

## HST-3000

### Option for Datacom Testing



#### Key Features

- Isolates and troubleshoots Datacom networks and Customer Premises Equipment (CPE)
- Supports RS-232/V.24, RS-449/V.36, V.35, EIA-530, and X.21 interfaces
- Provides DTE/DCE emulation and bidirectional monitoring
- Contains a full suite of BERT patterns with data rate support up to 10 Mbps
- Verifies Frame Relay service over Datacom interfaces

The JDSU HST-3000 Datacom Service Interface Module (SIM) is designed for field technicians who are responsible for installing and maintaining data communications circuits and network elements over RS-232/V.24, RS-449/V.36, V.35, EIA-530, and X.21 interfaces. Technicians can verify end-to-end connectivity, identify clocking errors, and measure throughput with the bidirectional monitoring, Data Terminating Equipment (DTE) emulation, and Data Communications Equipment (DCE) emulation features.

When using the HST-3000 for network troubleshooting, technicians can quickly and easily isolate circuit problems to a specific direction by analyzing the performance of the entire digital link in both directions. The HST-3000 can also verify operation or locate network problems by generating Bit Error Rate Test (BERT) patterns and testing Frame Relay service.

Rugged, versatile, and portable, the HST-3000 is the ideal instrument for technicians to test the entire circuit, from the customer premise and throughout the network. It can be built to order and quickly and easily upgraded in the field with new modules as application and technology needs change.

Programmed with highly integrated applications for in-service and out-of-service testing, the HST-3000 examines both the physical layer and service levels to ensure that the network is performing properly.



figure 1 Datacom Configuration Menu

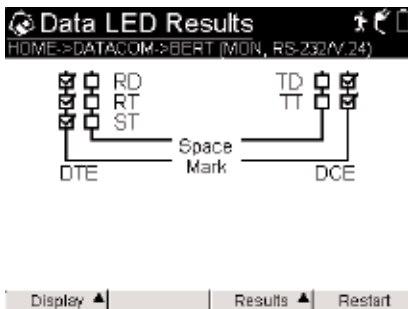


figure 2 Datacom LED Results Page

 A screenshot of the 'Perf G.821 Results' page. The page title is 'Perf G.821 Results' and the path is 'HOME->DATACOM->BERT (DTE, EIA, 530)'. The main content area shows a table of performance metrics for 'DTE'. The table has two columns: 'Verdict' and 'Pass'. The 'Verdict' column lists various metrics, and the 'Pass' column shows the corresponding values. At the bottom, there is a navigation bar with buttons for 'Display', 'Action', 'Results', and 'Restart'.
 

Verdict	Pass
AS	61
ASR	1.00
CSE8	0
EFS	61
EFSR	1.00
EB	0
EBR	0.00
SES	0
SESR	0.00
T8	61

figure 3 G.821 Performance Results Page

### DTE/DCE Emulation

The HST-3000 Datacom SIM can replace either a DTE or DCE device and can test head-to-head with existing network elements. By emulating the Customer Premises Equipment (CPE), the technician can control handshaking states between DTE and DCE devices to ensure proper transitions and to verify connectivity. Technicians can also sectionalize problems in the network by qualifying proper data transmissions and signaling states.

### Bidirectional Monitoring

The HST-3000 can passively monitor the Datacom link's transmission in both directions to confirm physical layer results.

### Traffic Generation

With the HST-3000, the user can send BERT patterns to verify error-free performance by transmitting ANSI, ITU, and user-programmable test patterns. Test head to head with other JDSU equipment or via loopback. Performance measurements such as Round trip delay and G.821 results allow users to verify all circuit parameters fall within the required level of performance.

### Frame Relay over Datacom

With the Frame Relay software option, technicians can verify that Frame Relay service is functioning properly by testing LMI activity, PVC/DLCI status, congestion, lost frames, and Committed Information Rates (CIR).

### Timing Analysis

When using synchronous timing, if the receiving device is not properly synchronized to the clock signal, misinterpretation of bits can cause bit errors and timing slips. The HST-3000 provides internal and interface clock source options, allowing technicians to rapidly diagnose and correct network timing problems.

### Verify End-to-End Connectivity

Technicians can quickly isolate any problem to a specific direction by analyzing the performance of the entire digital link in both directions. After the circuit is installed, the HST-3000 can be used to qualify proper channel routing, delay, and performance over the entire link.

### Self-Loop Testing

The HST-3000 provides an internal self-loop testing feature that connects the transmitter to the receiver without involving amplifiers or cables. This feature allows technicians to validate the unit settings and the selected test interface on the HST-3000. An external cable verifies the amplifiers as well as the current emulation cable.

### User-Configurable Setup

Technicians can select and configure the test interface, timing mode, timing source, data rate, flow control, and test pattern on the HST-3000. In addition to standard software LED result pages, the HST-3000 contains user-defined hardware Datacom LEDs on the module that displays signal states and mark/space.

### The HST-3000 is an All-in-One Tester

The HST-3000 is a modular platform that covers a broad range of interfaces and services.

**T1 and DS3** – Allows for monitoring, terminating, and drop and insert testing; standard and advanced BERT patterns; T1/DS3 and HDSL loopcodes; and PCM T1MS and signaling.

