

Agilent Technologies

LAN Analyzer Product Suite Product Overview

LAN Analyzer Product Suite

Detect, diagnose and correct hard-to-solve network problems

The Agilent Technologies LAN Analyzer Product Suite gives you the integrated hardware/software solution you need to accurately and efficiently monitor and troubleshoot your high-performance network. Based on unique software and patented silicon-accelerated hardware technologies, LAN Analyzer gives you the scalability, performance, and accuracy required to minimize network downtime in your mission-critical 10/100/1000 Ethernet and 4/16 Token Ring networks.

Features

- Integrated network monitoring and troubleshooting in a single, easy-to-use software package.
- Expert, Distributed, Active and VoIP software modules available.
- Complementary protocol decode kit available.
- Real-time MAC, network and application layer statistics and alarm settings with user-definable actions.
- Seven-layer, color-coded decodes.
- Powerful multi-layer capture and display filter capabilities with direct-fromdata instant filter generator.
- 32, 64 and 128 byte packet slicing options.
- Automatic name table address updating.
- Powerful, intuitive Windows 95/98/2000 and NT application.
- Supports up to 16 local LAN Analyzer 10/100 Cards and up to four 10/100/1000 Ethernet or 4/16 Token Ring adapters.

Benefits

- Minimize network downtime.
- Determine network capacity.
- Verify connectivity.
- Perform baselining and benchmarking.
- Complete network visibility with Distributed module.
- Solve problems quickly with Expert module.
- Monitor your entire LAN from a single console.
- Test new network configurations before deployment.



Agilent Technologies Innovating the HP Way

J1950A Software-based Performance Analyzer

Keep your mission critical networks up, running and safe

Agilent Technologies' LAN Analyzer is a powerful, integrated analyzer plus monitor application for 10/100/1000 Ethernet, and 4/16 Token Ring networks. Features such as real-time network statistics, 7-layer packet decode and analysis, advanced alarm setting and actions, powerful multi-layer filtering, packet slicing and automatic name table updating provide you with the most robust, easy to use set of network analysis and monitoring tools available, all in a single package.

LAN Analyzer incorporates comprehensive real-time monitoring capabilities with the powerful troubleshooting capabilities of a protocol analyzer. These capabilities can function simultaneously, enabling you to maintain your network while using a single multi-purpose tool.

LAN Analyzer monitors local network segments and a Distributed software module gives LAN Analyzer the capability to monitor remote segments as well.





LAN Analyzer's Intuitive User Interface

LAN Analyzer's intuitive user interface gives you a comprehensive view of the network, as well as the ability to easily drill down to a specific network segment. The main window provides a single, user-defined view for each of the segments being monitored. You determine what information to view for each segment, such as network utilization, protocol distribution or host table. In this same window LAN Analyzer enables you to easily create alarms that monitor multiple segments simultaneously.

To focus on a particular segment, just double-click on that segment to unveil LAN Analyzer's monitoring and troubleshooting tools. You can simultaneously set capture filters, view full 7-layer decodes of captured packets and display multiple real-time MAC, network, and application layer statistics in order to quickly understand the status and performance characteristics of the network segment. An optional Expert software module gives you an extra layer of intelligence by proactively reporting problems and recommending corrective actions.

For test and development environments, a LAN Analyzer Active software module provides advanced traffic generation and intelligent packet and capture file editing capabilities.





LAN Analyzer's main window provides an overview of the network segments being monitored. The Resource Browser (top left menu window) lists all of the monitored segments, both local and remote. The Alarm Browser (middle left window) lets you easily create alarm conditions. The Monitor View (right window) provides a user-definable view for each segment - in this example, the network utilization/errors strip chart is being displayed for a remote full-duplex Fast Ethernet segment. The Message Area (bottom window) displays system messages (see Figure 2).



Figure 3

Troubleshooting or monitoring a particular segment may require a more explicit view of that segment. Simply double-clicking on a segment in the Monitor View area of the main window brings up the Detail View for the target segment. You can simultaneously activate a wide array of troubleshooting tools (filters, 7-layer decodes) and monitoring tools (MAC, network, application layer statistics) suited to the task at hand. In this example, you see the utilization/ errors strip chart, the host table charting the top 10 talkers, protocol distribution and the detailed 7-layer packet decode.

System Requirements	System Memory Virtual Memor Disk Space OS Display Network Inter	ry Allocation fface	Pentium class, 200 96 MB minimum, 400 MB for 10/100 600 MB for Gigabi 20 MB Windows 95/98/20 800 x 600 (SVGA) 10/100 Ethernet L 1000 Ethernet, NI Analyzer 10/100 P) MHz minimum 192MB recommended) Ethernet it Ethernet 00 or NT 4.x AN Analyzer Card, NDIS 10/100/ DIS 4/16 Token Ring, LAN od or LAN Analyzer Gigabit Pod
Performance Statistics	MAC Layer Ma Network Laye Application La MAC Host Tab Network Host Application La MAC Statistics Utilization/Err Frame Size Di Protocol Distr VLAN Distribu Address Mapp Seven Layer P Real-Time Pac	atrix - Top Con r Matrix - Top ayer Matrix - Top ayer Matrix - To ble - Top Talker Table - Top Ta ayer Host Table s ors stribution tibution tion (Cisco IS bing Protocol Analys eket Decode Su	versations Conversations op Conversations s lkers - Top Talkers L) is mmary	
Decodes	TCP/IP IPX SMB AppleTalk	Vines DECnet DECLAT LAVC	IP Multicast Oracle Sybase Cisco VLAN des, see our webs	SNA and more ite at www.agilent.com/comms/

Note: The J1950A LAN Analyzer software is included in the J1980A Portable LAN Analyzer and does not need to be ordered separately with J1980A orders.

J1951A Expert Module

Automatically Detect and Diagnose Symptoms of Network Problems

Features

- Automatic detection and diagnosis of potential network problems.
- Detailed diagnosis includes recommended corrective action and user customization of probable causes.
- Performs analysis in real-time and on captured files.
- Detects common network problems; overloaded LANs/ servers misconfigured routers/ hosts, and potential hacker attacks ('TCP SYN').
- Associates symptoms with their appropriate VLANs and Frame Ids and detects VLAN-specific symptoms.
- Application response time capability provides added insight into overall network behavior.

Benefits

- Solve problems quickly.
- Reduce network downtime.

