ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Keysight / Agilent 37907A* at our website: *Click HERE*

Agilent Technologies

Signaling Advisor – 37907A

Data Sheet

Agilent Technologies

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Business and consumers are increasingly sensitive to even a minor deterioration in service quality. To maintain customer satisfaction and loyalty, your technology teams need tools that help identify potential problems and resolve faults quickly and effectively... they need an Agilent Technologies Signaling Advisor.

The Signaling Advisor is a software application designed to run on a dedicated mainframe. The resulting instrument simplifies assessment of signaling performance and trends. Add any appropriate optiona decodes and link interface modules, and you're ready to test across multiple links involving different protocol standards for example, at access network interfaces. At the heart of each Signaling Advisor, the intuitive graphical user interface makes measuring and understanding results easier for signaling engineers, enabling them to check performance and troubleshoot problems in signaling systems quickly and accurately.

A range of link interface modules (LIMs) provide the physical interfacing to network equipment. Each LIM connects to one type of physical interface (eg, E1 or T1), providing access to all signaling links on up to four bidirectional bearers. The mainframe supports two LIMs (eight bidirectional bearers). Optional undercradles expand capacity to four LIMs (16 bidirectional bearers) or provide Ethernet connectivity.

The architecture of the software and mainframe makes it easy for you to keep up with changing technologies and data rates, minimizing the need to replace equipment. Simply add a LIM or decode to bring your instrument in line with new needs. High performance and flexibility are designed into the Signaling Advisor mainframe, enabling it to cater for today's and tomorrow's applications. Separate processors (with independent memory) handle data acquisition and user interface, allowing optimum performance to be achieved.

EmuLite is an option which allows the Signaling Advisor to be upgraded to a fully integrated monitor and emulation solution. EmuLite creates and executes tests faster through use of its graphical message and sequence editors. This allows engineers more time to diagnose signaling problems without the need for programming.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

General Feature Summary

- Dedicated software for Cellular, PCS/GSM, GPRS, UMTS, cdma2000 and SS7 signaling networks
- Windows 98® based operation
- Multitasking applications (protocol analysis, statistics, call trace)
- Real-time or post-capture analysis
- Connect to up to 16 duplex physical bearers (E1 or T1, DS0, V.35, RS-232, RS-449)
- Analyze up to 32 duplex signaling links (8, 16, 32, 48, 56, and 64 kb/s)
- Analyze full duplex Ethernet/Fast Ethernet GSM sub-rate signaling
- (8, 16, 32 Kb/s) and TRAU decode support
- Analyze ATM signaling links, including Iu, Iub and Iur for W-CDMA
- Analyze Frame Relay and ISDN connections for WAN
- UMTS (E1/T1 ATM and STM-1/OC-3 ATM)
- Monitor up to 4 full rate GPRS Gb duplex bearers
- Monitor up to 3 full rate high speed SS7 bearers
- Chinese language GUI option
- Voice monitoring
- Link Status view
- Alarm View
- Auto-configuration identifies signaling links and protocol stacks
- Graphical configuration and measurement setup
- Triggers and filters (logging and display)
- On-line and context sensitive help
- Protocol help

Monitor Features

- Graphical call trace with filters and alarms
- User-configurable columnized traffic overview and columnized color coded, protocol decodes
- Graphical (or tabular) time-based statistics with thresholds
- Automatic message and sequence validation
- Point code interpretation
- Storage of captured data and configurations to disk
- Stand-alone PC software for post-capture analysis
- Timestamping up to 12 microsecond resolution
- Remote Control
- Compatible with capture file formats of Agilent Advisor and Network
- Analyzer protocol analyzers, acceSS7 monitoring system and Agilent 37900D signaling test set
- Export data to CSV file for further ‘off-site’ analysis

EmuLite Features

- Automatic test creation - copy messages and their sequence from call trace
- Graphical editor - quickly create messages - no more programming!
- Intelligent protocol field-based editor - correctly build complex signaling messages - not just in hex!
- Intelligent built in test manager - easily manage the execution of tests
- Graphical analysis tools - instantly identify failed tests and why they failed
- Easily verified network element responses
- Test all non-IP based GPRS interfaces
- Test SS7, GSM, GPRS, IS-41, CDMA, ISDN plus many more

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Automatic Configuration

The Signaling Advisor makes it easy for you to start monitoring, even if you don't know what timeslots or protocols are being used for signaling. The auto configure tool configures the instrument's receiver to match the bearer and then searches the bearer for signaling links (timeslots that are carrying signaling information). The correct protocol stack will be built based on signaling messages.

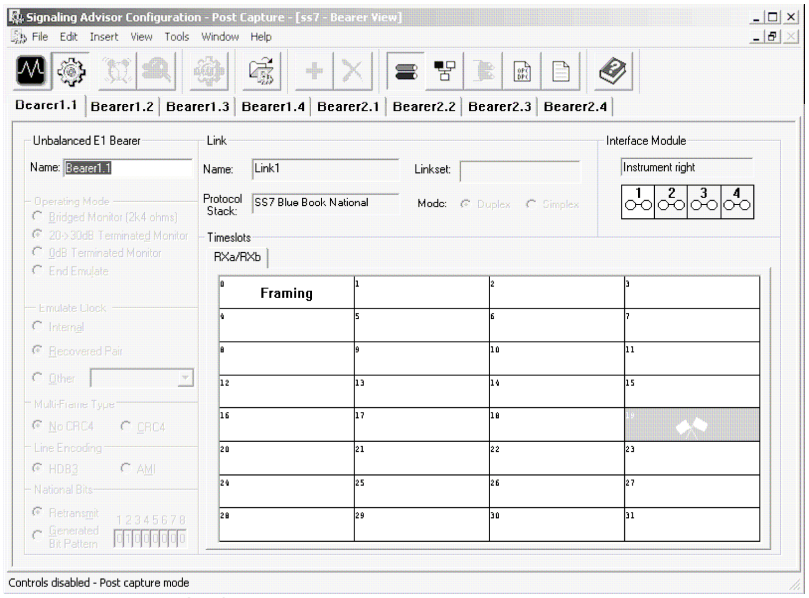


Figure 1: Network Configuration

Graphical Protocol Stack Editing

If the default protocol stacks do not match the signaling being tested, or a special variant is required, you can quickly change the assigned protocol stack graphically. Figure 2 shows a typical protocol stack.

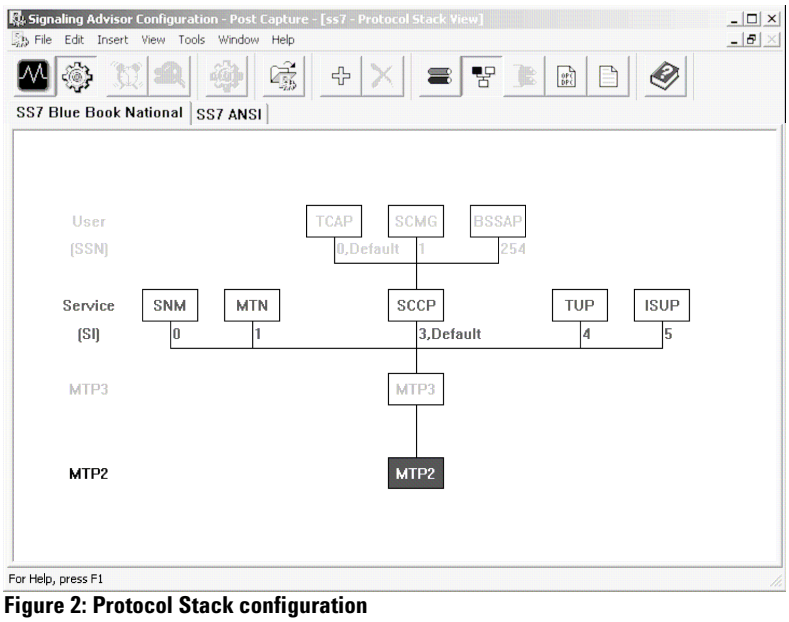


Figure 2: Protocol Stack configuration

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Point code Interpretation

You can program the software to interpret numerical originating and destination point codes (OPCs/DPCs) into text e.g., “1234” could be interpreted as “London”. The text will replace the numeric value on the display and printouts to facilitate decoding and analysis. This feature also supports varying point code formats.

Miscellaneous

- FISU/LSSU/PCR filters
- Simplex signaling links supported
- Voice monitoring (via handset)
- Save or print configurations

Measurement Setup

Real-time Analysis

The SS7 Signaling Advisor monitors up to 16 bidirectional bearers and up to 32 duplex signaling links simultaneously (spread across one or more bearers). Each signaling link can carry a different protocol. Monitored data is processed then automatically stored to hard disk.

