AXS-200/610

part of the SharpTESTER Access Line

NETWORK TESTING—ACCESS

Identify copper problems affecting triple-play quality

- Visual reports, graphs and histograms, displaying signal and noise issues
- 30 MHz spectrum analysis for VDSL2 and video prequalification and troubleshooting
- Single-ended tests minimizing repair time and costs
- Automated clear, pass/fail results speeding up and simplifying test cycles
- POTS and VF measurements for complete ADSL2+ and VDSL2 loop qualification

2004 FROST & SULLIVAN
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Growth Strategy Leadership Award

Locate, Interpret and Repair Local Loop Faults with Ease

Ensure QoS for Triple-Play Deployments

For many telcos, the launch of ADSL technology has gone quite smoothly; however, preparing the copper loop plant for triple-play services is another story–let alone deploying IPTV over the latest DSL, VDSL2. EXFO's AXS-200/610 Copper Test Set enables field technicians to view the entire VDSL2 spectrum in order to identify and find disturbances and signal issues that affect voice and video delivery over the last mile. It also offers an extensive range of single-ended tests that help field technicians quickly locate and repair the faults that affect quality of service (QoS).

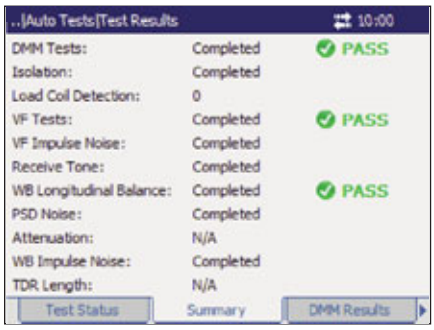
Easy operation. Clear results. A straightforward test solution

30 MHz Advanced Local-Loop Testing

Thanks to a 30 MHz bandwidth and wide dynamic range, the AXS-200/610 can test the local loop for almost every service that can be carried. Loop qualification becomes simple with the AXS-200/610's service-specific automated tests, reference cursors, specific noise filters and specialized loop evaluation algorithms. This unit is ideal for VDSL2, ADSL2+, ADSL2, ADSL, G.SHDSL, HDSL, HDSL2, T1/E1 and ISDN.

Prequalification in Seconds with the Automated Test Pass/Fail Indication

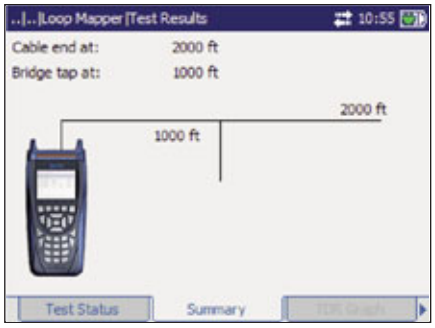
Providing complete feedback for quick pass/fail analysis thanks to its Auto Test feature, the AXS-200/610 simplifies the technician's job. This convenient, single-ended test tool allows for fast cable assessment to determine whether or not it is acceptable for VDSL2 and ADSL2+ services, based on predefined pass/fail criteria. This convenient, single-ended test tool allows you to quickly evaluate a cable to determine whether or not it is acceptable for VDSL2 and ADSL2+ services, based on predefined pass/fail criteria.



Auto-test screen

No More Guesswork with the Loop Mapper

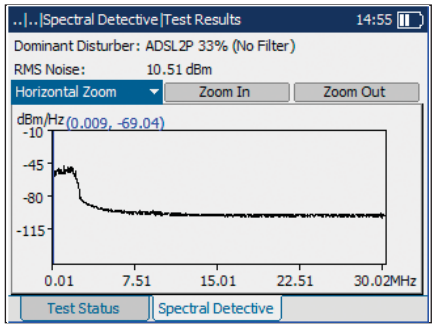
The AXS-200/610's convenient and powerful Loop Mapper tool simplifies the detection of faults, bridge taps or cable ends. By automatically selecting the time-domain reflectometer (TDR) and/or the frequency-domain reflectometer (FDR), based on the current line conditions, Loop Mapper displays a straightforward wiring diagram that contains distances, for easy interpretation.