As today's networks have become more complex, you've been required to develop more sophisticated skills to troubleshoot network problems. And while network management tools have become easier to use, they have also continued to provide more data than ever before. In order to solve problems quickly, you need to distill this wealth of data into meaningful information. Your ability to do this saves your company time and money by avoiding network downtime.



Figure 4

The LAN Analyzer Expert software module automatically detects symptoms of many common and hard-to-solve network problems, giving you a detailed diagnosis of the problems and then recommending corrective actions for solving those problems. LAN Analyzer Expert is highly customizable to allow you to incorporate information and knowledge specific to your environment, so you can troubleshoot more efficiently. You can adjust the threshold values for most symptoms and customize the LAN Analyzer Expert diagnosis test. This allows network managers of all skill levels to take advantage of the Expert module's powerful problem-solving capabilities (Figure 4). Drill down to the level of detail needed to solve the problem

LAN Analyzer Expert information is arranged into four major categories depending on the level of detail required.

- **Expert Overview** provides a table of all symptoms and the number of times each symptom is detected. Symptoms are detected from the MAC layer through the application layer of the ISO model, such as duplicate network layer address, TCP retransmissions, ICMP redirects and many more.
- **Expert Analysis** then provides a more detailed problem description on each symptom, including time stamp, source and destination addresses.
- Drilling down on any one symptom will bring up **Expert Diagnosis** which provides a detailed diagnosis of the problem, including a list of probable causes and recommended corrective actions.
- With **Expert Response Time**, you can view a table of most common application protocols such as HTTP, FTP, Telnet, and their associated minimum, maximum, and average response times. LAN Analyzer Expert also has the capability to associate any symptom with its VLAN identifier and can detect VLAN-specific problems such as illegal VLAN identifiers.

Additional insight into hard-to-solve problems is provided through two new views. The first, a 'symptom-centric' host table, lists all hosts or conversation pairs experiencing a particular symptom. The second, 'host-centric' view can be accessed from the host table, allowing you to see all LAN Analyzer Expert symptoms detected, as well as health statistics for that host.

LAN Analyzer Expert can be run in real-time or post-processing mode. When used on captured data, you can automatically drill down to the frame responsible for generating the symptom. In addition, the Expert software module's powerful alarm management tool is now extended to include two categories, LAN Analyzer Expert Alarms and Application Response Time Alarms. You can configure thresholds on any LAN Analyzer Expert symptom or response time and define one or more actions to be taken when a threshold is exceeded, including starting/stopping packet captures, sending an email, or dialing a pager.

Thus LAN Analyzer Expert, combined with Agilent's award-winning LAN Analyzer product suite, now delivers one of the industry's most powerful troubleshooting and management tools for keeping your network up and running smoothly.

Notes:To use the J1951A LAN Analyzer Expert, the J1950A software module must also be installed.

The J1951A LAN Analyzer Expert is included in the J1980A Portable LAN Analyzer and does not need to be ordered separately with J1980A orders.

J1952A Distributed Module

Simplify Remote Management of Distributed Networks

Features

- Full monitoring and analysis capabilities of LAN Analyzer software for remote 10/100/1000 Ethernet and 4/16 Token Ring resources.
- Any LAN Analyzer station can manage any LAN Analyzer or LAN Analyzer Pod.
- Broad range of security available with four user access levels.
- Access to remote resources password protected.
- Optional encryption prevents eavesdropping on sensitive management information.
- Architected to minimize the network bandwidth taken up by remote management.
- Remote communication supported over LAN and WAN.

Benefits

- Monitor your entire LAN network from a single console.
- Reduce expenses with dedicated agents.
- Peer-to-Peer architecture allows remote training.

The LAN Analyzer Distributed software module gives you access to LAN Analyzer's powerful analysis and monitoring capabilities for any network segment instrumented with Agilent data collection devices — LAN Analyzer Pods, Portables, Cards in PCs, or any PCs with an NDIS-compliant 10/100/1000 Ethernet or 4/16 Token Ring adapter.



Figure 5

The LAN Analyzer with its Distributed software module is the ideal solution for a centralized or distributed approach to network management. With the Distributed module, LAN Analyzer lets you centrally view and manage all Agilent data collection resources in the network. Each manageable device appears with its IP address or user-defined name. Selecting that device from the Windows®-based interface makes the device appear as if it is being managed locally. All troubleshooting and monitoring functions available locally with LAN Analyzer are also available remotely for these PCs and LAN Analyzer Pods that have the Distributed software module installed (Figure 5). In the case where a technician is on-site at a remote location to help troubleshoot a problem, Distributed module's peer-to-peer approach greatly minimizes the time required to resolve a problem. Distributed module lets both the network manager and the local technician simultaneously view and analyze the targeted segment. The network manager can then direct the technician to perform the appropriate action locally to correct the problem.

The Distributed module also enables the LAN Analyzer to become a powerful, portable troubleshooting tool. A field service engineer can connect a laptop to any Ethernet or Token Ring port on the customer network and get access to any network segment where a LAN Analyzer data collection device resides.

24-hour network access is available through LAN Analyzer with the Distributed software module. A network administrator can dial into a problem network segment from home or any other location to troubleshoot and monitor that segment.

Total Network Access with the LAN Analyzer Remote Module

In Figure 6, a mixed Ethernet and Token Ring network is instrumented with LAN Analyzer Pods, and LAN Analyzers with the Distributed software module installed. Two LAN Analyzer Pods provide visibility into the full-duplex links. The Network Operations Center (NOC) manages the entire network. A local technician on the Token Ring network can work with the NOC to troubleshoot a problem at the technician's location. During off-hours, a network manager can dial in from home to troubleshoot urgent network problems.

Notes:

To use the LAN Analyzer Distributed, the J1950A software module must also be installed.



J1953A Active Module

Advanced Traffic Generation and Packet Editing Functionality to Verify Connectivity across the network

Features

- Advanced traffic generation capabilities to simulate and troubleshoot 10/100/1000 Ethernet networks.
- Intelligent packet and capture file editing for full seven-layer customization of data to be stored or transmitted.
- Specify frame rate, burst count, or percentage utilization; automatically calculate inter-packet gaps for various traffic loads.
- Protocol templates available for packet customization.
- Automatic CRC generation and checksum calculation.

Benefits

- Verify connectivity across your network.
- Test new equipment or configurations before network deployment.

