Discover What's Possible™ Anritsu

PRODUCT INTRODUCTION

MP1590B

Network Performance Tester

EoS Function

ANRITSU CORPORATION

MP1590B Network Performance Tester

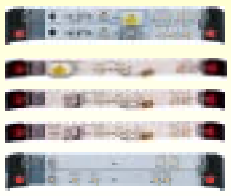
EoS Function–Product Introduction

Anritsu Corporation

17 May 2005

What's MP1590B?

Jitter Test
- Differential I/F
- High Precision
- 10.3G



Compliant Test
- OTN
- SONET/SDH
- PDH, DSn

NGN Test
- EoS
- VCAT
- LCAS

Ethernet/IP Test
- 10M/100M
- Gigabit
- 10 Gigabit

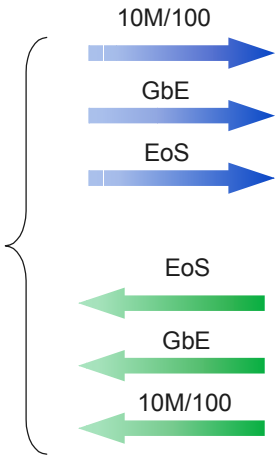
One Box Tester supporting Converged Network

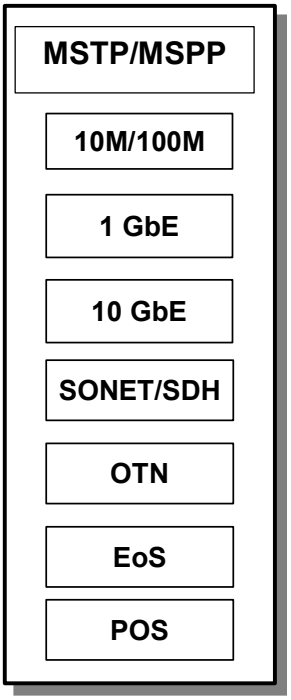
MP1590B

Applications

MSTP/MSPP Measurement

MP1590B

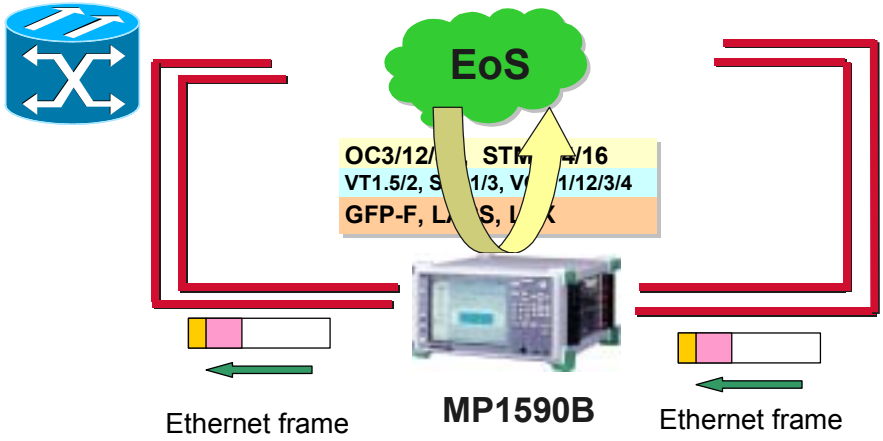




- Single tester support for convergence test with different I/Fs
- Independent I/F application

Applications

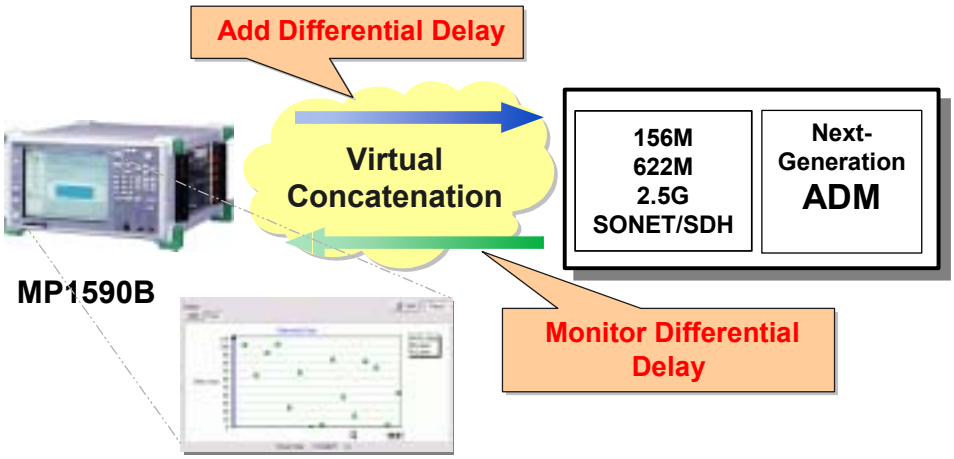
EoS Measurement



- Testing EoS encapsulation function
- Testing throughput for each of Ethernet to EoS, and EoS to Ethernet
- Simultaneous error/alarm measurement in Ethernet and SONET/SDH layers

