MU120020A
QoS Unit
Operation Manual

Seventh Edition

Read this manual before using the equipment.
Keep this manual with the equipment.

ANRITSU CORPORATION

Document No.: M-W1313AE-7.0

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.

MU120020A
QoS Unit
Operation Manual

30 July 1997 (First Edition)
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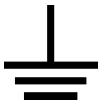
For Safety

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.

or



2. When supplying power to this equipment, connect the accessory 3-pin power cord to a grounded outlet. If a grounded outlet is not available, before supplying power to the equipment, use a conversion adapter and ground the green wire, or connect the frame ground on the rear panel of the equipment to ground. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock.

Repair

WARNING ⚠

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.

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.

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

1. Product Model

Plug-in Units: MU120020A QoS Unit

2. Applied Directive and Standards

When the MU120020A QoS 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

1. Product Model

Plug-in Units: MU120020A QoS Unit

2. Applied Directive and Standards

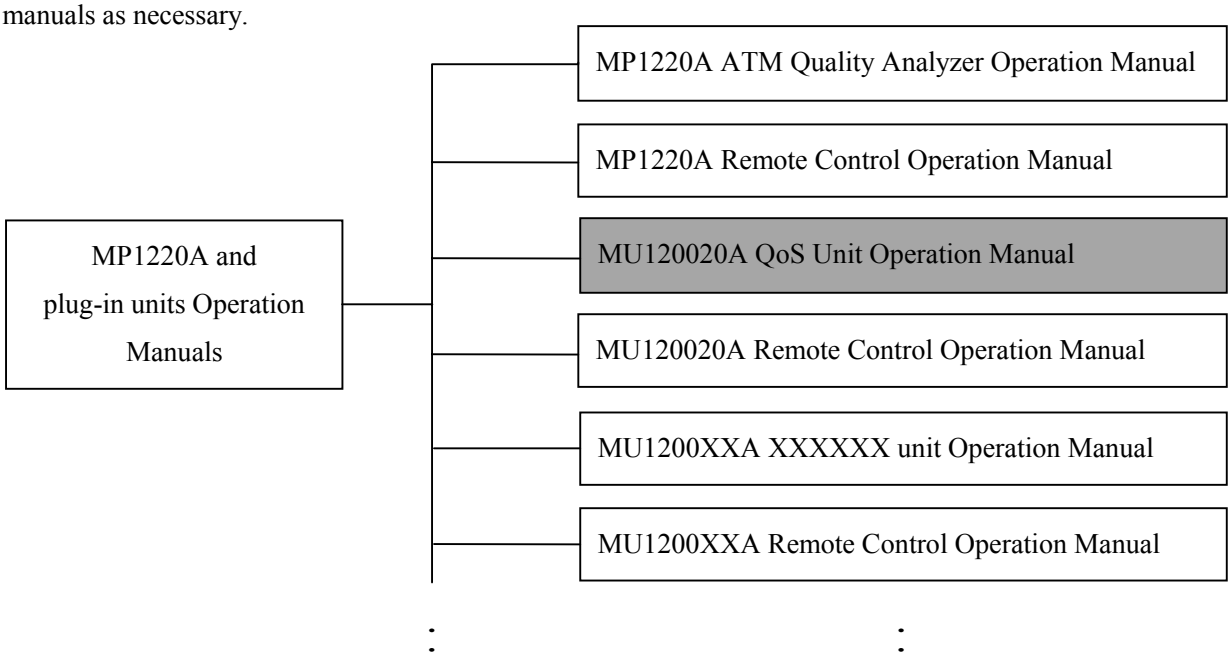
When the MU120020A QoS Unit is installed in the MP1220A, the applied directive and standards of this Unit are conformed to those of the MP1220A main frame.

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 This Manual

The MU120020A QoS unit is a plug-in unit that can be inserted into the MP1220A ATM quality analyzer. The Operation Manual is provided for the mainframe and each unit. The Remote Control Operation Manual is also provided for the mainframe and each unit (A remote control software product is an optional function). Use these manuals as necessary.



- MP1220A ATM Quality Analyzer Operation Manual

Outlines the MP1220A and describes the preparation, panels, specifications, performance, and operation.

- MP1220A ATM Quality Analyzer Remote Control Operation Manual

Describes the mainframe control via the external interface and contains sample programs.

- Operation Manual for each unit

Describes the overview, specifications, performance, and operation of each unit.

- Remote Control Operation Manual for each unit.

Describes the unit control via the external interface and contains sample programs.

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Section 1 OVERVIEW

1.1 Product Overview

The MU120020A QoS Unit (hereafter called the unit), a plug-in unit which is inserted into the slot on the MP1220A ATM Quality Analyzer (hereafter called the mainframe), detects cell errors, cell losses, cell misinsertions, and the cell transfer delay.

Features

- **Live monitor**

Simultaneously monitors the bandwidth and AIS/RDI status of up to 1023 channels on an ATM line.

- **Performance measurement**

Uses ITU-T O.191 test cells and various test cells to detect cell errors, cell losses, cell misinsertions, and bit errors.

- **Cell delay measurement**

Sends or receives delay measurement cells to detect the cell transfer delay and the cell delay variation.

- **OAM measurement**

Generates and detects AIS/RDI/LOC conditions (conforms to ITU-T I.610)

- **Non-conforming cell measurement**

Detects cells exceeding the PCR.

- **Cell interval measurement**

Measures the received cell interval.

- **Cell capture function**

Captures up to 4095 cells (all cells or cells sent via a channel to be measured) based on the trigger signal, and displays their contents.

1.2 Specifications

Table 1-1 lists specifications of the unit.

