

XTM SERIES

EMXP ACCESS UNIT

Hardened Packet-Optical Transport Switch – Optimized for Access

The **EMXP Access Unit (TM-EMXP-1U)** is part of the Infinera XTM Series, providing an access-optimized packet-optical transport switch that seamlessly integrates WDM transport capabilities and Layer 2 metro Ethernet functionality. With its temperature-hardened design and flexible port capabilities, it is ideal for use even in extreme environments.

The EMXP Access Unit inherits all the key capabilities found in the EMXP11e range of products including resiliency, management and application-specific characteristics, such as superior synchronization and low latency.

Optimized for Access – Flexible Port Configuration

The flexible port architecture of the EMXP Access Unit offers multiple port configurations in a 1 rack unit (1RU) access device. The small form-factor pluggable (SFP) and enhanced small form-

factor pluggable (SFP+)-based ports provide services such as Gigabit Ethernet (GbE), 10 GbE and Fast Ethernet (FE) and allow network operators a space-optimized access unit to mix and match service types for the best possible fit. Service options can be enhanced further by adding built-in electrical 1000/100/10 BaseT ports on the EMXP Access Unit.

Hardened Design – for Harsh Environments

The hardened design and extended temperature range (ETR) capabilities of the EMXP Access Unit make it ideal for deployments in non-controlled or harsh environments. An optional outdoor plant cabinet is available to house the EMXP Access Unit, resulting in a compact Ethernet demarcation unit that is ideal for outdoor locations in the access network.



Key benefits:

- Compact and cost-efficient access and aggregation of FE/GbE and 10 GbE local area network (LAN) services
- Flexible port capabilities with different port configuration options using SFP and SFP+ optics and built-in electrical ports
- Hardened design, extended temperature range and mounting in optional outdoor plant cabinet make it ideal in non-controlled, harsh or even outdoor environments
- Synchronous Ethernet and high-accuracy time-of-day distribution support for high-quality mobile network synchronization and TDM circuit emulation over Ethernet applications
- Metro Ethernet Forum (MEF) Carrier Ethernet 2.0 (CE 2.0)-compliant on all MEF services, including E-Line, E-LAN, E-Tree and E-Access
- Support the OpenFlow™ specification and provides an SDN-ready access device for increased network efficiency and reduced operational costs
- Ultra-low latency and zero jitter
- Sub 50 ms network resiliency
- Support for gray, CWDM and fixed/tunable DWDM optics for maximum flexibility

Ideal for Mobile Applications

The EMXP Access Unit offers efficient pre-aggregation for mobile applications such as mobile backhaul. It can aggregate traffic from cell sites, cloud-radio access network (C-RAN) central office sites or fixed Ethernet access.

Thanks to its superior synchronization and low latency capabilities, the EMXP Access Unit provides the high performance required by Long Term Evolution Advanced (LTE-A) and 5G. Further details on EMXP Access Unit synchronization capabilities are provided below.

The EMXP Access Unit is MEF CE 2.0-compliant and offers all CE 2.0 services including E-Line, E-LAN, E-Tree and E-Access. Accordingly, the EMXP Access Unit is ideal for Business Ethernet applications as well.

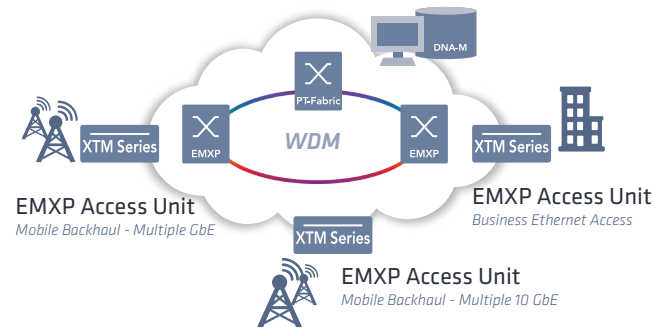


Fig: The Access-optimized EMXP Access Unit, with its Hardened Design and Key Performance Characteristics, Is Ideal In Applications Such as Mobile Backhaul and Business Ethernet

SDN-ready Access

The EMXP Access Unit supports the OpenFlow specification and is software-defined networking (SDN)-ready, allowing network operators to benefit from the increased network efficiency and reduced operational costs that an SDN-based network offers.

When the EMXP Access Unit is set to operate in SDN mode, it allows an external controller to manage resources in the data plane so that services can be created in a more automated and dynamic way.

Together with Infinera's Xceed Multi-layer SDN platform and the range of Xceed Applications, the EMXP Access Unit provides an SDN-driven access network.

Unified Management

The EMXP Access Unit is fully supported by and integrated into the Infinera Digital Network Administrator (DNA) multi-layer network management suite. DNA provides a full set of tools to plan, deploy and operate transport networks in a cost-effective and simple manner. DNA management provides a single system for multi-layer metro networks, template-based service provisioning and powerful troubleshooting capabilities.

Superior Synchronization and Low Latency Capabilities

As part of the Infinera EMXPiIe range, the EMXP Access Unit has leading edge synchronization and latency performance capabilities. The EMXP Access Unit provides built-in support for frequency through Synchronous Ethernet (SyncE) and for phase and time-of-day through precision time protocol (PTP). The SyncE implementation in the EMXP Access Unit supports clock selection logic and on-board holdover that exceeds Synchronous Digital Hierarchy (SDH) requirements. Synchronization signaling is used to provide traceability of the synchronization source and to do automatic synchronization source selection, resulting in highly reliable network synchronization.