The LAN Analyzer Active module adds advanced traffic generation and intelligent packet and capture file editing capabilities to the LAN Analyzer. Ideal for those in test, manufacturing and support organizations, the Active module provides the tools you need to thoroughly test, simulate and troubleshoot a network device or problem (see Figure 7).

You can quickly configure the LAN Analyzer Active module to generate a single packet such as an ARP or PING to troubleshoot a production network or to generate a series of packets to saturate a test network.



Figure 7

Advanced Traffic Generation

Once you've created a traffic stream via the Active software module's interactive screens, LAN Analyzer Active module can retransmit the stream to troubleshoot, test, or otherwise simulate a network. Use of a LAN Analyzer10/100 Card allows you to do this while maintaining precise timing and network load characteristics.

The LAN Analyzer Active module lets you create complex transmit specifications with user-defined packet data streams, a captured trace data file or a combination of these. Additional flexibility is provided through the use of "wildcards" in the source and/or destination address fields that allow randomized or sequential addresses. When run over a LAN Analyzer 10/100 Card, traffic rates over 100% of Fast Ethernet can be specified and packets can be generated from 8 to 15,000 bytes in length.

Intelligent Packet Editing

The LAN Analyzer Active module lets you capture traffic on a LAN and intelligently edit any part of the captured file. You can modify packet contents (including CRC), delete packets, add packets, and modify inter-packet gaps to as little as 25-nanosecond resolution when used over a LAN Analyzer 10/100 Card. The "intelligence" comes from an easy-to-use interface that is template and menu driven.

Because LAN Analyzer is a seven-layer protocol analyzer, the Active software module provides constant feedback on the type and validity of the packet stream being edited or created. The software, which decodes packets as they are being created, provides you with easy to understand translations, upper-layer checksum calculations, and MAC-layer CRC calculations, all of which may be created as valid or invalid to test different scenarios.

Transmit Specification: //Local/Module1	×
Defined Streams (Double click to activate/deactivate)	Transmission Modes
✓C:\Agilent\LAN Analyzer\examples\capture\Ex1.cap (Repeat:1 ✓C:\Agilent\LAN Analyzer\template\802-1d.cap (Repeat:1) ✓ 64/0800 00000000001 0000000002 IPG:9.60 usec (1) Sec	Iransmit Spec (4077 frame Time(s).
× F	C Transmit <u>C</u> ontinuously
MAC Address Names DA (Hex) 000000000000000000000000000000000000	Transmission Status Transmission Speed 10Mbps. 3 Stream(s) Active.
Packet Type (Hex) 0800 (IP) Packet Size 64 Data (32 bytes) AAAA030000008137FFFF9435AEAF45F9962310F0F0230FDABF54100000001 Seq #	Load Module
Stream Mode Add © Packet Gap © micro sec C milli sec C seconds C Frame Rate Add File	Open <u>Specs</u> Sa <u>v</u> e Specs
C Traffic <u>Bate</u> (%util) Packet Gap 9.60 Delete □ <u>Burst</u> Burst Count 1 Burst Gap (msec) 1 <u>Modify</u>	Ca <u>n</u> cel
Repeat Stream 1 Time(s). 🔽 Auto CRC Edit Data	Help

Figure 8

Customized Test Scenarios

LAN Analyzer Active module lets you customize test scenarios via the Transmit Specification window. In Figure 8, two user-defined data streams and one trace file comprise the traffic to be generated on the network. You have the capability to specify MAC addresses or a range of MAC addresses. A wide range of packet templates are included or you can manually create customized packets. Previously saved capture files can also be included in the test scenario. Packet transmission rates can be specified by packet gap, frame rate or traffic rate. The inherent flexibility of LAN Analyzer Active module's traffic generation capability allows you to create any test scenario, whether it be a pure performance test, a device conformance test, or a troubleshooting test.



Figure 9

LAN Analyzer Active module lets you edit any portion of a packet. You can alter a packet to give it a bad CRC value to see how a target network device reacts. Technical support may alter the network addresses of a customer - supplied trace to match the subnet address of the support lab. LAN Analyzer's comprehensive seven-layer packet decode provides constant feedback on the content and validity of the packet (Figure 9).

Notes: To use the LAN Analyzer Active software, the J1950A software module must also be installed.

J5431A VoIP Module

Providing the Answers for QoS on Multimedia IP Networks

Features	• Provides very complete, detailed and accurate decodes and summarization of the H.323 and related families of protocols and conversations, including ASN.1, MGCP, SIP, Cisco SSP, SGCP and more.
	• Calculates QoS metrics to validate reported RTCP packets from network
	infrastructure providers, such as Gateways and IPBXs.
	• Provides a rich set of information beyond typical CDR (Call Detail Records)
	in telephone PBXs to describe the end-points and QoS characteristics of each conversation.
	• Thresholds can be set so network engineers can quickly recognize calls that are out of acceptable QoS guidelines.
	 Information is displayed in three configurable views: Call View, Channel View and Packet Decode — all with extensive drill down capabilities.

Benefits

- Troubleshoot the most difficult high-speed, multimedia network applications.
- Quickly recognize calls that are out of acceptable QoS guidelines.
- Determine actual network performance.

Given the rapid acceptance of IP as the de facto network protocol, Quality of Service (QoS) has become one of the biggest challenges for network administrators. For voice and video applications that require real-time performance, eliminating latency, jitter and buffering in the network infrastructure is key. Policy-based systems, gateways, switches and routers are often configured with a myriad of vendor and protocol combinations to work in unison to provide priority for the real-time demands of multimedia traffic. LAN Analyzer Voice over IP (VoIP) proves the network is working as you have configured it.

