

HST-3000

DS3 Service Interface Module (SIM)



Key Features

- Reduce DS3 circuit testing time by using dual receivers for bi-directional monitoring, allowing for timely trouble isolation and correction
- Seamlessly transition from testing the DS3 interface to testing at the T1 tributary without swapping modules or test sets via the standard dual
- Transmit and receive DS1 interface
- Verify multiplexed operation by performing BER testing on one or all 28 DS1 channels within the DS3
- Accurately measure frequency and signal level to ensure optimal DS3 circuit performance
- Compact, lightweight and scalable tool ideal for the needs of the field technician today

The HST-3000 DS3 test option enables users to perform the test operations necessary to install, maintain, and troubleshoot DS3 circuits and DS1 channels within DS3 circuits. Test operations include in-service monitoring, bit error rate testing (BERT), and loopback testing. Technicians can quickly qualify networks for accurate multiplexed operation by performing BER testing on one or all DS1 channels transmitted by a DS3 multiplexer.



Explosive growth in demand for high-bandwidth applications and services is driving increased deployment of DS3 in today's network—both as a transport technology and as a service offering—leading to an increased need for test solutions that ensure the proper installation and maintenance of DS3 service. Technicians traditionally responsible for T1 and lower speed service installation and maintenance are now being tasked to take on DS3 testing responsibilities. This, coupled with today's smaller workforces and reduced budgets for equipment and training, presents a real challenge to service providers who must ensure that the service provisioning and trouble correction is done right the first time out.

Service Installation

Testing may be performed to a loop at the far-end cross connect-panel or straight away with another test set located at the far-end to sectionalize potential problems. For circuits with C-Bit framing, the HST-3000 can send DS3 FEAC loop commands and report FEAC alarms. For multiplexed DS3 testing, BERT patterns can be inserted on a single channel or all 28 DS1 channels within the DS3. Other standard features include error insertion to verify continuity, and alarm generation to verify proper network provisioning. Easy-to-read result menus allow technicians to view physical layer measurements, BERT results, parity errors, FEBEs and alarm conditions. The summary screen also provides a rapid assessment of overall test performance.

The HST's DS3 testing capability helps ensure the circuit is functioning properly before hand-off to the customer by providing simplified testing that includes a full range of test patterns and capabilities for both multiplexed and unchannelized DS3 circuits with M13 or C-Bit framing. Evaluation of BER test results, frequency, and signal level helps identify potential sources of problems such as faulty or loose cable crimps, improper line build out, excessive coaxial cable length and mis-allocated or faulty network equipment.

