MU120002A
STM-1/OC-3 Unit
Operation Manual

Sixth Edition

ANRITSU CORPORATION

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Insure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following five symbols may not be used on all Anritsu equipment. In addition, there may be other labels attached to products which are not shown in the diagrams in this manual.

Symbols used in manual

DANGER ⚠ This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

WARNING ⚠ This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

CAUTION ⚠ This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Insure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.

This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.

This indicates warning or caution. The contents are indicated symbolically in or near the triangle.

This indicates a note. The contents are described in the box.

These indicate that the marked part should be recycled.

For Safety

WARNING ⚠️

1. ALWAYS refer to the operation manual when working near locations at which the alert mark shown on the left is attached.   If the operation, etc., is performed without heeding the advice in the operation manual, there is a risk of personal injury.   In addition, the equipment performance may be reduced.

   Moreover, this alert mark is sometimes used with other marks and descriptions indicating other dangers.

2. Laser radiation warning
   - NEVER look directly into the cable connector on the equipment nor into the end of a cable connected to the equipment.   If laser radiation enters the eye, there is a risk of injury.
   - The Laser Safety label is attached to the equipment for safety use as indicated in "Laser Safety" on a following page.

3. This equipment cannot be repaired by the user.   DO NOT attempt to open the cabinet or to disassemble internal parts.   Only Anritsu-trained service personnel or staff from your sales representative with a knowledge of electrical fire and shock hazards should service this equipment.   There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel.   In addition, there is a risk of damage to precision parts.

Repair

WARNING ⚠️

For Safety

CAUTION ⚠️

Check Terminal

⚠️

1. Never input a signal of more than the indicated value between the measured terminal and ground. Input of an excessive signal may damage the equipment.

For Safety

For Safety

Laser Safety

The laser in this equipment is classified as Class 1 according to the IEC 60825-1 specifications, or as Class I according to the 21CFR 1040.10 specifications.   These classes of lasers are safe under reasonably foreseeable operating conditions.

Classes are indicated on the label attached near the laser-radiations.

Class 1 indicate the danger degree of the laser radiation specified below according to IEC 60825-1.

Class 1:   Lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Equipment Certificate

Anritsu Corporation certifies that this equipment was tested before shipment using calibrated measuring instruments with direct traceability to public testing organizations recognized by national research laboratories including the National Institute of Advanced Industrial Science and Technology, and the National Institute of Information and Communications Technology, and was found to meet the published specifications.

Anritsu Warranty

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within 1 year after shipment due to a manufacturing fault, provided that this warranty is rendered void under any or all of the following conditions.

- The fault is outside the scope of the warranty conditions described in the operation manual.
- The fault is due to mishandling, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster including fire, flooding, earthquake, etc.
- The fault is due to use of non-specified peripheral equipment, peripheral parts, consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation will not accept liability for equipment faults due to unforeseen and unusual circumstances, nor for faults due to mishandling by the customer.

Anritsu Corporation Contact

If this equipment develops a fault, contact Anritsu Service and Sales offices at the address at the end of paper-edition manual or the separate file of CD-edition manual.

CE Conformity marking

Anritsu affixes the CE Conformity marking on the following product (s) in accordance with the Council Directive 93/68/EEC to indicate that they conform to the EMC and LVD directive of the European Union (EU).

CE marking

$$C\hspace{-0.2em}\epsilon$$

1. Product Model

Plug-in Units: MU120002A STM-1/OC-3 Unit

2. Applied Directive and Standards

When the MU120002A STM-1/OC-3 Unit is installed in the MP1220A, the applied directive and standards of this Unit are conformed to those of the MP1220A main frame.

PS: About main frame

The kind of main frame (a measuring apparatus) will be to increase.
Please, contact us about the newest information of the main frame.

C-tick Conformity marking

Anritsu affixes the C-tick marking on the following product (s) in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

C-tick marking

✔N274

1. Product Model
Plug-in Units: MU120002A STM-1/OC-3 Unit

2. Applied Directive and Standards
When the MU120002A STM-1/OC-3 Unit is installed in the MP1220A, the applied directive and standards of this Unit are conformed to those of the MP1220A main frame.

PS: About main frame
The kind of main frame (a measuring apparatus) will be to increase. Please, contact us about the newest information of the main frame.

Preface

Organization of the Operation Manual

MU120002A STM-1/OC-3 Unit is one of the plug-in units which can be inserted to the MP1220A ATM Quality Analyzer.   Manuals are provided for the mainframe and each of the plug-in units.   Each manual is supplemented with a remote control instruction manual (the remote control software is optional).   Select and use the manuals that meet your needs

```
                                   ┌─────────────────────────────────────────────────┐
                                   │ MP1220A ATM Quality Analyzer Operation Manual   │
                                   └─────────────────────────────────────────────────┘
                                   ┌─────────────────────────────────────────────────┐
                                   │ MP1220A Remote Control Operation Manual         │
                                   └─────────────────────────────────────────────────┘
┌──────────────────┐               ┌─────────────────────────────────────────────────┐
│ Manuals for      │               │ MU120002A STM-1/OC-3 Unit Operation Manual      │
│ MP1220A and      │───            └─────────────────────────────────────────────────┘
│ plug-in units    │               ┌─────────────────────────────────────────────────┐
└──────────────────┘               │ MU120002A Remote Control Operation Manual       │
                                   └─────────────────────────────────────────────────┘
                                   ┌─────────────────────────────────────────────────┐
                                   │ MU1200XXA XXXXXX Unit Operation Manual          │
                                   └─────────────────────────────────────────────────┘
                                   ┌─────────────────────────────────────────────────┐
                                   │ MU1200XXA Remote Control Operation Manual       │
                                   └─────────────────────────────────────────────────┘
```
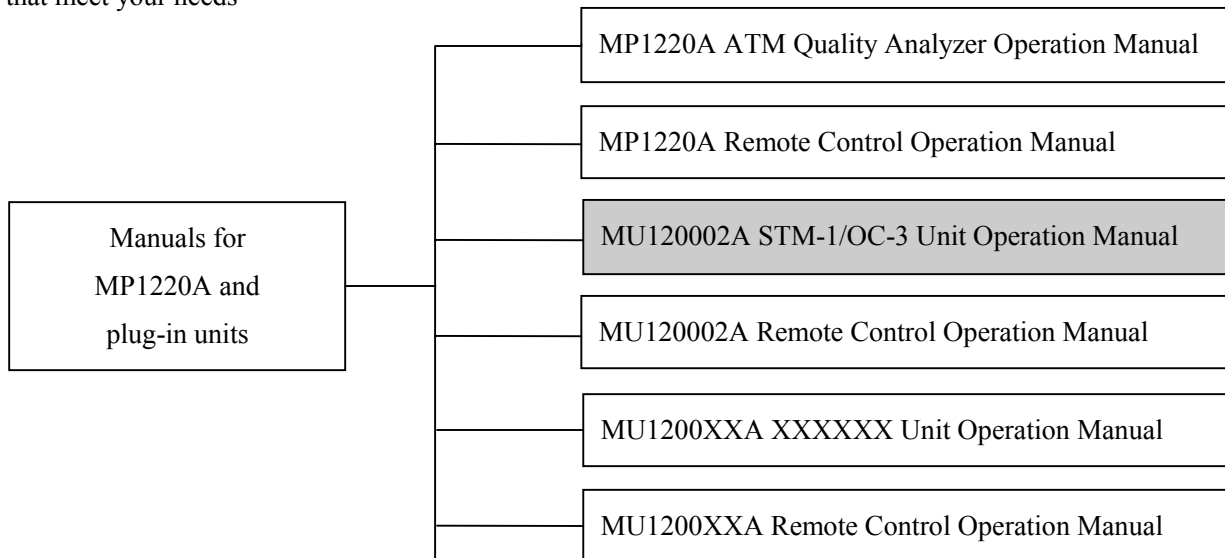
- MP1220A ATM Quality Analyzer Operation Manual
  Provides an overview of the MP1220A and describes its usage precautions, panel configuration, specifications, performance, and operation.
- MP1220A ATM Quality Analyzer Remote Control Operation Manual
  Describes how to control the equipment through an external interface, and provides program examples.
- Operation Manuals for each unit
  Provides an overview of each unit and describes its specifications, performance and operation.
- Operation Manuals for each unit's remote control units
  Describes how to control the unit through an external interface, and provides programs examples.

Contents

IV.

Section 1   Overview

1.1 Overview of the Product

MU120002A STM-1/OC-3 UNIT (this unit), which is to be inserted to a slot in the MP1220A ATM quality analyzer (main frame), adds the frame to or terminates the 156Mb/s signal, and gains HEC synchronization to the signal.

The optical and electrical input/output interfaces are provided in this unit.

Features

● Loopback function

　・Reception loopback (the received signal, as well as being measured by this unit, is redirected inside the unit to the transmitter side, and is sent to the external terminal, MU120020A QoS unit, and MU120021A protocol unit.)

　・Transmission loopback (the transmission signal, as well as sent to the external, is redirected and measured in the unit.)

● Error/Alarm measurement

　　Various types of error/alarms including error ratios, error count, error status display, and warning status display.

● Cell number count by HEC function

　・Number of cells disposed due to header error.

　・Number of cells whose header are error corrected.

1.2 Specifications

Table 1-1 shows the specifications of this unit.

