JDSU

COMMUNICATIONS TEST & MEASUREMENT SOLUTIONS

HST-3000

ISDN BRI Service Interface Module (SIM)

2007 FROST & SULLIVAN
Global Communications Test & Measurement Company of the Year Award

Key Features

- Emulation of the NT1, NT1/TE, and TE for testing voice, 56/64K data, and 3.1K audio call types on U interface
- U monitor capability allows bi-directional monitoring of in-service D-channel messages
- Auto SPID feature allows technicians to automatically assign SPID values
- Enables IDSL service pre-qualification with 128 K and 144 K BER testing
- Layer 1, 2, and 3 results, including plain English decodes of D-channel cause codes

The HST-3000 is a powerful and versatile handheld solution that tests ISDN BRI, copper, T1, and ISDN PRI. Hand-held, rugged, and easy-to-use, the HST-3000 is ideal for field use. Its modular design provides a scalable, all-in-one solution for testing ISDN BRI, as well as thorough testing of the facilities over which it is provided.

ISDN BRI provides enhanced network services to many residential and small business customers as well as a significant revenue stream for service providers. Not only is installation and maintenance of ISDN BRI more complex than POTS, but providers are often struggling daily to meet tighter deadlines with reduced budgets and smaller workforces. To meet these challenges, an easy-to-use, versatile test solution is required that helps reduce failures and repeat troubles while improving efficiency.

Equipped with the ISDN BRI option, the HST-3000 is ideal for the installation and troubleshooting of ISDN BRI circuits. As a field tool, the HST-3000 can place or receive calls to verify switch translations. As a Central Office (CO) tool, technicians can verify pair assignments, service activation, and service translations. The HST-3000 also offers an IDSL BERT mode to test B1, B1, 2B or 2B+D configurations to verify service before delivery to the customer.

Compact and rugged for field technicians, the HST-3000 can be used in all conditions, from inside an office environment to a noisy, wet outdoor span repeater. The HST-3000 also boasts automated setups and advanced features that ensure consistent adherence to service provider methods and procedures. Each HST-3000 is built to order and can easily be field-upgraded with new modules and software as application and technology needs change.

Call Verification

The HST-3000 offers NT1/TE and LT modes for testing support at the customer premises or switch. At the customer premises, a technician can verify BRI service and SPID assignments by drawing dial tone. Service translations can then be verified by placing and receiving calls on the U interface. Up to two simultaneous calls can be made consisting of voice, 3.1k audio, 56k data, or 64k data calls. At the CO, technicians can use the HST to verify cable pair assignments, identify line sealing current and polarity, as well as to verify service translations prior to service delivery. Manual or Auto SPID functionality gives technicians the flexibility to manually configure the SPID or automatically assign SPID values for single or dual calls. This allows for increased accuracy in testing and speeds service delivery to the customer.

The HST-3000 provides prompting to the user for manual response (acceptance/rejection) to incoming calls. It can also be set to automatically accept or reject incoming calls. After a call has been accepted, the technician can either drop the received B-channel data to the speaker or headset or BERT the call. BER testing and a voice path, via a handset, is provided to qualify these data and voice calls.

In addition, the HST-3000 can be placed into LT or NT mode to send or respond to EOC loop backs, providing a method of testing the 2B1Q BRI signal quality on the BRI line. Testing in either mode, the user can then conduct BER testing on either B-channel, both B-channels (2B) or the entire line (2B+D) using patterns such as 2047. This test verifies the U interface.

Easy-to-read result views allow technicians to view ISDN statistics, call status, BERT results, ISDN results, and D-channel decodes. A summary screen displays “All Results OK” or a summary of errors. The unit presents Layer 1, 2, and 3 results, including plain English decodes of D-channel.

