AXS-200/850

part of the SharpTESTER Access Line

NETWORK TESTING–TRANSPORT AND DATACOM

Innovative, all-in-one tiered-services test suite with unique graphical data display brings powerful testing capabilities to front line technicians

- Bidirectional RFC 2544 testing with independent results for each direction tested simultaneously
- Traffic generation and monitoring for network performance testing
- Multiple background streams traffic for carrier Ethernet services testing
- Bit-error-rate testing (BERT) up to layer 4
- Cable testing
- Intelligent network autodiscovery for simplified loopback testing
- Configurable VLAN and Q-in-Q capability
- QoS, ToS and diffserv capabilities
- Pass/fail results (LED indicators) with user-defined thresholds
- Compact, rugged, lightweight unit

COMPLETE IPv6 TESTING

FROST & SULLIVAN
2008 BEST PRACTICES AWARD
Global award for technology innovation in 1 and 10 Gigabit Ethernet testing

METRO Ethernet Forum
MEMBER

Next-Generation Network Assessment
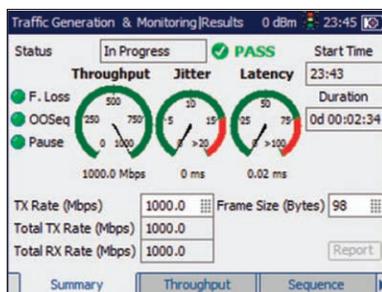
EXFO

EXPERTISE REACHING OUT

Simplifying Ethernet Testing

Part of EXFO's wide-ranging Ethernet test offering, the AXS-200/850 Ethernet Test Set delivers comprehensive test functionalities without the typical complexity associated with Ethernet/IP testing. Whether for installing, turning up or maintaining Ethernet and IP services, the AXS-200/850 is ready to perform. Thanks to a feature set that includes bidirectional RFC 2544, traffic generation and monitoring, multistream background traffic, BERT, as well as IP connectivity tools such as ping and traceroute, this lightweight, handheld unit provides front-line technicians with all the tools they need to get through their test cycles quickly and efficiently.
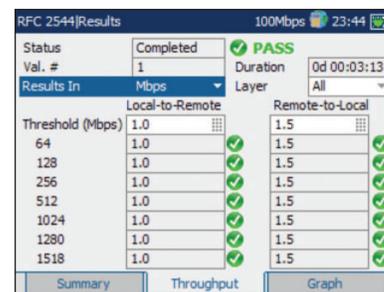
Quick Access to Test Results
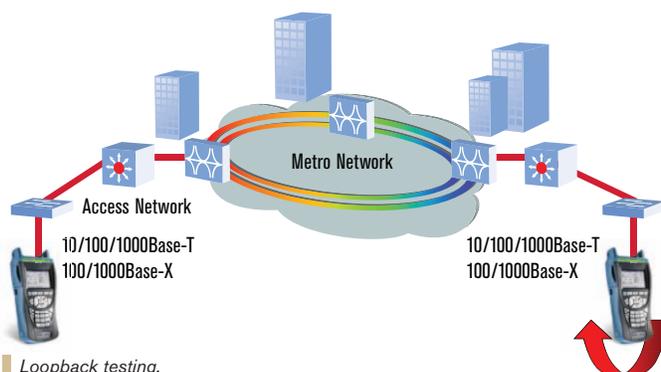

Cable test results.
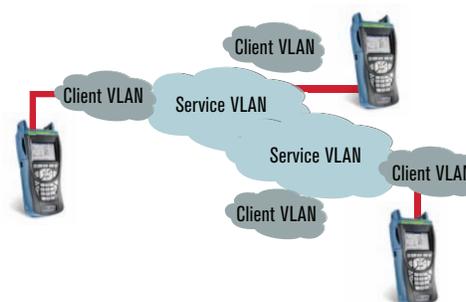

Traffic generation and monitoring results.

Bidirectional RFC 2544 results.