Table 1-1 Specifications

No.	Item	Specifications	
1	External interface		
1.1	Trig Input		
	Connector	BNC	
	Level	TTL	
	Logic	Active low	
	Impedance	75 Ω	
2	Transmission function		
2.1	Cell transmission timing	Each rate may be specified using [Mb/s], [Cells/s], [%], or [kb/s].	
	CBR	Rate (R)	:0.1 to 100[%] (step0.1[%])
	Burst	Burst Period (T1)	:1 to 8191[kCells] (step1[kCells])
		Cycle period (T2)	: (T1+1) to 8192[kCells] (step1[kCells])
		Maximum rate (Rmax)	:0.1 to 100[%] (step0.1[%])
		Minimum rate (Rmin)	:0 to (Rmax-0.1)[%] (step0.1[%])
	Sawtooth	Sawtooth Period (T1)	:1 to 98[kCells] (step1[kCells])
		Cycle period (T2)	:T1 to 8192[kCells] (step1[kCells])
		Maximum rate (Rmax)	:0.1 to 100[%] (step0.1[%])
		Minimum rate (Rmin)	:0 to (Rmax-0.1)[%] (step0.1[%])
	CBR with CDV	Rate (R)	:0.1 to 100[%] (step0.1[%])
		CDV	:0 to (1000-(RX10))[Cells] (step1[Cells])
	VBR	PCR	:50 to (Maximum Cell Rate)[kb/s](step1[kb/s]) (where, PCR > SCR)
		SCR	:40 to (90% of Maximum Cell Rate)[kb/s] (step1[kb/s])
		MBS	:10 to 2000[Cells] (step1[Cells])
	Poisson's distribution	Rate (R)	:0.1 to 100[%] (step0.1[%])
	Manual	Sends one cell upon reception of the transmission instruction.	
	External edge	Sends one cell on the falling edge of the external input signal.	
	External level	Sends cells when the external input signal is low.	
	Detailed CBR	Rate (R)	:1 to (Maximum Cell Rate)[kb/s](step1[kCells])

No.	Item	Specifications	
2.1	Burst for UPC	Rate (R)	:1 to (96.5% of Maximum Cell Rate)[kb/s] (step1[kCells])
		CDV	:0 to 600[Cells](R:1 to (90% of Maximum Cell Rate)[kb/s]) 0 to 200[Cells](R: (90% of Maximum Cell Rate) to (96.5% of Maximum Cell Rate)[kb/s]) (step1[Cell])
	Programmable	Length	:1 to 1000[Cells] (step 1[Cell])
		Repeat	:0 to 1000 (step1)
		Cell Type	:Foreground Cell / Idle Cell / Background Cell
	Timer	Transmission interval	:0.1 to 10[s] (step0.1[s])
	Block size	Block size	:128/256/512/1024/2048/4096/8192/16384/ 32768[Cells]
2.2	Foreground cell		
	Cell transmission timing	Foreground cells may be sent in the following timing. CBR Burst Sawtooth CBR with CDV VBR Poisson's distribution Manual External edge External level Detailed CBR Burst for UPC Programmable	
	Cell type	The following cells may be sent as foreground cells: O.191 test cell Extended O.191 test cell OAM test cell Null (PRBS) cell Null (time stamp) cell Null (programmable) cell AAL1 (PRBS) cell	

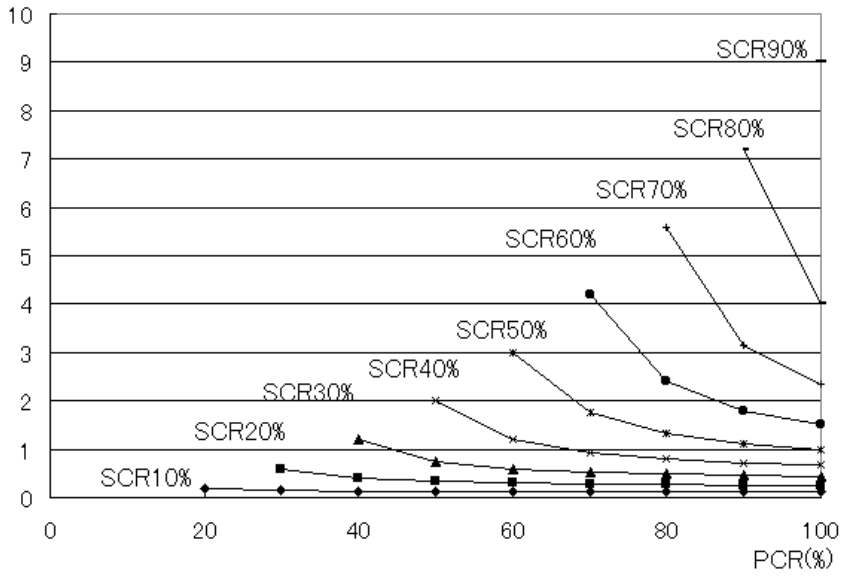
No.	Item	Specifications
2.2		AAL1 (time stamp) cell AAL1 (programmable) cell AAL3/4 (PRBS) cell AAL3/4 (time stamp) cell ALL3/4 (programmable) cell Upper unit cell
	No. of cells that can be sent at a time	One
	Save/load function	Save/loads the contents of a foreground cell.
2.3	Background cell	
	Cell transmission timing	Background cells may be sent in the following timing: CBR
	Cell type	The following cells may be sent as background cells: Null (programmable) cell Upper unit cell
	No. of cells that can be sent at a time	Up to 10 (one for upper unit cell).
	Save/load function	Save/loads the contents of background cells.
2.4	OAM cell	
	OAM flow	One of the following OAM flows may be selected: End-to-end F4 Segment F4 End-to-end F5 Segment F5
	Cell transmission timing	OAM cells may be sent in the following timing: Manual (forward monitoring cell not allowed) Timer (forward monitoring cell not allowed) External edge (forward monitoring cell not allowed) Block size (only forward monitoring cell allowed)

No.	Item	Specifications
2.4	Cell type	The following cells may be sent as OAM cells: AIS cell RDI cell CC cell Loopback cell PM activation/deactivation cell CC activation/deactivation cell Forward monitoring cell Backward reporting cell OAM (programmable) cell
	No. of cells that can be sent at a time	One
	Save/load function	Save/loads the contents of an OAM cell.
2.5	Bit error addition	
	Cell	Multiple cells may be selected from the following cell groups: Foreground cell Background cell OAM cell
	Timing	One of the following may be selected: Burst single All cells Burst rate (10^{-n} : n=3, 4, 5, 6)
	Burst size	1 to 64 [cells] (step 1 [cell])
	Addition byte position	1 to 53 [bytes] (step 1 [byte])
	Addition bit position	Any number of bits