The EMXP Access Unit has industry-leading 2 microseconds latency and near-zero jitter for all packet sizes, regardless of traffic load. Accordingly, the EMXP Access Unit is ideal for Ethernet applications in which latency and jitter are important, such as services for LTE backhaul, financial institutions and video distribution.

Resiliency in Access Networks

The EMXP Access Unit supports various network resiliency schemes, such as the IEEE 802.3ad link aggregation group (LAG). Normal LAG as well as N+1 and N+N protection LAG are supported. Furthermore, LAG can be distributed over two separate EMXP Access Units in a "multi-chassis LAG" that coordinates information to present a single LAG to the connected system.

For Ethernet transported over MPLS-TP pseudowires, protection is achieved with pre-defined back-up paths that ensure service continuity if the primary path fails. One of the benefits of MPLS is that it is possible to provide protection over any type of topology, including ring, full mesh or partial mesh, without involving a control plane.

Protection switching is performed with carrier-class sub-50 millisecond protection using any of the protection schemes detailed in the table below.

Specifications

Interfaces	<p>8xGbE/FE interfaces (SFP):</p> <ul style="list-style-type: none"> • Uncolored multi-mode and single mode • CWDM up to 16 channels and HD-CWDM for up to 36 channels • Single-strand fiber solution • Electrical SFP for 10/100/1000BASE-T • Support for SDH/SONET over Ethernet with iSFP <p>4xElectrical 10/100/1000BASE-T (RJ45)</p> <p>4x10G interfaces (SFP+):</p> <ul style="list-style-type: none"> • 10G Ethernet LAN mode • GbE if SFP is used • Uncolored multi-mode and single-mode • CWDM up to eight channels, DWDM up to 80 channels • Multispeed. SFP+ ports also support SFP and GbE interfaces
Resilience	<p>Link Aggregation with LACP. Normal LAG, N+1 and N+N protection LAG, Multi-chassis LAG</p> <p>ITU-T G.8032 Ethernet Ring Protection v1 and v2</p> <p>Supports Ethernet Ring over LAG and in-service adding/removing links</p> <p>MPLS-TP Linear Protection with Protection State Coordination (PSC) RFC6378</p>
Ethernet Services	E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN), E-Tree (EP-Tree), E-Access CE 2.0-compliant, MEF 9+14
Synchronous Ethernet and Timing	<p>ITU-T G.8262 Synchronous Ethernet Equipment Clocks (EEC)</p> <p>ITU-T G.8264 Ethernet Synchronization Messaging Channel (ESMC)</p> <p>ITU-T G.781 Synchronization Status Messages (SSM)</p> <p>IEEE 1588v2 Transparent Clock</p>
Performance Monitoring/ Operations, Administration and Management	<p>IEEE 802.1ag Continuity Check and Loopback, Port Mirroring</p> <p>MPLS G-ACh channel for OAM RFC5586</p> <p>Bidirectional forward direction (BFD) for MPLS Label Switched Paths (LSPs) RFC5884</p> <p>Management VLAN for in-band management</p> <p>Port isolation using private VLAN technique</p> <p>Y.1731 Loss Measurements and Delay Measurements</p> <p>Link Layer Discovery Protocol (LLDP)</p>
Source-specific Multicast	RFC4607 Source-Specific Multicast for IP RFC4541 IGMP Snooping
TDM over Ethernet	<p>STM-1 and OC-3 via circuit emulation over Ethernet in iSFP-TDM155</p> <p>STM-4 and OC-12 via circuit emulation over Ethernet in iSFP-TDM622</p> <p>STM-16 and OC-48 via circuit emulation over Ethernet in iSFP-TDM2488</p> <p>E1 via circuit emulation over Ethernet in iSFP-E1</p> <p>T1 via circuit emulation over Ethernet in iSFP-T1</p>
L2 Switching	<p>Selectable learning enabled per VLAN, 4,094 VLAN IDs, 128K MAC-addresses</p> <p>Storm control</p> <p>IEEE 802.1ad Q-in-Q SVLAN</p> <p>Flexible VLAN tag handling: push, pop, swap, pop-swap</p> <p>Super jumbo frames up to 10248 Bytes</p>
Physical Specifications	<p>1 RU, 19" standard rack mount</p> <p>Height: 44 mm (1.73 in)</p> <p>Depth: 197 mm (7.75 in) excl. mounting brackets</p> <p>Width: 445 mm (17.51 in) excl. mounting brackets</p> <p>Weight: 2.95 kg (6.50 lb) excl. mounting brackets</p>
Extended Temperature Range	<p>ETR -40 to +65 °C / -40 to +149 °F</p> <p>GR-3108 Class 2 - Protected Equipment in Outside Environments</p> <p>Full IP65 rating with dust and water protection together with cabinet</p>
Power	<p>Typical: 54 watts (W)</p> <p>Max: 70 W</p> <p>Dual DC inlets. Redundant, wide input DC (24V - 57,0V)</p> <p>External AC/DC converter. Two AC/DC units used for dual/redundant power. Only standard operating temperature.</p> <p>Multiple, redundant fixed fans</p>
Regulatory and Certification	<p>IEC 60950-1 / UL 60950-1 / CSA C.22.2 No 60950-1</p> <p>FCC Part 15 Class A, ICES-003</p> <p>CE Marking and RoHS Compliant, WEEE Compliant</p>

Specifications and Features Are Subject to Change

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