

FOX615 CESM1/CESM2 Core Units

Designed for packet-switched transport in mission-critical networks



CESM1 and CESM2 are MPLS-TP capable core units for the FOX615/612 Multiservice Platform optimized for mission-critical networks.

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01 Core unit CESM1/2 (left) and variant for fan-less operation CESM1/2-F

MPLS-TP readiness

CESM1 and CESM2 core units perform all node management functions of the FOX615/612 platform and data transport for the packet traffic. Designed to meet the most stringent environmental requirements, available are versions for fan-less operation, respective CESM1-F and CESM2-F.

CESM1 and CESM2 support MPLS-TP functionality, providing the application of MPLS protocol to the construction of packet-switched transport networks for mission-critical applications.

MPLS-TP allows provisioning of explicit co-routed bidirectional connection-oriented paths, static routing, protection (1:1), fast restoration mechanisms (below 50ms) and a comprehensive set of functions for operation and maintenance of a network without a dynamic control plane and IP forwarding.

CESM1 and CESM2 fully support the hybrid approach of FOX615/612 Platform thus enabling parallel operation of SDH and MPLS-TP networks and a smooth migration from SDH to MPLS-TP networks.

Key features

- MPLS-TP capable for packet-switched transport networks
- Support of Optical and Electrical Ethernet interfaces
- ERPS for Protection Switching in Ethernet rings
- Core Unit Hardware Redundancy
- SyncE and IEEE 1588v2 on all Ethernet front ports
- OSPF Routing for Management traffic

1:1 equipment protection

CESM1 and CESM2 can be installed redundantly in the FOX615/612 chassis. The redundant core unit works in a standby mode and takes over operation in case a failure occurs in the active unit. This mechanism ensures highest availability of the system, including the packet data layer, timing and synchronization as well as network element management.

ERPS for protection switching

CESM1 and CESM2 support Ethernet Ring Protection Switching (ERPS) for rapid restoration within Ethernet networks in ring topologies. ERPS compliance with ITU-T G.8032v2 allows ring interconnections supporting major/sub-ring configurations and multiple ERP instances (or multiple logical rings).

Timing and synchronization

The timing and synchronization functionalities include a 2048 kHz reference clock input.

The front ports support Synchronous Ethernet (SyncE) and IEEE 1588v2 (PTP). These options allow for synchronous timing and a very high timing precision of sub-microseconds that are required for various applications.

Management

All FOX615 functions are managed centrally via the management system FOXMAN-UN or via a local craft terminal (FOXCAST).

Technical data

Interfaces	CESM1	CESM2
Optical (SFP)	2 x 10 GbE	2 x 10 GbE 2 x 1 GbE
Electrical (RJ45)	3 x 10/100/1000BASE-T/TX with auto-negotiation (half/full duplex modes)	1 x 10/100/1000BASE-T/TX with auto-negotiation (half/full duplex modes)
SFP Modules	SFP+ modules (10GBASE-LR) / SFP modules (1000BASE-SX/-LX/-EX/-ZX)	
Synchronization		
Synchronous Ethernet	According to ITU-T G.8262 to transfer clock signals over Ethernet physical layer	
Synchronous Ethernet ESMC	According to ITU-T G.8264 for indication of clock quality level.	
Precision Time Protocol	According to IEEE 1588-2008v2 for the synchronization of network clock and time of day (ToD)	
Ethernet Functions		
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	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	
Ethernet Ring Protection Switching (ERPS)	According to ITU-T G.8032v2, supporting up to 12 ERP instances	
MPLS-TP	MPLS-TP function acc. to IETF RFC5921 Deterministic (static) LSP/PW configuration without the use of control plane protocols Co-routed bidirectional LSP supporting 1:1 linear protection environmental specification MPLS-TP L2 VPN support for VPWS	
Reverse Layer 2 Gateway Protocol (R-L2GP)	According to IEEE 802.1ah on MPLS-TP ports	
Management		
Functions	Management and control of FOX615/612 and all plug-in units Database with management information, Embedded software download Alarm collection and notification, External alarm interfacing via backplane and management OSPF routing for management traffic, Management via PDH ECC	
FOXCAST	Local management system	
FOXMAN-UN	Central management system	
Power Supply		
Input voltage nominal (min/max)	-48/-60 V DC (-40.5 V DC ... -72 V DC)	
Power consumption	30W	
Operation Environment		
Temperature range and humidity	As per FOX615 Platform	
Reliability	23-year MTTF at 35°C (MIL-HDBK-217F) fan-less operation 46-year MTTF at 35°C (MIL-HDBK-217F) fan-based operation	