MP1590B

Network Performance Tester EoS Measurement

MP1590B Network Performance Tester
EoS Measurement Quick Start Guide

Anritsu Corporation
IP Network Div.

First edition

Before using MP1590B

- **Requisite task before measuring**

  Put in "Key" and "Remote interlock" at the following circle.
  And turn on the key.
  In the case of "OFF", MP1590B cannot transmitted an optical signal.

EoS Measurement Flow

- EoS Measurement Flow

1. Setup
2. Port Setting (Mapping, Type, Bitrate and so on.)
3. Connecting
4. Setting concatenation
5. Measurement
- LCAS Test
- SDH/SONET Test
- VCAT test with Differential Delay
- EoS Frame test

6. Other functions
- Save/Load
- Printing and Screen Copy
- Switching between SDH and SONET

1. Setup - setup

- **Put MP1590B on a safe and stable place where MP1590B is not fallen down on.**
- **A cooling fan is situated on the rear panel of the MP1590B. Place the MP1590B 10 cm or more apart from obstructions such as walls.**
- **Supply power within voltage range of 100 to 115 Vac or 220 to 240 Vac and frequency range of 47.5 to 63 Hz. Power consumption is 500 Vac or less.**

1. Setup - Power-On/Off procedures

- MP1590B has two power switches,
  "Main power switch" and "Power switch for stand-by condition".

Main Power Switch

Power Switch for Stand-by condition

➢ The case of turning on the power

(1) Connect a power code after ensuring that main power switch is Off.
(2) Turn On the main power switch.
(2') From the Standby condition to power ON, press the power switch for stand-by condition.

➢ The case of turning off the power

(1) Press the power switch for stand-by condition.
(2) Turn off the main power switch.

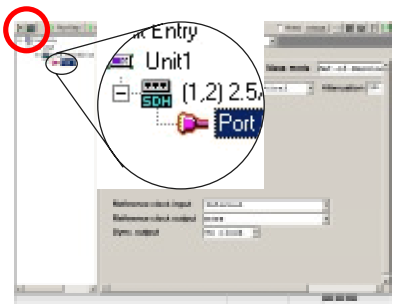
1. Setup - Selection of Measuring mode

- Select the mode of application before measuring.
  SDH/SONET/OTN mode is chosen here.

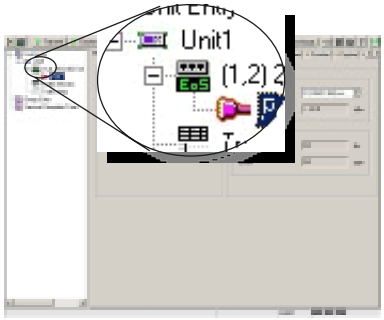
➢ SDH/SONET/OTN mode:
For measuring SDH/SONET/OTN, Jitter.
This mode does not support "VCAT" and "LCAS"

➢ EoS mode:
For measuring EoS, VCAT, LCAS.

Button of changing mode



SDH/SONET/OTN mode



EoS mode

2. Port setting (1)

- Choose bit rate, encapsulation (mapping), and concatenation type

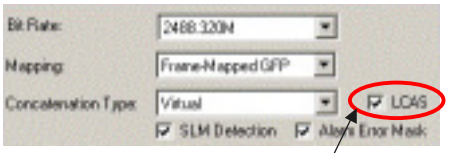
(1) Open Port Setting screen

Right-click the port icon and choose "Port Setting…" command.

(2) Choose bit rate, encapsulation (mapping), and concatenation type

Choose the following parameters in pull down menue:

- Bit rate
- Encapsulation (Mapping)
- Concatenation



To use the LCAS functions, check this box.

2. Port setting (2)

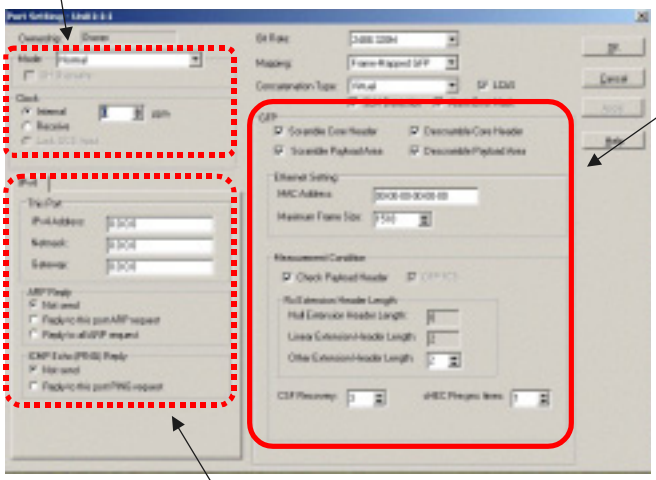
(3) Choose measurement mode and clock modes

(Measurement modes)

Normal mode -- Supports transmitting / receiving data. Select for two-way connection.

Through mode -- Transparent, OH Overwrite and Differential delay are also supported.

Monitor mode -- Not usually used



(4)GFP Initial setting

When GFP setting is required, set

- Scramble ON/OFF
- Ethernet Address of this port
- Extension Header parameters
- GFP FCS parameter of Rx side

according to the DUT conditions. This field changes according to the selected encapsulation (mapping).

This field is used when it connects to a DUT requires IP address like router, switch and so on.

3. Connecting

- Connecting

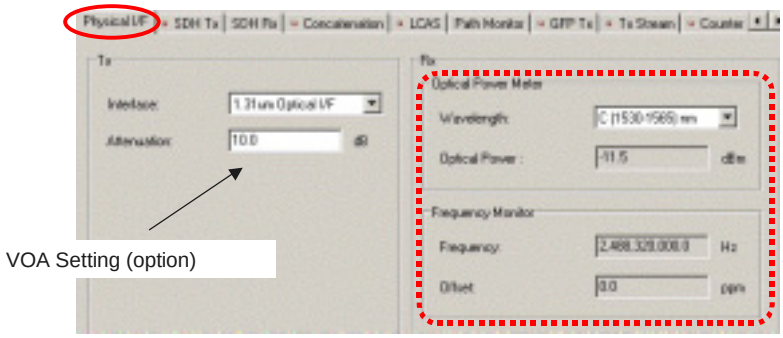
(1) Connect optical fiber.

➢ *You have to adjust output optical power using VOA option or external attenuator before connecting because Tx Laser is always on in EoS mode.*

(2) Check the optical input power in Analyze section.

➢ *You should adjust the optical input power to the optimum value.*

➢ *The optimum value : -10.0 dBm to -12.0 dBm*



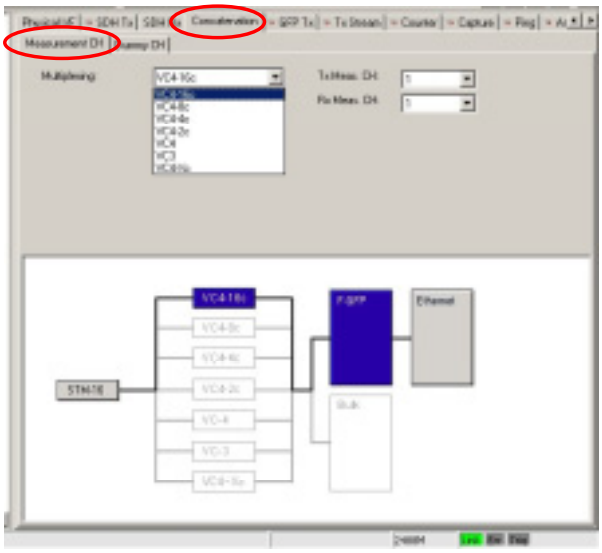
VOA Setting (option)

Optical input level and frequency

4. Setting Concatenation - Contiguous/Arbitrary

- Setting contiguous concatenation parameters

This setting is available when Concatenation Type is "Contiguous" in port setting.



(1) Multiplexing

Choose "Multiplexing" of measurement channel in pull down menu. When you choose "VC4-Xc", you can set size of concatenation.

