

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 E1617A* at our website: ***Click HERE***

52 Mb/s Optical Line Interface

Agilent Technologies Broadband Series Test System

E1617A



Product Features

- Generate normal or abnormal test traffic
- Cell error, loss and delay measurements
- Traffic capture and playback

The Agilent Technologies E1617A 52 Mb/s Optical Line Interface generates and analyses ATM cell streams contained within a SONET or SDH framing format. It is a single-slot module that provides test capability at the physical and ATM cell layers for the Agilent E4200/E4210 Broadband Series Test System.

The E1617A is capable of operating in both a cell mode and in a SONET/SDH frame mode. This allows the user to not only examine ATM cells mapped into a SONET/SDH frame but also all of the SONET/SDH frame data.

Line interface modules not only connect the device or system under test to your Broadband Series Test System, but also provide physical, convergence, and ATM cell testing capabilities. Transmission test functionality includes

- Traffic generation
- Cell error, loss & delay measurements
- Traffic capture & playback

Agilent Technologies
Innovating the HP Way

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

Key Features

Generate Normal or Abnormal Test Traffic

Create and detect erroneous test traffic on demand to test the robustness of a protocol implementation. Sophisticated protocol data unit builder, sequencing, and library functions let you easily create complex and realistic traffic. You can generate test traffic in the foreground channel, and use up to 100 background channels to simulate loading effects.

Cell Error, Loss & Delay Measurements

Bit rate error testing is done by placing PRBS patterns in cells, and looping these cells back through a system under test. The received cells are analyzed to detect PRBS errors. These errors can then be used as a trigger to capture data.

Cell delay, interarrival time, and loss measurements are easily accomplished with the BSTS. Timestamps are inserted in cells transmitted by the line interface. These cells can then be captured, and graphs for both cell delay and cell interarrival time displayed.

Sequence numbers are transmitted in ATM cells and looped back through a system under test. The lost cells can then be detected and counted with statistics or used as a trigger to capture data.

You can generate physical and convergence layer errors and alarms. You can also capture and playback convergence layer frames.

Real-time statistics can be gathered for the physical, convergence and cell layers. Statistics can be reported as errored seconds, event counts, or as error ratios.

Extensive Real-Time Measurements

Makes over 20 different real-time measurements including frame rate, minimum and maximum frame size, and framing errors at the physical layer.

Traffic Capture & Playback

Traffic can be captured with a 1500 cell capture memory. Complete control is available -- continuously capture with memory buffer lapping, or trigger on user-defined events. Captured traffic can be played back with automatic decoding into an English-language display. Terminology from standards documents is used wherever possible.

Since high-speed networks carry considerable volumes of traffic, you can increase your test productivity by using filters and triggers to display or capture only traffic of interest.

Filters let you select virtual channels or paths of interest. Triggers can be used to capture data matching a specific pattern. For example, triggers can be used to capture cells with header errors or sequence number errors, or upon changes in convergence layer frame bytes.

Typical Applications

The Broadband Series Test System (BSTS) is a modular test platform for high-speed ATM transmission and protocol testing. The BSTS can perform comprehensive testing of all layers, from physical through higher services. Due to its modular nature, you can create a customized configuration that suits your specific test needs. The fully-programmable BSTS is ideal for R&D engineering, product development, quality assurance, performance, type approval, and conformance testing.

The E1617A 52 Mb/s Optical Line Interface can be used in conjunction with other BSTS line interfaces, dedicated test modules, and test software to perform these tests.

With a commercial calibration, any problems are resolved as they are detected, and test data reflecting performance of your calibrated test system is provided. The standards-compliant calibration provides comprehensive before and after test data to document problem resolution.

Copyright 2000 Agilent Technologies

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

Configuration & Use With Other BSTS Line Interfaces, Test Modules & Test Software

Line interface modules can perform physical layer testing with a minimal BSTS configuration consisting of a line interface module and chassis. A complete range of test software applications and dedicated test modules is available to perform upper layer testing.

The E4209 Cell Protocol Processor provides monitoring and simulation test functions at the ATM and adaptation layers by executing optional protocol testing software applications. The CPP performs many functions in hardware that are usually done in software -- such as an automatic segmentation and reassembly engine for sophisticated real-time ATM, AAL and other higher layer protocol testing.

The E4219 ATM Network Impairment Emulator module lets you find the limits of performance by inserting impairments into an ATM cell stream. Route in your test cells, set cell delay and loss values to emulate a real-world network, connect the impaired cell stream output to your system under test, and see what happens.