No.	Item	Specifications
2.6	Cell loss addition	Multiple cells may be selected from the following cell groups:
	Cell	Foreground cell
		Background cell
		OAM cell
	Timing	One of the following may be selected:
		Burst single
		Single rate (10^{-n} : n=3,4,5,6,7,8,9)
	Burst size	1 to 64[cells] (step1[cell])
3	Reception function	
3.1	Live monitor	
	No. of channels	Up to 1023 channels
	Count	
	Type	The following counts may be output for each channel:
		Total number of cells
		CLP=0 cells
		CLP=1 cells
		VC-OAM (VP-OAM) cells except AIS/RDI cells
	Display	Displays data in the graph or table format ([Cells], [Cells/s], [Mb/s], [%]).
	Alarm	
	Type	The following types of alarm may be detected for each channel:
		VP-AIS
		VP-RDI
		VC-AIS
		VC-RDI
	Display	Table : Displays the alarm status.

No.	Item	Specifications
3.2	1-channel measurement	
3.2.1	Alarm detection	
	Type	The following types of alarm may be detected: VP-AIS VP-RDI VP-LOC VC-AIS VC-RDI VC-LOC LPAC
	OAM flow	One of the following OAM flows may be specified: End-to-end Segment End-to-end or segment
	Display	Displays alarm seconds and LEDs.
3.2.2	Error measurement	Errors may be detected using the following cells:
	Measurement cell	(1) O.191 test cell (2) Extended O.191 test cell (3) OAM test cell (4) Null (PRBS) cell (5) AAL1 (PRBS) cell (6) AAL3/4 (PRBS) cell (7) Forward monitoring cell (8) Backward reporting cell (9) Other cells
	Type	The following measurement may be performed for each cell: (For the non-conforming cell measurement, CBR/VBR.1/VBR.2/VBR.3 can be selected.) (1) O.191 test cell Bandwidth/Total cell/Lost cell/Misinserted cell/Errored cell/Total block/SECB/Non-conforming cell/(Arrival/ Peak)

No.	Item	Specifications
3.2.2		(2) Extended O.191 test cell Bandwidth/ Total cell/ Lost cell/ Misinserted cell/ Errored cell/ Tagging cell/ Total block/ SECB/ Non-conforming cell/ (Arrival/ Peak) (3) OAM test cell Bandwidth/ Total cell/ PRBS valid cell/ Lost cell/ Misinserted cell/Bit error/ Errored cell/ Non-conforming cell/ (Arrival/ Peak) (4) Null (PRBS) cell Bandwidth/ Total cell/ PRBS valid cell/ Bit error/ Errored cell/ Non-conforming cell/ (Arrival/ Peak) (5) AAL1 (PRBS) cell Bandwidth/ Total cell/ PRBS valid cell/ Bit error/ Errored cell/Non-conforming cell/ (Arrival/ Peak) (6) AAL3/4 (PRBS) cell Bandwidth/ Total cell/ PRBS valid cell/ Bit error/ Errored cell/Non-conforming cell/ (Arrival/ Peak). (7) Forward monitoring cell Bandwidth/ Total cell/ Lost cell/ Misinserted cell/ Total user cell (CLP=0)/ Total user cell (CLP=0+1)/ Total user cell (CLP=1)/ Lost user cell(CLP=0)/ Lost user cell (CLP=0+1)/ Lost user cell(CLP=1)/ Misinserted user cell CLP=0+1)/ Errored user cell (CLP=0+1)/ Total block/ SECB/ Non-conforming cell/ (Arrival/ Peak). (8) Backward reporting cell Bandwidth/ Total cell/ Lost cell/ Misinserted cell/ Total user cell (CLP=0)/ Total user cell (CLP=0+1)/ Total user cell (CLP=1)/ Lost user cell (CLP=0)/ Lost user cell (CLP=0+1)/ Lost use cell (CLP=1)/ Misinserted user cell CLP=0+1)/ Errored user cell (CLP=0+1)/ Total block/ SECB/ Non-conforming cell/ (Arrival/ Peak). (9) Other cells Bandwidth/ Total cell/ Non-conforming cell/ (Arrival/ Peak).

No.	Item	Specifications
3.2.2	Display Setting	Displays the number of errors, error rate, error second and LEDs. When CBR selected, PCR :0.1 to 100[%] (step0.1[%]) PCR may be specified using [Mb/s], [Cells/s], or [%]. 1 to (Maximum Cell Rate)[kb/s](step 1[kb/s]) When VBR 1/2/3 selected, PCR :50 to (Maximum Cell Rate)[kb/s](step1[kb/s]) (where, PCR > SCR) SCR :40 to (90% of Maximum Cell Rate)[kb/s] (step1[kb/s]) MBS :10 to 2000[Cells] (step1[Cells]) Figure 1-1 shows the resolution of MBS to PCR/SCR.  **Figure 1-1 Resolution of MBS** CDTV :0 to 65535 [cells] (step 1 [cell])
3.2.3	Error/alarm graph display Alarm type	Up to three types may be selected from the following alarm types: VP-AIS VP-RDI VP-LOC VC-AIS VC-RDI VC-LOC

No.	Item	Specifications
3.2.3	Error type	One error may be selected from the following: Bandwidth Lost cell Misinserted cell Bit error Errored cell Tagging cell Lost user cell (CLP=0) Lost user cell (CLP=0+1) Lost user cell (CLP=1) Misinserted user cell (CLP=0+1) Errored user cell (CLP=0+1) SECB Total block
	Horizontal axis	One of the following bar widths may be selected for use on the horizontal axis. 1 second/10 seconds/1 minute/10 minutes/1 hour/1 day
	Vertical axis	Displays counts, rates, seconds or Mb/s.
3.2.4	Cell delay measurement	
	Measurement type	Cell transfer delay/Cell delay variation
	Graph type	Linear scale/Logarithm scale
	Resolution (measurement display window width)	0.5[μs] (16[ms])/2[μs] (65[ms])
	Horizontal axis	One of the following bar widths may be selected for use on the horizontal axis. 0.5[μs]/2[μs]/10[μs]/50[μs]/100[μs]/500[μs]/1[ms]/2[ms]
	Vertical axis	Data is displayed using [Cells], [Cells/s], or [%].

