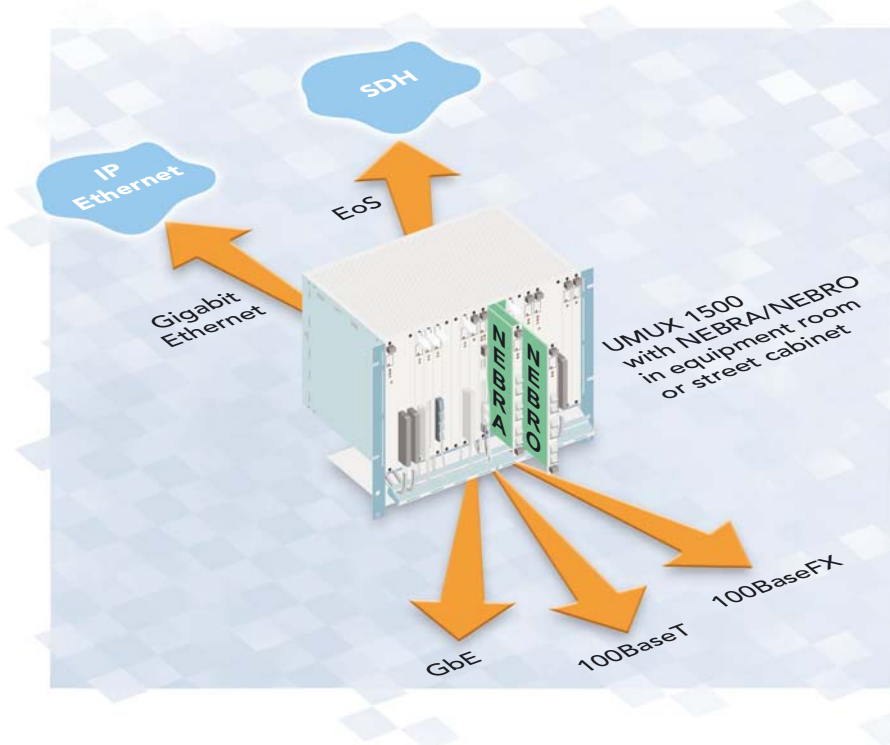


UMUX NEBRA/NEBRO

Enable your SDH access network to deliver Ethernet services



- Ethernet over SDH (EoS)
- VLAN tag stacking
- Traffic prioritization acc. to 802.1p
- LCAS support
- Fast and Gigabit Ethernet
- Electrical and optical customer interfaces

Reliable and cost efficient delivery of Ethernet based business services is a growing need for public and private network operators. The UMUX modules NEBRA/NEBRO open the world of Fast Ethernet and Gigabit Ethernet transport on SDH access networks (EoS, Ethernet over SDH).

