



Acterna HST-3000

Handheld Consumer Services Tester

Improving the installation, maintenance and troubleshooting of DSL services

With a market primed for broadband, operators are rapidly deploying DSL in their networks to deliver multimedia services over the existing copper wire in the local loop. Traditionally, one set of technicians performed individualized tests that qualified the copper while another set conducted DSL services testing and verification. In today's market, however, operators can no longer afford the time, capital expense, and labor costs to conduct tests separately and incrementally. Furthermore, test solutions must generate results that have a strategic impact throughout an operator's entire organization. This may include building customer loyalty by locating and fixing problems quickly, improving profitability by performing more tests with less staff, or leveraging workforce productivity by automating processes, methods, and procedures.

The Acterna HST-3000 is a modular handheld tester that can be built to order, to test the copper, test the DSL service and improve the process. Technicians use the HST-3000 copper base instrument and the copper service interface module (SIM) to qualify, maintain, and troubleshoot the local loop. This same base instrument, with a second SIM that tests both ADSL and the copper, enables one technician to perform tests that were previously conducted by two technicians using different equipment.

For those technicians who only need to test ADSL, the instrument can be configured for ADSL functionality only. Any HST-3000 module equipped to perform ADSL service tests can also verify ISP and Internet connectivity with the Acterna Advanced IP Suite software option. With the HST-3000 minimize the time and reduce the capital expense and labor cost associated with ADSL and copper testing.

Highlights

- A combined tester for Copper and DSL testing
- Lower repeat rates with automated close out tests, scripting/pass-fail tests, and backoffice integration
- Modular hardware and software architecture is flexible and easily upgraded
- Laptop/PC integration via RS-232, USB, or wireless for easy results transfer
- Intuitive, easy-to-use GUI, lightweight, rugged and water resistant

HST-3000 instruments are also “enabled” to interact easily with laptops, PCs, handheld computers, modems, and terminals via industry-standard links: serial, Bluetooth™ (short-range wireless), Ethernet, and USB. The tester interoperates with laptops and PCs to capture job ticket information, and to quickly transfer test results back to the PC and dispatch program.

The HST-3000 also includes AUTOTESTs for POTS, as well as a custom scripting capability that allows Acterna to customize test sequences and results thresholds. These advanced functions and features give operators the control they need to initiate faster service turn-up and maintenance, better workforce management and productivity, lower costs, and greater profitability.

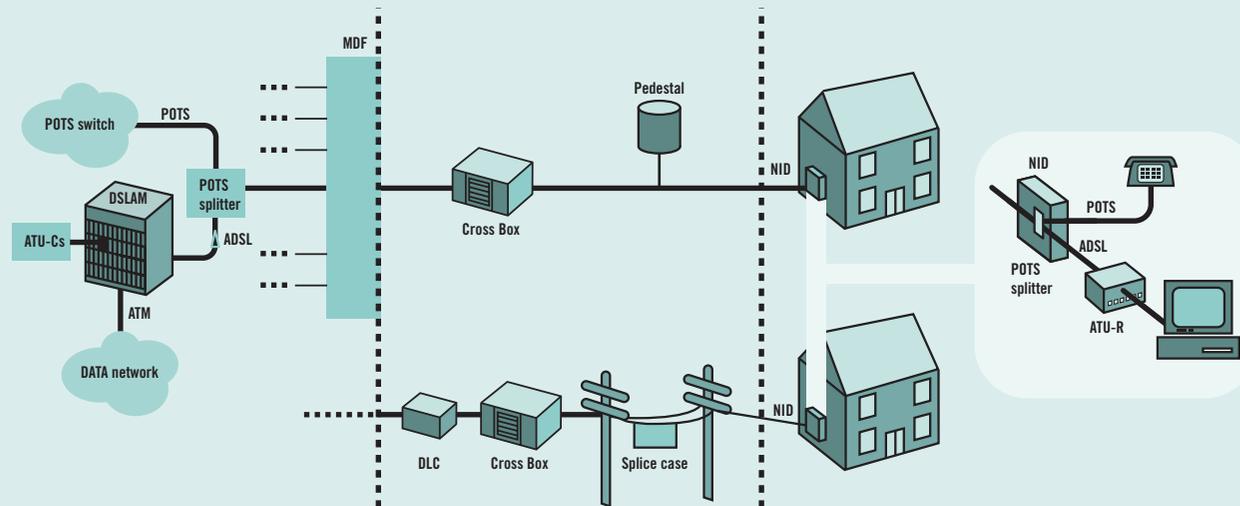
Test the copper

Testing the physical layer to predict a loop’s ability to support DSL and other services is a critical step. However, it is a time-consuming process that can delay service turn-up if not performed thoroughly.