Agilent LAN Analyzer - Detail	View - [C:VAgilent\L Module Monitor Views	AN Analyzer\examples s C <u>a</u> pture Views <u>T</u> ools	Capture\Ex1.cap] - <u>Window Help</u>	[LAN Analyzer Capture \	/iew - C <u>- 8 ×</u> <u>- 8 ×</u>
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🖻 🖬 💽 🔹 🛤	₽a 🏉 🗷 🕅 🖣	- H H + -	● 🖹 🖬 🗏 🕅	먦꽜뜛뼒롍뎔	🙊 와 🔛 💡
ID Status Elapsed [sec] Size	Destination	Source	Su	mmary
000004 0.00	4.394.800 64 13	3.139.61.86	133.139.61.118	TCP SP=30007	DP=1720
000006 0.01	6.929.880 108 13	3.139.61.118	133.139.61.86	Q.931 D Call	Proceeding <
000007 0.00 0.46	3.363.480 108 13 2.659.400 64 13	3.139.61.118 3.139.61.86	133.139.61.86 133.139.61.118	Q.931 D Aler TCP/IP Long A	ck - Ack Time
000009 1.16	5.912.000 269 13	3.139.61.118	133.139.61.86	Q.931 D Cónr	ect CRV=17301
					•
Q.931 - Call Si	gnaling Protoco	ol (Q.931)			▲
Protocol Discriminator	3 (Message Ler	ngth)			
Message Length	362 6 (0.031 (T.45)	1 Uson Notwork Coll	Control Morrogon	2	
Byte Field	0×02	I USER-NEUWORK Call	i control Messages)	
	0000	Not Used (MBZ)			
Call Reference	0010 I	Length of Call Refe	erence Field: 2		
Carrice ence	0	Originati	ion Side		
	.100 0011 10	01 0101 Call Refe	erence Value: 1730	1	
Message Type	0×05	-larr: Call Ertabli	ichment Mercane		
	0 0101	Type: Setup	rshinene wessage		
Information Elements 1:	0×04				
	000 0100	Variable Length Identifier Coding:	Rearer Canability		
Length	3				
Standard/Capability	0×88				
	.00	Ext. Un Coding Standard: II	TU-T Standardized	Codina	-
4	n .:::: :				
Hex					ASCTT A
0000: 00 80 87 80 EA 0010: 01 92 03 12 00	87 00 80 87 80 00 3C 06 F4 71	1A 7C 08 00 45 00 85 8B 3D 76 85 8B	ê	.E.	
Ready				Captur	e Filter: None

Figure 10

The LAN Analyzer VoIP software module enables capture, analysis and summarization of a broad range of QoS factors associated with H.323 and related multimedia IP traffic (voice, video, data). LAN Analyzer VoIP delivers an extremely rich set of reported and calculated data to validate QoS parameters presented by IP phones, PSTN/IP Gateways, IP switches, and IPBXs on a call-by-call, or channel-by-channel basis.

In order to assist you in troubleshooting complex VoIP network scenarios, the VoIP software module also supports SIP, Cisco's SSP, MGCP and SGCP protocols. Used with the LAN Analyzer basic software module, the VoIP module's detailed metrics and measurements also help you discover problems affecting user quality (like delay, jitter, and loss) and identify when to increase network capacity.

Supported Protocol Decodes

ITU H.323	Q.931, H.245, T.120, H.225.0, GK DISC, RAS, ASN.1
IETF	SIP, MGCP, SGCP, RTP, RTCP
Cisco	SSP
Codec	G.711, G.723, G.728, G.729, H.261, H.263

Data and Metrics Provided in the Channel Table View			
Index: Order in which the channels were created	Lowest and highest RTP Sequence number seen		
Protocol: RTP or T.120	Number of RTP Sender Reports seen		
Stream origination direction:	Number of RTP Receiver Reports seen		
Reverse = Stream originating at the callee	Number of RTP Source Descriptions seen		
	Number of RTP Goodbyes seen		
Logical Channel Number	DTOD Device data includions		
Session Identifier	Packet Count, Byte Count and Packets dropped,		
Codec Type	Average reported RTCP inter-arrival jitter, Minimum reported RTCP inter-arrival jitter,		
PC: Packet Count	Maximum reported RTCP inter-arrival jitter		
BC: Byte Count	Application Definition Count		
PD: Packets Dropped	Unknown Report Count		
Jitter calculated by LAN Analyzer in milliseconds	RTCP Canonical Name – RTCP Source Description		
Minimum jitter calculated by LAN Analyzer in msec.			
Maximum jitter calculated by LAN Analyzer in msec	RTCP Source Description information, including: Name, Email, Phone, Location, Tool and Note fields		

Notes: To use the LAN Analyzer VoIP, the J1950A software must also be installed.

Protocol Decode Kit

Custom Protocol Decode Development Facility for The LAN Analyzer

Features

Benefits

Provides the ability to create custom protocol decodes using LAN Analyzer. Integrates custom protocol decodes with standard LAN Analyzer protocol decodes.

- Create complete custom decodes, or replace existing upper layer decodes while maintaining standard lower layer decodes.
- Facilitates product development where custom LAN protocols are involved.
- Enables development of troubleshooting tools for support personnel.

• Complimentary module for the LAN Analyzer.

• Support new network protocols immediately.

The Protocol Decode Kit (PDK) module lets you add new protocol decodes to the standard set of decodes included in LAN Analyzer. New decodes created with PDK will fully integrate into LAN Analyzer's standard decode format, presenting Summary, Detail, and Hex views, and incorporating highlighted cross-tracking between Detail and Hex views. PDK allows you to use existing LAN Analyzer lower-layer decodes, and only requires you to detail the translation rules for the new protocol (see Figure 11).

A protocol parser is compiled into a loadable library using Microsoft® Visual C++. The resulting library file can be loaded by any LAN Analyzer, version 2.4 or later. The result is a portable custom protocol parser, which can be used on any LAN Analyzer system.

The protocol parser can also facilitate the generation of traffic that includes the new protocol. The intelligent frame editor of LAN Analyzer Active module seamlessly translates both the standard and the custom protocol decodes, assuring the accuracy of generated traffic.



Figure 11

	For the networking product developer, PDK aids in development and testing by translating proprietary or custom protocols used by the product. Design verification and problem troubleshooting is speeded up by eliminating manual decodes of messages using proprietary protocols. After you've released the product for production, you can distribute the protocol parser library generated using PDK to field and technical support people to assist them with product support and network troubleshooting.
Software Requirements	LAN Analyzer 2.4 or later Microsoft Visual C++ Version 4.2
Product Distribution	PDK is distributed free of charge. Download it from Agilent's website: www.agilent.com/comms/onenetworks

J1980A LAN Analyzer Portable

Portable network analysis and troubleshooting tool designed especially for engineers in the field

Features

10/100 Cardbus NIC with LAN Analysis and Expert Software



- Integrated network monitoring, troubleshooting, and expert analysis software.
- Custom 10/100 Ethernet Cardbus NIC and driver provide error counters and error packet capture capability.
- Ideal troubleshooting tool for field service engineers and network managers on the go.
- Advanced expert analysis provides automatic detection and diagnosis of potential network problems, minimizing network downtime even more.
- Application response-time provides added insight into overall network behavior.
- Real-time MAC, network and application layer statistics and alarm settings.
- Comprehensive color-coded protocol decodes for over 130 protocols, including: TCP/IP, IPX, SMB, AppleTalk, Vines, DECnet, IP Multicast, Oracle, Sybase, Cisco's VLAN, SNA, and more.
- Powerful multi-layer filter capabilities, with direct-from-data instant filter generator.

