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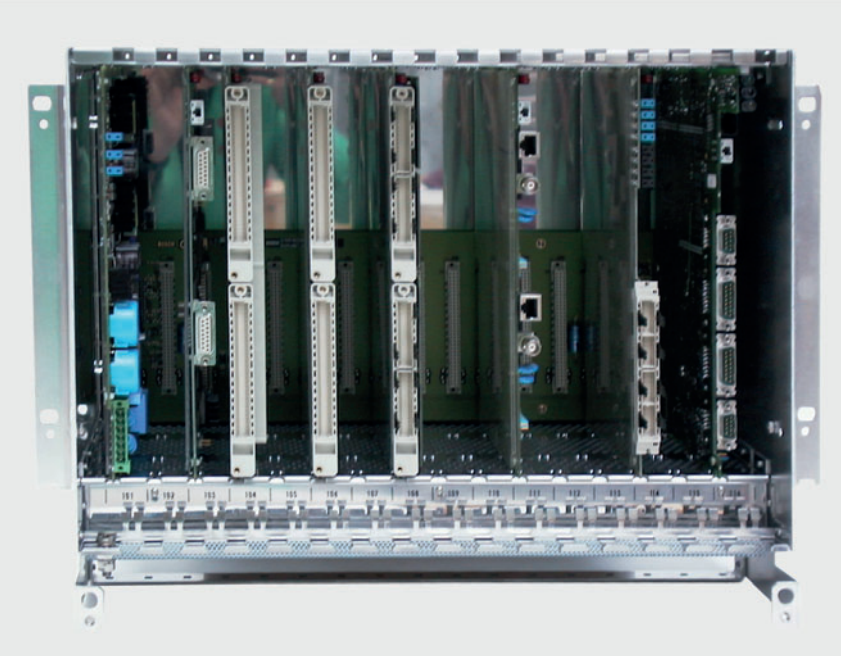
XMP1

Modulare Multi-Service Access System



XMP1: 16 slot subrack of the modular multi-service access system

- Various voice and data interfaces
- Modular system for all network topologies
- Powerful management for control, performance testing and diagnostic functions
- Carrier class availability and reliability with specific considerations of safety relevant applications
- Versatile protection and redundancy mechanism
- Integrated SDH unit for STM-1 and STM-4

Introduction

XMP1 is a modular, flexible and highly integrated multi-service access system within a single network element, that switches signals on 8/64 kbps level for PDH and VC-12, VC-3 and VC-4 level for SDH. The transmission rates are from 8 kbps up to 34 Mbps for PDH up to STM-1 and STM-4 for SDH. XMP1 is a nonblocking cross-connect system configurable as a terminal or add/drop multiplexer that enables you to set up complex communication and data networks adapted to your bespoke requirements.

The capacity of the digital switching matrix is 16 x 2 Mbps: 480 timeslots using CAS-Signaling, or 496 using 31 channels. The cross connect of each individual 64k signal inclusive associated signaling information (2 kbps) is freely configurable. These signals can be terminated on service interfaces and combined with other 2 Mbps signals (E1) for interworking with a transport network or as connection inside pure XMP1 networks.

Applications

The XMP1 has been designed as a cross connect multiplexer for various applications. In its standard application it can be configured to provide point-to-point, leased-line services in corporate networks, offering a full range of voice, ISDN, data and LAN services. The SDH and 64 kbps cross connection functionality is fully integrated to support a great variety of PDH 64 kbps based network applications as well as the seamless integration into STM-1/STM-4 rings, stars and meshed networks.

Flexible and Reliable

The flexible design of XMP1 allows the free placement of all cards in any vacant slot. Each node is available as 8/16/32 slot version The free combination of 64 kbps from different sites into a common 2 Mbps frame allows you to concentrate and use the bandwidth optimally.

The high reliability of XMP1 is due to its protection switching and redundancy mechanism and the hot standby duplication of key components such as the central unit and power supply. Versatile E1-route protection variants can be built up. Trunk protection, automatic or controlled line/card protection and 64 kbps channel protection are some of them. High level SDH protection is also provided in the form of Multiplex Section Protection (MSP) or Sub-Network Connection Protection (SNCP). Additional duplication of the switch functionality combined with the proven XMP1 redundancy concepts assures the highest availability. Optional integrated single-fibre operation offers a solution that minimizes infrastructure costs and maintains a high quality of service.

