

TSI-1569 ISDN Termination Unit



FEATURES

Originates and terminates primary rate ISDN calls at SW56, SW64, Nx56/64 kb/s, H0, and H11 rates.

Captures ISDN D-channel messages and displays in detailed or brief format.

SNMP and Telnet using 10Base2 and 10BaseT Ethernet Interfaces

Test Mode

Performs up to 23 simultaneous BERT tests with single Master Unit and an additional 24 simultaneous BERT tests with a Slave Unit.

Provides dial-up loopback and predetermined test patterns of N x 56/64K via the D-Channel of a primary rate interface.

Test D-Channel Layer 3 with preconfigured messages and cause codes.

Thru Mode

Bidirectional protocol analyzer capability with access using RS-232C or through a B-Channel from remote TSI-1569 or equivalent.

Cross Connect Mode

Receives calls, terminates D-Channel, bonds (Mode 1) if required and cross connects the Network DS-1 to the Terminal DS-1 based on called phone numbers.

DESCRIPTION

The TELESYNC TSI-1569 ISDN Termination Unit can be used in three different modes.

Test Mode: The TSI-1569 provides a dial-up means of automatically looping back or generating BERT patterns on any or all of the 23 DS-0 B channels in an ISDN PRI (23B+D) DS-1 data stream. The ISDN Termination Unit can be used to test SW56, SW64, Nx56/64 kb/s, H0, and H11 with a slave TSI-1569-2 (controlled by the Master Unit D-Channel). The TSI-1569 uses the ISDN D-channel to accept or originate calls using Q.931 protocol. In addition to call termination, call origination and BERTS measurements, the TSI-1569 captures up to 1000 D-channel messages and saves them in a log file.

Thru Mode: The TSI-1569 can be installed in the customer DS-1 PRI line (either central office or customer location) to monitor the bidirectional D-channel protocol. Access and control is through the RS-232C interface or dialed up through a B-channel using a TSI-1569 or equivalent.

Cross Connect Mode: The TSI-1569 functions as a network element to terminate the Switch (Network) D-channel and cross connect the Network calls to the DXC DS-1 based on called phone numbers. The TSI-1569 can also perform Mode 1 bonding of the incoming calls before cross connecting. The Cross Connect capability is used to interface ISDN dial-up services to packet or dedicated DS-1 networks.

D-CHANNEL CAPTURE LOG

The TSI-1569 captures inbound and outbound D-channel messages and stores them in a file. The file is either 1,000 messages or 20,000 bytes whichever occurs first. The log will accumulate messages until full. The capture feature is useful in debugging ISDN D-channel problems.

Most D-channel capture log messages are displayed in a "plain English" format which deciphers call control messages and information elements. For example, the Calling Number and the Calling Party Name are presented in plain text. Only messages that are transparently passed by the switch and have variable, user-defined formats are displayed in hexadecimal format.

ETHERNET INTERFACE

Ethernet (10Base2 and 10BaseT) with SNMP Version 2 agent provides network management and control. A Management Information Base (MIB) maintains status, configuration and performance parameters using SNMP. The embedded SNMP agent supports GET and SET requests and also provides traps to one or more manager stations. The traps are defined in CCITT/ISO Abstract Syntax Notation One (ASN.1). Trivial File Transfer (TFTP) allows the retrieval of D-Channel logs. The TFTP implementation utilizes UDP datagrams for the file transmission.

TEST MODE

CALL TERMINATION

The TSI-1569 is used in conjunction with ISDN central office switches to terminate calls. It utilizes the PRI ISDN D-channel (DS-0 channel 24) to accept incoming calls using Q.931 protocol. The ISDN switch is programmed to route incoming calls assigned to the TSI-1569 Switch DS-1 Input. In the initial call setup, the ISDN switch will specify the "Called Number" of the test capability being requested. The switch can specify the B-channel or group of B-channels on which the test capability is requested. The data rate (56K or 64K) per DS-0 B-channel will be set to match the rate of the incoming call. The call setup can be narrowband or wideband using fixed, flexible or floating types of channel allocation schemes. The patterns are specified using a table of phone numbers and corresponding patterns. The TSI-1569 can terminate simultaneous incoming calls, any combination of patterns and rates up to 23 DS-0s in a Master unit and an additional 24 DS-0s in a Slave unit.