Applications

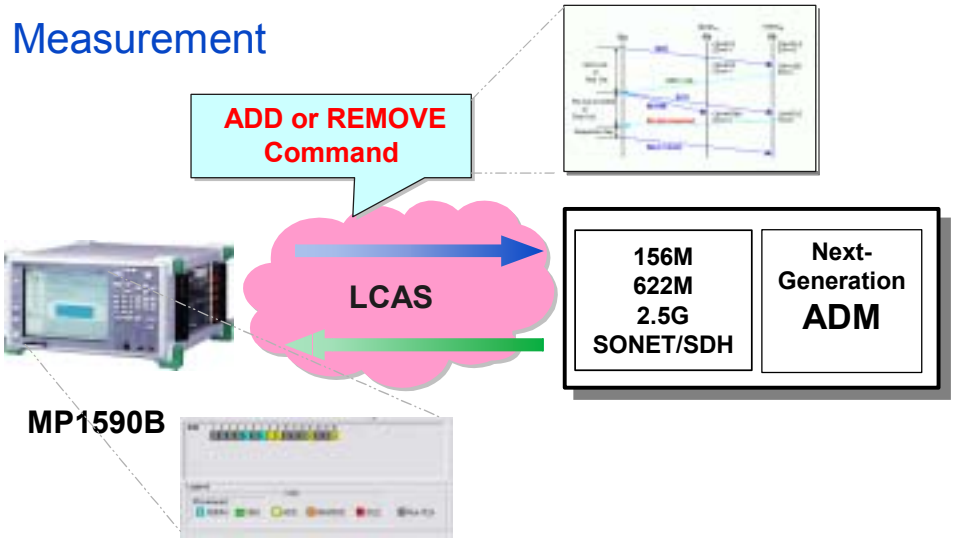
Differential Delay Measurement



- Differential Delay Tolerance inspection (also supports Through Mode)
- Differential Delay adds up to 512 ms to each CH of VCG independently
- Delay reproduces an actual network with the continuously Sweep mode

Applications

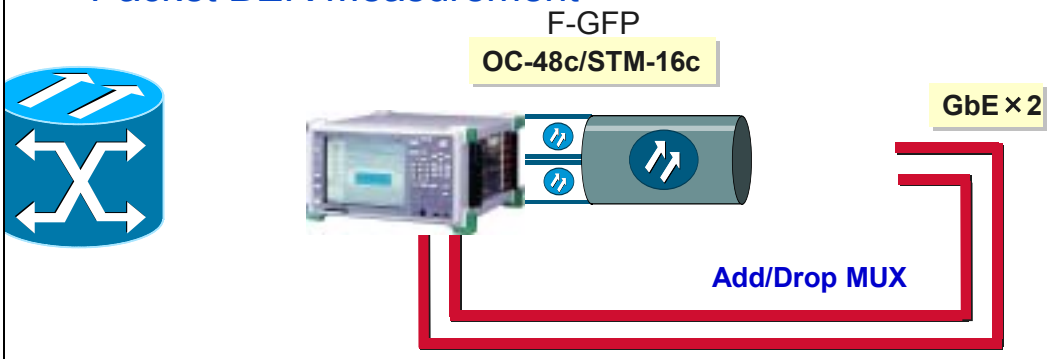
LCAS Measurement



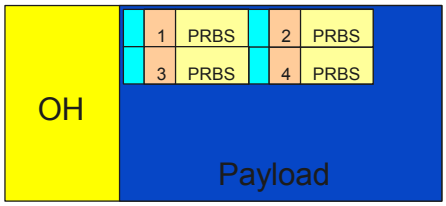
- Testing bandwidth control using LCAS command during data transfer
- LCAS Sequence measurement combining multiple LCAS command
- LCAS Sequence analysis using Capture function

Applications

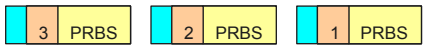
Packet BER Measurement



Tx in SONET/SDH side



Rx in Ethernet side



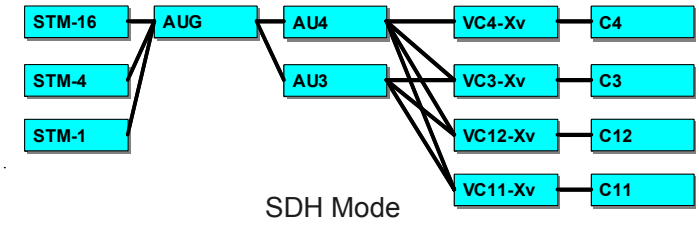
- Check PRBS errors
- Check sequence numbers
- Check frame loss

Key Features

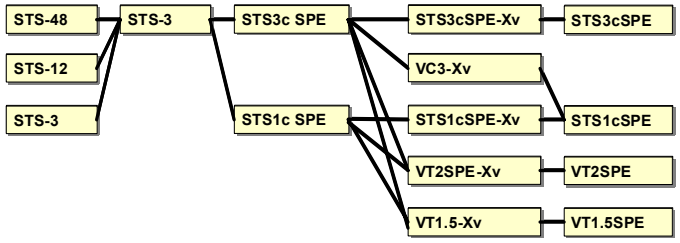
- Flexible VCAT Group
- Virtual Concatenation Deferential Delay measurement
- Enhanced LCAS function
- Path Monitor function
- Transmitted EoS frames
- Counter/256MB Capture
- Ethernet module for both MD1230 and MP1590
- Ethernet/IP Performance Test
- Multi Flow counter
- Ethernet Clock tolerance test
- Ethereal®

Virtual Concatenation – Mapping Structure

Virtual concatenation



SDH Mode



SONET Mode

Path	VCG Size
STS-3c/VC	1 to 16
STS-1/VC3(AU)	1 to 48
VT2/VC12	1 to 63
VT1.5/VC11	1 to 64

Mapping for both High order and Low order
VCG Size conforms to ITU-T recommendations
Without AUG boundary in LO

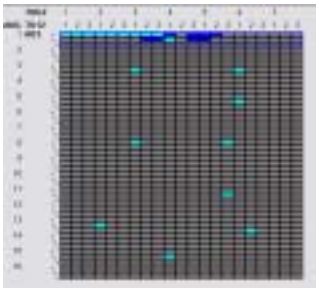
Virtual Concatenation – VCAT Member Configuration