Loop mapper screen showing bridge tap

Detecting Excessive Spectral Noise

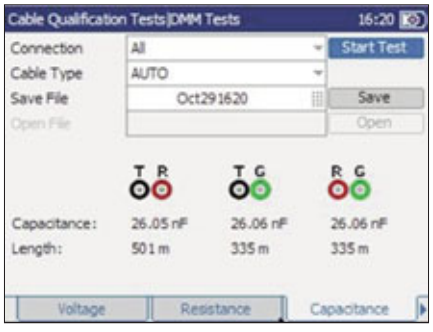
You can count on the AXS-200/610's Power Spectral Noise feature to manage the spectrum in your cable bundle. The unit's graphic display helps you determine which service is deployed on the loop and at what power level. This is the best technique to use in identifying signals that are too strong for the bundle, and it is essential in unbundled local loop environments for spectral policing.



Spectral Detective Test Results screen showing live disturber

Complete Metallic Testing with DMM and VF

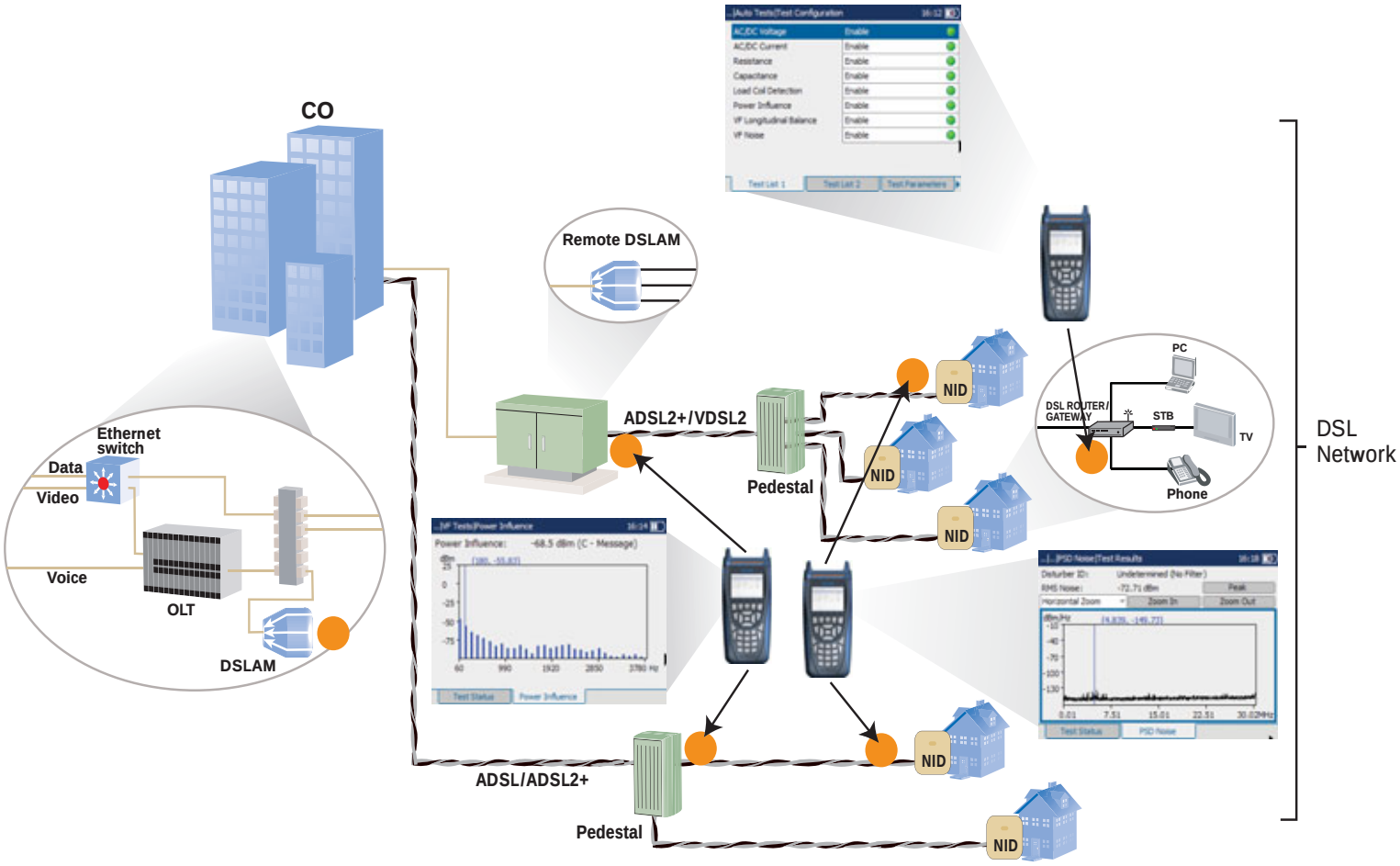
With the AXS-200/610, AC and DC voltage measurements are automatically performed and documented, without having to press countless buttons or having to move the test leads. The AXS-200/610 also measures AC and DC current to offer a complete picture of the electrical stability on the circuit under test. Additionally, the AXS-200/610 measures capacitance and resistance, while providing an automatic conversion of the measured capacitance/resistance into distance values.