(2) Measurement Channel

Choose "Measurement CH" for both Tx and Rx side independently.

(3) Dummy Channel

Dummy CH parameters can be set at the Dummy CH tab, when it is necessary to set parameters other than Measurement CH at Tx.

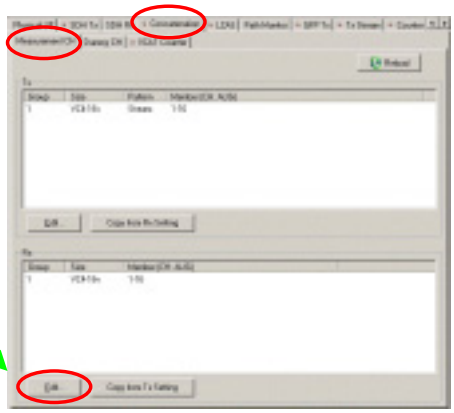
4. Setting Concatenation - Virtual (1)

- Setting virtual concatenation parameters

  This setting is available when Concatenation Type is “Virtual” in port setting.

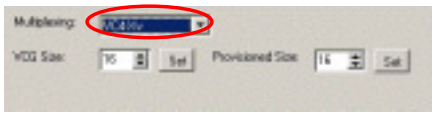
(1) Setting Rx-side VCAT group

At first, it has to match a concatenation and VCAT group with DUT’s one.
Click “Edit…” button, to set VCG at Rx side.

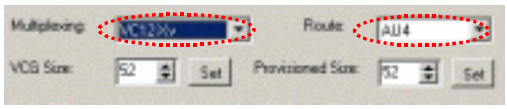


(2) Setting Multiplexing

Next, it has to choose “Multiplexing”. It also has to choose “Route” when it use Low Order Concatenation.



HO-VCAT

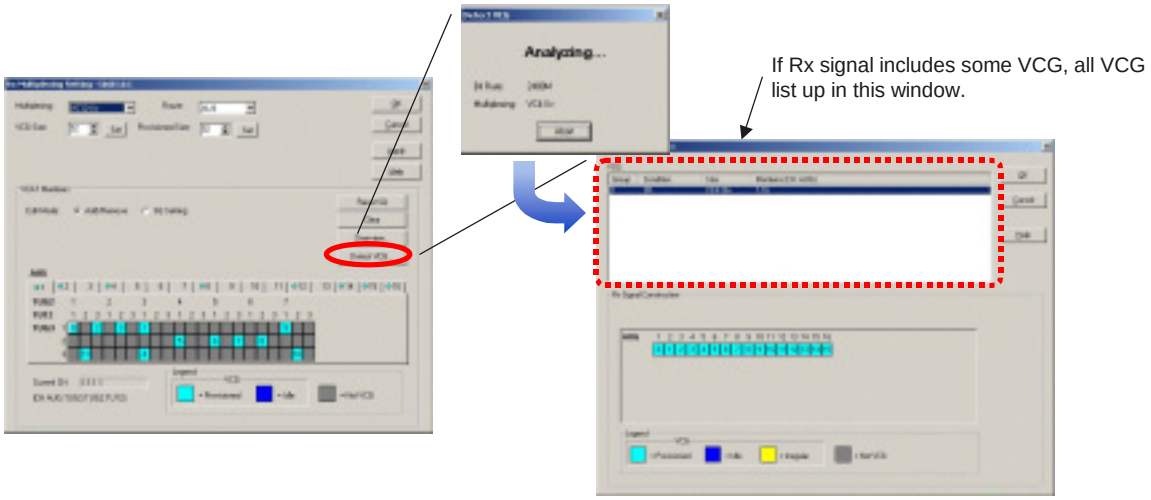


LO-VCAT

4. Setting Concatenation - Virtual (2)

(3) Detect VCG setting of DUT automatically

Click the “Detect VCG…” button in the Rx VCAT Group Setting screen to show the detected VCAT group in the Detect VCG screen.
After analyzing, the result screen is appeared. Choose measurement VCG from list window.
And click “OK” button for both Detect VCG and Rx Multiplexing screen.

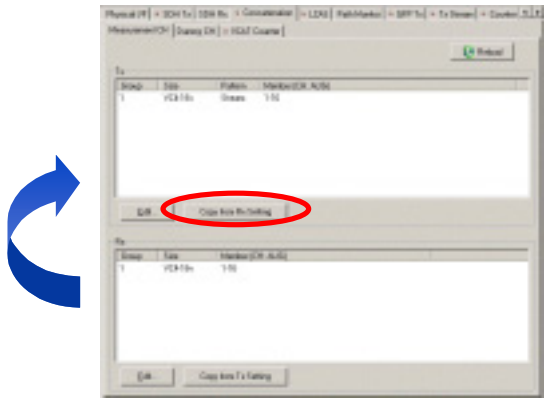


4. Setting Concatenation - Virtual (3)

If a VCG setting in Tx is the same as Rx's one, see the (4-1);
If a VCG setting is independent between Tx and Rx, see the (4-2);

(4-1) Copy Rx setting to Tx side

Click the "Copy from Rx Setting" button to copy Rx setting into Tx side.



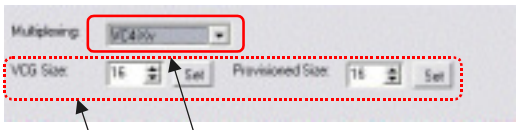
Finish to set concatenation, see ***(5);***

4. Setting Concatenation - Virtual (4)

(4-2) Tx-side VCG setting manually

Click the "Edit…" button to open Tx Multiplexing screen.

HO-VCAT



LO-VCAT

- Multiplexing:

  At first, choose "multiplexing" from pull down menu. If it set VC3, VC12 or VC11, it also choose "Route" from AU4 or AU3.

- **Choose** VCG size and Provisioned size automatically:

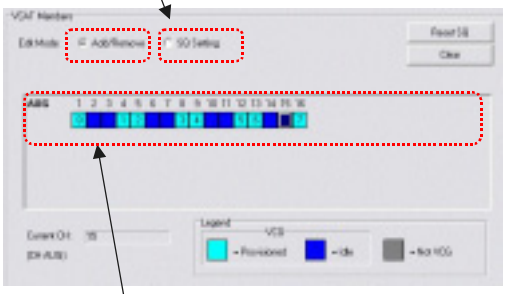
  VCG members and Provisioned channels can be picked up automatically when it set in this area. When it chooses manually, set VCG size to 0 and use the "VCG members" area.

4. Setting Concatenation - Virtual (5)

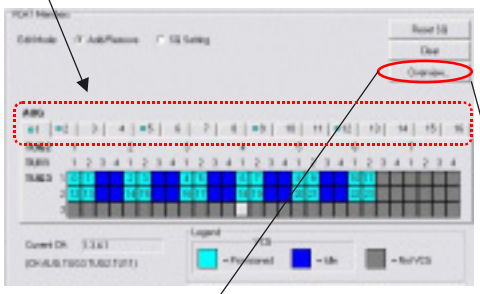
It is possible to change SQ for each channel in “SQ Setting mode”.

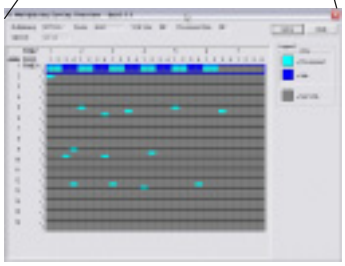
It is possible to choose channel across any AUG by this TAB in LO-VCAT.

HO-VCAT



LO-VCAT





➢ **Choose** VCG members and Provisioned channels manually:

Click “Add/Remove mode”. And choose channel from this area. A channel becomes VCG member by “Single Click” and becomes Provisioned channel by “Double Click”.