Virtual Concatenation Group Member Setting

Independent setting for VCG Size and Provisioned Size

VCG(Provisioned and Idle ch) without AUG boundary AUG/STS3c

One click member selection

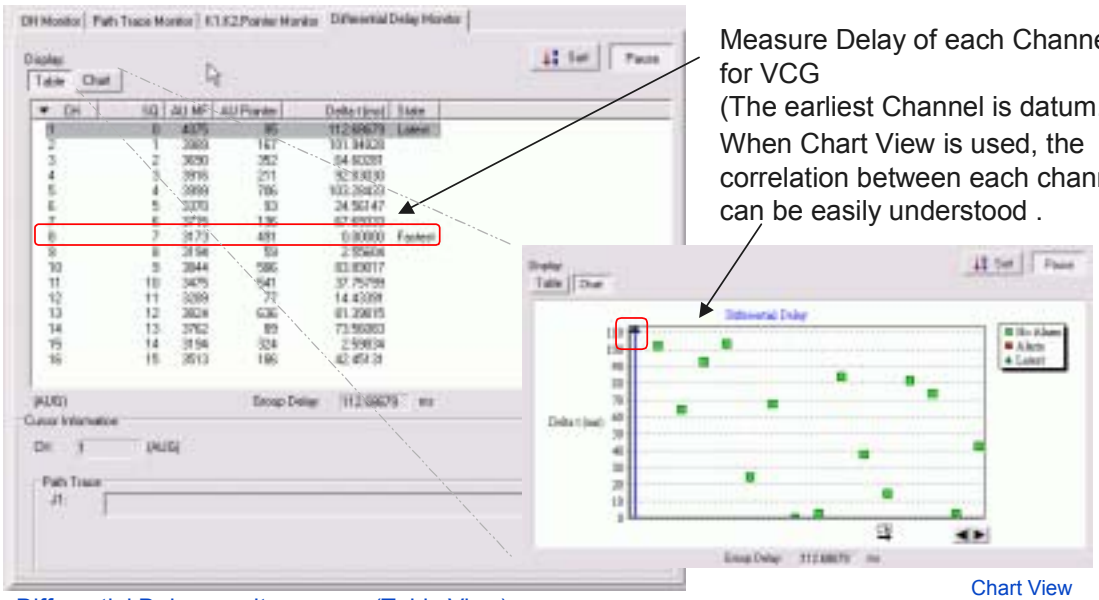


Virtual Concatenation Group setting

VCG member Overview Screen

Virtual Concatenation – Differential Delay monitor

Differential Delay monitor



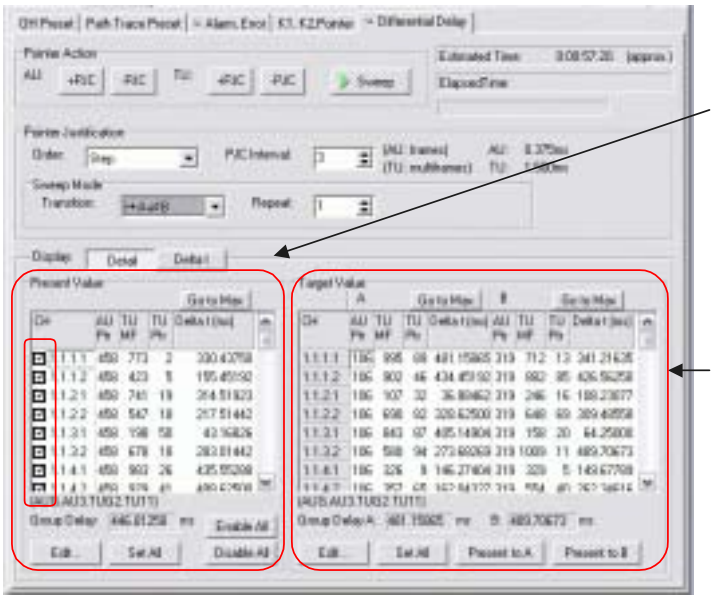
Measure Delay of each Channel for VCG
(The earliest Channel is datum.)
When Chart View is used, the correlation between each channel can be easily understood .

Chart View

Differential Delay monitor screen (Table View)

Virtual Concatenation – Deferential Delay Generator

Differential Delay Generator



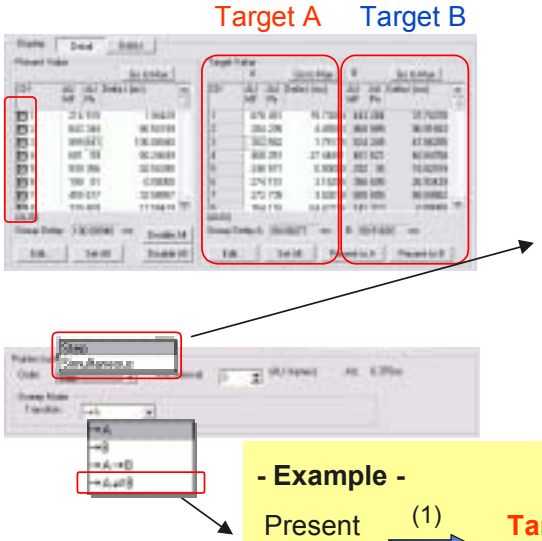
Displays current Tx Differential Delay. The Delay value can be changed directly here.

When using the Sweep mode, set the Target value to be changed here. Two Target values can be set; it is also possible to set the coming or going, etc., for each value.

Difference Delay Tx setting

Virtual Concatenation – Differential Delay Generator

Differential Delay Generator – Sweep Mode



The Delay value can be set independently for each Channel. In the Sweep Mode, two values can be set as the Target value.

This sets the Delay order.

Step: Changes each Channel in turn

Simultaneous: Changes each Channel simultaneously

Measurement can be performed under Delay conditions approximating those of an actual network by changing the 2 points.