Post-capture Analysis

All of the capabilities available for real-time analysis are also available for use on previously logged data. The user may perform the same operations as in real time.

Applications

In addition to the default protocol analysis application, it is possible to setup multiple applications for statistical analysis or call traces. Figure 2 shows a typical real-time measurement setup.

Triggers

Users can control the logging period by defining start and stop trigger events. Any number of triggers can be defined. These trigger can be:

- Date and time
- Occurrence of a specified message or parameter value in a message
- Event (eg, CRC error)
- Elapsed time from start trigger
- Repeatable start and stop triggers
- Users can also specify the period for each log file to be stored in a disk, up to a maximum of 7 days, 23 hours and 59 minutes.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Filters

Users can define filters that control the type and amount of data logged and displayed (e.g., filtering on selected links). The filters can also accept or reject messages based upon values within messages (e.g., message types or parameters within messages). A special view filter allows the user to display only invalid messages (i.e., messages which do not conform to the protocol standard configured). Filters can be logically combined using AND/OR.

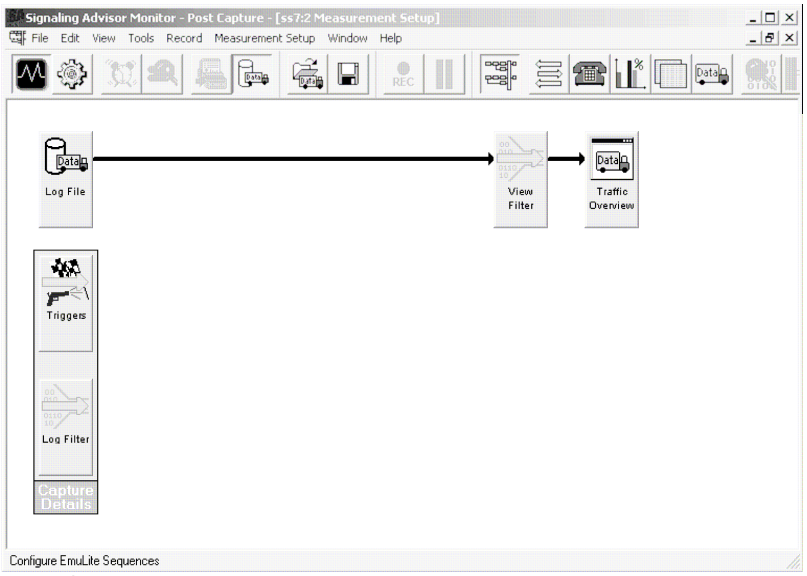


Figure 3: Measurement setup display.

Ethernet Monitoring for GPRS and cdma2000

Ethernet Monitoring for GPRS and cdma2000

Ethernet monitoring is available for the GPRS as well as the cdma2000 packet switched core network.

Expert Analyzer

The expert analyzer enables an instantaneous view of the key issues and overall health of your network. Utilization and significant events are shown graphically by protocol, and further information can be obtained by drilling down on items of interest.

Protocol Commentators

Commentators perform real-time analysis of frame sequences to detect protocol events. The logged events are linked to the corresponding captures frames. Three levels of events are shown: Alert events show serious problems, warning events show configuration or performance problems, and normal events show information on network transactions.

Connection and Node Statistics

These statistics give information on activity at a particular node or for a particular connection.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Ethernet Logging Filters

Up to 16 Ethernet filters are also available. The filters are logically OR'd together and can filter on the IP address, frame attribute such as good frames, bad FCS frames, runts, jabbers and dribbles. Up to 48 bytes in the data field can also be used as a filter criteria.

Node Discovery

The node discovery feature allows the Signaling Advisor to detect new nodes that have been connected to the network and adds it to its internal node list. The node list contains the following information:

- MAC (Medium Access Control) addresses
- Network addresses (IP, IPX, AppleTalk, DECnet, OSI CLNP)
- Node names (DNS name and address)

Decodes

Every frame captured can be decoded with details on each field, summary of key fields and hexadecimal decode.

Protocol Vitals

For the MAC layer and each protocol stack, protocol vitals show cumulative measurements and trends over time. Measurements are made simultaneously, with current, average and peak values. The last 60 samples can be displayed graphically and user-defined thresholds can be applied.

Eight types of LAN Measurements

The Fast Ethernet Interface and software provides real-time and post-capture analysis of Ethernet protocols. There are also eight built-in analysis tools:

- Expert analyzer
- Node statistics
- Node and connection statistics
- Protocol stack statistics
- Protocol commentators
- Node discovery
- Protocol Vitals
- Decodes

Automatic Negotiation

The automatic negotiation function configures the physical interface for line rate and connection.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Stimulus and Response Testing

The following pre-written stimulus/response sequences are available for Ethernet:

- Media – Ethernet cable integrity test.
- Response times – ICMP ping, ARP request, RARP

The following Novell network tests are also available:

- Server query - Determine connected networks (addresses and names of remote networks) (test server reachability)
- Find nearest server (in time, or nearest server of a specific type)
- Server list (list all active Novell servers)
- View nodes (list all Novell clients)
- Node ping (test client reachability)

ATM Testing

No matter where you are in the process of bringing up your ATM network, the Signaling Advisor gives you visibility to help you know what's happening. The Signaling Advisor is the complete ATM troubleshooting tool. From installation, maintenance and troubleshooting to performance optimization and remote monitoring, the Advisor lets you connect anywhere on the network, capture all the necessary data, and comprehend that information as it reveals problems and suggests solutions.

With the J5458A 3G W-CDMA Test Software, the ATM application will give you full visibility on all 3G W-CDMA interfaces, Iub, Iur, Iu-PS and Iu-CS.

Signaling Advisor has made ATM testing easy, with its groundbreaking user-friendly ATM software. To install or troubleshoot an ATM link, it is necessary to test for many things: physical errors, equipment interoperability, ATM cell congestion, and even LAN traffic problems. The Signaling Advisor offers integrated SS7, GSM, CDMA/cdma2000, GPRS, UMTS protocol analysis capabilities, along with, ATM and 10/100 Ethernet stimulus/response measurements, and statistical analysis capability – everything required to get a good look at the physical layer, ATM/MAC layer, and all of the upper protocol layers.

In addition, the ATM software can test ATM quality of service (QoS) with contract conformant traffic and can check live traffic for conformance to a traffic contract (policing). For Frame Relay, the ATM software can verify that Service Level Agreements are met. No matter what the traffic level, the Advisor will capture every cell or frame on full-duplex network connections. It monitors non-intrusively and decodes ATM data at full line rate. Further, it can simulate traffic from either direction within a connection. In addition, it can process previously captured data from its capture buffers or from a file for retransmission. The analyzer not only captures traffic when the network is working - it provides information when the network is broken - when it is needed the most.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Key ATM Features and Functionality

The software provides the following powerful ATM features and functions:

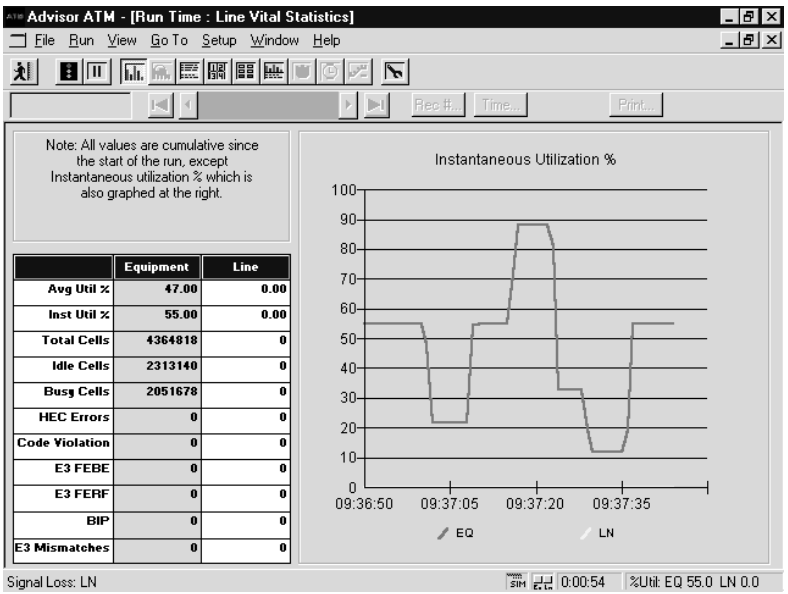
- Handles ATM testing rates from 1.5 Mb/s to 622 Mb/s; ATM Interfaces including T1/E1, J2, E3/T3, STM-1/OC-3, STM-1e/ EC-3, STM-4/OC-12, ATM25 (25.6 Mb/s UTP-3/5) and UTP155 are available as plug-in modules or undercradles
- Auto-discovers up to 1024 Virtual Channels on all ATM interfaces
- Analyses protocols including full rate capture with capture and display filtering and searching (e.g. set the capture filter to capture only ATM streams carrying IP traffic with specific IP addresses)
- Monitors, captures data, and decodes upper and lower layer protocols in real time
- Decodes and logs statistics for LAN encapsulated protocols over ATM, including Voice over IP decodes: H.323 series, IETF series (SIP, MGCP, SGCP, MEGACO), ITU-T T.38
- Finds Errors in capture file or buffer
- Decodes AAL-1, AAL-2, AAL-3/4, AAL-5
- AAL 5 CRC Statistics
- Decodes Frame Relay over ATM
- Decodes ATM UNI, NNI (B-ISUP, B-ICI) and PNNI signaling
- Decodes IMA Control Protocol (ICP) cells
- Real-time and post-processing User Assisted LAN over ATM
- Emulates ATM UNI signaling – check call set-up procedures
- Emulates ELAN Join (LANE)
- Generates user-defined cell traffic from a cell table
- Retransmits captured traffic which has been copied and pasted to the cell table, modified (e.g. VPI-VCI and/or embedded IP addresses changed); the HEC and AAL-5 CRC-32 are automatically recalculated
- Generates ATM ICMP Echo (PING)
- Generates and analyses OAM cells
- Tests ATM QoS performance to the ITU-T O.191 standard – measures cell loss, cell delay, cell delay variation, cell mis-insertion and cell errors
- Generates ATM traffic shaped to traffic contracts
- Polices ATM traffic to traffic contracts
- Tests simultaneously with other technologies (e.g. SS7, GSM, CDMA,
- GPRS, Ethernet)
- Measures optical power

Line Vital Statistics

ATM Line Vital Statistics saves valuable time automating the troubleshooting process. The Vitals application provides a quick view of overall ATM network health. From Vitals you can drill down to pinpoint a specific problem.

Values in the Vitals display are given in tabular form and are cumulative from the start of the test, except the instantaneous utilization, which is also displayed in graphical format for a quick view of overall usage of the network. Vitals data include such statistics as average utilization in percent, instantaneous utilization in percent, total cells, idle cells, busy cells, header (“HEC”) errors, code violations and frame alignment errors.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



	Equipment	Line
Avg Util %	47.00	0.00
Inst Util %	55.00	0.00
Total Cells	4364818	0
Idle Cells	2313140	0
Busy Cells	2051678	0
HEC Errors	0	0
Code Violation	0	0
E3 FEBE	0	0
E3 FERF	0	0
BIP	0	0
E3 Mismatches	0	0

Figure 4: ATM Line Vitals Statistics provides an instantaneouse view of overall network health.

Capture Filters and Counters

Hardware counters and filters allow the user to select cells or AAL5 PDUs to bring into the capture buffer. With data filtering, the user can zero in on exactly the data the user needs to see. The filters examine every cell in real time as it appears on the network. Since the filtering is done in the hardware, nothing is missed, and the performance of the measurements and user interface are not compromised.

Up to twelve hardware filters and counters can be enabled simultaneously and, additionally, any two of the filters can be enabled to capture all the cells that contain AAL5 PDUs. Flexible and user assisted menus can be used to define specific filters, counters, and triggers based on protocol headers (see figure 2). Examples include ATM, LAN over ATM (to RFC 2684/1483), Frame Relay (FRF.5), LAN over Frame Relay over ATM (to RFC 2427/1490 and FRF.5 simultaneously), and Classical IP and ARP over ATM (RFC 2225/ 1577). Filter and counter criteria can be used to start/stop the data capture and to center the data in the buffer, the user can see what led up to an event and what followed it. Filter criteria may also be used to ignore or store the data.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

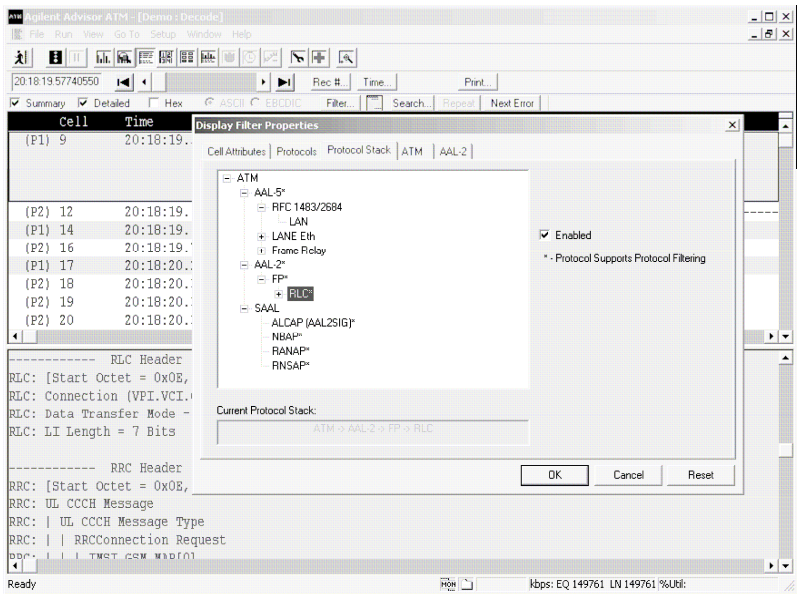


Figure 5: ATM Filter properties.

Filters are also used as counters to specify statistical measurements based upon any part of the ATM header or payload on the line (network) side, the equipment (user) side of the link, or both. The counter and filter results provide the following:

- Number of cells that met the filter criteria
- Percentage of cells out of the total busy (assigned) cells on the line
- Percentage of bandwidth these cells occupied
- Throughput in kb/s of these cells
- Throughput in cells per second of these cells

Whatever filters or connectors the user selects or creates, the results are automatically grouped in real time.

The following filters are provided, but others are easily created to incorporate several variations. Specific interface configurations and traffic generation cell tables can be saved along with filter configurations:

- IP address filtering
- ILMI filtering
- OAM filtering
- Protocol distribution filtering
- VP.VC filtering

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Display Filters and Searching

Display filtering and searching lets the user search through collected data to find specific IP addresses, values for protocol fields, or conversations on specific bi-directional virtual connections (by VPI-VCI). The display filters provide the flexibility to select protocol attributes or specific protocols from a checklist, and the power to filter on any bit, byte or characteristic, such as protocol. For example, filtering can be preformed on OAM traffic without having to know any of the protocol specifics.

Post-processing lets the user quickly zoom in on selected criteria, from the traffic passing between specific devices to individual conversations. Post-processing allows the user to:

- Search through the data by record or by time stamp
- Search for events or strings
- Filter on protocols
- Verify event-to-event timing
- View protocol errors
- Print a range of cells or the entire buffer
- Export data in CSV (comma separated variables) format
- Analyze statistics based on the buffered data

Optical Power Measurements

In addition to full ATM analysis, the STM-1/OC-3 ATM interface has a built-in optical power meter that allows the user to check power levels with an accuracy of +/- 0.5 dBm. This measurement capability has the ability to be performed using the same interface on an optical fiber carrying STM-4/OC-12c, even though the interface does not otherwise operate at 622Mb/s.

Signal Strength Pulse Amplitude Meter

In addition to full ATM analysis, the E1/T1 cells and frames interfaces have a built-in pulse amplitude signal strength power meter that allows users to check pulse amplitude levels with a resolution of +/-1 dBm. The dynamic range is between +6 dBmV and -40 dBmV.

Line Status

The operation of the physical interface is often critical in determining the cause of network problems. Therefore, the Advisor also tracks errors at the physical layer. Counts of error and alarm events are recorded on the display for both the line (network) and equipment (user) side. The time of the last occurrence of a particular event is recorded as well. Events are saved in the buffer and can be logged to disk.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

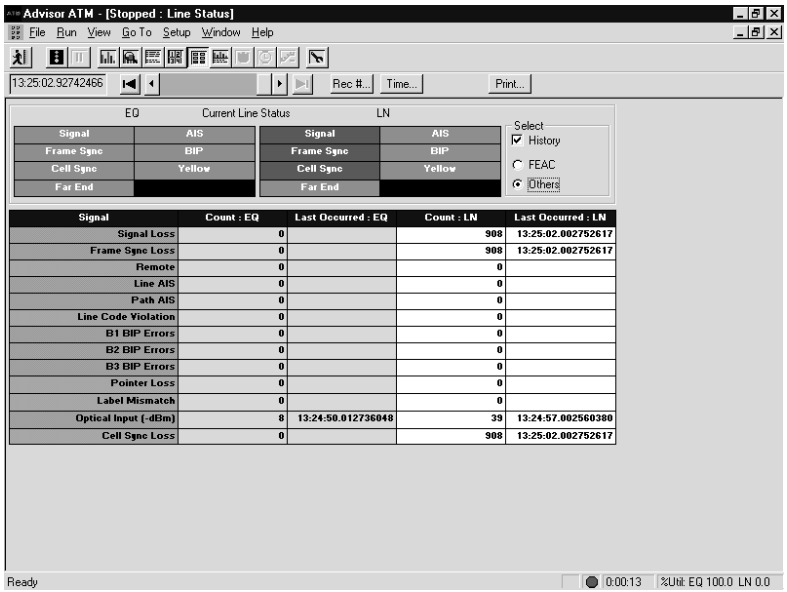


Figure 6: Line Status.