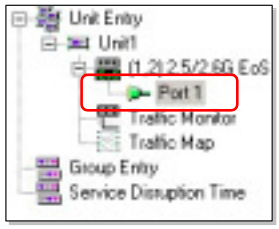
Finish to set concatenation, see ***(5);***

4. Setting Concatenation - Virtual (6)

(5) Check Linkup

When it completes to set concatenation for both Tx and Rx side, the port icon becomes green from red. And any alarm/error have gone.

Linkup



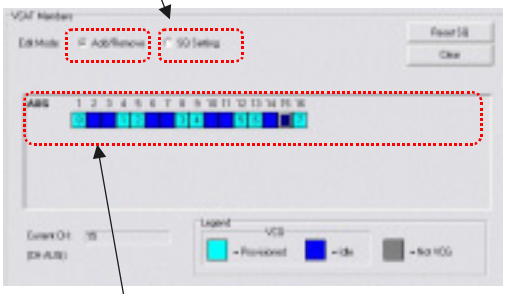
If an error/alarm occurs, please check counter to get detail information, see 5-(4-1);

4. Setting Concatenation - Virtual (5)

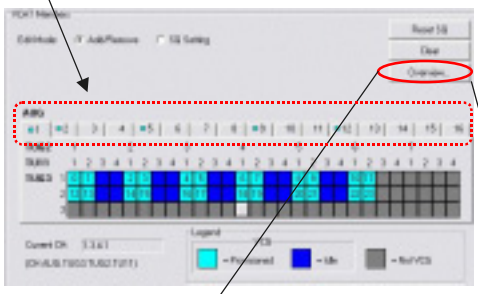
It is possible to change SQ for each channel in “SQ Setting mode”.

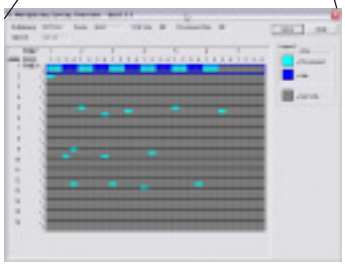
It is possible to choose channel across any AUG by this TAB in LO-VCAT.

HO-VCAT



LO-VCAT





➢ **Choose** VCG members and Provisioned channels manually:

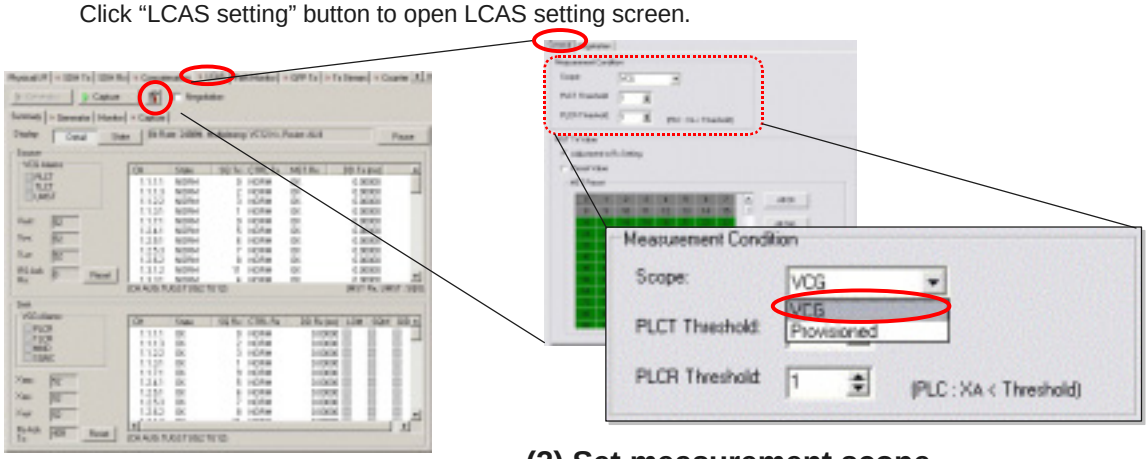
Click “Add/Remove mode”. And choose channel from this area. A channel becomes VCG member by “Single Click” and becomes Provisioned channel by “Double Click”.

5. Measurement - LCAS test (1)

Setting LCAS

(1) Setting LCAS

Before starting LCAS negotiation, it has to set some conditions of LCAS measurement .
Click “LCAS setting” button to open LCAS setting screen.



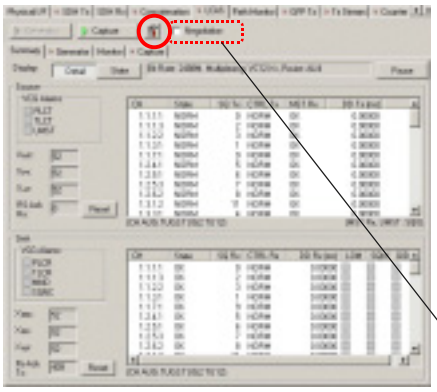
(2) Set measurement scope

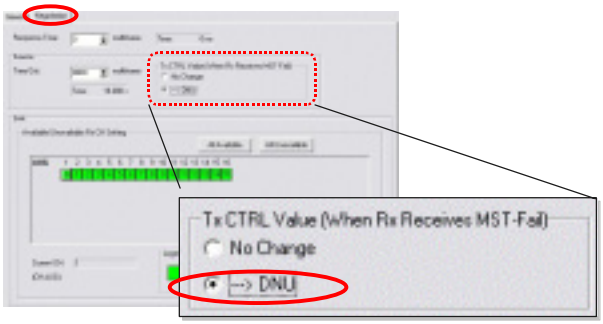
Next, choose a measurement scope.
It recommends “VCG” because you get information of all VCG member in this setting.

5. Measurement - LCAS test (2)

(3) Set Tx CTRL Value

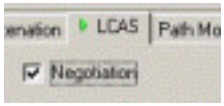
Choose a Tx CTRL Value.
It recommends "---> DNU" because LCAS equipment also become "DNU" when it receive MST-Fail.





(4) Negotiation ON

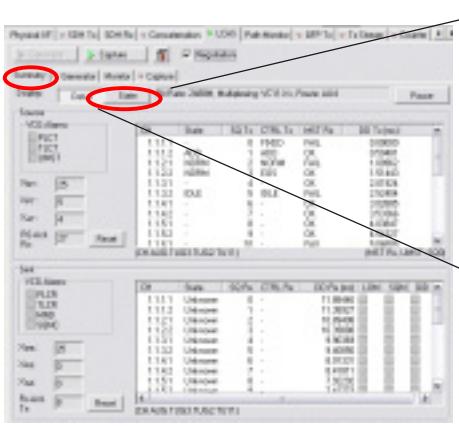
Check this box to start LCAS negotiation.

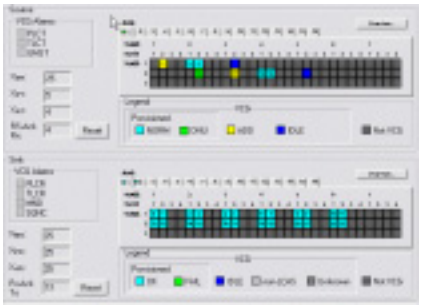


5. Measurement - LCAS test (3)

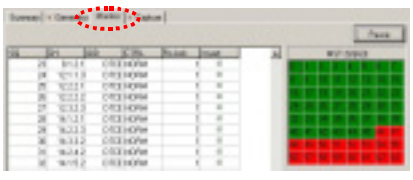
(5) Check a current LCAS status

It is possible to check a summary of LCAS condition for both Source and Sink side like channel, SQ, MST, CTRL and so on in real time. Before change add/remove channel, you should confirm a current status of LCAS. You can also get a status of each channel as graphic in Status mode.





If you need GID, Rs-Ack and Invert information, use monitor screen.

