

CSX4 - Family

2/4 – G.SHDSL Copper Modem



Introduction

The CSX4 is a fully-managed G.SHDSL modem for long distance transmission of voice, data and Ethernet services. It operates over 2-wire or 4-wire lines in any copper infrastructure. The CSX4 modems incorporate TC-PAM 16 technology for expanding E1, Ethernet, voice (ISDN BRI) or serial data (X.21, V.24) transmission range of up to 12 km. That offers carriers and enterprises a cost-effective solution for data transmission at high data rates over large distances in the First Mile. These devices offer variable data rates up to 2.3 Mbps over 2-wire and up to 4.6 Mbps over 4-wire. The number of operating line pairs, LTU/NTU mode and multiple data rates could be set via SNMP, Web-GUI, SSH and VT100 local management.

The CSX4 offers in-band management of the remote device, whereby the management data is transmitted together with the user data. The in-band management capability in combination with System Controller SCX2e allows Carriers and ISPs to maintain and supervise all devices inside management system via single NMS access point.

Additional features like performance monitoring and several test loops at line and user interface-ports give operators a wide bunch of easy service diagnostics in case of any problems in the network.

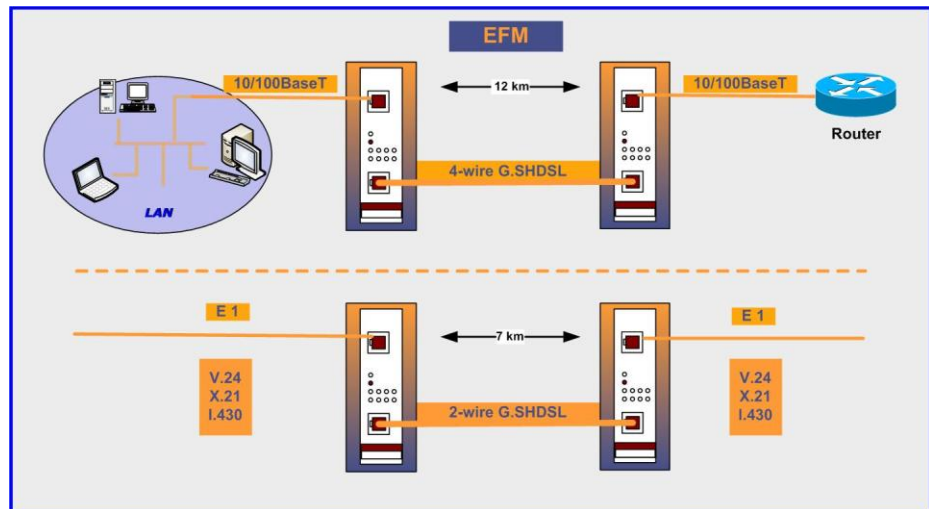
Features

- ▶ Enabling service in any copper infrastructure over 2/4-wire lines
- ▶ Operates at variable data rates between 64 kbps and 4608 kbps
- ▶ TC-PAM line coding extends operation range up to 12 km (64 kbps @ 2-wire, 24 AWG), w/o repeater
- ▶ Auto speed negotiation for line speed
- ▶ Selectable user interfaces
 - E1 (ITU-T G.703/G.704)
 - X.21 (D-Sub15)
 - V.24 (D-Sub25)
 - I.430 ISDN Basic Rate Interface
 - 10/100BaseTx (RJ45)
- ▶ ISDN Digital Leased Line
- ▶ Ethernet Bridge with auto negotiation and VLAN support (IEEE 802.1Q)
- ▶ Remote in-band management
- ▶ SNMPv2c, SNMPv3, Web-GUI (http), SSH and VT100 management options
- ▶ Performance monitoring on Line – and User-ports
- ▶ Extensive diagnostics, including several test loops at line and user interface ports
- ▶ Reliable performance over noisy line or poor line quality
- ▶ Plug-and-play installation because of automatic configuration
- ▶ Available as compact 3RU rack mount card or desktop version

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Application Example



Specifications

G.SHDSL Line Interface

- Standard: G.SHDSL acc. to ITU-T 991.2, Annex B
- Line Code: TC-PAM 16
- Line rate per pair: 208 kbps to 2320 kbps
- Data Rate: n x 64 kbps
 - 2-wire: 64 kbps to 2304 kbps
 - 4-wire: 128 kbps to 4608 kbps
 - switchable via management
- Connector: RJ45
- Impedance: 135 Ohm
- Transmit level @ 135 Ohm: acc. to TS101524, e.g. 14,5 dBm ±0,5 dB @ 2048 kbps

User Interfaces

- According to data sheet of User Interfaces (see following pages)

Typical Line Transmission Distance (24 AWG)

7 km	2-wire @ 256 kbps	4-wire @ 512 kbps
5 km	2-wire @ 768 kbps	4-wire @ 1536 kbps
3,7 km	2-wire @ 2304 kbps	4-wire @ 4608 kbps

- Line Transmission Distance depends on quality of used copper cable.