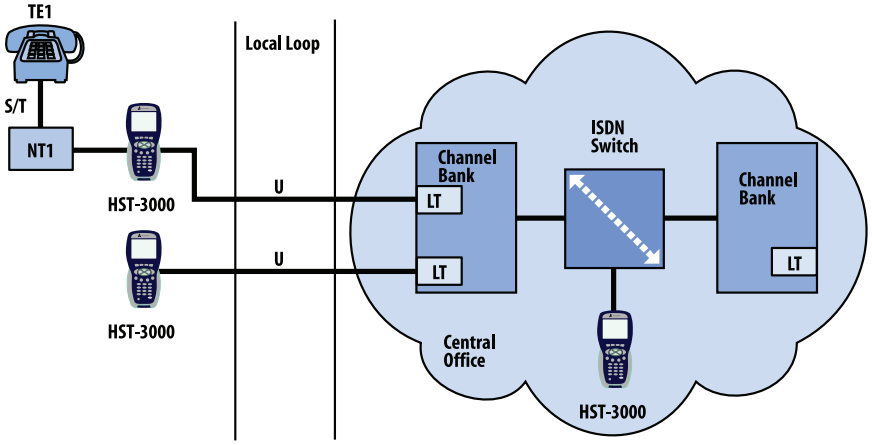

Figure 1. ISDN BRI testing

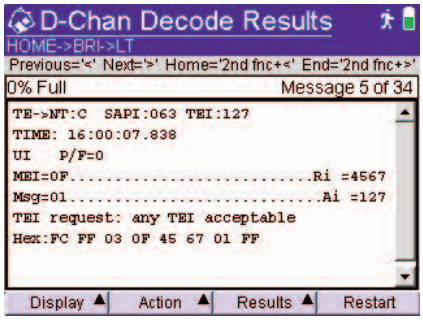

Figure 2. D-Channel Decode Results

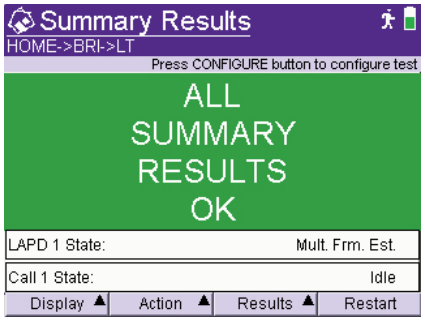

Figure 3. Summary Results

Troubleshooting

Non-intrusive bi-directional monitoring of in-service D-channel signaling messages make troubleshooting a new ISDN turn-up easier. For ISDN BRI circuits, the technician can access the D-channel on the U interface. If the problem can not be easily isolated at the customer premises or at the switch, then sectionalization can be accomplished by using the U-Monitor mode to monitor between the NT1 and LT devices. Used in tandem, the technician can sequentially replace each piece of premise equipment to identify the source of errors. Results can be displayed on-screen or stored for later retrieval and output via RS-232, USB or Ethernet connectivity—standard with each base unit.

D-Channel Decodes Analysis

D-channel decodes help to analyze such factors as call establishment status, uncompleted call and error message causes, and equipment "lock up" issues. The HST-3000 can monitor layer 2 (LAPD) and layer 3 (Q.931) cause code messages on the D-channel in both terminate and monitor modes. Layer 2 results give technicians the ability to check link and D-channel status, verify LAPD frames, and check utilization rates. Following link establishment, Layer 3 decodes allow technicians to verify such factors as call state, who made or dropped the call, why the call was dropped, where the call is being carried (TEI), and call types.

Test the Copper, Test the Service, Improve the Process

Equipped with the Copper Testing option, the HST-3000 can quickly troubleshoot the local loop for line impairments that degrade or impair ISDN BRI performance. With the HST-3000, technicians can quickly identify and locate cable impairments, including shorts, grounds, opens, crosses, bridged taps, wet sections and other high resistive faults. These impairments are easy to assess with the HST-3000 advanced time domain reflectometer (TDR), precision digital volt/ohm meter (DVOM) and an accurate resistive fault locator (RFL) to pinpoint troubles prior to circuit installation. The HST-3000 can also transmit and receive 40kHz wideband tones and with impulse noise, background noise measurements confirm that noise and loss meet acceptable criteria. Copper test features are optimized for use anywhere on the local loop—at the NID, crossbox, pedestal, main distribution frame or anywhere a technician might gain access to the local loop to locate the source of trouble.

After the physical layer has been tested, the actual ISDN service can be tested by placing and receiving calls verifying proper switch translations. The 2-wire facility that carries the ISDN BRI service can be qualified by performing BER analysis with a number of patterns, such as 63, 511 and 2047.

Pre-programmed tests and customized scripts ensure that all technicians, including novice users, follow the same procedures, eliminating mistakes caused by improper test configurations or incorrect procedures.

JDSU's TechComplete™ software (optional customized) allows the HST-3000 to improve turn-up and maintenance processes. This is done by operating with service provider's dispatch and closeout report systems to offload stored test results for later trend analysis and coaching reports. With these features, the HST-3000 can reduce repeat rates and failures and improve overall process efficiency.

Flexible and Rugged Design

The HST-3000 incorporates a rugged, weather-resistant design and long battery life that are ideally suited for use in the field. Its modularity allows for field upgrades to support new testing requirements. Standard Ethernet, USB, and serial connections offer flexibility to easily download software and offload captured test data.

Easily configurable, the HST-3000 can be used by different technicians with different responsibilities to perform a wide number of tests. The HST-3000 is easily upgradeable with technologies and advanced options that support the changing needs of service installers.