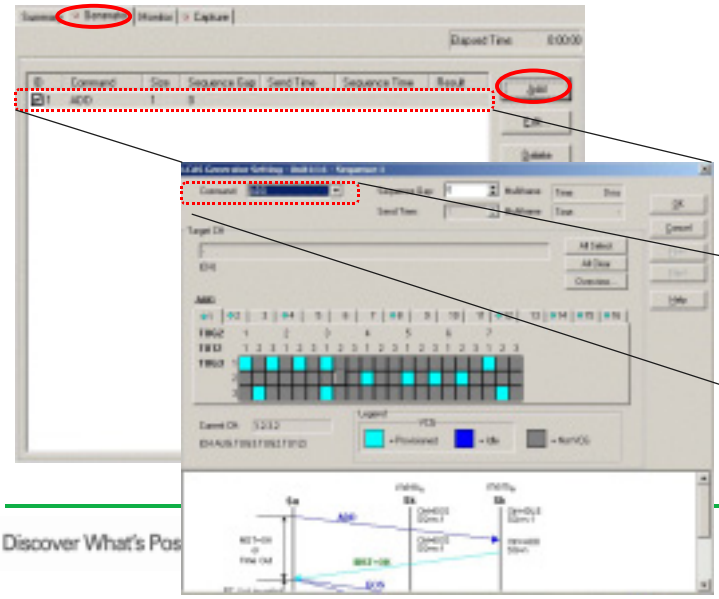


5. Measurement - LCAS test (4)

- Add/Remove channel into/from VCG

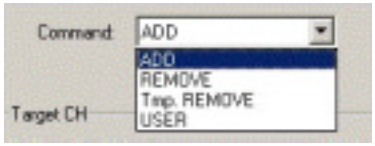
(1) Create new LCAS commands

Click “Generate” tab in LCAS screen, and “ Add “ button to create new LCAS command.



(2) Choose command type

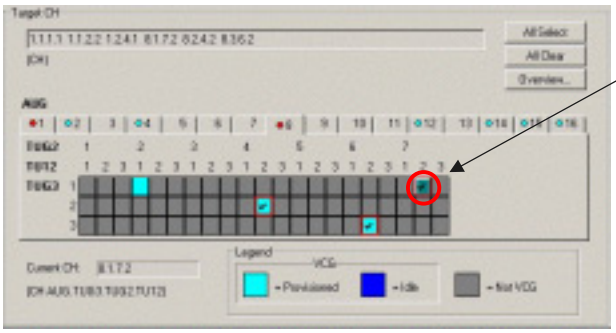
Double Click on command or Click “Edit…” button to open LCAS generator setting screen. And choose command type, at first.



5. Measurement - LCAS test (5)

(3) Choose target channel

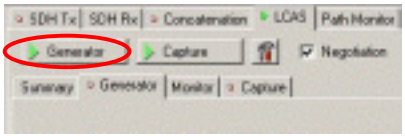
Next, choose target channel of LCAS command in graphical screen and click “OK” button.



Click on provisioned or Idle channel.

(4) Transmit LCAS command

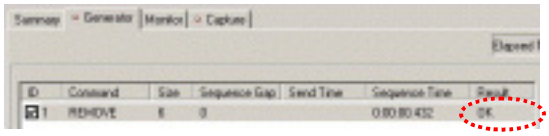
After setting LCAS command, “Generator” button become active. Click it to transmit LCAS command.



5. Measurement - LCAS test (6)

(5) Check a result of LCAS command

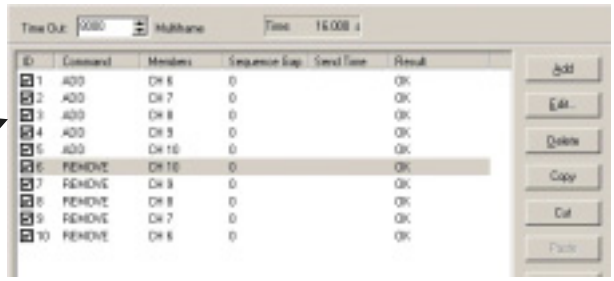
The result of LCAS command is shown in result field with “Sequence Time”. After LCAS command complete, also check the result in “Summary” screen or DUT side.



Application - Sending multiple LCAS send commands

Up to 64 LCAS send commands can be registered at the Generator tab.

Check or clear the checkbox for each command. Various pattern tests can be executed simply by changing the combination of checked checkboxes.



5. Measurement - LCAS test (7)

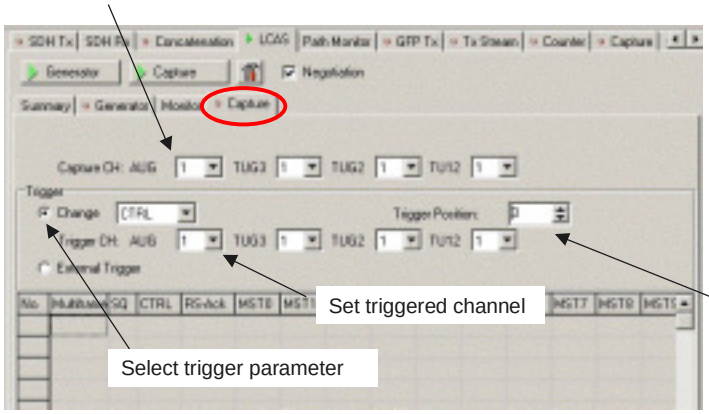
Capture LCAS command

(1) Create LCAS send command

Before capture, set the capture parameters. The following is recommend parameters.

Capture CH: Added or Removed channel
Trigger
Change:CTRL
Trigger Added or Removed channel
Trigger Position:3

Set captured channel

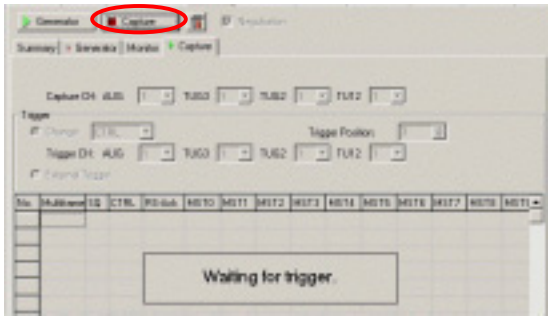


Set the position of triggered sequence. For example, when 3 is set, the triggered sequence is displayed third row and the condition before triggering is displayed in first and second row.

5. Measurement - LCAS test (8)

(2) Starting capture

Click the “Capture” button to start capture.



(3) Checking capture result

No.	Multiframe	SQ	CTRL	RS-Ack	MST0	MST1	MST2	MST3	MST4	MST5	MST6	MST7	MST8	MS
1	7491	255	IDLE	0	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FAIL	FA
*2	119	5	ADD	0	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FAIL	FA
3	32	5	ADD	0	OK	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FA
4	96	5	EOS	0	OK	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FA
5	33	5	EOS	1	OK	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FA
6	86	255	IDLE	1	OK	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FA
7	32	255	IDLE	0	OK	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FA
8	4720	255	IDLE	0	OK	OK	OK	OK	OK	FAIL	FAIL	FAIL	FAIL	FA

After LCAS sequence complete, click“Capture” button again to stop capture. The captured sequences are displayed like this picture.

5. Measurement - SDH/SONET test (1)

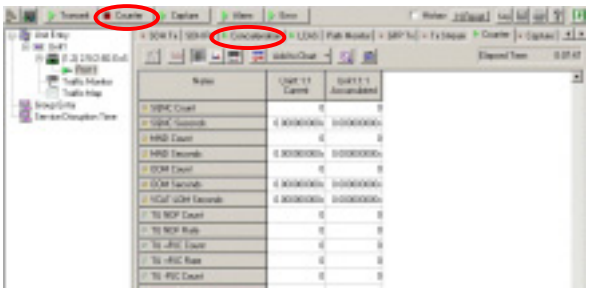
- Checking SDH/SONET frame status of VCG

(1) Checking SDH/SONET frame status

MP1590B has 3 way to check status of SDH/SONET. Click “Counter” button, then 2 counters are started. One is “counter”, other is VCAT counter. And the other way is Path Monitor, it always works.