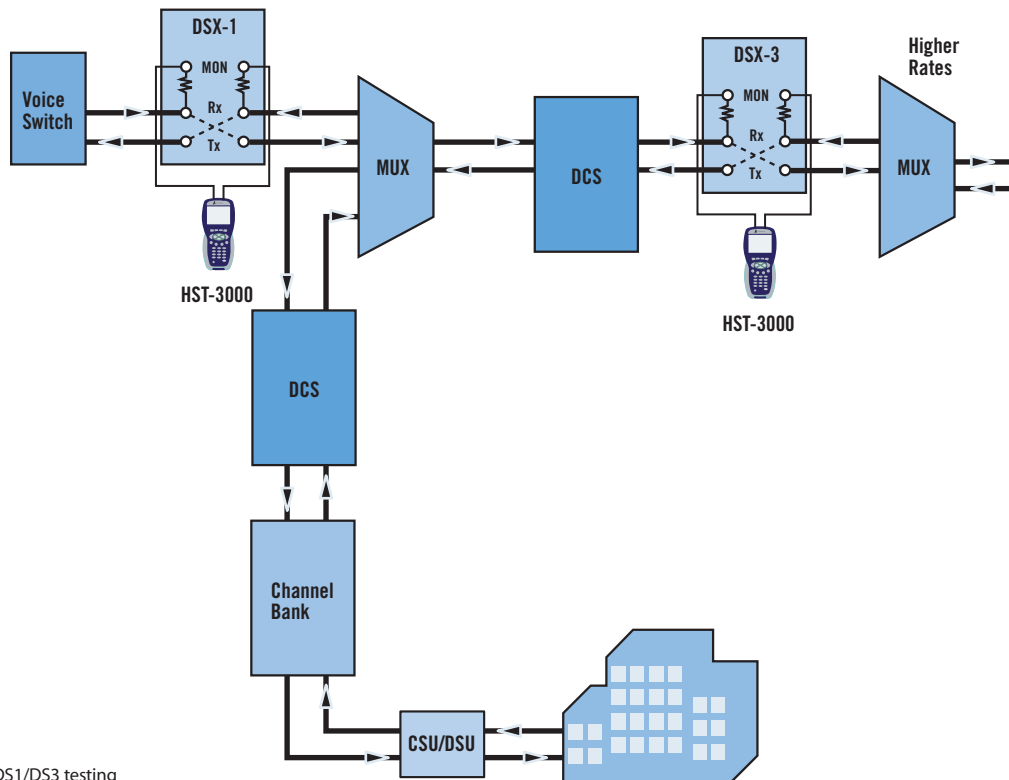


Figure 1: DS1/DS3 testing

T1 Testing

During DS3 installation or maintenance, it is often necessary to test at the T1 tributary level. The HST-3000 DS3 Option comes standard with dual transmit and receive for DS1 interfaces. This feature allows the user to switch from DS3 to DS1 physical layer testing without changing instruments or swapping modules—enabling timely and thorough testing of the T1 circuit to verify proper multiplexed operation.

Service Maintenance

It is often necessary to perform in-service monitoring of a DS3 circuit during routine maintenance or troubleshooting operations. The HST-3000 DS3 Option comes standard with dual DS3 receivers for bi-directional monitoring. This allows the user quick and non-intrusive identification and sectionalization of potential problems. Results from both receivers (primary and secondary) are easily viewable on the same screen.

The HST-3000 also provides the capability to isolate a single DS1 from the DS3 for analysis. If it becomes necessary to conduct intrusive testing to isolate and correct a problem, the full range of out-of-service testing, described earlier, is available.

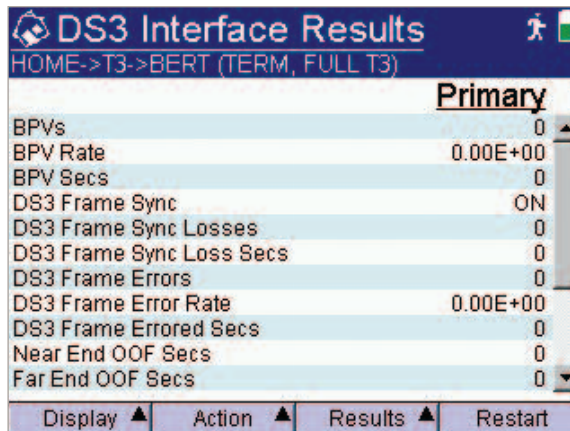


Figure 2: DS3 Interface Results

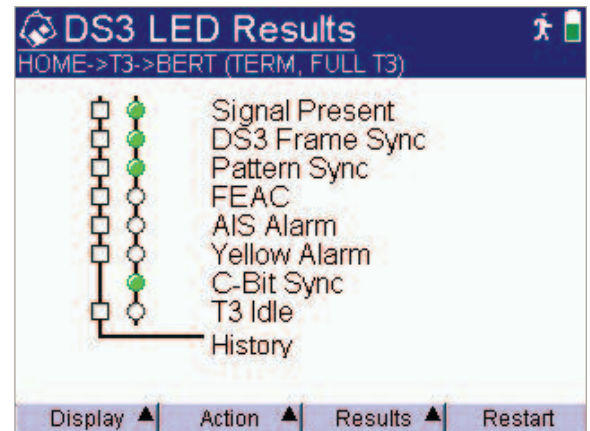


Figure 3: DS3 LED results

Test the Copper, Test the Service, Improve the Process

As an optional capability, the HST-3000 can be configured to include a robust suite of testing features for verification and troubleshooting of copper facilities. Equipped with this option, the HST-3000 can quickly troubleshoot the local loop for line impairments that degrade or impair DS1 performance. The user can quickly identify and correct cable impairments including: shorts, grounds, opens, crosses, bridged taps, wet sections and other highly resistive faults. These impairments are easy to locate with the HST-3000's 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 the full range wideband tones to 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.