Key Features

Traffic generation and monitoring	Allows full-line-rate bidirectional end-to-end testing for complete network performance evaluation.
Multistream background traffic	Used in conjunction with traffic generation, background traffic fully proves that the providers' network can truly offer end-to-end quality of service (QoS).
Cable testing	Allows for cable troubleshooting before committing to long-term testing phases, saving you time and money.
Bit-error-rate testing (BERT)	Performs BERT up to layer 4; offers a wide range of standard and customizable patterns.
Bidirectional RFC 2544	Offers Dual Test Set configuration to perform end-to-end, bidirectional RFC 2544 performance testing such as throughput, back to back and frame loss; latency results are returned via a round trip method.
VLAN with Q-in-Q	Encapsulates up to two VLAN layers for all tests including the modification of VLAN ID, priority, type and drop eligibility.
Intelligent autodiscovery	Finds multiple remote AXS-200/850 units and loops them up or down for loopback testing; offers the ability to discover and connect to any of EXFO's datacom testing solutions.
Smart Loopback	Loopbacks incoming test traffic up to layer 4.
Optical power measurement	Provides optical power readings during all testing phases.
Interoperability with Packet Blazer and Power Blazer units	Interoperates with EXFO's Packet Blazer Ethernet and Power Blazer test module series–the FTB-8510, FTB-8510B, FTB-8510G, FTB-8120NGE, FTB-8130NGE, FTB-8525, FTB-8535, RTU-310 and RTU-310G.
Service disruption time (SDT) measurement	Measures the downtime of a network triggered by a non-traffic period that could be caused by impairments or protection switching.
IPv6	Includes BERT, RFC 2544, traffic generation and monitoring, background streams, Smart Loopback, remote loopback, ping and traceroute.
Event logger	Allows users to track all current or historical events during test phases; events are color coded and embedded with a pass/fail analysis during and after testing.

Loopback testing.

Q-in-Q testing.

Built for Metro Ethernet Networks

For decades, Ethernet has proven itself to be a flexible and scalable networking technology. Much less expensive than a SONET/SDH or DSN/PDH interface of the same bandwidth, Ethernet also supports high bandwidths with fine granularity, which is not available with traditional SONET/SDH connections. Another advantage of an Ethernet-based access network is that it can be easily connected to the customer network (corporate and residential).

Applications

- Performance assessment of carrier Ethernet services
- Installation, activation and maintenance of metro Ethernet networks
- Deployment of active Ethernet (point-to-point) access services

Using EXFO's AXS-200/850 Ethernet Test Set, field technicians can effectively install, qualify and troubleshoot metro Ethernet networks thanks to powerful test capabilities:

Traffic Generation and Monitoring Testing

Thanks to the AXS-200/850 traffic generation and monitoring tools, technicians can monitor the following key QoS statistics in real time: throughput, frame loss, sequencing, packet jitter and latency.

Bidirectional RFC 2544 Testing

The industry-standard RFC 2544 benchmarking methodology defines a series of tests—throughput, latency, back-to-back and frame loss—allowing service providers to perform proper circuit and service-level agreement (SLA) validation.
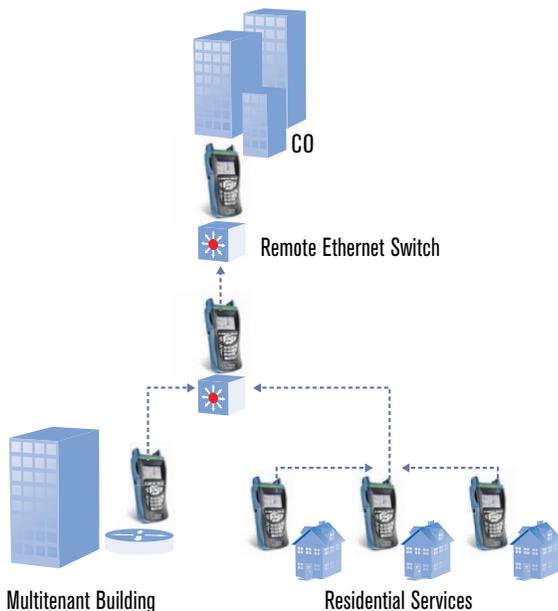
BER Testing

Signal integrity is generally expressed by the bit error rate (BER) value. When it comes to testing bit error rates, the AXS-200/850 has users covered, as it measures BER in various types of circuits and can effortlessly test end-to-end up to layer 4 networks.
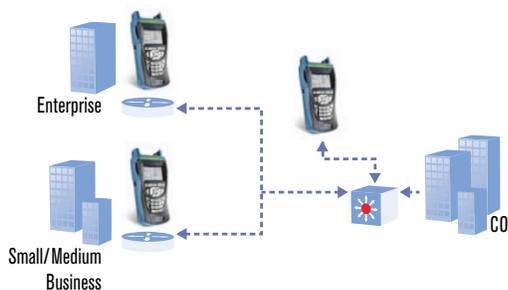
QoS Testing

The AXS-200/850 is ideally designed for performing quality of service (QoS) verification on metro Ethernet circuits. It offers VLAN priorities and specific settings (types of service, differentiated services), helping service providers ensure QoS expectations are met.

