



## MetroScope™ Service Provider Assistant Software Version 2

Fluke Networks' MetroScope Service Provider Assistant now offers expanded testing capabilities for carriers and MSO's with the release of Version 2 software. Key capabilities of this software include:

**ProVision™ Test Suite** – The first test designed to be compatible with Carrier Ethernet SLA's and MEF specifications. Four to twenty times (or more) faster than RFC 2544 testing, with more relevant results, asymmetric testing, multiple streams, and trending all with easy-to-read results.

**VLAN Q-in-Q Support and Testing** – Configure customer and service provider VLAN settings, and test priority preservation.

**Multicast/IPTV Testing** – Join multicast groups and measure performance.

**802.3ah Support** – Detect and control compliant devices for loopback testing.

**Server Performance Testing** – Validate performance of DHCP, DNS, e-mail, file, WINS, web, and other servers.

**Enhanced Remote Operation** – Faster operation and control via a second Ethernet port.

**Enhanced Traffic Generation** – Generate background traffic, new traffic patterns.

**VoIP Test Option** – Make phone calls, test call managers and measure call quality.

**Wireless Test Option** – Tests 802.11a/b/g Ethernet. Detects devices and access points, monitors usage and tests performance.



### ProVision™ Test Suite

ProVision testing is the first test designed to be compatible with Carrier Ethernet SLA's and MEF specifications. Like RFC 2544, it measures the critical parameters of throughput, loss, delay, and jitter. But it goes beyond this to offer easier set-up and operation, more complete testing, easy-to-understand results, and powerful troubleshooting.

### One test for easier set up and faster results

ProVision testing performs the critical measurements of throughput, loss, delay and jitter in a single process. This means that it can run at least four times as fast as an RFC 2544 test. Since all parameters are measured together, you can be sure that you didn't miss degradation in one parameter while measuring another.

A single test also means simplified test set-up.



### Faster, more relevant throughput testing

ProVison testing measures loss and throughput together, similar to most SLA's and MEF specifications. This is significantly different than RFC 2544 tests which measure throughput using a "lossless" approach, which tests at lower and lower rates until no frames are lost. While appropriate for bench testing a switch, this approach is ill-suited to a real-world circuit where a small amount of loss is tolerable. For example, a "lossless" test on a 100Mbps link with 0.01% loss will result in a throughput measurement of less than 2.5Mbps – certainly not the result the carrier or the customer expects.

In this example, ProVison would provide a more appropriate result of 99.99Mbps and 0.01% loss. And since ProVison test doesn't keep trying to find the "lossless" rate, it would provide the result at least five times faster than RFC 2544.

### Test asymmetric links

According to RFC2544, "test series should be run with the same data rate being offered from each direction". This is inappropriate for technologies where there are different rates for upstream and downstream. ProVison testing lets you set separate throughput test rates for upstream and downstream testing. This lets you test the performance of links based, for example, on DSL technologies.

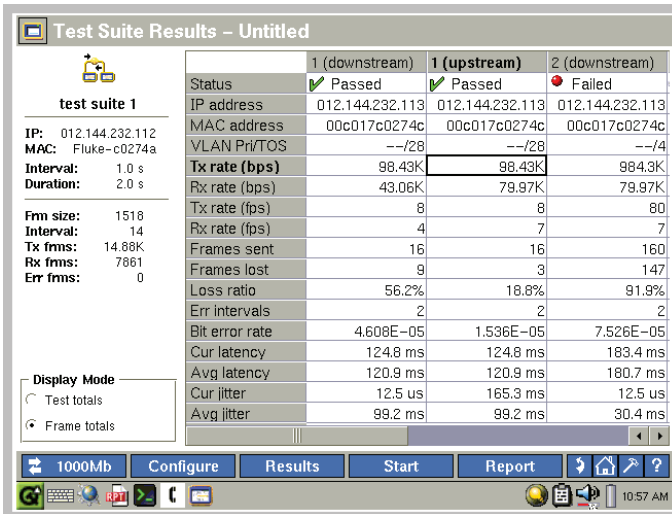


Figure 1: ProVison test displays all results for up to eight streams in one display.