No.	Item	Specifications
3.2.5	Cell interval measurement	
	Graph type	Linear scale/Logarithm scale
	Resolution (measurement display window width)	1[cell] (32k[cell]) /4[cell] (131k[cell]) /16[cell] (524k[cell]) /64[cell] (2M[cell]) /256[cell] (8M[cell]) /1k[cell] (33M[cell]) /8k[cell] (268M[cell] /66k[cell] (2174M[cell])
	Horizontal axis	One of the following bar widths may be selected for use on the horizontal axis. 1/4/16/256/1k/8k/66k[cell]
	Vertical axis	Data is displayed using [Cells], [Cells/s], or [%].
3.2.6	1-point CDV measurement	
	Graph type	Linear scale/Logarithm scale
	Resolution	1[cell]
	Horizontal axis	One of the following bar widths may be selected for use on the horizontal axis. 1/4/16/64/256/1k[cell]
	Vertical axis	Data is displayed using [Cells], [Cells/s], or [%].
3.2.7	Cell capture	
	Size	4095[cell]
	Cell filter	One of the following cell filter conditions may be selected: All cells User cell (excluding F4/F5OAM cell) User cell (including F4OAM cell) User cell (including F5OAM cell) User cell (including F4/F5OAM cell) Matching/mismatching with header + payload (1)

No.	Item	Specifications
3.2.7	End trigger	One of the following end trigger conditions may be selected: Manual Measuring cell reception End-to-end F4OAM cell reception Segment F4OAM cell reception End-to-end F5OAM cell reception Segment F5OAM cell reception Cell error detected Cell loss detected Cell misinsertion detected Cell tagging detected Non-conforming cell detected External input signal falling edge Internal trigger signal 1 falling edge Internal trigger signal 2 falling edge
	Payload display format	HEX/ASCII/Translate/Cell Interval
	Jump function	Top/Bottom/Trigger/Line
3.2.8	Internal trigger 1/2 output event	One of the following may be selected: End-to-end F4OAM cell received Segment F4OAM cell received End-to-end F5OAM cell received Segment F5OAM cell received Cell error detected Cell loss detected Cell misinsertion detected Cell tagging detected

No.	Item	Specifications
4	General specifications	
4.1	Size and weight	29.5H, 169W, 241D (mm), 1 kg or less
4.2	Environment	Conforms to the specifications of the mainframe.

1.3 Instrument Configuration

Table 1-2 lists the standard configuration of the unit.

Table 1-2 Standard Configuration

Item	Type/Symbol	Name	Quantity	Remarks
This unit	MU120020A	QoS Unit	1	
Accessories	M-W1313AE	MU120020A Operation Manual	1	
	M-W1319AE	MU120020A Remote Control Operation Manual	1	

Section 2 PREPARATION

2.1 Ambient Requirements

Use the unit in a place where:

1. the temperature is between 5℃ and 50℃ and the humidity is between 45% and 85%.
2. there is no direct sunlight or much dust.
3. the unit is not exposed to water or active gas.
4. the unit is not oxidized and there is no vibration.

2.2 Safety Precautions

- Use this unit only on an MP1220A ATM quality analyzer. Failure to follow this may result in damage or accidents.

- Apply only the rated voltage to the unit. Failure to follow this may result in circuit damage.

- When the unit is stored in a cold place for a long time and then used in a place with higher temperature, consideration may form on and inside the unit and possibly cause a short circuit. In this case, dry the unit before use.

- To avoid static electricity, be sure to connect a ground line to other units before connecting an input/output terminal.

- The outer conductor or the core line may act as a capacitor. Therefore, discharge them with a metal before use.

Section 3 PANELS

3.1 Panel Layout And Description

The following shows the front panel of the QoS unit;

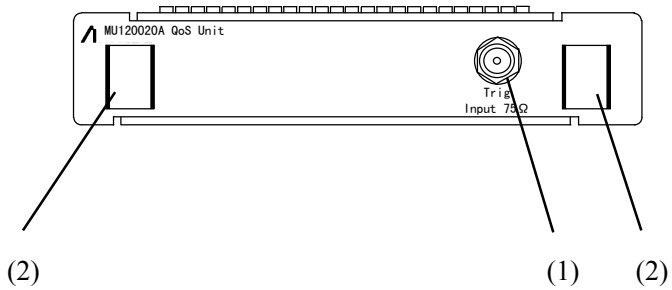


Figure 3-1 QoS Unit Front Panel

Table 3-1 Description of QoS Unit Front Panel

No.	Label	Description
1	Trig Input 75 Ω	Trigger input connector (BNC)
2	(Ejector)	Ejector for inserting/removing the unit

Section 4 SCREENS

4.1 MU120020A QoS Unit Window

The MU120020A QoS Unit window allows you to set up the unit and to display the result. You can call it from the tool bar of the MP1220A ATM Quality Analyzer window. For details, see the MP1220A ATM Quality Analyzer Operation Manual.

