

8 port SDH/SONET Muxponder

Efficient aggregation of SDH/SONET traffic

Key benefits:

- Single-board SDH/SONET Multiplexer
- Provides 8 x STM-1/STM-4 or OC-3/OC-12 to STM-16/OC-48 Multiplexing
- OH-Transparency mode enabling transparent transport of tributary signals
- Sub 50ms Client protection
- Line protection¹ providing increased reliability
- Technology agnostic. Pluggable transceivers enable usage in CWDM as well as DWDM networks

The 8 port SDH/SONET Muxponder is a powerful part of Transmode's TM-Series platform enabling optimized and cost efficient transport networks based on CWDM/DWDM technology.

A single board SDH/SONET multiplexer

The 8 port SDH/SONET Muxponder is in essence a standard SDH/SONET multiplexer on a single board. It performs OH-termination, pointer processing, VC-4 switching, parity calculations etc according to the SDH/SONET standards.

The support for up to 8 totally independent client tributaries provides a superb level of flexibility, allowing the flexible combination of the necessary number of STM-1/STM-4 or OC-3/OC-12 signals required for each application.

The 8 port SDH/SONET Muxponder also has some extra features that are not covered in the standards. As an option, it is possible to relay OH-information of the tributaries to provide a semi-transparent transport end-to-end. For example, this is a feature that can be of high importance for a city carrier that needs to preserve the integrity of each tributary signal, but still utilize the transmission network in a cost-efficient way by using multiplexed solutions.

Interfaces based on pluggable optics for low TCO

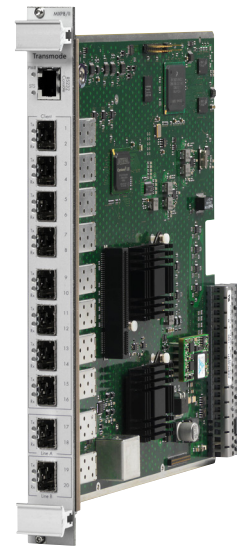
All interfaces are based on pluggable optics, including the line interface. The SFP-based line interface solution enables uncolored, DWDM or even CWDM interface options.

All client interfaces also use SFPs and can therefore support uncolored, CWDM or DWDM options to suit any interfacing requirement.

Usage in multiple applications brings flexibility

The flexibility of the unit enables usage in multiple applications:

- SDH/SONET interconnect: where native STM-16/OC-48 format is of primary importance. This could be the case when the line signal is to be carried through a SDH/SONET network



- CWDM/DWDM networking: Aggregating and transporting SDH/SONET signals in an efficient way on a single wavelength in a WDM network
- Mobile backhauling of STM-1/STM-4 or OC-3/OC-12 signals
- Transparent transport of STM-1/STM-4 or OC-3/OC-12 in Carriers-carrier networks

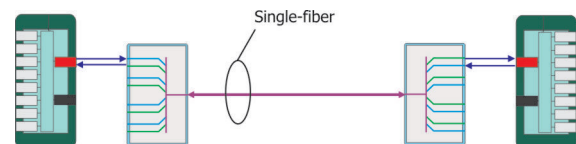


Fig.1 Example CWDM network over single fiber

A typical application is to use the 8 port SDH/SONET Muxponder as an aggregator of STM-1/STM-4 or OC-3/OC-12 signals to reduce the number of transported wavelengths.

Protection of both client and line signals

Client protection can be applied between two client ports on two different units, see figure 2. The protection switch is based on loss of optical signal or loss of frame and will be performed within 50ms.

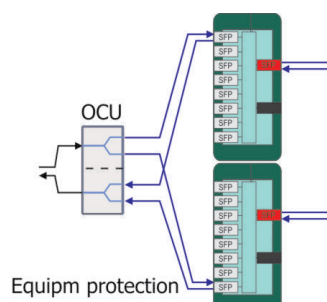


Fig. 2 Client protection

¹ Future release

1+1 Line protection can also be provided¹ by the second line SFP interface, see figure 3.

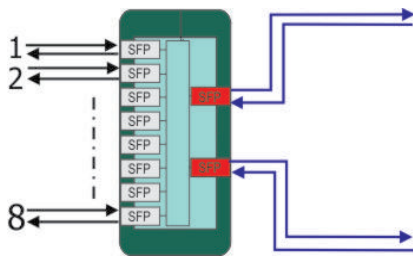


Fig. 3 Line protection

Synchronization sources

Since the incoming tributary signals normally will have different synchronization sources, they need to be frequency aligned prior to being multiplexed.

The frequency alignment is performed via pointer justifications on each incoming tributary signal according to the SDH/SONET standards.

The following synchronization sources can be used:

- Any of the eight incoming tributary signals
- The line signal e.g. received STM-16/OC-48 signal
- Internal, on-board oscillator

The selected synch source is used to synchronize both outgoing tributaries as well as outgoing line signal. Pointer justifications are therefore performed on both incoming as well as outgoing tributary signals.

Change of synch source can be manual or automatic and is hitless.

The S1 byte of the sync source that is used is inserted in all outgoing signals that are synched on this source. This is done to indicate quality of the used sync.

Tailored Network Element options

The 8 port SDH/SONET Muxponder can be mounted in any of the TM-Series chassis options;

- As a self-managed Network Element in a 1U TM-101/102 chassis
- As one of many traffic units in a TM-3000 (10U) or TM-301 (3U) chassis

This enables a tailored setup depending on current and future capacity needs of the site.

In the TM-101/102 option, the 8 port SDH/SONET Muxponder initiates the complete Embedded Node Management (ENM) on the on-board micro processor. This enables local management simply by connecting any PC or work station and launching a standard Internet browser. The embedded management channels enable easy remote management via the line signal. There is therefore no need to provide access to the customer DCN network if the 8 port SDH/SONET Muxponder is placed at a customer site.

Technical specifications:

Interfaces	STM-1, STM-4, OC-3, OC-12
Performance Monitoring	Based on B3 calculations Collected every 15min/24h and presented according to G.826 using ES, SES etc
OH-transparency	In OH-Transparency mode one or more of the following options can be chosen to let groups of bytes be transported transparently: <ul style="list-style-type: none"> • J0 mode: J0 • RSOH mode: E1, F1, D1-D3 and B1 • MSOH mode: E2, D4-D12, B2, K1 and K2 The S1-byte is set to reflect quality of selected sync source. The VC-4 POH is always transparently transported.
Protection	Client protection. 1+1 line protection ¹
Power consumption	Max 27W worst case (with all client ports active and using DWDM SPFs)
Misc interface features	Embedded management channels on line signal Trail Trace insertion to validate connection
Operational modes	SDH or SONET mode
Optical interface options	Client interfaces: SFP MM, SM @ 1310nm/1550nm Line interfaces: SFP 2,7Gb/s 120km/180km DWDM (up to 40 channels) or 40/80/100km CWDM (up to 16 channels)

¹ Future release

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