### Faster discovery, easier testing

The MetroScope tester now discovers remote devices including the low cost LinkRunner™ Reflector quickly, saving time in setting up tests.

### MultiStream testing

ProVison testing lets you configure multiple streams to test data flows to different sites, different VLANs and different classes of service in parallel. A total of eight streams may be measured simultaneously using from one to four MetroScope devices or four streams using from one to four reflectors. Individual limits on throughput, loss, delay, and jitter may be set for each stream. This not only allows for testing complex SLA's and circuits, but also reduces test time.

### One results display

The MetroScope tester's full VGA display shows the set up and all four measurements for up to three streams on one screen. More than three streams can be compared by using a simple scroll bar on the bottom of the display. And with color coding of pass/fail results, you can see at-a-glance which tests are passing and which are failing. No more scrolling through screen after screen to examine results.

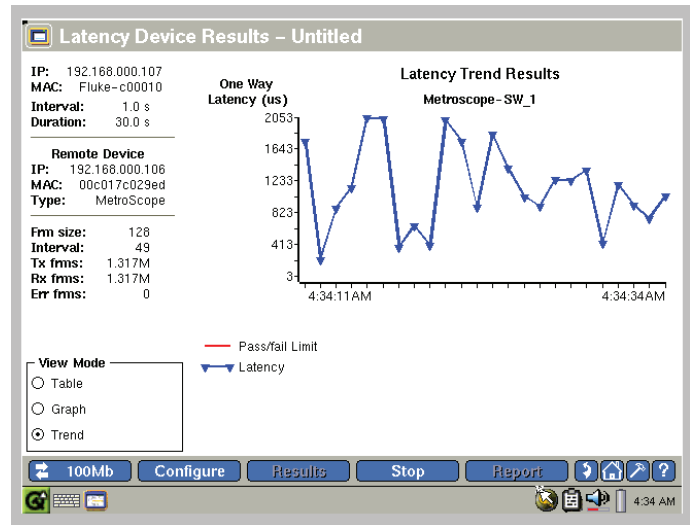


Figure 2: Trend results for up to 24 hours with full data export

### Trending up to 24 hours

ProVison testing can also solve problems by measuring performance of throughput, loss, delay, and jitter over time. This allows you to see not only if the circuit performance degraded, but how much and when. Compare results between parameters, VLANs, priorities and different sites. Loss results also display a bit-error-rate as well as errored-intervals and severely-errored-intervals to help quickly determine the scope of the problem.



## VLAN Q-in-Q and Priority Preservation Testing

The MetroScope version 2 software supports testing of VLANs, Q-in-Q applications and priority (ToS or DSCP). You get complete flexibility in configuring service provider (S-VLAN) and customer (C-VLAN) settings. Set priority using ToS or DSCP for the overall instruments or for each stream in the Provision tests. Ensure that VLAN and priority settings are preserved by providing immediate visual indicators if received QoS values are different from those set in the transmit stream. Both ProVision testing and RFC 2544 tests support this priority preservation testing mode.

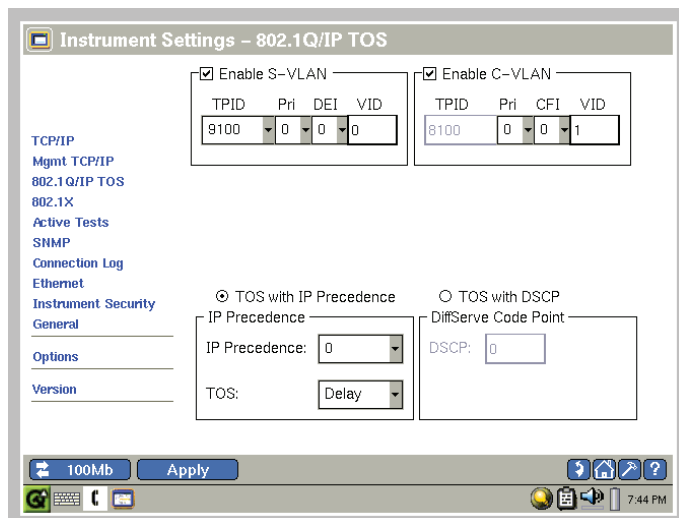


Figure 3: Flexible VLAN and Q-in-Q Settings

When monitoring network traffic, a MetroScope tester automatically provides an indication if Q-in-Q frames are detected and displays S-VLAN and C-VLAN identifiers as well as counting the number of such frames and the last time they were received.

