

FOX615 ETOP1

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



The Ethernet unit ETOP1 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 FOX615 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 FOX615 chassis switch.

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01 Optical Ethernet units ETOP1 (left) and variant for fanless operation ETOP1-F, operating either in Chassis switch mode or Standalone bridge mode

- 12 x 100 Mbps/1,000 Mbps Ethernet interfaces
- For FOX615 and FOX612 supporting 1/10 Gbps access to the backplane
- Synchronous Ethernet readiness
- Supports FOX615 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

The ETOP1 hardware is designed for Synchronous Ethernet (SyncE) applications such as master clock systems to achieve accurate transmission times and

reduce jitter/wander as well as asymmetric delay.

ETOP1 delivers advanced Ethernet functionalities such as VLAN tagging/ stacking, jumbo frames, VLAN QoS, RSTP/MSTP (MSTP support is system software release dependent).

Up to 240 optical or electrical connections can be provided with a fully-equipped subrack. ETOP1 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 ETOP1 can also take advantage of the different FOX615 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

ETOP1 unit loaded with its (factory) default unit software allows the unit to be part of FOX615 chassis switch architecture. This means that FOX615 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

ETOP1 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 FOX615 chassis switch. ETOP1-SAB also enables higher flexibility of (CE) VLAN bundling and service multiplexing.

The ETOP1-SAB can be used either using EoS (front connection) or MPLS-TP (backplane) uplink. Each ETOP1-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 ETOP1-SAB option create multiple segregated instances.

Fanless operation

ETOP1-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

FOX615 offers highest reliability and quality. For this purpose all modules come with an onboard power supply and high MTBF values.

Management

All modules of FOX615, including a variety of services and applications, are managed centrally by the FOXMAN management system, the network management system for the complete communications portfolio. Easy and intuitive configuration with user dialogues and equipment views is ensured by FOXCST, the graphical configuration tool. With FOXMAN and FOXCST systems, utilities 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

Data Transmission	
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
Standalone mode (SAB Software option) Functionality	
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
Ethernet Functionality	
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 (system software release dependence)
Further Hardware Information	
MTBF	50 years at 35° C
Ethernet backplane access	1 Gbps or 10 Gbps
Management	
FOXCST	For local management and offline configuration
FOXMAN-UN	For central management
Power Supply & Other	
Input voltage nominal (min/max)	-48/-60 V DC (-39.5 V DC ... -72 V DC)
Operation Environment	
Temperature range and humidity	According to FOX615 environmental specifications

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