System Design

The XMP1 consists of the following core building blocks, which are explained in the following.

Central Unit

The central unit provides the control of a node; running operating software; storing all node-specific data (cross connections, etc); and communicating with the network management system. It controls the peripheral hardware and alarm-processing, handling node configuration or software download without interruption. Another feature for secure operation is the provision of different clock supplies with network wide automatic priority clock control. The central units are available in four variants distinguishing in switching capacity and network management options.

SDH Unit

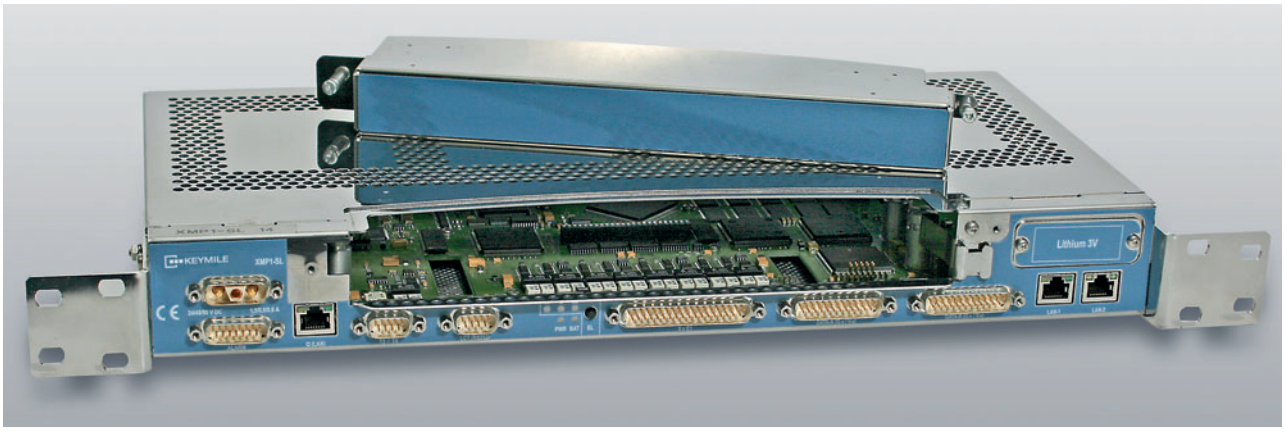
XMP1 offers STM-1 and STM-4 aggregate options for simplified network planning.

To provide both, SDH and 64 kbps PDH services in a single platform is a distinctive feature. With the compact design of the XMP1 subracks and its scalable flexible configuration options it enables efficient co-location with other equipment, such as DXCs, ATM switches, IP/Ethernet routers and DWDM. A network element can be upgraded in service from STM-1 to STM-4 by adding the SDH unit without hardware re-wiring and re-configurations in the already installed base. The SDH unit consists of two fixed combined modules that can be fitted into any adjacent pair of the generic XMP1 slots. A fully protected STM-1 or STM-4 can be provided by using the SDH unit twice. All external connectors are front-access for ease of installation and maintenance End-to-End integrated network management through the widely deployed ServiceOn solution provides rapid service provisioning, end-to-end performance monitoring and fast fault identification. There are two variants of SDH Units available.

- SCU provides pure SDH/E1 mapping
- EoSCU provides in addition Ethernet over SDH for four Ethernet ports.

Line Units

The line units are the uplink interfaces of the XMP1. They are available as E1 (2 Mbps), E3 (34 Mbps) and SHDSL ports. E1 and E3 ports are available with electrical and optical interfaces. To span longer distances via copper SHDSL port modules and repeater can be used. The optical E1 interfaces provide either a 1300 nm dual fibre or a mixed 1300/1500 nm for single fibre transmission. It is further able to convert directly from unframed electrical E1 to optical without using cross connect capacity. It is further able to convert directly from unframed electrical E1 to optical without using cross connect capacity.