## Enhanced Remote Operation

Now you can control your MetroScope tester through a second independent connection using the USB NIC card. This card may be set up with a static address or using DHCP. Test results will not be impacted by remote control traffic or vice-versa. You can troubleshoot links remotely even when they are inoperable. Additional MetroScope version 2 software enhancements allow the remote user interface to update up to four times faster than in previous versions, making remote operation even easier.

## Validate LAN Services

The Service Performance Tool verifies the existence and measures the responsiveness of key network services. Select from among six network services: DHCP, DNS, e-mail, file, WINS and web or provision a "User Defined" service with a specific TCP port. Add pass/fail thresholds for each service. Pass/fail assessment makes it easy for everyone to interpret the test results. Save the test configuration as a script for future testing or to share with team members. Configure the test and then click the start button to launch an automated series of service performance tests. View the results in tabular and graphical formats. Save the results for documentation and as an element of a LAN validation report.

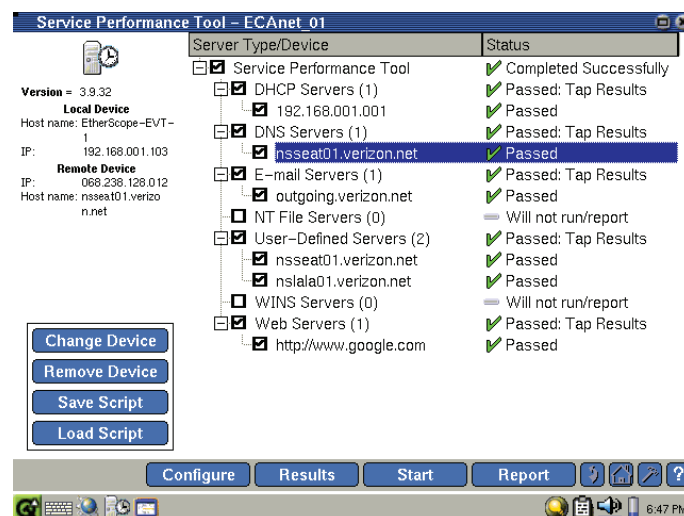


Figure 4: Verify and Measure Performance of Servers and Services

## Enhanced Traffic Generation

Traffic Generation may now be run "background" mode while making other measurements, letting you test how various traffic levels and types affect performance. Control Q-in-Q settings for generated traffic. Generate unicast, broadcast, or multicast traffic. Stress network devices with CRC errors and new frame content patterns including HFPAT, MFPAT and LFPAT for stressing network equipment. Any frame size from 48 to 2024 bytes may be selected.

## IPTV Testing

The MetroScope tester supports IP Video testing with the ability to enable IP Video streams using both RTSP for Video on Demand or IGMP for broadcast video. The IPTV client application lets you join multicast groups or send RTSP requests and measures the stream latency (zap time). Additionally MetroScope can generate traffic such as multicast IP/UDP packet types with addresses from 224.0.0.0-239.255.255.255 at frame sizes up to 2024 bytes.

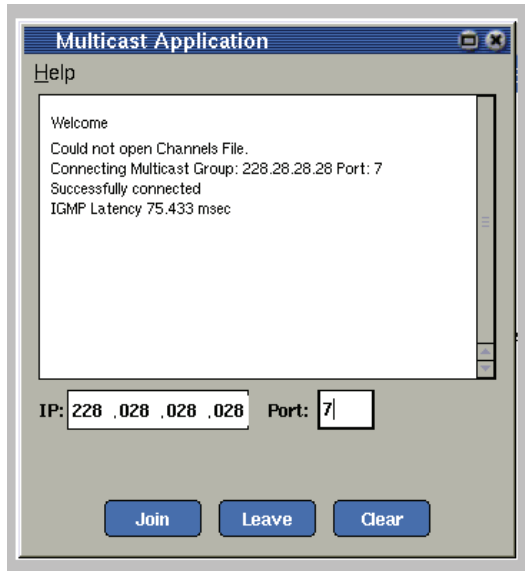


Figure 5: Multicast control application

## VoIP Testing Option

A MetroScope tester's SIP phone allows you to make calls, and measure key performance parameters. Make live calls to any SIP phone or play back .WAV files continuously. MetroScope is fully configurable, including call manager, NAT, and RTP settings. You can also set up the MetroScope to automatically answer incoming calls and play a calibrated WAV test file instead of making an active person to person call.