Line status is displayed in real time and is shown in figure 6. All of the events listed below are saved in the buffer and counted in the line status display. These events may be logged to disk. The current status of critical parameters (marked with an asterisk (*)) is also displayed in large green or red boxes in the line status display, for easy, at-glance viewing.

VP.VC Autodiscovery and Statistics

The Advisor can autodiscover up to 1024 virtual channels and for each collect and display VPI.VCI, maximum and instantaneous utilization and throughput (kb/s), cell and octet counts, header (“HEC”) errors and CLP status.

ATM Cell Generation

An ATM cell editor can build a *cell table* of up to 255 user defined or previously captured cells that can then be transmitted onto the network. Editing functions include the following:

- Add
- Edit
- Delete
- Copy
- Insert

Windows keyboard commands are also supported – Ctrl-c, Ctrl-v, Ctrl-x, etc. Sequences of captured cells (e.g. an AAL-5 PDU) can be copied and pasted to the cell table; the resulting cell table contents can be edited/modified (e.g. to change the VPI-VCI or to change embedded IP addresses) and the HEC and AAL-5 CRC recalculated, as appropriate, prior to transmission.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

During the time that the cell table is not being sent, the ATM software will send idle or unassigned cells. *Send Control* allows the contents of cell table to be sent once or repetitively, or for AIS or idle cells to be sent. The peak cell rate (PCR) of the cell table based traffic can be set from zero to the following maximum values, all of which are 100% utilization for that interface. Also, for ease of entry, a percent of utilization can be entered, such as 50% in place of the cells per second value.

- 353,207 cells per second for STM-1/OC-3
- 3,623 cells for DS1
- 4,528 cells for E1

To generate OAM cells, the user can use *quick tests* that include F4 and F5 segment or end-to-end cells with user-defined VPI[-VCI] values, they are transmitted from the traffic generator. To generate cell errors, modify the *quick tests* to add corrupted cells to the cell table.

The fields of the generated ATM cell header can be specified as follows:

- VPI values from 0 to 255 (UNI), or 0 to 4095 (NNI)
- VCI values from 0 to 65,535
- GFC values from 0 to 15 (UNI only, not applicable in NNI)
- PTI values from 0 to 7
- CLP values of 0 or 1
- HEC can be set to good (automatically calculated), bad, or user defined.

The generated ATM cell payload can be defined in hex, decimal, ASCII, or "don't care." Errors can be inserted on any bit within any byte of the payload.

ATM Quality of Service (QoS) and Policing Tests

The ATM software has the ability to do various real-time tests and measurements to check the performance of ATM networks. These fall into two main categories – policing and traffic contract shaped test cell generation, really mirror images of each other. In the case of policing, the ATM software monitors live traffic and measures conformance to the traffic contract. Test cell generation allows test traffic shaped to a traffic contract to measure the network's ability to deliver the promised QoS, i.e. is the network meeting its SLA (service level agreement) obligations?

Policing, traffic shaping and traffic contract measurements

One of the most important premises of the deployment of ATM networks is the ability to maintain a given level of QoS within the public ATM network. ATM networks protect themselves by policing incoming traffic to check its conformance with pre-determined traffic contract parameters. Some cells may have to be discarded or "tagged" (marked to low priority) in order to protect the traffic of other users of the ATM network.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

When customer traffic exceeds or 'violates' its contracted *peak cell rate* (PCR), taking into account its *cell delay variation tolerance* (CDVT), cells are discarded; when it exceeds the *sustainable cell rate* (SCR) parameters, taking into account its *maximum burst size* (MBS) allowances, cells may be discarded or tagged (cell loss priority (CLP) bit changed to 1), depending on the type of traffic contract. When congestion occurs in the core network, low priority cells (CLP = 1) are discarded first by core ATM switches before the cells of normal priority (CPL = 0). Policing enables networks to assure a consistent quality of service within the core network, preventing the overall network performance to be degraded by an individual user.

The ATM software's policing measurement feature is a real time measurement that checks a virtual connection's conformance to the traffic contract at the ingress to the public network; this could be a virtual channel connection or virtual path connection. The user specifies the traffic contract type (e.g. VBR.3/SBR3) and parameters (PCR, CDVT, SCR and MBS) for the virtual connection and the ATM software counts the non-conforming test cells and delivers a nonconformance count and non-conformance ratio for active traffic on the network. This measurement would be used typically to check a user's traffic either side of the boundary to the public network when quality of service is suspect (the user experiences unexpected levels of cell loss). If the user traffic entering the network does not conform, the network cannot be blamed for the resulting poor QoS.

Traffic Contracts Supported

As shown in figure 3, the user may specify one of the following types of traffic contract to determine how many cells in the virtual connection are conforming or non-conforming:

CBR.1/DBR/UBR.1: GCRA(1/PCR0+1, CDVT0+1)
VBR.1/SBR1: GCRA(1/PCR0+1, CDVT0+1), GCRA(1/SCR0+1, BT0+1), no tagging
VBR.2/SBR2: GCRA(1/PCR0+1, CDVT0+1), GCRA(1/SCR0, BT0), no tagging
VBR.3/SBR3: GCRA(1/PCR0+1, CDVT0+1), GCRA(1/SCR0+1, BT0+1), tagging supported

(note that in this notation, subscripts "0" and "1" means high and low priority cells respectively, so "0+1" means all cells; note also that BT (burst tolerance) is derived from the MBS, PCR and SCR values)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

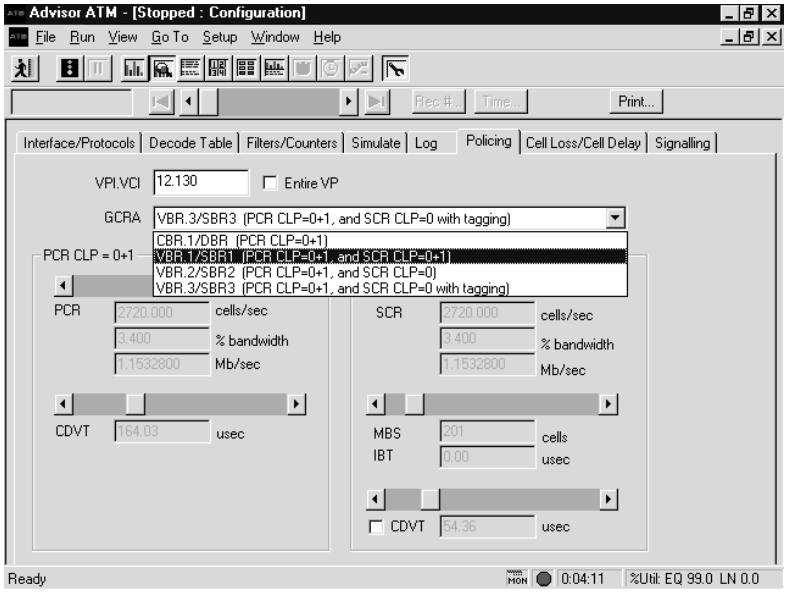


Figure 7: Traffic configuration shaping of test cell traffic and background traffic.

There are two sides to any contract and ATM traffic contracts are no exception. If the user traffic keeps to its contract obligations then the network should deliver the quality of service it guarantees in the traffic contract. This is usually specified in terms of cell loss and added cell delay variation, etc.

The ATM software is able to measure ATM layer QoS by generating test traffic shaped to meet the traffic contract in terms of PCR, CDVT, SCR and MBS; it also allows users to choose the standardized “Generic List” values for the parameters. The test traffic comprises test cells which conform to ITU-T Recommendation O.191 which specifies the test cell and the methodology for measuring ATM layer QoS parameters specified in ITU-T Recommendations I.356 and I.357, and the ATM Forum’s Traffic Management Specification version 4.1.