The MU120020A QoS Unit window consists of the panels listed below. Note that some panels are not displayed depending upon the measurement condition:

Table 4-1 Component Panels

Panel name	Main use	Measurement condition (*1)		
		N	S	L
Construction panel	Sets up the transmission/reception channels.	○	○	○
Tx-Setup panel	Sets up the transmission module.	○	○	○
Rx-Setup panel	Sets up the reception module.	○	○	
Alarm/Error panel	Displays the alarm/error measurement results.	○	○	
Analyze panel	Displays alarm/error data in the bar graph format.	○	○	
Capture Setup panel	Sets up cell capture conditions.	○	○	
Capture Result panel	Displays the cell capture results.	○	○	
Sub measurement panels	There are three sub measurement panels: Delay panel, Cell Interval panel and 1-point CDV panel. They respectively display cell transfer delay/cell delay variation measurement result, cell interval measurement result and 1-point CDV measurement result. The Rx-Setup panel allows you to display a sub measurement panel you want.		○	
Live Monitor panel	Displays the live monitor results.			○

(*1) N : There is no sub measurement in one-channel measurement.
S : There is sub measurement in one-channel measurement.
L : The Live Monitor is selected.

(*2) The Sub measurement and Live monitor are not performed at “Repeat” in measurement mode.

Figure 4-1 shows the MU120020A QoS Unit window.

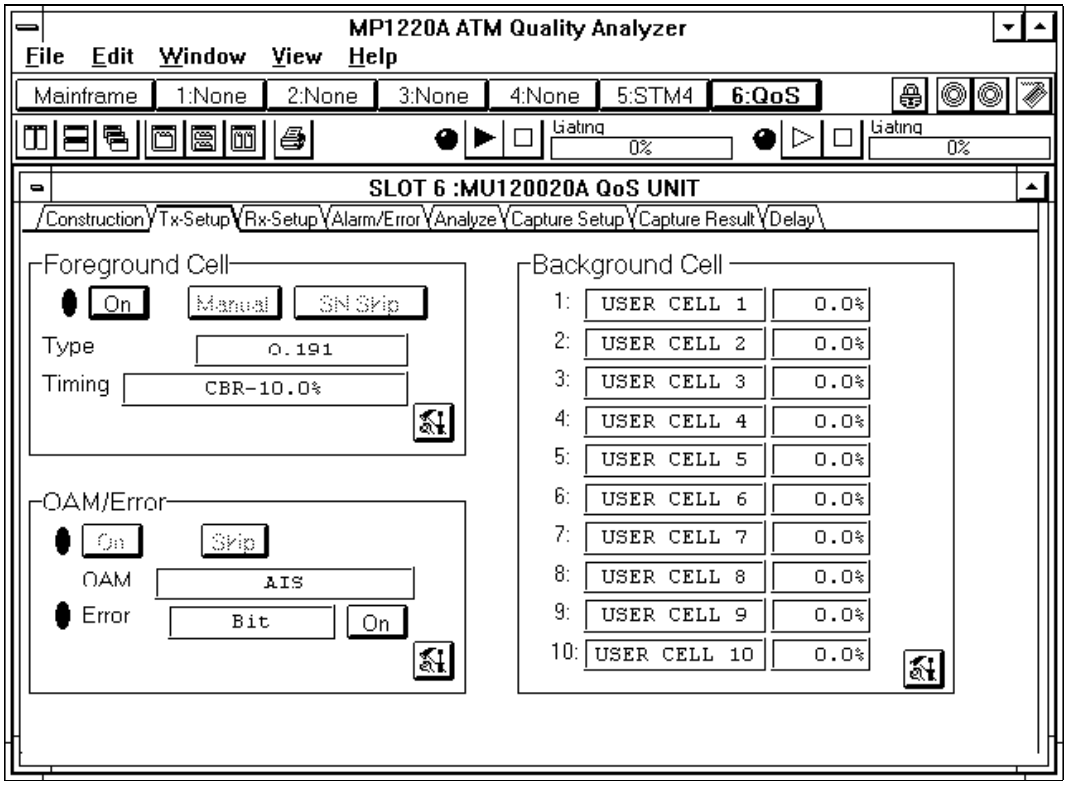


Figure 4-1 MU120020A QoS Unit Window

4.2 Construction Panel

Figure 4-2 shows the Construction panel, and Table 4-2 describes the panel.

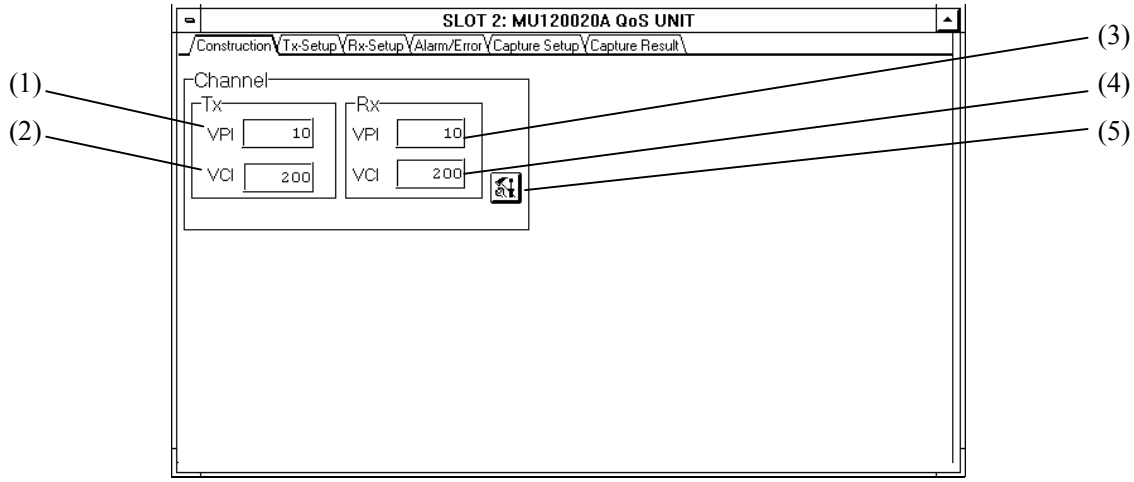


Figure 4-2 Construction Panel

Table 4-2 Construction Panel Description

No.	Item	Description
1	Tx VPI	Displays the default for the VPI value of a transmission cell specified in the Channel Setup dialog box.
2	Tx VCI	Displays the default for the VCI value of a transmission cell specified in the Channel Setup dialog box.
3	Rx VPI	Displays the VPI value of a reception cell specified in the Channel Setup dialog box.
4	Rx VCI	Displays the VCI value of a reception cell specified in the Channel Setup dialog box.
5		Opens the Channel Setup dialog box.