The HST-3000 copper base instrument enables POTS installation and maintenance technicians to quickly troubleshoot the local loop for faults and conditions that affect DSL, such as bridged taps and excessive length. Copper test features are optimized for use anywhere on the local loop. For example: residence, NID, crossbox, pedestal, drop, main distribution frame or anywhere a technician might gain access to the local loop to locate the source of trouble.

With a few keystrokes and the test instrument’s advanced time domain reflectometer (TDR) and precision digital volt/ohm meter (DVOM) with resistance to measure AC continuity, the length and location of bridged taps, wet sections, and load coils are detected. The HST-3000 will also quickly and accurately identify cable faults such as shorts, grounds, opens, crosses, splits, and high-resistance faults. If problems are intermittent, tracing will continue until the problem reappears. The HST-3000 also measures loop length using tip-to-ring capacitance measurements.

With a push of a button, loop current, circuit loss, power influence, circuit noise, and longitudinal balance tests run automatically. The HST-3000 graphically displays the comparison between test results and preset values so that technicians know immediately if the line quality is pass, fail, or marginal. In addition, with voice frequency and wideband TIMS, the HST-3000 easily proves that the copper pair meets loss requirements.



ADSL loop architecture

Test the service

From turn-up and throughout the life cycle of the service, operators must verify that customers are receiving the services they ordered at the level of quality they expect.

To verify POTS service, the HST-3000 checks for dial tone, supports caller ID, dials DTMF, detects ring signal, provides line-hold current, determines loss by transmitting and receiving voice frequency tones.

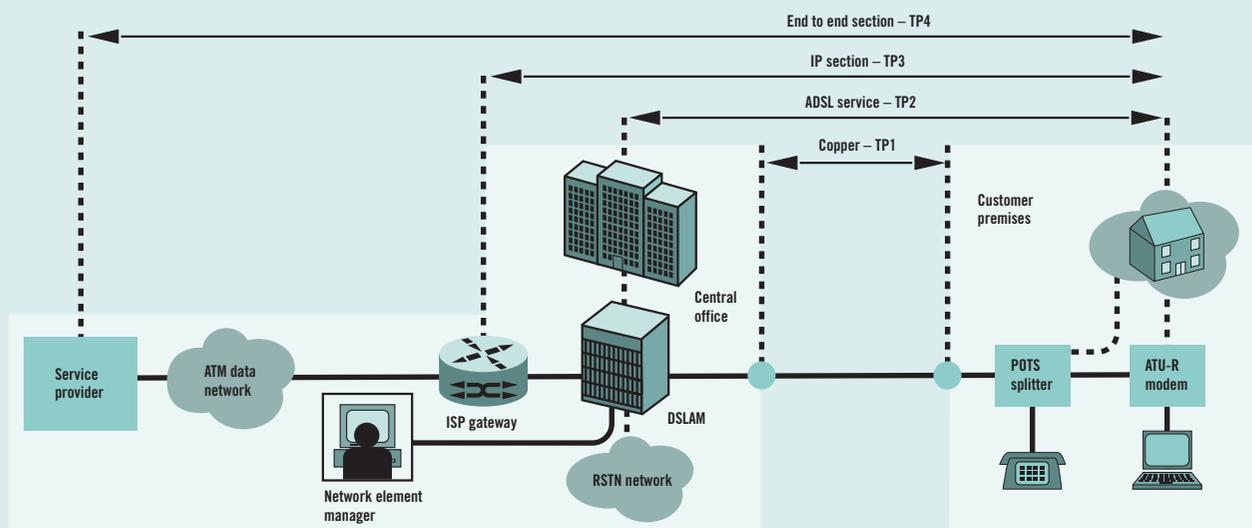
A true test of end-to-end service requires verifying ADSL access, IP network service, and end-to-end Internet service.