Call performance is measured in real time, including MOS, R-Factor, jitter, and dropped frames. Results can be trended on the display for the duration of the call. RTCP performance metrics are collected for monitoring upstream call quality. Performance reports can be generated at the touch of a button. You can even stress the network by running the traffic generator while making calls.

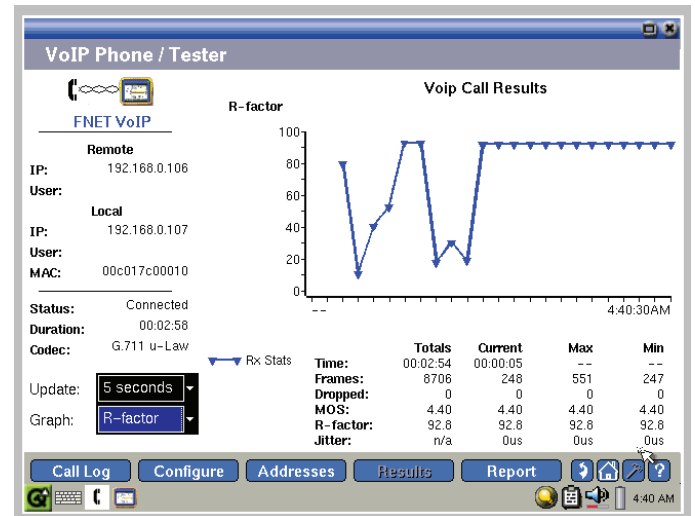


Figure 6: Make SIP calls and measure performance

## 802.3ah Support

Devices that support the 802.3ah protocol can be used as loopbacks for layer 1 testing with a MetroScope tester. This allows you to test Ethernet links using ProVision testing, RFC 2544 or the traffic generator without connecting an additional device such as a second MetroScope unit or LinkRunner Reflector to the far end of the link. The MetroScope tester acts as the Active OAM client performing remote device discovery, determining their capabilities, and sustaining an OAM session with just a few screen touches. The MetroScope tester keeps the link with the remote device during a Loopback session until the "Loop Down" command is sent and the client session is "Stopped".

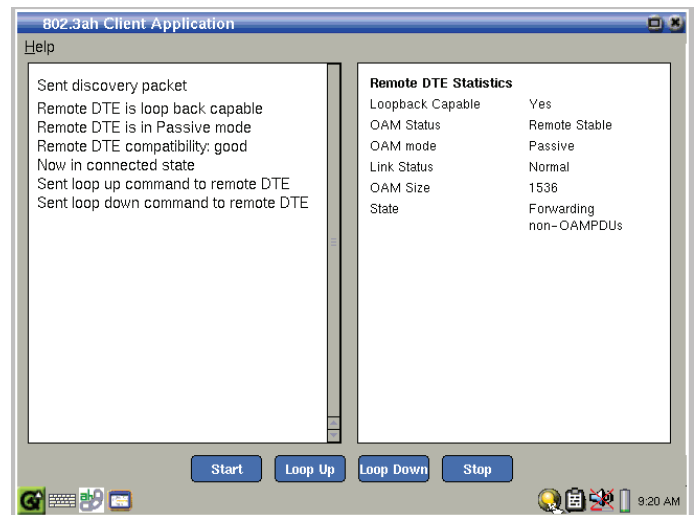


Figure 7: 802.3ah Control Application

## Wireless (802.11a/b/g) Option

### Measure RF signals

Continuously scans 2.4GHz and 5GHz frequencies providing visibility into wireless LAN coverage and performance. Choose the measurement you wish to view using drop down menus that include signal strength, signal to noise ratio, utilization, and several other useful measurements.

