

## HST-3000

### T1 Service Interface Module (SIM)



#### Key Features

- Provides thorough T1 testing including BERT, loopcodes, and NIU/CSU emulation
- VT100 emulation for access to T1, HDSL, HDSL2, HDSL2-4 wire performance statistics
- Copper option adds in-depth copper measurements including DVOM, graphical TDR, RFA/RFL, and load coil counter
- Lower repeat rates with automated close-out tests, scripting, and pass/fail tests loaded with operator-specific thresholds for methods and procedures
- Modular hardware and software architecture allows easy upgrades and enhancements
- Includes T-BERD® advanced stress patterns, intelligent repeater loop codes, and BERT patterns included
- Lightweight, rugged, water resistant, and battery powered handheld test instrument
- NetAnalyst control of Data Network Analyzer test devices
- Supports long-term testing with tabular and graphical results and provides the ability to save configurations and results

The JDSU HST-3000 is the ideal instrument for testing T1 services with built-in functionality that reduces repeat rates, failures, and kickbacks and ensures that all tests are performed the same way, every time.

Reduced budgets, smaller workforces, and untrained technicians can limit a carrier's ability to promptly provision T1 service. Overcoming these obstacles requires resources that facilitate the efficient and rapid deployment of T1 services regardless of whether the T1 line uses traditional repeaters, HDSL with 6 dB noise margin (HDSL2) or HDSL2 four-wire circuits.

Technicians use the HST-3000 optional copper test features to qualify and troubleshoot the circuit, and the T1 test features to bit error rate test (BERT) the line and verify the service. With the VT100 emulation feature, the HST-3000 provides instant access to HDSL/2/4 performance statistics. Technicians do not have to switch instruments or modules, because the HST-3000 combines all the tests into one tool with one common interface. The HST-3000 custom scripting feature automates the testing process, ensuring that tests are conducted completely and thoroughly every time and helps reduce repeat rates and failures by ensuring that the processes used to test are consistent.

With the HST-3000, technicians can complete faster service turn-ups, reduce failure rates, and lower costs, which are all key components to surviving in today's competitive environment.

| 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 |           |



## Functional Overview

Beginning with the construction of the circuit, and throughout the life cycle of the service, operators must verify that customers are receiving the quality they ordered. Whether qualifying the copper before handing the circuit over to an installation and maintenance crew, technicians must run a BER test. JDSU offers the HST-3000 to prequalify the circuit to ensure that it will run T1 service error free.

