

JDSU Acterna HST-3000 Specs

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HST-3000

Wireless Infrastructure Test Applications



Key Features

- Isolate and troubleshoot physical layer troubles from RF problems
- Conduct DS1 signal analysis and BER testing with standard and advanced stress patterns
- Conduct DS3 signal analysis and BER testing with patterns for both M13 and C-bit framing
- Offers dual DS1 receivers and transmitters for in-service monitoring as well as drop-and-insert and head-to-head testing
- Offers dual DS3 receivers for bidirectional monitoring
- Accurately measure frequency and signal level to ensure optimal T1 and T3 circuit performance
- Lightweight, rugged, water resistant, and battery-powered handheld test equipment ideal for the needs of wireless field technicians
- Functions as a traditional T-BER® with innovative copper applications

The JDSU HST-3000 is a rugged, versatile, and portable tester that is ideal instrument for wireless technicians in the field who conduct T1/T3 tests with advanced stress patterns, T1 autotests, and VT100 emulation. Specifically designed for the outdoor field technicians, the HST-3000 can be built to order and can quickly and easily be upgraded with new modules as application and technology needs change.

In this extremely competitive wireless market, it is crucial for providers to offer the best service and the broadest coverage. The public relies heavily on their cellular devices for voice and new data applications, including text messaging, e-mail, Internet access, and digital photography. Customers will seldom tolerate noisy signals, dropped calls, or busy lines. Losing customers remains a constant threat; therefore, the pressure on wireless providers to maintain error-free and reliable networks has become enormous.

Continued explosive growth in the demand for next-generation wireless services is driving increased deployment of base stations and land lines. This growth has increased the requirement for accurate and reliable test solutions ensuring proper installation and maintenance of services. The ability to quickly and accurately diagnose and isolate network problems is key to a successful business.

The HST-3000 offers a test solution that addresses the need to reduce failures, repeat rates, and kickbacks—especially for leased lines.

Wireless technicians use the HST-3000 to qualify and troubleshoot the circuit. They can also use the T1/T3 test features to bit error rate test (BERT) the line and to measure frequency and signal level on the circuit under test. Technicians can quickly qualify networks for accurate operation with dual transmitter and receiver T1 interfaces and with dual DS3 receivers. With advanced copper test capabilities, HST-3000 can detect and identify copper loop problems, resolving finger-pointing issues on leased lines from the local exchange carrier (LEC).

Programmed with highly integrated applications for in-service and out-of-service testing, the HST-3000 examines both the pipeline and service levels to ensure that networks are performing properly.

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Summary Settings	
CONFIG->SUMMARY	
1 - Test Mode	Terminate
2 - Pri. Input	Terminate
3 - Payload	Full Rate
4 - Framing	ESF
5 - Line Coding	B8ZS
6 - Pattern	3 in 24

SUMMARY | DS1 | PATTERN | LOOP

DS1 Test

DS1 Physical Layer Testing

The best way to test the network is to monitor the traffic at the T1 interface with an in-service test at the base transceiver station or cell tower, the base station controller, or the mobile switching center. The HST-3000 helps to ensure the proper performance of network connections to base stations by performing signal, alarm, and timing tests together with BERT analysis.

The ability of the HST-3000 to monitor and perform BER testing in both directions of a circuit simultaneously streamlines the identification and isolation of circuit problems from faulty network equipment. Further sectionalize troubles within the network using standard or user-programmable loop codes to loopback network equipment and to locate faulty repeaters. Advanced timing analysis also helps technicians pinpoint signal delays, timing slips, and mismatches between switch and remote equipment.

Locating problems in your network is especially important if the backhaul lines are leased and finger-pointing issues must be resolved. With the HST-3000, technicians can verify whether the faults are inside or outside of their network responsibilities.

BERT Results	
HOME->T3->BERT (TERM, FULL T3)	
Primary	
Pattern Sync	ON
Pattern Losses	0
Pattern Slips	0
Sync Loss Seconds	0
Bit Errors	0
Bit Error Rate	0.00E+00
Error Seconds	0
Error Free Seconds	119
Pattern	2*23-1
Framing	C-Bit
1 Insert 1 DS3 Frame Err...	3 Enable DS3 AIS
Display ▲	Action ▲
Results ▲	Restart

DS3 Test

DS3 Physical Layer Testing

The HST-3000 provides a comprehensive DS3 testing capability to ensure that the circuit is functioning properly and to confirm that the line is clean. 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, or mis-optioned or faulty network equipment.

