

Agilent N2620A FrameScope™ Pro

Handheld Triple Play Service Quality Test
and Gigabit Ethernet Troubleshooting

Technical Data, Software Release 7.0

Triple Play Testing with the FrameScope Pro

Agilent's FrameScope Pro is a handheld service deployment and troubleshooting tool. With the FrameScope Pro, technicians deploying Ethernet based services have a fast, efficient and very cost effective test solution to locate network issues and bottlenecks at any line rate up to 1 Gbit/s.

Data, voice and video service quality tests are available through a few taps on the FrameScope Pro's color touch screen. Agilent's unique Autotest measures the performance of network resources and services using the same operations that an end user would execute. User-centric service quality metrics, like MOS for VoIP telephony, help service technicians resolving troubleshooting tickets faster.

Pre-defined performance tests and online manuals make the FrameScope Pro very easy to use. Expert users can assist technicians in difficult cases through remote control and web based access to test results. Centrally defined, custom test suites can be distributed via ftp download to the entire service staff.



Features and Benefits

- Supports 802.3ab and 802.3z-compliant 10/100/1000BASE-T copper and 1000BASE-SX/-LX Gigabit fiber SFP interfaces.
- RFC 2544 performance benchmarking verifies throughput at full line rate on both copper and fiber Ethernet interfaces at speeds up to 1 Gbit/s.
- VoIP, IPTV and DSL testing for efficient deployment and troubleshooting of triple play services.
- Autotest application performance testing allows for quick isolation of protocol, configuration and resource performance problems.
- Automatic Network Discovery simplifies use and documents network resources and stations
- Remote control via any web browser allows troubleshooting, monitoring, and reporting from central office, eliminating costly dispatches
- Full-screen, color LCD displays clear and complete results
- Touch-screen interface and online manuals enhance ease of use.



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RFC 2544 Performance Benchmark Testing

The FrameScope Pro is a powerful Ethernet deployment tool capable of throughput, latency, back-to-back frames and frame loss rate measurements for SLA verification and performance testing. It uses a standardized point-to-point testing method defined by RFC 2544. The test results can be stored on the CompactFlash™ card or viewed and printed via the remote interface.

Automatic Network Discovery

Once connected, the FrameScope Pro automatically surveys the network and displays all devices in a switched network, giving support staff instant visibility into the IP and IPX devices on different subnets, along with their MAC addresses, network addresses, and names. Using the Network database populated by the network discovery function, rogue stations and unauthorized services can be found and identified.

Automated and Simplified Network Service Testing and Pre-Qualification

FrameScope Pro Autotest uses an innovative technique to objectively measure and benchmark the performance of network application servers, and produces detailed reports on the performance metrics. This unique feature is useful for both troubleshooting and network pre-qualification.

Quickly Diagnose and Troubleshoot Network Problems

FrameScope Pro contains a complete arsenal for troubleshooting tools from Ping and Trace Route to traffic generation, packet error rate testing (PERT) up to 24 hours, and statistical analysis of the traffic breakdown. With just a few clicks, FrameScope Pro allows you to identify 10/100/1000 Mbit/s Ethernet utilization, broadcasts, pause frames, collisions, and errors, or pinpoint incorrectly assigned subnet masks, misconfigured servers, and duplicate IP addresses.

Voice over IP Service Quality Testing

The FrameScope Pro is capable to measure the service quality of SIP (RFC 3261) and H.248 (RFC 3525) based VoIP services from end to end. After registering with the SIP server the FrameScope Pro places a call to another FrameScope or to a SIP phone. Once a connection could be successfully established, either pre-recorded wav files, or live audio is exchanged. Based on the RTP/RTCP packet statistics, Mean Opinion Score (MOS) and R-factor, according to ITU-T G.107, are measured to provide user-centric performance metrics.

In networks where no SIP server is present, two FrameScope Pro can establish a connection using the peer-to-peer protocol. This function is particularly useful to validate the VoIP readiness of a data network.

In Megaco/ H.248 controlled networks, FrameScope Pro can simulate a merged Media Gateway (MG) and an IP phone, place a VoIP call via Media Gateway Controller (MGC). Once a connection was successfully established, either pre-recorded audio files, or live audio is exchanged. Based on RTP/RTCP packet statistics, Mean Opinion Score (MOS) and R-factor, according to ITU-T G.107 are measured to provide user-centric performance metrics.