LAN Analyzer Portable is an integrated 10/100 Ethernet LAN analyzer package designed specifically for on-the-go field-service engineers and network managers. Featuring a custom 10/100 Ethernet CardBus NIC and driver, it allows any CardBus-enabled laptop to be used as a powerful LAN analyzer and monitor, with the added capability of viewing error counters and capturing error packets. This combination of real-time monitoring, protocol analysis, error counter and error packet capture, coupled with LAN Analyzer's comprehensive Expert software module, provides you with the most robust portable troubleshooting tool available in its class.

LAN Analyzer Portable, a native 32-bit Windows95/98 application, incorporates features such as real-time network statistics up through the application layer, 7-layer color-coded protocol decodes, advanced alarm management, and flexible template-based filtering anywhere in a packet. These capabilities can function simultaneously, so you can manage your network using a single multi-purpose tool.

Agilent Technologies' powerful expert analysis, included in LAN Analyzer Portable, distills a wealth of LAN data into meaningful information. LAN Analyzer Expert software automatically detects symptoms of many common and hard-to-solve network problems, provides a detailed diagnosis of the problems and then recommends corrective actions for solving those problems. LAN Analyzer Expert is highly customizable to allow you to incorporate information and knowledge specific to your environment, so you can troubleshoot more efficiently. This allows network managers of all skill levels to take advantage of LAN Analyzer Expert's powerful problem solving capabilities.

In addition to monitoring local network segments using its custom CardBus NIC, LAN Analyzer Portable supports up to three additional NDIS interfaces, including both Ethernet and Token Ring, enabling simultaneous management of multiple LANs. Agilent's custom 10/100 CardBus NIC can also be used as a standard 10/100 BaseT adapter for normal network use, eliminating the need for you to carry multiple network adapters.

Data Presentation Options

System Requirements

System	Pentium class PC CardBus-ready PC card slot to support		
3.6	Agilent 10/100 Ethernet CardBus NIC		
Memory	32MB minimum		
Disk Space	20MB		
OS	Windows 95/98/2000		
Display	800 x 600 (SVGA)		
Optional NDIS	10/100/1000 Ethernet		
	4/16 Token Ring		
MAC Laver Mat	rix - Top Conversations		
Network Layer	Matrix - Top Conversations		
Application I av	or Matrix Top Conversations		
MAC Host Table	Top Tallars		
Notwork Host 7	ble Top Talkers		
Network Host Table - Top Talkers			
Application Layer Host Table - Top Talkers			
MAC Statistics			
Utilization/Erro	rs		
Frame Size Dist	ribution		
Protocol Distric	button		
VLAN Distribut	ion (Cisco ISL)		
Address Mapping			
Seven Layer Protocol Analysis			
Real-Time Packet Decode Summary			
Expert Anaylsis			
Expert Diagnosis			
Expert Overview			
Symptom Snap	shot		

LAN Analyzer Portable's Intuitive User Interface





LAN Analyzer Portable's main window manages its enhanced CardBus interface(s), plus any other NDIS modules. Simple pull-down menus and iconic buttons provide access to configuration, real-time monitoring and packet capture functions. Alarm configuration is as simple as the drag-and-drop paradigm that Windows 95/98 provides. (Figure 12).





Troubleshooting or monitoring a particular segment may require a more explicit view of that segment. Simply double-clicking on a segment in the Monitor View area of the main window brings up the Detail View for the target segment. The user can simultaneously activate a wide array of troubleshooting tools (filters, 7-layer decodes) and monitoring tools (MAC, network, application layer statistics) suited to the task at hand. In this example (Figure 13) the user is viewing the utilization/errors strip chart, the host table charting the top 10 talkers, protocol distribution and the detailed 7-layer packet decode.

J1974A LAN Analyzer 10/100 Card

Ideal platform for Distributed Network Performance Analysis and Troubleshooting

Features

• Silicon-accelerated hardware engine captures every packet under any network load using any user-defined filter.

- Real-time packet decode and analysis.
- Filter on any part of a packet; up to eight filters may be applied to every packet simultaneously.
- Real-time packet save directly to disk.
- Packet slicing with 32, 64 and 128 byte options preserves buffer space.
- Auto-sensing 10/100 RJ-45 port supports 10Base-T and 100Base-TX.
- MII connector supports additional media through an external transceiver.
- Two LAN Analyzer Cards can provide a single, seamless view of full-duplex network traffic.
- Support for up to 16 LAN Analyzer Cards in a single PC.
- Captures and counts 10/100 Ethernet error packets.
- Supports simultaneous capture and transmit operation.

Custom 10/100 Ethernet Analyzer Card



The LAN Analyzer 10/100 Card and LAN Analyzer software form the industry's first integrated analyzer plus monitor incorporating simultaneous real-time network monitoring and line-rate packet capture. The LAN Analyzer 10/100 Card is the ideal hardware platform to troubleshoot network problems, monitor 10/100 networks and test 10/100 network equipment before deployment in a production environment.

Analysis

In order to accurately and effectively troubleshoot a network problem, an analyzer must never drop a packet. The LAN Analyzer 10/100 Card's revolutionary silicon-accelerated hardware engine captures every packet under any network load on any 10/100 Ethernet network. With a capture buffer ranging up to 64MB, LAN Analyzer Card can be counted on to collect the information needed to resolve a problem. Real-time packet decode and analysis provide immediate troubleshooting assistance. Real-time packet save directly to disk provides a way to capture a large amount of information needed to troubleshoot a problem over a longer period. Hardware-based filtering enables up to eight filters to be applied to any part of a packet. This filtering mechanism captures the desired packets without diminishing capture performance.

Monitoring

The LAN Analyzer 10/100 Card is also a monitoring tool that can be used to observe any 10/100 network in real-time as well as baseline a network over long periods. With its 512K real-time buffer, LAN Analyzer Card can collect MAC, network and application layer statistics and present several real-time views of network traffic.