Flexible, modular platform makes technology upgrades or hardware changes easy

Specifications

Technical Specifications

Interfaces

U-interface	2-wire 8-pin modular
10/100 BT Ethernet jack	8-pin modular
Serial port	DB9 female via cable (DCE)
USB Host	
USB Device	

ISDN BRI Specifications

Interface	U Interface with To LT and To NT
Devices	NT1
Physical Configuration	Point to Point, Synchronous and Full-Duplex
Bit Rate	160 kbps ±5ppm
User Data Rate	144 kbps ±5ppm
Line Coding	2B1Q
Maximum Voltage	±2.5 V ±5%
Bits Per Frame	240
Bits User Data	216
Bits Overhead 24	
Frames Per Second	666.66666…
Modes of Operation	NT1/TE LT Emulate U-Monitor (option)
Call Controls	5ESS per AT&T 5D5-900-321 NTI-F per NT NIS-S208 NATIONAL per Bellcore Documents for NI-1, NI-2,and NI-3

Layer Analysis

Layer 1 states
Layer 2 (LAPD) states
Layer 3 (call status) states
Cause messages
Loopbacks
D-channel decode monitor (DB-9)
D-channel message capture/LCD display/state

Voice Capability

Hands-free operation and Headset interface
DTMF dialing
B-channel selection
Dual call capability
Selectable call appearance
Calling party ID
Speed dialing (10, 30-digit numbers)

Data Capability

Circuit switched data calls
Selectable for 56 kbps or 64 kbps

ISDN Testing

U Interface	
BERT	Single channel independent of call set-up
BER testing patterns	All ones, all zeros, 511, 2047,2E15-1, 2E20-1, 2E23-1, programmable user pattern
Supporting PVC service testing	
IDSL BER testing at 128 kbps and 144 kbps	
Timed tests	

Facilities Testing

User-configured loopbacks
Margin testing (dB Loss Pad selection) U interface
Call appearance
Auto SPID testing

Physical Specifications

Size (h x w x d)	9.5 x 4.5 x 2.75 in. (241 x 114 x 70 mm)
Weight (with battery)	2.7 lbs. (1.23 kg)
Operating temperature	22° F to 122° F (5.5° C to 50° C)
Storage temperature	-40° F to 150° F (-40° C to 65.5°C)
Battery life	10 hrs. typical usage
Charging time	7 hrs. from full discharge to full charge
Operating humidity	10% to 80% relative humidity
Storage humidity	10% to 95% relative humidity
Display	3.8" diagonal, 1/4 VGA, Color Active Matrix with backlight (readable in direct sunlight)
	General Specifications
Ruggedness	Survives 3 feet (91 cm) drop to concrete on all sides
Water-resistant	Splashproof (may be used in heavy rain)
Languages	English, German, French, Spanish, Italian, Chinese, Turkish
Keypad	Typical 12-button keyboard

6

Specifications

Ordering Information

HST3000-NG	HST-3000 Mainframe without Copper (Color)
HST3000-NG-BW	HST-3000 Mainframe without Copper Testing (B&W)
HST3000C-NG	HST-3000 Copper Mainframe (Color)
HST3000C-NG-BW	HST-3000 Copper Mainframe (B&W)

Available SIMS (Modules)

