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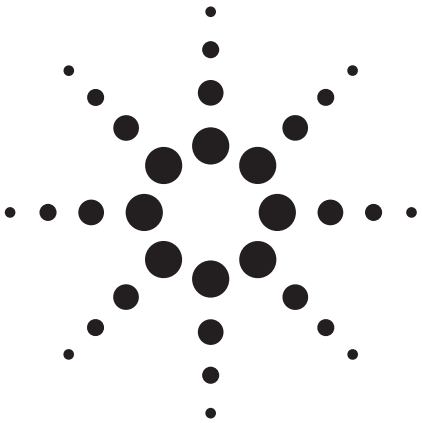
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Network Analyzer Family

Data Sheet



Agilent Technologies

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Agilent Technologies Network Analyzer Products

The Agilent Network Analyzer product family includes:

- Distributed Network Analyzer PRO (DNA PRO), a portable test platform designed for local and remote dispatched troubleshooting, and for distributed use in conjunction with the Network Troubleshooting Center (see below). It incorporates one acquisition system (enabling measurements on WAN† and LAN interfaces) and an embedded controller that runs Network Analyzer Software. It can be controlled via 10/100/1000 Mb/s Ethernet, 56 kb/s dial-up or, optionally, 802.11a/b/g WLAN.

- Distributed Network Analyzer MX (DNA MX), a rack-mountable test platform designed for remote troubleshooting, and for distributed use in conjunction with the Network Troubleshooting Center (see below). It incorporates one acquisition system (enabling measurements on WAN† and LAN interfaces) and an embedded controller that runs Network Analyzer Software. It can be controlled via 10/100/1000 Mb/s Ethernet or 56 kb/s dial-up.

- Distributed Network Analyzer (DNA), an ultra-portable test platform incorporating one acquisition system, operated and controlled from a PC running Network Analyzer Software (included), from the Distributed Network Analyzer PRO, from the Distributed Network Analyzer MX or from the Network Analyzer.

  Multiple DNAs can be daisy-chained together from a DNA PRO, DNA MX, Network Analyzer or PC to form a multi-interface, multi-technology test system, where all measurements are automatically synchronized to within 100ns. Alternatively, the DNA can act as a remote hardware agent in distributed systems, operating in client server mode.

  The acquisition systems for the DNA PRO, DNA MX, DNA and Network Analyzer are functionally identical and operate with the same Line Interface Modules (LIMs). LIMs are available for LAN and WAN† at rates up to 1 Gb/s.

- Network Analyzer, a compact portable test system incorporating two acquisition systems (enabling dual-port measurements on WAN† and LAN interfaces), PC, keyboard, and display, and running Network Analyzer Software.

- Distributed Network Analyzer ME (DNA ME), a portable/rack-mountable test system for use in conjunction with the Agilent Network Troubleshooting Center for remote/distributed 10/100 Mb/s Ethernet LAN testing. This product runs Network Analyzer Software.

- Network Analyzer Software is shipped on a CD as a standalone product and with the Distributed Network Analyzer to run on a PC system. It is also factory installed on the Network Analyzer, DNA PRO, DNA MX and DNA ME platforms. It has the following operation modes.
  - Controls the LIM based acquisition systems.
  - Supports LAN testing (10/100/1000 Ethernet, Token Ring) on the local PC system fitted with a Network Driver Interface Specification (NDIS) network interface card (NIC), and controls the Network Analyzer Software NDIS Server.
  - Performs off-line post-process analysis of LAN or WAN† data captured with all Network Analyzers, an Agilent Advisor or a NIC.

- Network Analyzer NDIS Server is able to connect to an NDIS-based NIC and capture data in promiscuous mode, performing various analysis tasks. It is controlled by client software (Network Analyzer Software) running on a separate PC.

- Network Troubleshooting Center (NTC) is a software product that allows the user to access, control and retrieve results from multiple remote analyzers to perform network-wide troubleshooting from a central location. In addition to troubleshooting of LAN and WAN† networks, the Network Troubleshooting Center also supports SNMP access to MIB-II, RMON and RMON2-compliant agents in network equipment.

  The acquisition systems in the DNA PRO, DNA MX, DNA and Network Analyzer, accept any available LAN or WAN line interface module (LIM) operating at rates up to 1 Gb/s. The acquisition system is designed to perform real-time analysis on traffic for troubleshooting and baselining purposes and to capture traffic at full line rate from all ports of any LIM into capture memory for protocol analysis. A sophisticated auto-encapsulation detection feature (patent pending) coupled with advanced hardware capture filters allows users to drill down into network traffic of interest and optimize the use of capture memory.

† WAN includes ATM throughout this specification.

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LAN LIMs currently exist for 10Base-T & 10/100Base-TX, 10/100Base-FX, and 1000Base-X (with optical fiber and copper interfaces).

Cell and frame-based WAN LIMs exist for E1/T1, E3/T3, STM-1o/OC-3, STM-4/OC-12/ STM-1/OC-3, V-Series (e.g. RS-232, etc.), HSSI, ATM25 and multi-port E1/T1 (with optional IMA support). When ATM is being analyzed, real-time AAL-5 and/or AAL-2 reassembly is performed on multiple virtual channels simultaneously and the resulting frames are transferred from the LIM to the main acquisition hardware for capture or further real-time analysis; a cell mode is also available for the user wanting to perform cell-specific measurements and analysis.

All LIMs are hot-swappable: the application automatically alerts the user that a LIM has been removed. The user may then launch the appropriate new technology-specific application when another LIM is inserted without risking damage to the LIM or having to power down and restart the analyzer.

External interfaces are provided for Global Positioning System (GPS) receivers, permitting accurate time-synchronization of multiple analyzers located in different geographical locations.

The DNA ME is a standalone platform with a built-in processor and NDIS-based 10/100 Mb/s Ethernet LAN test interfaces designed to be used with distributed LAN testing in corporate/enterprise environments. It runs Network Analyzer Software and is accessed from a user's PC using Network Troubleshooting Center software, a basic version of which is supplied (this basic version is also supplied with the DNA MX).

The Network Analyzer NDIS Server runs on a PC fitted with a 10/100/1000 Mb/s Ethernet, Token Ring or FDDI NDIS-based NIC. It is controlled from Network Analyzer Software on a local PC or Network Analyzer.

Network Analyzer Product	Distributed Network Analyzer support	Local NDIS NIC support	Network Analyzer NDIS Server support	Off-Line Analysis	Use as Agent or RMON for NTC
Network Analyzer	Yes	Yes	Yes	LAN/WAN/ATM	Yes
DNA PRO	Directly connected only	Yes	n/a	LAN/WAN/ATM	Yes
DNA MX	Directly connected only	Yes	n/a	LAN/WAN/ATM	Yes
DNA*	Yes†	Yes†	Yes†	LAN/WAN/ATM†	Yes†
DNA ME	Can access one DNA	Yes	n/a	LAN/WAN/ATM	Yes
Network Analyzer Software	Yes	Yes	Yes	LAN/WAN/ATM	Yes
Network Analyzer Software – Professional Edition	No	Yes	Yes	LAN/WAN/ATM	No
Network Analyzer Software – Standard Edition (freeware)	No	Yes	No	LAN only	No

* For Distributed Network Analyzer, Network Analyzer Software is included on CD with a single-use license

† From associated PC with Network Analyzer Software installed

Scope of this Data Sheet

This data sheet covers all the main Agilent Network Analyzer hardware products and the major accessories, plus hardware-based lower-layer capabilities and measurements; it also provides an overview of software platforms and add-on software products.

For a full description of the measurements and other capabilities, particularly at higher layers, please refer to the relevant Technical Overview listed in the Related Literature section on page 36.

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What's New in this Release

There are several new features in the latest release of the Network Analyzer product family. Details of application software capabilities and enhancements can be found in the Network Analyzer Family Technical Overview. This data sheet describes mainly hardware capabilities and enhancements, including firmware upgrades. Here are the main new added features:

- Distributed Network Analyzer PRO – an important new hardware platform
- Instrument Manager – Distributed application to manage and access remote DNA PROs and DNA MXs
- In addition to the existing IMA capabilities, multi-port ATM analysis is now available on the J6824A 8-port E1/T1 LIM, providing simultaneous ATM analysis on both directions of up to eight E1 or T1 interfaces
- Frame Relay over SONET/SDH analysis up to 622Mb/s

Hardware Platforms

Network Analyzer

The J6800A Network Analyzer is designed to address the real-time dispatched troubleshooting use model. It is a portable "all under one handle" system that includes two time-synchronized acquisition systems plus a PC with a keyboard and a large bright display. Each acquisition system supports any available LAN or WAN† plug-in Line Interface Module (LIM). There is also support for an external GPS receiver, allowing global synchronization of the analyzer. Should testing with more than two interfaces be required, the Network Analyzer supports daisy-chaining of multiple DNAs with full time synchronization between all test interfaces.

Network Analyzer Software running on the PC is used to control the internal acquisition systems and any attached DNAs. It also collects and post processes results from these systems.

Note that the internal PC is not used for real-time processing of measurements – this is all done in the acquisition systems and LIMs. This acquisition system processing allows the PC to handle multiple internal and external data acquisition systems simultaneously without impacting measurement performance.

Distributed Network Analyzer PRO

The new J6803A DNA PRO is a portable analyzer with a built-in acquisition system that supports any available LAN or WAN† LIM. It includes an embedded processor with removable hard disk drive storage and a built-in power supply. Should testing with additional interfaces be necessary, the DNA PRO also supports multiple directly attached J6801A DNAs with full time synchronization between the test interfaces.

Network Analyzer Software running on the embedded processor is used to control the internal acquisition system and attached DNAs. The DNA PRO is accessed and controlled from an external PC via a Windows-based Web browser or Network Troubleshooting Center (NTC) software. For fully centralized network troubleshooting using multiple analyzers, the J6782A Network Troubleshooting Center software provides a scalable solution.

There is support for an external GPS receiver, allowing global synchronization of the analyzer. As an alternative means for time synchronization, the DNA PRO operating system may be time synchronized via the Network Time Protocol (NTP) to an external NTP server.

For telemetry purposes, a choice of 10/100/1000 Mb/s PC-card or combo 56 kb/s modem and 10/100 Mb/s PC-card is included as standard with each DNA PRO. Additionally, optional region-specific 802.11a/b/g WLAN telemetry support is available. This flexible access to the analyzers allows a novel and very useful mode of operation. Consider the scenario where a DNA PRO is located close to network equipment, perhaps in a locked cabinet. An engineer could access and control the DNA PRO via a secure wireless connection from a laptop or PDA to the DNA PRO itself.

The DNA PRO and the DNA MX (described next) are designed to address two use models:

- *Dispatched Remote Troubleshooting,* in which, for example, a support engineer wanting to avoid a "truck roll" would dispatch the analyzer by courier to a customer site; the customer would connect the test interfaces of the analyzer to the network in trouble and connect the analyzer modem to the phone line. By having dial-up access, firewall issues associated with connection via the Internet are avoided, and the support engineer can easily access the analyzer to perform the testing.

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- *Distributed Remote Troubleshooting,* in which the analyzer is normally controlled remotely from a network operations center (NOC) via an Ethernet-based LAN connection, but sometimes needs to be accessed over a dial-up phone line via a built-in modem as an out-of-band back-up alternative.

With either use model, it might be required that the analyzer can be commanded to start measurements that will continue to run autonomously when the telemetry connection is dropped, with results being retrieved later in a subsequent connection; the DNA PRO and DNA MX both support this mode of operation.

Distributed Network Analyzer MX

The J6802B DNA MX is a rack-mountable analyzer with a built-in acquisition system that supports any available LAN or WAN LIM. It includes an embedded processor with removable hard disk drive storage, CD-RW drive and a built-in AC mains or -48 V DC power supply. Time synchronization options are similar to those described earlier for the DNA PRO. Should testing with additional interfaces be necessary, the DNA MX supports multiple directly attached J6801A DNAs with full time synchronization between the test interfaces.

† WAN includes ATM throughout this specification.

Network Analyzer Software running on the embedded processor is used to control the internal acquisition system and any directly attached DNAs. The DNA MX is accessed and controlled from an external PC via a web browser (requiring no other software) or from a PC that is running Network Troubleshooting Center software. For fully centralized network troubleshooting using multiple analyzers, the J6782A Network Troubleshooting Center software provides a scalable solution.

Included with each DNA MX is a choice of 10/100/1000 Mb/s PC-card or combo 56 kb/s modem and 10/100 Mb/s PC-card for telemetry purposes.

Distributed Network Analyzer

The J6801A DNA consists of one acquisition system that supports any available LAN or WAN LIM, plus a built-in power supply. It has its own IP address and is controlled via TCP/IP over Ethernet from a standard PC running the Network Analyzer Software (included with the analyzer for use with the controlling PC), or directly from a DNA PRO, DNA MX or Network Analyzer.