With the optional Auxiliary port, VoIP measurements in the presence of increased background traffic can be performed.

IPTV Service Quality Testing

The FrameScope Pro supports two test modes: in *MONITOR* mode, a Set Top Box is used to initiate the IPTV channel setup and to change channels, while the FrameScope Pro is analyzing IPTV traffic parameters.

In *TERMINATE* mode, the FrameScope Pro supports both RTSP and IGMP to control the IPTV channel setup: For the test of multicast video streaming, the FrameScope Pro uses IGMP to join and leave those multicast addresses to which the content is streamed.

For the test of RTSP based Video on Demand (VoD) streams, the FrameScope Pro establishes an RTSP session with the media server, performing as an RTSP client. Once the session setup is completed, the RTSP client triggers the server to start or stop media delivery.

Transport quality metrics derived from the sequence and timestamp information in the RTP header include packet count, packet loss ratio, and packet jitter. Results for one or two RTP channels (if video and audio channels are separate) are polled and displayed periodically.

MPEG-2 transport streams carrying MPEG-2 or MPEG-4 multicast video are measured for ETSI TR 101 290 parameters and MDI (Media Delivery Index, RFC 4445).

In addition to transport quality metrics, the FrameScope Pro also measures key service transaction parameters such as IGMP join/ leave latency and channel zapping time.

The video list configuration and download feature makes it easy to manage IPTV channels in test suites. Three scoring levels are configurable for most test results, for a quick indication of the service quality.

Connectivity to the Entire Network

FrameScope Pro supports a wide range of connection protocols and physical media to allow for connectivity and dial-in at subscribers' homes, at DSLAMs, aggregation switches, or in data centers. Supported connectivity protocols include IPoE and PPPoE, with and without stacked VLAN enabled, a technology often used to steer traffic loads in triple play networks. The instrument is equipped with an RJ45 test port for 10/100/1000 Mbit/s over copper and an SFP (Small Form-factor Pluggable) interface for Gigabit Ethernet over fiber. A USB-powered media converter for 100BASE-FX and a range of SFP Gigabit Ethernet optical transceivers are optionally available.

ADSL/ADSL2+ Physical Layer Testing

If equipped with the optional DSL Golden Modem, the FrameScope Pro provides not only physical layer measurements on DSL, but also performs network and service quality tests over the modem's Ethernet bridge function. This enables users to verify DSL installations, and to troubleshoot home gateway installations from the physical layer up to the triple play service quality, with a single test set.

General Specifications

User Interface

60 mm x 160 mm (2.38" x 6.25") touch-sensitive color LCD display

Dimensions

Size: 228 mm x 114 mm x 66 mm (9" x 4.5" x 2.6")

Weight: 1.2 kg (approx. 2.5 lbs.)

Test Interfaces

- Electrical 10/100/1000BASE-T RJ45 interface, full and half duplex
- Supported SFP fiber interfaces: 1000BASE-SX and -LX
- Optional Auxiliary 10/100BASE-T RJ45 interface for remote control over a separate network

or

- Optional Wiremap port for wiremap testing to locate miswires, shorts, and open ends (requires Wiremap adapter)

Data Storage

512 MB CompactFlash™ card included

Network Station Database, Network Settings, Test Results Database, Test Suites



Ports

- Universal Serial Bus (USB 1.1)
- Talkset Interface: 3.5 mm stereo jack
- CompactFlash™ memory card interface

Operating temperature

0°C to +40°C

Storage temperature

-10°C to +55°C

Relative humidity

10% to 90%



Power Supply

Removable/Rechargeable Lithium Ion batteries

Battery life:
5 to 8 hours of operation

AC Power Adapter:
100 – 240 V AC, 0.5 A, 47 – 63 Hz
(output 12 V DC, 1.5 A)

The AC power adapter plugs directly into the battery pack. The battery can be recharged outside the instrument.

Optional Auto Lighter DC Power Adapter, 12 V (output 12 V, 5 A)

Administration Functions

Remote control from any PC on the network, requires installation of a small applet.