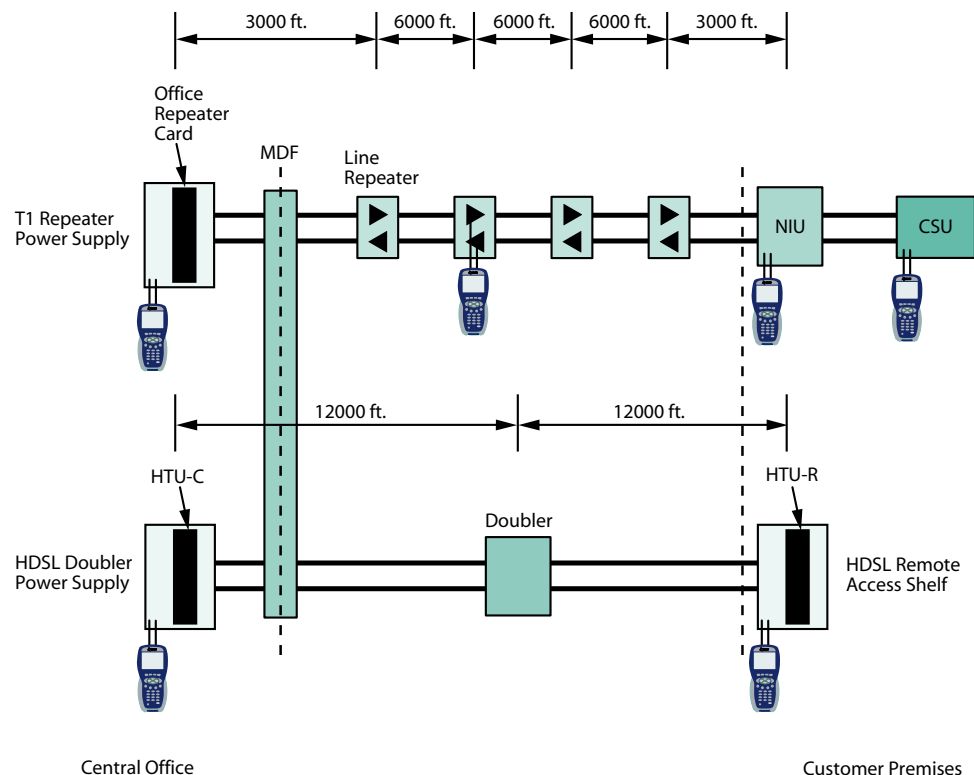
### DS1 BERT

To verify proper T1 transmission over a traditional repeatered T1 or an HDSL circuit, technicians must test the entire span from the central office to the customer premises. A true end-to-end service test requires stressing the span and verifying the error tolerance of the copper plant and network equipment. The HST-3000 includes the advanced stress patterns of the T-BERT to properly stress the network.

## Loopback Testing

Preprogrammed HDSL Terminal Unit - Central Office (HTU-C), HDSL Remote User (HTU-R), doubler, T1 Channel Service Unit (CSU), T1 Network Interface Unit (NIU), and repeater loop-codes enable the HST-3000 to quickly sectionalize transmission problems. In addition Pairgain, Teltrend, Adtran, Westell, and ADC equipment-specific loopcodes.

The test set can also emulate T1 customer premises equipment (CPE), simulating a CSU or NIU which allows the test set to be looped up from the central office to verify T1 service across the entire length of the span.



## 3

### Dual T1 Transmit and Receive

The dual T1 transmit and receive capabilities of the HST-3000 provide the ability to measure timing slips, passively monitor T1 circuits in both directions, and perform drop and insert testing. Using the split screen view in dual monitor mode, a span is easily sectionalized to quickly determine the location of a fault. Drop and insert testing allows the user to BERT single DS0s within a T1, without taking the entire T1 out of service.

### HDSL/2/4

The VT100 emulation feature lets technicians access HDSL and T1 network equipment for equipment configuration, specific performance data measurements, and loop up capabilities, without having to carry a laptop into the field. With the JDSU repeater extender, technicians can also gain access to the circuit at T1 repeaters.

### Fractional T1

The HST-3000 performs fractional T1 (FT1) BER tests on selected channels to verify transmission on contiguous and noncontiguous FT1 bandwidth, which lets the technician verify circuit performance with VF and 577 Hz ID tones at various output levels. In addition, the HST-3000 uses a variety of advanced stress patterns, such as 55 octet, T1-DALY, and other long user patterns as recommended by the ANSI T1.403 standard, to stress repeatered T1/FT1 circuits.

With its enhanced T1 features and functions, the HST-3000 is the ideal test instrument for technicians to troubleshoot and qualify the line swiftly and effortlessly.

### 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 and its modularity allows for field upgrades to support new testing requirements. The HST-3000 is easily upgradeable with technologies and advanced options that support the changing needs of service installers and its dynamic configurability allows it to be used by different technicians with different responsibilities to perform a wide number of tests. Standard Ethernet, USB, and serial connections offer flexibility to easily download software and offload captured test data.

### Specifications

#### Interfaces

|                                   |                                                |
|-----------------------------------|------------------------------------------------|
| Dual Tx/Rx T1                     | Bantam jacks                                   |
| Optional dual Tip/Ring and ground | Color-coded, shrouded 2 mm "mini-banana" jacks |
| 10/100 BT Ethernet                | 8-pin modular                                  |
| Serial port                       | BDB9 female via cable (DCE)                    |
| USB port                          |                                                |

#### T1

|                             |                                                      |
|-----------------------------|------------------------------------------------------|
| Payload                     | Full T1, 56k, 64k, Nx56, Nx64                        |
| Input impedance             |                                                      |
| Bridge                      | >100 $\Omega$                                        |
| Term                        | 100 $\Omega$ $\pm$ 5%                                |
| DSX-MON                     | 100 $\Omega$ $\pm$ 5%                                |
| Receive level               |                                                      |
| Bridge                      | 0 to -20.0 dBdsx                                     |
| Term                        | +6 to -35.0 dBdsx                                    |
| DSX-MON                     | +6 to -24 dBdsx                                      |
| Framing                     | ESF, SF(D4), SLIC-96, unframed                       |
| Transmitting timing sources | Internal clock<br>Recovered clock                    |
| Line codes                  | AMI, B8ZS                                            |
| Line build out level        | 0, 7.5, 15.0 and 22.5 dB<br>of cable loss at 722 kHz |
| Line build out tolerance    | $\pm$ 1 dB at 722 kHz<br>with LBO or 0 dB            |
| Error insert                | Logic, BPV, frame, single, multiple, rate            |