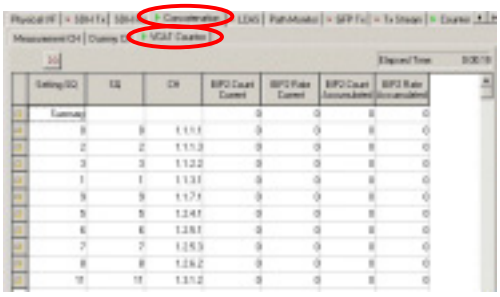
Part 1 - Counter function

The counter function counts a lot of item from SDH/SONET(1.5) layer to TCP/UDP(4) layer. It count total number of all VCG members.



Part 2 - VCAT counter function

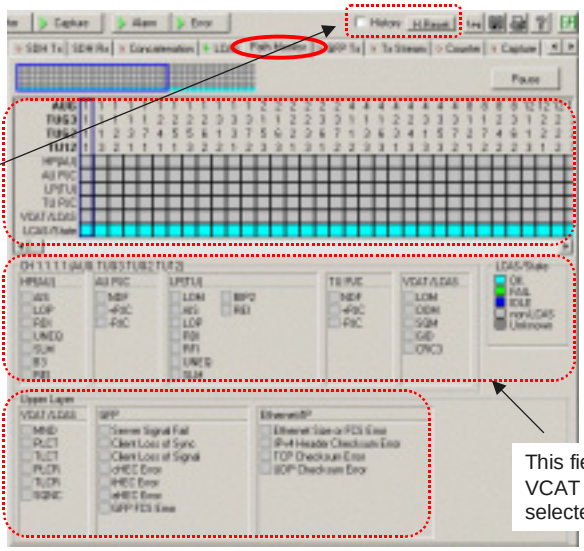
The VCAT counter counts B3 errors of each VCG member.



5. Measurement - SDH/SONET test (2)

Part 3 - Path Monitor

The Path Monitor is able to count the detail status of each VCG members.



This field is Quick View. It is possible to display a history of status when it check “History” box.

This field displays VCAT, EoS and Ethernet/IP status of VCG.

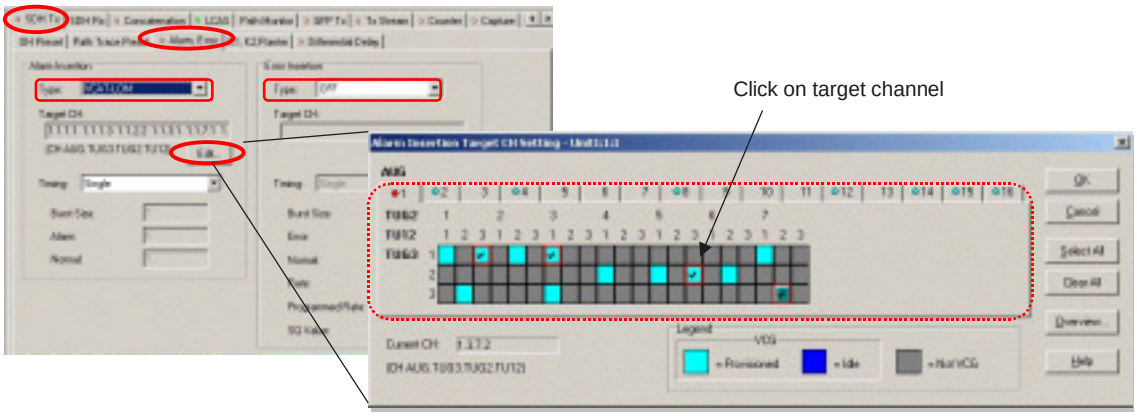
This field displays SDH/SONET, VCAT and LCAS status of the selected channel.

5. Measurement - SDH/SONET test (3)

- Insert an error/alarm in SDH/SONET layer

(1) Inserting errors/alarms

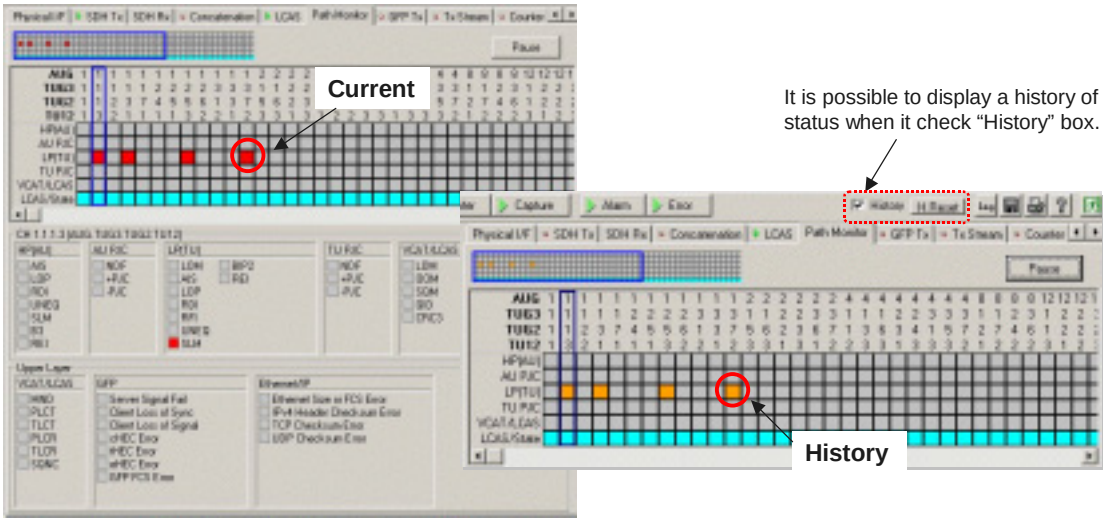
When it inserts an error/alarm in SDH/SONET layer, Click “SDH Tx” Tab and “Alarm Error” tab. It is possible to choose error/alarm in pull down menu. Moreover, it is also possible to choose some inserting channels freely.



5. Measurement - SDH/SONET test (4)

(2) Check status of each VCG member

When it receive errors/alarms, check status of each VCG member by Path Monitor.

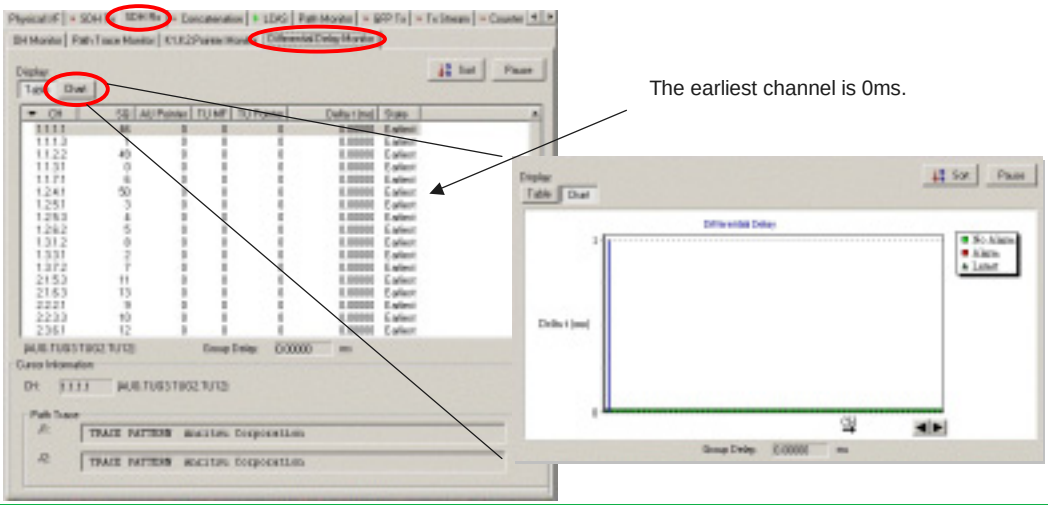


5. Measurement - VCAT differential delay test (1)

- Monitor VCAT differential delay

(1) Monitor VCAT differential delay in Rx side

It is possible to monitor VCAT differential delay in the “Differential Delay Monitor” in the “SDH Rx” tab. It displays delay and pointer value of each VCG member. Delay value is relative.