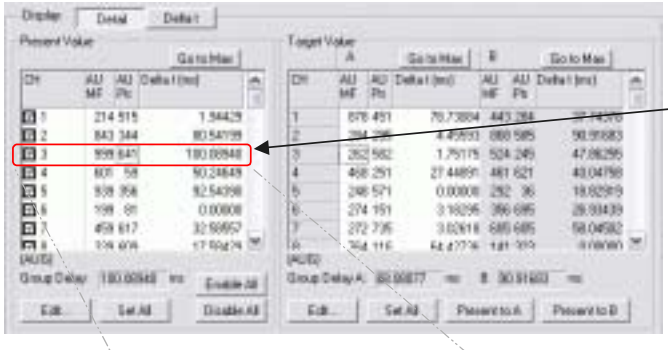
- Example -

Present 0 ms (1) **Target A** 256 ms (2) (3) **Target B** 0 ms

Repetition

Virtual Concatenation – Deferential Delay Generator

Differential Delay Generator – Direct mode



When the Delay value (not Sweep value) is inserted directly, the Present Value is changed.

The Delay value can be input in each of the

MFI value

Pointer value

Delta value

formats.

VCG member Overview Screen

LCAS – Summary

LCAS Summary Screen

When LCAS is used, the status of both the Source and Sink sides is listed.

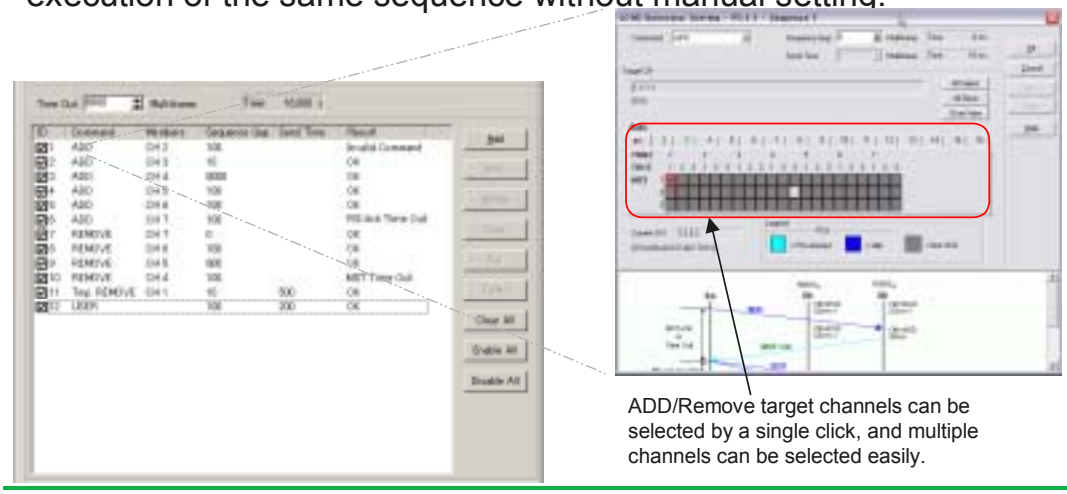
- Channel
- SQ
- CTRL
- MST
- Differential Delay value
- Each Alarm type

The built-in State mode can be used to easily understand the status of each Channel as a graphical display.

LCAS – Sequence Command Generator

LCAS Sequence Command Generation Function

Up to 64 LCAS sequences can be set on this screen; simply selecting the checkboxes and pressing the start button is all that is required to execute LCAS tests. Commonly used sequences can be registered to simplify re-execution of the same sequence without manual setting.

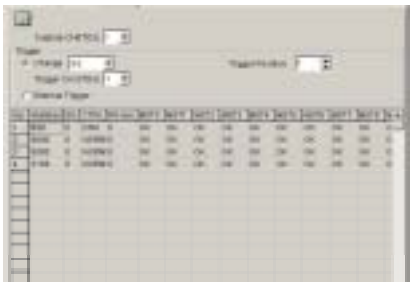


ADD/Remove target channels can be selected by a single click, and multiple channels can be selected easily.

LCAS – Monitor/Capture

LCAS Monitor

By using the LCAS monitor function, all members of the VC group and all the MST (Member Status) can be monitored simultaneously to confirm the current status.

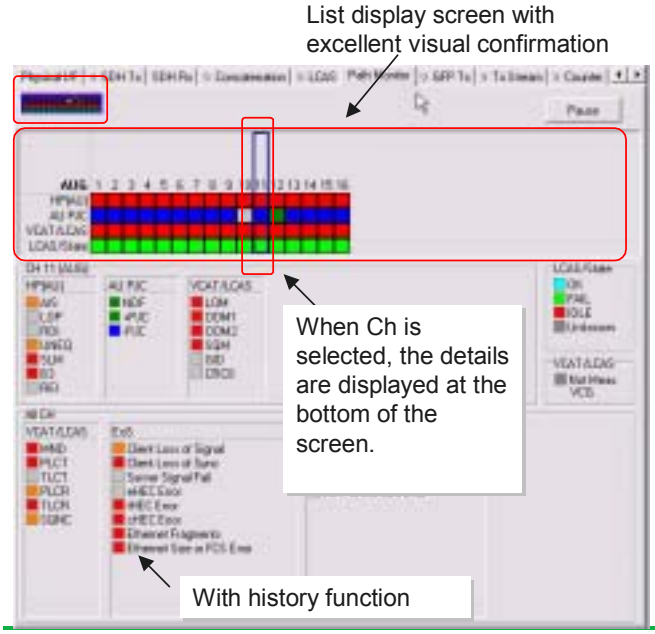


LCAS Capture

Up to 64 LCAS sequences can be captured and the trigger and capture target members can be selected freely. Since the time required for each sequence/command can be displayed, the time required for the LCAS sequence can be measured and failure analysis can be performed.