Table 1-1   Specifications

Number	Item	Specification

1
1.1
	Input/output
	Output
	  Transmission bit
	  rate
	  Output level
	  Mode
	  Emission center
	          wave length
	  Code
	  Quenching ratio
	  Connector
	  Output waveform
		Enable to select Optical or CMI.
		Optical output
		155.520Mb/s±10ppm (internal clock)
		-15 to -8dBm
		Single
		1.31 μ m band
		
		NRZ
		8.2dB or more
		SC (Duplex structure with Reception)
		Satisfies G.957 (ITU-T) and TA-NWT-000253.

1.2	Input
	  Reception bit rate
	  Input level
	  Optical reception
	    wave length band
	  Code
	  Connector
		Optical input
		155.520Mb/s±100ppm
		-29 to -8dBm
		1.31 μ m band
		
		NRZ
		Duplex structure with Transmission

1.3	CMI Output
	  Transmission bit
	  rate
	  Output waveform
	  Code
	  Connector
		Electrical output
		155.520Mb/s±10ppm (internal clock)
		Conforms to ITU-T G.703 pulse mask.
		CMI
		BNC75Ω

1.4	CMI Intput
	  Reception bit rate
	  Input level
	
	  Code
	  Connector
		Electrical intput
		155.520Mb/s±100ppm
		1Vp-p±0.1V + cable loss 0 to 12dB
		  When monitoring : 0.1Vp-p $\pm$ 0.01V
		CMI
		BNC75Ω

1.5	Ext Clk Input
	  Frequency
	  level
	  connector
		
		155.520MHz±100ppm (rectangular wave only)
		0.6 to 1.2Vp-p
		BNC 50Ω

Number	Item	Specification
1.6	Rcv Clk Output Frequency level connector	Reception clock output 　But, output the transmission clock when transmission to reception loop 　back. 155.520MHz ($\pm$ ppm range varies depending on the incoming frequency.) 0.6 to 1.0Vp-p (Duty 50$\pm$20%) BNC 50Ω
1.7	Trig Output Level Connector	 TTL level (triggered by Low level) BNC 75Ω
2 2.1	Operation mode Frame format	 SDH/SONET
2.2	Measurement mode	Input and output are mutually independent. The reception signal is looped back to transmission stage. The transmission signal is looped back to reception stage inside the unit.
2.3	Unit through function Transmission through Reception through	 The cell from the lower unit can be passed through upper unit. The cell from the upper unit can be passed through lower unit.
3 3.1	Transmission Network type	 UNI/NNI
3.2	Clock selection	Internal, External, Reception
3.3	Overhead setting SOH POH	 All bytes excluding B1, B2, H1, H2, H3. All bytes excluding B3.
3.4	TC function Fill cell setting for transmission Transmission cell scrambling Transmission HEC Coset processing	 GFC, PTI, CLP and payload. (48 byte are all same value.) ON/OFF ON/OFF
3.5	Pointer manipulation Pointer setting by the user	 NDF　：　0110 fixed Bit　　：　10 fixed in SDH, 00 fixed in SONET Pointer value：0 to 782
3.6	Justification Timing	+PJC, -PJC Single, Repeat interval in n (n=0.5, 1, 2, 5, 10)

Number	Item	Specification
3.7	Path/Section Trace (J0, J1) (SDH) Trace setting by the user CRC-7 addition Data setting display (SONET) Trace setting by the user Data setting display	ON/OFF ON/OFF CRC-7 addition ON: 15 byte HEX/ASCII CRC-7 addition ON: 64 byte HEX/ASCII ON/OFF 64 byte HEX/ASCII
3.8	Error addition Type Timing Burst Error addition byte Error addition bit	Bit, B1, B2, B3, FEBE-L (MS-REI), FEBE-P (HP-REI), Cell SINGLE, 1×10^{-n} (n=3, 4, 5, 6, 7, 8, 9), ALL But, B1, B3, FEBE-P (HP-REI) : SINGLE, 1×10^{-n} (n=4, 5, 6, 7, 8, 9) ALL only Cell : 1×10^{-n} (n=3, 4, 5, 6) only 1 to 64 (when Cell is selected) 1 to 53 (when Cell is selected) 1 to 8 (when Cell is selected)
3.9	Alarm addition Type Timing	LOS, LOF, AIS-L (MS-AIS), RDI-L (MS-RDI), AIS-P (AU-AIS), RDI-P (HP-RDI), LOP-P (AU-LOP), LCD ALL
4 4.1	Reception function Network type	UNI/NNI
4.2	1023ch Measurement function Setting	Type selection : VP or VP/VC Default channel : ON/OFF Channel number : 1 to 1023 Setting channel search time : 5 to 99 sec (1 second unit) : 1 to 99 min (1 minute unit)
4.3	H1, H2 Capture	Detects variation point of H1, H2 Event number : 512 Frame number : max. 65535/event
4.4	TC function Receiving cell descrambling Reception HEC Coset processing Reception HEC error correction	ON/OFF ON/OFF ON/OFF

Number	Item	Specification

4.5	Error detection
	    Type
	
	    Display
		B1, B2, B3, FEBE-L(MS-REI), FEBE-P(HP-REI)
		Corrected Cell, Discarded Cell
		Count : 0 to 999999, 1.00E06 to 9.99E15, >9.99E15
		Errors/second : 0 to 999999, 1.00E06 to 9.99E15, >9.99E15[s]
		Rate : 1.00E-15 to 1.00E00, 0.00E00 to 0.00E-15, <1.00E-15

4.6	Alarm detection
	    Type
	
	    Display
		LOS, OOF, LOF, AIS-L(MS-AIS), RDI-L(MS-RDI), AIS-P(AU-AIS),
		RDI-P(HP-RDI), LOP-P(AU-LOP), LOOP2, LOOP2ACK, LCD
		However LOS is not displayed in the transmission to reception loop back.
		0 to 999999, 1.00E06 to 9.99E15, >9.99E15[s]

4.7	Analyze function	Displays the detected Error/Alarm in the graph.

4.8	Monitor
	    Type
	    CRC-7
		AU pointer value, SOH, POH, K1/K2, J0, J1
		Displays the error or no error. (when J0 or J1)

5	Trigger generation
	    Type
	
	    Port connection
	    Trigger output
	    Internal trigger
		ON/OFF
		AIS-L (MS-AIS), RDI-L (MS-RDI), AIS-P (AU-AIS), RDI-P (HP-RDI),
		LOP-P (AU-LOP), LCD
		ON/OFF
		Internal-1/Internal-2
		Internal-1/Internal-2

6	Dimension and weight
	    Dimensions
	    Weight
		
		29.5(H)×169(W)×241(D)[mm]
		1.0 Kg or less

7	Environmental performance	Conforms to the mainframe specifications.

1.3 Configuration

1.3.1   Standard Configuration

Table 1-2 shows the configuration of this unit.

Table 1-2   Standard Configuration

Item	Type/No.	Description	Quantity	Note
This unit	MU120002A	STM-1/OC-3 Unit	1	
Manuals	M-W1309AE	MU120002A STM-1/OC-3 UNIT Operation Manual	1	
	M-W1315AE	MU120002A Remote Control Operation Manual	1	

1.3.2   Application Parts

Table 1-3 shows the application parts for this unit.

Table 1-3   Application Parts

Type/No.	Description	Quantity	Note
J0775D	75 Ω coaxial cable (2 m): terminated with BNC 75 Ω connector on both ends.	1	
J0776D	50 Ω coaxial cable (2 m): terminated with BNC 50 Ω connector on both ends.	1	
J0660B	Single mode optical fiber cable (2 m)	1	Terminated with SC-SP connector on both ends

Section 2   Preparation For Use

2.1   Environmental Requirements

Avoid using this unit in the environment described below:

1. Places where temperature rises above 50ºC or falls below 5ºC or where humidity exceeds 85% or falls short of 45%.

2. Places exposed to direct sunlight or dusty place.

3. Places where dew condensation or the presence of corrosive gases are expected.

4. Places where the unit is exposed to oxidation or strong vibration.

2.2   Safety Precautions

● Never attempt to insert the unit into the instruments other than the MP1220A ATM Quality Analyzer.   The unit is designed for use solely with the MP1220A, and any attempt to use with other instruments may cause irreversible damage or hazards.

● Do not apply higher voltage signal than rated for this unit.   This may cause circuit disruption.

● If the unit has been stored at a low temperature for a long period of time, take enough length of time for the unit to equilibrate with ambient temperature and get thoroughly dry.   Dew formation due to the lack of temperature equilibrium may cause short circuit.

● To avoid hazards due to static discharge, be sure to connect, prior to connecting input signals, ground lines of the instruments (including experimental ones) to be connected to the unit.

● Core and outer conductor of a coaxial cable tends to accumulate charge as a capacitor: Try to discharge using a metal rod or the like prior to use.

2.3   Warming Up

Warm up the MP1220A for 20 minutes or more after power-on, before performing a measurement.