4.2.1 Channel Setup Dialog Box

Figure 4-3 shows the Channel Setup dialog box, and Table 4-3 describes the dialog box.

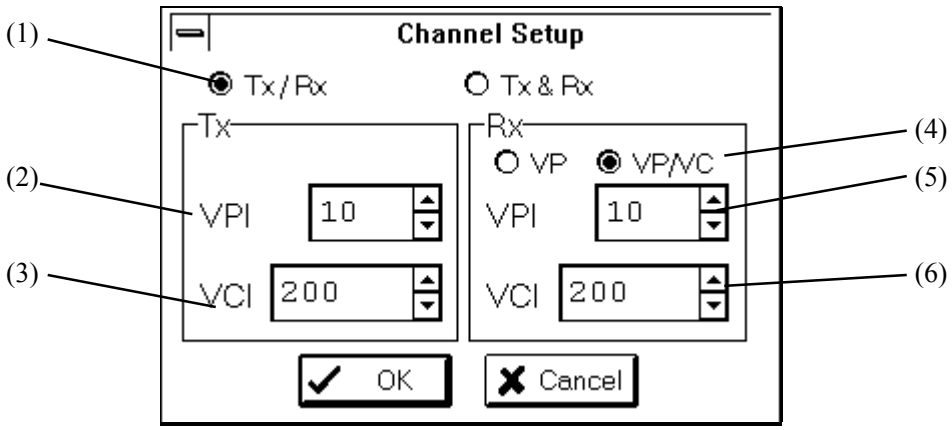


Figure 4-3 Channel Setup Dialog Box

Table 4-3 Channel Setup Dialog Box Description

No.	Item	Description
1		Selects the specification format of the VPI/VCI of transmission cells and reception cells. Tx/Rx : Specify the value for transmission and that for reception separately. Tx&RX : Specify the values for transmission and reception at the same time.
2	Tx (Tx&Rx) VPI	Specifies the default for the VPI value of transmission (transmission and reception) cells.
3	Tx (Tx&Rx) VCI	Specifies the default for the VCI value of transmission (transmission and reception) cells.
4	Rx	Selects the specification format of a channel for reception cells. VP : Specify the VPI value only. VP/VC : Specify the VPI/VCI values.
5	Rx VPI	Specifies the VPI value of reception cells.
6	Rx VCI	Specifies the VCI value of reception cells.

4.3 Tx-Setup Panel

Figure 4-4 shows the Tx-Setup panel, and Table 4-4 describes the panel.

