-4400 with 4 TMX-4401 modules



SABER-4400 with 4 TMX-4402 modules



SABER-4400 with 4 TMX-4403 modules



SABER-4400 with 4 TMX-4404 modules

TMX-440X

Transponder and Muxponder Modules

Product Specifications

Base Features

- Flexible family of sleds for SABER-4400 platform
- Removable, one-slot and two-slot sleds
- Transponders and multi-client port Muxponder options
- Hardened, extended temperature range (ETR)
- 100G to 400G Coherent DWDM line speeds
- 25G to 400G client speeds
- Client and line protection options
- Client and line encryption options
- Operate with Path Protection Modules (PPM)
- Selection of software-programmable pluggable optics
- CFP2 and QSFP-DD coherent DWDM line optics
- Advanced client and line performance monitoring and alarming
- OpenROADM data management models
- FlexE, Ethernet and OTN Mapping options

Parameter	TMX-4400	TMX-4401	TMX-4402	TMX-4403	TMX-4404
Width	1 slot	1 slot	2 slot	1 slot	2 slot
Transponder/Muxponder	Transponder	Muxponder	Muxponder	Muxponder	Muxponder
Client ports	1	4	4	4	4
Client port speeds	100 to 400G	25 to 400G	25 to 400G	25 to 400G	25 to 400G
Line ports	1	1	2	1	2
Line port speeds	100 to 400G	100 to 400G	100 to 400G	100 to 400G	100 to 400G
Line interface type	CFP2	CFP2	CFP2	QSFP-DD	QSFP-DD
Built-in protection	No	No	Yes	No	No
Line encryption	Pluggable dependent	Pluggable dependent	Pluggable dependent	Pluggable dependent	Pluggable dependent
Operating temperature	-40 to 65° C	-5 to 50° C	-40 to 65° C	-5 to 50° C	-40 to 65° C
GCC/FCC support	Yes	Yes	Yes	Yes	Yes
Multiplexing Formats	TMX-4400	TMX-4401	TMX-4402	TMX-4403	TMX-4404
Client FlexE mapping	1 slot	1 slot	2 slot	1 slot	2 slot
Client Ethernet mapping	Transponder	Muxponder	Muxponder	Muxponder	Muxponder
4x100GE → 400GE	1	4	4	4	4
Client OTN mapping	100 to 400G	25 to 400G	25 to 400G	25 to 400G	25 to 400G

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Sample of Supported Line Pluggable Coherent Optics

Additional options are available.
Refer to Coherent optics datasheets for specifications.

Part Name	Part Number	Description
CPO-DD-ZRP-01	1029-3505	QSFP-DD Coherent tunable DWDM pluggable for the TMX-4403 and TMX-4404 sleds. Supports openZR+; Extended temperature support in TMX-4404 sled.
CPO-CFP2-OPR-01	1029-3503	CFP2 Coherent tunable DWDM pluggable for the TMX-4400, TMX-4401, TMX-4402 sleds. Supports openZR+ and openROADM MSAs; Extended temperature support in TMX-4400 and TMX-4402 sleds.

Sample of Supported Client Grey Pluggable Optics

Additional options are available.

Part Number	Description
1029-3600	QSFP28, SR4, 100m
1029-3601	QSFP28, LR4, 10km, OTU4
1026-3604	QSFP28, LR4, 10km, 100GbE
1032-3001	QSFP-DD, 400G, LR4
1032-3002	QSFP-DD, 400G, FR4

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Ordering Information

Model	Part Number
TMX-4400	1032-2001
TMX-4401	1032-2002
TMX-4402	1032-2003
TMX-4403	1032-2004
TMX-4404	1032-2005



Zhone Technologies, Inc