

# ADSL Service Installation Tester

## SmartClass ADSL



### Key Features

- All-in-One tool for ADSL 1/2/2+ installation with Cu, ADSL and IP testing.
- Fast Cu tests for ADSL2+: DVOM, Leakage, current, capacitance/opens, Longitudinal Balance, and Loadcoil counter.
- Thorough ADSL analysis including graphical Bits-per-Tone and SNR-per-Tone.
- Full suite to verify connectivity with ATM OAM F4 and F5, PPP, static and dynamic IP, DNS support, IP PING, TRACERT, HTTP, and FTP.
- Extra capability to troubleshoot common problems: Ethernet T.E. mode to quickly isolate CPE, Through-mode to replace customer modem

### Applications

- Test and verify customer loop quality for ADSL 1/2/2+
- Installation and maintenance of ADSL2+ service
- Through mode test for ATU-R replacement
- Service testing at customer's BB connection isolates PC as failure point

The JDSU SmartClass ADSL is the perfect tool for the technician installing and maintaining ADSL services. The tester enables the technician to test loop quality, verify ADSL signal and performance, and validate the customer's Internet connection with unprecedented ease and speed. The SmartClass ADSL reduces finger pointing between customer and provider by testing from the customer's broadband connection, quickly isolating PC troubles.

A full set of copper tests qualify the customer loop for the delivery of newer services such as IPTV: 1Mohm, 100KOhm terminations, AC and DC volts, resistance, distance-to-short, Leakage, Opens/capacitance, DC current, Longitudinal Balance, and loadcoil counter. The full featured ADSL tests quickly verify provisioned rates and quality: Up/down actual and max rates, margin, attenuation, capacity, TX power, errors, alarms, ATM OAM and stats, Ethernet stats, BPT graphs, and more. The suite of IP tests easily and quickly verify ISP access and Internet connectivity: IP PING, TRACERT, HTTP, FTP upload and download. The built-in 10/100 Ethernet port tests the service from the customer's broadband interface.

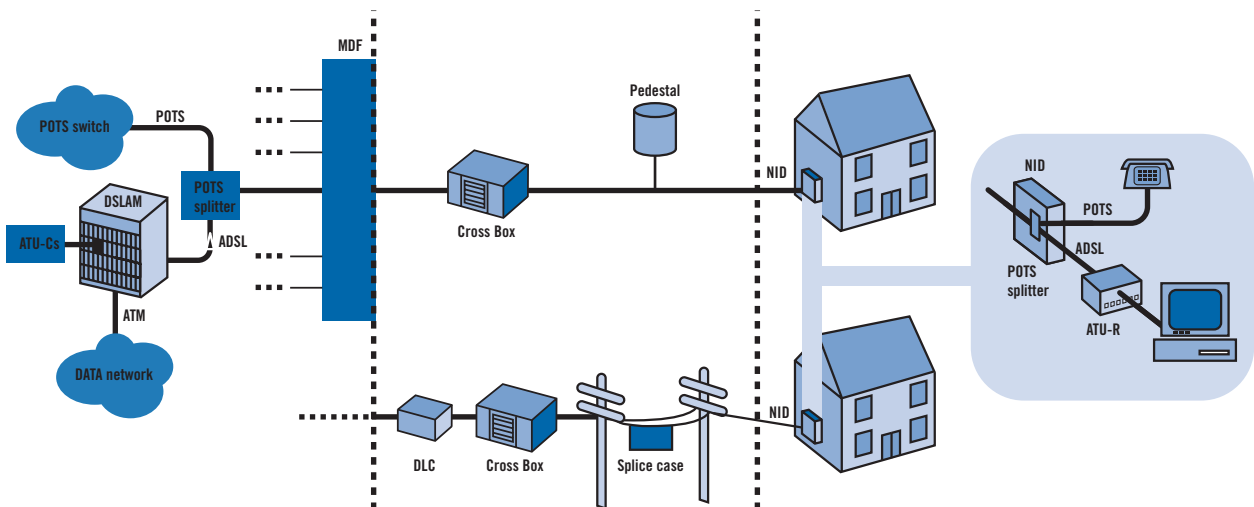
The SmartClass ADSL supports the storage and retrieval of pre-set configurations and allows technicians to transfer results to a PC using USB. The instrument's features, including its rugged design and field replaceable AA batteries, make it the essential ADSL installation tool for everyone.

