

# AXS-200/630

part of the SharpTESTER Access Line

NETWORK TESTING—ACCESS



## VDSL2, ADSL2+ and IP services tester for triple-play deployments

Based on industry-leading Broadcom DSL chipset for proven VDSL2 and ADSL2+ interoperability and support for impulse noise protection (INP) and Broadcom PhyR™ configurations.

### Features/Benefits

- Affordable triple-play testing over VDSL2 and ADSL1/2/2+ including Ethernet in/out operation for FTTx deployments
- DSL, IPTV and VoIP service assurance using a comprehensive range of metrics such as DSL link speeds, multilayer fault analysis histogram, MDI as well as IP packet loss and jitter
- VDSL2 and ADSL2+ Annexes A, L and M support for ultimate network flexibility

### Applications

- Detection of potential bottlenecks on subscriber loops to ensure high-quality, consistent and error-free triple-play services (IPTV, Internet and VoIP)
- IPTV analysis using STB emulation, RFC 4445 (MDI), PCR jitter and PID viewer results
- Triple-play deployment verification inside the subscriber premise using Ethernet in/out testing



## VDSL2 and ADSL2+ Triple-Play Services Testing

Get VDSL2 and ADSL1/2/2+ interoperability and backward-compatibility in a single test set thanks to EXFO's AXS-200/630 module for the AXS-200 SharpTESTER. Featuring the industry-leading Broadcom chipset, the AXS-200/630 provides you with a wide range of measurements so that no matter what stage of DSL deployment you are at—prequalification, installation, troubleshooting or repair—you have all the measurement tools you need to get the job done efficiently and properly.

Part of the SharpTESTER Access Line, the AXS-200/630's bright color LCD display provides a sharp graphical user interface for showing clear results (including graphs), making it a straightforward, user-friendly test solution, perfect for triple-play services analysis. Designed for real-life testing conditions, the AXS-200/630's display is ideally suited for use in direct sunlight thanks to its transfective color display.



## You need VDSL2 and Ethernet to deliver HD IPTV

VDSL2's high-speed capability not only breathes new life into your existing copper plant but it allows you to reduce churn and gain market share in delivering triple-play services to your customers. High-definition (HD) IPTV service is the killer application for VDSL2 deployment as it requires the most bandwidth and the best quality of service (QoS) that your customers have come to expect.

EXFO's AXS-200/630 offers a quick, yet thorough method for testing triple-play services—VDSL2 and Ethernet-based data, VoIP and IPTV testing—using pass/fail-driven automated functionalities.

In addition to validating connectivity to the DSLAM, the AXS-200/630 provides upstream and downstream parameters such as actual data rates, attenuation and noise margin. What's more, it delivers advanced IPTV measurements—packet jitter, packet loss, PCR jitter, MDI, PID viewer and IGMP zap time—both in Terminate (stand-alone) and Through mode operation. The AXS-200/630 also monitors residential VoIP call flow and statistics, facilitating VoIP QoS assurance.

Stream IP	Type	Rates	Usage
192.168.0.159:554	RTSP	3935 kbps	16%
192.168.0.159:6972	Unicast	64 kbps	0%
224.1.1.1:100	Multicast	4443 kbps	18%

■ Simultaneous detection of multicast (RTP/UDP), unicast (RTP/UDP) and TCP/RTSP VOD streams.

Stream Content	PID	Rate(kbps)
Video	300	3793
Audio	301	187
Program Association Table	0	16
Program Map Table	48	16

■ IPTV Test Results screen showing PID Viewer.

Stream Rates:	MDI: 70.4:0
IP Packet: 4131 kbps	DF(Ave): 69.0 ms
Transport Rate: 4337 kbps	DF(Min): 65.8 ms
Null Packet Rate: 0 kbps	DF(Max): 72.1 ms
	VB(Min): -36677
	VB(Max): 1528

■ Test Results screen showing stream parameters such as MDI.

## Impulse Noise Protection +

You need to provide your customers with comprehensive assurance against poor triple-play services. With this in mind, the telecom industry has adopted the DSL-based impulse noise protection (INP) parameter, which is particularly important when deploying IPTV services based on VDSL2 and ADSL2+. For example, the INP helps reduce the amount of macro-blocking in an IPTV stream caused by short duration and intermittent impulse noise spikes. However, the downside of standard INP implementation is that it can limit the speed of VDSL2 (or ADSL2+) offered to customers as well as the addressable service area (distance).

The AXS-200/630 supports the traditional INP parameter as well as Broadcom's innovative approach to INP called PhyR™. This technology allows for significantly lower BER, higher DSL rate and longer reach compared to standard INP implementations. As a result, the AXS-200/630 can be used to verify and ensure consistent QoS for DSL-based IPTV deployments without impacting speed or performance of the DSL link.

