MARCONI MHL 3000

Optical DWDM solution

General
The Marconi MHL 3000 is a multi-reach Optical DWDM platform for Metro & Core applications, designed for high flexibility when deploying network infrastructure.

The MHL 3000 provides protocol independent transport of SDH/SONET, Ethernet and SAN services, ranging from 100 Mbit/s to 40 Gbit/s, ready for 100Gb/s. High bandwidth optimization via integrated transponders and muxponders ranging from 2.5Gbit/s, to 10Gbit/s and 40Gbit/s.

Flexible node configurations as well as a wide range of transmission formats satisfies, in the most efficient way, any network requirement for present and future traffic needs.

Operational complexity is kept to a minimum by the MHL 3000 “plug and play” architecture. This simplifies network planning, commissioning, maintenance and control, resulting in reduced network complexity and lower cost of ownership.

Key features and benefits for MHL 3000 include:

- Adaptable to any network application through its high modularity and easy configurability for ring and mesh topology.
- Transponders and sub-rate aggregation provide outstanding bandwidth utilization and service support for high-speed data, storage, video and voice services.
- Full implementation of the Optical Transport Networking (OTN-G.709) with end-to-end monitoring.
- Wide range of solutions for router-to-router applications leverage on 10G infrastructure. e.g. 40G transmission based on ODB, DPSK, RZ-DQPSK, and 40G inverse multiplexer.
- Network flexibility with Wavelength Switches nodes for enhanced network connectivity and service provisioning.
- Protection options with 1+1 OSNCP and restoration configuration.
- ‘Plug and play’ solution for smooth and efficient network response.
- Dynamic network control and remote service provision minimize Total cost of Ownership.
- Simplified planning with Optical planner for optimized bandwidth, resources and optical parameters.

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Applications

MHL 3000 is a flexible and versatile platform delivering optimum network performance - linear, ring and mesh topology - with a low first-in cost and scalability up to 80chs. The single platform addresses CWDM applications, for low channel count and short distances, to high DWDM channel counts and longer distances, at rates up to 40Gbit/s, to satisfy increased traffic demand and higher bit rate services. The maximum capacity supported is 3.2 Tb/s.

Flexible network connectivity: Wavelength switches

MHL 3000 Metro supports fully reconfigurable or fixed multi-direction optical add-drop nodes, with 100% channel access. A Wavelength Switch simplifies the customer network planning and reduces human intervention. It provides dynamic re-configurability and reduces OEO cost on a highly loaded network. The solution can be upgraded from a 2 up to an 8 nodal degree with 40 and 80 channels. The architecture enables capacity growth, bandwidth growth and flexibility, with wavelength management and service provisioning. The colourless ROADM functionality avoids pre-assignment of wavelengths also delivering a flexible service.

Removed electrical regeneration

The MHL 3000's strength is the long distance up to 4000km that completely eliminate the need for costly electrical regeneration. Optical by pass significantly improves network economics and reliability on standard long haul applications, in simple rings or meshed topology.

40G connectivity

MHL 3000 enables router-router inter-connects at 40Gb/s on any 10G infrastructure. Fully integrated into the MHL 3000 shelf, the multiple modulation formats (eg Optical DuoBinary, DPSK, RZ-DQPSK) allow the deliver of efficient router connectivity. Full tunable optics simplifies the spare handling, while the restoration mechanism allows protected 40G services with a limited cost premium.

