

## Modem: TS-101 G.SHDSL LAN+E1



## Description

TS-101, G.SHDSL modem, transports multi mega bit stream over one or two pair of copper wires using TC-PAM technology. This modem supports multiple data rates ranging from 64 Kbps to 15Mbps(PAM128). It have Fast Ethernet **4 ports** and 1 slot for install and choice of either V.35,Syn data interface or E1 interface or G.703 Co-directional 64K.interface .RS232 or FXO or FXS.

The TS-101 uses in-band Embedded Operation channel for controlling and monitoring the remote unit. The comprehensive diagnostics function developed includes G.SHDSL, E1 line performance monitoring, in-band local and remote loop backs and real time alarm report.

## Features

- Meet ITU-T G.991.2 ETSI TS101 524.
- Support data rate from 64Kbps to 15Mbps(PAM128) per 64Kbps increment. in 2 wires
- Feature modular V.35, E1 G.703,RS232, 64K Co-directional , FXO, FXS.
- Provide remote control and monitoring using in-band EOC channel.
- Support DSL PRBS BER test.
- Support local, remote loop back.
- Perform G.SHDSL and E1 line performance monitoring.
- Provide 96\*15 minute and 7\*24 hours performance data storage.
- Detect and operate DSL loop crossover.
- **Support optional SNMP in-band management and Web GUI**
- Support remote download and configuration.
- Support different DTE interface can work simultaneous by sharing the DSL bandwidth
- Support G.bis data rate, 2 wires at 5.7M bis and 4 wires at 11.4M bis
- Support GSHDSL PAM 128 data rate up to 15Mbps in 2 wires

## Specification

### G.SHDSL line

Line Coding: 16 TC-PAM, 32 TC-PAM,128 TC-PAM is selectable  
 Line Rate: 192K bps ~ 57000 Kbps for one DSL loop.  
 384K bps ~ 114000 Kbps for two DSL loops.

Protection: ITU-T K.20, K.21 and IEC60950  
 Standard: ITU-T G.991.2, Annex A (Default), Annex B  
 Impedance: 135Ω +/- 5 %  
 Connector: RJ11

**System Timing**

## Payload timing

- (1) Internal clock, accuracy +/- 30ppm
- (2) T1/E1 input clock
- (3) Data port DTE clock[TT]
- (4) Line Recovered clock

**SHDSL timing**

- (1) Plesio synchronous, local oscillator: 22.1184MHz +/- 32ppm
- (2) Synchronous
- (3) Hybrid

**■ Data interfaces****LAN Interface**

Interface: IEEE 802.3/802.u 10/100 Base-T, Mac Address filtering bridge which supports up to 128 Mac address learning port based VLAN and VLAN tag inserting or removing are supported, support QoS and in band function Supports 2K MAC addresses table with 4-ways associative hash algorithm.

Data Rate: up to 15Mbps(PAM128), Nx64Kbps.

Bridge: IEEE 802.1D transport, self-learning

Connector: **4xRJ-45**

**■ Optional Data interfaces**

TS-101 supports multiple customer interfaces as E1, 1x V.35.64K G.703, RS232, FXO, FXS

**◆ E1 Interface**

Line rate: 2048KHz +/- 50 ppm

Line Code: HDB3

Framing: PCM31, PCM30, PCM31C, PCM30C and unframed

Data Rate: 64 Kbps to 2048K bps [NX64Kbps, N=1 - 32]

Operation: Full E1 or fractional E1

Pulse shape: Meet ITU-T G.703

Impedance: balanced 120Ω +/- 5% resistive or unbalanced 75Ω +/-5% resistive

Connector: 120ohm RJ45,75ohm BNC

**V.35 Data Port Interface**

Interface: V.35

Data Rate: 64 Kbps to 4608 Kbps

Connector: DB25F, DB25 to MR34 adaptation cable provided

**FXO/FXS Interface**

Interface: FXO 2/4ports or FXS 2/4ports (optional).

Connector: RJ-11

◆ **V.24/RS232 Data Interface**

Interface: V.24

Data Rate: Synchronous: 1.2、 2.4、 4.8,9.6,14.4,19.2, 38.4,56、 64 , or 128Kbps  
Asynchronous:1.2、 2.4、 4.8,9.6, 14.4,19.2, 38.4, 57.6, 115.2Kbps

Connector: DB25F

◆ **G.703 Co-directional Data Interface**

Interface: 64K Co-directional

Connector: RJ-45

■ **Maintenance**

Loopbacks: Local and remote AL/DL loopbacks via front panel loopback buttons,  
VT-100 menu screen or in-band loopback codes  
DSL PRBS BER testing  
SNR, LOSW, ES, SES and UAS for DSL loops  
Supports G.821 and G.826 error performance statistics for E1 interfaces

■ **Management Interface**

Craft port: RS-232/DB-9 for VT-100

Optional LCD display: Quick mode configuration, diagnostics and monitoring  
Telnet access and an optional SNMP agent support. Web

Optional SNMP/Telnet management is optional

■ **Jitter and Wander**

Meets G.823 and G.824 jitter and wander requirements for E1 interface

■ **Power input**

DC: -36 ~ -72 VDC

AC: 90 ~ 260V AC (47 ~ 63 Hz)

AC and/or DC power source can be field selectable. The AC and DC power inputs can be served as power protection mutually.

■ **Dimensions**

Enclosure:234.4mm x 155.5mm x 44.2 mm (WxLxH)

■ **Environment**

Temperature: 0 ~ 60 degree C

Humidity: Up to 95% non-condensing

### Application

Following Figure (a) shows a point to point application for user interface either at E1, LAN or V.35.



Figure (a) : Point to Point application

The STU-C shown on Figure (b) facilitates the transport of user time slot, via the E1 interface at central office, eliminating CSU/DSU required, to remote branch.



Figure (b) : Dynamic transport at central office