Measurements made by the ATM software are as follows:

Cell Loss Ratio
Cell Misinsertion Rate
Cell Error Ratio
Cell Delay Variation
Mean Cell Transfer Delay Minimum Cell Transfer Delay
Maximum Cell Transfer Delay
Severly Errored Cell Block Ratio
Availability Ratio
Transmitted Cells
Non-Conforming Cells
Tagged Cell

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Test traffic can be sent and received by the same Advisor for local testing or it can be sent by one Advisor and received on the other side of the network by another. Each Advisor on either end of a connection, can source test traffic in the opposite direction on the same bi-directional virtual connection and, at the same time, analyze traffic from the other; each Advisor is configured to source traffic conforming to the traffic contract for that direction of the virtual connection; such connections are often asymmetrical. As conforming test traffic is entering the network, any cell loss or cell delay variation detected on the far side of the network must be caused by the network itself; this can be compared with the SLA requirement to check that the network is complying with its side of the agreement. The Advisor is also capable of generating same link background traffic (on other virtual connections).

For more details about policing and shaping, see the ATM QoS White Paper (5968-8556E).

Inverse Multiplexing for ATM (IMA)

The Advisor can now decode IMA Control Protocol cells. These ICP cells are sent regularly on each E1 or T1 in an IMA Link Group in order to manage the IMA process. The ability to decode and display these physical layer cells helps troubleshooters identify IMA configuration problems.

ATM Signaling and Call Placement

While permanent virtual circuits (PVCs) have dominated the ATM world thus far, switched virtual circuits (SVCs) are increasing in utilization.

The Advisor includes UNI signaling emulation, ILMI address registration and LANE emulation to provide connectivity testing.
The signaling and call placement feature supports ATM Forum UNI 3.0, 3.1 and 4.0. The Advisor can emulate the user or network side of the UNI. In addition, the user can specify and edit the information elements (IEs) placed on Call Connect messages that specify what type of SVC to bring up.

Health Monitor

The health monitor is an application that can run in the background of any other ATM application giving the user an overall view of the ATM network health. For ATM the health monitor has red/green light alarms for “HEC” Errors, Line Status and Low Priority Cells (CLP=1).
When the Health Monitor alarm indicates a red light for any of these variables, the user can double-click on the health monitor to bring up the application where the error condition is found.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Decodes

The ATM software has decodes for every layer of the ATM protocol stack.

ATM physical layer: IMA control protocol
ATM cell layer: Cell header details

ATM adaptation layer: AAL-1, AAL-2, AAL-3/4, and AAL-5 (with complete reasembly) Services layer:

- Encapsulated protocols such as frame relay, X.25 and LAN
- MPEG-2 Decode
- Signaling UMTS W-CDMA, UNI 3.0, 3.1, 4.0 PNNI, B-ISUP, B-ICI, SPANS (Fore Systems)
- All major protocol suites are supported, including TCP/IP, 3Com, AppleTalk, Banyan, Cisco, DECnet, H.323, IBM/SNA, LLC, Microsoft
- LAN manager, Novell, OSI, SUN, XNS, ISO, SIP, MEGACO, MGCP, SGCP, RTP, GPRS, W-CDMA and more

The analyzer can capture all cells or filter certain cells, to maximize your capture buffer space. Events are time-stamped with 100 ns resolution. Protocol decodes can run simultaneously over all active VP.VCs, allowing the analyzer to decode all channels in real time or in post-process mode.

3G UMTS/W-CDMA Software Test Highlights

- 3G UMTS/W-CDMA RAN Decodes
  - Decodes Protocols on Iub, Iur, Iuc, Iup Interfaces
- 3G User plane and Control plane Decodes
- 3G Protocol Filters
  - FP_MAC_RLC_RRC
  - NBAP
  - ALCAP
  - RANAP
  - RNSAP
- Available AAL2 CID, LI Filters
- Available CSV Format Save to File
- Available Wide Range of 3GPP Version
  - 3GPP 03-2000, 06-2000, 12-2000, 06-2001
- Available SIGTRAN Stack
  - SCTP_M3UA_SCCP_3G protocols
- Available in Distributed Configuration
- Available Auto-discovery of up to 4096 VCs
- Available with any supported ATM LIMs
  - i.e. T1/E1/J2/25M/OC3

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

ATM Signaling Standards	
ALCAP	ITU-T Q.2630.1
STC	ITU-T Q.2150.1 ITU-T Q.2150.2
MTP3b	ITU-T Q2210 (07,1996) TTC (Japan)
SCCP	ITU-T Q.713
SSCF-NNI	ITU-T Q2140
SSCF-UNI	ITU-T Q2130
SSCOP	ITU-T QSAAL.1 ITU-T Q.2110
ISUP	ITU-T Q.763
TCAP	ITU-T Q.773
3GPP Protocols	
Iub	
FP	3GPP TS 25.435 (Iub) 3GPP TS 25.427 (Iub)
MAC	3GPP TS 25.321
RLC	3GPP TS 25.322
PDCP	3GPP TS 25.323
NBAP	3GPP TS 25.433
RRC	3GPP TS 25.331
BMC	3GPP TS 25.324
Iu	
FP	3GPP TS 25.425 (Iur)
IuUP	3GPP TS 25.415
RLP	3GPP TS 24.022
GTP-u	3GPP TS 29.060
RANAP	3GPP TS 25.41
RNSAP	3GPP TS 25.423
NAS(MM/CC/GMM/SM)	3GPP TS 24.007 3GPP TS 24.008
NAS(SMS)	3GPP TS 24.011
NAS(SS)	3GPP TS 24.080
M2UA	draft-ietf-sigtran-m2ua
M3UA	draft-ietf-sigtran-m3ua
SCTP	RFC2960

Please see 3G UMTS W-CDMA Test Software J5458A Product Overview for more details 5988-1164EN or visit our website: www.agilent.com/comms/XPI

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Monitor Tool

Viewing Messages

The main traffic overview display shows (chronologically) every message captured for each signaling link. This overview display shows one line of essential information for each message. The type and format of information is displayed in columns and is controlled by the user. Each message can be decoded further to show a one line description per octet/field. Figure 4 shows a typical traffic overview.

In the decode view, each protocol level is shown in a different color to make troubleshooting simpler. Users can customize colors to suit personal preference. When analyzing data, the user can pause the display and interrogate decodes before resuming the analysis. Captured data can be saved or exported. Figure 4 shows a typical traffic overview.

Time Stamping

Each captured message is given a timestamp. The timestamp reference is the instrument's internal clock.

Alarm View

If a physical layer alarm occurs (e.g., AIS), a pop-up alarm view window appears showing software LEDs for all bearers. This view can be expanded to show individual alarm conditions.

Link Status and Message Validation

Link status and link loading information is available for each link under test. Link loading statistics include erlang rate, percentage breakdown of traffic types, and counts of erroneous Signaling Units or frames.

Message Validation

The software can highlight message-encoding errors found in received messages. In the traffic overview display, a message with an error is highlighted in red. When the message is decoded, the erroneous section is also shown in red to aid troubleshooting.

Message Sequence Validation

The "message sequence validation" function advises the user of errors in message sequences (e.g., messages which do not fit into a normal call pattern). The erroneous messages are highlighted in red.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Data Import

It is possible to import data from the Agilent AcceSS7 monitoring system (in hex format) or from the Agilent 37900D signaling test set into the Signaling Advisor. In the case of the 37900D signaling test set, a software utility is provided with the Signaling Advisor to perform the necessary file format conversion.

Miscellaneous

- Post-capture synchronization of multiple capture files
- "Hide" sensitive data (e.g., credit card information) facility
- Find occurrences of a particular message/event. Find next/previous occurrence of the same message/event
- Save selected data (e.g., filtered or grouped messages) to a separate capture file.

