



## CSX family

G.SHDSL.bis and EFM Copper modems: 1, 2 or 4 wire-pairs

- ✘ Use as FE or Legacy Modem
- ✘ Ethernet Bridge with auto negotiation and VLAN support (IEEE 802.1Q)
- ✘ Supports data rates from 192 kbps up to 20 Mbps over TP
- ✘ Reliable performance even on noisy transmission lines with pc quality
- ✘ Plug-and-play installation
- ✘ Compact 3RU rack mount card and desktop version



**The CSX product family provides symmetrical high speed transmission on copper lines, based on G.SHDSL. It offers cost-efficient, flexible and reliable services for SME and SOHO customers as well as in campus applications. The CSX family is fully-managed and can be operated in a chassis as well as in a desktop housing. G.SHDSL is the best solution to quickly provide cost-effective, high-speed network service for users who need symmetrical connections.**

### Introduction

Several different user interfaces can be ordered to provide solution from Internet access (Ethernet/ EFM) to legacy services as machine-to-machine applications (V.24 / X.21). The DSL side of the CSX-family is using standard telephone lines for transmission. Up to 4 wire-pairs can be bundled to achieve data rates of up to 20Mbps across several kilometers. A regenerator is available to extend the operating distances massively.

Inband management of remote units makes supervision and configuration very easy and comfortable. Together with the management of the chassis, web-GUI, SNMP and ssh/telnet is available to integrate the devices into the NOC.

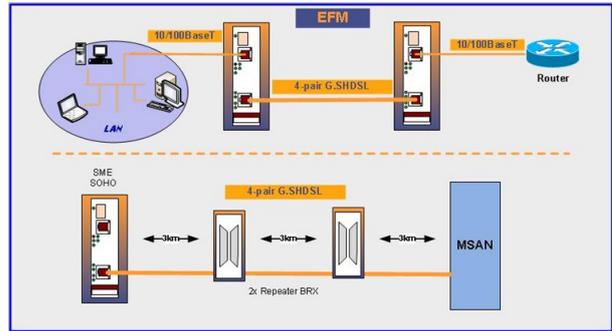
By utilizing the existing telephony infrastructure, the installation is simple and cost-efficient. With up to 20 Mbps full duplex speed IP telephony, web hosting and various broadband services can be easily provisioned.

### Features

- Enabling Internet or legacy service in any telephone infrastructure over 1/2/4 wire-pairs
- TC-PAM16 or PAM32 line coding
- Typical transmission range on AWG26 (0.4mm) cable with 13.5dBm line power is 4km @2,304kbps, noise free environment
- SHDSL regenerator available
- Selectable user interfaces:
  - IEEE 802.3 10/100BaseT (ComboPort)
  - V.24 (D-Sub25)
  - X.21 (D-Sub15)
- Remote in-band management
- SNMPv2c, SNMPv3, Web-GUI (http), SSH VT100 management options
- Performance monitoring
- Diagnostics, like test loops and integrated BERT

### Application Example

Extended distances to interconnect IP-services. Either in modem/campus scenarios (above) or in a telecom installation with MSAN as line termination (below). The optional usage of regenerators allows very long distance transmission. The combo Ethernet port offers media conversion from fibre (local) to copper (long haul), which is useful in



hash environments.

### Technical Specifications

#### Management

- Remote in-band management via EOC channel of SDSL data stream
- SNMPv2c, SNMPv3, SSH and Web-GUI via SCX2e system controller
- VT100 in SHX3 system housing (desktop)
- Remote flash update
- Performance monitoring for all interfaces

#### Supervision

- Performance monitoring for all interfaces
- Internal BERT and loops for quick diagnostic and failure location

#### Environmental

- Operating: -30 to +70°C (ETS300 019-1-4; class4.1)
- Transport: -40 to +70°C (ETS300 019-2-1; class2.3)
- Storage: -25 to +55°C (ETS300 019-2-2; class1.2)
- Humidity: 10 to 90%, non-condensing
- Safety-Norm: according to EN60950

#### EMC

- Emission: EN55022 class B
- Immunity: EN61000-4-3 10V/m

#### Physical

- Weight: < 200g
- Dimensions (H x W x D):
  - ⤿ 130mm x 30mm x 190mm
  - ⤿ 45mm x 145mm x 260mm (in SHX3)
- 19" rack: 10 slots available in 3RU rack (SRX10)

#### G.SHDSL line interface

- EFM acc. IEEE 802.3 and ITU-T G.998.2
- G.SHDSLbis acc. to ITU-T G.991.2, Annex F/G
- SDSL acc. to ETSI TS 101 524 V1.2.1 and V1.2.2
- Line Code: TC-PAM 16/32
- Data rate per pair: up to 5.7Mbps
- 1, 2 or 4 wire-pair variants available
- Automatic channel bundling (2 and 4 pair variant)
- Connector: RJ45; Impedance: 135 Ohm
- Synchronous and plesiochronous mode

supported

- Modes: STU-C and STU-R (configuration via management)
- Typical transmission range on 26 AWG (0.4mm):
  - ⤿ 4,0km (no noise)
  - ⤿ 2,8km (Telekom noise)

#### User interfaces

- Ethernet: IEEE 802.3 10/100BaseT and 100BaseFx
  - ⤿ Ethernet Bridge IEEE 802.1d
  - ⤿ VLAN support IEEE 802.1Q
  - ⤿ Auto-Cross-Over on RJ45 port
- Datacom: V.24 / X.21 (DCE and DTE mode)
- Telecom: E1/T1

#### Power

- Supply Voltage: +5 VDC via Backplane
- Power Consumption: < 5 VA, overcurrent protected
- Voltage/Lightning Protection: acc. ITU-T K.20/K.21
- Power supply via system rack SRX or housing SHX