CALL ORIGINATION:

The TSI-1569 originates calls over the PRI Switch ISDN D-channel using Q.931 messages. The call parameters are typically defined by the user through the RS-232C command port. The call may be single channel narrowband 56K unrestricted digital information, rate adapted for 64K speech or 64K restricted digital information or 64K unrestricted digital information. The call may be Multichannel wideband (unrestricted digital

information) consisting of Nx64K, N=2 to 23 (24 if a Slave TSI-1569-2 unit is used) or H0 with fixed, flexible or floating channel assignment or H11 if a 24B Slave TSI-1569 is used. The call origination SETUP message sent by the TSI-1569 contains all the information elements required to complete the call.

BIT ERROR MEASUREMENTS:

In addition to providing loopbacks and test patterns in response to incoming call requests, the TSI-1569 can perform Bit Error Rate Measurements (BERT) on incoming data. The TEST menu allows the user to define a test that configures the data pattern to be transmitted, received and measured. The TSI-1569 is capable of measuring bit errors on any of the patterns it transmits.

The TSI-1569 has the capability to originate and perform up to 23 simultaneous BERTS tests from the Master Unit and up to 24 tests in a Slave Unit. At any time during the tests, bit errors can be inserted in any channel. The unit can originate/terminate incoming calls up to the total number of DS-0 lines in the Master and Slave Units.

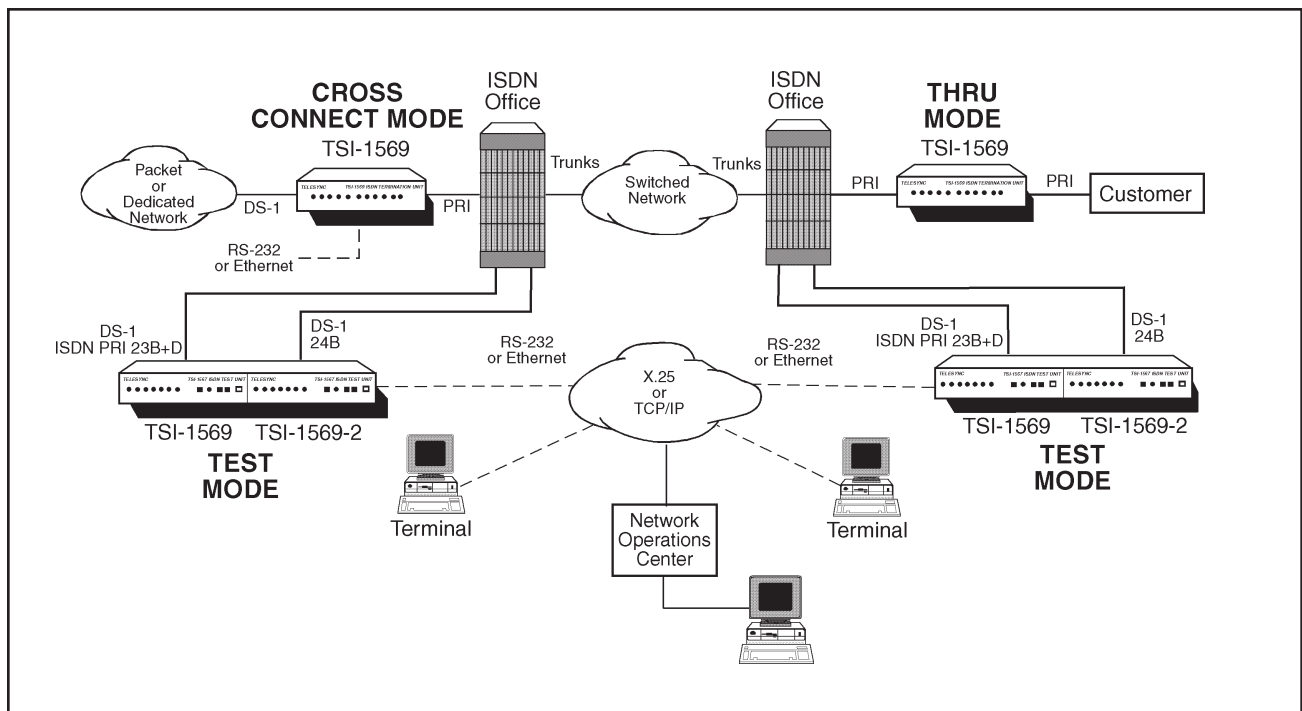
The TSI-1569 can originate an "Ascend type" inverse multiplexer BERT test. The TSI-1569 permits calling an Ascend Inverse Multiplexer operating in either Mode 1 or Transparent Mode and containing up to 23 DS-0 lines (24 DS-0 lines for a Slave Unit). The TSI-1569 bonds with the inverse multiplexer, sends a V.54 loopup and performs bonded BERT testing. The TSI-1569 also has the capability for an Imux (Mode 1) to call the TSI-1569, bond the channels and the TSI-1569 provides the loopback for BERTS testing at the Imux end.