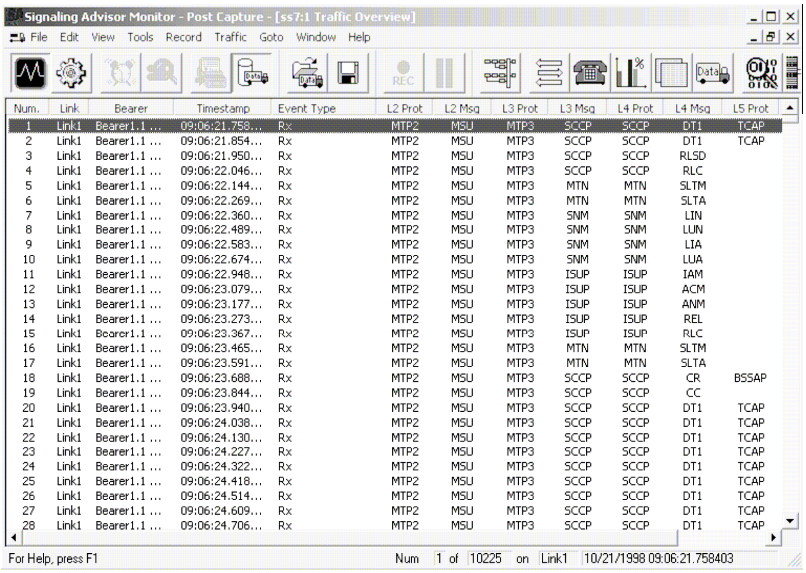


Figure 8: Traffic overview display.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Call Trace Tool

Call Trace Overview

The graphical call trace application traces calls (or message sequences) across all links and groups the messages together. It is therefore a very powerful facility for troubleshooting, particularly since it operates in both real-time and post-capture modes.

The application produces a user-configurable window which contains one line for each call. For example in the case of ISUP, this window would typically show:

- Call identifier
- Call status
- Call duration
- Call setup time
- Call cleardown time
- Called party number
- Calling party number
- OPC/DPC/CIC
- Release cause
- Graphical representation of call phases

GPRS Session Trace Tool

The GPRS session trace is the equivalent of a call trace application for the GPRS Gb interface. It captures and groups the signaling messages for user sessions such as PDP context and GPRS attach/detach procedures. The type of information displayed in the summary view is typically:

- Session status (active/terminated)
- Session type (attach/PDP)
- Session ID number/status
- Related GMM ID number
- IMSI/TLLF
- IMEI
- Location Area Code/Routing Area Code/Cell identifier
- Setup Time/Session Duration
- Source IP address (PDP contexts only)
- Uplink/Downlink packet and octet counts (PDP contexts only)
- Reject reason (PDP contexts only)

Group Function

From the call trace overview window, it is very easy to display all the signaling messages related to a specific call or sequence – simply double click on it. Alternatively, it is possible to click on any message in the traffic overview and use the group function to display all the messages associated with it (i.e., messages in the same call or sequence). Figure 9 shows a typical call trace overview.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Summary View

The call trace and GPRS session trace overview window has a summary view which shows the total number of calls seen, the number of open calls and

Filtering

Perhaps the most useful aspect of call trace is its filtering. This allows the user to program the call trace application with specific parameters such as (in the case of ISUP):

- Called party number
- Calling party number
- OPC/DPC/CIC
- Release cause
- Call duration

and to capture and display calls containing the parameter of interest.

Multi-protocol

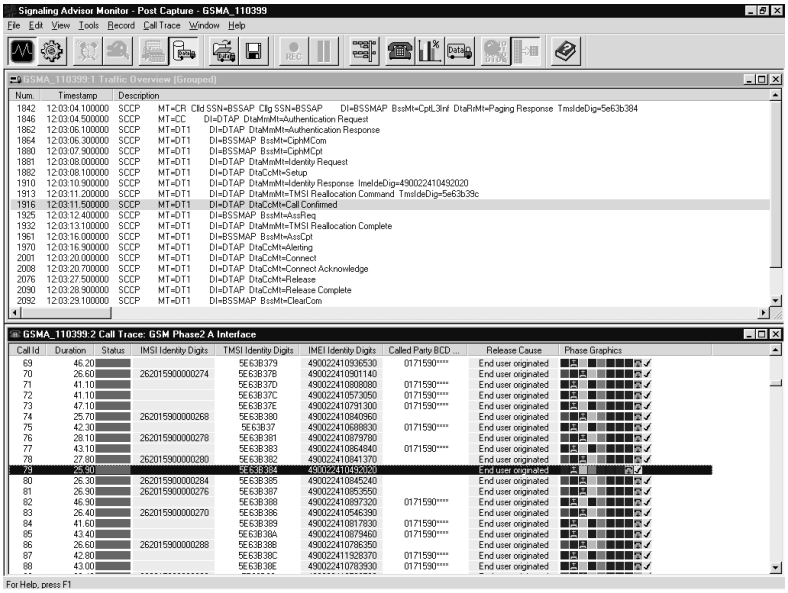
A range of call traces that link calls across multiple protocols is available.

Alarms

It is possible to program the call trace application to highlight specific calls in the call trace overview which have alarm conditions (e.g., calls with abnormal release causes).

Data Export

Call trace results can be exported to a CSV (Comma Separated Value) file for analysis in another application (e.g., Spreadsheet or Database). There are also special call traces that provide CSV files ready for use in Agilent's OPAS32 analysis software.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figure 9: Call trace display.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Statistics Tool

Graphical Statistics

User-definable graphical statistics are available in real-time or postcapture modes. There are several SS7 message transfer part (MTP) statistics, as well as user part specific statistics (e.g., message types or release causes). Statistics are typically counts or ratios. The statistics may be displayed graphically as:

- 2D Bar charts
- Radar diagram

Figure 10 shows a typical statistics graph.

Tabular Statistics

Tabular statistics are drawn by call traces. This provides a more detailed and dynamic view of network performance, incorporating several program measures. For example, gather performance data (handovers, errors, call success rates etc.) about all BTSs attached to a single BSC in a GSM network.

Time-based Statistics

It is possible to produce the graphical statistics as a tabular time series, where the intervals can be set from one minute to 24 hours.

Statistic Thresholds

The user can set lower and upper thresholds which, when exceeded, will result in color changes to the statistical graphs to highlight “alarm” conditions.

Ethernet Statistics (available with E7578A)

There are numerous predefined statistics available to help trouble shoot your IP connection. Statistics such as frame length, node statistics, error statistics utilization, runts, jabbers and trend displays are available. The statistics can be viewed as pie charts, gauges, counts or over time.

Call-based Statistics

The most advanced statistics features involve using the call trace application to evaluate call based statistics such as call completion ratio, min/mean/max call setup times, min/mean/max call durations.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

GSM Network Optimization

Special statistical profiles are included in the Signaling Advisor for the analysis of the radio resource element of the GSM Abis interface signaling.

These profiles extract key information from, for example, measurement result messages, and then present it to the user in a form which can aid network optimization.

GPRS Statistics

Predefined GPRS statistics (for the GPRS Gb interface) aid troubleshooting and trend analysis. The statistics are available graphically and can be measured over time if required. The statistics currently available are:

- Message / packet and cause / reject counts for all protocols
- SAPI distributions
- Higher layer protocol distributions
- Link utilization mean/max
- Packet length distribution
- Attach Time min/mean/max
- Session status (successful/unsuccessful) count
- PDP context activation Time min/ mean/max
- PDP context Deactivation time min/mean/max
- PDP context Duration MIN/MEAN/ MAX
- Uplink/downlink packet counts
- Uplink/downlink octet counts

Data Export

Statistics can be exported to a CSV (Comma Separated Value) file for further analysis in another application (e.g., Spreadsheet or Data base).



Figure 10: Shows a typical statistics graph.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

EmuLite

Introduction

Emulation is the ability to define and send signaling messages in a predefined sequence to a unit under test and respond to received messages.

Traditional emulation tools require complex programs to be written to perform even the simplest of tasks. Writing programs using a programing language is time consuming, error prone and distracts engineers from solving signaling problems rather then solving programming problems.

EmuLite revolutionizes the way in which emulation is performed through use of its key capabilities which are summarized in this section.

Graphical Message Editor

The EmuLite intelligent field based message editor allows message creation and modification using familiar protocol field names. When creating a message, users are shown the valid selections from which they can choose, significantly reducing the possibility of error.
Message fields can be saved into variables. EmuLite automatically updates all lengths, pointers and odd or even indicators.

Graphical Sequence Editor

Tests are configured using ‘drag and drop’ icons such as arrows, branches and timers. These automatically generate test scripts – a time-consuming and complicated task if programmed manually. More time can therefore be spent diagnosing signaling problems without the need for programming.