Cable Testing

With the help of the Wiremap test, field technicians can check for continuity problems as well as for MDI and MDIX compatibility. Also, knowing the length, distance to fault, propagation delay and skew further ensures that the physical cabling is within the IEEE 802.3 standard specifications.

Active Ethernet services.

Business services.

Metro Ethernet buildout.
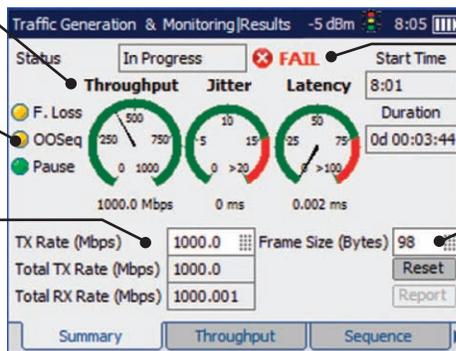
Radically Simple QoS Testing

The AXS-200/850 traffic generation and monitoring tools make it fast and simple to test packet jitter, real-time latency, throughput, sequencing and frame loss. Speedometer-like gauges with built-in user-definable pass/fail thresholds give you immediate and accurate results at a glance–no need to shuffle through pages of information to find out why a test is failing. Frame loss, out-of-sequence LED indicators notify you of any current or historical defects. Whether incremental or large changes to the bandwidth or frame size are required, on-the-fly traffic generation adjustments are provided for quick and instant results without having to stop testing and look for other pages to make these adjustments.

Regardless of the network under test, it is always necessary to verify that it can handle the allocated bandwidth and expected QoS. With this critical data and simplified results page you can quickly and easily determine whether the network under test conforms to their customers' expectations.

Throughput, jitter and latency visual pass/fail thresholds, analog gauges and digital readouts

Frame loss, out-of-sequence, pause frames
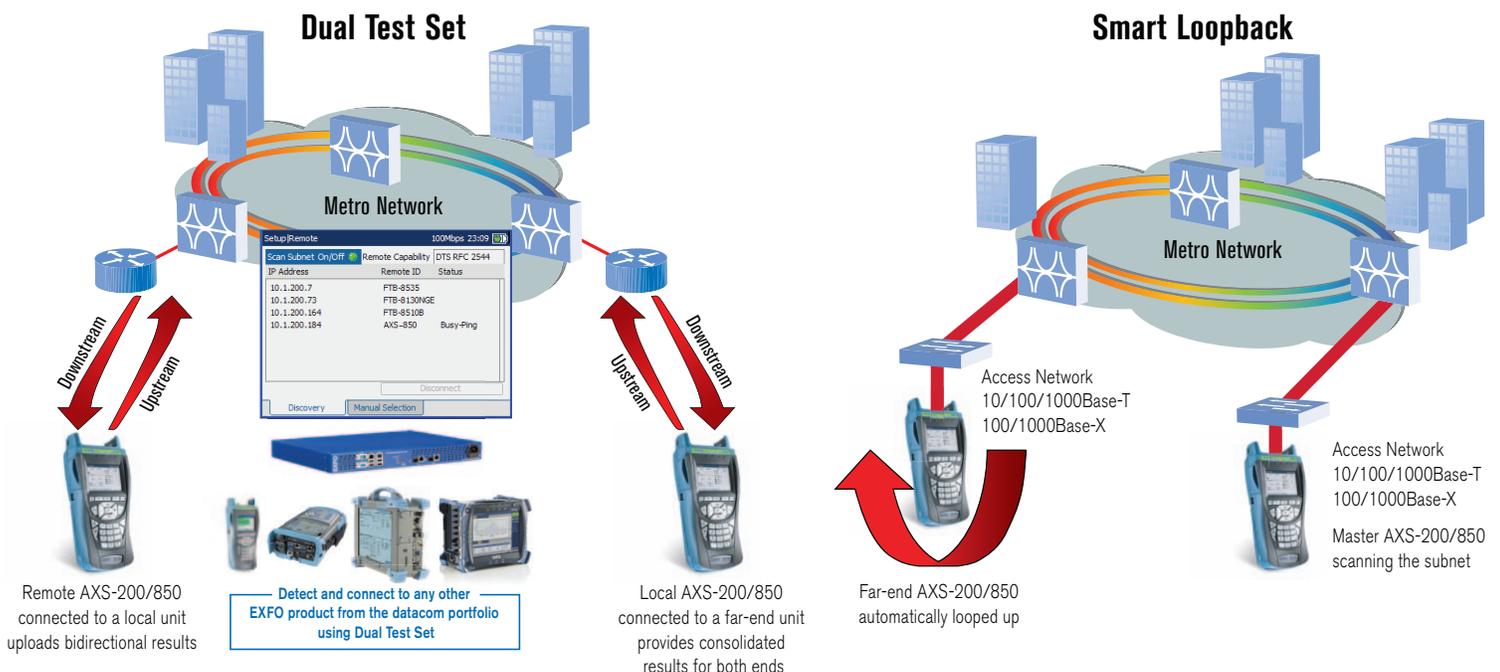
Real-time bandwidth adjustment