Section 3   Description Of The Panels

3.1   Organization of Panels And Their Descriptions

Fig. 3-1 shows the panel of this unit, and Table 3-1 describes its functions.
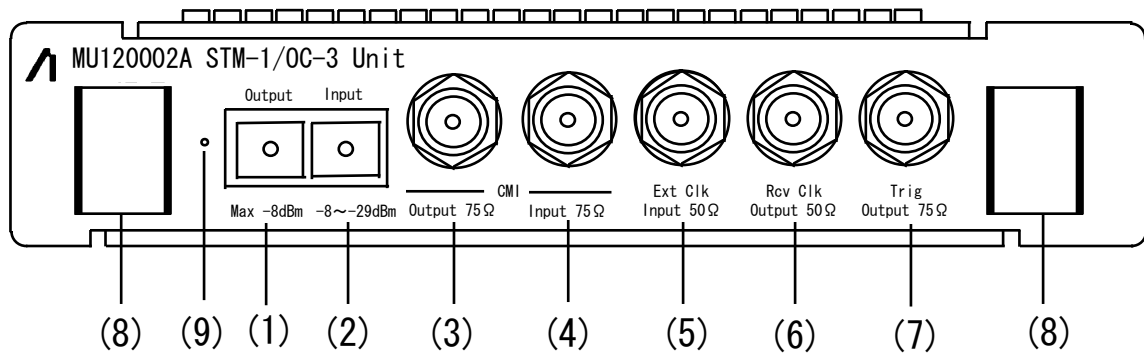
Fig. 3-1   Front Panel of MU120002A STM-1/OC-3

Table 3-1   Description of MU120002A STM-1/OC-3 Front Panel

No.	Label	Description
(1)	Output	Optical output connector (SC)
(2)	Input	Optical input connector (SC)
(3)	CMI Output 75 Ω	CMI (Electrical) output connector
(4)	CMI Input75 75 Ω	CMI (Electrical) input connector
(5)	Ext Clk Input 50 Ω	External clock input connector (BNC)
(6)	Rcv Clk Output 50 Ω	Received clock output connector (BNC)
(7)	Trig Output 75 Ω	Trigger output connector (BNC)
(8)	(Ejector)	Ejector for pulling out the unit
(9)	(LED)	LED indicator. Emits light during the signal is being output.

Section 3   Description Of The Panels

Section 4   Description Of The Screen

4.1   MU120002A STM-1/OC-3 UNIT Window

MU120002A STM-1/OC-3 UNIT window displays all the settings and measurement results of this unit, which can be invoked from the tool bar of the MP1220A ATM Quality Analyzer Window.   For detailed descriptions, refer to the MP1220A ATM Quality Analyzer Operation Manual.   MU120002A STM-1/OC-3 UNIT window consists of the following panels.

Table 4-1   Panels of the Window

Panel	Main purpose
Construction panel	Sets up for transmitter/receiver interfaces
Tx-Setup panel	Sets up for transmitter
Rx-Setup panel	Sets up for receiver
Alarm/error panel	Displays the results of alarm/error measurements
Analyze panel	Display history of alarm/error measurements. But, this panel is only displayed when the Logging of Measurement-1 panel is set ON in Mainframe window. (Refer to the MP1220A ATM Quality Analyzer Operation Manual)
Monitor panel	Display the overhead status of the monitor
Pointer History Panel	Displays status of occurrence of pointer variation

Fig. 4-1 shows the MU120002A STM-1/OC-3 UNIT Windows.
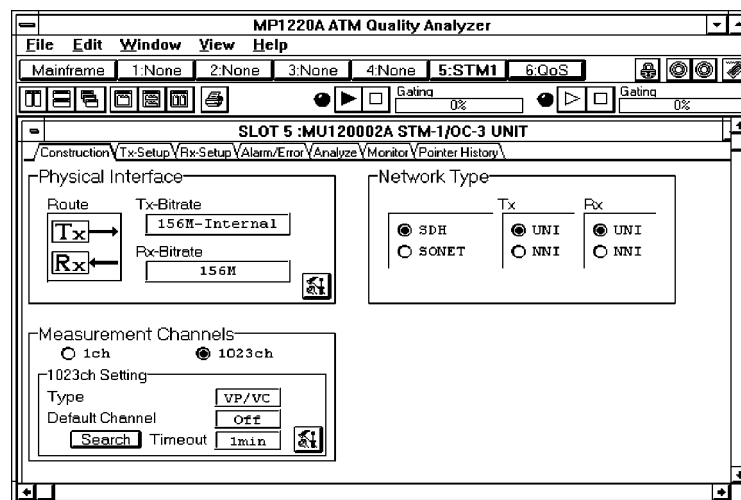
Fig. 4-1   MU120002A STM-1/OC-3 UNIT Window

4.2   Construction Panel

Fig. 4-2 shows the Construction panel, and Table 4-2 describes its functions.
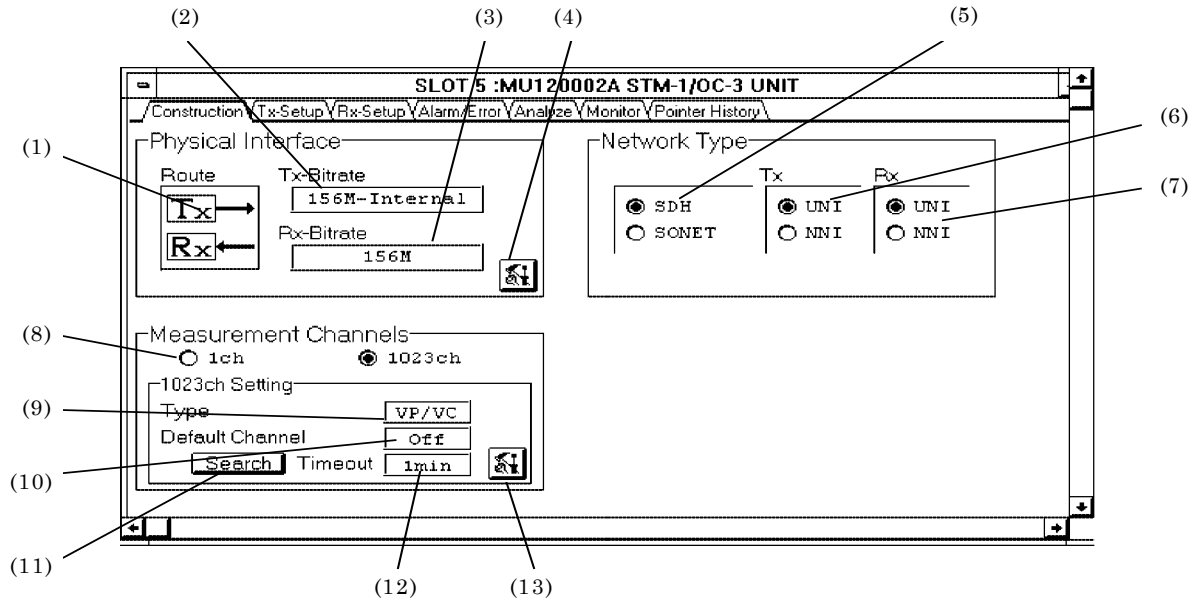
Fig. 4-2   Construction panel

Table 4-2   Description of Construction Panel

Number	Item	Description
(1)	Route	Displays signal flow inside the unit
(2)	Tx-Bitrate	Displays the bit rate and type of clock in the transmission unit.
(3)	Rx-Bitrate	Displays the bit rate in the reception unit.
(4)		Opens Physical Interface Setup dialog box
(5)	SDH, SONET	Sets up the frame.
(6)	Tx	Network type of the transmitter
(7)	Rx	Network type of the receiver
(8)	Measurement Channels	Sets the monitor of the band width of each channel and AIS/RDI status in ATM network. (Live-Monitor measurement) The MU120020A QoS Unit and MU120021A Protocol Unit are needed for selecting "1023ch" of the Live-Monitor measurement. 1ch : Selects the monitor for 1ch. 1023ch : Selects the monitor for 2ch to 1023ch at the same time. When set "1023ch" at "Repeat" in measurement mode, the warning dialog box appears and the setting returns to "1ch".
(9)	Type	Displays the types of 1023ch measurement compatible channels.
(10)	Default Channel	Displays if the Default Channel settings are activated.
(11)	Search	If the button is pushed, 1023ch search is started.
(12)	Time Out	Displays the timeout for 1023ch search.
(13)		Opens the Search Condition Setup dialog box. Cannot be set up during measurements.

4.2.1   Physical Interface Setup Dialog Box

Fig. 4-3 shows the Physical Interface Setup dialog box, and Table 4-3 describes its functions.
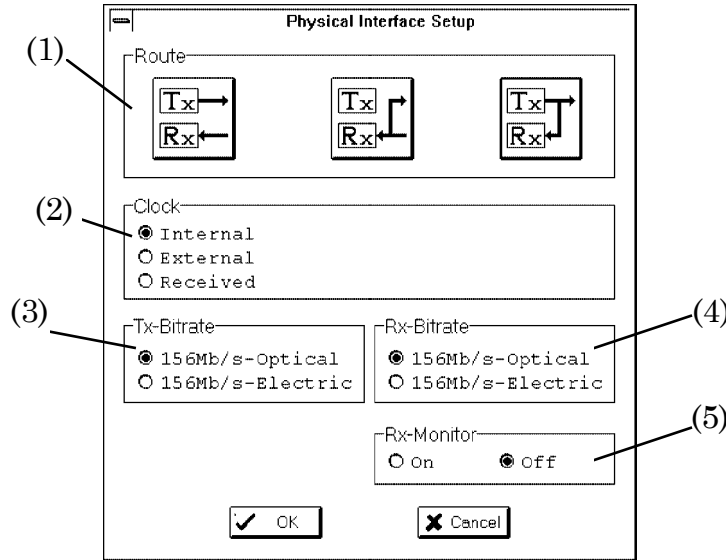

Fig. 4-3   Physical Interface Setup Dialog Box

Table 4-3   Description of Physical Interface Setup Dialog Box

Number	Item	Description
(1)	Route	Selects a signal flow inside the unit. : Transmitter and Receiver function independently. : Receiver loop back : Transmitter loop back

(2)	Clock	Selects type of the working clock.
		    Internal : Uses the internally generated clock.
		    External : Uses the clock provided through the external connector.
		    Received : Uses the clock regenerated from the received data.