## ADSL overview

Delivery of ADSL services requires a single copper pair configuration of a standard voice circuit with an ADSL modem at each end of the line, creating three information channels – a high speed downstream channel, a medium speed upstream channel, and a plain old telephone service (POTS) channel for voice. Data rates depend on several factors including the length of the copper wire, the wire gauge, presence of bridged taps, and cross-coupled interference. The line performance increases as the line length is reduced, wire gauge increases, bridge taps are eliminated and cross-coupled interference is reduced.

The modem located at the subscriber's premises is called an ADSL transceiver unit-remote (ATU-R), and the modem at the central office is called an ADSL transceiver unit-central office (ATU-C). The ATU-Cs take the form of circuit cards mounted in the digital subscriber line access multiplexer (DSLAM). A residential or business subscriber connects their PC and ATU-R modem to a telephone outlet on the wall.

ADSL2 has been specifically designed to improve the rate and reach of ADSL largely by achieving better performance on long lines. ADSL2 accomplishes this by improving modulation efficiency, reducing framing overhead, achieving higher coding gain, improving the initialization state machine, and providing enhanced signal processing algorithms. ADSL2+ further improves on the ADSL2 standard by allocating additional spectrum for downstream data, dramatically improving the data rate over ADSL2 or ADSL.



## Measuring ADSL Performance

The SmartClass ADSL can be used to verify that service can be delivered at the provisioned bit rates and quality levels by a quick sync check at various points along the customer circuit (ATU-R, NID, splice case, Cross Box, MDF, DSLAM).

If the tester cannot synchronize with the DSLAM, the SmartClass ADSL provides the copper tests needed to check the wire pair for service affecting faults, or in the worst case helps find a new serviceable pair. In addition to the DVOM, the included Capacitance (Opens) test, Longitudinal Balance, and loadcoil counter tests help identify unique ADSL problems.

If the delivered service is slower than expected, the SmartClass ADSL provides the Resistance and Opens tests to verify the presence of service-affecting bridged taps or the balance test to assess noise immunity. Use the loadcoil counter to count the number of service-choking loadcoils on the line, as well as check for a very high noise level. The bits-per-tone and SNR-per-tone graphs are handy to correlate dips in performance with specific frequencies and x-talk.

The instrument also enables technicians to verify end-to-end IP connectivity and performance using IP PING, Trace Route, HTTP "Web Test," and FTP. Users can also back up circuit and log-in configurations for easy recall later.



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## Specifications

## Configurations

ADSL Annex A  
 ADSL Annex B  
 Cu-ADSL Annex A  
 Cu-ADSL Annex B

## ADSL Specifications

## Standard compliance, ADSL over POTS modem

– ANSI T1.413-1998, Issue 2  
 – ITU-T G.992.1 Annex A (G.DMT)  
 – ITU-T G.992.2 Annex A (G.lite)  
 – ITU-T G.992.3 Annex A, L, M  
 – ITU-T G.992.5 Annex A (ADSL2+)  
 – ITU-T G.992.5 Annex L (RE-ADSL)  
 – ITU-T G992.5 Amendment 1

## Standard compliance, ADSL over ISDN modem

– ITU-T G.992.1 Annex B (G.DMT)  
 – ITU-T G.992.3 Annex B (G.DMT.BIS)  
 – ITU-T G.992.5 Annex B (ADSL2+)

## General settings

– Auto Sync  
 – Auto or manual framing mode

## Physical layer feature support

– Actual and maximum bit rates capacity  
 – Noise margin  
 – Attenuation  
 – Modern state  
 – TX power  
 – Far vendor ID, revision  
 – Graphical display of BPT (bits-per-tone)  
 – Re-sync counter  
 – Graphical display of SNR (SNR-per-tone)  
 – Fast or interleaved

## ADSL errors

– LOS (loss of sync)  
 – LOF: (Loss of Frame)  
 – LOP: (Loss of Power)  
 – CRC (cyclic redundancy check)  
 – HEC (header error correction)  
 – FEC (Forward Error Correction)  
 – Modem errors

## PPP/IP connectivity

– BRAS: PAP/CHAP  
 – IPCP  
 – NAT  
 – PPPoA, PPPoE, IPoA, IPoE, Bridged  
 – RFCs 2364, 2516, 1483, 2684