DNAs can be used in standalone mode connected to a PC, or daisy-chained together to create multi-port test systems. Distributed remote operation is possible, allowing one or more DNAs to be operated remotely over a LAN. Also, Agilent's proprietary Control & Sync system allows 100 ns resolution time synchronization between directly interconnected analyzers via the Ethernet cable. There is also support for an external GPS receiver, allowing global synchronization of the analyzer.

Distributed Network Analyzer ME

The J6805A DNA ME is designed to address enterprise LAN network testing. It has an embedded processor with two half-duplex or one full-duplex 10/100Base-TX test interfaces.

This analyzer addresses the *Distributed Remote Troubleshooting* use model focused on the Enterprise market in which the analyzer is controlled remotely from a network operations center (NOC) via a dedicated Ethernet-based LAN telemetry port.

Network Analyzer Software running on the embedded processor performs analysis using the NDIS†-based test interfaces. The DNA ME operating system may be time synchronized via the Network Time Protocol (NTP) to an external NTP source. The DNA ME is accessed and controlled from an external PC which is running Network Troubleshooting Center software. For fully centralized network troubleshooting using multiple analyzers, the Network Troubleshooting Center software provides a scalable solution.

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Software Products

Network Analyzer Software

The J6840A Network Analyzer Software is comprehensive software for accessing and managing all hardware in the Network Analyzer product family plus local NDIS†-based NICs. It provides:

- All available protocol analysis of LAN and WAN (which includes ATM) and mobile networks, including protocol decoding, protocol vitals, statistical analysis and expert analysis.
- Control for the Network Analyzer NDIS Server.
- Full off-line analysis of data previously captured on Network Analyzer and Agilent Advisor systems, including data collected from NDIS† NICs.

Network Analyzer Software is pre-loaded and enabled on the Network Analyzer, DNA PRO and DNA MX platforms and is supplied on CD with the Distributed Network Analyzer platform together with a single-use license, enabling the user to access a Distributed Network Analyzer from a PC.

Network Analyzer NDIS Server

The J6835A Network Analyzer NDIS Server is able to connect to an NDIS†-based NIC and capture data in promiscuous mode, performing various analysis tasks. This server is accessed from the Network Analyzer Software client and does not, itself, contain any analysis GUI.

Network Troubleshooting Center

The Network Troubleshooting Center (NTC) can access, control and retrieve results from multiple remote analyzers (the number supported simultaneously depends on the option chosen), providing the ability to troubleshoot networks of various sizes from a central location. NTC also supports SNMP access to MIB-II, RMON and RMON2-compliant agent MIBs in network equipment.

† NDIS: Network Driver Interface Specification

Acquisition Platform Specifications

There are currently five acquisition platforms in the Agilent Network Analyzer product family.

J6803A Distributed Network Analyzer PRO

One acquisition system (see the Acquisition System sub-section)
Built-in controller:
- 1.6 GHz Intel Pentium M CPU
- 1 GB DDR 333MHz memory
- Removable 60 GB hard disk drive

Telemetry ports, four options:
- Single-port 10/100/1000 Ethernet (default)
- Combo 10/100 Ethernet/ 56kbps modem
- Dual-port 10/100/1000 Ethernet
- Optional 802.11a/b/g wireless LAN (region specific)

Two USB 2.0 ports
Time Synchronization:
- GPS: via 10 MHz (75 Ohm), 1 pps (75 Ohm) & RS-232C from external GPS receiver
- NTP: Network Time Protocol via 10/100 Ethernet telemetry port from external NTP server

Network Analyzer Software pre-loaded on built-in controller
Network Analyzer Instrument Manager (for downloading to controlling PC)
System Recovery CD
Run-Time Store to Media

J6802B Distributed Network Analyzer MX

One acquisition system (see Acquisition System sub-section below)
Built-in controller:
- 2.8 GHz Intel Pentium 4 CPU
- 1 GB DDR 333MHz memory
- Removable 120 GB hard disk drive

CD RW drive
Telemetry/Auxiliary ports, three options:
- Single-port 10/100/1000 Ethernet (default)
- Dual-port 10/100/1000 Ethernet
- Combo 10/100 Ethernet/ 56kbps modem

Two USB 2.0 ports
Time Synchronization:

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GPS: via 10 MHz (75 Ohm), 1 pps (75 Ohm) & RS-232C from external GPS receiver
NTP: Network Time Protocol via 10/100 Ethernet telemetry port from external NTP server
Network Analyzer Software pre-loaded on built-in controller
Network Analyzer Instrument Manager (for downloading to controlling PC)
System Recovery CD
Run-Time Store to Media
Optional -48 V DC Power Supply Available

J6801A Distributed Network Analyzer
One acquisition system (see the Acquisition System sub-section below)
Built-in power supply
Network Analyzer Software CD with a single-use license
Control: TCP/IP over 10/100Base-TX via RJ-45 Control & Sync In connector from:
Control & Sync Out connector of a Network Analyzer, DNA PRO, DNA MX or another DNA
a standard PC/laptop directly connected via Ethernet, or indirectly connected via a LAN or an Internet
Time Synchronization:
Control & Sync: From an upstream a Network Analyzer, DNA PRO, DNA MX or DNA via the Control & Sync In interface (see more details below),
GPS: via 10 MHz (75 Ohm), 1 pps (75 Ohm) & RS-232C from external GPS receiver
Run-Time Store to Medium

J6800A Network Analyzer
Two acquisition systems (see the Acquisition System sub-section)
Built-in PC controller:
700 MHz Intel Pentium III processor
256 MB memory
Removable 30 GB (or larger) hard disk drive (also available as the J6750A accessory)
14" Ultra VGA Bright Active Color Industrial Display
Keyboard and Touchpad pointing device
CD-RW drive
Dual PC CardBus slots
PC-related external interfaces:
Dual USB
PS2 (for external mouse)
External display
Operating System: Microsoft Windows XP Professional®
Time Synchronization:
GPS: via 10 MHz (75 Ohm), 1 pps (75 Ohm) & RS-232C from external GPS receiver
NTP: Network Time Protocol via 10/100 Ethernet telemetry port from external NTP server
Network Analyzer Software pre-loaded on built-in PC controller
System Recovery CD
Combo 10/100 Ethernet/56kb/s modem network interface PC card and optical USB mouse are supplied
Run-Time Store to Media

J6805A Distributed Network Analyzer ME
Dual 10/100Base-TX NDIS-based test interfaces for testing two half-duplex or one full-duplex interface.
Built-in controller with 10/100Base-TX telemetry port
Built-in power supply
Time Synchronization:
Network Time Protocol (NTP) via 10/100 Ethernet telemetry port from external NTP server
Network Analyzer Software pre-loaded on built-in controller
Software to access/control the unit from a PC running Windows, 2000, XP or NT 4.0 SP5
System Recovery floppy disk

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Acquisition System
Two instances of the acquisition system are used in the Network Analyzer and one is used in the DNA PRO, the DNA MX and the DNA; the specifications are identical for the acquisition systems used in all four platforms.

Detailed specifications
Accepts any LAN or WAN† LIM (currently up to 1 Gb/s)
LIMs can be hot-swapped
Operates on two ports per LIM
Operates with the following link-layer technologies:
- ATM
- CiscoSLE
- Ethernet
- Frame Relay
- HDLC/SDLC
- LAPB
- LAPD
- Packet over SONET/SDH (IETF RFC 2615/1662, 1619/1662, Cisco HDLC)
- PPP (RFC 1662, 1663)

Embedded processor: Intel X-Scale 450
Capture buffer:
- Capture rate: Full line rate per port on any installed LIM up to 1 Gb/s
- Buffer memory size (used for user data and associated analyzer overhead): user adjustable up to 256 MB, shared equally between both ports
- Data time stamping: 100 ns

Hardware real-time capture filters:
- 100% line rate filtering
- 32 filters

Auto-encapsulation discovery for LAN over WAN†
Traffic Generation:
- At 100% line rate for LAN and ATM
- Scenario replay for LAN

† WAN includes ATM throughout this specification

Control & Sync
Multiple DNAs can be daisy-chained together with a standard UTP-5 cable and controlled from a PC, from a Network Analyzer, from a DNA PRO or from a DNA MX.

Each DNA gets time-synchronization signals via the UTP-5 cable from the upstream analyzer (including an upstream Network Analyzer, DNA PRO or DNA MX, if present). No configuration is necessary. The first analyzer in the daisy-chain provides the actual time shared, and this time can, itself, be derived from an attached GPS time source, NTP server, or, in the absence of these, from the internal clock of the attached PC or Network Analyzer. Cabling between analyzers is between the Control & Sync Out RJ-45 connector on the upstream analyzer and the Control & Sync In RJ-5 connector on the downstream analyzer.

Time synchronization can be performed between Network Analyzer platforms with similar LIMs with a time accuracy of:

- +/- 100 nanoseconds for high-speed LIMs (greater than 2.05 Mbps), excluding DS1 channelization of DS3 LIMs.

- +/- 5 microseconds for low-speed LIMs (2.05 Mbps and less), including DS1 channelization of DS3 LIMs.

Time synchronization can also be performed between Network Analyzer platforms with dissimilar LIMs with a time accuracy no worse than the sum of accuracies of each individual LIM type.

Time accuracy specifications exclude any distance-dependent propagation delay due to the interconnection cable.

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Detailed specifications

Maximum number of daisy-chained DNAs: 8

(Recommended maximum for the number of DNAs daisy-chained from a Network Analyzer is four, providing support for a total of six LIMs; the DNA PRO and DNA MX each support seven DNAs; for controlling eight DNAs, it is recommended that a 1GHz or faster PC be used as the controller)

Maximum length of UTP-5 cable between any two analyzers (including a Network Analyzer, DNA PRO or DNA MX, if present): 10 m

Maximum total length of UTP-5 cable between all analyzers (including a Network Analyzer or Distributed Network Analyzer MX, if present): 40 m

Note: Normal Ethernet cable limitations apply to the connection between a PC and the first DNA in a chain as no Control & Sync timing information is passed between these.

Network Analyzer Software Product Specifications

Minimum Recommended PC Requirements

The minimum recommended PC requirements for running all Network Analyzer Software products and related add-on software:

Speed: 400 MHz

Memory: 256 MB

Free hard disk drive space required for installation: 350 MB

Free hard disk drive space required after installation: 150 MB

Network Analyzer Software can run on the following operating systems:

Microsoft Windows 2000®

Microsoft Windows XP®

Microsoft Windows NT® 4.0 Service Pack 5 or higher

J6840A Network Analyzer Software

A single-use license key for the Network Analyzer Software is included with the Distributed Network Analyzer acquisition platform and is auto-licensed on the DNA PRO, DNA MX, DNA ME and Network Analyzer platforms. Network Analyzer Software can also be purchased separately as the J6840A product. This software performs the following functions:

- Control of the DNA hardware via TCP/IP and control of the DNA PRO, DNA MX, DNA ME and Network Analyzer acquisition hardware.
- Network measurement and analysis for LAN and WAN environments.
- Support for network traffic acquisition and analysis using an NDIS network interface card (NIC) for LAN technologies (10/100/1000 Ethernet, Token Ring, FDDI) on the local PC.
- Control of the Network Analyzer NDIS Server (J6835A).
- Off-line Analysis, providing users with full protocol analysis capabilities on saved capture data (display filtering, searching, decoding, etc.) without connecting to acquisition hardware (e.g. DNA). Data files captured on an Agilent Advisor can also be analyzed.

For full details of the extensive capabilities of Network Analyzer Software see the Network Analyzer Family Technical Overview (the Related Literature section has ordering information).

J6839A Network Analyzer Software Professional Edition

Network Analyzer Software Professional Edition is a stand-alone application that is purchased separately. This software performs the following functions:

- Real-time network measurement and analysis for LAN and off-line analysis for LAN and WAN environments.
- Support for network traffic acquisition and analysis using an NDIS network interface card (NIC) for LAN technologies (10/100/1000 Ethernet, Token Ring, FDDI) on the local PC.
- Control of the Network Analyzer NDIS Server (J6835A).
- Off-line Analysis, providing users with full protocol analysis capabilities on saved capture data (display filtering, searching, decoding, etc.) without connecting to acquisition hardware (e.g. DNA). Data files captured on an Agilent Advisor can also be analyzed.

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J6838A Network Analyzer Software Standard Edition

The Network Analyzer Standard Edition is free network analysis software suitable for evaluation purposes and for entry-level use.

- It can determine who is on your network, who is using bandwidth, and where errors may be occurring on the network, identifying problems before they become serious issues that impact productivity and performance.
- Expert analysis tools can be used to solve network problems quickly and effectively by reducing thousands of IP and Novell frames into a handful of significant events.
- It can capture and analyze network traffic in real-time using your PC's local NDIS Ethernet adapter.
- It can analyze LAN data offline and quickly pinpoint problems on your network.