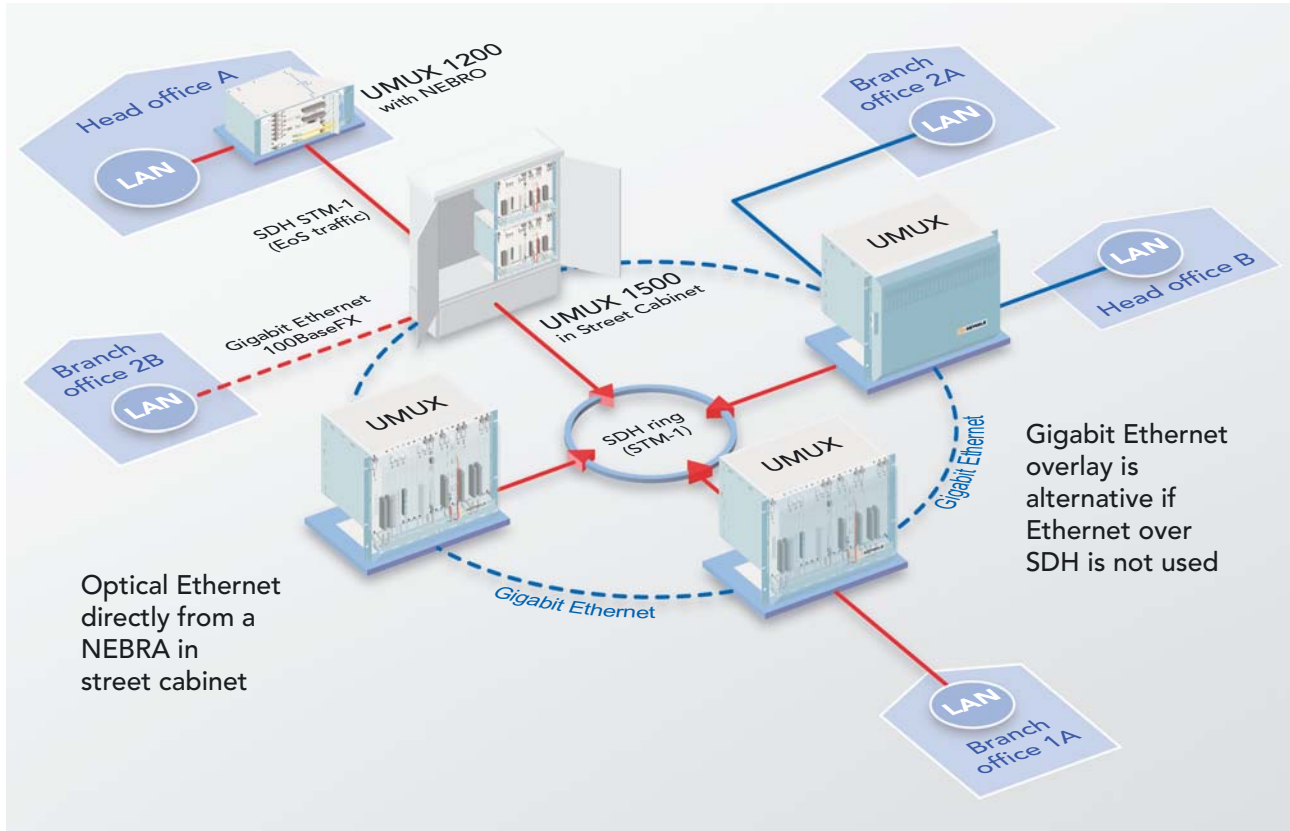
■ Applications

With the NEBRA/NEBRO units the UMUX multi-service access platform offers cost effective Fast Ethernet and Gigabit Ethernet connectivity combined with the proven reliability and manageability of SDH networks.

This makes it ideal for bandwidth intensive point-to-point applications like corporate internet access, LAN interconnections and VPNs (Virtual Private Networks). Furthermore NEBRA/NEBRO

support point-to-multipoint services with a typical application being the connection of branch offices to the head office.

Thanks to the carrier grade reliability of UMUX and the protected Ethernet over SDH transport, NEBRO/NEBRA are used as well in dedicated networks of railways, power utilities and other private network operators.



UMUX with NEBRA/NEBRO at the heart of a first NGN installation

■ Interfaces

Each module provides six Ethernet interfaces to connect your customers.

NEBRA

- 4 x SFP cages for 100Base-FX
- 2 x SFP cages for 100Base-FX or Gigabit Ethernet

NEBRO

- 4 x 10/100Base-T
- 2 x SFP cages for 100Base-FX or Gigabit Ethernet

■ Traffic Backhaul

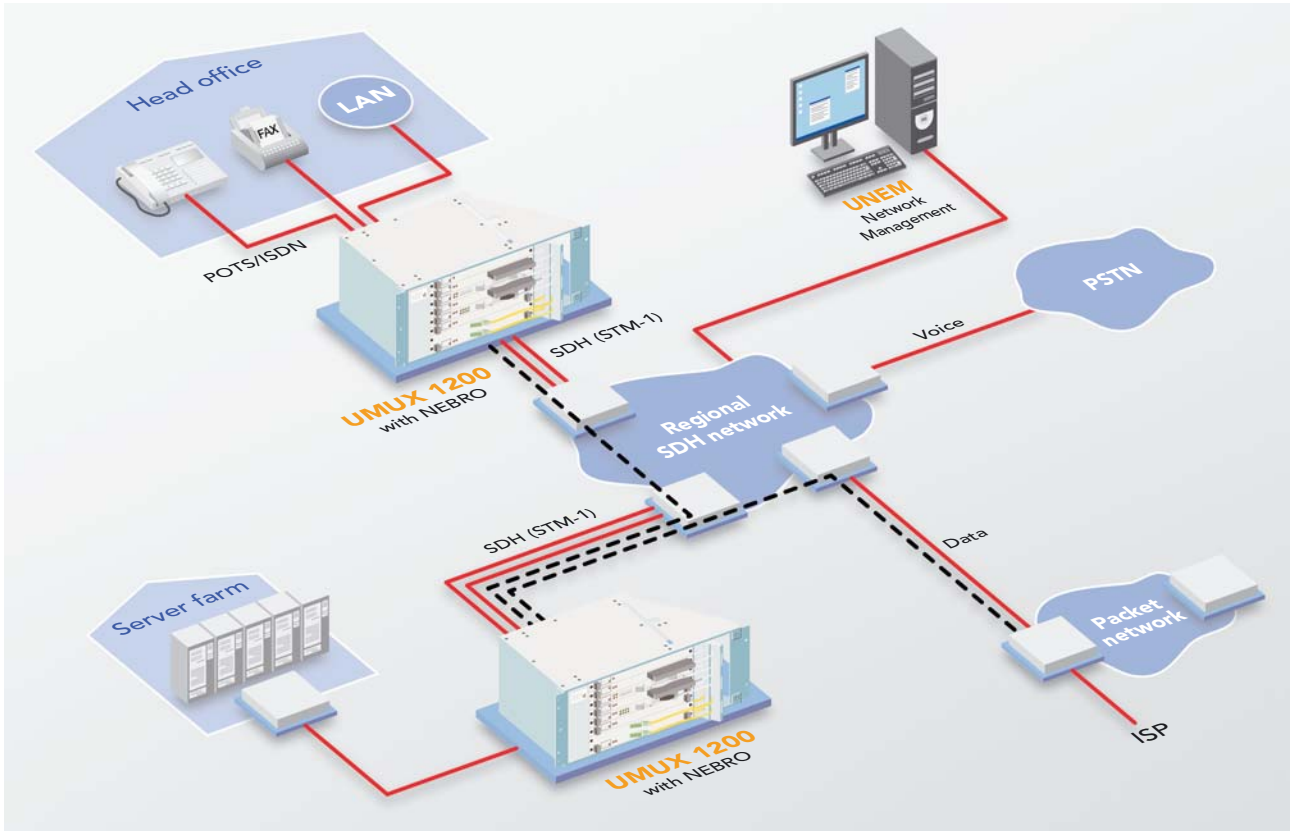
The flexibility of NEBRA/NEBRO allows operators to choose between SDH and Ethernet backhaul for their data traffic.