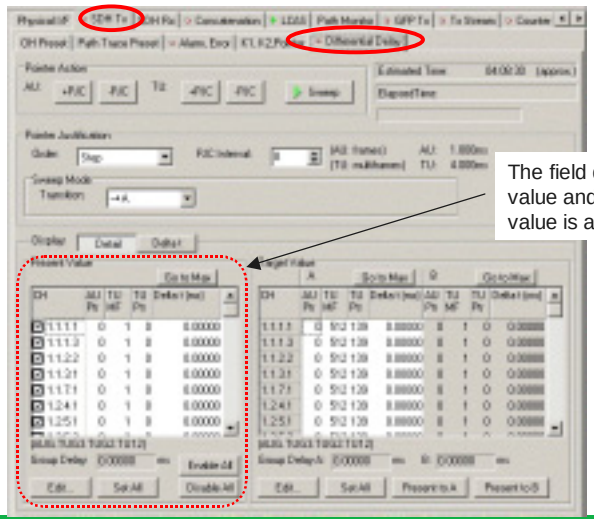


5. Measurement - VCAT differential delay test (2)

- Add VCAT differential delay

(1) Check current added differential delay in Tx side

At first, check current added differential delay in Tx side in “Differential Delay” in “SDH Tx” Tab.

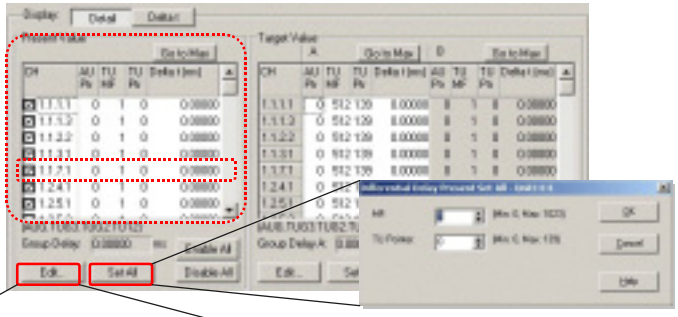


The field displays current added delay value and pointer value. This delay value is absolute.

5. Measurement - VCAT differential delay test (3)

(2) Add delay directly

When it adds delay into VCG member directly, it is possible to change delay value of VCG member with NDF in Present Value area.



All channels can be change at a same time.

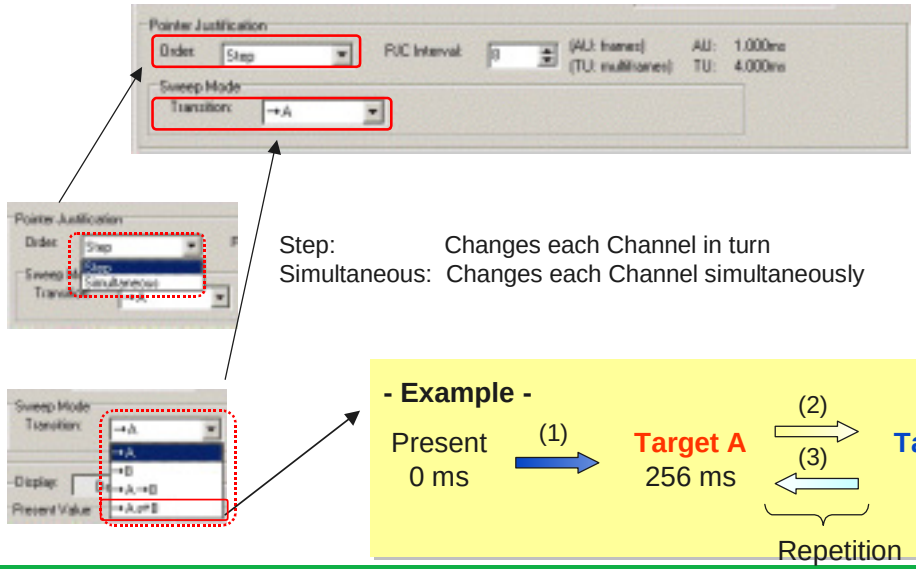
It adds delay into a channel.
The Delay value can be input in each of the following formats.

- MFI value
- Pointer value
- Delta value

5. Measurement - VCAT differential delay test (4)

(3) Set a way of adding differential delay for Sweep mode

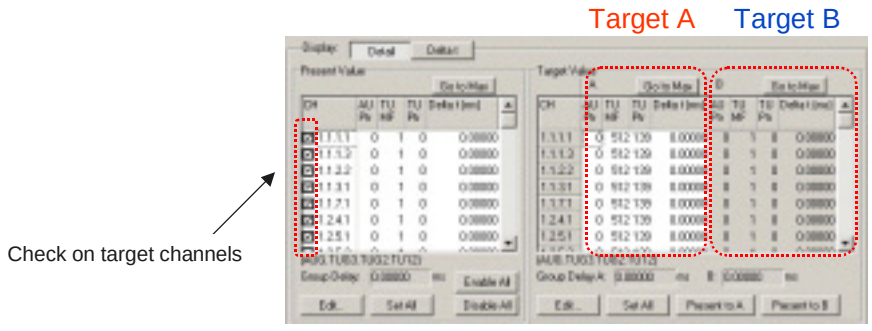
It is possible to add delay gradually by Sweep mode. Set a way of adding differential delay as Pointer Justification by “Order” and “Transition”.



5. Measurement - VCAT differential delay test (5)

(4) Set delay value

Set target channels and target value for Sweep mode.



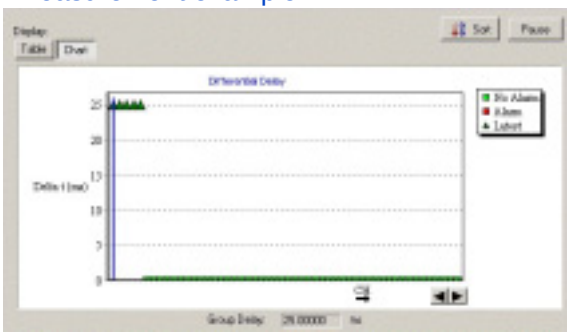
(5) Add differential delay in Sweep mode

Click “Sweep” button to add delay gradually.

5. Measurement - VCAT differential delay test (6)

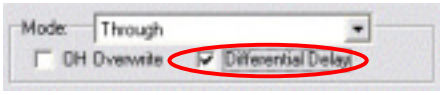
(6) Monitor VCAT differential delay in Rx side again

Measurement example



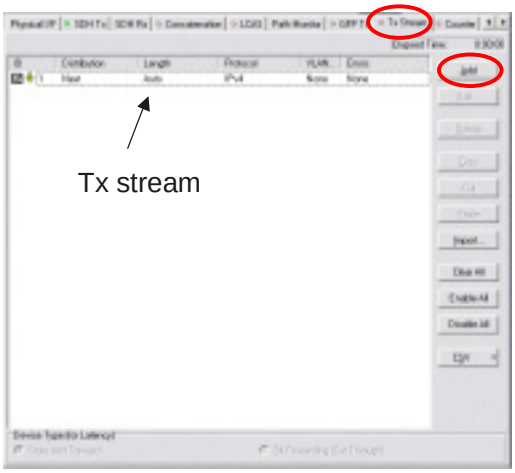
(7) differential delay with Through mode

When it adds delay in Through mode, it set through mode in “Port Setting” and check “differential delay”.



5. Measurement - EoS test (1)

- Setting GFP frame as EoS transmitting data
  -This setup is enabled when the port mapping setting is Frame mapped GFP.