Overall pass/fail assessment

Real-time frame size adjustment

Intelligent Network Discovery Mode

Using an AXS-200/850, you can access multiple EXFO datacom remote testers. One click lets you scan the network and choose from a list of all available EXFO datacom testers on the network. Simply select the unit to be tested with and choose whether you want traffic to be looped back via Smart Loopback or Dual Test Set for simultaneous bidirectional RFC 2544 results. No more need for an additional technician at the far end to relay critical information–the AXS-200/850 takes care of it all.

Dual Test Set

Smart Loopback

Metro Network

Metro Network

Access Network
10/100/1000Base-T
100/1000Base-X

Access Network
10/100/1000Base-T
100/1000Base-X

Master AXS-200/850
scanning the subnet

Remote AXS-200/850
connected to a local unit
uploads bidirectional results

Detect and connect to any other
EXFO product from the datacom portfolio
using Dual Test Set

Local AXS-200/850
connected to a far-end unit
provides consolidated
results for both ends

Far-end AXS-200/850
automatically looped up

Rugged, Lightweight and Designed for Front-Line Technicians

EXFO's AXS-200/850 Ethernet Test Set was designed according to the real-life challenges brought by Ethernet testing. Its user-friendly features shorten the learning curve for both expert and entry-level technicians and enable them to complete their test cycles quickly and efficiently.

Pass/Fail Testing

Thanks to built-in pass/fail thresholds, the AXS-200/850 delivers clear-cut assessment of test results. What's more, thresholds can be modified for testing rate-limited services.

Results Display

Test results are presented according to three formats:

- Pass/fail results based on default or user-configured thresholds
- Sneak-peek results during tests
- Complete results down to their associated frame sizes

Event Logger

The Event logger functionality allows users to pinpoint exactly when and how their tests are failing. Key features include:

- Color coded events
- Broken pass/fail thresholds are presented with both the expected and duration of exceeded threshold values
- Pass/fail status is provided at the conclusion of the log
- Events displayed in full context such as Bit Error, Link Down, etc.
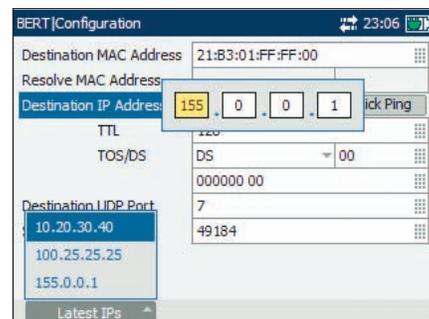
Quick Configuration Recall

With the AXS-200/850, the user no longer needs to search for previously entered MAC or IP addresses. The AXS-200/850 remembers the last three IP and MAC addresses, allowing for an instantaneous entry of address information.
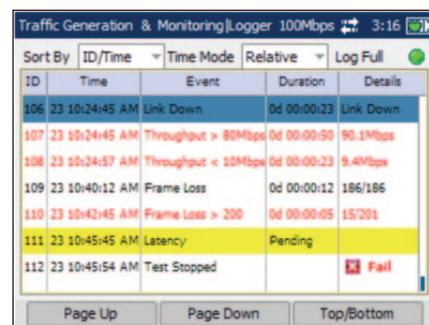
Print Report

The AXS-200/850 supplies users with a print report that contains complete test results, which can be viewed and saved internally or off the unit via a USB memory stick or network connection.
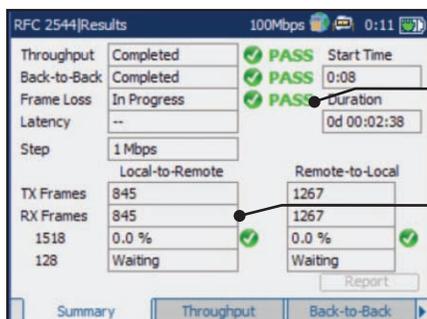
LED Indicators

Platform LEDs offer crucial information for pass/fail results, laser on/off, errors or alarms, test running and link status.