Testing

As a test tool, LAN Analyzer 10/100 Card's capability as a traffic generator is unparalleled. Not only can it generate packets ranging from 8 to 15,000 bytes, it can transmit at full line-rate on 10Mbps or 100Mbps networks. LAN Analyzer Card can also capture and transmit simultaneously, making it the ideal tool to test the full-duplex capability of a network device. With an optional external trigger module, LAN Analyzer Card can trigger a logic analyzer to debug a network device during development. With a precise timestamp resolution of 35 nanoseconds, LAN Analyzer Card provides the necessary accuracy to test any 10/100 network device.

Technical Specifications

Operational Specifications

Network Ports	Auto-sensing 10/100 Ethernet RJ-45 port,
I FD Indicators	MII supports additional media
Conture/Transmit Buffer	Un to 64MP ontions
Real-time Buffer	512KB
Interface Functionality	
Capture Performance	10Mb: >14,880pps
-	100Mb: >148,809pps
Capture Filter	Hardware-based, up to 8 filters may be applied on a
	single packet with no performance degradation
Error Packets	Captures and counts all 10/100 Ethernet error
	packets
Packet Slicing	32, 64, 128 bytes, or full packet options
Timestamp Resolution	35 nanoseconds
Full-Duplex Receive	Synchronizing two interfaces provides a single,
	seamless view of full-duplex network traffic
Capture/Transmit	Support for simultaneous capture and transmit
Transmit Performance	10Mbs:14,880pps
	100Mbs:148,809pps
Transmit Functions	Generate packet from 8 bytes to 15,000 bytes,
	transmit error packets, transmit packets from
	capture buffer

Physical Specifications

Bus	3/4-sized ISA board
Height	4.8 in/12.1 cm
Width	10.0 in/25.4 cm
Weight	0.5 lb/1.1 kg
Power Consumption	3.5A

System Requirements

System	Pentium class system
Memory	32MB minimum
Disk Space	15MB
OS	Windows 95/98/2000 or NT 4.x
Software	LAN Analyzer core software plus all optional modules
Max no. of interfaces	Up to 16 interfaces may be installed in one PC

J1970A LAN Analyzer 10/100 Pod

Lightweight system that can quickly locate the source of network performance problems

Features

- Portable or rack mount system for high performance network analysis.
- Lightweight unit with laptop PC dimensions.
- Silicon-accelerated hardware engine captures every packet under any network load using any user-defined filter.
- Separate auto-sensing 10/100 Ethernet RJ-45 port provides connectivity to network or local PC for management access.
- Manageable locally or remotely from any PC equipped with LAN Analyzer Distributed software.
- In-band management via Telnet and SNMP.
- Connection to 12-port taps facilitates cost-effective analysis and monitoring of up to twelve 10/100 Ethernet segments from a single LAN Analyzer Pod.
- Full-duplex configuration monitors and analyzes a single full-duplex or two half-duplex links.

Distributed 10/100 Ethernet Analyzer System



The LAN Analyzer 10/100 Pod is a powerful, full-featured analysis and monitoring system. Accessed locally or remotely by LAN Analyzer software, the LAN Analyzer Pod provides the tool necessary to effectively diagnose, troubleshoot and monitor any full or half-duplex 10/100 Ethernet network.

Field service personnel require a portable, lightweight system that can quickly locate the source of a problem. The size of a laptop PC, the LAN Analyzer Pod connects to a laptop running LAN Analyzer software through a 10/100 Ethernet port.

Network operations personnel need both a powerful troubleshooting device and a monitoring system that can provide a real-time view of the network. LAN Analyzer Pod's high performance architecture, consisting of silicon-accelerated hardware and a MIPS R4000 processor, can capture every packet and troubleshoot network problems at even the highest 10/100 Ethernet network loads.

LAN Analyzer Pod is also the ideal system to deploy in the wiring closet. Rack mounted with 10/100 Ethernet switches, hubs, and routers, LAN Analyzer Pod can collect information from any segment directly connected to the system. When connected to Agilent's multiport taps, LAN Analyzer Pod provides troubleshooting and monitoring capabilities for up to 12 segments. LAN Analyzer Pod can also be deployed remotely at those locations not frequented by technicians or field support personnel. Deployment at these remote locations and strategic points in the network provide an effective way to manage many Ethernet segments. Just connect the management port to any 10/100 Ethernet segment and it becomes accessible from any LAN Analyzer system on the network.

Technical	Specifications	Operational Specifications	
		Analyzer Ports	10/100 RJ-45,
			10/100 MII
		Analyzer Port LEDs	Link, 10/100Mbps
		Management Port	10/100 RJ-45
		Management Port LEDS	Power, Status, Link,
			10/100Mbps
		Console Port	9-pin serial port connects to PC
		LAN Analyzer Tap Port	9-pin serial port connects to LAN Analyzer
			single or 12-port tap
21		Management	SNMP, Telnet

Environmental Specifications

Temperature	
Operational	0° to 40° C
Non-operational	-10° to 65° C
Humidity	10 - 95% non-condensing
Electromagnetic	FCC Class A, CE
Compatibility	
Safety	UL, CUL, TUV

Power Specifications

Power Consumption75WFuse Protection2.5A 250Input Voltage Range90 to 138Input Frequency47 to 63Inrush Current (Peak)27A 115

2.5A 250V 90 to 135 VAC, 180 to 270 VAC 47 to 63 Hz 27A 115 VAC, 54A 230 VAC

Physical Specifications

Height	2.6 in / 6.5 cm
Width	12.2 in / 31.1 cm
Depth	9.0 in / 22.9 cm
Weight	7.0 lb/3.2 kg
Mount	19" rack mount

LAN Analyzer Pod Deployment



Figure 14

LAN Analyzer Pod can be deployed as both a portable or rack-mountable integrated 10/100 Ethernet analyzer plus monitor system. The size of a laptop PC, a field service engineer can connect LAN Analyzer Pod directly to the network segment to be viewed. Rack mounted in a wiring closet, LAN Analyzer Pod can be attached to a LAN Analyzer Tap to transparently analyze multiple Ethernet segments. LAN Analyzer Pod's management port connects to any 10/100 Ethernet port in the network, thereby enabling it to be managed by any LAN Analyzer system installed with the LAN Analyzer Distributed software module.