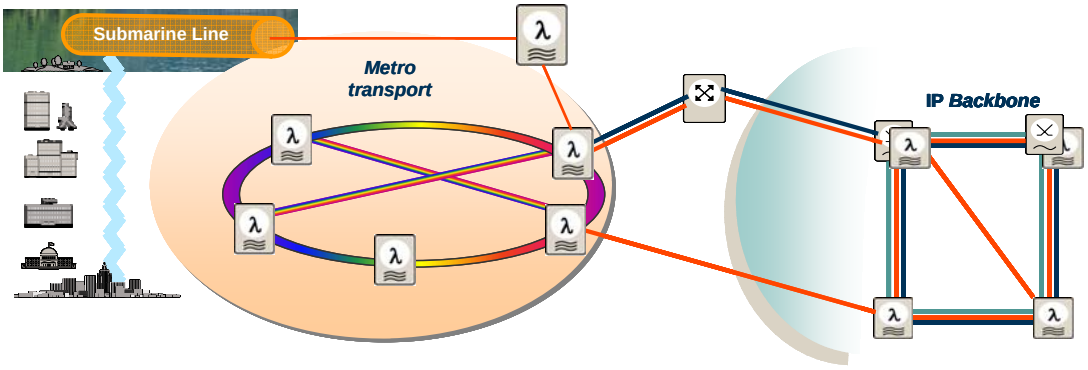
Drop and Continue function

MHL 3000 provides broadcast TV, IP and Ethernet services. The IP TV broadband infrastructure with MHL 3000 is enabled by dropping the signal at each node and broadcasting to the all downstream connected nodes. The solution enables a fast and flexible introduction of new services.

Effective multi-service delivery

MHL 3000 Metro provides protocol independent transport of SDH/SONET, Ethernet and SAN services, ranging from 100 Mbit/s to 40 Gbit/s, and 100Gb/s ready. The MHL 3000 is adaptable to the widest range of network and performance requirements. Modularity is key to the flexible support of multiple service types.

MHL 3000 Application Diagram:



Key Advantages

Optical Transport Network

MHL 3000 interfaces provides an embedded OTN frame structure, which addresses the full network monitoring and supervision required for cost effective end-to-end managed services. All the MHL 3000 interfaces, including 40 Gbit/s, are full ITU-T G.709-conpliance including the 6 levels of Tandem Connection Monitoring and full signal transparency for client TDM and data services. The standard forward error correction (FEC) or enhanced FEC (EFEC), with performance monitoring enable to increase the quality of service.

Festoon-type single span connections

MHL 3000 addresses repeater-free, single-span interconnections for festoon application. The amplification solution based on Raman can easily cope with high span losses of 70dB.

Agile Multi-service Transport Platform

Full Service Broadband supports seamless connectivity on Ericsson products. The efficient use of bandwidth to provide HDTV, IPTV is enabled with agile optical packet transport network solutions in an integrated managed solution. This solution supports full multi-service flexibility from packets data to wavelengths, and TDM aggregation, with a complete end-to-end management, and established ServiceOn network management system.

2,5G interfaces

The MHL 3000 2.5G Xponder is a configurable multi-function card supporting a single or dual transponder with TDM or data aggregation. It offers flexibility with hot pluggable optics: grey, CWDM or DWDM SFPs, combined with options of protection & regeneration. Full payload and overhead transparency for “carrier’s carrier” applications with standard G.709 frame and monitoring. This enables network planning and embedded monitoring facilities, as well as minimizing services’ cost.

10G interfaces

MHL 3000 offers a single and dual multi-rate transponder with pluggable client SFP/XFP optics and TDM and Data muxponders Tunable as well as pluggable DWDM XFP optics enhance spares management. The transport card provides a standard G.709 structure and OTU2 framing with FEC/EFEC to enhance optical performance. The embedded remote management via Data Communication Networks (DCN), and embedded monitoring facilities enhances the QoS.

High network resiliency

MHL 3000 has a comprehensive optical protection suite, to deliver maximum service availability at optimum cost. Standard 1+1 OSNCP can be combined with full card redundancy for single wavelength protection. Optical path restoration and route diversity increases the resilience of Ericsson’s optical portfolio, even against double failures, for efficient and economical use of bandwidth. A distributed Control Plane, based on ASTN architecture and using GMPLS protocols enables dynamic network reconfigurablity.

Management

Ericsson’s ServiceOn OSS solution manages the full Ericsson Broadband Network product range (Optical, Wireless and Broadband Access), delivering end-to-end, best-in-class, service oriented management with seamless OSS integration.

Technical Data

APPLICATIONS Edge, Metro and Core

TOPOLOGY Point-to-point, linear, ring, hubbed, meshed

CAPACITY 80chs @ 40G.