Parameter	DownStream	UpStream
SNR Margin:	22.0 dB	0.0 dB
Attenuation	0.0 dB	0.0 dB
Output Power:	0.0 dBm	-24.0 dBm
INP:	1.0	1.0
Interl.Depth:	361	139
Interl.Delay:	4.0 ms	4.0 ms
TRELLIS:	ON	OFF
BITSwap:	Not Active	Not Active

■ DSL Results screen.

# True Backward-Compatible and Interoperable Testing

Since the AXS-200/630 is based on the industry-leading Broadcom chipset, you are assured of excellent interoperability for VDSL2 and ADSL2+ when testing against other Broadcom chipset-based devices as well as other manufacturer chipsets.

Thanks to the AXS-200/630's Broadcom chipset, you can use the Broadcom's Nitro mode when testing ADSL2+ to effectively negotiate with DSLAM (also using a Broadcom chipset) in order to achieve data rates as high as 30 Mbit/s (depending on DSLAM setup, loop length, noise influences and circuit quality).

Line Tests CPE Test		
Line Status:	Showtime	
Operational Mode :	ADSL2plus-AnnexM	
CO VendorID:	BDCM	
CO Version:	0xFFFF910C	
Parameter	DownStream	UpStream
Max BitRate:	26092 kbps	1773 kbps
Actual BitRate:	22327 kbps	1773 kbps
Capacity:	85.6 %	100.0 %

■ ADSL2+ Test Results screen.

Line Tests CPE Test		
Line Status:	Showtime	
Operational Mode :	VDSL2-17a	
CO VendorID:	BDCM	
CO Version:	0x910C	
Parameter	DownStream	UpStream
Max BitRate:	141304 kbps	N/A
Actual BitRate:	79945 kbps	15148 kbps
Capacity:	56.6 %	N/A

■ VDSL2 Test Results screen.

## Key Features

<b>INP and PhyR™</b>	Supports Broadcom's PhyR™ functionality and legacy impulse noise protection parameters
<b>User-definable automated test routines</b>	Presents easy-to-interpret pass/fail results
<b>FTTx support</b>	Enables DSL and 10/100 Mbit/s Ethernet assessment of triple-play services in Terminate and Pass Through mode
<b>IPTV analysis</b>	Provides key IPTV qualification parameters with features such as set-top box (STB) emulation, join/leave requests, PCR jitter analysis and PID viewer
<b>MDI reporting</b>	Supports media delivery index (RFC 4445) for evaluating the IPTV quality of experience
<b>VoIP analysis</b>	Ensures VoIP services are not affected by packet loss or jitter
<b>Data analysis</b>	Offers a common set of measures such as ping, traceroute, HTTP speed testing and FTP speed testing to ensure reliable and consistent Internet connectivity
<b>Multilayer fault analysis histogram</b>	Visually indicates when and at what layer errors are occurring, helping to identify the source of the problem as well as facilitating quick and efficient troubleshooting

# xDSL/Triple-Play Testing Specifications

## VDSL2 VTU-R-MODULE

Chipset	Broadcom
Standard Compliance	
VDSL2	ITU-T G.993.2
ADSL1/2/2+	Annex A option (over POTS): ITU-T G.992.5 (ADSL2+), ITU-T G.992.3 (ADSL2), ITU-T G.992.1 (G.DMT) and ANSI T1.413 Issue 2 Annex L (RE-ADSL) and Annex M are also supported
DSL measurements (upstream and downstream)	Maximum attainable bit rates Actual achieved bit rates Latency mode: fast, interleaved Capacity Signal-to-noise ratio (SNR) margin Output power Attenuation Carrier load (bits/bin) Interleave depth Interleave delay Trellis coding Bit swapping
Miscellaneous functions/measurements	PhyR™ and INP support ATM F4 and F5 OAM loopback (ADSL1/2/2+ modes only) Link errors FEC, CRC, HEC Loss of sync counter VDSL2 per band information

## IPTV-OVER-DSL/ETHERNET TESTING

Physical-layer support	VDSL2 ADSL1/2/2+ Ethernet 10/100
Supported video compression/standards	MPEG2, MPEG4 part 2 and 10 (H.264/AVC), WM9
Operation	Terminate and Pass Through
IPTV parameters/functionality	Video streaming (channels) detection IGMP join/leave requests with STB emulation Bandwidth usage per channel IGMP packets information Set-top box (STB) traffic/setup information Key IP video QoS parameters: packet loss, packet jitter, zap time, PCR jitter, PID statistics Media delivery index (MDI) showing delay factor, media loss rate and virtual buffer QoS pass/fail indicators Graphic results: bandwidth usage and multilayer fault analysis histogram IP packet and PCR jitter histograms Multicast/unicast RTP/UDP IP stream support TCP/RTSP VOD support Multiple downstream PVC in ATM mode for IPTV
IP connectivity support	DNS, DHCP client/server, NAT, VLAN