(1) Create Tx stream

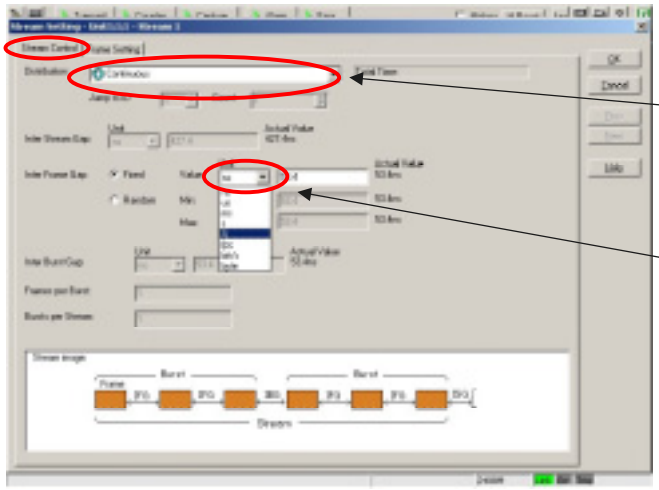
Select the Tx Stream tab and fetch the Tx Data Setting screen. Click the Add button to register a new Tx stream. The transmitted data contents MAC/IP address, transmitted load, transmitted data repetition pattern are defined in the Tx stream. Up to 256 streams can be registered.

The GFP Tx tab contains settings required for the ARP and Ping auto-reply function. When using neither the ARP nor Ping functions, these settings are not required.

5. Measurement - EoS test (2)

(2) Setting Tx stream transmission method

Double-click the Tx stream or click the “Edit…” button to set the Tx stream control and Tx stream repetition pattern at the Stream Control tab of the Tx Stream Edit screen.



When sending with a fixed load, select Continuous at the Distribution menu (transmits set frame continuously).

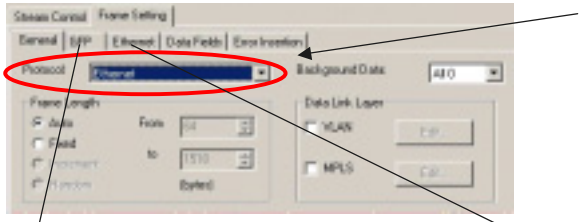
When Continuous is set, the load setting is set at Frame Gap. The various units for the Inter Frame Gap are set at the Unit menu.

Select % and input the value as 100% . (100% is Full wire rate of total bandwidth of provisioned channel.)

5. Measurement - EoS test (3)

(3) Setting frame data

The Tx data contents (protocol, MAC/IP address, etc.) are set at the Frame Setting tab at the Tx Stream Edit screen.



First, select the protocol. Select None when using only GFP frames, or Ethernet when using GFP+Ethernet frames. Ethernet is selected in this example. The contents of higher-level tabs change according to the selected protocol..

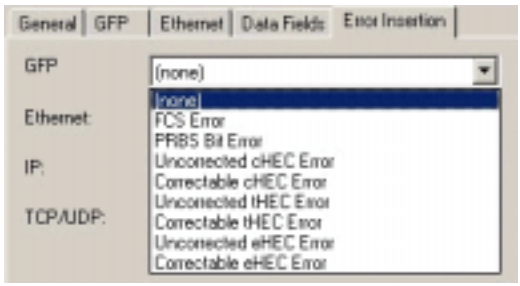
GFP-related data (FCS, Extension Header, etc) is set at the GFP tab.

Ethernet-related data (MAC Address, Ethernet Type, etc.) is set at the Ethernet tab.

5. Measurement - EoS test (4)

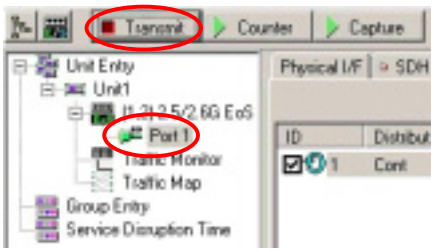
(4) Inserting error frames

When it is necessary to set error frames, select the Error Insertion tab.
Error frames can be set independently for each GFP, Ethernet, IP, TCP/UDP layer.



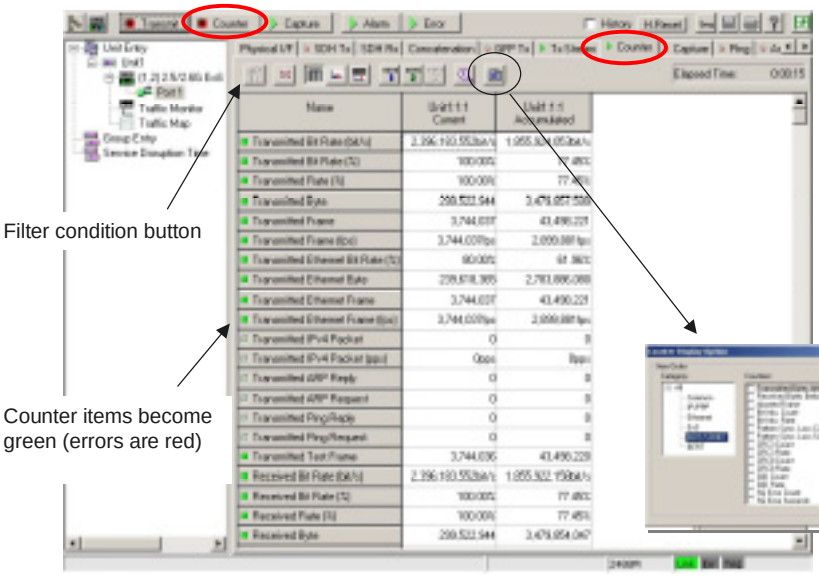
(5) Starting Tx stream transmission

After completing the settings, click the “OK” buttonand click the “Transmit” button to transmit the Tx stream.
During sending, a small arrow icon (->) is displayed on the Port icon. In the example on the right, receiving is also being checked simultaneously, so a double-ended arrow
(<->) is displayed.



5. Measurement - EoS test (5)

Checking received stream after setting Tx stream

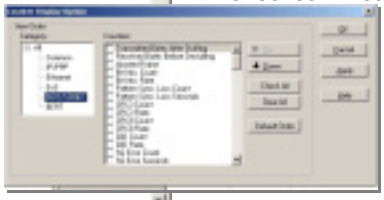


(1) Starting counting

Move to the Counter tab and click the “Counter” (ON/OFF) button to start counting items such as:

- Transmitted frame count
- Received frame count
- Error count
- etc.

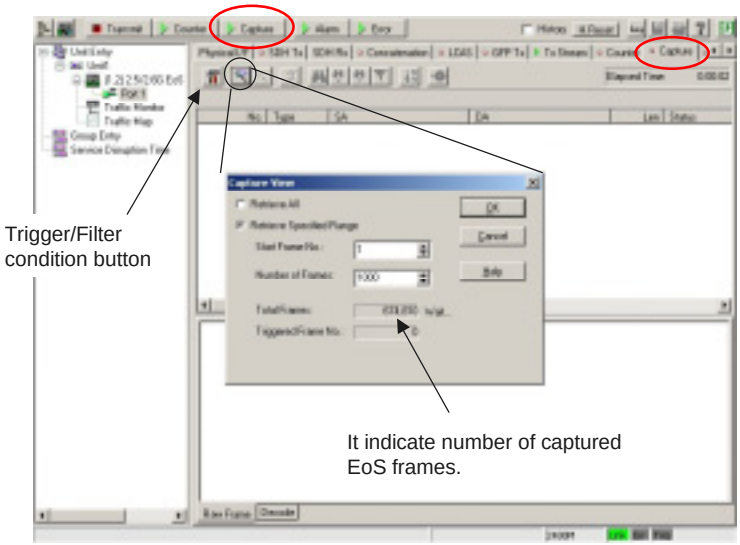
Various information can be checked in real time.



The counter items and their order can be set freely.