VCAT/LCAS – Path Monitor

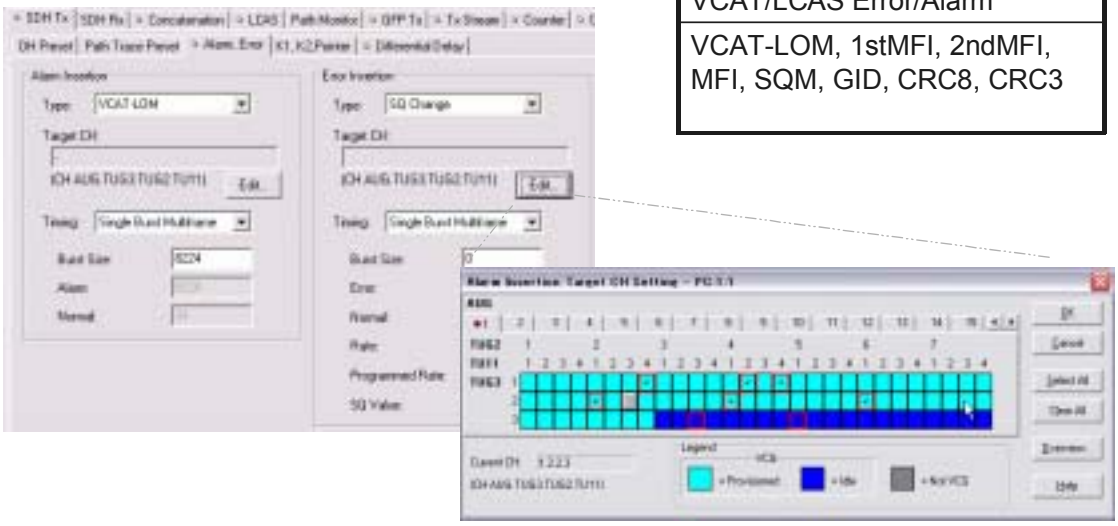
Path Monitor Screen



SONET/SDH Error, Alarm
RJC
VCAT Error, Alarm
LCAS Error, Alarm
EoS Error
PPP/IP/TCP/UDP Error
of each VCG channel is measured in real time.
Since all VCG Provisioned Channel operation can be measured simultaneously, more detailed measurement is possible.

VCAT/LCAS – Error/Alarm

Error/Alarm Addition Screen



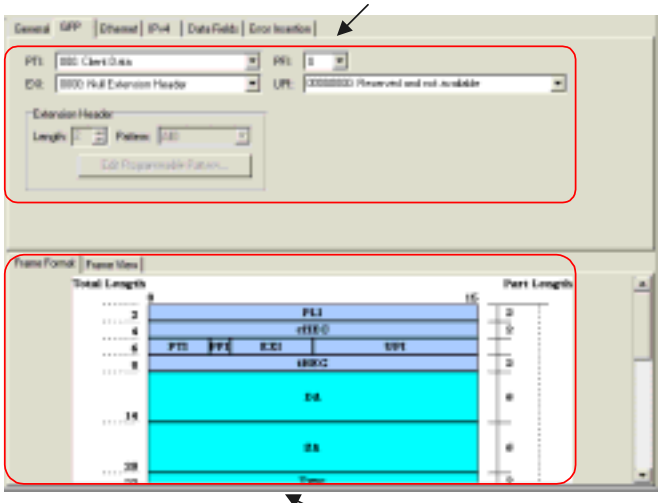
VCAT/LCAS Error/Alarm
VCAT-LOM, 1stMFI, 2ndMFI, MFI, SQM, GID, CRC8, CRC3

Errors and Alarms can be inserted into any channel.
(Addition to multiple channels is also supported.)

EoS – Transmitting

F-GFP Frame Editing Screen

The GFP header value can be edited freely.



Frame length, protocol stack, etc., can be referenced easily.

Mapping
Framemapped-GFP, PPP, Cisco HDLC, MAPOS, LEX, LAPS(X.86), Bulk, Unframe

Frame Length
8 Byte to 65k Byte

Send Rate
0% to 100% (Full wire rate)

Protocol
VLAN, MPLS, IP, TCP/UDP, User

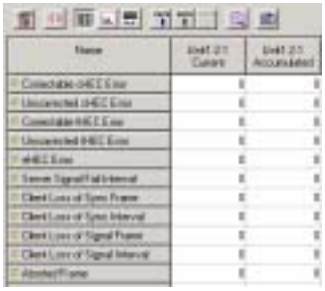
EoS – Real Time Counters

GFP Counters

- Transmitted GFP Frame
- Transmitted GFP Byte
- Received GFP Frame
- Received GFP Byte
- GFP FCS Error
- GFP uncorrectable cHEC
- GFP correctable cHEC
- GFP uncorrectable tHEC
- GFP correctable tHEC
- GFP eHEC Error
- Client Loss of Signal Frame
- Client Loss of Signal Interval
- Client Loss of Sync Frame
- Client Loss of Sync Interval
- Server Signal Fail Interval

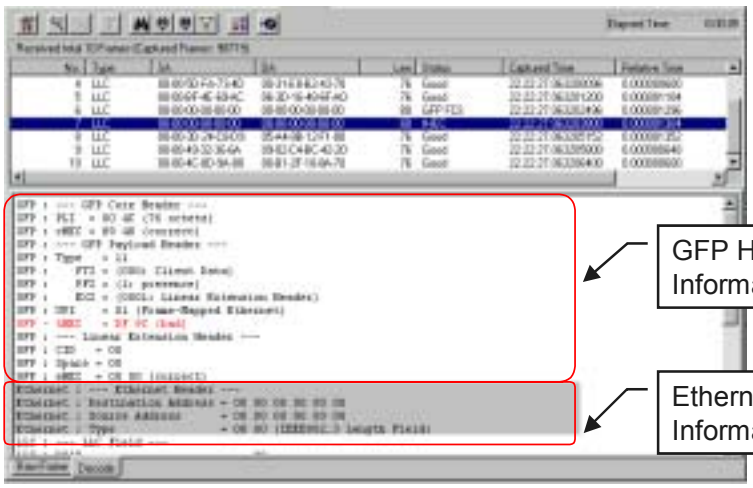
➢ More than 40 SONET/SDH, VCAT, LCAS Counters

More than 60 IP/Ethernet Counters



EoS – Capture and Decode

EoS Frame Capture and Decode



EoS Frame Capture
256 MB

The EoS receive frame can be stored and protocol analysis performed for GFP, PPP, Ethernet, TCP/UDP, etc. This permits effective troubleshooting when used in combination with the trigger and filter functions.