To verify DSL service, a technician synchronizes the HST-3000 to the ATU-C or DSLAM, from anywhere along the loop – the main distribution frame to the customer premises. If the HST-3000 detects a problem such as excessive attenuation, a technician can segment and troubleshoot the source of the problem.

The HST-3000 confirms DSL physical layer performance by emulating ADSL transceiver unit modems. The ADSL termination unit at the customer site (ATU-R) synchronizes with an ADSL termination unit at the central office (ATU-C) or a digital subscriber line access multiplexer (DSLAM), and establishes a permanent virtual connection (PVC) with a service provider's ATM network.

For DSL service verification, the HST-3000 tests ADSL data rates, noise margin, and line capacity. This ensures the ability of all connections, from the CPE through the local loop through the network to the Internet, to support network and user traffic. Because experience shows that many problems are from CPE configuration errors and network provisioning, operators can rely on the HST-3000 to identify these problems quickly, ensuring their technician's time is not wasted troubleshooting an ADSL circuit.

Each DSL line is configured to connect to the ATM network, which is then configured to route traffic to an ISP. In addition, with a single instrument, technicians can check ATM statistics, data rates, and signal-to-noise margin, and test the physical layer, all during the same trouble call.



Each layer must be verified to commission ADSL service

Improve the process

The HST-3000's remote operation, pre-programmed tests, serial and wireless interfaces have a strategic impact on every aspect of an operator's entire network. The HST-3000's increased productivity improvement provides for consistent testing and lower operational costs.

From the technician's terminal, work orders can be sent directly to the HST-3000, which will automatically send close-out tests and time-stamped results back to the terminal. These results, incorporated into a central database for an up-to-date profile of the copper network, can be compiled into trends analysis reports, to further reduce unnecessary truck rolls.

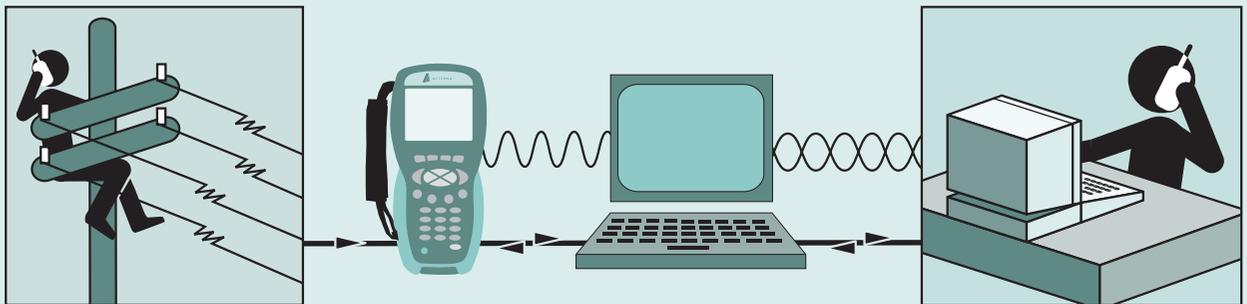
The first DSL tester to utilize Bluetooth wireless, the HST-3000 alleviates the need to physically connect wires to laptops in order to access dispatch and various applications.

The HST-3000's preprogrammed 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.

Automated test script from the menu-driven GUI enables good pair check to measure AC/DC volts, resistance, and opens; the five point close out test measures current, loss, noise, power influence, and balance. Results from these measurements are compared to predetermined parameters and known good thresholds with results given as pass, marginal, or fail.

By verifying the digital quality of a copper line before service is commissioned, operators avoid repeat truck rolls and degraded services once customers are online.

Easily configured, the HST-3000 can be used by different technicians with different responsibilities to perform a wide number of tests. The HST-3000 is easily upgraded with advanced options to support the changing needs of the operation.



