

## FOX615 EPOI1

High density Ethernet unit with Power over Ethernet support and optional Standalone Bridge mode in mission-critical networks

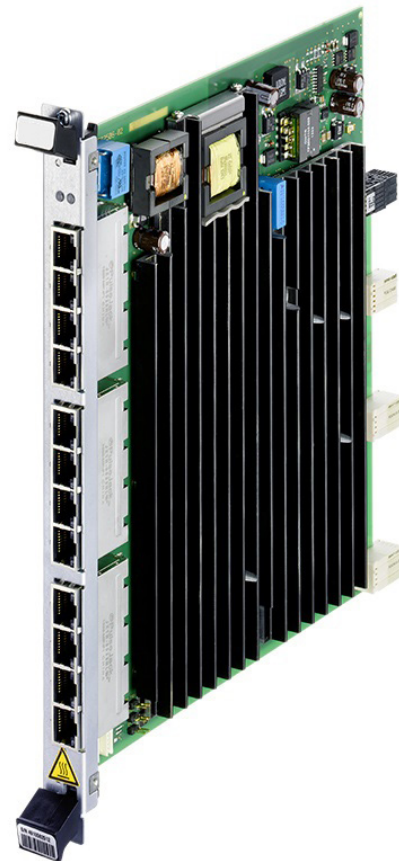
### FOX615 EPOI1

The Ethernet unit FOX615 EPOI1 offers 12 Ethernet ports with Power over Ethernet (PoE) capabilities, providing up to 30 W per port (PoE+).

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.

The EPOI1 capability to distribute PoE, together with its switching functions, makes it particularly suitable for addressing the need for Ethernet connectivity on locations where powering facilities are not easily accessible.

- 12 x 10/100/1000BASE-T ports with PoE support (PoE+)
- Synchronous Ethernet readiness
- For FOX615 family subracks
- Supports FOX615 chassis switch mode or optional standalone bridge mode (optional software)
- Combined with central unit, can be part of MPLS-TP or ERPS networking (system software dependent)
- Fanless operation supported
- All functions managed out of one management system



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### Power over Ethernet in FOX615

On many locations, Ethernet connections must be provided to a variety of devices like video cameras, IP telephones, access systems, wireless access points. Sometimes, providing a power outlet to these devices would imply additional investment to get the infrastructure in place. In these cases, having the power delivered to the devices using the Ethernet cable is of great advantage. Additional to providing power without the need for additional infrastructure, PoE installations also allow having a single centralized backup system in the case of power failure. The backup for the telecommunication equipment also serves as the backup for all the devices powered by it. Some of the applications that can be served by PoE capabilities are video surveillance, security access control Voice over IP telephony, and industrial automation.

EPOI1 provides an embedded PoE capability in order to solve the issue of lack of powering infrastructure, plus the advantage to make installations of this type a lot faster.

#### **Chassis switch mode with default unit software**

EPOI1 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**

EPOI1 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. The EPOI1-SAB can be used either using EoS (front connection) or MPLS-TP (backplane) uplink. Each EPOI1-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 EPOI1-SAB option create multiple segregated instances. EPOI1-SAB also enables higher flexibility of (CE) VLAN bundling and service multiplexing.

#### **Ethernet services**

The EPOI1 hardware has been prepared for Synchronous Ethernet (SyncE) to synchronize on NE clock and achieve accurate transmission times and reduce jitter/wander as well as asymmetric delay.

EPOI1 delivers advanced Ethernet functionalities such as VLAN tagging/stacking, jumbo frames, VLAN QoS, RSTP, and port security.

EPOI1 provides high bandwidths of up to 1,000 Mbps via standard RJ45 connectors. Each of the electrical Ethernet interfaces can be configured individually. In addition to the 10 GbE backplane access, which can be used with FOX615 Central unit. This provides sufficient capacity for future requirements.

Ethernet services aggregated on EPOI1 can also take advantage of the different FOX615 multi-service capabilities and the variety of interfaces and transport technologies, e.g. optical and electrical Ethernet and the SDH uplink via Ethernet over SDH.

#### **ERPS for protection switching**

In Chassis switch mode, combined with chassis central unit, EPOI1 can be part of system solution of Ethernet Ring Protection Switching (ERPS) for rapid restoration within Ethernet networks in ring topologies. ERPS support is installed software dependent.

ERPS compliance with ITU-T G.8032v2 allows ring interconnections supporting major/subring configurations and multiple ERP instances (or multiple logical rings).

#### **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).

#### **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 services are managed centrally via the management system FOXMAN-UN or via local management access (FOXCAST).

## Technical Data

<b>Data Transmission</b>	
Number of ports	12 x 10/100/1000BASE-T, acc. to IEEE Std. 802.3-2008.
Connector	RJ45
<b>Power over Ethernet</b>	
Standards supported	PoE acc. to IEEE802.3af-2003, PoE+ acc. to IEEE 802.3at-2009 Electrical Isolation (Environment A) acc. to IEEE Std. 802.3-2008
Supported functionality (on each port)	PoE ports functioning as power sourcing equipment (PSE) supporting detection/ classification of Powered Devices (PDs)
Total power feeding	Up to 84 W of accumulate power budget for all PoE ports (measured at the outputs)
<b>Synchronization</b>	
SyncE	Synchronous Ethernet ready for downstream mode
<b>Ethernet Functionality</b>	
Ethernet Functionality	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 (depending on installed software)
ERPS	Chassis switch mode with ERPS on central unit (installed software dependent)
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>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
<b>Management</b>	
FOXCST	For local management and offline configuration
FOXMAN-UN	For central management
<b>Power Supply &amp; Other</b>	
Input voltage nominal (min/max)	-48/-60 V DC (-39.5 V DC ... -72 V DC)
MTBF	50 years at 35 °C
<b>Operation Environment</b>	
Temperature range and humidity	According to FOX615 environmental specifications