The HST-3000 lets users qualify DS3 circuits with an array of BER testing patterns for both M13 and C-bit framing. It also supports the verification of frame synchronization on the circuit. For more comprehensive and flexible testing, technicians can insert test patterns or tones on single, multiple, or all DS1 channels within the DS3 circuit. The HST-3000 DS3 BER testing measurements include:

- DS3 FEAC loopback codes
- Advanced stress patterns
- Signal level and frequency
- Insertion of logic and frame errors

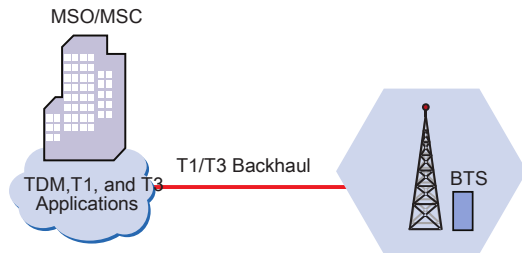
Easy-to-read result menus allow technicians to view physical layer measurements, BERT results, parity errors, far-end block errors (FEBEs), and alarm conditions. Additionally, the summary screen provides a rapid assessment of overall test performance.

Straightaway Testing

Straightaway testing is useful in isolating problems between the base stations and the mobile switching center. A known test pattern can be simultaneously transmitted in each direction between the HST-3000 and network test equipment, providing for easier sectionalization of network and equipment troubles. Looping up a customer service unit (CSU), which only requires one test set, can also verify T1/T3 circuits.

End-to-End Testing

If problems remain after running straightaway or loopback tests, it is possible that another providers' network introduced errors. Testing through to the far end, also known as end-to-end testing, can determine whether the problem is outside the immediate network. With a pair of HST-3000s at either end of the line and conducting end-to-end testing of the network using both straightaway and loopback tests will isolate the trouble.



BTS = Base Transceiver Station

MSO/MSC = Mobile Switching Office/
Mobile Switching Center

Figure 1. T1/T3 Backhaul Testing

VT100 Emulation

With the HST-3000 VT100 Emulation feature, technicians can access T1 and HDSL network equipment for configuration, performance data measurements, and loopback capabilities without having to carry a PC or laptop into the field.

T1 Autotest

The HST-3000 standard T1 Autotest allows technicians to select a series of BERT patterns and the time duration for each pattern. A standard and advanced T1 patterns are available to choose from, giving the user a lot of flexibility. Results can be easily saved and can also be associated with a work order ticket.

Saved Results

Save hundreds of results on the HST-3000 and then export them directly to a printer or to a PC via serial or Ethernet connections. Then e-mail, print, or save the results files on a PC. The HST-3000 file manager also allows technicians to view previously saved test information on the test instrument.

Copper Plant Testing

The HST-3000 copper features enable wireless technicians to quickly troubleshoot their T1/T3 copper lines for faults and conditions that can degrade the service. This option can locate physical plant impairments proving to leased-line providers that problems exist on the cable. The HST-3000 has an advanced time domain reflectometer (TDR), precision digital volt/ohm meter (DVOM), and an accurate resistive fault locator (RFL) to pinpoint troubles.

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. 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 variety of tests. The HST-3000 is based on a modular platform allowing for the addition of upgrades and options in the field. Other supported testing applications include ADSL, G.SHDSL, DDS-LL, PCM Signaling and TIMS, BRI, and VoIP.

To accommodate the future and changing needs of wireless field technicians, the HST-3000 is an easily upgradeable platform that will allow for the support of new technologies and advanced options.



Figure 2. The architecture of the HST-3000 enables fast, easy field-swapping of a wide variety of test modules.

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Specifications

Interfaces

DS3 (Single Tx/Dual Rx) BNC
 DS1 (Dual Tx/Rx) bantam jacks
 10/100 BT Ethernet jack 8-pin modular
 Serial port DB-9 female via cable (DCE)
 USB host
 USB device

T1

Operating modes Self test, T1 unframed, T1 D4 framed, FT1 ESF framed, T1 test loopback, T1 line loopback
 Input impedance bridge $>100\Omega$
 Term $100\Omega \pm 5\%$
 DSX-MON $100\Omega \pm 5\%$
 Receive level bridge 0 to -20.0 dBds
 Term +6 to -35.0 dBds
 DSX-MON +6 to -24.0 dBds
 Transmitting timing source internal clock, recovered clock
 Line codes AMI, B8ZS
 Line build out level 0, 7.5, 15.0, and 22.5 dB of cable loss at 722 kHz
 Line build out tolerance ± 0.5 dB at 722 kHz with LBO of 0 dB
 Error insert Logic, BPV, Frame

DS3

Operating modes Terminate and Monitor
Receiver (input)
 Frequency 44,736 Mbps + 300 pps
 Impedance Nominal 75Ω
 Term 0 to 12 dB of cable loss at 22 MHz
 DSX-MON -20 dB loss plus 0 to 9 dB c
 loss from high signal 22

Transmitting timing source internal clock, recovered (from network) clock
 Tests BERT, Monitor, Framing Auto, M13, C-bit
 Line coding B3ZS
 Error/Alarm types Logic, BPV, Parity, Frame, AIS, RAI
 FEAC loop codes NIU, DS3 line, DS1