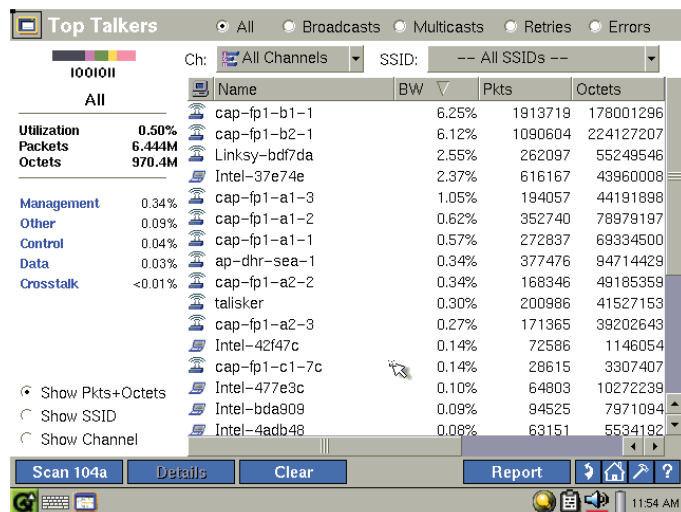


Figure 8: Details on each channel

### Discover wireless LANs

Identifies all wireless network access points and discovers all associated clients. Visibility into wireless network utilization helps you make better decisions about access point placement and expansion to support actual usage patterns.

### Identify top AP/clients

Identify the busiest access points and the most demanding wireless clients. Drill-in to view wireless LAN metrics such as FCS errors, crosstalk, and retries. Identify suspicious activity, then identify the source and solve the problem.

### WLAN rogue hunting

Use the wireless "Security Scan" feature to identify rogue APs and "Locate" to hunt them down. MetroScope utilizes an external, directional antenna to speed location of targeted 802.11 devices by 75% compared to a standard omni-directional antenna. Rotate the antenna 360° and note the direction of strongest signal strength on the graphical display. Follow the strongest signal strength path to locate the target device. Direct the antenna upwards and downwards to locate APs in ceilings and on floors above and below – extremely helpful in a multi-floor environment.

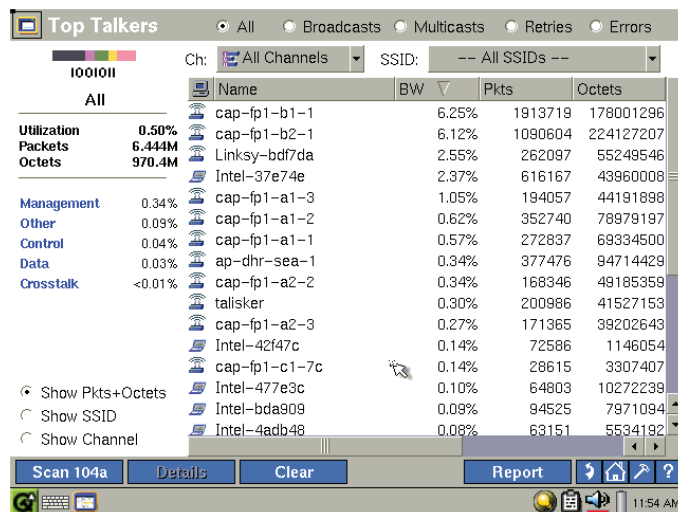


Figure 9: Display statistics for all access points and clients

The handheld MetroScope tester is an ideal portable platform for rogue hunting. It is compact, lightweight and engineered for durability. Easily see changes in wireless signal strength on the bright, color touch-screen display.

### Survey RF sites

Use Wireless MetroScope tester to capture baseline RF coverage data immediately after the wireless infrastructure is installed, and then compare historical data to periodic survey data over time. Use this information to make minor adjustments to wireless access point transmit power, relocate access points, or add new access points before RF environmental changes impact your user community.