DMM screen showing capacitive length

The Essential Triple-Play Last Mile Deployment Tool

The AXS-200/610 is the ideal local-loop prequalification and troubleshooting tool for xDSL services, up to VDSL2. This instrument enables telcos and contractor personnel to identify the causes of unsuccessful triple-play, DSL and/or VF circuit deployment, while helping cable repair crews to locate with precision and to eliminate loop faults. The AXS-200/610 puts an end to the guesswork involved in locating loop faults, freeing up valuable staff and company resources, which saves precious time. Thanks to its single-ended test capabilities, service providers not only see a reduction in CAPEX but also in OPEX–making the AXS-200/610 a money-saving tool.



Designed to Evolve with Your Network

Providing complete local-loop testing with a bandwidth of up to 30 MHz for copper/DSL/triple-play, the AXS-200/600 series is designed to evolve with your network. Additionally, these units offer accurate ADSL1/2/2+, VDSL2 and Ethernet-based analysis of triple-play services (voice, video and data).

SPECIFICATIONS

RECEIVER CHARACTERISTICS [a]

Receive frequency	200 Hz to 10 kHz: 1 Hz
Receive frequency	10 kHz to 20 kHz: 10 Hz
Receive frequency	20 kHz to 30 MHz: 1 kHz
Frequency uncertainty (accuracy)	±0.1%
Receive level	–90 to +10 dBm at 100 Ω or 135 Ω resolution 0.1 dB –100 to +10 dBm at 600 Ω resolution 0.1 dB
Level uncertainty (accuracy)	±1.0 dB for 200 Hz to 20 kHz at 0 dBm ±1.0 dB for 20 kHz to 30 MHz at 0 dBm
Impedance (Ω)	100, 135 and 600 bridging (100 kΩ)

TRANSMITTER CHARACTERISTICS

Transmit frequency	200 Hz to 20 kHz, resolution 1 Hz steps	
Transmit frequency	20 kHz to 30 MHz, resolution 1 kHz steps	
Transmit level	–10 to +10 dBm at 100 Ω or 135 Ω –20 to +10 at 600 Ω	
Frequency accuracy	±50 ppm, ±0.5 (Hz)	
Level uncertainty (accuracy)	±0.6 dB	200 Hz to 1 MHz
	±1 dB	1 MHz to 2.2 MHz
	±2 dB	2.2 MHz to 17 MHz
	±3 dB	17 MHz to 30 MHz
Impedance (Ω)	100, 135 and 600	

VF NOISE MEASUREMENT

Range (dBm)	0 to –90, subject to instrument noise floor
Uncertainty (accuracy)	±1 dB
Filters	None, 3 kHz flat, C-message, psophometric, notched and D filter (IEEE 743-1995)
Graphic results	Delay distribution and jitter histogram

