

## XMC20 ETO12

High-density Ethernet unit with optional Standalone Bridge (SAB) mode for Mission-Critical Networks



The Ethernet unit ETO12 provides 12 Ethernet interfaces for optical or any of the wide range of electrical SFP modules (choice of 100 Mbps or 1,000 Mbps). Default unit (factory) software and mode provides Ethernet services using XMC20 chassis switch. An alternative optional unit software can be loaded to allow standalone bridge (SAB) mode for segregation of Ethernet services. In SAB mode, on-unit VLAN wire speed switching functionality allows segregation of one layer-2 switching instance dedicated to select service(s), isolated from other switch instances running on either other Standalone units or XMC20 chassis switch.

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01 Optical Ethernet units ETO12 (left) and variant for fanless operation ETO12-F, operating either in Chassis switch mode or Standalone bridge mode

- 12 x 100 Mbps/1,000 Mbps Ethernet interfaces
- For XMC25, XMC23 and XMC22 supporting 1/10 Gbps access to the backplane
- Synchronous Ethernet readiness
- Supports XMC20 chassis switch mode or optional standalone bridge mode (optional software)
- Designed for indoor and outdoor usage
- Fanless operation possible
- All functions from one network management system

### Ethernet services

ETO12 delivers advanced Ethernet functionalities such as VLAN tagging/ stacking, jumbo frames,

VLAN QoS, RSTP/MSTP (MSTP is supported only in System Release R4 with chassis switch mode).

Up to 240 optical or electrical connections can be provided with a fully-equipped subrack. ETO12 is ideal for high availability mission-critical Applications, in the context of transport, authority, oil-&-gas and utility networks which require performance in extreme environmental conditions. Ethernet data aggregated on ETO12 can also take advantage of the different XMC20 multiservice capabilities and the variety of interfaces and transport technologies, e.g. optical and electrical MPLS-TP and the SDH uplink via Ethernet over SDH.

**Chassis switch mode with default unit software**

ETO12 unit loaded with its (factory) default unit software allows the unit to be part of XMC20 chassis switch architecture. This means that XMC20 is one switch and an expandable number of ports. Every inserted Ethernet unit will expand the switch. With it one can adapt network access point to the local demands.

**Standalone bridge mode with optional unit software**

ETO12 unit can alternatively be loaded with SAB unit software to provide on-unit VLAN Bridge function (independent switching instance). This allows for segregation of services on this switch instance from other instances, including XMC20 chassis switch. The ETO12-SAB can be used either using EoS (front connection) or MPLS-TP (backplane) uplink. Each ETO12-SAB option allows creation of VLAN enabled and independent switching instance, therefore allowing the creation of separate Ethernet network and separation of traffic into different SDH channel or MPLS-TP link. Multiple ETO12-SAB option create multiple segregated instances. ETO12-SAB also enables higher flexibility of (CE) VLAN bundling and service multiplexing.

**Fanless operation**

ETO12-F can be operated in subracks without a fan unit (passive cooling). Passive cooling reduces operational costs, because no maintenance-intensive mechanical components are in the access

node.

**Safety concept**

XMC20 offers highest reliability and quality. For this purpose all modules come with an onboard power supply and high MTBF values.

**Management**

All modules of XMC20, including a variety of services and applications, are managed centrally by the UNEM management system, the network management system for the complete communications portfolio. Easy and intuitive configuration with user dialogues and equipment views is ensured by ECST, the graphical configuration tool. With UNEM and ECST systems, customers can enhance the overall performance of their operational networks, reducing costs and accelerating the circuit provisioning process with only one element manager for all service types.

## Technical Data

<b>Data Transmission</b>	
Ethernet ports	12 x 100 Mbps or 1,000 Mbps optical or electrical ports
Connector type	LC or SC depending on optical SFP
Optical transmission	Bidirectional or unidirectional depending on optical SFP
Electrical transmission	CAT5 or CAT5e
<b>Standalone mode (SAB Software option) Functionality</b>	
Switching capacity	22 Gbits/s, 33 M frames/s, wire speed traffic forwarding @ 84 bytes/frame
MAC Table	Wire speed MAC address learning CAM table size 16000 addresses
Maximum number of rate limiters (including the number of CVP and PWAC ports)	250
<b>Ethernet Functionality</b>	
VLAN services	Customer bridging acc. to IEEE 802.1Q-2011, 4096 VLANs supported Port-based customer VLAN tunneling (Q-in-Q) Port-/PCP-/DSCP-based classification (CoS) of ingress traffic with eight priority queues per port Maximum frame length of up to 9'216 bytes (Jumbo frames)
Port Mirroring (Chassis switch mode only)	Up to 32 source ports (RX/TX traffic) to a single mirror port
Port Security	Ingress Storm Control (flood control, flood rate limiting)
Spanning Tree Protocols	RSTP (Rapid Spanning Tree Protocol), acc. to IEEE 802.1D-2004 MSTP (Multiple Spanning Tree Protocol), acc. IEEE 802.1Q-2011 (system software release dependence)
ERPS	Chassis switch mode: combined with central unit Ethernet Ring Protection Switching (ERPS), acc. to ITU-T G.8032v2 (system software release dependence)
MPLS-TP	Ethernet ports can be used as Pseudo Wire Attachment Circuit (PWAC) ports or Customer VLAN (CVP) ports in MPLS-TP networks (installed software dependence)
<b>Further Hardware Information</b>	
MTBF	50 years at 35° C
Ethernet backplane access	1 Gbps or 10 Gbps
<b>Management</b>	
ECST	For local management and offline configuration
UNEM	For central management
<b>Power Supply</b>	
Input voltage nominal (min/max)	-48/-60 V DC (-39.5 V DC ... -72 V DC)
<b>Operation Environment</b>	
Temperature range and humidity	According to XMC20 environmental specifications

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