Quick configuration recall.

Event logger.

Critical and fail-safe pass/fail diagnosis

Sneak-peek of current test running

LEDs offer crucial test information

Directional arrows and function keys

Alphanumeric keypad

Specifications

OPTICAL INTERFACES

	100Base-FX	100Base-LX	1000Base-SX	1000Base-LX	1000Base-ZX	1000BASE-BX10-D	1000BASE-BX10-U
Optical interfaces	One port at 100M or GigE						
Available wavelengths (nm)	850, 1310 and 1550						
Wavelength (nm)	1310	1310	850	1310	1550	Tx: 1490 Rx: 1310	Tx: 1310 Rx: 1490
Tx level (dBm)	−20 to −15	−15 to −8	−9 to −3	−9.5 to −3	0 to +5	−9 to −3	−9 to −3
Rx level sensitivity (dBm)	−31	−28	−20	−22	−22	−20	−20
Maximum reach	2 km	15 km	550 m	10 km	80 km	10 km	10 km
Transmission bit rate (Gbit/s)	0.125	0.125	1.25	1.25	1.25	1.25	1.25
Reception bit rate (Gbit/s)	0.125	0.125	1.25	1.25	1.25	1.25	1.25
Tx operational wavelength range (nm)	1280 to 1380	1261 to 1360	830 to 860	1270 to 1360	1540 to 1570	1480 to 1500	1260 to 1360
Measurement accuracy							
Frequency (ppm)	±15	±15	±15	±15	±15	±15	±15
Optical power (dB)	±2	±2	±2	±2	±2	±2	±2
Maximum Rx before damage (dBm)	+3	+3	+6	+6	+6	+6	+6
Jitter compliance	ANSI X3.166	IEEE 802.3	IEEE 802.3	IEEE 802.3		IEEE 802.3ah	IEEE 802.3ah
Ethernet classification	ANSI X3.166	IEEE 802.3	IEEE 802.3	IEEE 802.3		IEEE 802.3ah	IEEE 802.3ah
Laser type	LED	FP	VCSEL	FP	DFB	DFB	FP
Eye safety	CLASS 1	CLASS 1	CLASS 1	CLASS 1	CLASS 1	CLASS 1	CLASS 1
Connector	LC	LC	LC	LC	LC	LC	LC
Transceiver type	SFP	SFP	SFP	SFP	SFP	SFP	SFP

ELECTRICAL INTERFACES

	10Base-T	100Base-TX	1000Base-T
Electrical interfaces	One port 10/100Base-T or 1000Base-T		
	Automatic detection of straight/crossover cable		
Tx bit rate	10 Mbit/s	125 Mbit/s	1 Gbit/s
Tx accuracy (ppm)	±15	±15	±15
Rx bit rate	10 Mbit/s	125 Mbit/s	1 Gbit/s
Rx measurement accuracy (ppm)	±15	±15	±15
Duplex mode	Half and full duplex	Half and full duplex	Full duplex
Jitter compliance	IEEE 802.3	IEEE 802.3	IEEE 802.3
Connector	RJ-45	RJ-45	RJ-45
Maximum reach (m)	100	100	100

TESTING

RFC 2544	Throughput, back-to-back, frame loss and latency measurements according to RFC 2544. Frame size: RFC-defined sizes, user-configurable between 1-7 sizes.
Traffic generation and monitoring	Capability to generate traffic and monitor Ethernet and IP networks. Capability to perform traffic shaping with the following statistics: throughput, frame loss, sequencing, packet jitter, latency, frame size, traffic type and flow control.
Multistream background traffic	Capability to transmit and monitor up to three additional streams over Ethernet and IP networks. Configurable per-stream analysis; capability to set packet size, MAC source/destination address, VLAN ID, VLAN priority, IP source/destination address, ToS field, DSCP field, TTL, UDP source/destination port and payload.
BERT	Up to layer 4 supported with or without VLAN Q-in-Q.
Patterns (BERT)	PRBS 2E9-1, PRBS 2E11-1, PRBS 2E15-1, PRBS 2E20-1, PRBS 2E23-1, PRBS 2E31-1 and one user pattern. Capability to invert patterns.
Bit error insertion	1-50
Error measurement	Jabber/giant, runt, undersize, oversize, FCS, symbol, alignment, collision, late collision, excessive collision.
Error measurement (BERT)	Bit error, bit mismatch 0, bit mismatch 1.
Alarm detection	LOS, link down, pattern loss, frequency.
VLAN stacking	Capability to generate streams with up to two layers of VLAN (including IEEE 802.1ad Q-in-Q tagged VLAN) traffic by VLAN ID or VLAN priority at any of the stacked VLAN layers.
Cable testing	Category 5 cable (or better), 100 Ω UTP/STP cable, ≤120 meters
Service disruption time (SDT) measurement	Includes statistics such as longest, shortest, last, average, count, total and pass/fail thresholds.
IPv6 testing	Includes BERT, RFC 2544, traffic generation and monitoring, background streams, Smart Loopback, remote loopback, ping and traceroute.

ADDITIONAL FEATURES

Optical power measurement	Supports optical power measurement at all times; displayed in dBm.
Remote loopback	Detects other AXS-200/850 and sets them into Smart Loopback mode.
Dual test set	Detects and connects to any of EXFO's datacom testers to perform bidirectional RFC 2544 testing.
Save and load configuration	Ability to store and load test configurations to/from a non-volatile USB memory stick.
Pass/fail analysis	Provides a pass/fail outcome with user-adjustable thresholds for all test results.
IP tools	Capability to perform ping and traceroute functions.
Smart Loopback	Capability to return traffic to the local unit by swapping packet overhead up to layer 4.
Report generation	Ability to generate test reports on the unit or exported via USB.
Event logger	Supports logging of test results with absolute or relative time and date, details and duration of events, color-coded events and pass/fail outcome.
Remote control	Remote control through VNC.

GENERAL SPECIFICATIONS

Size (H x W x D)	284 mm x 125 mm x 82 mm	(11 $^3/_{16}$ in x 4 $^{15}/_{16}$ in x 3 $^1/_4$ in)
Weight (with battery)	1.4 kg	(3 lb)
Temperature		
operating	0 °C to 50 °C	(32 °F to 122 °F)
storage	−40 °C to 60 °C	(−40 °F to 140 °F)
Relative humidity	0 % to 93 %, non-condensing	
Battery life (typical usage)	Up to 4 hours	
Battery charging time	2 hours from full discharge to full charge	
Languages	English, Chinese	

SFP UPGRADES

FTB-8590	SFP modules GigE/FC/2FC at 850 nm, MM, < 500 m
FTB-8591	SFP modules GigE/FC/2FC at 1310 nm, 10 km
FTB-8592	SFP modules GigE/FC/2FC at 1550 nm, 90 km
FTB-85910	SFP modules 100Base-FX, 1340 nm, MM, 2 km
FTB-85911	SFP modules 100Base-LX10, 1310 nm, SM, 15 km

BIDIRECTIONAL SFP UPGRADES

FTB-8596	SFP modules Bidir 1490TX 1310RX 1000BASE-BX10
FTB-8597	SFP modules Bidir 1310TX 1490RX 1000BASE-BX10
FTB-8598	SFP modules Bidir 1310TX 1490/1550RX 1000BASE-BX
FTB-8599	SFP modules Bidir 1550TX 1310RX 1000BASE-BX

ORDERING INFORMATION

AXS-850-XX-XX

Models
AXS-850 = Ethernet 10/100 Base-T electrical
AXS-850-1 = Ethernet 10/100/1000 electrical and GigE optical

Options
00 = Without options
100optical = Enable support for 100M optical interface
GigE = Enable support for 1000Base-T and GigE optical [a]
Cable_test = Cable test
TRAFFIC GEN = Traffic generation and monitoring test
MULTI_STREAM = Multiple streams
IPV6 = Internet protocol version 6

Note
a. Includes GigE electrical and GigE optical; available only with AXS-850-1.

Example: AXS-850-100optical-Cable_test

Complementary Products

AXS-200/855
Multilayer Access Test Set

The AXS-200/855 is the industry's first all-in-one handheld solution for dual DS1/E1, DS3, ISDN PRI and Ethernet testing. This test set provides field technicians with unsurpassed, radically simple multilayer access testing in a lightweight, rugged unit optimized for fast, straightforward testing.

RTU-310
IP Services Test Head

The RTU-310 IP Services Test Head enables carriers to ensure the reliability and performance of their Ethernet-based services. Its wide range of test functionalities provide all the necessary measurement tools for service turn-up, troubleshooting as well as verifying service-level agreements between service providers and their customers.

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