Your local Agilent Technologies field engineer will help you select the best test system configuration to meet your needs. Since the Broadband Series Test System is a flexible and modular ATM/B-ISDN test platform, you can maximize the return on your test equipment investment by selecting a chassis, line interfaces, dedicated hardware modules, and test software that suits your specific needs. Remember that you can always add extra software or modules at any time.

Warranty & Support Options

All BSTS hardware components are warranted for a period of 3 years. Products must be returned to an authorized Agilent service center for service. At the time of purchase you may select warranty option W01, a no-charge option which converts the standard 3-year return to Agilent warranty to a 1-year on-site warranty.

Support option UK6, available at time of purchase, is a standards-compliant calibration which ensures that your BSTS test system operates within specified tolerances. A certificate of calibration is issued for compliance with ISO 9000 standards which require that records documenting the calibration of measuring and test equipment are maintained. Certificates of calibration are not available for products which do not contain components requiring calibration (such as software).

Two other types of calibration, commercial and standards-complaint, are available at any time from your local Agilent service center. Both provide test data and a certificate for your records.

With a commercial calibration, any problems are resolved as they are detected, and test data reflecting performance of your calibrated test system is provided. The standards-compliant calibration provides comprehensive before and after test data to document problem resolution.

If you should have an out-of-warranty test system, you can arrange for service simply by contacting your local Agilent sales office.

Product Numbers

E1617A	52 Mb/s Optical Line Interface
E4200B	BSTS Form-7 Transportable Chassis
E4210B	BSTS Form-13 Mainframe Chassis
E4209B	Cell Protocol Processor
E4219B	ATM Network Impairment Emulator

Copyright 2000 Agilent Technologies

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

Technical Specifications

Traffic Generation

Modes

Three Tx/Rx modes are available. In Terminal mode, full signal generation and analysis functions are available. In Repeater mode, the received signal is re-transmitted (physical layer loop back). In Local Loop back mode, the transmit signal is electrically looped to the receiver.

ATM Cell Generation

The transmitted cell stream can contain ATM cells generated internally by the E1617A, and ATM cells generated by an optional E4209 Cell Protocol Processor module. ATM cells generated on-board can consist of one foreground channel to stimulate the channel under test, and up to one hundred background channels for loading purposes. Fill cells are used to occupy unused bandwidth.

Total Bandwidth	• 48.384 Mb/s
Modes	• User-Network Interface (UNI) or Network-Node Interface (NNI)
HEC	• Automatic generation
Fill Cells	• Idle or unassigned
Channel Priority Order	• Foreground, background, CPP (highest to lowest priority)
Channel Control	• VCI • VPI • GFC • Payload Type • Cell Loss Priority
SAR-PDU Support	• AAL-0 • AAL-1

Foreground Channel

Bandwidth	• From 10 b/s to 48.384 Mb/s in 1 b/s increments
Accuracy	• +/- 3 b/s of selected value
Channel Depth	• 1500 cells (variable)
Cell Payload	• Timestamp • Single cell PRBS • Cross cell PRBS • Data pattern • Byte access

Background Channels

Number of Channels	• Up to 100
Bandwidth	• 3000 b/s to 48.384 Mb/s in increments of 1 b/s
Accuracy	• +/- 1500 b/s of selected value
Distribution	• Off • Periodic
Channel Density	• Bandwidth and cell distribution for each background channel is individually assignable up to maximum bandwidth
Channel Depth	• 16 cells
Cell Payload	• Single cell PRBS • Data pattern • Byte access

Cell Payloads

Payloads	• Time stamp (32-bit departure time stamp value with 100 nanosecond resolution) • Cross cell PRBS-9 • PRBS-15 (inverted and not inverted) • PRBS-23 • Single cell PRBS-9 • Data pattern or byte access
Data Patterns	• User byte • AA55h or FF00h • Incrementing (value of each successive byte is incremented by 1)
Byte Access	• Payload of all cells in the selected channel can be edited by the user in an active channel environment, or off-line as a sequence of PDUs • AAL-1 automatically inserts first payload byte containing SN/SNP values and CSI bit

Erroring Control

Error conditions can be introduced to simulate alarm signals and signal stressing. Error stressing is used to generate incorrect bytes in a test signal. I

