

FOX615 DEFM1

High-density SHDSL EFM with advanced switching for mission-critical applications



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01 DEFM1 (left) and
variant for fanless
operation DEFM1-F

The 24 SHDSL front-ports of DEFM1 can be bonded in groups of up to four ports for increasing the transport capacity. The DEFM1 may be used for interconnection of various services as LAN interconnection or voice and video transmission from a remote side CPE or subtended FOX615 via copper lines.

- 24 x SHDSL/SHDSL.bis (EFM) with up to 5.7 Mbps per port
- Line aggregation of up to 4 ports with max. 22.8 Mbps
- LT/NT-mode for subtending over copper
- ERPS* for protection switching in Ethernet rings
- Network clock distribution over DSL-line
- Supports FOX615 chassis switch architecture
- For all FOX615 subracks
- Designed for indoor and outdoor deployment
- Supports fanless operation
- All functions out of one network management system

The DEFM1 SHDSL Ethernet unit for FOX615 provides the transport of symmetrical Ethernet services over plain copper cables.

For transmission, the reliable and robust SHDSL EFM (Ethernet First Mile) technology acc. ITU-T G.991.2 and IEEE 802.3-2012 is used.

SHDSL.bis

With TCPAM 16/32 line coding acc. to Annex A/B and F/G of ITU-T G.991.2 DEFM1 is able to transport up to 22.8 Mbps over four ports.

Pair bonding

DEFM1 provides line aggregation of up to four wire pairs, supporting different rates on the pairs of a bundle for optimum bandwidth and signal to noise ratio. The traffic remains in case of linefaults (with reduced bandwidth), as long as at least one pair of the bundle is operating.

Ethernet over very long distance

For very long distance applications, DEFM1 supports up to 8 cascaded SHDSL EFM regenerators. Thereby, the achievable transfer distance can be expanded up to the factor 9.

Multiple network topologies

Due to LT/NT-configuration capability in conjunction with network-clock distribution option, DEFM1 provides FOX615 subtending and the realization of star-, ring- and meshed network topologies with FOX615 over copper cables via SHDSL EFM including synchronization.

Ethernet services

DEFM1 delivers advanced Ethernet functionalities such as VLANtagging/ stacking, VLAN QoS, RSTP/ MSTP, port security and ERPS*. Each of the Ethernet interfaces can be configured individually. A wide range of Ethernet applications can be realized, from standard LAN connections up to mission-critical Ethernet data transmission.

Ethernet data aggregated on DEFM1 can also take advantage of the different FOX615 multi-service capabilities and the variety of interface and transport technologies, e.g. optical and electrical Ethernet and the SDH uplink via Ethernet over SDH.

ERPS* for protection switching

DEFM1 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/subring configurations and multiple ERP instances (or multiple logical rings).

Chassis switch architecture

DEFM1 is part of the FOX615 chassis switch architecture. This means, that FOX615 acts as one switch with one IP address and expandable number of ports. Every inserted Ethernet unit will expand the switch. With it you can adapt your access node to the local demands.

Safety concept

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

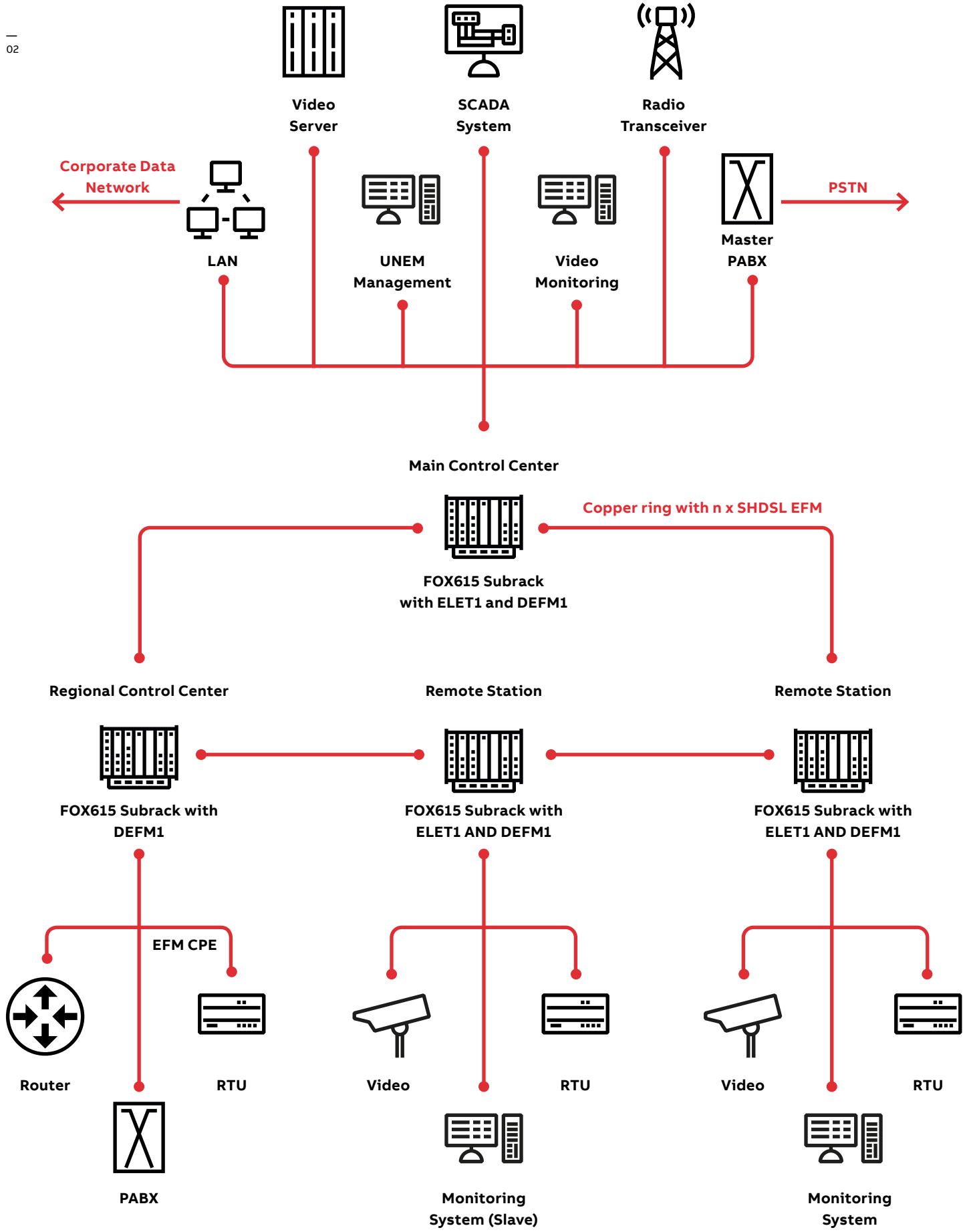
Management

The FOX615 management and the variety of services are administrated centrally by a variety of network management interfaces. Operators save costs and accelerate the provisioning process with only one element manager for all services.

Fanless variant

DEFM1-F, as a 2-slot wide unit variant of DEFM1 supports fanless operation.





Technical data

| SHDSL EFM | |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of ports | 24 |
| Supported standards | ITU-T, G.991.2, Annex A/B – up to 2.3 Mbps (TCPAM-16), ITU-T, G.991.2, Annex F/G – up to 3.8 Mbps (TCPAM-16), 5.7 Mbps (TCPAM-32) |
| EFM (Ethernet in the First Mile) | According to IEEE 802.3-2012 |
| Pair bonding | Line aggregation of up to 4 port up to 22.8 Mbps (TCPAM-16/32) |
| Synchronization (with later ESW release) | |
| NTR (Network Timing Reference) | Network clock distribution via SHDSL-clock from LT port to NT port |
| Ethernet Functionality | |
| VLAN services | Customer bridging acc. to IEEE 802.1Q-2011, 4,096 VLANs supported Port-based customer VLAN tunnelling (Q-in-Q) Port-/PCP-/DSCP-based classification (CoS) of ingress traffic with eight priority queues per port Maximum frame length of up to 2,024 bytes |
| Spanning tree protocols | RSTP (Rapid Spanning Tree Protocol), acc. to IEEE 802.1D-2004 MSTP (Multiple Spanning Tree Protocol), acc. IEEE 802.1Q-2011 |
| VLAN | ERPS (Ethernet Ring Protection Switching), acc. to ITU-T G.8032v2, supporting up to 12 ERP instances |
| Further Features | |
| Power Back-off | Supported |
| Different rates on bonded pairs | Supported, individual configuration per port |
| LT/NT-mode configuration | Supported |
| Regenerator support | Up to 8 cascaded regenerators (with later ESW release) |
| Remote power feeding (RPF) | Supported with external RPF-unit |
| Management | |
| FOXCAST | For local management and offline configuration |
| FOXMAN | For central management system |
| Power Supply | |
| 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 |