VF IMPULSE NOISE

Low threshold (dBm)	0 to –40, in 1 dB steps
Mid threshold	Low threshold plus separation
High threshold	Mid threshold plus separation
Separation (dB)	1 to 6 in 1 dB steps
Dead time (ms)	125
Filters	None, 3 kHz flat, C-message, psophometric, notched and D filter (IEEE 743-1995)
Counter	Maximum 999 for each threshold
Timer	1 minute to 24 hours, default is 15 minutes

POWER INFLUENCE (NOISE TO GROUND)

Noise range	–60 to +10 dBm
Accuracy (dB)	±1.0
Level uncertainty (accuracy)	±1.0 dB at –60

VF LONGITUDINAL BALANCE

Frequency (Hz)	1004
Frequency uncertainty (accuracy)(ppm)	±50
Level range (dB)	0 to 80
Level uncertainty (accuracy)(dB)	±0.5

TIME DOMAIN REFLECTOMETRY (TDR)

Mode	One shot, continuous (auto-repeat) with cursor and zoom
Distance range (m)	3 to 6000 (10 ft up to 20,000 ft)
Pulse width	15 ns to 20 µs (auto-selected in auto TDR test)
Test signals	Sine wave, compensated sine wave, half-sine wave and square wave
Amplitude	10 V p-p on cable, 20 V p-p open circuit
V.O.P.	0.400 to 0.999 or 120 to 299 m/µs
Distance uncertainty [b] (accuracy) (m)	±(0.3 + 1 % x distance) or ±(1 ft + 1 % x distance)
Units	Feet, meters and nanoseconds
Horizontal scale (m)	Automatic or 30 (100 ft), 300 (1000 ft), 600 (2000 ft), 1500 (5000 ft), 3000 (10,000 ft), 6000 (20,000 ft), 13,500 (45,000 ft) and 15,000 (50,000 ft)

LOAD COIL DETECTION

Count	Five
Plot (kHz)	up to 10
Distance range	up to 8,000 (up to 27,000 ft)

SINGLE-END FREQUENCY RESPONSE

Distance range (m)	10 to 5000 (30 ft to 16,000 ft)
Frequency range (MHz)	Up to 30
Frequency uncertainty (accuracy)(ppm)	±50
Uncertainty (accuracy) (dB)	±1.0 typical
Resolution (dB)	0.1 dB
Horizontal scale (MHz)	ADSL2+ = 2.208, VDSL2-12 = 12, VDSL2-17 = 17.66, VDSL2-30 = 30
Vertical scale	0 to +90

NOTE

a. Characteristics are subject to instrument noise floor (approx -70 dBm). Levels below -70 dBm can be measured using the PSD noise test.

b. Does not include the uncertainty due to VOP.

SPECIFICATIONS (CONTINUED)

PSD NOISE MEASUREMENT

Test type	Continuous or peak-hold
Vertical scale	–10 to –145 dBm/Hz or +20 to –110 dBm
Horizontal scale	4.3125 kHz to 17 MHz, in 4.3125 kHz steps or 8.625 kHz to 30 MHz, in 8.625 kHz steps
Noise filters	None or E, F, G, VDSL2-8, VDSL2-12, VDSL2-17 and VDSL2-30

DSL IMPULSE NOISE MEASUREMENT

Threshold	–50 dBm (40 dBrn) to 0 dBm (90 dBrn) in 1 dB steps
Counter	Maximum 65,000
Test duration	1, 5, 10, 15 and 60 min, 24 h or continuous (up to 360 h)
Histogram plot interval	1, 5, 10, 15 or 60 min
Uncertainty (accuracy)	±2 dB

SWEPT LONGITUDINAL BALANCE TEST

Frequency accuracy (ppm)	±50 ppm
Uncertainty (accuracy)(dB)	±2.0 dB
Vertical scale	0 to 80.0 dB 0 to 60.0 dB 2.2 MHz to 30 MHz
Horizontal scale	ADSL/2+: 26 kHz to 2.2 MHz, SHDSL: 26 kHz to 1 MHz, VDSL/VDSL2-12: 26 kHz to 12 MHz, VDSL2-17: 26 kHz to 17.66 MHz, VDSL2-30: 26 kHz to 30 MHz

DMM (DIGITAL MULTIMETER)