Ethernet Module Lineup

Standard Modules

MU120101A 10M/100M Ethernet Module

MU120102A Gigabit Ethernet Module

Advanced Protocol Modules

MU120111A 10/100M Ethernet Module

MU120112A Gigabit Ethernet Module

Update

MU120118B/C 10Gigabit Ethernet Module

Power Protocol Modules

New

MU120121A 10/100/1000M Ethernet Module

New

MU120122A Gigabit Ethernet Module

Supports use of MD1230 Ethernet module for making genuine Ethernet tests

Performance Tests

Throughput, Latency, Protocol Analyze

Protocol Tests

IPv6, OSPFv2/v3, BGP4+, MPLS, PIM-SMv2, MLDA, IGAP

Enhanced Tests

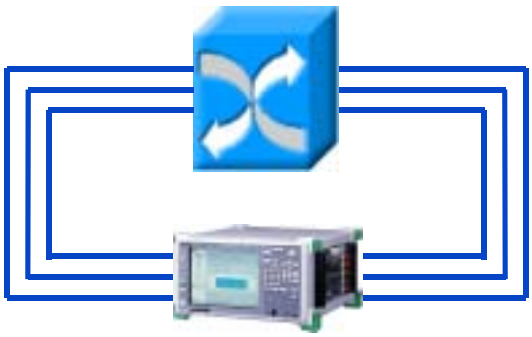
10M/100M/1000M I/F, Multi-flow Counter, VLAN Stacking, Clock Tolerance

Performance Test

Performance Test

Supports Ethernet and POS performance and load tests

DUT



MP1590B

EoS doesn't support

- Throughput
- Latency*3
- Variable Packet Counters
- VLAN / Stacking VLAN*1
- MPLS
- IPv6*2
- Short and Jumbo Frames

10M/100M, Gigabit, 10M/100M/1000M, 10Gigabit Ethernet I/F
GFP/PPP/LEX/LAPS/Cisco HDLC/MAPOS at 156M to 2.5G

*1: Stacking VLAN supported by Power Protocol module
*2: EoS Unit does not support IPv6 measurement

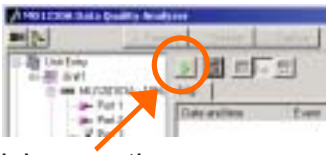
Automatic Test

Automatic Test / Ethernet module

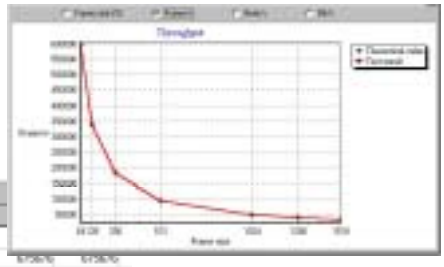
An automatic test function meeting FC2544/RFC2889 recommendations is built-in. Simply clicking the start button starts automatic measurement and displays measurement results in the recommended format.

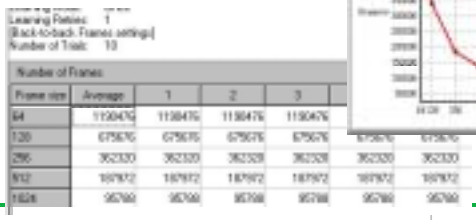
RFC2544 Auto-test Item

- Throughput
- Latency
- Frame Loss Rate
- Back to Back Frames
- System Recovery
- Reset



One click operation



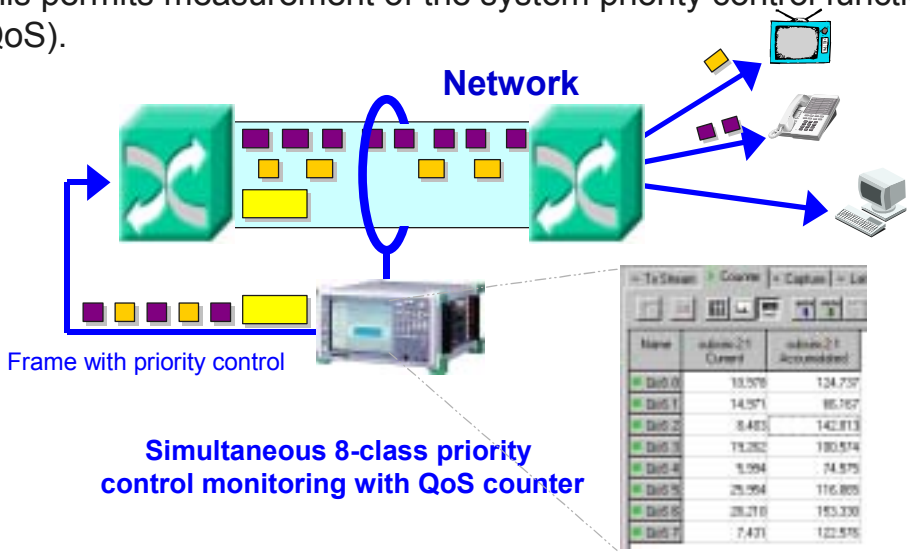


This function is not supported by the EoS Unit.

QoS Test

QoS Test

The EoS and Ethernet module have a built-in 8-class QoS counter. This permits measurement of the system priority control function (QoS).