## Supplemental (v2) specifications

ProVision™ Tests	
<b>Compatible remote devices</b>	MetroScope, LinkReflector, EtherScope, Physical Loopback, 802.3ah Devices
<b>Test Configuration</b>	Each test may be made up of an unlimited number of suites which run sequentially. Each suite may measure a maximum of eight streams total (including upstream and downstream) from one to four MetroScope units or a maximum of four streams (round trip) from one to four reflectors
<b>Test Duration</b>	Each suite can run for any length of time from 1s to 24h. Suites may be run sequentially for virtually unlimited test lengths
<b>Tests</b>	Throughput, Latency, Jitter, Loss/BERT, measured in parallel
<b>Frame Content</b>	All 0s, all 1s, alternating 1s and 0s, Pseudo Random Bit Sequence (PRBS), Incrementing Byte, HFPAT, LFPAT, MFPAT, LCRPAT, SCRPAT
<b>TCP port</b>	User defined, per stream
<b>Frame size</b>	48 to 2024, RFC-2544 sweep, Jumbo sweep
<b>Rate (bps)</b>	Up to 1000 MBps (selectable per stream)
<b>802.1Q settings</b>	VLAN Id, QoS with CoS and ToS, QinQ VLAN Id, priority for each individual stream or all streams. Programmable TPID, DEI, CFI and VID for all streams
<b>IP TOS settings</b>	IP Precedence/TOS parameter, DiffServe Code Point
<b>Pass/Fail Limits</b>	Throughput (separate upstream and downstream), Latency, Jitter, Loss/BERT
<b>Summary Display</b>	Summary matrix of all streams and all measurements; IP/Mac addresses, VLAN Priority/TOS, status, Tx and Rx rates in bps and fps, frames sent and lost, loss ratio, errored intervals; current, average, maximum latency and jitter
<b>Detailed Display</b>	Individual measurements may be shown in tabular (by frame size), graphical (by frame size) or trending (by current interval or total test duration for all frame sizes)
<b>Frame Loss Statistics</b>	Total, current, and maximum for: frames sent and lost, loss ratio, BER, errored intervals, severely errored intervals
<b>Data Export</b>	Throughput, Frames Sent/Received, Loss, Delay and Jitter test results for each stream are time – stamped and saved to the CF card once per measurement interval for the duration of the test

Traffic Generator	
<b>Traffic type</b>	Broadcast, multicast or unicast
<b>Frame type</b>	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
<b>Frame size</b>	48-2024 bytes
<b>Rate (bps)</b>	Utilization: 0.1-100%, Frames/second 1-1488095
<b>Duration</b>	Seconds: 1 – continuous, Frames: 1 – continuous
<b>FCS Error</b>	Generates any frame setting with an FCS error
<b>Background mode</b>	May be run concurrent with all other MetroScope tests excluding ProVision and RFC 2544 tests
802.3ah Client	
<b>Functions</b>	Remote device discovery, loop-up with 1s keep-alive, loop down. May be run in background while other MS functions are active
<b>Display</b>	Loopback capability of remote, OAM status, OAM mode link status, maximum OAM size, remote state
IPTV Client	
<b>Configuration</b>	Multicast Group IP, Port Number, join, leave, RTSP URL, setup, play, pause, teardown
<b>Results</b>	IGMP Latency, Total Packets Sent, Connected Time, Received Packet Rate, MDI Delay Factor and Media Loss Rate



Server Performance Test	
Category of devices tested	DHCP Servers, DNS Servers, E-mail Servers (SMTP, POP3), 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
NT File Server pass/fail criteria	Ping response time, SYN/ACK response time, connect time
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
VoIP Phone Option	
Calling Modes	SIP Call Manager, Direct IP Address
Address Book	Stores complete settings for up to 99 destinations
WAV File Output	Play 1-30 times or continuous
Settings	Call Manager Registration (Username, Password, Registrar, Proxy); NAT (Server); RTP (Codec and Port); Answer Control (Auto, Wave File, Do Not Disturb);
Call Log	ASCII log of all major call events
Measured Results	Total, current, maximum and minimum for: Frames Received and Dropped, MOS, R-Factor, Latency
Trend Graphs	MOS, R-Factor, Latency Graph with user-selectable update interval of 5s, 10s, 1 min, 10 min, 1 hour

Wireless LAN Adapter Option	
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

**NETWORK SUPERVISION**

Fluke Networks  
P.O. Box 777, Everett, WA USA 98206-0777

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

©2008 Fluke Corporation. All rights reserved.  
Printed in U.S.A. 9/2008 3382217 D-ENG-N Rev A