XMP1-SL: 1 HU unit with one universal slot

The available line units are:

- E1 6 dB in-house, 120/75 ohm
- E1 2 fibre with 25 dB or 39 dB
- E1 1 fibre with 25 dB, 1300/1500nm or 1500/1300 nm
- E3 multiplexer 6 dB in-house, 75 ohm
- E1 or E2, 120 ohm
- E3 optical, 28 dB, 1300 nm
- SHDSL 2 or 4 copper wires

Service Units

A wide range of various service units are available to suit different customer needs. Applications for voice, ISDN, data transmission, LAN as well as Teleprotection for customers in the utility environment can be realised. The analogue voice interfaces use 2-wire/4-wire with E&M, as well as POTS services with CAS-signaling. The ISDN cards provide a basic rate access as S and U interface. The modular design of the V and X data interfaces allows an incremental installation according to operational requirements. For special applications, there are also G.703 modules as codirectional and contra-directional interfaces. The LAN interface has self-learning bridge functionality. The available service units are:

- 2/4-wire E&M
- 2-wire exchange connection
- 2 wire subsriber POTS connection
- Combination exchange/ subscriber POTS/local battery
- 4-wire subscriber ISDN BRA
- 2 -wire ISDN BR 2B1Q
- G.703 co/ contra-directional
- V11, X.21, V.24, V.35
- RS-485 2-wire
- single/double current signals
- n x 64k V.11 or V.11 + V.35
- 10BaseT
- IEEE C37.94

Network Management

ServiceOn XMP1 is a PC-based system, for managing pure XMP1 networks or XMP1 network elements as part with other transmission elements. ServiceOn XMP1 can be connected to any node in the network via serial V.24 interface or Ethernet (RJ45) provided by a sub-module on Central Unit. Its automatic management channel routing by using Y-bits of the service digits in an E1 signal (timeslot 0) ensures that management information will be always transported to the connected nodes. Based on that, XMP1 operates with multiplexers from other vendors in existing networks. Local installation and maintenance is performed with a modular service PC (LCT) using software running on a standard PC/laptop. SOX provides a fully controlled system including performance, testing and diagnostic functions, enabling cost-effective management for all sizes of networks.

Technical data

General		
ITU-T recommendations	G.703, G.703.6, G.703.7, G.703.8, G.704, G.706 (CRC4), G.711, G.712, G.732, G.742, G751, G.796, G.803, G.811, G.812, G.821, G.823, V.110, R.111	
Electrical safety, EMC	EN 60950, EN 55022 Class B, EN 50121-4, EN 300386	
Environment	Operation ETS 300019 Class 3.2	
Synchronisation input/output	2048 kHz acc. to G.703 section 10, SEC according to G.813	
Power supply	Nominal Voltage 48 ... 60 V DC, tolerance range 35 ... 75 V DC	
Power consumption	Depends on configuration (160 W maximum) per subrack	
Dimension XMP1 (H x W x D)	353.5 mm x 440.8 mm x 240.6 mm (for ETSI or 19" mounting)	
Dimension XMP1-SL (H x W x D)	55 mm x 450 mm x 300 mm	
Subrack versions	8, 16, or 32 slot	
System Parameters		
Number of E1 interfaces	Up to 16, depending on type of central unit	
Number of timeslots	512	
Cross connect capacity	496 x 64 kbps, 252 x VC-12, 4 x VC-4, 12 x VC-3	
Synchronization	CRC4 procedure, switchable	
Clock supply	External clock, internal clock, recovered receive clocks at the 16 ports or ISDN interfaces	
Network clock selection	According to network wide priority list	
SDH Characteristics		
ITU-T recommendations	SDH unit is designed to meet the appropriate sections of ITU-T recommendation G.703, G.704, G.707, G.783 and G.957	
STM-1	electrical, 1310 nm and 1550 nm options to S1.1, L1.2 and L1.2	
STM-4	1310 nm and 1550 nm options to S4.1, L4.1 and L4.2	
Single-fibre working	STM-1 or STM-4 using either a 1310/1550 nm or red/blue (based around 1550 nm) combination	
SDH Tributary Interfaces	**EoSCU**	**SCU**
Number of E1 ports	6	8
Numer of EoS interface	4 x 10/100 Mbps, SFP-based, optical/electrical	–
2 Mbps external	electrical, acc. to G.703 (unstructured and structure acc. to G.704)	
2 Mbps internal	8 x E1 towards 64 kbps core, according to G.704	
Electrical connectors	Sub-D (2 Mbps)	
Management		
LCT, PC terminal (connector)	V.24 (RS-232), IP (RJ45)	
Network management (connector)	V.24 (RS-232), IP (RJ45)	

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