(3)	Tx-Bitrate	Sets up transmitter speed
(4)	Rx-Bitrate	Sets up receiver speed

(5)	Rx-Monitor	Selects input level of received signal. Cannot be specified if Tx monitor is selected in (1), or 25M is selected in (4).
		    On : Signal from the Monitor Point is connected, where the instrument's output signal is attenuated by 20dB.
		    Off : The instrument's output is directly connected.

4.2.2   Search Condition Setup Dialog Box

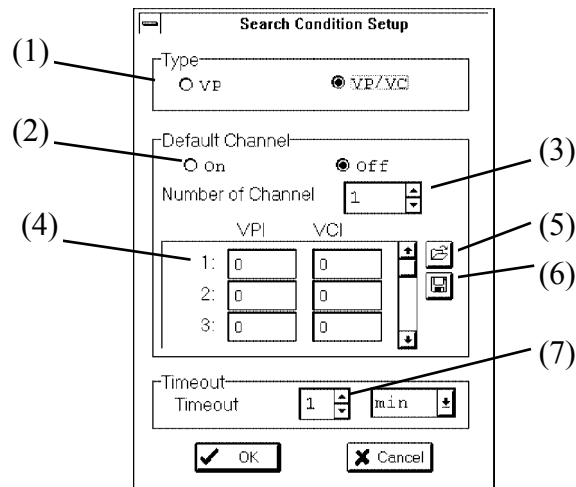Fig. 4-4 shows the Search Condition Setup dialog box, and Table 4-4 describes its functions.

Fig. 4-4   Search Condition Setup Dialog Box

Table 4-4   Description of Search Condition Setup Dialog Box

Number	Item	Description
(1)	Type	Selects types of cells to search.
(2)	Default Channel	Selects if Default Channel settings are activated.
(3)	Number of Channel	Specifies the number of channels to search.
(4)		Specifies the values for VPI and VCI.
(5)		Reads Default Channel settings from a file.
(6)		Saves Default Channel settings to a file.
(7)	Time Out	Specifies timeout for 1023ch search.

4.3   Tx-Setup Panel

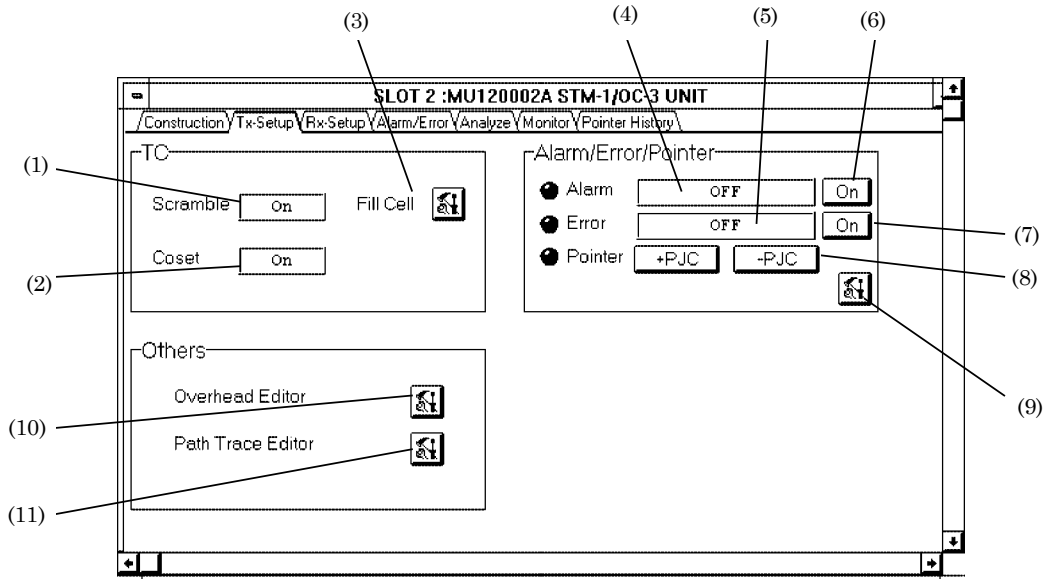Fig. 4-5 shows the Tx-Setup panel, and Table 4-5 describes its functions.

Fig. 4-5   Tx-Setup Panel

Table 4-5   Description of Tx-Setup Panel

Number	Item	Description
(1)	Scramble	Displays ON/OFF setting of scramble processing for transmitter cell payload.
(2)	Coset	Displays ON/OFF setting of Coset processing for transmitter cell HEC.
(3)	Fill Cell	Opens Tc Setup dialog box.
(4)	Alarm	Displays the currently selected alarm type.
(5)	Error	Displays the currently selected error type.
(6)	On	Adds the alarm shown in (4).
(7)	On	Adds the error shown in (5).
(8)	+PJC, -PJC	Executes $\pm$ Justification to the pointer.
(9)		Opens Alarm/Error/Pointer Setup dialog box.
(10)		Opens Overhead Editor.
(11)		Opens Path Trace Editor.

4.3.1   Tc Setup Dialog Box

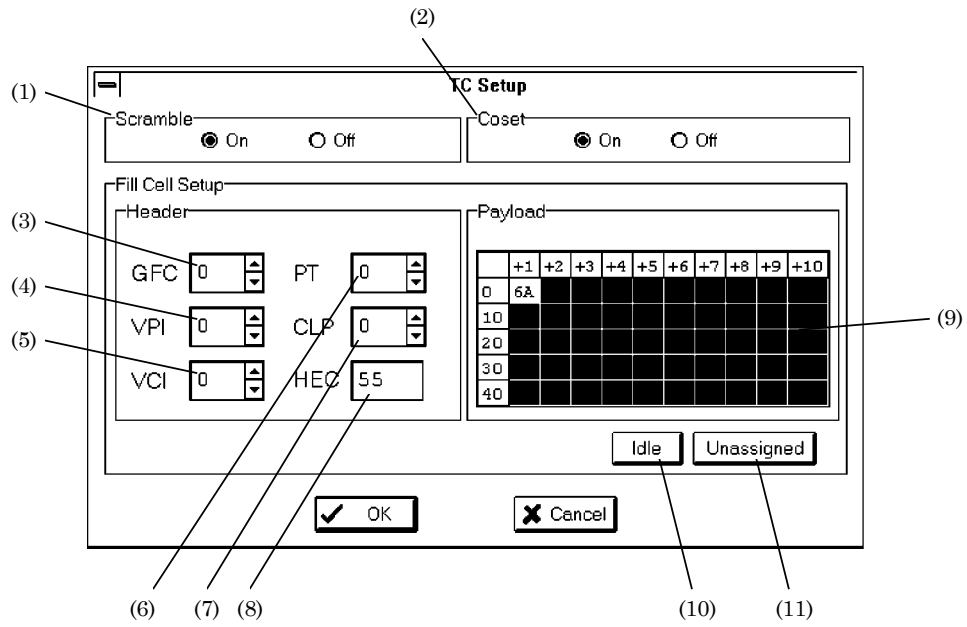Fig. 4-6 shows the Tc Setup dialog box, and Table 4-6 describes its functions.

Fig. 4-6   Tc Setup Dialog Box

Table 4-6   Description of Tc Setup Dialog Box

Number	Item	Description
(1)	Scramble	Selects ON/OFF setting of scramble processing for transmitter cell payload.
(2)	Coset	Selects ON/OFF setting of Coset processing for transmitter cell HEC.
(3)	GFC	Selects the GFC value. The GFC value cannot be specified if NNI is selected in 4.2 (5).
(4)	VPI	Displays the VPI value (fixed to be zero).
(5)	VCI	Displays the VCI value (fixed to be zero).
(6)	PT	Specifies the PT value.
(7)	CLP	Specifies the CLP value.
(8)	HEC	Specifies the HEC value.
(9)	Payload	Specifies the payload value. Double click on the frame of crossing the vertical position 0 and horizontal position +1, then Byte Setup dialog box is opened.
(10)	Idle	If the button is pressed, the contents of Idle cell are shown in Header and Payload group box. The contents of the Idle cell are : GFC:0, VPI:0, VCI:0, PT:0, CLP:1, HEC : calculated value, Payload:6A.
(11)	Unassigned	If the button is pressed, the contents of Unassigned cell are shown in Header and Payload group box. The contents of the Unassigned cell are : GFC:0, VPI:0, VCI:0, PT:0, CLP:0, HEC : calculated value, Payload:6A.

4.3.1.1   Byte Setup dialog box

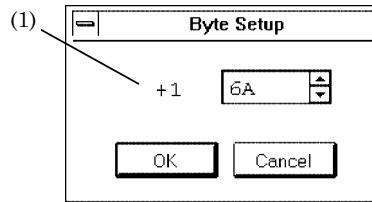Fig. 4-7 shows the Byte Setup dialog box, and Table 4-7 describes its functions.

Fig. 4-7   Byte Setup Dialog Box

Table 4-7   Description of Byte Setup Dialog Box

Number	Item	Description
(1)		Specifies the payload value. 48 bytes are the same value as bite unit.

4.3.2   Alarm/Error/Pointer Setup Dialog Box

4.3.2.1   Alarm panel

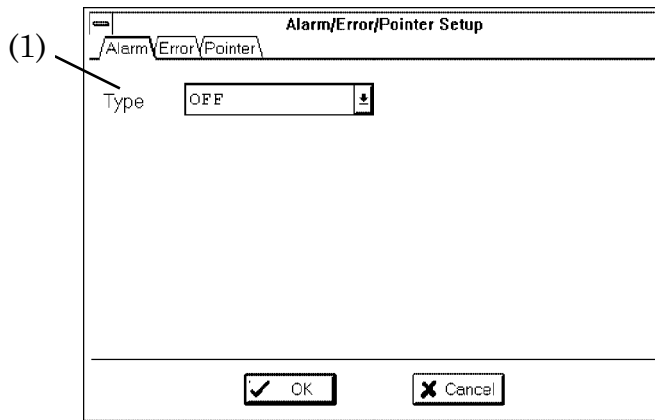Fig. 4-8 shows the Alarm panel, and Table 4-8 describes its functions.