FIBER TYPES G.652, G.653, G.654 and G.655

TRANSMISSION FORMAT NRZ, ODB, RZ , RZ, DPSK, DQPSK

NETWORK APPLICATIONS
- Network size: up to 1000km regional and 4000km core
- Multispan applications (examples): 29 spans at 20 dB @10G, 27 spans at 21 dB @2.5G, 15 span x 20dB @ 40G
- Typically: 25 nodes per ring

OPTICAL AMPLIFIER MODULES
- Output power from +16 to 20.5dBm
- Gain: up to 29 with 10dB gain range
- Dynamics: 1-80channels
- Embedded optical levelling and control
- Raman amplifier: Counter- and co-propagating for Core applications.

OPTICAL ADD-DROP
Multi-direction flexible and fixed OADM's
- ROADM
- WSS up to 8 nodal degrees
- Colourless and directionless option
- 100% add-drop capacity
- C and DWDM filters
- Add-drop filter granularity: 1/2/4 channels
- In service upgrade – band filter

TRIBUTARY CARDS
- 2.5G Xponder: 2xSTM16, 4xGbE/FC, 4xSTM1/4, and 4xESCON, 4xAny
- 10G Multirate transponders (10GbE WAN/LAN, STM-64/OC-192)
- 2x10G multirate transponders (2xSTM-64/OC-192)
- 10 Gbit/s TDM Muxponder (4xSTM-16/OC-48/ODU1)
- 10 Gbit/s Data Muxponder (8xGbE/FC);
- 40 Gbit/s transponder (STM-256/OC-768)
- 40G inverse multiplexer (4x 10G)
- 40G Muxponder (4xSTM-64/OC-192/ODU-2/10GbE)

PLUGGABLE OPTICS Grey, C/DWDM SFP/XFP

TUNABILITY FULL C BAND

OPTICAL CONNECTORS Standard optical connector: SC; High-density card connectors: LC

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PERFORMANCE MONITORING
- Standard G.709
- Embedded analogue monitoring
- Optical performance monitoring (G.697)
- Gigabit Ethernet performance monitoring
- Historical registers (15 minutes and 24 hours)

SERVICES
SDH/SONET/CBR:
- STM1/OC-3/CBR-155 Mbit/s;
- STM-4/OC-12/CBR-622 Mbit/s;
- STM-16/OC-48/CBR-2.5 Gbit/s;
- STM-64/OC-192/CBR-10 Gbit/s;
- STM-256/OC-768/CBR-40 Gbit/s;
- Ethernet:
- Gigabit Ethernet;
- 10G Gigabit Ethernet WAN/LAN-Phy;

Video:
- 270 Mbit/s

Storage:
- Ficon, Fiber Channel: 1G/2G/4G/10G;
- Escon

MANAGEMENT
- Management protocols: Q Ethernet; OSI or IP-based DCN;
- Element Manager: ITU-T 3010;
- Q.Protocol: ITU-T G.733, Q.811 and Q.812;
- Qecc Protocol: ITU-T G.784
- TL1 interface

MECHANICAL SPECIFICATION
Shelf Dimensions (w x d x h)
- CLE 450mm x 230mm x 50mm
- Compact 450mm x 280mm x 220mm
- Single row shelf 500mm x 280mm x 495mm

RACK: ETS 300 119-3, ANSI 19"/23"

SUPPLY VOLTAGE -48 VDC to -60 VDC nominal

STANDARDS CONFORMANCE
- Optical Safety: IEC 60825, Hazard Level 1M;CDRH Laser Notice No.50
- Electrical Safety: IEC and UL 60950
- Climatic ETSI 300-019-1-3: Class 3.1e/3.2
- Transport: ETSI 300-019-1-2: Class 2.3;
- Storage: ETSI 300-019-1-1: Class 1.2;
- NEBS Level 3:GR 63, GR 109
- OSMINE, TL-1 compliance.
- Acoustic noise: ETSI 300-753.
- Electromagnetic Compatibility: ETSI 300-753, FCC Part 15

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