Management

- Remote in-band management via EOC channel of the G.SHDSL data stream
- SNMPv2c, SNMPv3, SSH and Web-GUI via SCX2 system controller
- VT100 in SHX3 system housing (desktop)
- Remote flash update via http, TFTP or VT100
- Performance monitoring for G.SHDSL, E1 and Ethernet

Environmental

- Operating: +5 to +40°C (ETS300019-1-3; class3.1)
- Transport: -25 to +70°C (ETS300019-1-2; class2.2)
- Storage: -25 to +55°C (ETS300019-1-1; class1.2)
- Humidity: 10 to 90%, non-condensing
- Safety-Norm: acc. to EN60950
- EMC
 - Emission: EN55022 class B
 - Immunity: EN61000-4-3 10V/m

Power

- Supply Voltage: +5 VDC via Backplane
- Power Consumption: < 7 VA, overcurrent protected
- Voltage/Lightning Protection: acc. ITU-T K.20/K.21
- Power supply via system rack SRX or housing SHX

Physical

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

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E1 User Interface

An E1 link operates over two separate sets of wires. The line data rate is 2.048 Mbit/s (full duplex) which is split into 32 timeslots.

Specification

- Connector: RJ-45 or BNC
- Standard: ITU-T G.703
 - Data Rate: 2048 kbps
 - Line Code: HDB3
 - Input Impedance: 120 Ohm (RJ45) or 75 Ohm (BNC)
 - Transmit Amplitude: 3,00 V (RJ45) or 2,37 V (BNC)
- Framing: ITU-T G.704, unframed CRC4 selectable
- Jitter: ITU-T G.823



X.21 User Interface

X.21 is a digital signaling interface recommended by ITU-T that includes specifications for DTE/DCE physical interface elements, alignment of call control characters and error checking, elements of the call control phase for circuit switching services, data transfer and test loops.

The physical and electrical characteristics of this interface are now specified in ITU-T recommendation V.11.

Specification

- Standard: ITU-T V.11
- Data Rate: n x 64 kbps, up to 4608 kbps
- Connector: D-Sub15 (female)
- DTE / DCE mode settings per Jumper



V.24 User Interface

V.24 (RS-232-C interface or EIA-232) an ITU recommendation is used for serial data connection between DTE (Data terminal equipment) and DCE (Data Circuit-terminating Equipment). In RS-232, data is sent as a time-series of bits. Both synchronous and asynchronous transmissions are supported.

Specification

- Standard: ITU-T V.11, IEC 60870-5-101
- Data Rate:
 - synchronous: Nx 64k (N=1...3)
 - asynchronous: up to 230kBaudps
- Connector: D-Sub25 (female)
- DTE / DCE mode settings per jumper



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Ethernet Bridge User Interface

Ethernet bridge is able to connect two networks.

supports automatic negotiation of connection speed and so the transmission of VLAN frames.

Specification

- Standard: IEEE 802.3 / 802.1d, IEC 60870-5-104
- Interface Data Rate: 10/100 Mbps (auto negotiation or fix configuration),
- Payload rate: n x 64kbps, up to 4608 kbps
- Bridge Table Size: 10k MAC addresses
- Packet Size: 64 to 1522 bytes (VLAN support acc. to IEEE802.1 q)
- Connector: RJ45
- Automatic MDI-MDIX selection in auto negotiation mode only.



I.430 ISDN Basic Rate Interface

The I.430 ISDN BRI is used to offer Digital Leased Circuits (DLC) over PDH networks. Thus legacy equipment can be connected at low bandwidth via S0-bus extension.

Specification

- Selectable Data Rate: 64, 128, 192 and 256 kbit/s
- Connector: RJ45 with S0 pin out
- Selection of NT and TE mode
- Termination 100 Ohm/open
- 4 types of DLC are supported:
 - D64S: 1x 64Kbps
 - D64S2: 2x 64kbps
 - S01/TS01: 1x B-Channel, 1x D-Channel
 - S02/TS02: 2x B-Channel, 1x D-Channel



Specification may change without prior notice. Please refer to www.arcutronix.com for latest data-sheets.

For more information please contact arcutronix GmbH or visit us at www.arcutronix.com.

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