(1)

Fig. 4-8   Alarm Panel

Table 4-8   Description of Alarm Panel

Number	Item	Description
(1)	Type	Selects the type of alarms to add.

4.3.2.2   Error Panel

Fig. 4-9 shows Error panel, and Table 4-9 describes its functions.

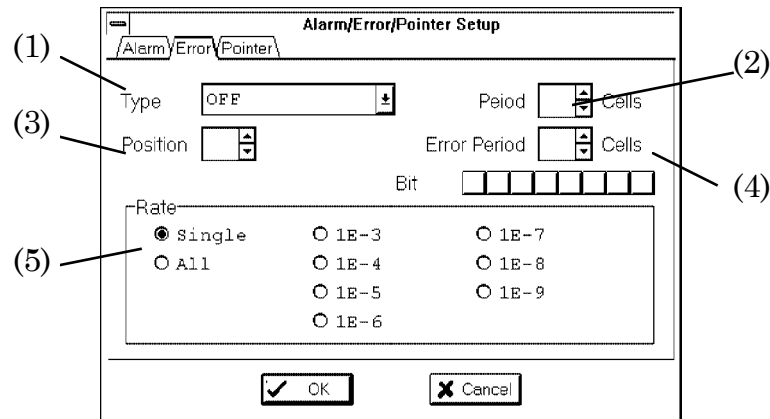Fig. 4-9 Error Panel

Table 4-9   Description of Error Panel

Number	Item	Description
(1)	Type	Selects the type of errors to add. If Cell is selected, When Bit has been selected in the Setup screen of the MU120020A QoS Unit or MU120021A Protocol Unit, the selection of Cell will display a warning dialog and prompt user's confirmation.
(2)	Period	Specifies the number of contiguous cells to add error. Specify a desired value (1 to 64); the value can only be set if Cell is selected in (1).
(3)	Position	Specifies the byte position of the cell to be bit-reversed. The value can only be set if Cell is selected in (1).
(4)	Bit	Specifies the bit to be reversed. This selection can be made only if Cell is selected in (1).
(5)	Rate	Selects the timing of error addition. The options are: Single, All, Rate (1E-n, n=3,4,5,6,7,8,9).

4.3.2.3   Pointer Panel

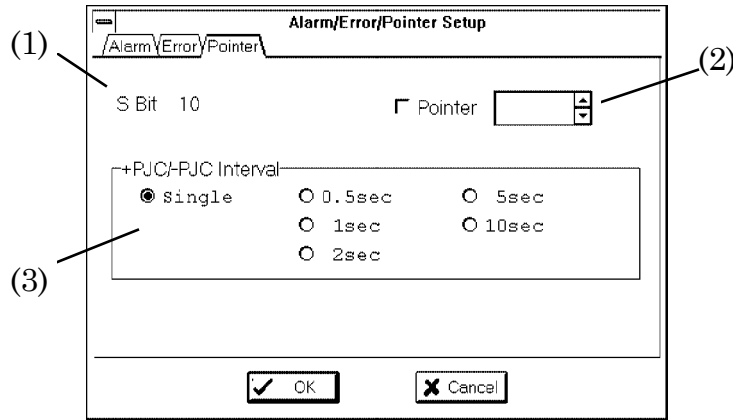Fig. 4-10 shows the Pointer panel, and Table 4-10 describes its functions.

Fig. 4-10   Pointer Panel

Table 4-10   Description of Pointer Panel

Number	Item	Description
(1)	S Bit	Specifies the SBit.
(2)	Pointer	Specifies the value of Pointer.
(3)	+PJC/-PJC Interval	Selects the interval for Justification of Pointer.

4.3.3   Overhead Editor

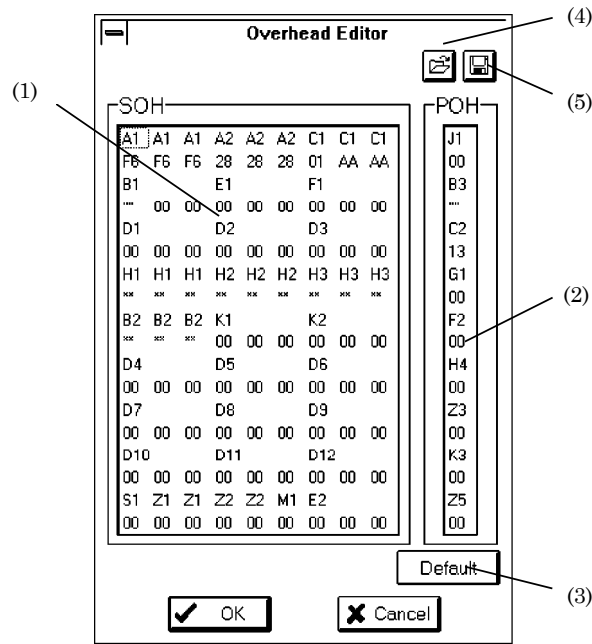Fig. 4-11 shows the Overhead Editor, and Table 4-11 shows its functions.

Fig. 4-11   Overhead Editor

Table 4-11   Description of Overhead Editor

Number	Item	Description
(1)	SOH	Displays the section overhead (SOH).
(2)	POH	Displays the pass overhead (POH).
(3)	Default	Specifies the initial values.
(4)	🖻	Reads the over head setting values from a file.
(5)	🖫	Writes the over head setting values to a file.

4.3.3.1   Byte Setup Dialog Box

Fig. 4-12 shows the Byte Setup dialog box, and Table 4-12 describes its functions.
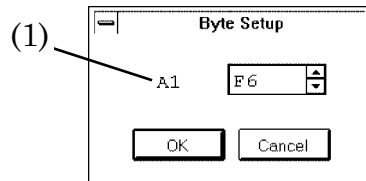

Fig. 4-12 Byte Setup Dialog Box

Table 4-12 Description of Byte Setup Dialog Box

Number	Item	Description
(1)		Sets up SOH, POH

4.3.4   Path Trace Editor (J0, J1)

Fig. 4-13 shows the Path Trace Editor (J0, J1), and Table 4-13 describes its functions.
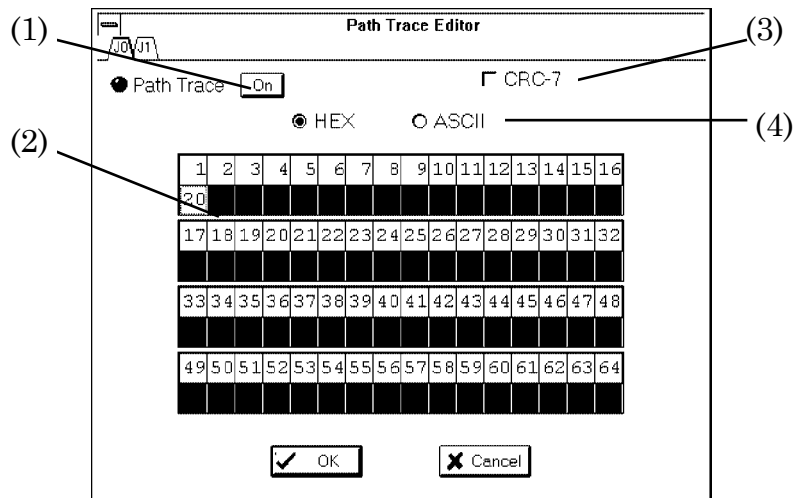
Fig. 4-13   Path Trace Editor (J0, J1)

Table 4-13 Description of Path Trace Editor (J0, J1)

Number	Item	Description
(1)	On/Off	Selects ON/OFF for Path Trace submission.
(2)		Displays the Path Trace settings.
(3)	ORC-7	Selects ON/OFF for CRC-7 addition.
(4)	HEX/ASCII	Selects types of Path Trace setting.

4.3.4.1 Byte Setup Dialog Box

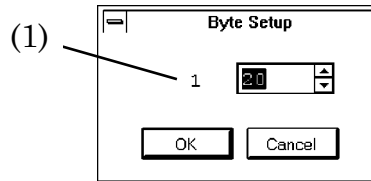Fig. 4-14 shows the Byte Setup dialog box, and Table 4-14 describes its functions.

(1)

Fig. 4-14   Byte Setup Dialog Box

Table 4-14   Description of Byte Setup Dialog Box

Number	Item	Description
(1)		Sets up Path Trace.

4.4   Rx-Setup Panel

Fig.4-15 shows the Rx-Setup panel, and Table 4-15 describes its functions.