Call Simulation

Users can generate test sequences automatically from previously captured data as opposed to entering all the data manually. A sequence of related messages captured using the call trace function can be copied directly to the EmuLite sequence editor. This sequence and the messages within it can then be modified, if required, to create a test ready for execution.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

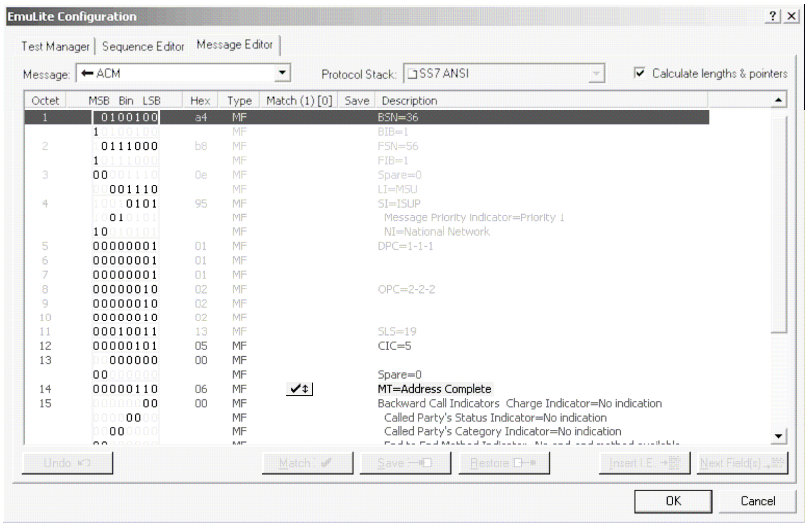


Figure 11: Message editor.

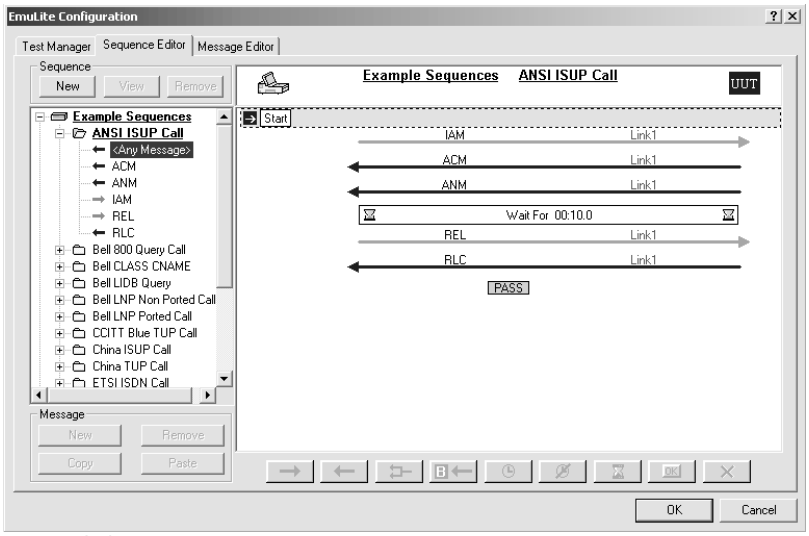


Figure 12: Sequence editor.

Conformance and Compatibility Tests

NIIF (formerly NOF) tests and high speed SS7 sequences are included – ready to run.

Test Manager

The test manager allows single or multiple tests to be selected and run sequentially. Results are stored in the test log and can be optionally logged to a .CSV file during execution. The EmuLite status view shows the progress of each test by displaying the messages and a PASS or FAIL indicator.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Graphical Test Analysis

EmuLite's status view identifies all tests which have failed. Advanced decode analysis tools allow messages to be examined in detail providing quick fault identification.

Fully Integrated with Monitor

EmuLite is fully integrated with the Signaling Advisor's monitor software. All analysis tools such as call trace, statistics and decodes are available for use. The flexibility of this software also allows existing monitor-only customers to upgrade easily to EmuLite.

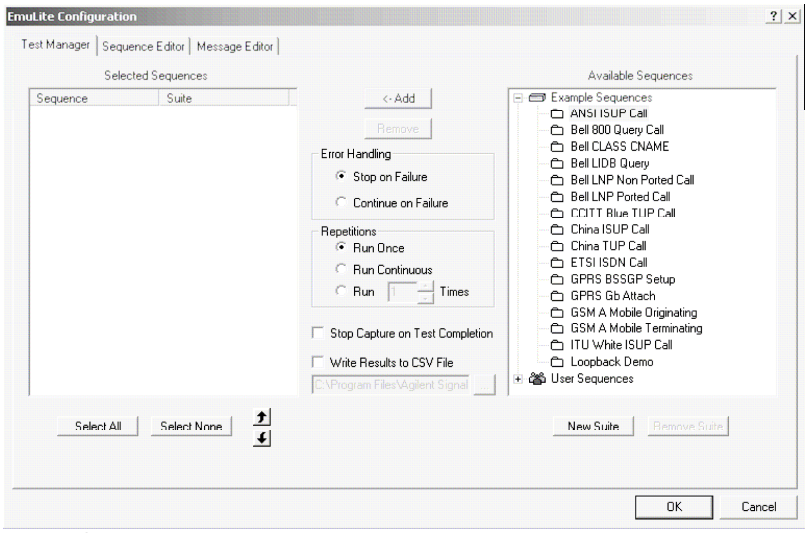


Figure 13: Test manager display.

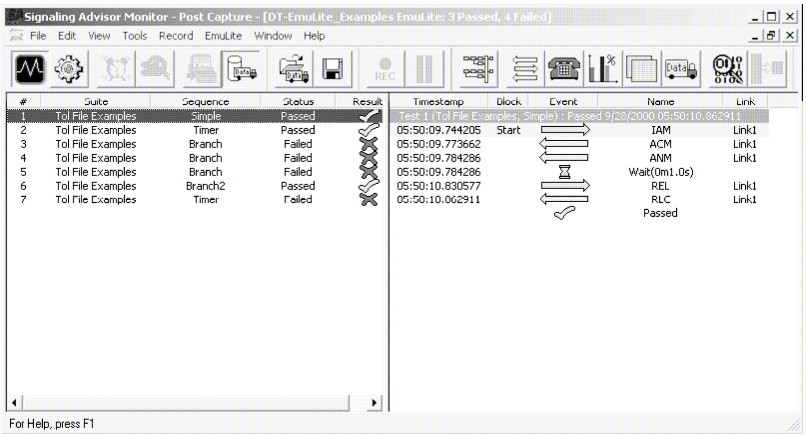


Figure 14: Test analysis display.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Specifications for Mainframe and Interfaces

37907A Signaling Advisor Mainframe

Number of LIM slots available: 2

Processing capacity: Up to 32 duplex signaling links (64 kb/s at 1 erlang)

Telephone handset connector: RJ11

Physical dimensions:
L × W × H (mm): 310 × 310 × 100
Weight: 7 kg
Volume: 10 liters

Power: 100-120Vac±10%, 220-240Vac±10%, 50-60Hz, 110VA max.

Operating Conditions

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

Humidity:
Operating: 20% to 80% relative humidity
Non-condensing to 40 °C. Storage: 10% to 90% relative humidity to 60 °C

Altitude:
Operation: 4,575 meters (15,000 feet); Storage 15,250 meters (50,000 feet).

Safety conditions
This instrument is designed for indoor use. Safety class I

Integrated PC (minimum specification)

Processor: Intel® Pentium or equivalent.
Clock speed: 400 MHz (min).
RAM: 256 MB.
Hard disk: 3 GB IDE (min).
Floppy drive: 3.5 inch, 1.44 MB DOS format.
Display: 10.4 inch LCD color SVGA (active matrix TFT).
Pointing device: Integrated mouse (external serial mouse also supplied as standard).

Operating system: MS Windows® 98

External interfaces

Video output: SVGA, 800 × 600 resolution
Printer: Parallel port
Serial: RS-232-C
PCMCIA PC cards: Slots for one type III or two type II

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

E7577A Link Expansion Undercradle

Number of LIM slots available: 2

Physical dimensions:
L × W × H (mm): 310 × 310 × 50.
Weight: 1 kg.

Interface Modules
A range of link interface modules (LIMs) allow the Signaling Advisor to connect to most network interfaces (each LIM supports four duplex signaling links):
2.048 Mb/s (E1) – balanced
2.048 Mb/s (E1) – unbalanced
1.544 Mb/s (T1)
DS0
V.35
RS-232
RS-449

E7578A Fast Ethernet Undercradle

Physical Dimensions:
L × W × H (mm): 310 × 310 × 50.
Weight: 2 kg.
- Attachable undercradle for Ethernet/Fast Ethernet analysis
- Data rate 10/100 Mbps with Auto-negotiation facility
- Full duplex analysis capability

Connectors: RJ-45 for 10/100Base-T/TX
- Second RJ-45 allows testing in switched Ethernet/Fast Ethernet environment

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

E7571A 2.048 Mb/s (E1) balanced LIM

Features:

- Monitor four bi-directional links per LIM (eight receivers)
- GSM sub-rate 32/16/8 kb/s and TRAU support
- Fractional E1 support

Connectors: 8 × Bantam connectors

Line codes: HDB3 or AMI.

Framing: To ITU-T G.732, (CRC4) as specified in ITU-T G.704.

Timestamp accuracy : +/- 12 msec.