The TSI-1569 also has the following test capabilities:

- DTMF dialing after ISDN call setup
- DS-0 amplitude and frequency measurement
- D-channel preconfigured responses to calls
- B-channel preconfigured responses to calls
- Callback capability
- Echo Cancelers on/off

Patterns Supported

Name	Name
-----	-----
Loop	48 Octet
DDS Idle	55 Octet
63	55 Daly
511	96 Octet
2047	120 Octet
2e15	Tone 404
2e20	Tone 1004
2e23	Tone 2100
Zeros	Tone 2804
Ones	LoopUp CSU
1:7	LoopDn CSU
2 in 8	LoopUp Net
3 in 24	LoopDn Net
DDS-1	LoopUp V54
DDS-2	LoopDn V54
DDS-3	SeqByChNum
DDS-4	SeqByFrNum
DDS-5	



HANDSET/VOICE CALL:

The TSI-1569 can generate a voice call using an optional telephone handset. The handset plugs into the TSI-1569 rear panel Handset connector. A number is input through the RS-232C interface for the TSI-1569 to call and connect to the Handset.

THRU MODE

PROTOCOL ANALYZER:

The TSI-1569 can be configured to operate as an in-line protocol analyzer. By connecting the DS-1 network side to the TSI-1569 DS-1 Switch input and the DS-1 terminal side to the TSI-1569 DS-1 DXC side, the TSI-1569 performs as a regenerator and captures the ISDN protocol. The TSI-1569 captures bidirectional D-channel messages and stores them in a file. The file is either 1,000 messages or 20,000 bytes whichever occurs first. The log will accumulate messages until full. The THRU Mode capture log feature is useful in debugging ISDN D-channel problems.

REMOTE CONTROL:

The TSI-1569 can be controlled through the RS-232 interface, Ethernet interface or by using a TSI-1569 or equivalent through a B-channel call with subaddressing. The remote B-channel control functions the same as the RS-232 interface permitting dumping of the D-channel log as well as test call origination.

CROSS CONNECT MODE

CROSS CONNECT:

The TSI-1569 functions as a network element to terminate the Switch (Network) D-channel and cross connect the calls to the DXC DS-1 based on called phone numbers. Up to 10 DS-1 signals can be controlled with a single D-channel. The calls can be any combinations of SW56, SW64 and Nx56/64. The TSI-1569 can be used to interface a noncontiguous constant delay network with a packet network, DS-1 dedicated network or a Nx56/64 contiguous network.

BONDED CALLS:

The TSI-1569 can perform Mode 1 bonding of the Switch side incoming calls before cross connecting to the DXC side. The calls can be up to 23 B-channels in a Master unit or Backup D-channel unit and 24 each in up to 8 Slave units.

BACKUP D-CHANNEL TEST:

The TSI-1569 with a TSI-1569-2 card in the B side of chassis 0 has the capability to perform backup D-channel. The A side TSI-1569-2 card has the primary D-channel (DS-0 # 24) and upon detecting a failure, the D-channel control is automatically switched to the B side card where the backup D-channel is DS-0 # 24 of the backup primary rate line. The RS-485 interface permits up to 4 additional chassis or a total of 1 PRI line, 1 backup PRI line and 8 DS-1s controlled by the D-Channels.