Access to measurement results through web browser

Generation of printable reports through web browser

Download of pre-defined test suites from a customer-managed ftp server

Download of a pre-defined video station list from a customer-managed ftp server

Available User Interface Languages

English, French, Spanish, Italian, German, Simplified Chinese, Korean, Japanese

Available User's Manuals

English, French, German, Japanese

Basic Network and Service Testing, All Product Kits

Supported Protocols	IP, IPX, NetBIOS
Dial-Up and Addressing	PPPoE, DHCP
Tagging VLAN Support QoS/ TOS Support	IEEE 802.1Q (VLAN), IEEE 802.1AD (VLAN, QinQ), configurable VLAN tags and priority fields QoS IP, TOS, DSCP
Network Discovery	automatic network discovery, active and passive VLAN discovery
Autotest Supported RFCs Supported Services	RFC 2617 (HTTP Basic Authentication Scheme), RFC 959 (FTP) Email, Web, File, DNS, DHCP, WNS, Novell, Print, FTP, Primary DC, Secondary DC Servers, Switches and Routers
Tools	Ping (up to 9,000 Bytes, don't fragment bit configurable), Trace route, Locate Switch Port, Error (problem) log Wiremap test (requires option N2620A-040 Wiremap port and N2614A-001 Wiremap adapter) Demo (training) mode Comprehensive built-in help function
Traffic Statistics	Protocol statistics Top talker analysis Local utilization and error statistics Local error source
SNMP Query Functions	Locate Switch Port SNMP public MIBs SNMP community setup
Report Generation Formats Tests Statistics	Comma Separated Value (csv, raw data) JAVA (formatted report with tables and graphs, requires JAVA version 1.4.2 or later installed) html (formatted report with tables) Autotest, RFC 2544 performance benchmarking, VoIP, IPTV, DSL, TCP/UDP throughput test, IP and MAC loopback test, Network Station List, Network Statistics

Basic Network Performance Testing, All Product Kits

Loopback Measurements	delay to IP (layer 3) or MAC (layer 2) address, requires additional FrameScope Pro
Traffic Generation Max. Data Rate Setup Parameters Error Generation Canned frame types	1000 Mbit/s, full duplex (frame length 40 to 16,000 Bytes) duration in number of frames, or continuous generation frame length in Bytes (40 to 16,000 Bytes) utilization in percent of port speed (adjustable during test) utilization in frames per second short and long frames 802.3/802.2, Ethernet II/IP, 802.2/IP, SNAP/IP, Ethernet/IPX, 802.2/IPX, 802.3/IPX, SNAP/IPX
Packet Error Rate Test (PERT) Max. Data Rate Setup Parameters Max. Duration	bidirectional, downstream or upstream frame loss test, performed between two FrameScope Pro units, or using a loopback device 1000 Mbit/s, full duplex (frame length 64 to 16,000 Bytes) duration in hours, or continuous generation frame length in Bytes (64 to 16,000 Bytes) frame rate utilization in percent of port speed data pattern (choice of 6 pre-configured patterns, and custom pattern) 24 hours
TCP/ UDP Throughput Test Protocol Support Max. Throughput Copper Interface Fiber Interface	ftp over TCP or UDP 9/ 70/ 200 Mbit/s (UDP, at 10/ 100/ 1000 Mbit/s port speed) 6/ 20/ 20 Mbit/s (TCP, at 10/ 100/ 1000 Mbit/s port speed) 200 Mbit/s (UDP), 17 Mbit/s (TCP), full duplex, at 1 Gbit/s port speed

RFC 2544 Network Performance Testing, Option N2620A-031, Product Kit N2620A-001

Supported Protocols	IP, IPX, NetBIOS
Dial-Up and Addressing	PPPoE, DHCP
Supported RFCs	RFC 2544, RFC 1242
Performance Benchmarking Test Parameters Frame Lengths Jumbo Frames Remote Device	throughput, latency, frame loss rate, back-to-back frames (frame burst test) 64, 128, 256, 512, 768, 1024, 1280, 1518 Bytes (plus 4 – 12 Bytes if VLAN tagging is activated) up to 16,000 Bytes additional FrameScope Pro or FrameScope 350 (firmware rev. 3.2.8 or later, no VLAN), physical loopback, IP or MAC packet responder
Max. Throughput Copper Interface Fiber Interface	1000 Mbit/s, full duplex (frame length 64 to 16,000 Bytes) 1000 Mbit/s, full duplex (frame length 512 to 16,000 Bytes) (983.1 Mbit/s at 64 Bytes, 992.9 Mbit/s at 128 Bytes, 999.09 Mbit/s at 256 Bytes)
Min. Latency	4 μ s (at 64 Bytes frame length)