**Frame Relay** – Tests Frame Relay service over Datacom, T1, and DDS-LL links.

**BRI** – Places and receives voice and data calls using the two B channels on S/T and U interfaces.

**PRI** – Places and receives calls using all 23 B channels. Also supports NFAS and D-channel back up.

**DDS** – Supports 4-wire local loop and T1 DDS support, BERT, loopcodes, and CSU/DSU emulation.

**Copper qualification** – Supports DVOM, TDR, Wideband Tones, RFL, Spectral Analysis, Analog Loss and Noise, POTS Dialer, and Load Coil Counter.

**Ethernet** – Verifies Ethernet connectivity with receiver (RX) and Transmitter (TX) bytes, frames, and errors. Also supports ping and trace routing.

**VoIP** – Places and receives VoIP calls. Also verifies connectivity and Quality of Service (QoS).

**ADSL** – Verifies ISP and Internet connectivity. Supports ATU-R/C Emulation.

**G.SHDSL** – Supports installation and verification of G.SHDSL circuits with STU-R/C emulation.

### Saved Results

Hundreds of results can be saved on the HST-3000 and can then be exported directly to a printer or to a PC via serial or Ethernet ports. The results files can then be e-mailed, printed, or saved onto a PC. The HST-3000's file manager also allows technicians to view previously saved test information directly on the instrument.

### VT100 Emulation

With the HST-3000's 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.

### Flexible and Rugged Design

The HST-3000's rugged, weather-resistant design and long battery life are ideally suited for use in the field. Standard Ethernet, USB, and serial ports 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. This flexibility also allows for the support of future growth in new technologies and advanced options to accommodate the changing needs of versatile technicians.

**Specifications**
**Interfaces**

Via adapter cables:  
 RS-232/V.24, RS-449/V.36, V.35, EIA-530, X.21  
 10/100 Ethernet jack 8-pin modular  
 Serial port DB9 female via cable (DCE)  
 USB host  
 USB device

**Data rates (emulate and monitor)**

X.21	Sync 50 bps to 2,048 kbps
RS-232/V.24	Async/Sync 50 bps to 128 kbps
EIA-530	Sync 50 bps to 10 Mbps
V.35	Sync 50 bps to 2,048 kbps
RS-449/V.36	Sync 50 bps to 10 Mbps

**Datacom specifications**
**BERT Patterns**

Mark (All Ones), Space (All Zeros), 1:1, 1:3, 1:4, 1:7, 3:1, 7:1, 63, 511, 2047, 2047R, 2047R INV, 2<sup>^</sup>15-1 (ANSI, ITU, INV), 2<sup>^</sup>20-1 (ANSI, ITU, INV), 2<sup>^</sup>23-1 (ANSI, ITU), QRSS, QBF1 (FOX), QBF (2,3), User Bit, User Byte, Delay

**Transmit Clock Sources**

Internal +/-2.5 ppm, 1 ppm per year aging

**Interface**
**Signaling Lead Control**

Emulate DTE	RTS, DTR, LL, RL
Emulate DCE	CTS, DSR, DCD, TMA

**Self Loop**

Internal

External cable check

**Result Categories**

Summary, Signal, BERT, Data, LED, Data LED, Control LED, G.821, Time

**Physical Specifications**

Size	(H x W x D) 9.5 x 4.5 x 2.75 in
Weight	2.7 lb (with battery)
Operating temperature	22°F to 122°F
Storage temperature	-40°F to 150°F
Battery life	10 hours typical usage
Charging time	7 hours from full discharge to full charge
Operating humidity	10% to 80% relative humidity
Storage humidity	10% to 95% relative humidity
Display	1/4 VGA monochrome transreflective, 3.8-in diagonal (readable in direct sunlight)

**General**

Ruggedness	Survives a 3-ft drop to concrete on all sides
Keypad	Typical 12-button keyboard

**Software Options**

The following software options are available for the main-frame and Datacom module only.

HST3000-FR	Frame Relay software option
HST3000-VT100	VT100 option
HST3000-Script	Scripted testing software option
HST3000S-Web	Web browser software option
HST3000-VOIP	VoIP software option
HST3000-IP	IP Ping Suite software option

**Accessories**
**Datamm Cables**

CB-44390	X.21 DTE/DCE Emulation
CB-44346	X.21 Y Monitor
CB-44385	RS-232/V.24/EIA-530 DTE/DCE Emulation
CB-44348	RS-232/V.24/EIA-530 Y Monitor
CB-44389	V.35 DTE/DCE Emulation
CB-44341	V.35 Y Monitor
CB-44388	RS-449/V.36 DTE/DCE Emulation
CB-44347	RS-449/V.36 Y Monitor
Charger/Adapter	AC/DC battery charger/adapter, 120 VAC (50/60 Hz) input; 12 VDC (1 A) output
Soft Cover	Form fitting nylon glove for test set and leads
Carrying Case	Heavy duty, nylon case for testset, extra SIMs, accessories and cables
Battery	Lithium ion

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**Test & Measurement Regional Sales**

<b>NORTH AMERICA</b> TEL: 1 866 228 3762 FAX: +1 301 353 9216	<b>LATIN AMERICA</b> TEL: +55 11 5503 3800 FAX: +55 11 5505 1598	<b>ASIA PACIFIC</b> TEL: +852 2892 0990 FAX: +852 2892 0770	<b>EMEA</b> TEL: +49 7121 86 2222 FAX: +49 7121 86 1222	<b>WEBSITE: <a href="http://www.jdsu.com">www.jdsu.com</a></b>
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