



EtherScope™ Series II

Network Assistant

Frontline IT professionals rely on the EtherScope Series II to complete their daily tasks fast.

- **Measure Ethernet performance** – quantify and document Ethernet performance to establish a baseline, to demonstrate performance after a network upgrade, or to verify an SLA. Measure end-to-end throughput, latency, frame loss, jitter, and bit errors at rates up to 1 Gigabit. Easily interpret test results with pass/fail thresholds.
- **Install wired and wireless LANs** – complete projects on-time with fewer problems by testing as you go, ensuring that each step of the project is correctly installed and configured before moving on to the next step. Test cabling, verify and edit switch and access point configurations, and confirm network connectivity and availability of key services.
- **Validate LAN installations** – as the final step in completing a project, validate LAN performance as proof of a job well done. Together, the Ethernet Performance Tests and the Service Performance Tool make LAN validation quick and easy, while pass/fail thresholds make reports easy for everyone to understand.
- **Troubleshoot LAN and WLAN problems** – a comprehensive set of LAN and WLAN tests help first responders analyze, isolate and solve network problems fast – or at least prove it's not the network. Easy to use and carry, featuring a compact and ruggedized platform, bright color touch screen, intuitive UI and on-board help – the EtherScope is ready to assist when it's time for action.

Power of wired and wireless analysis

To install and troubleshoot today's mixed 802.3 and 802.11 networks, you need a tool capable of analyzing both – like the EtherScope Pro Network Assistant. Don't be satisfied with a partial view of your network. Wired and wireless analysis is essential to get a comprehensive view of your network from both sides of the access point, enabling quick problem resolution.

Complete Ethernet performance testing

Measuring and documenting the end-to-end performance, or perceived speed, of an Ethernet link is critical in several scenarios: to establish a baseline for troubleshooting "the network is slow" issues, as an element of LAN validation by demonstrating that a newly installed LAN is delivering the expected speed, and as a means of verifying service level agreements (SLAs). The Ethernet Performance Tests suite provides the essential RFC2544 tests (throughput, latency, loss, back-to-back) plus advanced tests such as loss rate, jitter and bit errors. Create custom test scripts to automate testing for simplicity and efficiency, to configure tests for the turn-up of specialized services, and to establish test limits for simple pass/fail results analysis. Use two EtherScopes for upstream and downstream testing, or team an EtherScope with a low-cost LinkRunner Pro Reflector for loopback testing.

Verify and measure network services

A click of a start button and a glance at the results screen provides verification that key network services are available and responding appropriately. The Service Performance Tool tests the following server categories: DHCP, DNS, email, FTP, NT file, web and WINS. Apply custom, service-specific pass/fail limits to each for quick and easy results analysis.

Save the test configuration as a script and incorporate service testing into your LAN installation best practices – to verify services during the installation process and, together with Ethernet Performance Tests, as an element of a LAN validation assessment.

Wireless security and policy enforcement

An unauthorized access point can compromise network security. Periodic site audits and EtherScope's automated WLAN device discovery with security scan will uncover rogue APs and policy violations. Use the WLAN locate tool and LAN device discovery to track down the physical location of Wi-Fi devices. Remove these rogues to secure your network.





Gigabit LAN analysis

Verify twisted-pair and fiber optic cabling with tools like TDR, fault location, wiremap, digital toning and optical power loss.

Discover what is on your network and where, with automated device, network and VLAN discovery.

Analyze local traffic to spot suspicious activity by user and protocol.

Troubleshoot frontline network issues with advanced diagnostics for switched environments.

Monitor network health by trending switch port utilization and errors by traffic type.

Interface with 10/100/1000BASE-T and 100/1000BASE-X twisted-pair and fiber optic links.

Click the Details button to drill down into each test. For example, observe Ethernet signaling and negotiation, including 802.3af PoE.

Verify and document network services with on-board tools like the Service Performance Tool with pass/fail assessment.