#### 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 lb)                                                                            |
| 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<br>with backlight (readable in direct sunlight) |

#### General

|                 |                                                                |
|-----------------|----------------------------------------------------------------|
| Ruggedness      | Survives 91 cm (3 ft) drop<br>to concrete on all sides         |
| Water-resistant | Splashproof (may be used in heavy rain)                        |
| Languages       | English, German, French, Spanish,<br>Italian, Chinese, Turkish |
| Keypad          | Typical 12-button keyboard                                     |

## Ordering Information

### Base Unit

|             |                                           |
|-------------|-------------------------------------------|
| HST3000-NG  | HST-3000 Mainframe without Copper (Color) |
| HST3000C-NG | HST-3000 Copper Mainframe (Color)         |

### 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-CAR2A         | ADSL1/2/2+ with Copper (ATU-R, Annex A)                                         |
| HST3000-CAR2A-T1      | 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-CARCA         | Copper and ATU-R/C Dual Mode, AoPOTS                                            |
| HST3000-CARCB         | Copper and ATU-R/C Dual Mode, AoSDN                                             |
| HST3000-CARCE         | Copper and ATU-R (Annex A), CE Marked                                           |
| HST3000-WB2           | Wide Band 2 (up to 30 MHz) Copper Test                                          |
| HST3000-VDSL-CNXT     | VDSL with Connexant Chipset                                                     |
| HST3000-VDSL-CNXT-WB2 | VDSL and Copper (up to 30 MHz) with Connexant Chipset                           |
| HST3000-VDSL-IK       | VDSL with Ikanos Chipset                                                        |
| HST3000-VDSL-IK-WB2   | VDSL and Copper (up to 30 MHz) with Ikanos Chipset                              |
| HST3000-INF-VDSL      | VDSL with Infineon Aware Chipset                                                |
| HST3000-INF-VDSL-WB2  | VDSL 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 and T1                                           |
| HST3000-T3            | Dual TX/RX Bantam T1 Interface, and Dual RX/Single TX BNC DS3 Interface/and DS3 |
| HST-BRA               | ETSI (Euro) ISDN BRA                                                            |
| HST3000-BRI           | ISDN BRI                                                                        |
| HST3000-CSHCE         | G.SHDSL and Copper                                                              |
| HST-GSH               | G.SHDSL                                                                         |
| HST3000-GSHCE         | 2-Wire G.SHDSL                                                                  |
| HST3000-CSH4          | Copper, 4-Wire G.SHDSL (STU-R/C, Annex A/B)                                     |
| HST3000-BLK           | Blank                                                                           |

### Software Options

|                   |                                                 |
|-------------------|-------------------------------------------------|
| HST3000-BLUETOOTH | Bluetooth Wireless                              |
| 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-UNISTIM   | VoIP Signaling Call Controls for UNISTIM        |
| HST3000-OPTETH    | Optical Ethernet                                |
| HST3000-IPV6      | IPv6                                            |
| HST3000-MPLS      | MPLS                                            |
| HST3000-MSTR      | Multiple Streams                                |
| HST3000-TCPUDP    | TCP/UDP                                         |
| HST3000-FTP       | FTP                                             |
| HST3000-WBTONES   | WB TMS                                          |
| 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                                     |

## Test & Measurement Regional Sales

|                                                                                |                                                                      |                                                                   |                                                               |                                                                          |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>NORTH AMERICA</b><br>TEL: 1 855 ASK-JDSU (275-5378)<br>FAX: +1 301 353 9216 | <b>LATIN AMERICA</b><br>TEL: +1 954 688 5660<br>FAX: +1 954 345 4668 | <b>ASIA PACIFIC</b><br>TEL: +852 2892 0990<br>FAX: +852 2892 0770 | <b>EMEA</b><br>TEL: +49 7121 86 2222<br>FAX: +49 7121 86 1222 | <b>WEBSITE: <a href="http://www.jdsu.com/test">www.jdsu.com/test</a></b> |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|