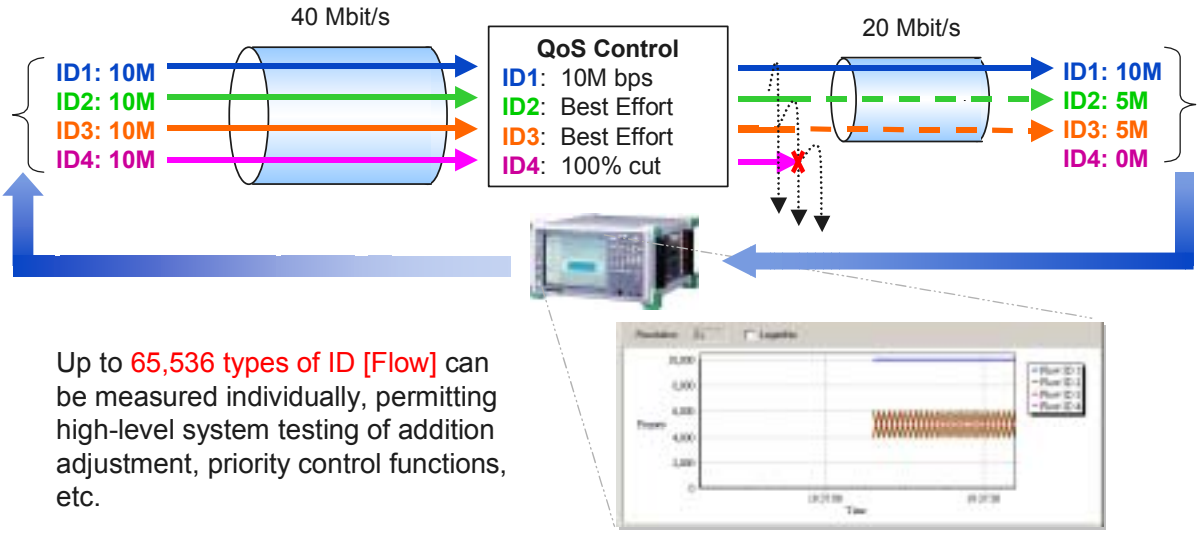


QoS Test – Multi-flow Counter

Multi-flow Counter

*Supported by Power Protocol module

In more complex QoS testing, data for each individual ID [Flow] can be measured more effectively using the Multi-flow Counter function.



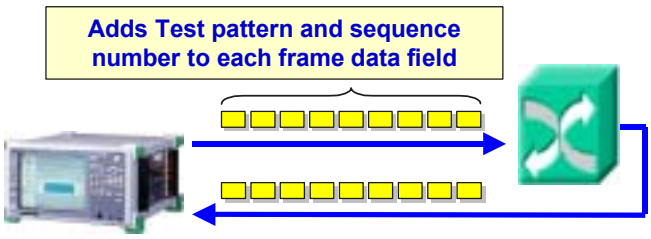
Up to 65,536 types of ID [Flow] can be measured individually, permitting high-level system testing of addition adjustment, priority control functions, etc.

Ethernet BER Test

Packet BER Test (Option-11)

Measures sequence No. and BER of packet data field

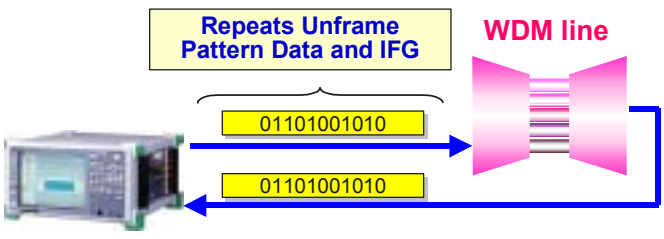
- Packet BER
- Sequence check
- Packet Loss



Unframed BER Test

Measures BER in all fields of packets (Inserts IFG between packets)

- All0, All1
- User 16bits
- PRBS23
- PRBS31
- CRPAT
- CJPAT



Ethernet Clock Tolerance Test

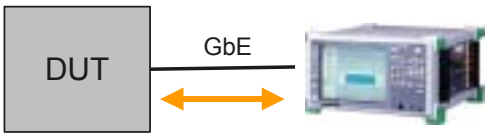
Variable Send Clock Function

*Supported by Power Protocol module

The Power Protocol module has a built-in function for varying the send clock. By using this function, the DUT clock tolerance can be tested.

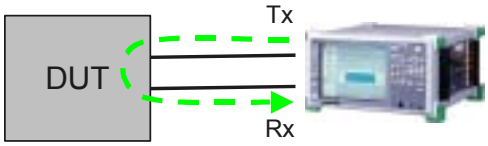
Setting range: **–100 ppm to +100 ppm** (Clock accuracy: –4 ppm to +4 ppm)

Link Test



Link Test
-100 ppm?
+100 ppm?