Measurement	Range	Resolution	Accuracy
DC voltage	0 to 200 V	1 V	±2 %, ±1 V
AC voltage	0 to 140 Vrms	1 V	±2 %, ±1 V
Resistance	0 to 999 MΩ	3 digits	
	0 to 999 Ω		±2 % or ±5 Ω
	1 kΩ to 99 MΩ		±2 % ±1 digit
	100 MΩ to 999 MΩ		±5 % ±1 digit
	Distance up to 30,000 m (100,000 ft)		
Capacitance	1 nF to 10 µF	3 digits	±2 % ±1 digit
	Distance up to 30,000 m (100,000 ft)		
DC current	0 to 110 mA	1 mA	±2 % ±1 digit
AC current	0 to 77 mA	1 mA	±2 % ±1 digit

SPECTRAL DETECTIVE

Allows the AXS-200/610 to bridge (high-impedance) onto a live circuit to display a plot of transmitted levels and spectrum (PSD). The Spectral Detective test can be referenced to any user-selected impedance. The impedance reference setting is required to display proper readings in dBm/Hz or dBm.

Test type	Continuous or peak-hold
Bridging impedance (kΩ)	15 kΩ
Vertical scale	–10 to –145 dBm/Hz or +20 to –110 dBm
Horizontal scale	4.3125 kHz to 17 MHz, in 4.3125 kHz steps or 8.625 kHz to 30 MHz, in 8.625 kHz steps
Noise filters	None or E, F, G, VDSL2-8, VDSL2-12, VDSL2-17 and VDSL2-30

STRESS/LEAKAGE (ISOLATION RESISTANCE)

Source	100 VDC, current safely limited to < 1.0 mA
Range (MΩ)	0 to 999 auto-ranging
Resolution	3 significant digits
Uncertainty (accuracy)	0 to 999 Ω ±1 % or ±5 Ω 1 kΩ to 99 MΩ ±1 % ±1 digit 100 MΩ to 999 MΩ ±5 % ±1 digit
Soak timer (s)	1 to 99

RFL

Test type	Single pair and separate good pair
Fault detection (MΩ)	0 to 20 resolution three digits
Loop resistance (kΩ)	7 maximum
Multiple cable sections	Five (includes gauge and temperature setting)
Fault location	*Total resistance, near-end to fault resistance, fault to strap resistance (four significant digits) *Total length, distance to fault, distance from fault to strap (3 m/1 ft resolution)
Uncertainty (accuracy) (Ω)	0.2, ±02 %

GENERAL SPECIFICATIONS [a]

Module size (H x W x D)	283 mm x 125 mm x 92 mm	(11 1/8 in x 4 15/16 in x 3 5/8 in)
Module weight (with battery and transceivers)	1.2 kg	(2.6 lb)
Temperature		
operating	0 °C to 50 °C	(32 °F to 122 °F)
storage	–20 °C to 70 °C	(–4 °F to 158 °F)
Humidity	5 % to 95 % relative, non-condensing	
Power supply	Input: 110 V to 240 V AC at 1.8A 50 Hz to 60 Hz Output: 18 V to 24 V DC at 3.33 A to 2.50 A, 60 W	
Battery	Internal rechargeable Li-Ion battery, with battery state indication	
Test connections	Five-colored banana for T, R, G, T1 and R1	
Differential voltage protection	125 VRMS or 400 VDC max	
Common mode voltage protection	1000 VRMS	
Self-test	Routine on power-up	
Voltage detection	> 20 V will trigger alarm message	
Results storage	128 Mbytes	
Languages	English, French, German, Spanish, Chinese (Simplified)	

STANDARD ACCESSORIES

Hand strap, Certificate of Compliance
ACC-5COLR: 5 colors 4 mm banana conn. tel.
ACC-STRAP: RFL strap

Note

a. Specifications based on 24 AWG (0.5 PE mm) cabling and subject to change without notice.

ORDERING INFORMATION

AXS-610-XX

Model
AXS-610 = Copper test module

Software Options
00 = Without software upgrade
VDSL2WB = 30 MHz Wideband Option
LOOPMAPPER= LOOPMAPPER

Example: AXS-610-VDSL2WB

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