Download the software and obtain a 6-month License Key at **www.agilent.com/comms/freenetworkanalyzer.**

J6835A Network Analyzer NDIS Server

The J6835A Network Analyzer NDIS Server is a remote software agent process that is able to connect to an NDIS-based NIC and capture data in promiscuous mode, performing various analysis tasks. Measurements on 10/100/1000 Mb/s Ethernet, Token Ring or FDDI NICs are supported. This server is accessed from the Network Analyzer Software client and does not, itself, contain an analysis GUI.

Additional Software

General

All the following products (except the J6848A Report Center) require Network Analyzer Software to be present and each is activated by a single-use license key. They are supported on all platforms running Network Analyzer Software, including PCs.

Signaling Analyzer

The Signaling Analyzer software provides fast and comprehensive signaling analysis of wireless, wireline, and data communications networks. Key features such as hardware filtering, automatic configuration, multiple interface call/data session tracing, and built-in statistics help to identify and pinpoint problems and detect trends that affect customer satisfaction.

The Signaling Analyzer comes in a range of real-time and off-line products. The real-time products provide features such as call trace, message flow analysis, statistics, voice playback, and protocol decode with continuous updates, and the off-line products operate on data files previously captured on Network Analyzer hardware. The Signaling Analyzer real-time products require a J6801A DNA with an external PC, a J6803A DNA PRO or a J6802B DNA MX.

For full details of the Signaling Analyzer products, see the Signaling Analyzer Technical Overview (the Related Literature section has ordering information).

J6765A RFC2544 LAN Benchmarking License

The RFC2544 LAN Benchmarking License enables active performance testing over Gigabit and 10/100 Ethernet interfaces. Measurements include throughput, latency, frame loss, and back-to-back frames without loss, all for varying frame sizes per IETF RFC2544. This test enables fast and efficient benchmarking of network devices to certify and troubleshoot network installations. Testing is enabled over the J6830A 10/100 BaseTX, J6831A 10/100 Base FX, and J6832A Gigabit Ethernet LIMs.

J6766A Multi-Protocol Label Switching (MPLS) Analysis

The Network Analyzer family of products can connect to a variety of physical network interfaces and deliver advanced real-time analysis and statistics for MPLS Labeled Switched Paths (LSPs). The three main groups of MPLS-related protocols are covered:

- Topology determination protocols, such as OSPF, IS-IS
- Path creation protocols such as LDP, RSVP-TE
- Data forwarding protocols.

The Network Analyzer connects to layer 2/3 VPNs and can decode and analyze MPLS over layer 2 or layer 3 technologies such as Ethernet, Fast Ethernet, Gigabit Ethernet, Packet over SONET/SDH, ATM, Frame Relay, HDLC, PPP, etc. For more details, see the Network Analyzer Family Technical Overview (the Related Literature section has ordering information)

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J6825A IMA (Inverse Multiplexing for ATM) Software
This software is required for use with the J6824A Multi-port E1/T1 LIM to provide IMA functionality. Details of the IMA functionality are included in the J6824A LIM specification later in this Data Sheet

J6842A 3G UMTS W-CDMA Test Software
The 3G UMTS W-CDMA test software is a tool for engineers and technicians to install and troubleshoot 3G Radio Access Networks. The software provides various 3G protocol decodes for Iub, Iur, and Iu interfaces with extensive filtering capabilities. It enables accelerated development and deployment of 3G Radio Access Networks. For more details, please see the 3G UMTS W-CDMA Test Software Data Sheet (the Related Literature section has ordering information).

J6845A 3G cdma2000 Test Software
The 3G cdma2000 test software for the Network Analyzer makes it easy and fast to troubleshoot the new cdma2000 Ethernet based packet switched radio access and core network. The software enables protocol support for a variety of protocols used in cdma2000 as well as advanced filtering and statistics capability. Ethernet expert analysis coupled with cdma2000 filtering capability makes it quick and easy to troubleshoot 3G cdma2000 packet switched networks.

Feature Summary:
- A3, A7, A9, A11 and Radius control plane protocols supported
- A2, A5, A8, A10 user plane protocols supported
- cdma2000 protocol filters supported:
  - Mobile IP (A11)
  - Radius
  - Radius Accounting
  - IOS A9
  - GRE
  - IP in IP (IPv4 and IPv6)
  - Min IP in IP (IPv4 and IPv6)
  - UDP Port
  - Station Filters (IPv4 and IPv6 Address)

J6844A Telephony Network Analyzer
The Telephony Network Analyzer simplifies and expedites the resolution of quality and signaling problems in IP telephony networks. It provides simple and precise diagnostics of VoIP Quality of Service (QoS) through non-intrusive measurements, including new voice quality measurement technology known as predictive Mean Opinion Scores (MOS). It also provides simplified troubleshooting of call signaling and control through embedded expert analysis of VoIP protocols. As a Network Analyzer solution, the Telephony Network Analyzer supports testing over LAN and WAN networks. This powerful tool offers the most advanced VoIP signaling and service quality troubleshooting capabilities available:

- Non-intrusive voice quality measurements using breakthrough predictive MOS technology for passive voice clarity MOS scoring
- Simple analysis that exposes the impairments to voice quality
- RTCP and RTP voice session sorting and prioritization for easy drilldown to problem areas
- H.323, SIP and MGCP commentators with CDR completion statistics
- Precise measurements of IP network performance for VoIP services
- Diagnostics for troubleshooting and identifying problems at the root cause
- Simplified troubleshooting of call signaling and control to quickly turn-up or restore service

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Run-Time Store to Media

The Run-Time Store to Media application makes it easy to store massive amounts of data to the internal hard drive, any PCMCIA or USB-based storage device during application run-time. It is standard in the software and does not need a license to enable it. The amount of data that can be stored on the storage device of preference is limited only to the size of the storage device and the partition being written to. You can specify file sizes to be stored by the Run-Time Store to Media application so the files stored become more manageable by the end user. In addition, you can specify the path, file name, description of the saved data and number of files to be saved. There is also a "Next Individual File" button to manually override the size-triggered save function to quickly save smaller size files when you know you have captured a problem event.

The Run-Time Store to Media application can store data to an internal hard drive at rates of 10 Mbps or higher, depending on the average frame length and Network Analyzer platform configuration and settings. Running multiple simultaneous instances of this application may impair this performance.

J6848A Report Center

Agilent Report Center provides network baselining and benchmarking reports. This standalone Windows® application supports both the Agilent Advisor and Network Analyzer product families.

Report Center provides interactive reports with variable display intervals, intelligent thresholds, zoom capabilities and multi-segment time correlation. Output is created in Adobe Acrobat, HTML, and Rich Text Format. Please see the J6848A Technical Overview for additional information (the Related Literature section has ordering information).

J5479A Voice Quality Tester – Ethernet VoIP Interface

The Voice Quality Tester (VQT) is a comprehensive and objective voice quality test system. It enables the design, deployment, and operation of voice services on next generation networks by providing accurate and objective testing of voice service quality. The VQT provides detailed test and analysis capabilities for voice quality on modern telephony networks such as IP Telephony and Voice Over ATM.

The VQT Ethernet VoIP interface is available on the Network Analyzer's 10/100 Mbps Ethernet NIC. The VQT Ethernet VoIP interface supports VoIP call generation using the Session Initiation Protocol (SIP) and H.323, and G.711 and G.729 codecs. The VQT Ethernet VoIP interface enables testing directly into an IP network for the following applications:

- Troubleshoot voice quality impairments by segmenting an IP network for fault isolation – great for network delay and clarity analysis
- Assess voice performance of Pre-VoIP Networks
- Test voice quality for VoIP end users – VQT emulates an IP phone

A separate license key for PESQ (J1997A), PSQM+(J1983A), or PAMS (J1982A) is required. Please see the Voice Quality Tester Technical Overview for additional details (the Related Literature section has ordering information). Note that this VQT software can be used stand-alone on a PC fitted with a suitable NIC – it does not require Network Analyzer to be present.

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Network Troubleshooting Center

The Network Troubleshooting Center (NTC) can access, control and retrieve results from multiple (remote) analyzers, allowing centralized troubleshooting. It also supports SNMP access to MIB-II, RMON and RMON2-compliant agents in network equipment. A basic version of this product is included with all Network Analyzer family hardware platforms; this version has the ability to access and control Network Analyzer platforms, and to perform SNMP-based data collection from up to four interfaces simultaneously (an interface is defined as an analyzer, MIB-II or RMON2 MIB).

J6782A NTC RMON supports SNMP-based data collection from MIB-II, RMON and RMON2-compliant agents for up 500 interfaces on the UNIX version, and up to 200 interfaces on the Windows version.

For full details of this product please refer to the Network Troubleshooting Center Technical Overview (see the Related Literature section near the end of this data sheet for ordering information).

Requirements when using Network Analyzer Software with NTC

While the Network Analyzer Software will run on a wide range of Microsoft Windows® operating systems (as detailed earlier in this data sheet), it must be running on Windows XP® if it is to be accessed by Network Troubleshooting Center software. This also applies to the Network Analyzer hardware platforms, which run Network Analyzer Software internally. The J6802B DNA MX, J6803A DNA PRO and J6805A DNA ME have Network Analyzer Software running on Windows XP® internally, as does the current version of the J6800A. Earlier versions of the J6800A were supplied with the Windows 2000® operating system and will need to be upgraded to Windows XP® if they are to be used with NTC. Similarly, a PC controlling a J6801A must be running Network Analyzer Software on Windows XP® when working with NTC.

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Interface Application Support The following table shows a list of technologies supported by specific feature and related interface.

		Interface																	
		STM-4/OC-12 /STM-1/OC-3 J6810B		Four-Port STM-1/OC-3 LIM Multiplexer J6828A	STM-1o/OC-3 J6811A	E3/T3 (DS3) J6813B			T1/E1 J6815B	E1/T1 J6816B	E1 J6817B	ATM25 J6818A	V Series J6820B	HSSI J6821A	Multi-port E1/T1 J6824A		10BaseT / 10/100BaseTX J6830A	10/100 BaseFX J6831A	1000 BaseX J6832A
						T3		E3							IMA	MP			
		BULK	TRIB			BULK	TRIB	BULK											
	Currently Available	⌘		⌘	⌘	⌘			⌘	⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	⌘
Application	Pulse Amplitude / Optical Power Measurements	⌘		⌘	⌘	⌘			⌘	⌘	⌘	☒	⌘	☒	⌘		☒	☒	☒
PHY	Channelized (demultiplexing of lower rate tributaries)	⌘		☒		⌘		☒											
PHY	Line Status	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
PHY	Phyical Layer Vitals	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	⌘	⌘	⌘	⌘
ATM	Fractional E1/DS1		⌘	☒			⌘		⌘	⌘	⌘				⌘	⌘			
ATM	IMA (Inverse Multiplexing for ATM) Analysis		☒	☒			☒								⌘				
ATM	Multi-Port ATM			⌘												⌘			
ATM	ATM Layer Vitals	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	⌘			
ATM	AAL Vitals	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	⌘			
ATM	Auto-discovery of multiple VPI/VCIs	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	☒			
ATM	HW-based VPI-VCI statistics	⌘	⌘	☒	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	⌘			
ATM	Policing on multiple VCs	⌘	⌘	☒	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			☒	☒			
ATM	Real-time AAL-2 and/or AAL-5 Reassembly on 4096 VCs	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	⌘			
ATM	Real-Time Filtering	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	⌘			
ATM	ATM Decodes	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘			⌘	⌘			
ATM	Traffic Generation	⌘			⌘	⌘		⌘	⌘	⌘	⌘	☒			☒	☒			
ATM	ATM Ping	⌘			⌘	⌘		⌘	⌘	⌘	⌘	☒			☒	☒			
Frame Relay	Fractional E1/DS1		⌘				⌘		⌘	⌘	⌘				☒	☒			
Frame Relay	Frame Relay Vitals	⌘	⌘			⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Frame Relay	HW-based DLCI statistics	⌘	⌘			⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Frame Relay	Top Talkers (node/connection statistics)	⌘	⌘			⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Frame Relay	Real Time Filtering	⌘	⌘			⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Frame Relay	Frame Relay Decodes	⌘	⌘			⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Frame Relay	LMI Statistics/Commentator	⌘	⌘			⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Application	HDLC/SDLC/Cisco SLE/PoS Analysis	⌘	⌘		⌘	⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Application	HDLC/PoS Traffic Generation	☒	☒		☒	⌘	☒	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Application	HDLC/PoS Ping	☒	☒		☒	⌘	☒	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Application	PPP Analysis (excludes multilink & async)	⌘	⌘		⌘	⌘	⌘	⌘	⌘	⌘	⌘		⌘	⌘	☒	☒			
Application	ISDN Layer 3 decodes		⌘				⌘		⌘	⌘	⌘				⌘	⌘			
LAN	Buffer Replay																⌘	⌘	⌘
LAN	Traffic Generation																⌘	⌘	⌘
LAN	Ping/Arp/TraceRoute																⌘	⌘	⌘
LAN	Novell Active Tests																⌘	⌘	⌘
LAN	IP active network discovery																⌘	⌘	⌘
LAN	VLAN statistics																⌘	⌘	⌘
LAN	Real Time Filtering	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
LAN	MAC Node Statistics (Layer 2)	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	Expert Analysis	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	IPv4 and IPv6	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	Encapsulation Discovery	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	Node Discovery	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	Connection Statistics	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	Protocol Statistics	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	Protocol Commentator	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	Protocol Decodes	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	User Defined Decoding	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	MPLS Analysis (separately licensed product)	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
Higher Layers	RFC 2544 Benchmarking (separately licensed product)																⌘	⌘	⌘
Higher Layers	Telephony Network Analyzer (separately licensed product)	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘

⌘	Yes
☒	Not Yet
	Not Applicable

*ATM Layer errors are only reported in the decodes with the "A" version of this interface

Table 1 Interface Application Support

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Line Interface Module (LIM) Specifications

General

Network Analyzer LIMs provide physical layer and link layer connectivity to the embedded data acquisition and real-time systems in these products:

- J6800A Network Analyzer
- J6801A DNA
- J6802B DNA MX
- J6803A DNA PRO

They also gather physical and link layer statistics. For example, LIMs handling ATM provide real-time AAL-2 and AAL-5 reassembly on thousands of virtual channels simultaneously, and provide ATM and AAL error statistics. All LIMs have the hardware resources to generate traffic for their associated network technologies.