J5430A LAN Analyzer Gigabit

Full wire-speed data capture does not miss a single packet

Features

- Silicon-accelerated hardware engine captures and transmits at full-line rate simultaneously.
- 128 MB of capture/transmit buffer.
- Filter on any part of a packet; up to four filters may be applied to every packet.
- Packet slicing with 32, 64, 128 byte options preserves buffer space.
- Supports 1000Base LX or SX with hot swappable G-BIC snap-in modules.
- Save packet buffer directly to disk.
- Dual modules can provide a single, seamless view of full-duplex gigabit network traffic.
- Fault tolerant fiber taps provide uninterrupted network service while attaching or moving LAN Analyzer Gigabit.
- Captures and counts Gigabit Ethernet error packets.
- Supports simultaneous full bandwidth capture and transmit operation.
- Precise timestamp resolution of 25ns.

LAN Analyzer Gigabit

The LAN Analyzer Gigabit is a silicon-accelerated 1000Base SX/LX analyzer providing unique solutions to network analysis and equipment test needs.

Analysis

To accurately and efficiently analyze or troubleshoot a network, the Network Engineer needs to:

- See 100% of the traffic, even under full load, including all errors and anoma lies.
- Sort through the mass of Gigabit traffic quickly to find the data of interest or sources of problems.
- Do the analysis transparently without breaking links or degrading service.

LAN Analyzer Gigabit fulfills these needs with its unique features and capabilities.

- LAN Analyzer Gigabit was designed to be fast. It captures the data stream at full Gigabit line rate including corrupted, fragmented, and oversize anomalies without skipping a single packet.
- LAN Analyzer Gigabit is smart. To speed the search for that needle-in-thehaystack, LAN Analyzer Gigabit's multiple, configurable Boolean hardware filters allow you to selectively capture the precise traffic that fits your analysis criteria. Using LAN Analyzer Gigabit and the LAN Analyzer software suite as your key analysis tools helps you manage the analysis of the otherwise overwhelming quantity of traffic generated by a gigabit network.
- You don't have to break links to analyze your network.



To insure that you never impact user service, Agilent Technologies' external Gigabit Fiber Optic Taps let you insert the LAN Analyzer Gigabit into the full data stream without stopping traffic. Other analyzers with their internal taps demand that links be broken to insert the analyzer into the data stream or require the use of a mirror port. But a mirror port of a switch may not forward anomalies and other parts of the data streams, thus screening out a valuable source of troubleshooting information.

Testing

As a test tool, LAN Analyzer Gigabit's capability as a traffic generator is unparalleled. Not only can it generate packets ranging from 24 bytes to 15,000 bytes, but it can transmit at full line-rate on Gigabit networks. LAN Analyzer Gigabit can also capture and transmit simultaneously, making it the ideal tool to test the full-duplex capability of a network device. With the precise timestamp resolution of 25 nanoseconds, LAN Analyzer Gigabit provides the accuracy to test most any Gigabit network device.

LAN Analyzer Gigabit uses hot swappable snap-in G-BIC modules with duplex SC connectors for either 1000 BASE-SX single mode or 1000 BASE-LX multi mode media. G-BICs may be ordered separately to allow for convenient conversion between the two media.

Interface Functionality	
Capture Performance:	>1,488,090 pps
Capture Filter:	Hardware-based, up to 4 filters may be applied on
Error Packets:	Captures and counts all Gigabit Ethernet error packets
Packet Slicing:	32 byte, 64 byte, 128 byte, or full packet options
Timestamp Resolution:	25 nanoseconds
Full-Duplex Receive:	Synchronizing two interfaces provides a single, seamless view of full-duplex network traffic
Capture/Transmit:	Support for simultaneous capture and transmit
Transmit Performance:	>1,488,090 pps
Transmit Functions:	Generate packets from 24 bytes to 15,000 bytes, transmit error packets, transmit packets from capture buffer
Operational Specification	S
Network Ports:	Gigabit industry standard G-BIC Interface available as SX or LX snap-in modules
Network Media:	1000 Base-SX multimode or 1000 Base - LX single mode SC connectors
LED Indicator:	Link state and test
Capture/Transmit Buffer:	128MB
Power Specifications	
Power Consumption	75W
Fuse Protection	2.5A250V
Input Voltage Range	90 to 135 VAC, 180 to 270 VAC
Input Frequency	47 to 63 Hz
Inrush Current (Peak)	27A 115 VAC, 54A 230 VAC
Physical Specifications	
Height	2.6 in / 6.5 cm
Width	12.2 in / 31.1 cm
Depth	9.0 in / 22.9 cm
Weight	7.0 lb / 3.2 kg
Mount	19" rack mount

Technical Specifications

J199x LAN Analyzer Tap Family

Eliminate the need to break a connection each time a segment needs to be analyzed

Features

- Allows an analyzer to be inserted into a full-duplex 10/100/1000 Ethernet segment.
- Eliminates the need for network connections to be broken, minimizing network downtime when an analyzer is needed.
- Support for full- or half-duplex segments:
 - 1000Base-SX or LX
 - 100Base-TX or FX
 - 10Base-T or FL
- Fault tolerance:
 - Bypass circuit on power failure.

Manual bypass switch for individual segments on

a LAN Analyzer 12-Tap.

Completely passive, fail-safe tap for fiber.

- Analyze individual segments or rove between segments using a LAN Analyzer 12-Tap.
 - Software control through serial interface or across LAN when connected to a LAN Analyzer.
 - Manual control through push button on unit.

Benefits



• Cost-effective support for switched networks.

- Fault-tolerant design.
- View VLAN traffic.
- Minimize network downtime by leaving taps in place.

While switched LANs have dramatically increased bandwidth, they have also introduced the problem of visibility into full-duplex switched LANs. Analyzers cannot plug into multiple point-to-point full-duplex links to monitor them. "Port mirroring" is a partial answer but has limitations in that error packets and VLAN information is not duplicated to the mirror port. Further, mirror ports do not work well for full-duplex connections—one of the primary uses of Fast Ethernet links.

Enter the LAN Analyzer Tap family of products, a line of fault-tolerant wiring devices that may be inserted into full- or half-duplex 10 or 100 Mbps Ethernet links for use with the LAN Analyzer, LAN Analyzer Pod or third-party 10/100 Ethernet probes and LAN Analyzers. LAN Analyzer Taps provide a cost-effective and unique way for analyzers to see all of the traffic on one or more previously "blind" full-duplex links.