## Through modes

– Bridged Ethernet  
 – IPoE  
 – IPoA  
 – PPPoE  
 – PPPoA

## ATM

VCC scan: up to five VPI/VCI  
 OAM F4/F5 near and far loopbacks

## IP

– MAC address  
 – WAN/LAN status screens  
 – GATEWAY/DNS screen  
 – DHCP client on WAN and LAN  
 – IP release/renew  
 – DNS support WAN & LAN  
 – DHCP server on LAN

## IP PING

– IP PING: TX/RX, received, delay  
 – PING count, PING size  
 – PING to URL (DNS)  
 – Remote PING monitor

## TRACERT

– IP, name, hops, delay

## Web Test (HTTP)

– URL  
 – download status  
 – file size  
 – time  
 – rate

## FTP

– URL/File  
 – connection status  
 – time  
 – file size K bytes  
 – rate Kbs

## DNS

configure up to three manual addresses

## Ethernet statistics

– RX/TX bytes  
 – RX/TX frames  
 – RX/TX errors  
 – Collisions

## ATM statistics

– ATM OAM F4/5 near and far loopback count  
 – UP/DN Good and Idle cell count  
 – Bad HEC cell count  
 – Dropped Cell count  
 – TX/RX PDUs  
 – TX/RX AAL Bytes  
 – TX/RX Total error count

## Copper Test Specifications

Test	Range	Resolution	Accuracy
AC Volts	0 – 300 Peak	1V	2% ± 1V
DC Volts	0 – 300 (VDC + Peak AC)	1V	2% ± 1V
<b>Resistance</b>			
	0 - 999 Ω	1	2% ± 2.5 Ω
	1.0K - 9.99K	10	2% ± 2.5 Ω
	10K - 99.9K	100	2% ± 2.5 Ω
	100K - 999K	1K	2% ± 2.5 Ω
	1M - 9.9M	10K	6.5% ± 2.5 Ω
	10M - 100M	100K	6.5% ± 2.5 Ω
<b>Leakage</b>			
	0 - 999 Ω	1	2% ± 2.5 Ω
	1.0K - 9.99K	10	2% ± 2.5 Ω
	10K - 99.9K	100	2% ± 2.5 Ω
	100K - 999K	1K	2% ± 2.5 Ω
	1M - 9.9M	10K	6.5% ± 2.5 Ω
	10M - 100M	100K	6.5% ± 2.5 Ω
<b>Distance to short</b>			
	0 - 30Kft/10Kkm	1ft/1m	
<b>Capacitance/Opens</b>			
	0 - 2,999ft/999m	1ft/0.1m	2.5% ± 45pF
	0 - 44.9nF		
	3000ft/1Kkm - 66Kft/20Kkm	1ft/0.1m	2.5% ± 45pF
	45nF - 1.04μ		
<b>DC Current</b>			
	1 - 110mA	1 mA	± 2% ± 1mA
<b>Longitudinal Balance</b>			
	35 - 85dB	1dB	2dB
<b>Loadcoil counter</b>			
	0 - 27Kft/8230m	up to 5	± 1

## General specifications

## Languages

– English, Chinese, German, Italian, Spanish, Portuguese

## Power supply

– 4 AA field replaceable batteries (NiMH and or Alkaline)  
 – Operating time: about 20 on/off cycles and tests on a full charge, depending on usage and conditions  
 – Auto power down (adjustable)  
 – Charging time 3 to 4 hours for fast charge, overnight for maximum charge and performance  
 – AC line operation via external adapter/charger

## Permissible ambient temperature

– Nominal range of use -5°C (23°F) to +50°C (122°F)  
 – Storage and transport -30°C (-22°F) to +60°C (140°F)

## Humidity

– Operating humidity 10% to 80%

## Physical specifications

– Size (H x W x D) 230 x 120 x 50 mm (9.05 x 4.72 x 1.97 in)  
 – Weight, including batteries < 1.1KG (2.5 lbs)  
 – Weight without accessories 0.6KG/1.5 lbs  
 – Display 240x160 monochrome display

## CE Marked

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**Ordering Information**

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<i>Order number</i>	<i>Description</i>
CSC-DLSLIL-P2	ADSL Silver package complete (Annex A)
CSC-DLSLIL-P2B	ADSL Silver package complete (Annex B)
CSC-DSLGLD-P3	Copper and ADSL Gold Package complete (Annex A)
CSC-DSLGLD-P3B	Copper and ADSL Gold Package complete (Annex B)

Packages include standard accessories, USB cable and test leads.

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