PC, work order and back office connectivity built in

Instrument specification

Interfaces	Dual TIP/RING and Ground POTS/Copper	Color-coded, shrouded 2mm "mini-banana" jacks
	ADSL	8-pin modular
	10/100 BT Ethernet jack	8-pin modular
	Serial port	DB9 female via cable (DCE)
	USB Host	
	USB Device	
	Bluetooth short-range wireless	

Copper specifications

Main functions	Range	Resolution
Voltage (DC)	0 to 99.9 V	0.1 V
	100 to 300 V	1 V
Voltage (AC)	0 to 99.9 V	0.1 V
	100 to 300 V	1 V
Current (DC)	0 to 110 mA	0.1 mA
Resistance (DC)	0 to 9999 Ω	1 Ω
	10 K Ω to 999.9 K Ω	100 Ω
	1 M Ω to 99 M Ω	100 K Ω
With CO voltage	0 to 9999 Ω	1 Ω
Opens	0 to 10,000 ft.	1 ft.
	10,000 ft. to 50,000 ft.	10 ft.
	50,000 ft. to 100,000 ft.	100 ft.
RFL	0 to 9.99 Ω	0.01 Ω
	10 to 99.9 Ω	0.1 Ω
	100 to 999 Ω	1 Ω
Loss		
With 600 Ω Zin	-40 to +10 dBm, 200 to 4000 Hz	0.1 dB, 1 Hz
With 100 or 135 Ω Zin	-70 to +10 dBm, 20K to 1.6 MHz	0.1 dB, 1 KHz
Tones	Select Nyquist Frequencies	
With 600 Ω Zout	200 to 4000 Hz, -20 to +1 dBm	1 Hz, 0.1 dB
With 100 or 135 Ω Zout	20 K to 1.6 MHz, -20 to +5 dBm	1 KHz
PI	40 to 100 dBrc	1 dB
Noise (600 Ω Zin)	0 to 50 dBrc	1 dB
Dial Mode	DTMF	Standard
Caller ID	Date, time, number, name	-
Carrier Level	-4 to -32 dBm	-
TDR	5 to 500 ft.	2.6 ft
	100 to 10,000 ft.	50 ft
	1 Kft. To 20 Kft.	200 ft.
Load Coil Count	5 out to 27 Kft	1



**Service Interface
Module (SIM)**

Flexible, modular platform makes technology upgrades or hardware changes easy



*HST-3000 Handheld Consumer Services Tester
for Copper and DSL testing
Actual Size: 9.5 x 4.5 x 2.75 in
Weight: 2.7 lb with battery*

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 hrs. 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 transfective, 3.8-in diagonal (readable in direct sunlight)

General

Ruggedness	Survives 3-ft drop to concrete on all sides
Water-resistance	Splashproof: may be used in heavy rain
Language	English
Keypad	Typical 12-button keyboard

Standards

ADSL Standards	ANSI T1.413, ITU G.992.1 Annex A, ADSL over POTS (G.DMT), and G.992.2 (G.Lite), Cisco CAP
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Ordering information

Base units

HST-3000C	HST-3000C base with copper testing Requires the purchase of a SIM – see separate listing for HST3000-CAR or HST3000-CU (Ethernet and serial ports included)
HST-3000	HST-3000 base without copper testing Requires the purchase of a SIM – see separate listing for HST-3000-CAR or HST-3000-AR (Ethernet and serial ports included)

SIMS (Modules)

HST-3000-AR	DSL (ATU-R) Service Interface SIM
HST-3000-CAR	Combo: ADSL (ATU-R) and dual T/R/G interface for Copper test SIM
HST-3000-CU	Dual T/R/G interface for copper test

Software options

HST-3000S-IP	Advanced IP Suite – PING and Through Mode support for PPPoA, PPPoE, IPoA and IPoE, F4/F5 OAM Tx and Rx, and ATM Loopback
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Accessories

Test leads	POTS – 5-ft banana plugs to alligator clips, ADSL – 8-pin mod to alligator clips or 8-pin mod to 8-pin mod
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 test set, extra SIMs, accessories and cables
Battery	Lithium ion (8 hrs modem operation)

Acterna AdvantageSM – adding value with global services and solutions

From basic instrument support for your field technicians to management of complex, company-wide initiatives, Acterna's service professionals are committed to helping you maximize your return on investment. Whatever your needs – product support, system management, education services, or business planning and consulting – we offer programs that will give you the competitive edge. This is the foundation of Acterna Advantage.

Acterna is the world's largest provider of test and management solutions for optical transport, access and cable networks, and the second largest communications test company overall. Focused entirely on providing equipment, software, systems and services, Acterna helps customers develop, install, manufacture and maintain optical transport, access, cable, data/IP and wireless networks.

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