The combination of the LAN Analyzer plus LAN Analyzer Taps presents a more effective solution than analyzers that can only view a single full-duplex 10/100 Ethernet segment:

- LAN Analyzer Taps eliminate the need for network connections to be broken and re-cabled each time a network segment needs to be analyzed.
- In networks with multiple full-duplex links LAN Analyzer with LAN Analyzer Taps are much more cost-effective
- LAN Analyzer Tap-12 provides the ability to view up to twelve full-duplex segments from a single LAN Analyzer or LAN Analyzer Pod.

In addition, LAN Analyzer Taps eliminate many of the problems commonly associated with the use of a switch mirror port:

- Switch performance degradation.
- Inability to mirror errors such as undersize and oversize packets, and packets with a bad CRC.
- Inability to view VLAN traffic
- Poor full-duplex support.





Full-Duplex 10/100/1000 Ethernet Splitters

J1990A LAN Analyzer Tap

- Supports a single full- or half-duplex 100Base-TX or 10Base-T connection.
- External 9V AC power supply.
- Provides fault-tolerant bypass circuit on power failure.

J1991A LAN Analyzer Tap-12

- Supports up to 12 full- or half-duplex 100Base-TX and 10Base-T connections.
- Fault-tolerant, automatic bypass circuit on power failure.
- Manual bypass switch for individual segments.
- Rove analyzer between segments through software (local or remote) or manual push button.
- 19" rack-mountable.

J1992A LAN Analyzer Tap-Fiber

- Supports a single full- or half-duplex 100Base-FX or 10Base-FL connection.
- Supports multimode fiber (SC connectors).
- Completely passive device eliminates need for power supply.
- Absolute fail-safe operation.

Specification	LAN Analyzer-Tap	LAN Analyzer-Tap Fiber	LAN Analyzer-Tap-12
Network Ports	1 pair 100Base TV er 10Base T	Two Duplex SC connectors	12 pairs
/Iviedia Monitor Porto	100Base-TX of TUBase-T	Multimode fiber (62.5/125mm)	
INDINION FOILS	i pan Power	Iwo Simplex SC connectors	i pan 12 Tap. 12 Monitor
	Fower	none	Status Power
Push Buttons	N/A	N/A	Advance, Bypass
Console Interface	N/A	N/A	VT-100 (DB-9)
Latency	Less than 1 bit time	0	Less than 1 bit time
	@ 100Mbps	•	@ 100Mbps
Insertion Loss	N/A	≤ 5.0dB	N/A
Power Consumption	1.5W	N/A	18W
Fuse Protection	Internal to Class II supply	N/A	2 A, Internal to power
			Supply
Input Voltage	Depends on Class II supply	N/A	85 to 265 VAC
Input Frequency	47 to 63 Hz	N/A	47 to 63 Hz
Heat Dissipation	5.12 BTU/hr	N/A	60 BTU/hr.
Height	1.1 in/2.8 cm	5.0 in/12.7 cm	1.7 in/4.4 cm
Width	4.1 in/10.4 cm	1.2 in/3.05 cm	17.0 in/43.2 cm
Depth	3.47 in/8'.8 cm	4.5 in/11.5 cm	9.0 in/22.9 cm
Weight	5.5 oz/156 g	8.3 oz/235.4 g	6.2 lb/13.6 kg
Mount	Free standing	Free standing/19" rack mount	19" rack mount/table top
Operational Temperature	0° to 40° C	-40° to 80° C	0° to 40° C
Storage Temperature	-10° to 65° C	-40° to 85° C	-10° to 65° C
Operational Humidity	10 - 95% non-condensing	85% @ 85° C non-condensing	10 - 95% non-condensing
Storage Humidity	10 - 95% non-condensing	85% @ 85° C non-condensing	10 - 95% non-condensing
Electromagnetic			
Compatibility	FCC Class A	N/A	FCC Class A, CE
Satety	N/A (low voltage)	N/A	UL, CUL, TUV

Technical Specifications

Related Literature

LAN Analyzer Product Suite

Photo Card

5968-9599E

Warranty

Hardware: 1 year warranty Software: 90 day replacement only

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E-mail to: csp_telesales@agilent.com	Phone Number
Visit our web site	Fax Number
www.agilent.com/comms/onenetworks	Do you have a budget set for this application? Yes No In process
	What is your time frame to implement this product? 30 days 180 days 90 days Other – (please define)
Product(s) of Interest	
The Agilent Advisor – Integrated Advisor LAN Advisor WAN Advisor ATM	d, High-Performance Troubleshooting for:
 The LAN Analyzer – Scaleable E Telegra Fax Test – Fax Protocol Telegra Voice Quality Tester – 	Ethernet and Token Ring Test Solutions and Low Generation Analysis Detailed Voice Analysis for Clarity, Echo and Delay using
 Telegra Voice and Fax over If FASTest – Automated Service Ver 	PSQM and PAMS – Protocol Analysis rification for PSTN and IP Networks
What is the main problem you need to solve on your networ	u :k?



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The LAN Analyzer Product Suite is Y2K Compliant

Agilent Ordering Information

LAN Analyzer Software		LAN Analyzer Accessories	
J1950A J1951A J1952A J1953A J5431A PDK	LAN Analyzer Software Expert Software Distributed Software Active Software VoIP Software Protocol Development Kit	J1990A J1991A J1992A	Full Duplex Ethernet Tap LAN Analyzer Tap 12 LAN Analyzer Tap Fiber

LAN Analyzer Hardware

LAN Analyzer Training

J1970A	LAN Analyzer 10/100 Pod	J5400A	Interactive Multimedia CBT Family
J1974A	LAN Analyzer 10/100 Card	Opt 200	Single User License
J1980A	LAN Analyzer Portable	Opt 224	24 User License
J5430A	LAN Analyzer Gigabit	Opt 299	99 User License

Get a Free Trial Version of LAN Analyzer Software

Simply visit our website at www.agilent.com/comms/onenetworks to download your free 15 day trial version of this powerful, integrated analyzer and monitor software for 10/100/1000 Ethernet and 4/16 Token Ring networks. All of the software modules described in this document are available for you to try. And while you're on line, check out the complete list of protocols you can test with LAN Analyzer products.

By internet, phone or fax, get assistance with all your Test and Measurement needs.

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