Test	Status
Connection	IP address 010.248.001.123 ✓
Local Statistics	BW: <1%, peak: 6.7%, avg: 0.2% ✓
Protocol Statistics	Running... ✓
Top Talkers	Running... ✓
VLAN Statistics	3 VLANs detected ✓
Device Discovery	61 devices ✓
Network Discovery	1 IP, 3 NetBIOS ✓
VLAN Discovery	8 VLANs ✓
Nearest Switch	Ext_Summit48 (port 1/50) ✓
Switch Scan	Monitoring nearest switch ✓
Key Devices	All devices responding ✓
Problem Detection	7 detected ✓
Performance Tests	Ready to Run ✗

Manage VLANs by tracking local traffic and identifying VLAN configurations by switch port.

Measure and document Ethernet link performance at rates up to 1 Gigabit.

Pin	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	802.3af PoE
Actual:	2.4V	-0.3V	1.1V	49.9V	49.9V	0.3V	49.9V	49.9V	Power
Advertised:	10/100Mb								

Server Type/Device	Status
Service Performance Tool	Completed Successfully
DHCP Servers (1)	Passed: Tap Results
012.144.232.080	Passed
DNS Servers (1)	Passed: Tap Results
012.144.232.080	Passed
E-mail Servers (1)	Passed: Tap Results
smtp.mail.yahoo.com	Passed
FTP Servers (1)	Passed: Tap Results
012.144.232.080	Passed
NT File Servers (1)	Passed: Tap Results
012.144.232.080	Passed
User-Defined Servers (1)	Passed: Tap Results
012.144.232.080	Passed
WINS Servers (0)	Will not run/report
Web Servers (1)	Passed: Tap Results
http://www.google.com	Passed



802.11 WLAN analysis

Monitor authentication and association processes, including 802.1X, to fix connectivity problems.

Discover who is on your network and where they are located with automated discovery of devices and networks.

Troubleshoot coverage issues by measuring RF environmental metrics like SNR.

Secure your WLAN and enforce policy via periodic site audits and security scan.

Identify and locate unauthorized rogue devices.

Active and passive 802.11a/b/g analysis, plus 802.11n (draft) passive AP discovery and locate.

Capture RF coverage data and compare to previous results to spot changes.

Solve problems that are automatically detected and logged.

Find help with the context sensitive help system.

Edit device configurations with on-board tools like Telnet, FTP, and terminal emulator.

Test	Status
Connection	IP address 173.196.153.087
Channels	Scanning 44 channels...
Utilization	Channel 11b/g - BW: 6%
Top Talkers	Linksy-bdf7da - BW: 5.15%
Device Discovery	64 devices
AP Top Talker	Linksy-bdf7da - BW: 4.66%
Client Top Talker	GemTek-7322d1 - BW: 0.81%
Network Discovery	3 Infra, 1 AdHoc, 1 Bridge, 1 IP
Site Survey	Current Reading
Security Scan	1 Unauthorized devices
Key Devices	All devices responding
Problem Detection	3 detected

Click the details button to drill down into each test. For example, monitor RF signal strength to hunt down a rogue AP.

Device: Linksy-bdf7da

Style: Chart Meter

Range: Auto

Last Value: -62 dBm | Max Value: -62 dBm | Min Value: -82 dBm

Update every: 2 seconds

Last seen: 17:46:06 2008-02-26

SSID: Fnet_11n

MAC: 001d7ebdf7da

- Ping
- Trace Route
- Web Browser
- Telnet
- SSH Telnet
- Terminal
- FTP
- TFTP
- Wireless Throughput
- Report