Frame Transfer Test



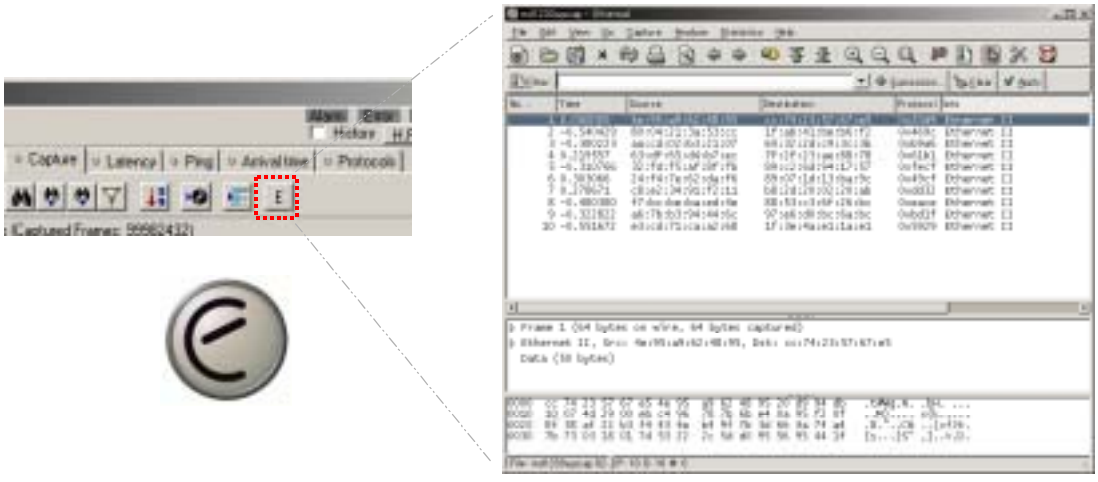
Frame Transfer Test
Tx –100ppm Rx –100ppm?
Tx +100ppm Rx –100ppm?
Tx –100ppm Rx +100ppm?
Tx +100ppm Rx +100ppm?

Supported I/Fs
- 10/100BASE-T
- 1000BASE-X
- 1000BASE-T

Protocol Analysis

Ethereal®

In addition to the standard built-in analysis functions, protocol analysis for the latest protocols is also supported using Ethereal®.



Ethereal® is a registered trademark of Ethereal Inc. in the USA.
This is free open-source software that may be installed by the customer at his or her own risk.

OTN/SONET/SDH Test

OTN, SONET/SDH

- ITU-T G.709, G.8251 Recommendations
  - OTU2: 10.7G, OTU1: 2.66G
  - FEC: Read-Solomon Code RS (255, 239)
- Telcordia GR-253, ITU-T G.703, G.707 Recommendations
  - OC 1~192/STM 0~64, DSn/PDH
- Main Functions
  - Overhead Tests: OTN, SONET/SDH OH setting and monitoring
  - Arbitrary concatenation
  - Error/Alarm testing and detection
  - Thru mode: Transparent, OH overwrite
  - APS (Automatic Protection Switch) testing
  - Clock/Frame sync signal output
  - External light source input

Jitter Test

Jitter Measurement

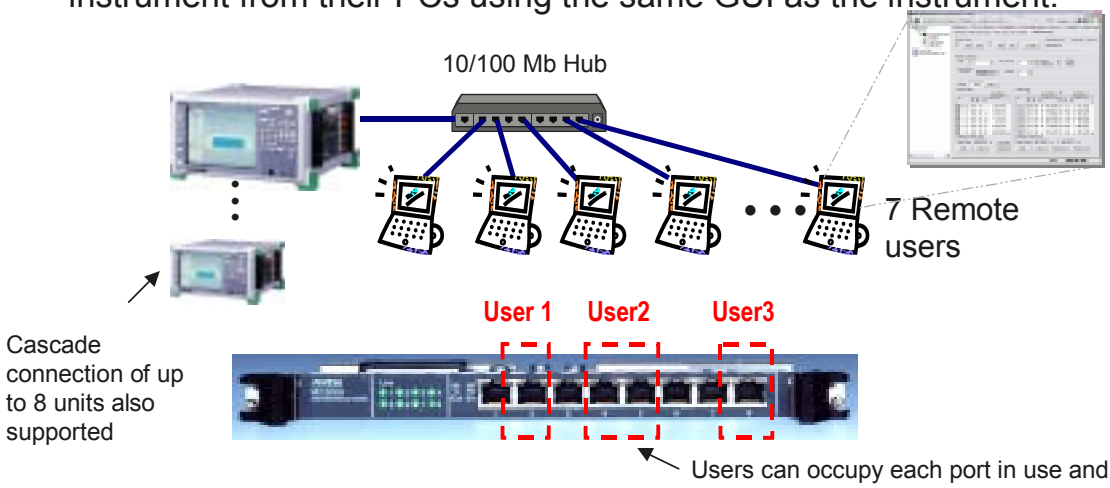
- Basic measurements
  - Jitter Transfer
  - Jitter Tolerance
  - Jitter Generation
  - Output Jitter
  - Wander Generation/Measurement (P-P, +P, -P, TIE)

- High-accuracy Jitter Measurement and Excellent Measurement Reproducibility
  - ***MP1590B Option 30 High-accuracy Jitter Measurement***
    - Generation measurement accuracy: ±20 mUIp-p
    - Measurement reproducibility: ±5 mUIp-p
    - Stable measurement without optical input level and wavelength dependency

Remote Control

Remote Control

Remote control software (sold separately) is also available. This software permits up to 8 remote users to control one measuring instrument from their PCs using the same GUI as the instrument.



Unit Configuration

Combination Examples

MP1590B

Ethernet Only

Slot1	
Slot2	
Slot3	
Slot4	
Slot5	
Slot6	

Ethernet module can be used in slots 3, 4, 5 and 6

10/10.7G with Jitter

Slot1	MU150100A
Slot2	
Slot3	Optical Tx Unit
Slot4	Optical Rx Unit
Slot5	Jitter Unit
Slot6	

10/10.7G

Slot1	MU150100A
Slot2	
Slot3	Optical Tx Unit
Slot4	Optical Rx Unit
Slot5	
Slot6	

Ethernet module can be used in slots 5 and 6

2.5/2.6G with Jitter

Slot1	MU150101A
Slot2	
Slot3	
Slot4	
Slot5	Jitter Unit
Slot6	

Ethernet module can be used in slots 3 and 4

2.5/2.6G

Slot1	MU150101A
Slot2	
Slot3	
Slot4	
Slot5	
Slot6	

Ethernet module can be used in slots 3, 4, 5 and 6

Thank you very much.

Discover What's Possible™

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Specifications are subject to change without notice.

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