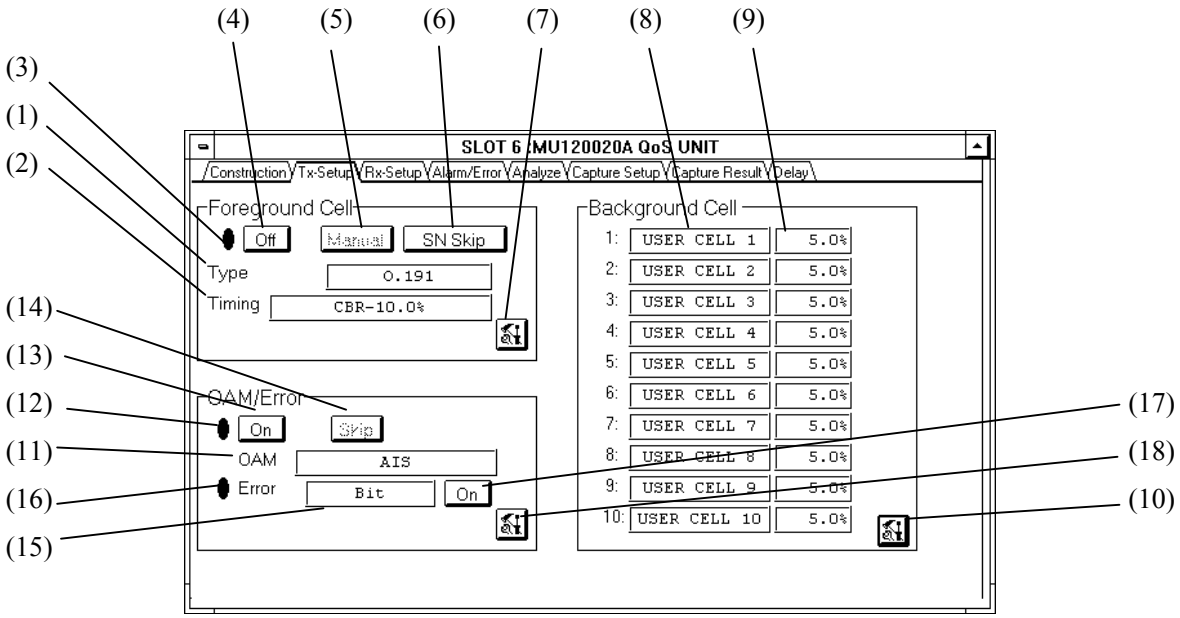


Figure 4-4 Tx-Setup Panel

Table 4-4 Tx-Setup Panel Description

No.	Item	Description
1	Type	Displays the foreground cell type specified on the Cell panel in the Foreground Cell Setup dialog box .
2	Timing	Displays the foreground cell transmission timing specified on the Timing panel in the Foreground Cell Setup dialog box .
3	●	Is turned on when foreground cells or background cells is being transmitted and is turned off when the transmission stops.
4	On/Off	Starts or stops the transmission of foreground cells or background cells.
5	Manual	Is effective when you select Manual for the foreground cell transmission timing and when you send cells. Each time you press this button, one foreground cell is sent.
6	SN Skip	Is effective when the foreground cell is an O.191 test cell, extended O.191 test cell, or OAM test cell and when you send cells. Each time you press this button, the SN value increments by the specified value.
7		Opens the Foreground Cell Setup dialog box.
8		Displays the background cell names specified on 1 to 10 panels in the Background Cell Setup dialog box. The character string "Upper Unit" is displayed when you select an upper unit on the Timing panel in the Background Cell Setup dialog box.
9		Displays the cell rate specified on the Timing panel in the Background Cell Setup dialog box.
10		Opens the Background Cell Setup dialog box.
11	OAM	Displays the OAM cell type specified on the OAM panel in the OAM/Error Addition Cell Setup dialog box.
12	●	Is turned on when OAM cells is being transmitted and is turned off when the transmission stops.
13	On/Off	Starts or stops the transmission of OAM cells.
14	Skip	Is effective when the OAM cell is a forward monitoring cell or a backward reporting cell and when you send OAM cells. Each time you press this button, an MCSN value skip, TUC value skip, or BEDC value error is added.
15	Error	Displays the error type specified on the Error panel in the OAM/Error Addition Cell Setup dialog box.
16	●	Is turned on when an error is being added and is turned off when the addition of an error stops.
17	On/Off	Starts or stops the addition of an error.
18		Opens the OAM/Error Addition Cell Setup dialog box.

4.3.1 Foreground Cell Setup Dialog Box

4.3.1.1 Cell Panel

Figure 4-5 shows the Cell panel, and Table 4-5 describes the panel.

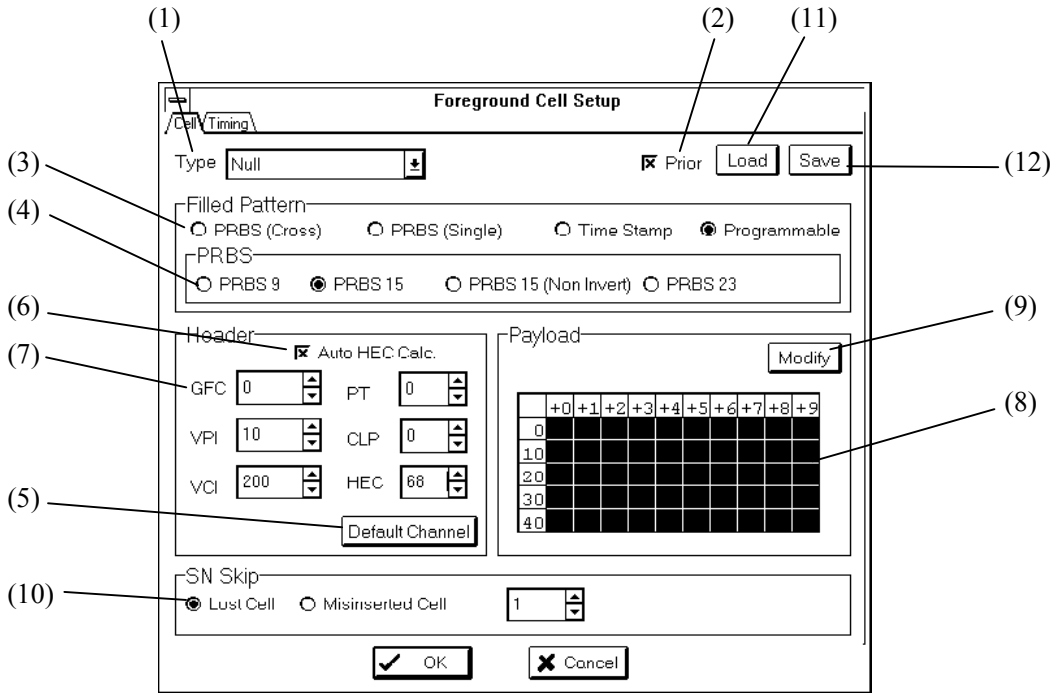


Figure 4-5 Cell Panel

Table 4-5 Cell Panel Description

No.	Item	Description
1	Type	Selects a foreground cell type. When selecting an AAL1 cell, you can specify the CSI value of the AAL1 cell. When you select an AAL3/4 cell, you can specify the number of times the AAL3/4 cell is to be repeated as well as an MID value.
2	Prior	Assigns a higher priority to the foreground cell transmission rate over the background cell transmission rate.
3	Filled Pattern	Selects a foreground cell payload pattern.
4	PRBS	Selects a PRBS stage number.
5	Default Channel	Specifies the VPI/VCI value of the transmission cell specified on the Construction panel.
6	Auto HEC Calc.	Automatically calculates the HEC value.
7	GFC, VPI, VCI, PT, CLP, HEC	Specifies the header value of the foreground cell.
8		Displays and specifies the payload value of the foreground cell. Specify the value in the text box or Modify dialog box.
9	Modify	Opens the Modify dialog box.
10	SN Skip	Is effective when the foreground cell is an O.191 test cell, extended O.191 test cell, or OAM test cell. This is used to skip the SN value in order to select events or to specify the number of events.
11	Load	Opens the Load dialog box and calls the saved Foreground Cell Setup dialog box setting.
12	Save	Opens the Save dialog box and saves the Foreground Cell Setup dialog box setting.

4.3.1.2 Modify Dialog Box

Figure 4-6 shows the Modify dialog box, and Table 4-6 describes the dialog box.

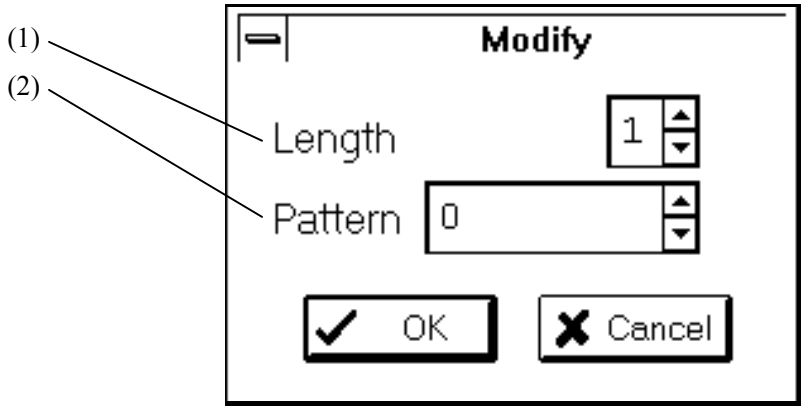


Figure 4-6 Modify Dialog Box

Table 4-6 Modify Dialog Box Description

No.	Item	Description
1	Length	Specifies the length of the payload repetition pattern.
2	Pattern	Specifies the payload repetition pattern.