Connection Configurations

Unless otherwise stated, LIMs provide two input ports and two output ports allowing any of the following connection configurations:

- WAN Terminal Mode – uses one input and one output of WAN LIMs
- WAN Bridged Monitor Mode – uses both inputs and outputs of WAN LIMs for bi-directional monitoring at test access points; high input impedance should normally be selected.
- WAN Jack Monitor Mode – uses both inputs of WAN LIMs only for bi-directional monitoring at protected monitor points.
- WAN Through Monitor Mode – uses both inputs and outputs of WAN LIMs providing bi-directional repeater functionality plus bi-directional monitoring functionality. Each receiver input is terminated.
- LAN Node Mode – uses an interface port of LAN LIMs to transmit and receive
- LAN Monitor Mode – uses both interface ports of LAN LIMs to monitor traffic passively between two devices

The operation of the physical interface is often critical in determining the cause of network problems. Therefore, the acquisition system tracks errors at the physical layer. Signal events are recorded on the display for both the line (network) side as well as the equipment (user/subscriber) side. The time of the last occurrence of a particular event is recorded as well.

Physical Layer Status and Link Layer (VPI.VCI and DLCI) Statistics

Line status is displayed in real time. All of the events listed in the "Physical layer alarms and statistics" section for each interface below are saved in the buffer and counted in the line status display. These events may be logged to disk.

The following hardware-based statistics are gathered in real time per port (direction) for each ATM and Frame Relay interface (and subrate, in the case of the J6810B LIM). Note that there are two analysis selections for ATM: cell mode, where cells are forwarded by the LIM to the capture memory and analysis system, and frame mode, where hardware reassembly of the cells using AAL-2 and/or AAL-5 is performed in the LIM and the resulting frames forwarded to the capture memory and analysis system.

Common Statistics (cell mode ATM, frame mode ATM, and Frame Relay)

- Instantaneous Utilization (%) – The utilization during the last sample period (per port and per VC).
- Average Utilization (%) – The average utilization since the start of the run or last reset (per port and per VC).
- Maximum Utilization (%) – The maximum utilization attained during any sample period since the start of the run or last reset (per port and per VC).
- Instantaneous Throughput (kb/s) – The throughput during the last sample period (per port and per VC).
- Average Throughput (kb/s) – The average throughput since the start of the run or last reset (per port and per VC).
- Maximum Throughput (kb/s) – The maximum throughput attained during any sample period since the start of the run or last reset (per port and per VC).
- Total Bytes – The total number of bytes (at 48 bytes per cell for ATM cell mode) since the start of the run or last reset (per port and per VC).

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ATM Statistics (cell mode)

- Total Cells – The total number of cells since the start of the run or last reset (per port and per VC).
- Total HEC – The total number of cells with header errors (per port).
- Total Cell Loss Priority – The total number of cells with CLP set since the start of the run or last reset (per port and per VC).
- Total Congestion – The total number of cells with Congestion set since the start of the run or last reset (per port and per VC).
- Total F5 OAM Cells – The total number of F5 OAM cells since the start of the run or last reset (per port and per VC).

ATM Statistics (frame mode)

- AAL indication – indicates 2 (AAL-2), 5 (AAL-5) or 0 (other/unknown) (per VC).
- Total HEC – The total number of cells with header errors (per port).
- Total F5 OAM Cells – The total number of F5 OAM cells since the start of the run or last reset (per port and per VC).
- Total AAL-5 frames – The total number of AAL-2 and AAL-5 PDUs since the start of the run or last reset (per port and per VC).
- CRC Errors – The total number of AAL-5 PDUs with CRC errors since the start of the run or last reset (per port and per VC).
- Total Cell Loss Priority – The total number of AAL-5 PDUs with CLP set in at least one cell in the PDU since the start of the run or last reset (per port and per VC).
- Total Congestion – The total number of AAL-5 PDUs with Congestion set in at least one cell in the PDU since the start of the run or last reset (per port and per VC).

Frame Relay Statistics

- Total Frames – The total number of frames since the start of the run or last reset (per port and per VC).
- Total Discard Eligible – The total number of frames with DE set since the start of the run or last reset (per port and per VC).
- Total Forward Explicit Congestion Notification – The total number of frames with FECN set since the start of the run or last reset (per port and per VC).
- Total Backward Explicit Congestion Notification – The total number of frames with BECN set since the start of the run or last reset (per port and per VC).

Length Statistics (frame mode ATM, and Frame Relay)

Length Statistics uses seven histogram "bins" to accumulate statistics in the following ranges of frame length. This measurement also works in cell mode but, of course, only the first bin gets used in this case as cells always have 48-byte payloads, so it accumulates a count of total cells in the <64 bytes bin.

- < 64 bytes – The total number of AAL-5 PDUs (in frame mode) or Frame Relay frames less than 64 bytes in length since the start of the run or last reset.
- 64 to 127 bytes – The total number of AAL-5 PDUs (in frame mode) or Frame Relay frames between 64 and 127 bytes inclusive since the start of the run or last reset.
- 128 to 255 bytes– The total number of AAL-5 PDUs (in frame mode) or Frame Relay frames between 128 and 255 bytes inclusive since the start of the run or last reset.
- 256 to 511 bytes – The total number of AAL-5 PDUs (in frame mode) or Frame Relay frames between 256 and 511 bytes inclusive since the start of the run or last reset.
- 512 to 1023 bytes – The total number of AAL-5 PDUs (in frame mode) or Frame Relay frames between 512 and 1023 bytes inclusive since the start of the run or last reset.
- 1024 to 1518 bytes – The total number of AAL-5 PDUs (in frame mode) or Frame Relay frames between 1024 and 1518 bytes inclusive since the start of the run or last reset.
- > 1518 bytes – The total number of AAL-5 PDUs (in frame mode) or Frame Relay frames greater than 1518 bytes in length since the start of the run.

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ATM Policing

The policing measurement operates in real-time with all ATM-capable LIMs up to 622 Mb/s, including ATM channelized sub-rates of the J6810B SDH/SONET LIM and the multi-port ATM (but not IMA) operation on the J6824A 8-port E1/T1 LIM. In all cases, policing is performed on up to 1024 virtual circuits simultaneously. Virtual circuits are auto-discovered and the measurement is performed in hardware prior to the hardware-based AAL-2/AAL-5 reassembly, so it works in cell mode or frame mode. It can be used simultaneously in real time with other measurements such as the VPI.VCI statistics and, in frame mode, higher-layer analysis. The measurement can also be used to post-process data from the capture buffer or from file (cell mode only).

The following traffic service configurations are supported:

- CBR.1/DBR/UBR.1 (GCRA(1/PCR^{0+1}, CDVT^{0+1}), no tagging
- VBR.1/SBR1 (GCRA(1/PCR^{0+1}, CDVT^{0+1}), GCRA(1/SCR^{0+1}, BT^{0}), no tagging
- VBR.2/SBR2 (GCRA(1/PCR^{0+1}, CDVT^{0+1}), GCRA(1/SCR^{0}, BT^{0}), no tagging
- VBR.3/SBR3 (GCRA(1/PCR^{0+1}, CDVT^{0+1}), GCRA(1/SCR^{0}, BT^{0}), tagging

Results are provided in a table format by ATM VPI.VCI. Configuration of the traffic contract parameters can be performed globally, in ranges of VPI.VCI or individually per VPI.VCI. The configuration can be saved and restored from file.

ATM Usage Expert (Traffic Contract Estimation)

This novel and useful measurement is able to derive suitable traffic contracts for actual constant/deterministic bit rate (CBR/DBR) and variable/statistical bit rate (VBR/SBR) traffic by post-processing data from the capture buffer. This measurement has to run in post-process mode as it requires two passes through the cell data to perform the analysis; it therefore operates in cell-mode only. Estimated traffic contracts can be subsequently applied for live real-time policing analysis on the same virtual circuit in cell mode or frame mode.

1-Point CDV

A side-effect of the policing measurement is the ability to graph 1-point cell delay variation (that is, CDV observed at a single point). The graph is derived from the data collected per virtual channel of cell inter-arrival times. For each virtual channel, the measurement keeps multiple bins of accumulated counts of inter-arrival times that occur within the ranges covered by these bins. The graph can be plotted as a distribution of hits against inter-arrival times or hits against cells/second. As a non-intrusive passive measurement on live traffic, this is particularly useful for observing the behavior of CBR/DBR traffic where CDV can impact the quality of service of the emulated circuit being carried in the virtual channel. This measurement is performed simultaneously with other policing measurements and a graph of any policed virtual circuit can be displayed at any time.

Traffic Generation

Traffic Generation is now available for LAN and ATM

For ATM, the user is allowed to create either a set of cells, or a set of frames plus (optionally) cells for transmission onto a network. For each frame or cell in a transmit set, users have three options:

- Start with pre-defined templates (IP frames or cells)
- Start with frames or cells previously captured on ATM networks
- Create their own frames or cells.

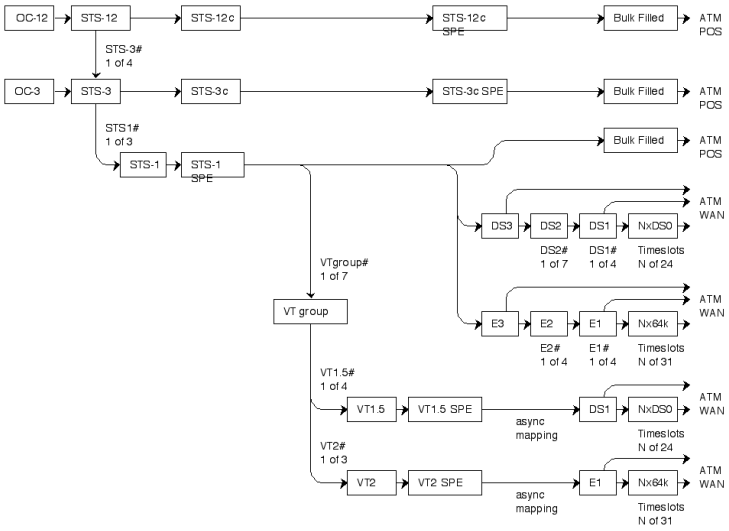
As the transmit set is created and edited, the frame editor contains an integrated decode view that auto updates the decode of the edited frame or cell after every change made. This instantaneous visual decode feedback allows easy customization of the frames/cells in the transmit set. HEC and/or CRC-32 errors can be added.

In ATM cell mode, templates are available for the creation of AAL-5 cell sequences and for F4 and F5 ATM layer OAM cells. If the VPI.VCI is 0.0, templates for F1 and F3 physical layer OAM cells and IMA ICP/filler cells are available. In ATM frame mode, the traffic generator frame builder allows frames to be built. The frame will be encapsulated (RFC2684/RFC1483-routed) and segmented using AAL-5.