Error Stressing Control	• Off • On • Pulse On (error condition is normally off; pulses on) • Pulse off (normally on; pulses off) • Sequence On (normally off; alternates on/off/on) • Sequence Off (normally on; alternates off/on/off)
ATM Error Injection	• Cell header or payload bytes with bit error masking
Cell Loss	• Sequence Number in the SAR-PDU is skipped and a fill cell is inserted
PRBS Error Add	• Single bit error add to the PRBS pattern in the cell payload

Copyright 2000 Agilent Technologies

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

SONET/SDH Features

SONET/SDH Stressing	• SPE pointer errors can be introduced once or as a user defined sequence • Data errors can be introduced singly or at a rate of 1.0e-9 to 1.0e-3 on to the Section/RS BIP, Line/MS BIP, Path BIP, Line/MS FEBE and Path FEBE • Loss of signal, for a single frame, or continuously
Framing Formats	• SONET STS-1, SDH STM-0
TOH/SOH	• Can be any user specified value between 00 and FFh (except B1 and B2 bytes)
B1 and B2	• Automatically calculated
D1 and D12	• User specified
H1 to H3	• SPE/AU4 pointer bytes may be set to any fixed value with or without NDF
Pointer Movement	• Increment, decrement, ramping
SPE/AU4 POH	• Path overhead can be user specified except for B3 byte which is automatically calculated
J1	• User specified 64 or 15 byte path trace message
G1	• Set enhanced RDIi-P to any of 8 values; REI-P can be user specified

ATM, SONET/SDH Measurements

Measurements are sampled every 100 milliseconds and accumulated over the user-specified measurement period. Results from the most recent complete measurement period are retained.l

Measurement Period	• Range 1 second to 3 days in resolutions of 1 second
Result Types	• Cumulative or latched (based on most recent measurement period)
Result Formats	• Count • Ratio • Seconds
ATM Cell Measurements	• HEC errors • Corrected headers • Cell count • Cell bandwidth • Select Cell Not Received (SCNR) alarm seconds
Cell Delay Measurements	• Cell delay • Inter-arrival time • Cell delay variation
Virtual Channel Errors	• AAL-1 SN/SNP errors • Cell loss • PRBS errors • PRBS sync loss alarm seconds
SONET/SDH Measurements	• Out of frame errors • Loss of frame alignment errors • Loss of pointer errors • Loss of cell synchronization errors • Loss of signal errors • Line AIS • Line FERF • Path AIS • Path FERF • Path yellow • Section BIP • Line BIP • Path BIP • Path FEBE • Line FEBE • Uncorrected HEC error

Traffic Capture & Playback

ATM Capture

Provides capture of 1500 cells from the selected ATM cell stream. Capture is manual or event triggered. Manual triggering captures 1500 cells after the trigger. Event triggering captures 750 cells pre-trigger, and 750 cells post-trigger.e

Manual	• Triggered on user request
ATM Cell Triggers	• Cell loss • Header error • PRBS error • SN/SNP byte error

SONET Capture

When in "SONET/SDH" frame mode the LIF captures and displays TOH data, POH data and path trace messages.

Copyright 2000 Agilent Technologies

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

Front Panel Connectors and Indicators.

OC-1 Input	• FC-PC adapter • Rx sensitivity -34 dBm maximum • Input overload greater than -7 dBm • 1310 nm single and multi-mode
CO-1 Output	• FC-PC adapter • Class 1 laser • 1310 nm • Output power is -5 dBm and -15 dBm min
Reference Clock Input	• SMB connector • 10 dBm into 50 ohms • 51.84 MHz with better than a 60/40% duty cycle
Rx & Tx Trigger Outputs	• SMB connectors • TTL outputs
Tx Clock & Data Outputs	• SMB connector • ECL levels • Clock, 51.84 MHz with better than a 60/40% duty cycle • Data, 51.84 Mb/s serial stream • Timing propagation delay of 2.5 to 5.0 nanosecond wrt rising clock edge • 50 ohms, terminated to -2 V
Rx Clock & Rx Data	• SNB connectors
Inputs	• ECL levels • Clock, 51.84 Mhz with better than a 60/40% duty cycle • Data, 51.84 Mb/s serial stream NRZ • Setup and hold time within 400 picosecond wrt rising edge • 50 ohms, terminated to -2 V
D1 & D2 Data Ports	• High density 26 pin slim line female D connectors • Provide a parallel input and output port for the LIF • TTL signal level, 50 ohm source impedance; load impedance must be greater than 500 ohms and under 15 pF
LED Indicators	• Failed • Error • Access • Ref Clk • Gating • Signal • Sync • BIP • Laser

Size, Weight & Power Dissipation.