TSI-1569 ISDN TERMINATION UNIT



SPECIFICATIONS

Front Panel Indicators:

Power Green LED indicates -48Vdc applied

DS-1 Switch LOS Red LED indicates input DS-1 signal from network not detected.

DS-1 Switch Error Red LED indicates input DS-1 signal from network is making errors.

DS-1 DXC LOS Red LED indicates input DS-1 signal from terminal (Thru and Cross Connect Modes only) not detected.

DS-1 DXC Error Red LED indicates input DS-1 signal from terminal (Thru and Cross Connect Modes only) is making errors.

Master indicates the TSI-1569-2 Card is performing as a Master unit (23B + D).

Active Green LED indicates one or more of the DS-0 B-channels are active.

Mode TEST, THRU, CROSS CONNECT indicates the TSI-1569-2 Card is operating in the Test, Thru or Cross Connect mode.

Alarm Red LED indicates DS-1 LOS, Frame Loss, excessive DS-1 error rate or internal failure

Rear Panel Inputs/Outputs/Controls

Ethernet 10Base2 for SNMP and control.

Chassis 0-5 rotary switch for setting chassis number in the Cross Connect Mode.

B Ethernet 10BaseT for SNMP and Telnet control of side B Card

B Switch DS-1 In/Out B Card, Network side, screw terminal blocks, DS-1 Levels, +6dB DSX to -30dB DSX.

B DSX DS-1 In/Out B Card, Terminal side, (Thru and Cross Connect Modes only) screw terminal blocks, DS-1 Levels, +6dB DSX to -30dB DSX.

B RS-232C B Card DB-9 Male, 1 Start Bit, 1 Stop Bit, 8 Data Bits, No Parity.

B Power: B Card power, screw terminal block -48VDC 20 Watts.

Baud Rate: Switch selectable 2400, 9600, 19200, 38400 baud. Selects rate for A RS-232C and B RS-232C.

S/T: ISDN BRI S/T Interface for future option.

Handset connection for an optional handset.

Alarm Contacts NC, NO and Common indicates A or B Card DS-1 LOS, excessive DS-1 error rate or Card failure.

A Ethernet 10 BaseT for SNMP and Telnet control of side A Card.

A Power: A Card power, screw terminal blocks -48VDC 20 Watts.

A RS-232C A Card DB-9 Male, 1 Start Bit, 1 Stop Bit, 8 Data Bits, No Parity.

A Switch DS-1 In/Out A Card, Network side, screw terminal blocks, DS-1 Levels, +6dB DSX to -30dB DSX.

A DSX DS-1 In/Out A Card, Terminal side, (Thru and Cross Connect Modes only) screw terminal blocks, DS-1 Levels, +6dB DSX to -30dB DSX .

Termination: Switch terminates the RS-485.

RS-485 RJ-45 connectors, RS-485 serial interface allows a card with ISDN PRI D channel (NFAS) to control 4 additional chassis each with two TSI-1569-2 cards when operating in the Cross Connect Mode.

Dimensions: TSI-1569 Chassis accepts two TSI-1569-2 ISDN Termination Cards 1.75"H x 21.5"W x 11.5"D 23" Rack Mount only.

Weight: 4 Pounds for Chassis and 1 Pound for each TSI-1569-2 Card (2 Maximum) Installed

Temperature: 0C to 50C Operating, -25C to 75C Storage

ORDERING INFORMATION

TSI-1569 ISDN TERMINATION UNIT includes Chassis, 1 TSI-1569-2 ISDN Termination Card, 1 blank Panel.

TSI-1569-2 ISDN Termination Card

P/N 400132 Handset

TELESYNC reserves the right to update the product specifications without notice.

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TELESYNC

5555 OAKBROOK PARKWAY • SUITE 110 • NORCROSS, GA 30093
PHONE: (770) 246-9662 • FAX (770) 246-9733 • www.telesync.com