Physical

Size (h x w x d) 241 x 114 x 70 mm (9.5 x 4.5 x 2.75 in.)
 Weight (with battery) 1.23 kg (2.7 lbs.)
 Operating temperature 5.5 to 50°C (22 to 122°F)
 Storage temperature -40 to 65.5°C (-40 to 150°F)
 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

Ruggedness Survives 91 cm (3 ft) 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

Base Unit	Software Options
HST3000-NG HST-3000 Mainframe without Copper (Color)	HST3000-BLUETOOTH Bluetooth Wireless
HST3000C-NG HST-3000 Copper Mainframe (Color)	HST3000S-WEB Web Browser
	HST3000-REMOP Remote Operation
	HST3000-SCRIPT Scripted Test
	HST3000-DSL2 ADSL2 and ADSL2+
	HST3000S-IP Advanced IP Suite—PING and Through Mode Support
	HST3000S-IP-Video IP Video Analysis
	HST3000S-VMOS Video MOS Analysis
	HST3000-MSTV Microsoft IPTV Video Analysis
	HST3000-VT100 VT100 Emulation
	HST3000S-VOIP VoIP Software Analysis
	HST3000S-H.323 H.323 VoIP Signaling
	HST3000S-MGCP SCCP MGCP VoIP Signaling
	HST3000S-MOS VoIP Mean Opinion Score
	HST3000S-SCCP SCCP VoIP Signaling
	HST3000S-SIP SIP VoIP Signaling
	HST3000-UNISTAMP VoIP Signaling Call Controls for UNISTAMP
	HST3000-OPTETH Optical Ethernet
	HST3000-IPV6 IPv6
	HST3000-MPLS MPLS
	HST3000-MSTR Multiple Streams
	HST3000-TCPUDP TCP/UDP
	HST3000-FTP FTP
	HST3000-WBTONES WB TIMS
	HST3000-PCMTIMS TIMS (PCM)
	HST3000-PCMSIG Signaling (PCM)
	HST3000-SPE Spectral Noise
	HST3000-RFL RFL
	HST3000-TDR TDR
	HST3000-PRI ISDN PRI (NC Standard)
	HST3000-ST Basic Rate ISDN S/T (ANSI)
	HST3000-T1DDS DDS-T1
	HST3000-TxIMP Transmission Impairments
	HST3000-FR Frame Relay
	HST3000-PS Pulse Shape

Available SIMS (Modules)
HST3000-CUCE Copper only SIM, CE Marked
HST3000-AR2A-T1 ADSL2+ T1 (ATU-R, Annex A)
HST3000-AR2A ADSL1/2/2+ (ATU-R, Annex A)
HST3000-AR2B ADSL1/2/2+ (ATU-R, Annex B)
HST3000-AR2B-T1 ADSL2+ T1 (ATU-R, Annex B)
HST3000-CAR ADSL1/2/2+ with Copper (ATU-R, Annex A)
HST3000-CAR2A Copper, ADSL2+ T1 (ATU-R, Annex A)
HST3000-CAR2B ADSL1/2/2+ with Copper (ATU-R, Annex B)
HST3000-CAR2B-T1 Copper, ADSL2+ T1 (ATU-R, Annex B)
HST3000-CARB Annex B Copper/ATU-R
HST3000-CARC Copper and ATU-R/C Dual Mode, Annex B
HST3000-CARCB Copper and ATU-R/C Dual Mode, Annex B
HST3000-CARCC Copper and ATU-R (Annex A), CE Marked
HST3000-WB2 Wide Band 2 (up to 30 MHz) Copper
HST3000-VDSL-CNXTVDSL with Connexant Chipset
HST3000-VDSL-CNXTW Broad Copper (up to 30 MHz) with Connexant Chipset
HST3000-VDSL-IK VDSL with Ikanos Chipset

HST-3000-VDSL-IK-VDSL and Copper (up to 30 MHz) with Ikanos Chipset
HST3000-INF-VDSL/DSL with Infineon Aware Chipset
HST3000-INF-VDSL/DSL and Copper (up to 30 MHz) with Infineon Aware Chipset
HST3000-ETH 10/100/1000 Ethernet
HST3000-CT1 T1 and Copper
HST3000-DC Datacom
HST3000-E1 E1
HST3000-E1-DC E1/Datacom
HST3000-4WLL 4-Wire Local Loop
HST3000-T1 Dual TX/RX Bantam T1 Interface
HST3000-T3 Dual TX/RX Bantam T1 Interface
HST3000-T3 and Dual RX/Single TX BNC DS3 Interface
HST3000-ETSI ETSI (Euro) ISDN Line
HST3000-BRI ISDN BRI
HST3000-CSHCE G.SHDSL and Copper
HST3000-GSHDSL G.SHDSL
HST3000-GSHCE 2-Wire G.SHDSL
HST3000-CSH4 Copper, 4-Wire G.SHDSL (STU-R/C, Annex A)
HST3000-BLK Blank

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