Size	• 1 slot C-size VXI card
Weight	• 1.3 kg (2.9 lb) nominal
Power Dissipation	• 40 Watts (max)
SONET/SDH	• SDH as per ITU-T G.708 and I.361 for BSTS system software CD-ROM releases prior to A.09; SDH as per ITU-T G.707 (draft) COM 15-163-E, July 1995 “Draft revised ITU-T recommendation G.707. Network node interface for the synchronous digital hierarchy (SDH)” for A.10 and subsequent releases • SONET as per Bellcore TA-NWT-000253 for BSTS system software releases up to A.09; SONET as specified by Bellcore GR-253-CORE “Synchronous Optical Network (SONET) Transport Systems: Common Generic Criteria” for A.10 and subsequent releases
PRBS Patterns	• PRBS-9 as per ITU-T O.153 1992 • PRBS-23 as per ITU-T O.151 1992
EMC	• CISPR11, Class A

Copyright 2000 Agilent Technologies

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

Applicable Standards.

ATM Cells	• ITU-T Recommendation I.361 1995 B-ISDN ATM layer specification • Bellcore TA-NWT-001113 1993 Asynchronous Transfer Mode and ATM Adaptation Layer (AAL) Protocols Generic Requirements
SONET/SDH	• SDH as per ITU-T G.708 and I.361 for BSTS system software CD-ROM releases prior to A.09; SDH as per ITU-T G.707 (draft) COM 15-163-E, July 1995 "Draft revised ITU-T recommendation G.707. Network node interface for the synchronous digital hierarchy (SDH)" for A.10 and subsequent releases • SONET as per Bellcore TA-NWT-000253 for BSTS system software releases up to A.09; SONET as specified by Bellcore GR-253-CORE "Synchronous Optical Network (SONET) Transport Systems: Common Generic Criteria" for A.10 and subsequent releases
PRBS Patterns	• PRBS-9 as per ITU-T O.153 1992 • PRBS-23 as per ITU-T O.151 1992
EMC	• CISPR11, Class A

Copyright 2000 Agilent Technologies

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



Agilent Technologies Broadband Series Test System

The Agilent Technologies BSTS is the industry-standard ATM/BISDN test system for R&D engineering, product development, field trials and QA testing. The latest leading edge, innovative solutions help you lead the fast-packet revolution and reshape tomorrow's networks. It offers a wide range of applications:

- ATM traffic management and signalling
- Packet over SONET/SDH (POS)
- switch/router interworking and performance
- third generation wireless tesing
- complete, automated conformance testing

The BSTS is modular to grow with your testing needs. Because we build all BSTS products without shortcuts according to full specifications, you'll catch problems other test equipment may not detect.

www.Agilent.com/comms/BSTS

United States:
Agilent Technologies
Test and Measurement Call Center
P.O. Box 4026
Englewood, CO 80155-4026
1-800-452-4844

Canada:
Agilent Technologies Canada Inc.
5150 Spectrum Way
Mississauga, Ontario
L4W 5G1
1-877-894-4414

Europe:
Agilent Technologies
European Marketing Organisation
P.O. Box 999
1180 AZ Amstelveen
The Netherlands
(31 20) 547-9999

Japan:
Agilent Technologies Japan Ltd.
Measurement Assistance Center
9-1, Takakura-Cho, Hachioji-Shi,
Tokyo 192-8510, Japan
Tel: (81) 426-56-7832
Fax: (81) 426-56-7840

Latin America:
Agilent Technologies
Latin American Region Headquarters
5200 Blue Lagoon Drive, Suite #950
Miami, Florida 33126
U.S.A.
Tel: (305) 267-4245
Fax: (305) 267-4286

Asia Pacific:
Agilent Technologies
19/F, Cityplaza One, 1111 King's Road,
Taikoo Shing, Hong Kong, SAR
Tel: (852) 2599-7889
Fax: (852) 2506-9233

Australia/New Zealand:
Agilent Technologies Australia Pty Ltd
347 Burwood Highway
Forest Hill, Victoria 3131
Tel: 1-800-629-485 (Australia)
Fax: (61-3) 9272-0749
Tel: 0-800-738-378 (New Zealand)
Fax: (64-4) 802-6881

UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.
Copyright ©2000 Agilent Technologies

Specifications subject to change.

5965-6754E 02/00 Rev C

Agilent Technologies
Innovating the HP Way

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