EtherScope Series II Network Assistant Specifications

General specifications	
Weight, with battery	0.86 kg (1.9 lb)
Dimensions	19.1 x 15.2 x 4.4 cm (7.5 x 6.0 x 1.75 in)
Display	LCD touch screen, 640 x 480 pixels, TFT (active) color panel, touch pad
LED indicators	6 (including power LED)
Carrying case	Rugged carrying case with two removable pockets, camcorder strap and adjustable strand hook
Power	
Battery	Lithium Ion 7.2V DC (nominal), 4.2Ah, removable/rechargeable
Battery life	4 hour typical, 10 hour in standby mode
External AC adapter/battery charger	AC input: 90 to 264 V ac, 48 to 62 Hz; 1.5 A DC output: 15 V dc, 1.2 A (isolated output)
Auto charger	12V "cigarette lighter" charger with (1.8 m) 6 foot fully extended coiled cord and LED power indication
Ports	
Communication and accessory ports	1 USB, 1 PCMCIA/Cardbus (PC Card type II), 1 SFP cage, 1 CompactFlash (Card Type I/II), 1 DB-9 serial, headphone jack, microphone jack, Kensington lock receptacle
RJ-45/Copper port	RJ-45 10/100/1000BASE-T Ethernet
Fiber port	Small Form-factor Pluggable (SFP) in accordance with MSA
Supported SFP modules	1000BASE- LX, SX, ZX, BX, 100BASEFX
SFP connector	Duplex LC
Environmental and safety	
Operating temperature	0° to +50°C (32° to 122°F) with up to 95% relative humidity
Battery charging temperature	10° to +40°C (50° to 104°F) with up to 95% relative humidity
Storage temperature	-20° to +60°C (-4° to 140°F)
Shock and vibration	Meets requirements of MIL-PRF-28800F for Class 3 equipment
Safety	CSA Canada and United States, CE, FCC Part 15 Class A, C-TICK N10140; UL and CSA approvals for universal AC adapter. EMC Complies with EN61326, Class A, Criteria C
Fiber optic power measurements	
Receive input power Transmit output power Temperature Voltage TX bias current	Real-time access to digital diagnostic monitoring of SFP operating parameters in accordance with the SFP Multi Source Agreement (MSA) and SFF-8472

Copper media	
Cable types	Unshielded twisted pair LAN cables (100 and 120 Ohm UTP) Foil-screened twisted pair LAN cables (100 and 120 Ohm SFTP)
Cable length	1 to 305 m (3 to 1000 ft), accuracy dependent upon the cable type selected
Length resolution	± [5% of reading + 1 m (3 ft)], with open, shorted, with wire map adapter, or terminated with reflection ≥ 20%
Receive level	100 to 5000 mVp-p
Datalink signal	500 to 4000 mVp-p
Measuring terminated cables	The Cable Verification feature tests the individual twisted-pairs of a cable that are terminated into most equipment vendor's Ethernet ports such as on a hub, switch or NIC. All cable tests other than WireView wire map and office locator ID are operational in the presence of datalink signal
Wiremapper/office locator compatibility	Detects combinations of shorts, opens, and connector miswires. Compatible with Fluke Networks WireView wire map adapter/ office locator
Fault tolerance	The RJ-45 Ethernet connection on the analyzer is designed to withstand a maximum of 100 volts
Performance tests	
Compatible remote devices	EtherScope, MetroScope, LinkReflector, hardware loopback
RFC-2544 compliant tests	Throughput, latency, frame loss, back-to-back
Additional performance tests	Loss Rate, Jitter, FrameBERT
Frame content	All 0s, all 1s, alternating 1s and 0s, Pseudo Random Bit Sequence (PRBS), Incrementing Byte
Frame size	64, 128, 256, 512, 1024, 1280, 1518, RFC-2544 sweep, Jumbo sweep, or user-defined including baby jumbo sizes up to 2024
Application port	User defined
Rate (bps)	Up to 1000 M
802.1Q settings	VLAN Id, priority
IP TOS settings	IP Precedence/TOS parameter, DiffServe Code Point
Throughput settings	Duration, maximum rate, measurement accuracy, pass/fail limits
Latency settings	Duration, rate, iterations, pass/fail limits
Frame loss settings	Duration, rate, step size, pass/fail limits
Back to back settings	Min and Max duration, rate, iterations, pass/fail limits
Loss Rate	Duration, rate, pass/fail limits
Jitter settings	Duration, rate, pass/fail limits
FrameBERT settings	Duration, rate, pass/fail limits



Specifications (continued)

Server response tool	
TCP port response	DNS name, IP address, port name, port number, port response time
TCP trace route	Hop count, router name, IP address, average RTT and percentage of total RTT
Internetwork throughput option	
Compatible remote device	EtherScope, MetroScope, LinkReflector, OptiView v3 Integrated Network Analyzer, OneTouch Series II
Frame content	All 0s, all 1s, alternating 1s and 0s, Pseudo Random Bit Sequence (PRBS)
Frame size	64, 128, 256, 512, 1024, 1280, 1518, sweep of all sizes
Rate (bps)	12336 to 1000 M
Duration(s)	1 to 64,800 (18 hr)
Results	Frames sent, received, rate and percent loss for both upstream and downstream directions
Results format	Tabular, graphical, xml-based report
Traffic generator	
Traffic type	Broadcast, multicast or unicast, FCS errors
Frame type	Benign Ethernet, Benign LLC, NetBEUI, Benign IP, IP/ICMP Echo, IP/UDP Echo, IP/UDP Discard, IP/UDP Chargen, IP/UDP NFS, IP/UDP NetBIOS
Frame size	48, 64, 128, 256, 512, 1024, 1280, 1518, 2024, user defined
Rate	Utilization (%): >0 – 100, Frames/second: 1 – 1488095
Duration	Seconds: 1 – continuous, Frames: 1 – continuous
LinkReflector specifications	
Weight	10 oz (311 grams) with batteries installed
Dimensions	5.3" h x 3.1" w x 1.3" d (13.46 cm x 7.87 cm x 3.30 cm)
Operating temperature	10° to +40°C (50° to 104°F) with up to 95% relative humidity
Media access	10BASE-T, 100BASE-TX, 1000BASE-T (IEEE 802.3), and PoE (IEEE 802.3af)
Operating modes	Packet filter: none, non-broadcast, MAC, Fluke, MAC and Fluke Packet address swap: none, source/destination MAC, MAC and source/destination IP
Address setting	Manual or DHCP

LinkReflector troubleshooting mode	
Cable tests	Pair lengths, opens, shorts, splits, crossed, straight through, and cable ID
Tone generator	IntelliTone digital tone: [500 kHz]; analog tones: [400Hz, 1kHz]
Ping	Automatically pings default router and DNS server; can be configured to ping up to 10 additional devices
802.1x	Discovers and gains authentication to 802.1x networks
PoE Detection	Detects and identifies PoE type
Port Verification	Displays make, model, address, slot, and port of the nearest LLDP device
User Interface (UI)	Display: black and white, 2 x 1 in display, link LED; control: five push-buttons for selection of icons and navigation of menus; power: on/off button
Ports	Test ports: RJ45 ports (2): network test port, loop-back wire map port; Application port: mini-USB, Kensington lock receptacle
Power Source	4 AA batteries or optional Li-ion Battery Pack with AC Charger



ES2-PRO-SX/I contents



Specifications (continued)

Service Performance Tool	
Category of devices tested	DHCP Servers, DNS Servers, E-mail Servers (SMTP, POP3), FTP Servers, NT File Servers, Web Servers, WINS Servers, User-Defined Servers
Test controls	Iterations, interval
Add device by	IP address or host name (except Web Server where URL added)
DHCP Server pass/fail criteria	Ping response time, server response time
DHCP Server BOOTP parameters (optional)	Subnet mask, domain server, WINS server, NetBIOS scope, POP3 server, router/default gateway, client DNS domain, NetBIOS node type, SMTP server, web server
DNS Server pass/fail criteria	Ping response time, server response time
E-mail Server pass/fail criteria	Ping response time, SMTP SYN/ACK response time, SMTP response time, POP3 SYN/ACK response time, POP3 response time
E-mail Server operation modes	Connect only, log in only, send/receive
FTP Server pass/fail criteria	Ping response time, SYN/ACK response time, connect time, disconnect time, delete file time, write rate, read rate
FTP Server operation modes	Server response, read, write/read/delete
NT File Server pass/fail criteria	Ping response time, SYN/ACK response time, connect time, disconnect time, delete file time, write rate, read rate
NT File Server operation modes	Server response, read, write/read/delete
Web Servers pass/fail criteria	Web Server name lookup time, ping response time, SYN/ACK response time, first reply time, receive time, receive rate
WINS Servers pass/fail criteria	Ping response time, server response time
User-Defined Servers pass/fail criteria	Ping response time, SYN/ACK response time
Results format	Tabular, graphical, xml-based report
Instrument Settings	
TCP/IP	DHCP, static
802.1Q	LAN: VLAN ID, priority
IP Type Of Service (TOS)	LAN: IP precedence, DSCP
Security	LAN: 802.1X WLAN: 802.1X, WEP, WPA PSK, 802.11i PSK, WPA, WPA2
802.1X EAP type	TLS, GTC, MD5, MSCHAPV5, PEAP GTC, PEAP MD5, PEAP MS-CHAP-V2, PEAP TLS, TTLS PAP, TTLS CHAP, TTLS MSCHAP, TTLS MSCHAP-V2, TTLS EAP-MD5, TTLS EAP-GTC, TTLS-EAP-MSCHAP-V2, TTLS EAP-TLS, EAP FAST

Instrument Settings (continued)	
Active tests	LAN: User defined tests to appear on home page
SNMP	LAN: v1, v2, v3 (with SHA and MD5 authentication, DES encryption)
Ethernet	LAN: Auto-negotiation, force setting, MAC address
Group names	WLAN: assign alias to one or more devices
Tools	
LAN	Ping, trace route, trace switch route, traffic generator, web browser, telnet, SSH telnet, terminal, FTP, TFTP, xDP port reporter (CDP, LLDP), report
WLAN	Ping, trace route, web browser, telnet, SSH telnet, terminal, FTP, TFTP, wireless throughput, report
Wireless LAN Adapter Card	
Specification compliance	IEEE 802.11a, 11b, 11g
Certifications	FCC part 15, Telec, CTICK, ETSI, EN301893, EN60950
Interoperability	WECA Compliant
Interface	32-bit Cardbus
Outdoor operating range	Up to 515 m (1690 ft)
Indoor operating range	Up to 85 m (279 ft)
Data rate	802.11a: up to 54 Mbps, 802.11b: up to 11 Mbps, 802.11g: up to 54 Mbps
Output power	18 dBm peak power
Infrastructure mode	BSS
External antenna connector jack	Hirose MS-147
Wireless LAN Directional Antenna	
Frequency range	2.4 – 2.5 and 4.9 – 5.9 GHz
Minimum gain	5.0 dBi in the 2.4 GHz band and 7.0 dBi in the 5 GHz band
External antenna connector plug	Hirose MS-147