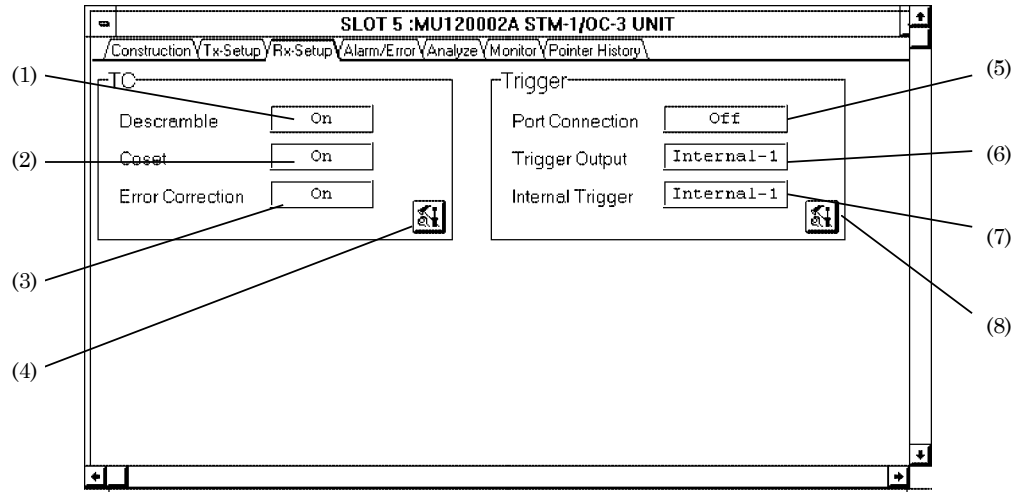Fig. 4-15   Rx-Setup Panel

Table 4-15   Description of Rx-Setup panel

Number	Item	Description
(1)	Descramble	Displays the Descramble setting.
(2)	Coset	Displays the Coset process setting.
(3)	Error Correction	Displays the Error correction setting.
(4)	⬛	Opens TC Setup dialog box.
(5)	Port Connection	Shares the trigger between units.
(6)	Trigger Output	Displays the current setting if the trigger signal is output to Trigger Output.
(7)	Internal Trigger	Displays the current setting if the trigger is output to trigger line.
(8)	⬛	Opens Trigger Setup dialog box.

4.4.1   TC Setup Dialog Box

Fig. 4-16 shows the TC Setup dialog box, and Table 4-16 describes its functions.
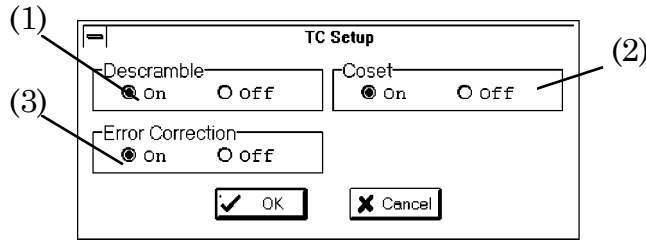
Fig. 4-16   TC Setup Dialog Box

Table 4-16   Description of TC Setup Dialog Box

Number	Item	Description
(1)	Descramble	Selects ON/OFF of descrambling for receiving cell payload.
(2)	Coset	Selects ON/OFF of Coset processing for receiving cell HEC.
(3)	Error Correction	Selects ON/OFF of HEC correction for receiving cell.

4.4.2   Trigger Setup Dialog Box

Fig. 4-17 shows the Trigger Setup dialog box, and Table 4-17 describes its functions.
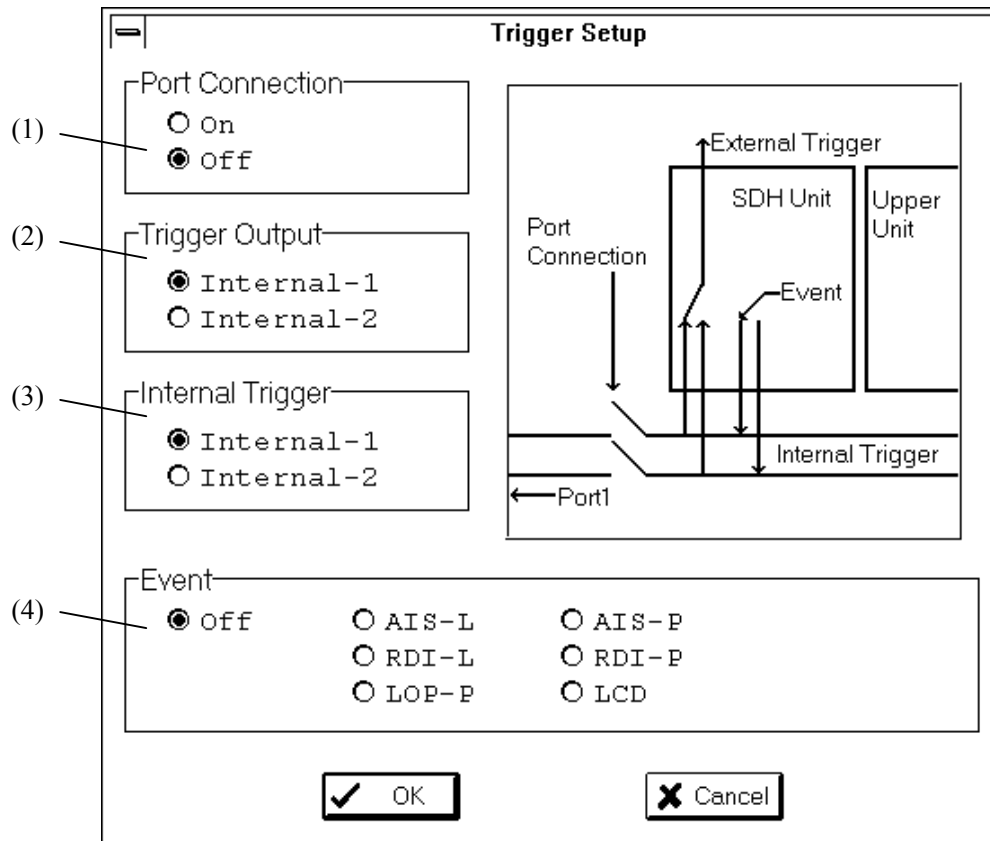
Fig. 4-17   Trigger Setup Dialog Box

Table 4-17   Description of Trigger Setup Dialog Box

Number	Item	Description
(1)	Port Connection	Trigger signal is shared in the unit group when select On.
(2)	Trigger Output	Sets up the Trigger Output connector Internal-1 : Trigger line 1 trigger is connected to Trigger Output connector. Internal-2 : Trigger line 2 trigger is connected to Trigger Output connector.
(3)	Internal Trigger	Select trigger (LCD) and sets up trigger line. Internal-1 : Connect trigger to the trigger line 1. Internal-2 : Connect trigger to the trigger line 2.
(4)	Event	Selects the type of trigger output.

4.5 Alarm/Event Panel

Fig. 4-18 shows the Alarm/Error panel, and Table 4-18 describes its functions.
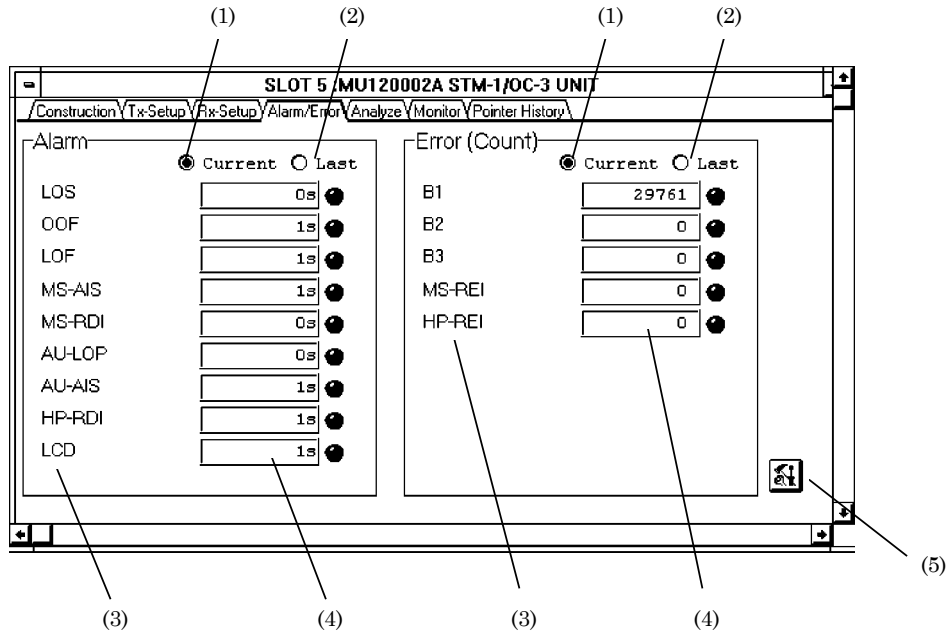
Fig. 4-18 Alarm/Error Panel

Table 4-18 Description of Alarm/Error Panel

Number	Item	Description
(1)	Current	Displays the interim results from the start to the current time.
(2)	Last	Displays the final results after the measurement is complete.
(3)		Displays Alarm, Error, and all the cell items.
(4)	LED	Displays alarms, errors, and status of cell detection. Red : Now being detected Mandarin : Detected during a measurement (if Current is selected) Detected in the last measurement (if Last is selected)
(5)		Opens the Layout dialog box

4.5.1   Layout Dialog Box

Fig. 4-19 shows the Layout dialog box, and Table 4-19 describes its functions.
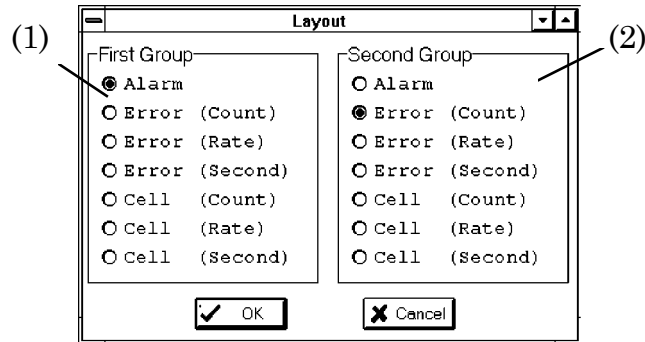
Fig. 4-19 Layout Dialog Box

Table 4-19   Description of Layout Dialog Box

Number	Item	Description
(1)	First Group	Selects a group box to be displayed in the Alarm/Error panel. Options are : Alarm, Error (Count, Rate, Second), Cell (Count, Rate, Second), and Sync Event(Count/s).
		If lengthwise-split or full screen is selected, the items selected here will appear on the left side of the display. If widthwise-split screen is selected, the items will appear on the upper side of the display.
(2)	Second Group	The same types of selections are made with First Group. If widthwise-split screen is selected, these items will appear on the bottom side of the screen.