Level 1 receive alarm indications:
- Loss of signal
- Alarm indication signal
- Line code violation
- Out of frame (loss of frame)
- Remote alarm indication.
- Out of multiframe (CRC4)

Receiver levels:
Terminated: Tx level less 30 dB flat loss, less dB cable loss at 1.024 MHz Bridged: Tx level less 6 dB cable loss at 1.024 MHz

Receiver impedances
Terminated: 120 ohm
Bridged: 3.7 kohm
Receive clock
tolerance: 2.048 MHz ± 50 ppm

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

E7572A 2.048 Mb/s (E1) Unbalanced LIM

Features:
- Monitor four bi-directional links per LIM (eight receivers)
- GSM sub-rate 32/16/8 kb/s and TRAU support
- Fractional E1 support

Connectors: 8 × BNC connectors

Line codes: HDB3 or AMI

Framing: To ITU-T G.732 (CRC4) as specified in ITU-T G.704

Timestamp accuracy : +/- 12 msec.

Level 1 receive alarm indications:
- Loss of signal
- Alarm indication signal
- Line code violation
- Out of frame (loss of frame)
- Remote alarm indication
- Out of multiframe (CRC4)

Receiver levels
Terminated: Tx level less 30 dB flat loss, less 6 dB cable loss at 1.024 MHz Bridged: Tx level less 6 dB cable loss at 1.024 MHz

Receiver impedances:
Terminated: 75 ohm
Bridged: 2.4 kohm
Receive clock tolerance: 2.048 MHz ± 50 ppm

J2900A High Speed Undercradle

Physical dimensions:
L × W × H (mm): 310 × 310 × 50.
Weight: 1.5 kg.

Features:
- Attachable undercradle for ATM analysis
- Provides one port for E1/T1 or OC-3/STM-1 ATM module
- Data rates from 1.553Mbps to 155Mbps with VP/VC auto discovery facility
- Full duplex analysis capability

Modules Supported in J2900A:
- **J2912B** - STM-1/OC-3 Plug-in Module for ATM analysis
- **J2298D** - E1/T1 RJ-45/RJ-48C/mini-bantam Interface for ATM
- **J2294D** - E1/T1 DB-9/RJ-45 Interface Module for ATM
- **J2296D** - E1 BNC 75 ohms Interface Module for ATM

Connectors:
- RJ-45, BNC and mini-bantam for E1/T1
- Optical connectors for OC-3/STM-1 optical

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

E7573A T1 Link Interface Module

Features:
- Monitor four bidirectional links per LIM (eight receivers)
- GSM sub-rate 32/16/8 kb/s and TRAU support
- Fractional T1 support

Connectors: 4 × dual Bantam connectors.

Line codes: B8ZS or AMI.

Framing: SF (superframe) and ESF (extended superframe

Timestamp accuracy : +/- 15 msec

Level 1 receive alarm indications:
- Loss of signal
- Alarm indication signal
- Bipolar violation
- Loss of frame
- Remote defect indication
- Severely errored frame

Receiver levels
Terminated: Tx level less 20 dB flat loss, less 6 dB cable loss at 0.772 MHz Bridged: Tx level less 6 dB cable loss at 0.772 MHz

Receiver impedances
Terminated: 100 ohm
Bridged: 1 kohm
Receive clock
tolerance: 1.544 MHz ± 50 ppm

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

E7574A V.35 Link Interface Module

Features:
- Monitor four bidirectional links per LIM (eight receivers)
- Support V.35, RS-449 (V.11), RS-232 (V.28) interfaces
- Support data rates of 64 kb/s for V.35 and R-S449, and up to 64 kb/s for RS-232.

Connectors: 2 × CHAMP 50-pin connectors.

Framing: None

Timestamp accuracy : +/- 350 msec at 64 kb/s.

Level 1 receive alarm indications:
- Loss of signal
- Loss of clock

Receiver levels
Terminated
V.35
Mark voltage: –0.2 V to –1.0 V
Space voltage: 0.2 V to 1.0 V
Common mode
voltage: ± 2 V

RS-449
Mark voltage: –0.2 V to –6.0 V
Space voltage: 0.2 V to 6.0 V
Common mode
voltage: ± 7 V

RS-232
Mark voltage: –3 V to –15 V
Space voltage: 3 V to 15 V

Receiver impedances
V.35 (bridged): > 20 kohm.
RS-449 (bridged): > 20 kohm.
RS-232 (bridged): 3 kohm to 7 kohm.
Receive clock tolerance: ± 4% at up to 56 kb/s, ± 1% at 64 kb/s.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

E7575A DS0/DS0A Link Interface Module

Features:
- Monitor four bidirectional links per LIM (eight receivers)
- Support 64 kb/s and 56 kb/s data rates

Connectors: 4 × dual Bantam connectors, 1 × female DB9 (clock input)

Line codes: AMI

Framing: None

Timestamp
accuracy : +/- 350 msec at 64 kb/s

Level 1 receive alarm indications:
- Loss of signal
- Loss of clock cycle
- Loss of byte clock cycle

Receiver levels:
Mark voltage: ± 2.7V to >5.5 V
Space voltage: 0 ± 1.0 V

Receiver impedances
Terminated: 135 ohm
Bridged: > 2 kohm.
Receive clock
tolerance: ± 1%.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Notes:

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Agilent Ordering Information

37907A **Signaling Advisor mainframe**

Undercradles

E7577A	Link Expansion Undercradle
E7578A	Fast Ethernet Undercradle
J2900A	Agilent Advisor high speed acquisition undercradle
J2912B	Agilent Advisor OC-3/STM-1 plug-in module
J2294D	E1/T1 DB-9/RJ-45 interface module
J2296D	E1 BNC 75 ohm interface module
J2298D	E1/T1 RJ-45/RJ-48C/mini-bantam interface
J2905B	ISDN S/T/U Interface module

Line Interface Modules (LIMs)

E7573A	T1 Link Interface Module
E7574A	V.35 Link Interface Module
E7575A	DS0/DS0A Link Interface Module

Software

37908A **Signaling Advisor Base Software**

Vendor Variants

37908A-051	Nokia A-bis protocol support
37908A-052	Ericsson A-bis protocol support
37908A-053	Alcatel A-bis protocol support
37908A-054	Nortel A-bis protocol support
37908A-055	Motorola A-bis protocol support
37908A-058	Ericsson INAP protocol support
37908A-059	Nortel INAP protocol support
37908A-060	Ericsson MAP/CS1+ Protocol Support

Additional Capability

37908A-011	Access Network protocol support
37908A-012	GSM Phase 2 and 2+ protocol support
37908A-013	Cellular/PCS protocol support
37908A-043	GPRS decodes for the Gb interface
37908A-120	Emulite Graphical Emulation capability

Warranty and Support Services

Hardware	3 year Agilent instrument warranty and service plans
Software	90-day media replacement

Together with Agilent, gain the e**X**treme **P**roductivity **I**mprovements that your business demands!

www.agilent.com/comms/XPI

You can also contact one of the following centers and ask for a Communications Services Solutions representative.

Argentina	+54 11 5811 7115
Australia	1 800 629 485
Austria	+43 (01) 25 125 7006
Belgium	+32 (0) 2 404 9340
Brazil	+55 11 4197 3600
Canada-English	877 894 4414
Canada-French	877 894 4414
China	800 810 0189
Denmark	+45 70 13 15 15
Finland	+358 (0) 10 855 2100
France	+33 (0) 825 010 700
Germany	+49 (0) 18 05 24 63 33
Hong Kong	800 930 871
India	1600 112 929
Ireland	+353 1890 924 204
Israel	+972 3 6892 500
Italy	+39 02 92 60 8484
Japan	0120 421 345
Luxemborg	+32 (0) 2 404 9340
Malaysia	1800 888 848
Mexico	+52 01800 506 4800
Netherlands	+31 (0) 20 5472111
Norway	+47 23 25 3720
Philippines	1800 1651 0170
Poland	+48 22 723 0066
Russia	+7 095 797 3963
Singapore	1800 375 8100
South Korea	080 769 0800
Spain	+34 91 631 3300
Sweden	0200 88 22 55
Switzerland-German	+41 (0) 1 735 9300
Switzerland-Italy	+39 (0) 2 92 60 8484
Switzerland-French	+33 (0) 825 010 700
Taiwan	0800 047 866
Thailand	1800 226 008
United Kingdom	+44 (0) 7004 666666
USA	800 452 4844

Product specifications and descriptions in this document subject to change without notice.
©Agilent Technologies, Inc. 2000-2004
Printed in Singapore Jan 01, 2004

5988-4930EN

Agilent Technologies

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP