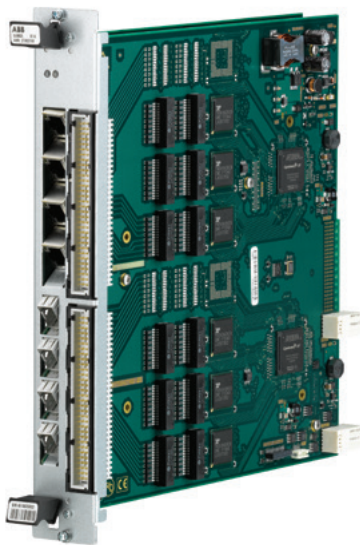


FOX615 SAMO3

SAMO3 provides transport of TDM and Ethernet services over SDH STM-16/4/1 and offers 48 E1 interfaces for mission-critical networks



Mission critical networks are often still based on SDH technology. FOX615 with the SDH SAMOx interface cards allows building up of entire SDH networks. In case of high density E1 port requirements SAMO3 offers the SDH, E1 and EoS functionality required in one interface.

01 SAMO3

SAMO3 offers ability to transport TDM and Ethernet services via STM-16, STM-4, or STM-1 offering communication channel performance required by the most critical applications and offering at the same time 48 E1 ports.

The hybrid design of FOX615, where SAMO3 provides the SDH and E1 ports, enables the smooth migration from SDH networks to pure packet switched without exchange of hardware by allowing the coexistence of both types of transport technologies simultaneously.

Main characteristics

- Interfaces:
 - 2 x SDH STM-16/STM-4
 - 2 x SDH STM-4/STM-1
 - 4 x 10/100/1000BaseT
 - 48 x E1 front interfaces
- PDH/SDH mapping/ demapping for:
 - 2 Mbps unframed
 - 2 Mbps framed
 - n x 64 kbps
- Layer-2 switching
- ERPS for protection switching in Ethernet/SDH rings (Supported only in System Release R1)
- SDH/PDH protection (MSP, SNCP)

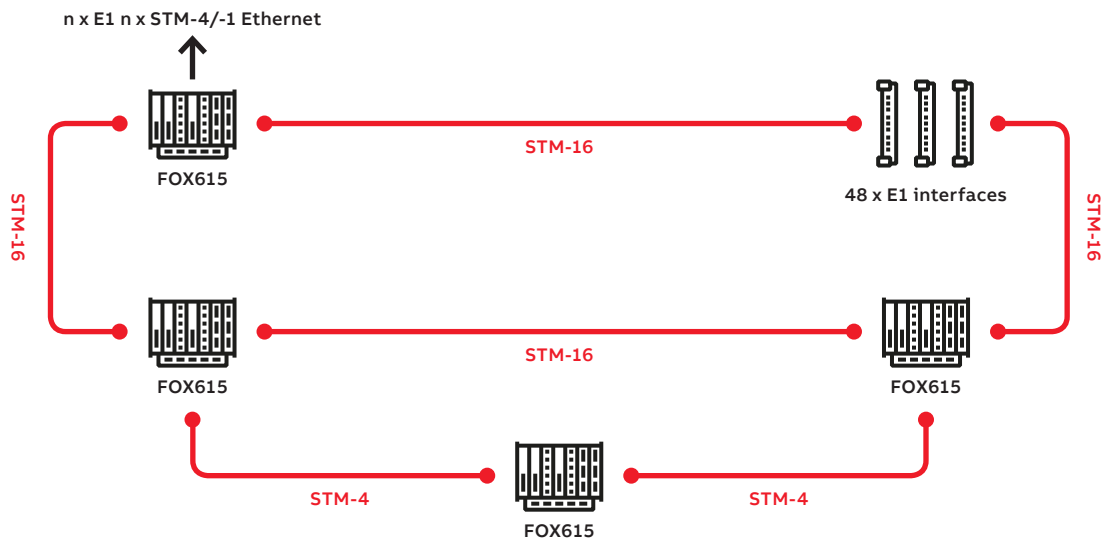
- 1+1 equipment protection including E1 front interfaces
- Interoperability with FOX515 SYN4E as well as NEBRO for EoS

Overview

SAMO3 can be fitted in the subracks FOX615, FOX612. SAMO3 provides SDH, Ethernet and E1 interfaces on the front of the unit. It has access to the traffic of the TDM bus as well as to the GbE/10 GbE star of the backplane. SAMO3's access to the TDM backplane allows the transport of TDM traffic from any TDM interface installed in the FOX615 subrack. This includes SHDSL TDM lines, E1 as well as legacy voice services. The SAMO3 is available in a 2-slot wide variant.

High density E1 transport

In addition to the transport capabilities of TDM bus traffic, SAMO3 provides E1 front interfaces for clock and data transparent transport of up to 48 x 2 Mbps data channels over the SDH network without occupying TDM bus capacity. When SAMO3 is working with a second SAMO3 in equipment protection mode, the E1 front interfaces are fully protected as well.



Ethernet-over-SDH (EoS)

SAMO3 can transport Ethernet traffic via an SDH network with its Ethernet-over-SDH functionality. The Ethernet data can be supplied via the front ports of the unit or the backplane. Hence, data from installed Ethernet cards can be processed as well as data from the core unit CESMx. Beside the Layer 2 switching operational mode, the front ports can be configured for a direct point-to-point connection mode, to ensure the availability of the required bandwidth.

Supported topologies

The unit allows the realisation of various SDH transport topologies:

- Ring networks, including multiple ring connections on one FOX615
- Linear networks
- Star networks
- Meshed networks

Protection functions

The SAMO3 provides a set of functions which guarantees the highest equipment service availability through the support of traffic and equipment protection mechanisms:

- Multiplex Section Protection (MSP)
- Subnetwork Connection Protection (SNCP)
- 1+1 equipment protection including E1 front interfaces
- Synchronous Equipment Timing Source (SETS) protection
- Ethernet-over-SDH providing Link Capacity Adjustment Scheme (LCAS)
- Hardware protection for E1 interface ports

Chassis switch architecture

The SAMO3 is part of FOX615's chassis switching architecture. This means that FOX615 is one switch with one IP address and an expandable number of ports. Every installed Ethernet card will expand the switch. With it the access node can be adapted to the local demands.

ERPS for protection switching

SAMO3 supports Ethernet Ring Protection Switching (ERPS) for rapid restoration within Ethernet/ SDH 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).

Safety concept

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

Management

All services are managed centrally via the management system FOXMAN-UN or via the local craft terminal FOXCST.

Technical Data

| General | |
|---------------------------------------|---|
| VC cross connects | High Order: 125x125 VC-4 Low Order: 48 x 48 VC-3, 1309x1309 VC-12 |
| Multiplex Section Protection (MSP) | 1+1 unidirectional and bi-directional |
| Traffic protection | Subnetwork Connection Protection (SNCP) |
| Equipment protection | 1+1 EQP, with 2 units via the backplane, E1 front interfaces protected via Y-Cable |
| Performance monitoring | According to G.826 |
| Synchronisation | SETS according ITU-T G.813 |
| Access to TDM bus | 64 terminated/transparent 2 Mbps channels, n x 64 kbps with grooming |
| Ethernet switching | Onboard 10 Gbps VLAN-aware Layer2 switch |
| 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. Maximum frame length of up to 9'216 bytes (Jumbo frames) |
| 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- (Supported only in System Release R1) |
| ERPS | Ethernet Ring Protection Switching (ERPS), acc. to ITU-T G.8032v2, supporting up to 12 ERP instances (Supported only in System Release R1) |
| Remote management | Via DCC-channel (MSOH and/or RSOH), OSPF routing on CESMx |
| SDH Network Interfaces | |
| Bit rate | 2.5 Gbps (STM-16), 622 Mbps (STM-4), or 155 Mbps (STM-1) |
| Number of ports (single unit) | 2 x STM-16/STM-4 and 2 x STM-4/STM-1 |
| Number of ports (EQP-pair, two units) | 4 x STM-16/STM-4 and 4 x STM-4/STM-1 |
| Port types (optical and electrical) | SFP-based |
| Ethernet-over-SDH (EoS) | |
| Framing procedure | GFP according to ITU-T G.7041 |
| Virtual concatenation (VCAT) | According to ITU-T G.707 |
| Link Capacity Adjustment (LCAS) | According to ITU-T G.7042 |
| Number of EoS channels | Up to 32 |
| Total bitrate (all EoS channels) | Up to 2 Gbps |
| Ethernet Interfaces | |
| Interfaces (connectors) | 4 x 10/100/1000BaseT (RJ45) |
| Mode of operation | EoS and GbE point-to-point and switched operation |
| E1 Interfaces | |
| Interfaces | 48 x 2 Mbps transparent according ITU-T G.703 for direct mapping into VC-12's |
| Management | |
| FOXCST | For local management and offline configuration |
| FOXMAN-UN | For central management |
| Power Supply | |
| Input voltage nominal (min/max) | -48/-60 VDC (-39.5 V DC ... -72 V DC) |
| Operation Environment | |
| Temperature range and humidity | According to FOX615 environmental specifications |