4.6   Analyze Panel

Fig. 4-20 shows the Analyze panel, and Table 4-20 describes its functions.
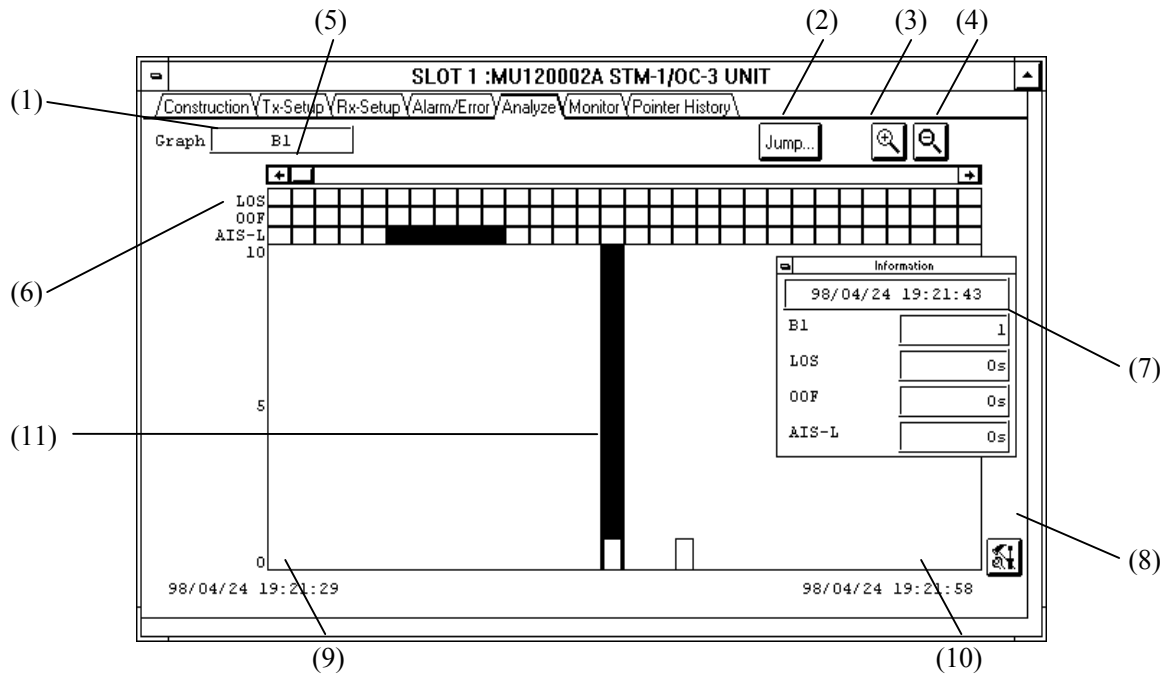
Fig. 4-20   Analyze panel

Table 4-20   Description of Analyze panel

Number	Item	Description
(1)	Graph	Displays the type of error shown in the graph. Settings can be modified in Analyze Setup dialog.
(2)	Jump..	Opens the Jump dialog box. It can not be selected when the Auto Scroll is performed.
(3)	🔍⊕	Zooms out the graph in such a way that the marker always comes to the center of the screen.
(4)	🔍⊖	Zooms in the graph in such a way that the marker always comes to the center for the screen.
(5)	[Scroll bar]	Scroll the screen horizontally.
(6)	[Alarm]	Shows the occurrence of alarms. Up to three alarm items can be displayed simultaneously.
(7)		Shows the time at the marker position, and detailed information of errors/alarms at that point.
(8)	🗾	Opens Analyze Setup dialog box.
(9)		Shows the time associated with the top of the graph currently displayed.
(10)		Shows the end time associated with the graph currently displayed.
(11)		The marker for specifying one bar in the bar graph. Specify it by clicking the bar or Jump dialog box.

4.6.1   Jump Dialog Box

Fig. 4-21 shows the Jump dialog box, and Table 4-21 describes its functions.

Fig. 4-21   Jump Dialog Box

Table 4-21   Description of Jump Dialog Box

Number	Item	Description
(1)	Date	Sets the date to the marker position to move to.
(2)	Time	Sets the time to the marker position to move to.

4.6.2   Analyze Setup Dialog Box

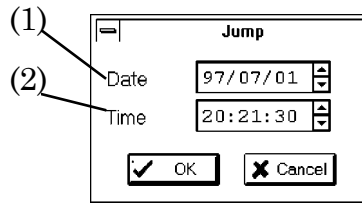Fig. 4-22 shows the Analyze Setup dialog box, and Table 4-22 describes its functions.
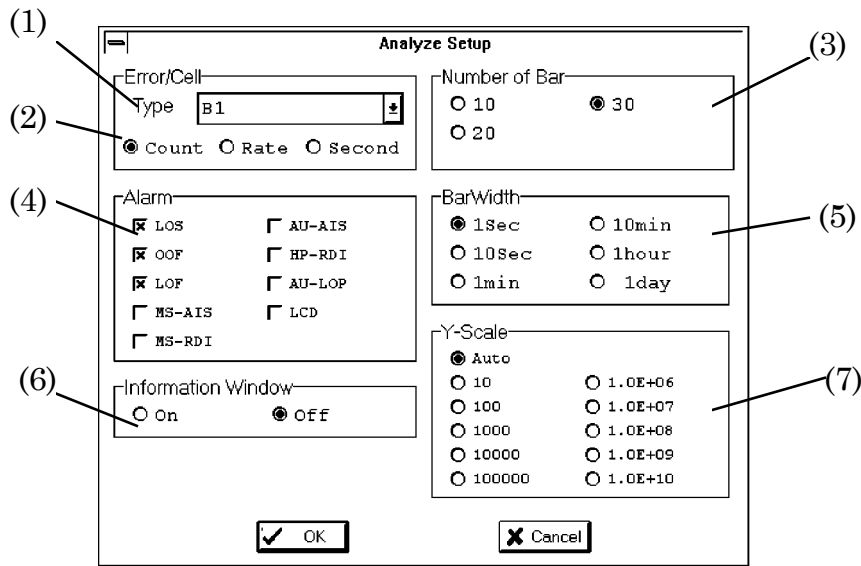
Fig. 4-22   Analyze Setup Dialog Box

Table 4-22   Description of Analyze Setup Dialog Box

Number	Item	Description
(1)	Type	Selects either an error or a cell to display in the graph. Only one item of error/cell is displayed at one time.

(2)		Selects the type of error to display.
		    Count : Number of errors is displayed
		    Rate : Error rate is displayed
		    Second : Error seconds is displayed.

(3)	Number of Bar	Selects the number of bar graphs to be displayed on one screen.
(4)	Alarm	Selects alarm items to be displayed in the graph. Up to three alarm items can be shown at one time.
(5)	Bar Width	Selects the length of time indicated by one bar graph.
(6)	Information Window	Selects if 4.6 (7) is to be shown in Analyze sheet.

(7)	Y-Scale	Selects vertical axis for the bar graphs.
		    Auto : Vertical axis is automatically scaled so that minimum vertical span
		            that can contain the maximum graph value is automatically selected.

4.7   Monitor Panel

Fig. 4-23 shows the Monitor panel, and Table 4-23describes its functions.
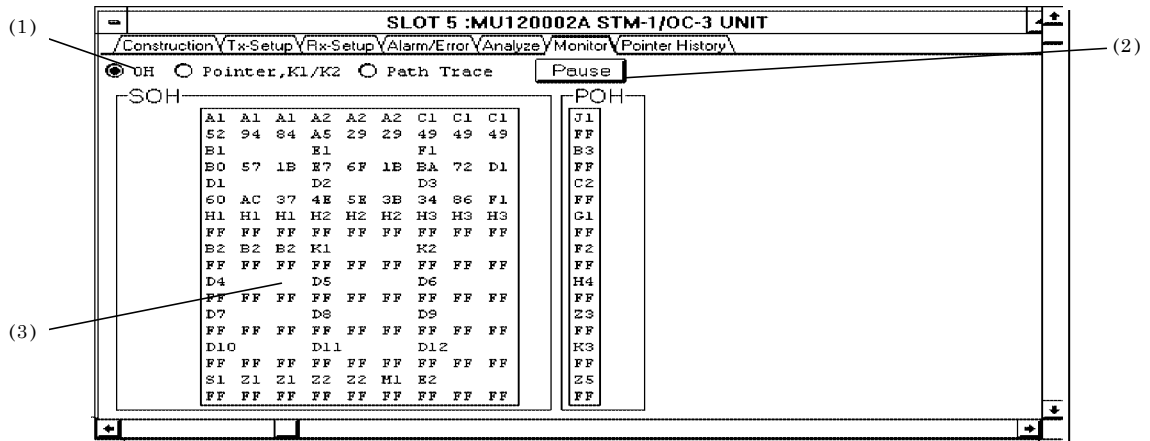
Fig. 4-23   Monitor Panel

Table 4-23   Description of Monitor Panel

Number	Item	Description
(1)		Switch the content of screen (3)
(2)	Pause	Pause the display

(3)		Items displayed in the screen is determined by the selection in (1)
		
		  OH : All the bytes of SOH and POH are displayed.
		