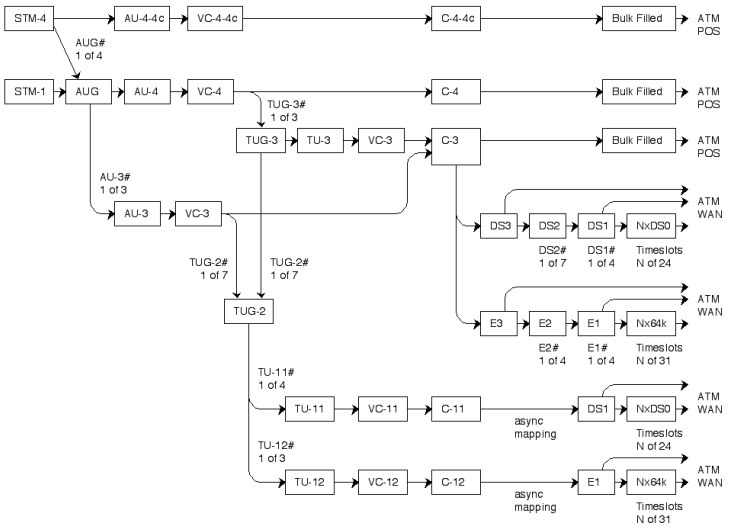
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Tributary Analysis

The following two diagrams depict the multiplexing functionality of the STM-4/OC-12/STM-1/OC-3 LIMs. These interfaces allow connecting to a higher rate link, and internally demultiplexing the packets to get into a specific tributary for in-depth troubleshooting.



J6810B LIM SDH Configurations



J6810B LIM SONET Configurations

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J6810B STM-4/OC-12/ STM-1/OC-3 LIM
(622.080/155.520 Mb/s)

General
This dual-rate LIM plugs into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. The LIM handles ATM, Packet over SONET/SDH and Frame Relay at 622 Mb/s and 155 Mb/s, and performs ATM and WAN analysis on lower-rate sub-multiplexes/tributaries down to fractional E1/DS1 rates, as shown in the Tributary Analysis diagrams on the previous page. When analyzing ATM at any supported rate, real-time AAL-2 and AAL-5 reassembly is performed simultaneously on up to 4064 virtual channels and the resulting frames are passed from the LIM to the acquisition system for further analysis. Cell mode is also available. ATM Policing can be performed on up to 1024 virtual circuits in frame mode or cell mode simultaneously with other measurements.

The functionality of this LIM can be enhanced with the addition of the J6828A Dual 4-Port STM-1/OC-3 External LIM described on page 31.

The LIM has dual-rate optical interfaces and can be used in single-mode or multi-mode environments; when used in multi-mode environments, 10 dB attenuators should be used on the optical outputs (a pair of suitable attenuators is supplied with the LIM).

Note: Both SDH and SONET framing are fully supported in this LIM; the SDH terminology is given first (that is, SDH/SONET); SONET terminology has recently changed and the newer terminology is used here with older terms shown in parentheses, where appropriate.

Common to Inputs and Outputs:
Framing:
- SDH: STM-4, STM-4c and STM-1, ITU-T G.707
- SONET: STS-12, STS-12c, STS-3 and STS-3c, GR-253

SDH / SONET Frame Scrambling ($x^7 + x^6 + 1$)
ATM Cell Scrambling: conforms to ITU-T I.432.1 ($x^{43} + 1$) and may be turned on (default) or off

Inputs:
Two input ports (single-mode/multi-mode compatible)
Connectors: LC-PC
Monitor modes:
- Through monitor mode:
  - uses both inputs and outputs; signal is terminated and regenerated
- Test access point monitor mode; uses inputs only

Sensitivity:
- Typ. -32 dBm
- Min. -28 dBm
- Max. -8 dBm (receiver overload limit)

Loss of Signal Detect Level: -34 dBm (typical)
Receiver wavelength range: 1310/1550 nm
Real-Time Optical Power measurement for each LIM port:
- Dynamic Range: +0.5 dBm to -32 dBm
- Accuracy @ 1310 nm:
  - ±1 dBm +0.5dBm down to -15dBm
  - ±3 dBm -15dBm down to -32dBm

Physical Layer line status indications for each LIM port (SDH / SONET):
- Loss of Signal (LOS)
- Loss of Frame (LOF)
- Loss of Pointer (LOP)
- Loss of Cell Delineation (LCD)
- MS-RDI / RDI-L (Line FERF)
- RDI / RDI-P (Path FERF)
- MS-AIS / AIS-L (Line AIS)
- AIS / AIS-P (Path AIS)

Physical Layer line vital counts for each LIM port (SDH / SONET):
- MS-RDI / RDI-L (Line FERF)
- RDI / RDI-P (Path FERF)
- MS-AIS / AIS-L (Line AIS)
- AIS / AIS-P (Path AIS)
- MS-REI / REI-L (Line FEBE)

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REI / REI-P (Path FEBE)
B1 BIP errors
Loss of Cell Delineation (LCD) – performed at the selected level of demultiplexing

Physical Layer Demultiplexing:
see SDH and SONET Tributary Analysis diagrams

ATM Layer at any supported rate for each LIM port (network and equipment):
Full rate cell processing
Auto-discovery and notification of up to 4064 virtual channels (VPI-VCI)
ATM policing, traffic contract estimation and 1-point CDV (see details on page 17)

ATM Adaptation Layer (AAL) – frame mode:
Auto-discovery and notification of up to 4064 AAL-2 Channels (VPI-VCI-CID) and/or AAL-5 virtual channels (VPI-VCI), any mix of AAL-2 and AAL-5
Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-2 SSCS PDUs at all rates up to 622 Mb/s (corner case: reassembly of long sequences of shortest possible CPS packets at 622 Mb/s is best effort)
Count of total AAL-2 SSCS PDUs
AAL-2 SSCS PDUs are reassembled to the SSSAR sub-layer
Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-5 SSCS PDUs (guaranteed at all rates up to 622 Mb/s)
Count of total AAL-5 SSCS PDUs
Reassembly of any mixture of up to 4064 AAL-2 and AAL-5 SSCS PDUs
Reassembled AAL-5 SSCS PDUs with trailer CRC-32 errors

ATM and AAL statistics per VPI.VCI collected on multiple VCs (see details on page 15)

Packet over SONET/SDH analysis configurations supported:
IETF PPP in HDLC: RFC 1662 and both current RFC 2615 (x^{43} + 1 scrambled SONET/SDH payload) and obsolete RFC 1619 (unscrambled SONET/SDH payload) versions with version auto-detect based on POH C2 byte value (default) and manual over-ride for scrambling enable/disable
Cisco HDLC over SONET/SDH
FCS-16 and FCS-32 auto-detect and manual override

Frame Relay over SONET/SDH analysis configuration supported as per FRF.14

WAN analysis supported (at tributary rates shown in SDH and SONET Tributary Analysis diagrams):
Frame Relay, HDLC/SDLC, sync PPP

WAN Statistics for the selected configuration on each LIM port:
Total frames
Bridged frames
Bridged broadcast frames
Bridged multicast frames
Total octets
Throughput (kbps)
Aborted frames
Short frames
FCS errors

Frame Relay statistics per DLCI collected on 1024 VCs (see details on page 15)

Capture rate: Full rate, full duplex, at all supported configurations up to 622 Mb/s

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Outputs:
Two output ports
Connectors: LC-PC
1310nm Class 1 laser (single mode, but multi-mode fiber compatible with 10 dB attenuator)
Output levels:
- Min. -15 dBm
- Max. -8 dBm

Clocking:
- Recovered (loop)

Traffic Generation:
- Full rate ATM traffic generation at 155 Mbps (over STM-1/OC-3) and 622 Mbps (over STM-4/OC-12) – see details on page 17

J6811A STM-1o/OC-3 LIM
(155.520 Mb/s)

General
This LIM plugs into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. The LIM handles ATM and Packet over SONET/SDH at 155 Mb/s. When analyzing ATM, real-time (full rate) AAL-2 and AAL-5 reassembly is performed simultaneously on more than 4064 virtual channels and the resulting frames are passed from the LIM to the acquisition system for further analysis. Cell mode is also available. ATM Policing can be performed on up to 1024 virtual circuits in frame mode or cell mode simultaneously with other measurements.

The LIM has optical interfaces and can be used in single-mode or multi-mode environments; when used in multi-mode environments, 10 dB attenuators should be used on the optical outputs.

Note: Both SDH and SONET framing are fully supported in this LIM; the SDH terminology is given first (i.e. SDH/SONET); SONET terminology has recently changed and the new terminology is used here with older terms shown in parentheses, where appropriate.

Common to Inputs and Outputs:
Framing:
- SDH: STM-1, ITU-T G.707
- SONET: STS-3c, GR-253

SDH / SONET Frame Scrambling ($x^7 + x^6 + 1$)
ATM Cell Scrambling: conforms to ITU-T I.432.1 ($x^{43} + 1$) and may be turned on (default) or off

Inputs:
Two input and output ports (single-mode/multi-mode compatible)
Connectors: SC-PC
Monitor modes:
- Through monitor mode: uses both inputs and outputs; signal is terminated and regenerated
- Test access point monitor mode; uses inputs only

Sensitivity:
- Typ. -32 dBm
- Min. -28 dBm

Loss of Signal Detect Level:
- -34 dBm

Receiver wavelength range: 1310/1550 nm
Optical power measurement for each LIM port:
- +3 dBm to -42 dBm dynamic range in steps of 0.1 dBm
- ±0.5 dBm absolute accuracy at 1310 nm
- (can also be used to measure power at 622Mb/s)

Physical Layer line status indications for each LIM port (SDH / SONET):
- Loss of Signal (LOS)
- Loss of Frame (LOF)
- Loss of Pointer (LOP)
- Loss of Cell Delineation (LCD)
- MS-RDI / RDI-L (Line FERF)
- RDI / RDI-P (Path FERF)
- MS-AIS / AIS-L (Line AIS)
- AIS / AIS-P (Path AIS)

Physical Layer line vital counts for each LIM port (SDH / SONET):
- MS-RDI / RDI-L (Line FERF)
- RDI / RDI-P (Path FERF)
- MS-AIS / AIS-L (Line AIS)

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AIS / AIS-P (Path AIS)
MS-REI / REI-L (Line FEBE)
REI / REI-P (Path FEBE)
B1 BIP errors
Loss of Cell Delineation (LCD)

ATM Layer at any supported rate for each LIM port (network and equipment):
Full rate cell processing
Auto-discovery and notification of up to 4064 virtual channels (VPI-VCI)
ATM policing, traffic contract estimation and 1-point CDV (see details on page 17)

ATM Adaptation Layer (AAL) – frame mode:
Auto-discovery and notification of up to 4064 AAL-2 Channels (VPI-VCI-CID) and/or AAL-5 virtual channels (VPI-VCI), any mix of AAL-2 and AAL-5
Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-2 SSCS PDUs
Count of total AAL-2 SSCS PDUs
AAL-2 SSCS PDUs are reassembled to the SSSAR sub-layer
Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-5 SSCS PDUs
Count of total AAL-5 SSCS PDUs
Reassembly of any mixture of up to 4064 AAL-2 and AAL-5 SSCS PDUs
Reassembled AAL-5 SSCS PDUs with trailer CRC-32 errors

ATM and AAL statistics per VPI.VCI collected on multiple VCs (see details on page 15)

Packet over SONET/SDH analysis configurations supported:
IETF PPP in HDLC: RFC 1662 and both current RFC 2615 (x^{43} + 1 scrambled SONET/SDH payload) and obsolete RFC 1619 (unscrambled SONET/SDH payload) versions with version auto-detect based on POH C2 byte value (default) and manual over-ride for scrambling enable/disable
Cisco HDLC over SONET/SDH
FCS-16 and FCS-32 auto-detect and manual override

Capture rate: Full line rate (full duplex)

Outputs:

1310nm Class 1 laser (multi-mode fiber compatible with 10 dB attenuator, available separately as J2928A)

Output levels:
Min. -12 dBm
Max. -7 dBm

Clocking:
Recovered (loop)

Traffic Generation:
Full rate ATM traffic generation – see details on page 17

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J6813B E3/T3 (DS3) LIM
(34.368 / 44.736 Mb/s)

General
This LIM plugs into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. The J6813B supports ATM, Frame Relay, HDLC, SDLC and PPP. When analyzing ATM, real-time (full rate) AAL-2 and AAL-5 reassembly is performed simultaneously on more than 4064 virtual channels and the resulting frames are passed from the LIM to the acquisition system for further analysis. Cell mode is also available. ATM Policing can be performed on up to 1024 virtual circuits in frame mode or cell mode simultaneously with other measurements. The module can be configured for use as an E3 or T3 interface.