5. Measurement - EoS test (6)

- Capture function for checking actual EoS frame traffic



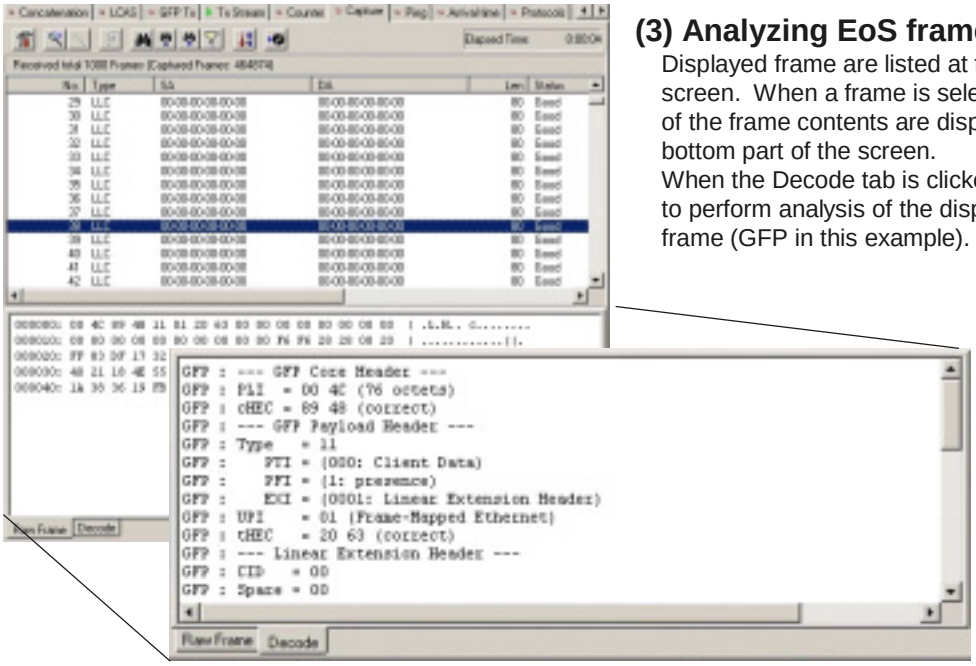
(1) Starting capture

Move to the Capture tab and click the “Capture” (ON/OFF) button to start capture.
Click the button again to stop capture.

(2) Displaying captured data

After capture, select the captured frames to be displayed on the screen.
Click the Retrieve Capture Data button to display the Capture View screen and select the frame to be displayed.
In this example, frames 1 to 1000 will be displayed.

5. Measurement - EoS test (7)



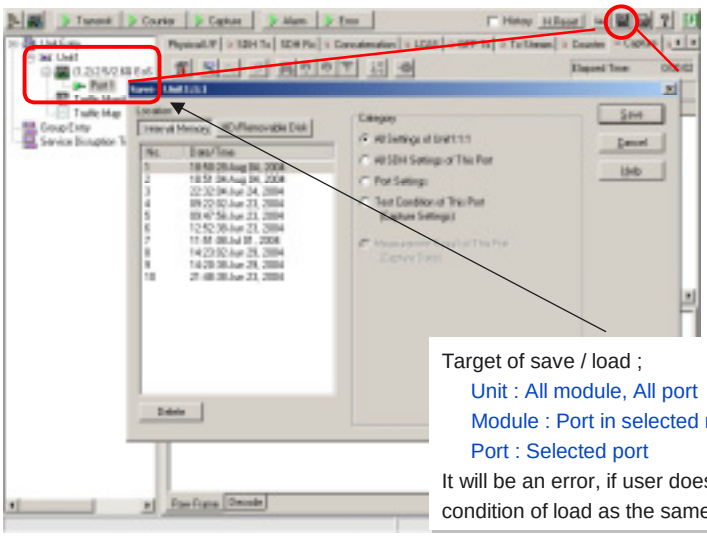
(3) Analyzing EoS frame

Displayed frame are listed at the top of the screen. When a frame is selected, the details of the frame contents are displayed at the bottom part of the screen.
When the Decode tab is clicked, it is possible to perform analysis of the displayed EoS frame (GFP in this example).

6. Others - Save/Load

(1) Save and Load a Measurement Condition / Result

Click the FD icon at the top of window in order to save a measurement condition / result.
And use after stopping measurement, since it cannot be used during measurement, transmission, Counter, Capturing, etc.



Target of save / load ;
- Unit : All module, All port
- Module : Port in selected module
- Port : Selected port

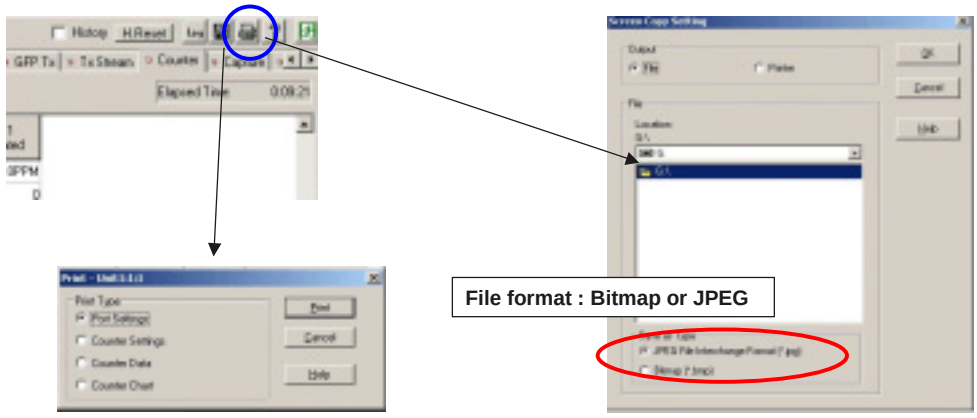
It will be an error, if user does not select the target condition of load as the same target condition of save.

(2) Procedure for save and load

a. Stopping all measurement
b. Select a target of save/load in Tree View
c. Select “Save…” or “Load…”
d. Select the destination to save / load
e. Select an item of save / load
f. Execute

6. Others - Printing/Copying Screen -

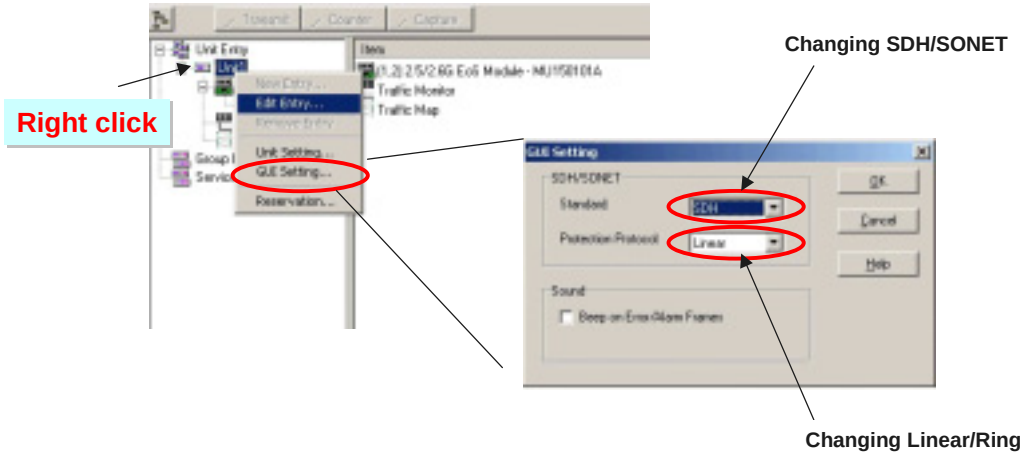
- **Print out**
  - **Click Printer icon at the top right of window and select “Print…”.**
    Next select a target of print and Click “Print”.
    The item which can be printed changes with screens currently displayed.
- **Screen Copy**
  - **Click Printer icon at the top right of window and select “Screen Copy Setting”.**
    Next Set up the destination to output / save and the file format.
    Push the Screen Copy button on a front panel in order to save the current screen.



File format : Bitmap or JPEG

6. Others - Changing SDH/SONET

- **It is possible to change SDH/SONET in GUI Setting window.**
  Click “Unit” in Tree view by the right button, and select “GUI Setting…” in dropped menu.
  Select SDH view / SONET view at “Standard” in pop-up window, and click “OK”.



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