

TSI-2069 E1 ISDN Termination Unit



FEATURES

Originates and terminates ISDN calls at Nx56/64 kb/s, H0, H11 and H12 rates.

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

Telnet and SNMP using 10BASE2 Ethernet Interface

Test Mode

Performs up to 30 simultaneous BERT tests to verify network and customer data line integrity and connectivity

Provides dial-up loopback and predetermined test patterns of Nx56/64 kb/s, H0, H11 and H12 rates via the D-Channel of a E1 ISDN interface.

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

Thru Mode

Bi-directional protocol analyzer capability with access using RS-232C, Ethernet or through a B-Channel from remote TSI-2069 or equivalent.

Cross Connect Mode

Receives calls, terminates D-Channel, bonds (Mode 1) if required and cross connects the Network E1 to the Terminal E1 based on called phone numbers.

DESCRIPTION

The TELESYNC TSI-2069 E1 ISDN Termination Unit can be used in 3 different modes.

Test Mode: The TSI-2069 provides a dial-up means of automatically looping back or generating BERT patterns on any or all of the 30 DS-0 B Channels in an E1 ISDN data stream. The E1 ISDN Termination Unit can be used to test Nx56/64 kb/s, H0, H11 and H12. The TSI-2069 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-2069 captures the last 1000 D-channel messages and saves them in a log file.

Thru Mode: The TSI-2069 can be installed in the customer E1 ISDN line (either central office or customer location) to monitor the bi-directional D-Channel protocol. Access and control is through the RS-232C interface, Ethernet interface or dialed up through a B-channel using a TSI-2069 or equivalent.

Cross Connect Mode: The TSI-2069 functions as a network element to terminate the Switch (Network) D-channel and cross connect the Network calls to the DXC (Terminal) E1 based on called phone numbers. The TSI-2069 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 fractional E1 networks.

ALL MODES

D-CHANNEL CAPTURE LOG: The TSI-2069 captures inbound and outbound D-channel messages and stores them in a file. The file contains the last 1000 messages received or transmitted unless the file is cleared. 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: Thin Ethernet (10Base2) 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. Complete operation and control of the TSI-2069 is provided through a Telnet session. The TSI-2069 limits the number of simultaneous Telnet sessions to one.

TEST MODE

CALL TERMINATION: The TSI-2069 is used in conjunction with ISDN central office switches to terminate calls. It utilizes the ISDN D-channel to accept incoming calls using Q.931 protocol. The ISDN switch is programmed to route incoming calls assigned to the TSI-2069 Switch E1 Input. In the initial call setup, the switch will specify the “Called Number” of the test capability being requested. The switch will 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-2069 can terminate simultaneous incoming calls, any combination of patterns and rates up to 30 DS-0 in an E1 ISDN interface and an additional 30 simultaneous BERT tests with the B-side card in the Chassis and a second E1 ISDN interface.

CALL ORIGINATION: The TSI-2069 originates calls over the E1 Switch ISDN D-channel using Q.931 messages. The call parameters are

typically defined by the user through the RS-232C command port or Telnet session over the Ethernet port. The call may be single channel narrowband 64K audio, 64K speech, 64K restricted digital information, 64K unrestricted digital information or 56K adapted to 64K. The call may be Multichannel wideband (unrestricted digital information) consisting of Nx56/64K, N=1 to 30 or H0, H11 or H12 with fixed, flexible or floating channel assignment. The call origination SETUP message sent by the TSI-2069 contains all the information elements required to complete the call.