## VoIP-OVER-DSL/ETHERNET TESTING

Physical-layer support	VDSL2 ADSL1/2/2+ Ethernet 10/100
Recognized signalling protocol	Session initiation protocol (SIP) v2 (RFC 3261)
Operation	Pass Through
Recognized codecs	G.711, G.729, G.726, G.723
VoIP parameters/functionality	Call monitoring/analysis/statistics Call flow Key VoIP QoS parameters: packet loss, packet jitter QoS pass/fail indicators Graphic results: delay distribution, jitter histogram
IP connectivity support	DNS, DHCP client/server, NAT, VLAN

## Specifications (continued)

### DATA ANALYSIS MODE

Physical-layer support	VDSL2 ADSL1/2/2+ Ethernet 10/100
Encapsulation methods	PPPoE (RFC 2516), RFC 2684 supporting bridged Ethernet (IPoE), IPoA (RFC 1577), PPPoA/LLC and PPPoA/VC-MUX (RFC 2364)
Operation	Terminate and Pass Through
Login format	Username and password using PAP or CHAP
IP connectivity support	DNS, DHCP client/server, NAT, VLAN
Ping	Pings another device on the network Ping device: Gateway, destination IP address or URL Number of pings: 1 to 99 Packet size: 32 to 1500 bytes (32 is default) Results: Indicate packet size, packets sent/received, minimum/average/maximum round-trip times in milliseconds (ms)
Traceroute	Determines the path used to reach device on the network Timeout: In seconds Time to live (TTL): Default is 100 ms, maximum is 5 s Packet size: 32 bytes Number of hops: 1 to 30 (default is 30) Results: Indicate IP address of hop and round-trip time in milliseconds (ms)
HTTP speed test	Downloads a Web page and indicates speed of download Address: IP or URL Protocol: HTTP Results: Time, speed in kbit/s
FTP speed test	Displays speed to upload and/or download a file Address: IP or URL Protocol: FTP Results: Time, speed in kbit/s

### GENERAL SPECIFICATIONS

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)	1.1 kg	(2.4 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	100-240 VAC at 1.8 A, 50 Hz to 60 Hz	
output	18-24 VDC at 3.33 A to 2.50 A, 60 W	
Battery	Internal rechargeable Li-Ion battery, with battery state indication	
Test connections	RJ-45 for ADSL2+ and Ethernet 10/100 WAN RJ-45 for Ethernet 10/100 LAN	
Differential voltage protection	125 VRMS or 400 VDC max	
Common mode voltage protection	1000 VRMS	
Self-test	Routine on power-up	
Results storage	128 Mbytes	
Languages	English, French, German, Spanish, Chinese (Simplified)	

### STANDARD ACCESSORIES

Hand strap, Certificate of Compliance  
 ACC-RJTC: Test Cable: RJ-45 to telco clip  
 ACC-RJRJ: RJ-45 Ethernet cable



ORDERING INFORMATION

**AXS-630-XX-XX**

**Model** ■

AXS-630 = VDSL2, ADSL2+ and IP Triple-Play Test Set

**DSL module** ■

V2XA = VDSL2 with ADSL2+ Annex A

■ **DSL Software Options**

00 = Without software upgrade

MDI = Media delivery index <sup>a</sup>



ADSL2+M = Annex M support

TPP-BUNDLE = Triple-play bundle (IPTV, VoIP and data analysis support)

**Note**

a. Available only if TPP-BUNDLE is selected.