Common to Inputs and Outputs (E3 and T3):
Two input and output ports
Connectors: 75 Ohm BNC female

When E3 is selected:
Electrical: ITU-T G.703
Line Code: HDB3
Framing:
- Frame Relay: ITU-T G.751
- ATM: ITU-T G.832

ATM Cell Mapping:
- Direct (ITU-T G.804)

ATM Cell Scrambling:
- Conforms to ITU-T I.432.1 ($x^{43} + 1$) and may be turned on or off

When T3 is selected:
Electrical: ITU-T G.703
Line Code: B3ZS
Framing:
- C-bit and M13 (auto-select on input side)

Fractional DS3:
- any DS0 or combination of DS0s within any DS1 within DS3

ATM cell Mapping:
- Direct (normal mode, ITU-T G.804)
- PLCP (obsolescent mode, ITU-T G.804)

ATM Cell Scrambling:
- Conforms to ITU-T I.432.1 ($x^{43} + 1$) and may be turned on or off

Inputs (E3 and T3):
Received pulse amplitude measurement (mVpeak) on each port
Monitor modes:
- Terminated/Repeater (75 Ohm unbalanced)
- Bridged (high impedance)

When E3 is selected:
Levels:
- Auto gain control for high, low and monitor jack; all unbalanced 1.2Vpeak to 36mVpeak, 34 dB dynamic range

Physical Layer line status indications for each LIM port:
- Loss of Signal (LOS)
- Loss of Frame (LOF)
- Alarm Indication Signal (AIS)
- Remote Defect Indication (RDI), formerly known as FERF
- Loss of Cell Delineation (LCD)

Physical Layer line vital counts for each LIM port:
- Code violations
- Out of frame (OOF) events
- Remote Defect Indication (RDI), formerly known as FERF
- Remote Error Indication (REI), formerly known as FEBE
- Bit Interleave Parity (BIP-8)
- Payload type mismatch
- Loss of Cell Delineation (LCD)

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When T3 is selected:

Levels:
- Auto gain control for high, DSX-3, low, and monitor jack (min. = DSX -23 dB); all unbalanced 1.2 V peak to 36 mV, 34 dB dynamic range

Physical Layer line status indications for each LIM port:
- Loss of Signal (LOS)
- Loss of Frame (LOF)
- Alarm Indication Signal (AIS)
- Remote Defect Indication (RDI), formerly known as FERF
- Loss of Cell Delineation (LCD) – directly mapped ATM mode
- PLCP OOF (out of frame) – PLCP ATM mode
- PLCP RAI – PLCP ATM mode

Physical Layer line vital counts for each LIM port:
- Code violations
- Frame bit error
- P1/P2 parity errors
- C-bit parity errors
- Remote Error Indication (REI), formerly known as FEBE
- Loss of Cell Delineation (LCD) – directly mapped ATM mode
- PLCP OOF (out of frame) – PLCP ATM mode
- PLCP Frame Bit Error – PLCP ATM mode
- PLCP BIP Error – PLCP ATM mode
- PLCP REI (remote error indication, formerly FEBE) – PLCP ATM mode

When E3 or T3 is selected:

ATM Layer at any supported rate for each LIM port (network and equipment):
- Full rate cell processing
- Auto-discovery and notification of up to 4064 virtual channels (VPI-VCI)
- ATM policing, traffic contract estimation and 1-point CDV (see details on page 17)

ATM Adaptation Layer (AAL) – frame mode:
- Auto-discovery and notification of up to 4064 AAL-2 Channels (VPI-VCI-CID) and/or AAL-5 virtual channels (VPI-VCI), any mix of AAL-2 and AAL-5
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-2 SSCS PDUs
- Count of total AAL-2 SSCS PDUs
- AAL-2 SSCS PDUs are reassembled to the SSSAR sub-layer
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-5 SSCS PDUs
- Count of total AAL-5 SSCS PDUs
- Reassembly of any mixture of up to 4064 AAL-2 and AAL-5 SSCS PDUs
- Reassembled AAL-5 SSCS PDUs with trailer CRC-32 errors

ATM and AAL statistics per VPI.VCI collected on multiple VCs (see details on page 15)

Statistics for Frame Relay, HDLC/SDLC, sync PPP for each LIM port:
- Total frames
- Bridged frames
- Bridged broadcast frames
- Bridged multicast frames
- Total octets
- Throughput (kbps)
- Aborted frames
- Short frames
- FCS errors

HDLC FCS can be set to 16-bit (default) or 32-bit with two variants of each

Frame Relay statistics per DLCI collected on 1024 VCs (see details on page 15)

Capture rate: Full line rate (full duplex)

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Outputs (E3 and T3):
Termination:
75 Ohm
Levels:
ITU-T G.703
Clocking:
Recovered (loop)
Traffic Generation
Full rate ATM traffic generation – see details on page 22

J6815B T1/E1 LIM,
J6816B E1/T1 LIM,
J6817B E1 LIM
(1.544 / 2.048 Mb/s)

General
These LIMs plug into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. All three ±LIMs handle ATM, Frame Relay, HDLC, SDLC and PPP. When analyzing ATM, real-time (full rate) AAL-2 and AAL-5 reassembly is performed simultaneously on more than 4064 virtual channels and the resulting frames are passed from the LIM to the acquisition system for further analysis. Cell mode is also available. ATM Policing can be performed on up to 1024 virtual circuits in frame mode or cell mode simultaneously with other measurements.

The J6815B LIM has four Bantam connectors and two 8-pin RJ connectors, which can be switched between RJ-48C and RJ-45 pin wiring via the configuration menu. This module can be configured as a T1 (100 Ohm, 1.544 Mb/s, default) or E1 (120 Ohm 2.048 Mb/s) interface.

The J6816B LIM has DB-9 and 8-pin RJ connectors which can be switched between RJ45 and RJ48C wiring via the configuration menu. Converter cables are available to connect the DB9 to 120 Ohm Siemens 3-pin connectors. This module can be configured as an E1 (120 Ohm, 2.048 Mb/s, default) or T1 (100 Ohm, 1.544 Mb/s) interface.

The J6817B LIM has 75 Ohm BNC connectors. This module can be configured only as an E1 (2.048 Mb/s) interface. Third-party vendors make conversion cables from this ISO BNC connector to the 'small Siemens BNC (1.6/5.6 mm)', 'large Siemens BNC', 'British Telecom BNC', etc.

Common to Inputs and Outputs:
Two input and output ports

When E1 is selected:
Interface termination:
120 Ohm balanced (J6815B, J6816B); 75 Ohm unbalanced (J6817B)
Line Code:
ATM: HDB3
Other WAN: HDB3, AMI
Framing:
ITU-T G.704 alternate framing with or without CRC-4
Fractional (ATM and Frame Relay), any multiple of 64 kb/s channel
Unframed at 2.048 Mb/s
ATM Cell Mapping:
Direct (ITU-T G.804)
ATM Cell Scrambling:
Conforms to ITU-T I.432.1 ($x^{43} + 1$) and may be turned on or off

When T1 is selected (not applicable with J6817B):
Interface termination:
100 Ohm balanced
Line Code:
ATM: B8ZS
Other WAN: B8ZS, AMI
Framing:
Extended Super Frame (ESF) with CRC-6
D4 (Super Frame)
Fractional (ATM and Frame Relay), any multiple of 56 kb/s or 64 kb/s channels
Unframed 1.544 Mb/s
ATM Cell Mapping:
Direct (ITU-T G.804)

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ATM Cell Scrambling:
Conforms to ITU-T I.432.1 ($x^{43} + 1$) and may be turned on or off

Inputs:
Received pulse amplitude measurement (dBdsx)

When E1 is selected:
Monitor modes:
Terminated (120 Ohm)
Bridged (High Impedance)
Monitor Jack: -20 dB and -30 dB
Physical Layer line vital counts for each LIM port:
Code violations
Loss of frame (LOF) events
Frame bit error
CRC-4 error
Loss of Cell Delineation (LCD)
Physical Layer line status indications for each LIM port:
Loss of Signal (LOS)
Loss of Frame (LOF)
Alarm Indication Signal (AIS)
Remote Alarm Indication (RAI), formerly known as FERF
Loss of Cell Delineation (LCD)

When T1 is selected:
Monitor modes:
Terminated (100 Ohm)
Bridged (High Impedance)
Monitor Jack (20dB)
Interface types (and input sensitivities):
DSX-1 (+6 dB to -10 dB)
Network Interface (+6 dB to -36 dB)
Physical Layer line status indications for each LIM port:
Loss of Signal (LOS)
Loss of Frame (LOF)
Alarm Indication Signal (AIS)
Remote Alarm Indication (RAI), formerly known as FERF
Loss of Cell Delineation (LCD)
Physical Layer line vital counts for each LIM port:
Code violations
Loss of frame (LOF) events
Frame bit error
ESF CRC-6 error
1s density
Excess 0s
Loss of Cell Delineation (LCD)

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When E1 or T1 is selected:

ATM Layer at any supported rate for each LIM port (network and equipment):
- Full rate cell processing
- Auto-discovery and notification of up to 4064 virtual channels (VPI-VCI)
- ATM policing, traffic contract estimation and 1-point CDV (see details on page 18)

ATM Adaptation Layer (AAL) – frame mode:
- Auto-discovery and notification of up to 4064 AAL-2 Channels (VPI-VCI-CID) and/or AAL-5 virtual channels (VPI-VCI), any mix of AAL-2 and AAL-5
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-2 SSCS PDUs
- Count of total AAL-2 SSCS PDUs
- AAL-2 SSCS PDUs are reassembled to the SSSAR sub-layer
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-5 SSCS PDUs
- Count of total AAL-5 SSCS PDUs
- Reassembly of any mixture of up to 4064 AAL-2 and AAL-5 SSCS PDUs
- Reassembled AAL-5 SSCS PDUs with trailer CRC-32 errors

ATM and AAL statistics per VPI.VCI collected on multiple VCs (see details on page 15)

Statistics for Frame Relay, HDLC/SDLC, sync PPP for each LIM port:
- Utilization in percent
- Total frames
- Bridged frames
- Bridged broadcast frames
- Bridged multicast frames
- Total octets
- Throughput (kbps)
- Aborted frames
- Short frames
- FCS errors

HDLC FCS can be set to 16-bit (default) or 32-bit with two variants of each Frame Relay statistics per DLCI collected on 1024 VCs (see details on page 15)

Capture rate: Full line rate (full duplex)

Outputs:

Termination:
- 120 Ohm when E1 is selected
- 100 Ohm when T1 is selected

Levels:
- ITU-T G.703

Clocking:
- Recovered (loop)

Traffic Generation:
- Full rate ATM, traffic generation – see details on page 22.

J6818A ATM25 LIM
(25.6 Mb/s)

General

This LIM plugs into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. The LIM interfaces handle ATM at 25.6 Mb/s. Real-time (full rate) AAL-2 and AAL-5 reassembly is performed simultaneously on more than 4064 virtual channels and the resulting frames are passed from the LIM to the acquisition system for further analysis. Cell mode is also available. Policing can be performed on up to 1024 virtual circuits in frame mode or cell mode simultaneously with other measurements.

Common to Inputs and Outputs:

Main Specifications: ATM Forum af-phy-0040.000, ITU-T I.432.5

Ports: Two bi-directional, one toward the equipment and the other toward the network: 100 Ohm (for UTP-3 cable) and 120 Ohm (for UTP-5 cable)

Test configuration modes:
- Terminal (toward network or equipment – available in a future software upgrade);
- Monitor (both directions for protocol analysis with repeater functionality in each direction)

Connectors: RJ-45 (UTP)

Line Code: NRZI

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Symbol Coding: 4B5B
Line Symbol Rate: 32 Mbaud
Cell Mapping: Symbolic direct (i.e. no framing)
Cell Scrambling: Conforms to af-phy-0040.000 ($x^{10} + x^7 + 1$)

Inputs:
Physical Layer Alarms and Statistics:
- Invalid symbol
- Short cell
- Loss of signal (LOS)
- Loss of Timing Synchronization
- Timing synchronization frequency

ATM Layer at any supported rate for each LIM port (network and equipment):
- Full rate cell processing
- Auto-discovery and notification of up to 4064 virtual channels (VPI-VCI)
- ATM policing, traffic contract estimation and 1-point CDV (see details on page 17)

ATM Adaptation Layer (AAL) – frame mode:
- Auto-discovery and notification of up to 4064 AAL-2 Channels (VPI-VCI-CID) and/or AAL-5 virtual channels (VPI-VCI), any mix of AAL-2 and AAL-5
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-2 SSCS PDUs
- Count of total AAL-2 SSCS PDUs
- AAL-2 SSCS PDUs are reassembled to the SSSAR sub-layer
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-5 SSCS PDUs
- Count of total AAL-5 SSCS PDUs
- Reassembly of any mixture of up to 4064 AAL-2 and AAL-5 SSCS PDUs
- Reassembled AAL-5 SSCS PDUs with trailer CRC-32 errors

ATM and AAL statistics per VPI.VCI collected on multiple VCs (see details on page 15)
Capture rate: Full line rate (full duplex)

Outputs:
Clocking:
- Recovered from line (loop), recovered from X8 8 kHz time synchronization source

J6820B V-Series LIM
(up to 10 Mb/s)

General
This LIM plugs into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. Connection to supported interfaces is by means of separately supplied external monitor/simulate cables, each specific to a particular V-series interface.