HST3000-4WLL	4-Wire Local Loop SIM
HST3000-AR2A-TI	ASDL2+ TI (ATU-R, Annex A) SIM
HST3000-AR2A	ADSL1/2/2+ (ATU-R, Annex A) SIM
HST3000-AR2B	ADSL1/2/2+ (ATU-R, Annex B) SIM
HST3000-AR2B-TI	ADSL2+ TI (ATU-R, Annex B) SIM
HST3000-ARB	Annex B ATU-R SIM
HST3000-ARCA	ATU-R/C Dual Mode SIM, AoPOTS SIM
HST3000-ARCB	ATU-R/C Dual Mode SIM, AoISDN SIM
HST3000-ARCE	ADSL (ATU-R) SIM
HST3000-BLK	Blank SIM
HST-BRA	ETSI (Euro) ISDN BRA SIM
HST3000-BRI	ISDN BRI SIM
HST3000-CAR	Copper (ATU-R) SIM
HST3000-CAR2A	ADSL1/2/2+ with Copper (ATU-R, Annex A) SIM
HST3000-CAR2A-TI	Copper, ADSL2+ TI (ATU-R, Annex A) SIM
HST3000-CAR2B	ADSL1/2/2+ with Copper (ATU-R, Annex B) SIM
HST3000-CAR2B-TI	Copper, ADSL2+ TI (ATU-R, Annex B) SIM
HST3000-CARB	Annex B Copper/ATU-R SIM
HST3000-CARCA	Copper and ATU-R/C Dual Mode SIM, AoPOTS
HST3000-CARCB	Copper and ATU-R/C Dual Mode SIM, AoISDN
HST3000-CARCE	Copper and ATU-R (Annex A) SIM, CE Marked
HST3000-CSHHV	G.SHDSL, 380V SPAN, DVOM SIM
HST3000-CSH4	Copper, 4-Wire G.SHDSL (STU-R/C, Annex A/B) SIM
HST3000-CSHCE	G.SHDSL and Copper SIM
HST3000-CT1	T1 and Copper SIM
HST3000-CU	Dual T/R/G Interface to Copper Test SIM
HST3000-CUCE	Copper only SIM, CE Marked SIM
HST3000-CUVDSL-CNXT	VDSL and Copper with Connexant Chipset SIM
HST3000-CUVDSL-IK	VDSL and Copper with Ikanos Chipset SIM
HST3000-CUVDSL-INF	VDSL and Copper with Infineon Aware Chipset SIM
HST3000-DC	Datacom SIM
HST3000-E1	E1 SIM
HST3000-E1-DC	E1/Datacom SIM
HST3000-ETH	10/100/1000 Ethernet SIM
HST-GSH	G.SHDSL SIM
HST3000-GSHCE	2-Wire G.SHDSL SIM
HST3000-T1	Dual TX/RX Bantam T1 Interface and T1 SIM
HST3000-T3	Dual TX/RX Bantam T1 Interface, and Dual RX/Single TX BNC DS3 Interface/and DS3 SIM
HST3000-VDSL-CNXT	VDSL with Connexant Chipset SIM
HST-3000-VDSL-CNXT-WB2	VDSL and Copper (up to 30 MHz) with Connexant Chipset SIM
HST3000-VDSL-IK	VDSL with Ikanos Chipset SIM
HST-3000-VDSL-IK-WB2	VDSL and Copper (up to 30 MHz) with Ikanos Chipset SIM
HST3000-VDSL-INF	VDSL with Infineon Aware Chipset SIM
HST-3000-VDSL-INF-WB2	VDSL and Copper (up to 30 MHz) with Infineon Aware Chipset SIM
HST3000-WB2	Wide Band 2 (up to 30 MHz) Copper Test SIM

7

Specifications

Software Options

HST3000-BLUETOOTH	Bluetooth Wireless Software Option
HST3000-DSL2	ADSL2 and ADSL2+ Software Option
HST3000-FR	Frame Relay Software Option
HST3000-FTP	FTP Software Option
HST3000-IPV6	IPv6 Software Option
HST3000-MPLS	MPLS Software Option
HST3000-MSTR	Multiple Streams Software Option
HST3000-MSTV	Microsoft IPTV Video Analysis Software Option
HST3000-OPTETH	Optical Ethernet Software Option
HST3000-PCMSIG	Signalling (PCM) Software Option
HST3000-PCMTIMS	TIMS (PCM) Software Option
HST3000-PRI	ISDN PRI Software Option (NC Standard)
HST3000-PS	Pulse Shape Software Option
HST3000-REMOP	Remote Operation Software Option
HST3000-RFL	RFL Software Option
HST3000-SCRIPT	Scripted Test Software Option
HST3000-SPE	Spectral Noise Software Option
HST3000-ST	Basic Rate ISDN S/T (ANSI) Software Option
HST3000-T1DDS	DDS-T1 Software Option
HST3000-TCPUDP	TCP/UDP Software Option
HST3000-TDR	TDR Software Option
HST3000-TxIMP	Transmission Impairments Software Option
HST3000-UNISTIM	VoIP Signaling Call Controls for UNISTIM Software Option
HST3000-VT100	VT100 Emulation Software Option
HST3000-WBTONES	WB TIMS Software Option
HST3000S-H.323	H.323 VoIP Signaling Software Option
HST3000S-IP	Advanced IP Suite – PING and Through Mode Support Software Option
HST3000S-IP-Video	IP Video Analysis Software Option
HST3000S-MGCP	SCCP MGCP VoIP Signaling Software Option
HST3000S-MOS	VoIP Mean Opinion Score Software Option
HST3000S-SCCP	SCCP VoIP Signaling Software Option
HST3000S-SIP	SIP VoIP Signaling Software Option
HST3000S-VMOS	Video MOS Analysis Software Option
HST3000S-VOIP	VoIP Software Analysis Software Option
HST3000S-WEB	Web Browser Software Option

Test & Measurement Regional Sales

NORTH AMERICA
TEL: 1 866 228 3762
FAX: +1 301 353 9216

LATIN AMERICA
TEL: +55 11 5503 3800
FAX: +55 11 5505 1598

ASIA PACIFIC
TEL: +852 2892 0990
FAX: +852 2892 0770

EMEA
TEL: +49 7121 86 2222
FAX: +49 7121 86 1222

www.jdsu.com/test