Example: AXS-630-V2XA-TPP-BUNDLE

 <p><b>Rugged Handheld Solutions</b></p> <table border="0"> <tr> <td><b>OPTICAL</b></td> <td><b>COPPER ACCESS</b></td> </tr> <tr> <td>— OTDRs</td> <td>— ADSL/ADSL2+, SHDSL, VDSL test sets</td> </tr> <tr> <td>— OLTSs</td> <td>— VoIP and IPTV test sets</td> </tr> <tr> <td>— Power meters</td> <td>— Ethernet test sets</td> </tr> <tr> <td>— Light sources</td> <td>— POTS test sets</td> </tr> <tr> <td>— Talk sets</td> <td></td> </tr> </table>	<b>OPTICAL</b>	<b>COPPER ACCESS</b>	— OTDRs	— ADSL/ADSL2+, SHDSL, VDSL test sets	— OLTSs	— VoIP and IPTV test sets	— Power meters	— Ethernet test sets	— Light sources	— POTS test sets	— Talk sets		 <p><b>Platform-Based Solutions</b></p> <table border="0"> <tr> <td><b>OPTICAL FIBER</b></td> <td><b>DWDM TEST SYSTEMS</b></td> <td><b>TRANSPORT AND DATAKOM</b></td> </tr> <tr> <td>— OTDRs</td> <td>— OSAs</td> <td>— Next-generation SONET/SDH and OTN testers</td> </tr> <tr> <td>— OLTSs</td> <td>— PMD analyzers</td> <td>— SONET/DSn (DS0 to OC-192) testers</td> </tr> <tr> <td>— ORL meters</td> <td>— Chromatic dispersion analyzer</td> <td>— SDH/PDH (64 kbit/s to STM-64) testers</td> </tr> <tr> <td>— Variable attenuators</td> <td></td> <td>— T1/T3, E1 testers</td> </tr> <tr> <td></td> <td></td> <td>— 10/100 Mbit/s and Gigabit Ethernet testers</td> </tr> <tr> <td></td> <td></td> <td>— Fibre Channel testers</td> </tr> <tr> <td></td> <td></td> <td>— 10 Gigabit Ethernet testers</td> </tr> </table>	<b>OPTICAL FIBER</b>	<b>DWDM TEST SYSTEMS</b>	<b>TRANSPORT AND DATAKOM</b>	— OTDRs	— OSAs	— Next-generation SONET/SDH and OTN testers	— OLTSs	— PMD analyzers	— SONET/DSn (DS0 to OC-192) testers	— ORL meters	— Chromatic dispersion analyzer	— SDH/PDH (64 kbit/s to STM-64) testers	— Variable attenuators		— T1/T3, E1 testers			— 10/100 Mbit/s and Gigabit Ethernet testers			— Fibre Channel testers			— 10 Gigabit Ethernet testers
<b>OPTICAL</b>	<b>COPPER ACCESS</b>																																				
— OTDRs	— ADSL/ADSL2+, SHDSL, VDSL test sets																																				
— OLTSs	— VoIP and IPTV test sets																																				
— Power meters	— Ethernet test sets																																				
— Light sources	— POTS test sets																																				
— Talk sets																																					
<b>OPTICAL FIBER</b>	<b>DWDM TEST SYSTEMS</b>	<b>TRANSPORT AND DATAKOM</b>																																			
— OTDRs	— OSAs	— Next-generation SONET/SDH and OTN testers																																			
— OLTSs	— PMD analyzers	— SONET/DSn (DS0 to OC-192) testers																																			
— ORL meters	— Chromatic dispersion analyzer	— SDH/PDH (64 kbit/s to STM-64) testers																																			
— Variable attenuators		— T1/T3, E1 testers																																			
		— 10/100 Mbit/s and Gigabit Ethernet testers																																			
		— Fibre Channel testers																																			
		— 10 Gigabit Ethernet testers																																			

**EXFO Corporate Headquarters** > 400 Godin Avenue, Quebec City (Quebec) G1M 2K2 CANADA | Tel.: 1 418 683-0211 | Fax: 1 418 683-2170 | info@EXFO.com

Toll-free: 1 800 663-3936 (USA and Canada) | [www.EXFO.com](http://www.EXFO.com)

<b>EXFO America</b>	3701 Plano Parkway, Suite 160 Plano, TX 75075 USA	Tel.: 1 800 663-3936	Fax: 1 972 836-0164
<b>EXFO Europe</b>	Omega Enterprise Park, Electron Way Chandlers Ford, Hampshire S053 4SE ENGLAND	Tel.: +44 2380 246810	Fax: +44 2380 246801
<b>EXFO Asia</b>	151 Chin Swee Road, #03-29 Manhattan House SINGAPORE 169876	Tel.: +65 6333 8241	Fax: +65 6333 8242
<b>EXFO China</b>	No. 88 Fuhua, First Road, Central Tower, Room 801 Futian District Beijing New Century Hotel Office Tower, Room 1754-1755 No. 6 Southern Capital Gym Road Beijing 100044 P. R. CHINA	Tel.: +86 (755) 8203 2300 Tel.: +86 (10) 6849 2738	Fax: +86 (755) 8203 2306 Fax: +86 (10) 6849 2662

EXFO is certified ISO 9001 and attests to the quality of these products. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. EXFO has made every effort to ensure that the information contained in this specification sheet is accurate. However, we accept no responsibility for any errors or omissions, and we reserve the right to modify design, characteristics and products at any time without obligation. Units of measurement in this document conform to SI standards and practices. In addition, all of EXFO's manufactured products are compliant with the European Union's WEEE directive. For more information, please visit [www.EXFO.com/recycle](http://www.EXFO.com/recycle). Contact EXFO for prices and availability or to obtain the phone number of your local EXFO distributor.

For the most recent version of this spec sheet, please go to the EXFO website at <http://www.EXFO.com/specs>  
In case of discrepancy, the Web version takes precedence over any printed literature.