Monitor/Simulate Cables (J6757A)
option #001: V.35
option #002: RS-449/V.36
option #003: V.10/V.11 (for X.21)
option #004: RS-232C
option #005: EIA-530

Detail:
Bit rates:
- 2400 b/s to 8.192 Mb/s on V.35, Sync or Sync NRZI;
- 2400 b/s to 10 Mb/s on V.36/RS-449/422/423/EIA-530 and X.21, Sync or Sync NRZI
- 300 b/s to 256 kb/s on V.24/V.28/RS-232C

Lead status:
- RTS, CTS, DTR, DSR, and CD (V.24/V.28/RS-232C and V.35)
- CS, RS, RR, TR, and DM (V.10/V.11 and V.36/RS-449/422/423)

Statistics for Frame Relay, HDLC/SDLC, sync PPP for each LIM port:
- Utilization in percent
- Total frames
- Bridged frames
- Bridged broadcast frames

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Bridged multicast frames
Total octets
Throughput (kbps)
Aborted frames
Short frames
FCS errors

HDLC FCS can be set to 16-bit (default) or 32-bit with two variants of each Frame Relay statistics per DLCI collected on 1024 VCs (see details on page 15)
Capture rate: Full line rate (full duplex)

J6821A HSSI LIM
(up to 52 Mb/s)

General

This LIM plugs into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. Connection to the ports DCE and DTE is accomplished through a 25-twisted-pair cable with male HSSI connectors. Cable impedance is specified at 100 ohms (cable not supplied by Agilent). The LIM supports Frame Relay, HDLC, SDLC and Sync PPP.

J6821A HSSI LIM supports only monitor mode. Bridged and Transmit modes are not supported directly out of the LIM. Bridged mode provided by the J6756B HSSI Tap.

Detail

Bit Rates
56 kb/s to 51.850 Mb/s
Example: DS3 (44.736 Mb/s), SONET STS-1 (51.84 Mb/s)
Lead Status
Data: SD and RD
Clock: ST, TT, and RT
Control: CA and TA
Test: LA, LB, LC, and TM
Statistics for Frame Relay, HDLC, SDLC, and Sync PPP for each LIM port
Utilization in %
Total Frames
Bridged Frames
Bridged Broadcast Frames
Bridged Multicast Frames
Total Octets
Throughput (Kb/s)
Abort Frames
Short Frames
FCS Errors

HDLC FCS can be set to 16-bit (default) or 32-bit with two variants of each Frame Relay statistics per DLCI collected on 1024 VCs (see details on page 15)
Capture Rate: Full Line Rate (full duplex)

J6824A Multi-port E1/T1 LIM
(up to 16 Mb/s)

General

This LIM plugs into the Network Analyzer, DNA PRO, DNA MX and DNA platforms. The LIM has 8 ports, which are configurable for E1 or T1 framing. Each port on the LIM uses an 8-pin Modular connector (wired as RJ-48C), suitable for balanced 100 Ohm T1, or 120 Ohm E1 interfacing, or unbalanced 75 Ohm E1 interfacing. Three cable options are available, each providing a set of eight cables terminated with RJ-48C connectors at one end for plugging into the LIM and option-specific male connectors on the other end:

option #001: RJ-48C to pairs of male Bantam connectors
option #002: RJ-48C to pairs of 75 Ohm BNC connectors
option #003: RJ-48C to RJ-45 wired 8-pin Modular connectors (swaps cable pairs between RJ-48C pins [1,2]/[4,5] to RJ45 pins [5,4]/[6,3], respectively).

This LIM can provide analysis of IMA (Inverse Multiplexing for ATM) traffic, multi-port ATM, channelization with HDLC (SS7, Frame Relay and ISDN) or TRAU 16K framing for the Agilent Signaling Analyzer, and multi-port ISDN decodes. The IMA analysis requires, additionally, the presence of the J6825A IMA software product. Real-time (full rate) AAL-2 and AAL-5 reassembly is performed simultaneously on more than 4064 virtual channels on aggregated IMA traffic or on

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each port of multi-port ATM and the resulting frames passed from the LIM to the acquisition system for further analysis. Cell mode is also available.

Network Analyzer application:
Multi-port ATM
Inverse Multiplexing for ATM (IMA)
Multi-port ISDN PRI layer 2 statistics and layer 3 decodes

Signaling Analyzer Real-Time (SART) application:
Multi-port ATM
Inverse Multiplexing for ATM (IMA)
Multi-port channelized with HDLC (SS7, Frame Relay, and ISDN) or TRAU 16 Kb/s framing

Common features of all 8 Ports:
Receiver Modes: Bridged (High Impedance), Terminated, Monitor Jack, and Thru/Bridged.

Bridged, Terminated and Monitor Jack modes use two receivers per port connected to pins [1,2] and [4,5] of the 8-pin Modular connector providing full duplex 8 port monitoring (also see below for details on the J6826A and J6827A monitor taps)

Thru/Bridged monitoring of signals uses pairs of ports (1&2, 3&4, 5&6, 7&8). Signals on port 1 and port 2 (pins [1,2] and [4,5]) are connected together to pass through the customer data which is monitored by two receivers set to Bridged (High Impedance) mode. Ports 3 and 4, ports 5 and 6, and ports 7 and 8 are similarly set to Thru/Bridged mode providing 4 port Thru/Bridged full duplex monitoring.

Received pulse amplitude measurement (dBdsx), displayed in 2.5 dB ranges

Future Run Modes: various emulation signals with one input receiver and one output transmitter per port.

Hardware is compliant with the following standards (NOTE: some standards do not apply to current run modes or features, but apply to features added in the future):

ANSI: T1.403-1995, T1.231-1993, T1.408
AT&T: TR54016, TR62411
ITU-T: G.703, G.704, G.706, G.736, G.775, G.823, G.932, I.431, I.432, O.151, O.161
ETSI: ETS 300 011, ETS 300 166, ETS 300 233, CTR12, CTR4
Japanese: JTG.703, JTI.431, JJ-20.11 (CMI Coding Only)

When E1 is selected:
Interface termination:
120 Ohms balanced
75 Ohms unbalanced
Line Code:
HDB3, AMI
Framing:
ITU-T G.704 alternate framing with or without CRC-4
Fractional, any multiple of 64 kb/s channel
Receiver Modes:
Terminated (120 Ohm or 75 Ohm)
Bridged (High Impedance)
Monitor Jack (-20 dB, -26dB, and -32 dB)
4 Port Thru/Bridged

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When T1 is selected:

Interface termination:
- 100 Ohms balanced (no converter cable required)

Line Code:
- B8ZS, AMI

Framing:
- Extended Super Frame (ESF) with CRC-6
- D4 (Super Frame)
- J1-ESF (calculates CDC-6 per JT-G.704)
- J1 D4 (uses Fs bit 12 as the RAI bit), WAN only
- Fractional, any multiple of 56 kb/s or 64 kb/s channels

Receiver Modes:
- Terminated (100 Ohm)
- Bridged (High Impedance)
- Monitor Jack (-20 dB)
- 4 Port Thru/Bridged

Measurements and Statistics:

When E1 is selected:

Physical Layer line status indications for each LIM port:
- Loss of Signal (LOS)
- Loss of Frame (LOF)
- Alarm Indication Signal (AIS)
- Remote Alarm Indication (RAI), formerly known as FERF
- Loss of Cell Delineation (LCD)

Physical Layer line vital counts for each LIM port:
- Code violations
- Loss of frame (LOF) events
- Frame bit error
- CRC-4 error

When T1 is selected:

Interface types (and input sensitivities):
- DSX-1 (+6 dB to -10 dB)
- Network Interface (+6 dB to -36 dB)

Physical Layer line status indications for each LIM port:
- Loss of Signal (LOS)
- Loss of Frame (LOF)
- Alarm Indication Signal (AIS)
- Remote Alarm Indication (RAI), formerly known as FERF
- Loss of Cell Delineation (LCD)

Physical Layer line vital counts for each LIM port:
- Code violations
- Loss of frame (LOF) events
- Frame bit error
- ESF CRC-6 error
- 1s density

When E1 or T1 Eight-port ATM (including IMA) is selected:

Convergence Sub-Layer Vital counts for each LIM port:
- Single-bit HEC Error
- Multi-bit HEC Error
- Loss of Cell Delineation (LCD)

ATM policing (not available with IMA), traffic contract estimation and 1-point CDV (see details on page 17)

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Inverse Multiplexing for ATM (IMA) – requires J6825A software:

IMA sub-layer:
- Conforms to ATM Forum af-phy-0086.001/ITU-T I.761
- Number of links in an IMA Group: 2 to 8
- Number of simultaneous IMA Groups: 1 (currently)
- Fractional E1/T1 links supported
- Auto-configuration of IMA Group with manual over-ride
- ICP (IMA Control Protocol) Cell decode (per link)
- Auto-detection of change in configuration (excluding link test mode byte 15, and test data bytes 16 and 17) with protocol analysis capture trigger
- Optional capture of all ICP cells or changing ICP cells in protocol capture (cell mode)

IMA Vital Counts for each LIM port:
- All ICP Cells
- Changed ICP Cells
- Filler Cells

ATM Vital Counts per IMA Group (frame mode)
- Utilization
- Idle Cells
- Busy Cells
- Congestion Experienced
- CLP (low priority)
- Total Frames (frame mode)
- Bridged Frames (frame mode)
- Bridged Broadcast Frames (frame mode)
- Bridged Multicast Frames (frame mode)
- AALx Bad CRC-32 (frame mode)
- OAM F1 Cells (cell mode)
- OAM F3 Cells (cell mode)
- Resource Management Cells (cell mode)

ATM Layer for each direction (network or equipment) of the IMA Group:
- Full rate cell processing
- Auto-discovery and notification of up to 4064 virtual channels (VPI-VCI)

ATM Adaptation Layer (AAL) – frame mode:
- Auto-discovery and notification of up to 4064 AAL-2 Channels (VPI-VCI-CID) and/or AAL-5 virtual channels (VPI-VCI), any mix of AAL-2 and AAL-5
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-2 SSCS PDUs
- Count of total AAL-2 SSCS PDUs
- AAL-2 SSCS PDUs are reassembled to the SSSAR sub-layer
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-5 SSCS PDUs
- Count of total AAL-5 SSCS PDUs
- Reassembly of any mixture of up to 4064 AAL-2 and AAL-5 SSCS PDUs
- Reassembled AAL-5 SSCS PDUs with trailer CRC-32 errors

ATM and AAL statistics per VPI.VCI collected on multiple VCs (see details on page 15)

Channelization:

Simultaneous 8-port receive for both Network and Equipment sides
Up to 256 channels supported, aggregated across all 8 ports per side
8, 16, 32, 56, 64, Nx56, and Nx64 Kb/s data rates per channel supported
HDLC, SS7 and standard 16 K TRAU framing formats supported

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WAN Multi-port ISDN Measurements:
Simultaneous decoding of layer 3 Q.931 call activity on up to 8 ISDN PRI D-Channels
Statistics for each port:

- Utilization
- Total Frames
- Bridged Frames
- Bridged Broadcast Frames
- Bridged Multicast Frames
- Total Octets
- Throughput (Kb/s)
- Aborted Frames
- Short Frames
- FCS Errors

Transmitter Outputs (future emulation):
Termination:
100 Ohms (balanced) via LIM RJ-48C connectors
120 Ohms (balanced) via LIM RJ-48C connectors
75 Ohms (unbalanced) via LIM RJ-48C to BNC connectors with Cable Option 2

Levels:
ITU-T G.703

Clocks:
Recovered (loop), Internal, and External (input on one LIM port)
Currently, only monitor modes are available with this LIM

J6826A Eight-Port T1/E1 Balanced Monitor Tap (up to 2 Mb/s)

General
Eight full-duplex T1/E1 links are passed through the Monitor Tap using pairs of Modular 8-pin (RJ45 type) connectors (all eight pins of each connector are passed through). The two data signals on connector pins [1,2] and [4,5] of each connector pair are wired to attenuator resistors to provide a 20 dB Monitor Jack circuit that can be directly connected to the J6824A Eight-Port T1/E1 LIM. Eight 3-foot, shielded, RJ48C to RJ48C cables are supplied with the Monitor Tap for connection to the J6824A LIM.

Specifications
Insertion Loss: <0.5 dB
Attenuation: -20.7 dB nominal for T1
Attenuation: -19.3 dB nominal for E1
Maximum data rate: 2.048 Mb/s

J6827A Eight-Port E1 BNC Monitor Tap (up to 2 Mb/s)

General
Eight full-duplex E1 75 Ohm BNC ports are passed through the Monitor Tap using pairs of pass through BNC to BNC connections, and each of these links are wired to attenuator resistors to provide a 20 dB Monitor Jack circuit. The monitor tap contains impedance conversion transformers to change these signals from unbalanced 75 Ohm to balanced 120 Ohm outputs for direct connection to the J6824A Eight-Port T1/E1 LIM. Eight 3-foot, shielded, RJ48C to RJ48C cables are supplied with the Monitor Tap for connection to the J6824A LIM.