VoIP Quality of Service Testing, Options N2620A-030, -03E, -03G, 032

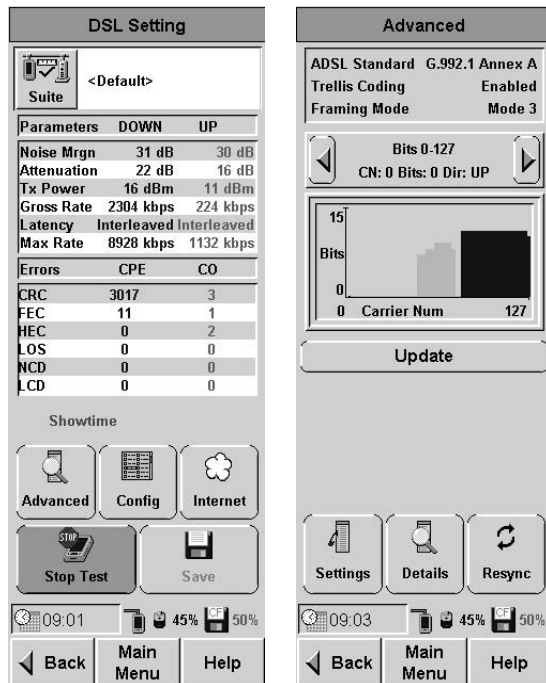
Supported Protocols	Session Initiation Protocol (SIP), RFC 3261, requires option N2620A-030 or -03E Peer-to-peer SIP, RFC 3261, requires option N2620A-030 or -03E STUN, RFC 3489, requires option N2620A-03E H.248/ Megaco, RFC 3525, requires option N2620A-032
R-Factor	R-Factor/Reference R-Factor, according to ITU-T G.107
Mean Opinion Score	MOS/Reference MOS, according to ITU-T G.107
VoIP Statistics	Parameters calculated based on the incoming RTP packets: <ul style="list-style-type: none"> • total packets sent • total packets lost • packet loss ratio • inter-arrival jitter • packet round-trip delay based on the exchanged RTCP packets Additional parameters available for SIP calls only: <ul style="list-style-type: none"> • total packets discarded • packet discard ratio
Supported Codecs	G.711 A-law, G.711 μ -law G.723.1 G.729A, G.729B G.721 or, respectively, G.726 with 32 kbit/s G.726 with 16, 24, and 40 kbit/s
Audio Content	Pre-recorded Harvard Sentences Live audio through headset
Operating Modes SIP (RFC 3261) H.248.1 v2 (RFC 3525)	FrameScope Pro acts as a SIP phone, initiating calls to, and receiving calls from other SIP phones, a SIP gateway or another FrameScope Pro., with, or without a SIP server/ proxy; requires option N2620A-030 or -03E FrameScope Pro acts as an IP phone media gateway, initiating calls to, and receiving calls from other IP phones, or another FrameScope Pro via MGC on demand; requires option N2620A-032
VoIP Traffic Generation Supported Codecs	emulates up to 100 VoIP streams with valid RTP headers, requires option N2620A-03G <ul style="list-style-type: none"> • G.711 A-law, G.711 μ-law (no meaningful audio data) • G.729A (no meaningful audio data)
Background Traffic Generation	emulates background traffic on the test port (burst frames with invalid RTP headers, bandwidth equivalent to up to 1000 RTP streams using supported codecs) requires option N2620A-041 AUX port to perform the VoIP quality test

IPTV Quality of Service Testing, Options N2620A-070, -071

Parallel Monitoring Capacity	1 stream, active testing up to 10 streams, passive monitoring, requires option N2620A-071
Signaling	RTSP (RFC 2326) for Video on Demand(VOD) streams IGMP v2 (RFC 2236) and v3 (RFC 3376) for multicast streaming Video streams with VLAN tagging, requires option N2620A-071
Transport	RTP/RTCP (RFC 3550), UDP, MPEG-2 Transport Stream, Unicast and Multicast
IPTV RTP Transport Statistics	RTP transport, as defined in RFC 3550: <ul style="list-style-type: none"> total packets received total packets lost inter-arrival jitter interval packet loss ratio
One-Way Loss Pattern Sample Metrics, requires Option N2620A-071	As defined in RFC 3357: <ul style="list-style-type: none"> packet loss distance packet loss period
IPTV Statistics, requires Option N2620A-071	MPEG-2 TS (Transport Stream) statistics, as defined in ETSI TR 101 290: <ul style="list-style-type: none"> TS sync loss Sync byte error PAT error PAT error 2 Continuity count error PMT error PMT error 2 Transport error PCR repetition error PCR discontinuity indicator error Service transaction quality: <ul style="list-style-type: none"> IGMP join latency IGMP leave latency IGMP channel zapping time Media Delivery Index (MDI, RFC 4445) <ul style="list-style-type: none"> MDI:MLR (media loss rate); requires transport over RTP MDI:DF (delay factor) Average throughput
Max. Stream Bit Rate	15 Mbit/s
Min. IGMP Join/ Leave Latency	0.5 ms
Test Reporting	Log the results of all tests for review by technicians back at the NOC Signaling events (IGMP/RTSP) Video quality measurements
Configurable Parameters	Multicast address/port RTSP URL RTSP server port RTP port Thresholds for the 3-level scoring of key parameters (requires option N2620A-071)