- Ethernet over SDH (EoS): EoS is transported over the backplane to an SDH aggregate unit.
- Optical Ethernet: In this mode one of the front Ethernet interfaces is used for backhaul traffic.

Traffic prioritisation, VLAN tagging and Rapid Spanning Tree Protocol are supported in both modes.

■ Ethernet over SDH

Using EoS (Ethernet over SDH), the Ethernet frames are encapsulated in SDH by using GFP (Generic Frame Protocol) and transported through the SDH network in a VC-12 or VC-3 group (virtual concatenation). The Ethernet over SDH transport on the network side is in accordance with the relevant ITU-T standards and permits transparent operation with legacy SDH equipment as well as interworking with any other EoS standard compliant equipment.



Ethernet service delivery with NEBRO – Ethernet through regional SDH network

■ LCAS

NEBRA/NEBRO provide LCAS (Link Capacity Adjustment Scheme) capabilities. With LCAS network operators are in the position to offer Ethernet services with dynamically increased or decreased capacities.

■ Seamless Migration

The existing base of UMUX 1500 and UMUX 1200 chassis is compatible with the NEBRA/NEBRO plug-in modules. Hence UMUX network elements can be smoothly upgraded to support new broadband Ethernet services.

The ability to support EoS and Ethernet backhaul transmission NEBRA/NEBRO enable network operators to migrate further to overlay Ethernet networks while re-using the installed base.

■ One Management System

The management of the various types of services and transport functions is all centralized under the umbrella of the UCST/UNEM system. This enables the operator to act in a familiar environment and accelerates the provisioning process.

■ Contact

Contact us to find out more about NEBRA/NEBRO and the UMUX platform.

Technical data

Supported services	
Ethernet switching	Switch bypass mode or standard IEEE 802.3 frame switching based on port or VLAN tag ID
Ethernet transport	Standard EoS (Ethernet over SDH) transport ITU-T G.707 – virtual concatenation ITU-T G.7041 – GFP ITU-T G.7042 – LCAS
Performance monitoring	SDH monitoring according to ITU-T G.826 Ethernet monitoring
Ethernet over SDH characteristics	
SDH card type	Tributary card
Capacity	Up to 63 x VC-12/3 x VC-3
Number of EoS ports	8
Virtual concatenation	On VC-12 and VC-3 level
Ethernet characteristics	
Frames	Standard IEEE 802.3 frames and baby jumbo frames up to 1,600 bytes supported
Number of MAC addresses	Up to 4096
VLAN support	VLAN tagging or pass-through (IEEE 802.1Q) VLAN tag stacking (IEEE 802.1ad)
Spanning Tree	Spanning Tree according to IEEE 802.1D Rapid Spanning Tree (IEEE 802.1w)
Traffic prioritisation	4 x CoS queues per port (IEEE 802.1p)
NEBRA interfaces	
Optical front interfaces	4 cages supporting SFP 100Base-FX 2 cages supporting SFP 100Base-FX or GbE plug-in modules
NEBRO interfaces	
Electrical front interfaces	4 x 10/100Base according IEEE 802.3 auto-negotiating full/half-duplex mode, automatic MDI/MDIX crossover, RJ-45 connectors
Optical front interfaces	2 cages supporting SFP 100Base-FX or GbE plug-in modules
Protection	
SDH	SNCP protection scheme
Power	
Maximum power consumption per card	13 W
Dimensions	
Module width (4 TE)	1 slot
3rd party interoperability	
Ethernet	With standard Ethernet equipment
Ethernet over SDH	Transparent for legacy SDH equipment and interoperable with EoS standard compliant nodes
Operating Environments	
Temperature range	According to UMUX environmental specification
Humidity	According to UMUX environmental specification



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or contact us: info@keymile.com ...