Specifications
Insertion Loss: <0.7 dB
Attenuation: -22.4 dB nominal
Maximum data rate: 2.048 Mb/s

J6828A Four-Port STM-1/OC-3 LIM Multiplexer

General
This stand-alone multiplexer has four pairs of STM-1/OC-3 optical input ports. It is designed to be used with the J6810B STM-4/OC-12/STM-1/OC-3 LIM operating in a special mode to expand the latter's analysis capability to both directions of four STM-1/OC-3 ATM cell streams for use with the Agilent Signaling Analyzer Real-Time product. This external LIM is powered from a 5V DC supply with AC input (provided).

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Inputs

Eight input ports grouped as four input port pairs
Connectors: SC-PC
Sensitivity:
- Min. -34 dBm

Loss of Signal Detect Level:
- Max. -36 dBm
- Min. -45 dBm

Framing:
- SDH: STM-1, ITU-T G.707
- SONET: STS-3c, GR-253

SDH / SONET Frame Scrambling ($x^7 + x^6 + 1$)
Receiver wavelength range: 1200/1600 nm
Optical power measurement for each LIM port:
- 0 dBm to -50 dBm dynamic range in steps of 0.1 dBm
- +/-0.5 dBm absolute accuracy at 1310 nm

Physical Layer line status indications for each LIM port (SDH / SONET):
- Loss of Signal (LOS)
- Loss of Frame (LOF)
- Loss of Pointer (LOP)
- Loss of Cell Delineation (LCD)
- MS-RDI / RDI-L (Line FERF)
- RDI / RDI-P (Path FERF)
- MS-AIS / AIS-L (Line AIS)
- AIS / AIS-P (Path AIS)

Physical Layer line vital counts for each LIM port (SDH / SONET):
- MS-RDI / RDI-L (Line FERF)
- RDI / RDI-P (Path FERF)
- MS-AIS / AIS-L (Line AIS)
- AIS / AIS-P (Path AIS)
- MS-REI / REI-L (Line FEBE)
- B1 BIP errors
- Loss of Cell Delineation (LCD)

Outputs

Two output ports
Connectors: LC-PC
1310nm Class 1 laser
Output levels:
- Min. -15 dBm
- Max. -8 dBm

Framing:
- SDH: STM-4, ITU-T G.707
- SONET: STS-12, GR-253

SDH / SONET Frame Scrambling ($x^7 + x^6 + 1$)

Functionality Available with J6828A/J6810B Combination

When the multiplexer is connected to the J6810B STM-4/OC-12/STM-1/OC-3 LIM, the combined functionality available for each pair of STM-1/OC-3 ports (using the Signaling Analyzer Real-Time product) is as follows (note that this functionality is not supported with the J6810A LIM).
ATM Layer for each LIM port (network and equipment):
- Full rate cell processing
- Auto-discovery and notification of up to 4064* virtual channels (cell mode)

ATM Adaptation Layer (AAL) – frame mode:
- Auto-discovery and notification of up to 4064* AAL-2 Channels (VPI-VCI-CID) and/or AAL-5 virtual channels (VPI-VCI), any mix of AAL-2 and AAL-5
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-2 SSCS PDUs (corner case: reassembly of long sequences of shortest possible CPS packets is best effort)
- Count of total AAL-2 SSCS PDUs
- AAL-2 SSCS PDUs are reassembled to the SSSAR sub-layer
- Concurrent real-time reassembly of the first 2000 bytes of multiple AAL-5 SSCS PDUs

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Count of total AAL-5 SSCS PDUs
Reassembly of any user defined mixture of up to 4064* AAL-2 and AAL-5 SSCS PDUs
Reassembled AAL-5 SSCS PDUs with trailer CRC-32 errors
ATM and AAL statistics per VPI.VCI collected (see details on page 15)
Capture rate: Full rate, full duplex, on all ports

*aggregated over all four ports

J6830A 10BaseT, 10/100BaseTX LIM, J6831A 10/100BaseFX LIM, J6832A 1000BaseX LIM

General
These LIMs plug into the Network Analyzer, DNA, DNA PRO and DNA MX platforms. The J6830A LIM handles Ethernet and Fast Ethernet over unshielded twisted pair (UTP) cable. The J6831A LIM handles Fast Ethernet over multi-mode optical cable. The J6832 LIM accommodates a pair of GBIC interface adapters for handling Gigabit Ethernet over short reach (SX), long reach (LX) optical fiber, UTP-5 cable, or any combination of these; a pair of SX GBICs (Short range Gigabit Interface Connectors) is included with this LIM. All LIMs are capable of analysis and simulation. Other types of conforming GBIC may be supported (though not supplied by Agilent), such as CX.

J6830A specific:
Connectors: two RJ-45 (UTP)
Auto-sensing 10/100 Ethernet ports for 10BaseT and 100BaseTX
A second RJ-45 port allows testing of full duplex Ethernet between two network elements.

J6831A specific:
Connectors: two duplex SC multi-mode 1300nm

J6832A specific:
GBIC interfaces supported (any combination of the following):
J5491A SX GBICs (850 nm multi-mode) – included with the J6832A LIM
J5492A LX GBICs (1310 nm mono-mode)
J5495A T GBICs (UTP copper)
Other GBIC Interfaces supported:
Cisco WS-G5487 1000Base ZX GBIC (WS-G5487)

All LIMs:
Line and MAC statistics:
bytes transmitted (total and per second)
bytes received (total and per second)
errors (total and per second)
broadcasts (total and per second)
multicasts (total and per second)
frames transmitted (total and per second)
frames received (total and per second)
% transmitted
% received
local collisions
remote collisions
late collisions
remote late collisions
runts
frames with bad FCS
misaligned frames
Dribbles
Runts (good FCS)
Jabbers
Jabbers (good FCS)
Full rate, full duplex capture

Related Literature

Network Analyzer Family	Technical Overview	5988-4231EN
Network Troubleshooting Center	Technical Overview	5988-8548EN
Signaling Analyzer	Technical Overview	5988-0347EN
Report Center	Technical Overview	5988-4165EN
Telephony Network Analyzer	Technical Overview	5988-7901EN

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Voice Quality Tester	Technical Overview	5968-7723EN
J6842A 3G UMTS/W-CDMA Test Software	Data Sheet	5988-7000EN

Trademarks

Windows® is a U.S. Registered trademark of Microsoft Corporation.
Pentium® is a U.S. Registered trademark of Intel Corporation.
Adobe Acrobat® is a trademark of Adobe Systems Incorporated.

Physical Specifications

J6800A Network Analyzer
Size (depth x width x height): 356 x 402 x 142 mm (14 x 15.8 x 5.6 inches)
Weight: 9 kg (20 lb.)

J6801A Distributed Network Analyzer
Size (depth x width x height): 307 x 259 x 61 mm (12.1 x 10.1 x 2.4 inches)
Weight: 2.3 kg (5.3 lb.)

J6802B Distributed Network Analyzer MX
Size (depth x width x height): 406 x 440 x 88 mm (14.6 x 17.3 x 3.5 inches)
Weight: 7.3 kg (16.5 lb.)

J6803A Distributed Network Analyzer PRO
Size (depth x width x height): 311 x 300 x 114 mm (12.25 x 11.75 x 4.5 inches)
Weight: 4.5 kg (9.7 lb.)

J6805A Distributed Network Analyzer ME
Size (depth x width x height): 300 x 240 x 72 mm (11.8 x 9.5 x 2.8 inches)
Weight: 3.9 kg (10.5 lb.)

Power Requirements

J6800A Network Analyzer
External: 100 – 240 V ~, 50 – 60 Hz, 2.5A

J6801A Distributed Network Analyzer
External: 100 – 240 V ~, 50 – 60 Hz, 2.0A

J6802B Distributed Network Analyzer MX option 1AC
External: 100 – 240 V ~, 50 – 60 Hz, 2.5A

J6802B Distributed Network Analyzer MX option 1DC
External: _40 – _56 VDC, 1.4A Typ (JA18)

J6803A Distributed Network Analyzer PRO
External: 100 – 240 V ~, 50 – 60 Hz, 2.5A

J6805A Distributed Network Analyzer ME
External: 100 – 240 V ~, 50 – 60 Hz, 3.0A

Temperature

Operating: +5° to +40° C (+41° to +104° F)
Non-operating: -25° to +60° C (-13° to +140° F)

Humidity

Operating: 20% to 80%, Non-condensing
Non-operating: 10% to 90%, Non-condensing

Altitude

Operating: 4,570m (15,000 ft)
Non-operating: 12,200m (40,000 ft)

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Regulatory Compliances

EMC:	Europe:	Low Voltage and EMC Directives (CE marked) IEC 61326-1
	Canada:	ICES-001 (marked)
	Australia/New Zealand:	AS/NZS 2064.1 (C-Tick marked)
Safety:	IEC 61010-1 (CE marked) UL 3111 CSA C22.2 No.1010.1 (CSA-C/US marked)	

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Agilent Ordering Information

Hardware and Software Platforms

J6782A	Network Troubleshooting Center RMON
J6800A	Network Analyzer
J6801A	Distributed Network Analyzer
J6802B	Distributed Network Analyzer MX
J6803A	Distributed Network Analyzer PRO
J6805A	Distributed Network Analyzer ME
J6839A	Network Analyzer Software – Professional Edition
J6840A	Network Analyzer Software
J6835A	Network Analyzer NDIS Server

Line Interface Modules (LIMs)

J6810B	STM-4/OC-12/STM-1/OC-3 LIM (LC optical connectors)
J6811A	STM-1o/OC-3 LIM (SC-PC optical connectors)
J6813B	E3/T3 (DS3) LIM (unbalanced 75 Ohm BNC connectors)
J6815B	T1/E1 LIM (balanced 100 Ohm RJ-45 and WECO Bantam connectors)
J6816B	E1/T1 LIM (balanced 120 Ohm DB-9 and RJ-45 connectors)
J6817B	E1 BNC LIM (unbalanced 75 Ohm BNC connectors)
J6818A	ATM25 LIM (RJ-45 connectors)
J6820B	V-Series LIM (requires J6757A cable(s))
J6821A	HSSI LIM
J6824A	Eight-port T1/E1 LIM (IMA support requires J6825A software)
J6830A	10Base-T and 10/100BaseTX Ethernet LIM
J6831A	10/100Base-FX Ethernet LIM
J6832A	1000Base-X Ethernet LIM (includes pair of SX GBICs)

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Software Applications

J5425A	Switch Advisor
J5479A	Voice Quality Tester (VQT) 10/100 Interface
J6765A	RFC2544 LAN Benchmarking License
J6766A	Multi-Protocol Label Switching (MPLS) Analysis
J6825A	IMA Software (for use with J6824A LIM)
J6842A	3G UMTS W-CDMA Test Software
J6844A	Telephony Network Analyzer
J6845A	3G cdma2000 Test Software
J6848A	Report Center
J6849A	One-time Software Upgrades
J7830A	Signaling Analyzer Real-Time

Accessories

J1990A	LAN Analyzer Tap
J6750A	Alternative hard disk drive for the J6800A Network Analyzer
J6751A	Alternative hard disk drive for the J6802A DNA MX
J6751B	Alternative hard disk drive for the J6802B DNA MX
J6752A	Alternative hard disk drive for the J6803A DNA PRO
J6753A	Additional combo 56K modem with 10/100Base-TX Network interface PC-Card
J6756B	HSSI Monitor Tap
J6757A	Monitor/Simulate Cables (five cable options)
J6760A	Deluxe carrying case for the J6803A DNA PRO, J6801A DNA, and laptop
J6761A	Deluxe wheeled case for the J6800A (not suitable for airline bag checking)
J6762A	Wheeled transit case for the J6800A
J6763A	Transit carry case for the J6801A and J6805A
J6772A	2U Rack Mount Kit for the J6801A, J6826A, J6827A and J6828As
J6775A	Rack Mount Kit for the J6805A
J6824A #001	mini-Bantam Conversion cable for J6824A LIM
J6824A #002	75 Ohm (unbalanced) BNC Conversion cable for J6824A LIM
J6824A #003	100 Ohm (balanced) RJ-45 Conversion cable for J6824A LIM
J6826A	Eight-Port T1/E1 Balanced Monitor Tap
J6827A	Eight-Port E1 BNC Monitor Tap
J6828A	Four-Port STM-1/OC-3 LIM Multiplexer (for use with J6810B LIM)

Warranty and Support Services

Hardware 1-year
Agilent instrument warranty and service plans
Agilent instrument phone support plan
Agilent instrument software support plan
Software 90-day media replacement

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