Ordering Information

Model	LAN analysis option	WLAN analysis option	Fiber interface option	RFC2544/IT0 option	LinkRunner Pro Reflector kit	Contents
ES2-LAN*	•					LAN analyzer Series II mainframe, rechargeable Li-Ion battery pack (installed), protective boot, carrying strap, AC adapter/battery charger, remote wire map (WireView #1), CompactFlash® card, patch cable, RJ-45 adapter, Getting Started Guide, resource CD, carrying case
ES2-LAN-SX	•		•			LAN analyzer, SX Fiber Above plus 1000BASE-SX SFP
ES2-LAN-SX/I	•		•	•		LAN analyzer, SX Fiber, RFC2544/IT0 Above plus Performance Tests**, Traffic Generator, Service Performance Tool and Server Response Tool
ES2-LAN-SX/I-KIT	•		•	•	•	LAN analyzer, SX Fiber, RFC2544/IT0, LRPRO-R Above plus LinkRunner Pro with Reflector option enabled, LinkRunner Pro Li-Ion battery pack, LinkRunner Pro carrying case
ES2-WLAN		•				WLAN analyzer Series II mainframe, rechargeable Li-Ion battery pack (installed), protective boot, carrying strap, AC adapter/battery charger, remote wire map (WireView #1), CompactFlash® card, patch cable, RJ-45 adapter, 802.11a/b/g Cardbus adapter, external directional antenna, Getting Started Guide, resource CD, carrying case
ES2-PRO*	•	•				WLAN and LAN analyzer Above (adds LAN analysis)
ES2-PRO-SX/I	•	•	•	•		WLAN and LAN analyzer, SX Fiber, RFC2544/IT0 Above plus 1000BASE-SX SFP and Performance Tests**, Traffic Generator, Service Performance Tool and Server Response Tool
ES2-PRO-SX/I-KIT	•	•	•	•	•	WLAN and LAN analyzer, SX Fiber, RFC2544/IT0, LRPRO-R Above plus LinkRunner Pro with Reflector option enabled, LinkRunner Pro Li-Ion battery pack, LinkRunner Pro carrying case
ES2-PRO-SXLX-I/S	•	•	•	•		WLAN and LAN analyzer, SX and LX Fiber, RFC2544/IT0, accessories kit ES2-PRO-SX/I plus 1000BASE-LX SFP, spare battery, external battery charger and AC adapter, USB mini keyboard, WireView #2 - #6, large carrying case

* This model not available in all geographies; contact your local Fluke Networks office for information.

** Performance tests are end-to-end and require a compatible remote device.

NETWORK SUPERVISION

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Fluke Networks operates in more than 50 countries worldwide. To find your local office contact details, go to www.flukenetworks.com/contact.

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Options & Accessories

Model	Option
ES-WLAN-OPT	802.11a/b/g WLAN upgrade option for all LAN-only models, enables WLAN option and includes 802.11a/b/g adapter and external directional antenna
ES-LAN-OPT	10/100/1000 LAN upgrade option for WLAN-only model, enables LAN option
ES2-SX-OPT	100/1000 Fiber upgrade option for all Series II LAN-enabled models, enables Fiber option and includes 1000BASE-SX SFP
ES-ITO-OPT	RFC2544/IT0 upgrade option for all LAN-enabled models, enables RFC2544/IT0 option and adds Service Performance Tool and Server Response Tool
Model	Support
GLD-ES	Gold support, covers any mainframe, 1 year
Model	Accessory
ES-ACCY-KIT	Spare EtherScope battery, external battery charger and AC adapter, USB mini keyboard, WireView #2 - #6, large carrying case
FNET-EXTANT-KIT	802.11a/b/g Cardbus adapter, external directional antenna (for WLAN enabled models)
FNET-EXTANT	External directional antenna (for WLAN enabled models)
FNET-WCARD	802.11a/b/g Cardbus adapter (for WLAN enabled models)
ES-SWUGD-V4	Software upgrade to version 4
ES-BATTERY	Li-Ion battery
ES-BATT-CHG	External battery charger and AC adapter
WIREVIEW 2-6	Remote identifiers 2 - 6
MS-100FX	100BASE-FX optical transceiver module, SFP, 1310nm FP laser
MS-SX	1000BASE-SX optical transceiver module, SFP, 850nm VCSEL
MS-LX	1000BASE-LX optical transceiver module, SFP, 1310nm FP laser
ES2-ZX	1000BASE-ZX optical transceiver module, SFP, 1550nm DFB laser
DSP-FTK	Fiber optic test kit with 850/1300nm LED source and 850/1300/1550nm optical power meter
MS-AUTO-CHG	Auto lighter charger
OPVS2-KB	Mini USB keyboard
DTX-ACUN	AC charger, universal
CIQ-RJA	RJ45/11 modular adapter
MT-8200-63A	IntelliTone 200 probe
LRPRO-REFLCT	LinkRunner Pro with Reflector Option
LRPRO-REFLCT-OPT	Reflector Option for LinkRunner Pro