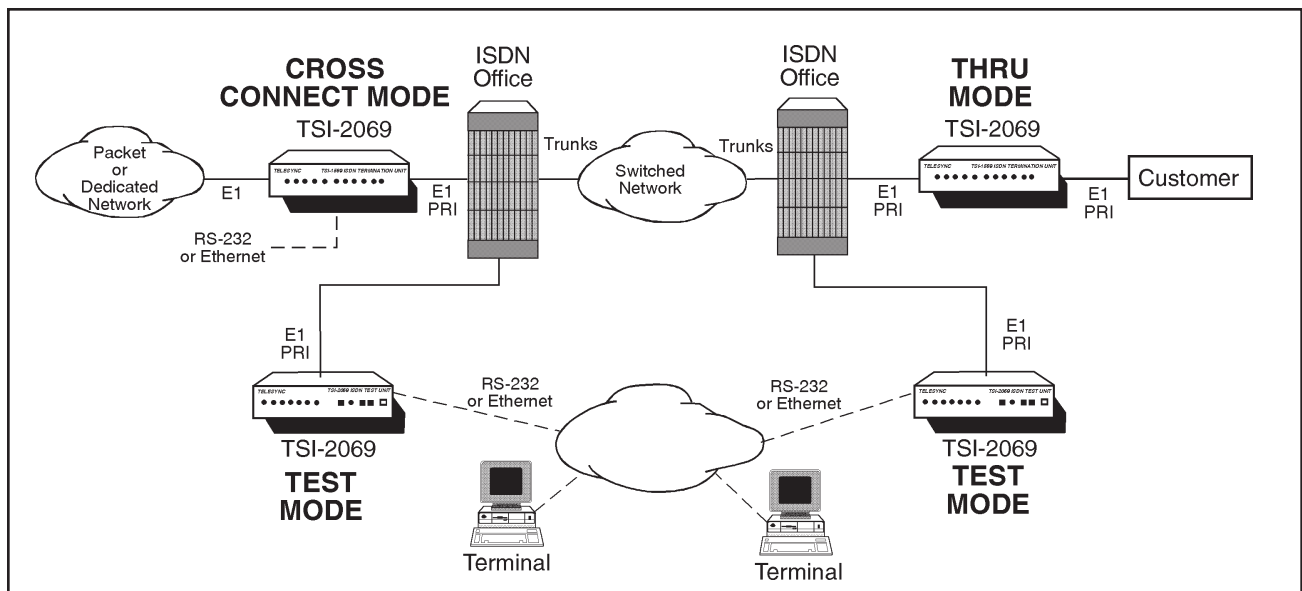
BIT ERROR MEASUREMENTS: In addition to providing loopbacks and test patterns in response to incoming call requests, the TSI-2069 can perform Bit Error Rate Test (BERT) on incoming data. The TEST menu allows the user to define a test that configures the data pattern to be transmitted, received and measured. The TSI-2069 is capable of measuring bit errors on any of the patterns it transmits.

The TSI-2069 has the capability to originate and perform up to 30 simultaneous BERTS tests with a single TSI-2069-2 Card in the chassis. An additional 30 simultaneous BERTS tests can be performed with a second TSI-2069-2 Card in the chassis. 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.

The TSI-2069 can originate an “Ascend type” inverse multiplexer BERT test. The TSI-2069 permits calling an Ascend Inverse Multiplexer operating in either Mode 1 or Transparent Mode and containing up to 30 DS-0 lines. The TSI-2069 bonds with the inverse multiplexer, sends a V.54 loopup and performs bonded BERT testing. The TSI-2069 also has the capability for an Imux (Mode 1) to call the TSI-2069, bond the channels and the TSI-2069 provides the loopback for BERTS testing at the Imux end.

The TSI-2069 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
- Pass/Fail Test



PATTERNS SUPPORTED

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

HANDSET/VOICE CALL: The TSI-2069 can generate a voice call using an optional telephone handset. The handset plugs into the TSI-2069 rear panel Handset connector. A number is input through the RS-232C interface for the TSI-2069 to call and connect to the Handset.

THRU MODE

PROTOCOL ANALYZER: The TSI-2069 can be configured to operate as an in-line protocol analyzer. By connecting the E1 network side to the TSI-2069 E1 Switch input and the E1 terminal side to the TSI-2069 E1 DXC side, the TSI-2069 performs as a regenerator and captures the ISDN protocol. The TSI-2069 captures bi-directional D-channel messages and stores them in a file. The log contains the last 1000 transmit or receive messages. The THRU Mode capture log feature is useful in debugging PRI D-channel problems.

REMOTE CONTROL: The TSI-2069 can be controlled through the RS-232 interface, a Telnet session over the Ethernet interface, or by using a TSI-2069, TSI-1569 or equivalent through a B-channel call using subaddressing or special telephone numbers. The remote B-channel connection functions the same as the RS-232 interface permitting dumping of the D-channel log as well as test call origination. When Remote Control is being used, the local RS-232C interface and the Telnet session over the Ethernet interface are locked out.

CROSS CONNECT MODE

CROSS CONNECT: The TSI-2069 functions as a network element to terminate the Switch (Network) D-channel and cross connect the calls to the DXC E1 based on called phone numbers. The calls can be any combinations of SW56, SW64 and Nx56/64. The TSI-2069 can be used to interface a noncontiguous constant delay network with a packet network or a Nx56/64 contiguous network.

BONDED CALLS: The TSI-2069 can also perform Mode 1 bonding of the Switch side incoming calls before cross connecting to the DXC side. The calls can be up to 30 B-channels.