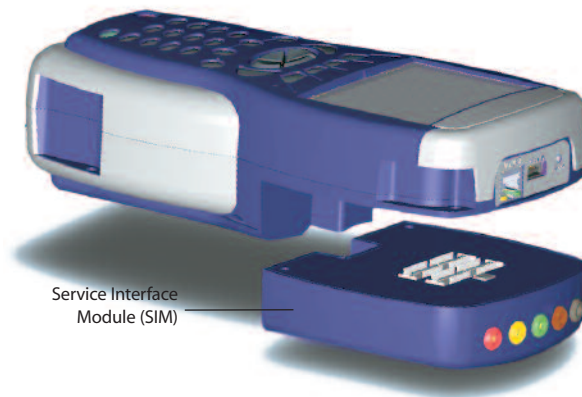
The HST-3000 DS3 Option provides the complete range of both DS1 and DS3 physical layer circuit testing. Building on these capabilities, the HST-3000 can be equipped with options that support ISDN Primary Rate (PRI) testing as well as PCM signaling and TIMS testing for verification of digital voice service on a T1 line. The HST-3000 can easily scale to address the full breadth and depth of testing requirements from qualification of the copper pair through voice and data service verification.

The HST-3000 offers pre-programmed tests and customized scripts that simplify testing and ensure consistent adherence to standard test procedures. These customizations help eliminate mistakes caused by improper test configurations or incorrect methodologies. JDSU's TechComplete™ software (optional, customized) allows the HST-3000 to improve turn-up and maintenance processes. This is done by operating with a 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.

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

DS3 (Single Tx/Dual Rx)	BNC
DS1 (Dual Tx/Rx)	Bantam Jacks
10/100 BT Ethernet jack	8-pin modular
Serial port	DB9 female via cable (DCE)
USB Host	
USB Device	

DS3 Specifications

Operating Modes	Terminate and Monitor
Receiver (Input) Specifications	
Frequency	44,736Mbps + 300 ppm
Impedance	Nominal 75 Ohms at 22MHz (unbalanced to ground)
Range	TERM: 0 to 12 dB cable loss at 22 MHz DSXMON: -20dB loss plus 0 to 9 dB of cable loss from high signal of 22 MHz

Jitter Tolerance

Transmitter (Output) Specifications	
Frequency	44,736 Mbps + 50 ppm
Impedance	Nominal 75 Ohms unbalanced to ground
Timing	
	Internal Clock
	Recovered (from network) Clock
Pulse (High)	Nominal 1.2Vp
Pulse (DSX)	Nominal 0.6 Vp
Pulse (Low)	Nominal 0.3 Vp with 75 Ohms
Pulse Shape	Per T1.102 (1993) & ITU-T G.703
Output Jitter	Per T1.102 (1993)
Tests	
	BERT, Monitor
Framing	Auto, Unframed, M13, C-bit
Line Coding	B3ZS
Error/Alarm Types	Logic, BPV, Parity, Frame, AIS, RAI
Loopback Codes	NIU, CSU, HDSL, MSS, user defined and repeater
FEAC Loop Codes	NIU, DS3 line, DS1 line

Frequency & Level Measurements

Frequency	Range: 44,736 + 350 ppm Accuracy: + 3ppm, + 1ppm/year Resolution: 4 Hz
Level Vp	Range: 0.0 V to 1.99 V Accuracy: (+ .02V/+ 10%) Resolution: 0.01 V

DS1 Specifications

Operating Modes	Terminate, Monitor, Drop & Insert, Loopback, (Full T1 and Fractional)
Framing	Unframed, D4/SE, ESF
Line Coding	AMI, B8ZS
Input Impedance	BRIDGE > 1000 Ohms TERM 100 Ohms + 5% DSX-MON 100 Ohms + 5%
Receive Level	BRIDGE 0 to -20.0 dBdsx TERM + 6 to -35.0 dBdsx DSX-MON +6 to -24.0 dBdsx
Timing Sources	Internal Clock Recovered (from network) Clock
Line Build Out Level	0, 7.5, 15.0, and 22.5 dB of cable loss at 722 kHz
Error Insertion	Logic, BPV, Frame

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

Ordering information

HST3000-NG	HST-3000 Mainframe without Copper (Color)
HST30HST3000-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	ADSL2+ 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

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

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