Digital Subscriber Line (DSL) Testing, Options N2620A-055, -056, -057

	Option N2620A-055	Option N2620A-056
Supported Standards	ITU-T G.994.1 (Handshake), G.992.1 Annex A (ADSL), G.992.3 Annex A (ADSL2), G.992.5 Annex A (ADSL2+), ETSI TS 101 388, T-Com 1 TR 112 (U-R2)	ITU-T G.994.1 (Handshake), G.992.1 Annex B (ADSL), G.992.3 Annex B (ADSL2), G.992.5 Annex B (ADSL2+), ETSI TS 101 388, T-Com 1 TR 112 (U-R2)
Max. Throughput Downstream Upstream	24 Mbit/s 2 Mbit/s	24 Mbit/s 2 Mbit/s
Line Test Parameters (displayed separately for upstream and downstream path)	Noise Margin, Line Attenuation, Transmitting Power, Gross Data Rate, Max. Data Rate, Latency Path, Bit Allocation	
Error Counters (displayed separately for Customer Premises Equipment and Central Office side)	CRC, FEC, HEC, LOS, NCD, LCD	



If equipped with one of the DSL test options, the FrameScope Pro displays detailed line parameter measurement results acquired by the Vierling DSL tester.

Ordering Information

FrameScope Pro Product Kits

All FrameScope Pro Product Kits contain:

(1) FrameScope Pro, (1) AC Power Adapter, (1) Soft Carrying Case, (1) Battery Pack, (1) Hanging Strap, (1) USB Cable, (1) FrameScope Pro User's Guide, (1) FrameScope Pro Utilities CD, (1) CompactFlash™ Card, (1) Stylus with Spiral Cord, (1) Screen Cover, (1) Dust Cap.

N2620A-003

FrameScope Pro Basic, includes headset N2620A-060

N2620A-001

FrameScope Pro Ethernet, includes RFC 2544 test license N2620A-031

Software Upgrade Licenses

(multiple software licenses can be combined)

N2620A-030

VoIP Quality of Service Test, standard SIP RFC 3261 signaling protocol

N2620A-03E

VoIP Quality of Service Test, SIP signaling protocol with STUN support

N2620A-03G

VoIP Traffic Generation

N2620A-032

VoIP Quality of Service Test, H.248 / Megaco

N2620A-031

RFC 2544 Network Performance Test

N2620A-070

IPTV RTP Transport Statistics

N2620A-071

IPTV RTP Transport Statistics, IPTV Transport Stream Statistics, MDI and Transaction Analysis

N2620A-058

Standalone software license for current owners of Vierling VIT-A2 and VIT-V2 DSL Testers.

Optional DSL Test Kits

(Golden Modem with accessories and software license)

N2620A-055

ADSL/ADSL2+ Test Kit, ITU-T G.992.1/3/5 Annex A

N2620A-056

ADSL/ADSL2+ Test Kit, ITU-T G.992.1/3/5 Annex B



Recommended Accessories

N2620A-050

Multimode SFP Transceiver, 1000BASE-SX

N2620A-051

Single Mode SFP Transceiver, 1000BASE-LX

N2620A-053

100BASE-FX Media Converter, USB powered

N2620A-060

Headset, binaural, with microphone and volume control

N2614A-001

Wiremap Adapter

N2595A-096

Rechargeable Battery Pack

N2595A-094

Auto Lighter DC Power Adapter, 12 V

N2620A-080

Universal AC Adapter

N2605A-090

Accessory Kit (replacement stylus, display cover, dust caps, strap set, etc.)

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