

XMC20 COGE5/COGE7

Core unit of the XMC20 Platform, designed for packet-switched transport in mission-critical networks

XMC20 COGE5/COGE7

COGE5/COGE7 is a core unit for the XMC22, XMC23, and XMC25, optimized for applications in mission-critical networks. It performs all central functions of the system and data transport for the Ethernet traffic and data synchronization.

- Support of Optical and Electrical Ethernet interfaces
- MPLS-TP capable for packet-switched transport networks
- ERPS for Protection Switching in Ethernet rings
- Core Unit Redundancy support
- SyncE and IEEE 1588v2 on all Ethernet front ports
- Support XMC20 Chassis Switch Architecture
- OSPF Routing for Management traffic

Interfaces

COGE5 comes with three electrical interfaces and two cages for optical SFP+ or SFP modules.

COGE7 comes with a single electrical interface and four cages for optical SFP+ or SFP modules.

Multiple 10 GbE or 1 GbE uplinks can be realized as well as a redundant 1:1 connection for protection of the transmission.

The 10/100/1000BaseT interfaces can be used for cascading or ring connection with other XMC20 or also for the uplink.



01 Core unit COGE5 (left) and variant for fanless operation COGE5-F

MPLS-TP readiness

COGE5/COGE7 support MPLS-TP functionality, providing the application of MPLS to the construction of packet-switched transport networks.

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

ERPS for Protection Switching

COGE5/COGE7 supports 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).

1:1 Equipment Protection

COGE5/COGE7 can be installed redundantly in the XMC20 subracks. The redundant COGE5/COGE7 works in a hot standby mode and takes over operation in case a failure occurs in the active unit. This mechanism ensures the highest availability of the system.

Timing and Synchronization

The timing and synchronization functionalities include a 2048 kHz reference clock input as well as Synchronous Ethernet (SyncE) and IEEE 1588v2 (PTP) support. These options allow for synchronous timing and a very high timing precision of sub-microseconds that are required for various applications.

Management

All services are managed centrally via the management system UNEM or via the local craft terminal ECST.

Technical Data

Interfaces	COGE5	COGE7
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 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 XMC20 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	
ECST	Local management system	
UNEM	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 XMC20 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	