		  Pointer, K1/K2 : AU Pointer, K1/K2 bit is displayed.
		  Path Trace : Trace data of J0 and J1 are displayed.
		The display is renews each 500ms.

4.8   Pointer History Panel

Fig. 4-24 shows the Pointer History panel, and Table 4-24 describes its functions.
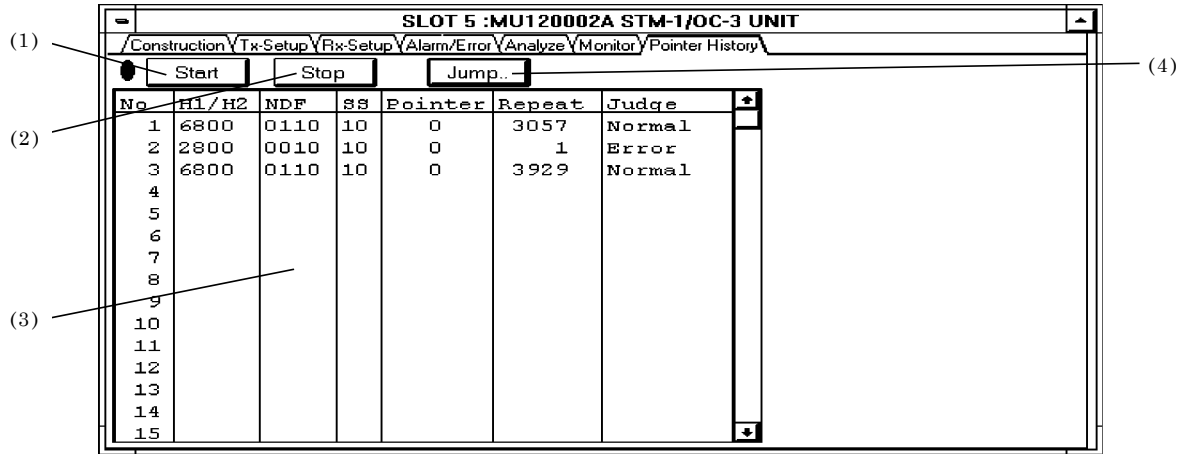
Fig. 4-24   Pointer History Panel

Table 4-24   Description of Pointer History Panel

Number	Item	Description
(1)	Start	Reads the first 512 events in history, and automatically terminates.
(2)	Stop	Terminate the history log.
(3)		Displays history. H1/H2 : Displays H1/H2 value by hexadecimal digit. NDF : Displays N bit by bit pattern. SS : Displays SS bit by bit pattern. Pointer : Displays Pointer value by decimal digit. Repeat : Displays the frame numbers of same continuance pointer. Judge : Judges NDF, +Just, -Just, Error or Normal.
(4)	Jump...	Opens Jump dialog box.

4.8.1   Jump Dialog Box

Fig. 4-25 shows the Jump dialog box, and Table 4-25 describes its functions.

(1)
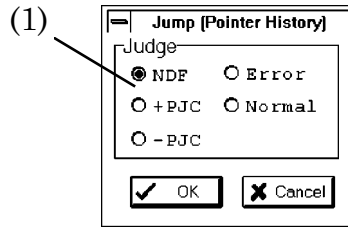
Fig. 4-25   Jump Dialog Box

Table 4-25   Description of Jump Dialog Box

Number	Item	Description
(1)	Judge	Searches an item that matches the specified in the second or later lines of 4.8 (3), and moves it to the first line.

Section 5   Measurement

5.1   Performance Measurement

1. Connection

   Connect the system as shown in Fig. 5-1, and turn the power on.

Fig. 5-1   Connection for Performance Measurement

2. Physical Interface Settings

   Open the Physical Interface dialog box under Physical Interface group box in the Construction panel.
   Specify physical interface settings as follows:

   Route   : [Tx→ / Rx←]
   Clock   : Internal
   Tx-Bitrate   : 156Mb/s
   Rx-Bitrate   : 156Mb/s

3. Results of measurement

   Open the Layout dialog box in the Alarm/Error panel.   Select Error (Count), Error (Rate), or Error (Second) in either First Group or Second Group group boxes.
   Push the start button (Go button) to start measurement, and the result will be displayed in the Alarm/Error panel. Either intermediate, or final results will be displayed by selecting Current or Last.

4. Analyze

   If the use of the log file had been specified in the main frame, the user has an access, by opening an Analyze sheet, to the information concerning the time and frequency of error occurrence.

Section 6   Performance Test

6.1   About Performance Tests

This Section describe how to carry out performance tests to make certain that the unit is working properly.   For detailed procedures to insert the unit to the main frame, to turn on power, and to open the MU120002A STM-1/OC-3 Unit windows, refer to the MP1220A ATM Quality Analyzer Operation Manual.

A performance test sheet is contained in Appendix A.

6.1.1   Alarm/Error Measurement Test

1. Connection

Connect the system as shown in Fig. 6-1, and turn on the power.
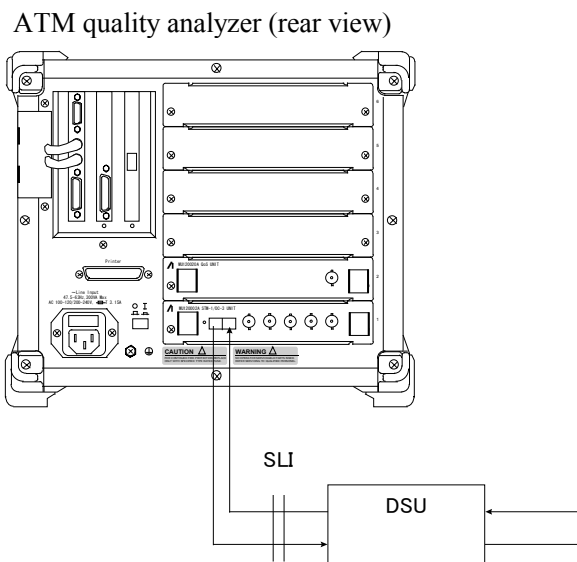
ATM quality analyzer (rear view)

Fig. 6-1   Connection for Alarm/Error Measurements

2. Physical Interface Setup

Open the Physical Interface Setup dialog box under Physical Interface group box in the Construction panel.
Specify physical interface settings as follows:

Route   :
Clock   : Internal
Tx-Bitrate : 156Mb/s
Rx-Bitrate : 156Mb/s

3. Results of Measurements

Open the Layout dialog box in Alarm/Error panel.   Select an item from the options: Alarm, Error(Count), Error(Rate), Error(Second), Cell(Count), Cell(Rate), and Cell(Second).

Push the start button (Go button) to start measurements, and the results will be displayed in Alarm/Error panel. Either interim or final results will be displayed by selecting Current or Last.

Repeat steps 1 through 3 for each case in which Tx-Bitrate and Rx-Bitrate in physical interface are set to be 156Mb/s-Electric.

Section 7   Maintenance

7.1   Daily Maintenance

1. Wipe dirt off the instrument with a cloth and diluted synthetic detergent.

2. Suck dust with a vacuum cleaner.

3. If any part is found loose, use the dedicated tool to tighten it.

7.2   Notes on Storage

For a prolonged storage of the instrument, pay attention to the followings:

1. Remove dust and dirt from the instrument prior to storage.

2. Avoid storage in the place where temperature rises above 60℃, or falls below -20℃.

3. Avoid prolonged storage in a place where the sun directly hits the instrument, or dust may accumulate.

4. Avoid prolonged storage in a place exposed to direct sunlight or with much dust.

5. Avoid storage in a place where the instrument is exposed to oxidation or strong vibration.

7.3   Transportation

If the packing materials used for factory shipping have been preserved, do use them for the transportation of the instrument.   Otherwise, follow the packaging procedures described below.   Do not fail to wear a clean pair of gloves, and handle the instrument with care to avoid making scars or bruises on the surface.

1. Clean dirt and dust off the instrument's surface with a dry cloth.

2. Check if any part is missing or have become loose.

3. Protruding or damage-prone portion should be carefully protected.   Wrap the instrument with sheets of polyethylene, and furthermore with sheets of moisture proof paper.

4. Place the wrapped instrument inside a cardboard box and seal the box with masking tapes.   Transportation distance and method may necessitate the use of a cart box for protection.

7.4   Calibration

This instrument can only be calibrated by the manufacturer.   Periodical calibration is recommended to maintain utmost performance.

Appendix

Appendix A   Performance Test Sheet

Instrument : MU120002A STM-1/OC-3 Unit   Report No.   : _____

Serial No. : _____   Tested by   : _____

Test Site : _____   Ambient Temperature : _____ °C

Date   : ___ / ___ / _____ (   )   Relative Humidity   : _____ %

Notes   : _____

            _____

            _____

Alarm/Error Performance Test

Item	Criteria	Result	Pass/fail
B1	0[Count]		
B2	0[Count]		
B3	0[Count]		
FEBE-L(MS-REI)	0[Count]		
FEBE-P(HP-REI)	0[Count]		
LOS	0[Count]		
LOF	0[s]		
OOF	0[s]		
AIS-L (MS-AIS)	0[s]		
RDI-L (MS-RDI)	0[s]		
AIS-P (AU-AIS)	0[s]		
RDI-P (HP-RDI)	0[s]		
LOP-P (AU-LOP)	0[s]		
LCD	0[s]		
Corrected	0[Count]		
Discarded	0[Count]		

Appendix A   Performance Test Sheet

Index

Index