4.3.1.3 Timing Panel

Figure 4-7 shows the Timing panel, and Table 4-7 describes the panel.

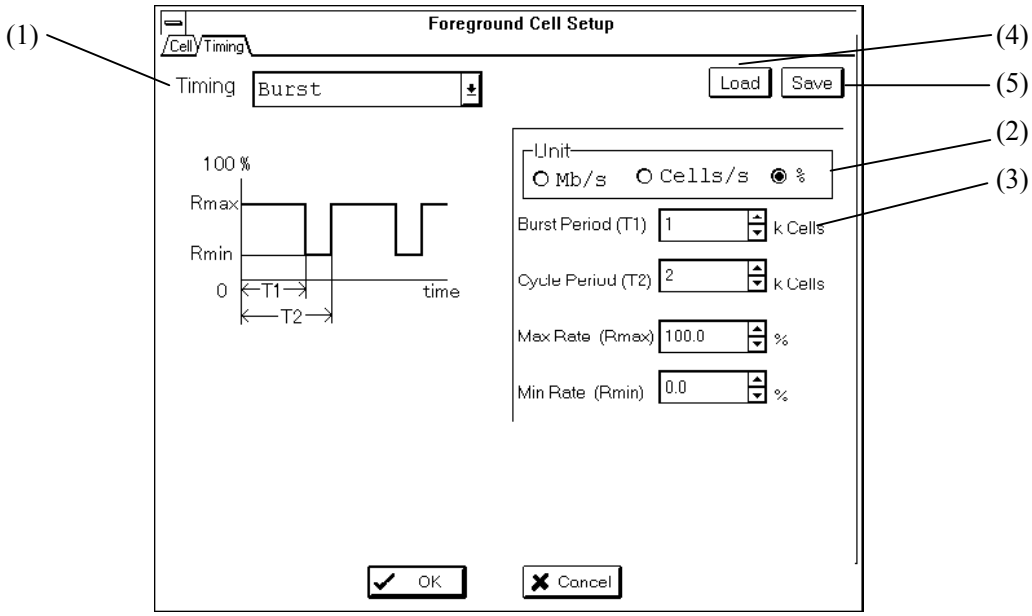


Figure 4-7 Timing Panel

Table 4-7 Timing Panel Description

No.	Item	Description
1	Timing	Selects a foreground cell transmission timing.
2	Unit	Selects the unit in which foreground cell transmission timing parameters are specified.
3		Specifies foreground cell transmission timing parameters. The display depends on the selected foreground cell transmission timing. When the Timing selected to VBR, the actual value at sending cell differs from the set value. Therefore, the actual value is displayed in the parentheses below the set value.
4	Load	Opens the Load dialog box and calls the saved Foreground Cell Setup dialog box setting.
5	Save	Opens the Save dialog box and saves the Foreground Cell Setup dialog box setting.

4.3.2 Background Cell Setup Dialog Box

4.3.2.1 Timing Panel

Figure 4-8 shows the Timing panel, and Table 4-8 describes the panel.

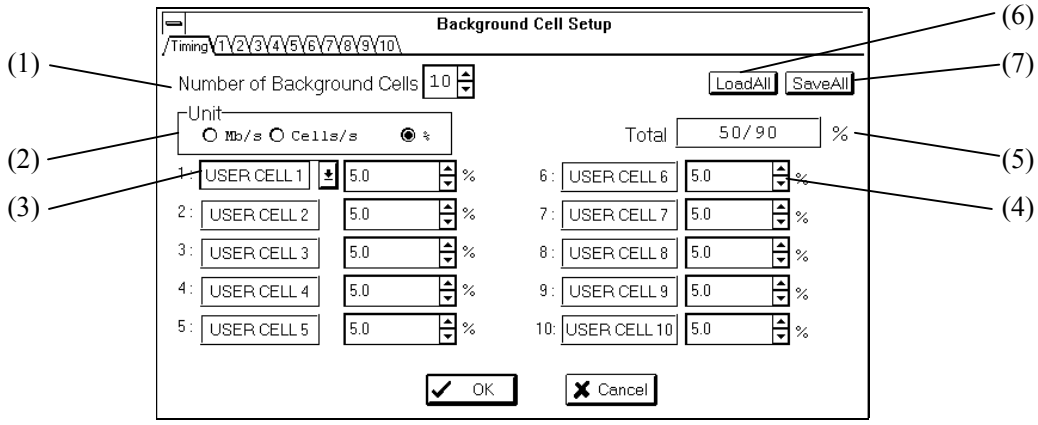


Figure 4-8 Timing Panel

Table 4-8 Timing Panel Description

No.	Item	Description
1	Number of Background Cells	Specifies the number of types of background cells to be transmitted.
2	Unit	Selects the unit in which background cell transmission cell rates are specified.
3		Displays the background cell names specified on 1 to 10 panels in the Background Cell Setup dialog box. An upper unit may be selected only for background cell 1. In this case, the character string "Upper Unit" is displayed.
4		Specifies the background cell transmission cell rate.
5	Total	Display the background cell transmission cell rate set for the transmittable cell rate as the background cell.
6	Load All	Opens the Load dialog box and calls the saved Background Cell Setup dialog box settings.
7	Save All	Opens the Save dialog box and saves the Background Cell Setup dialog box settings.

4.3.2.2 1 to 10 Panels

Figure 4-9 shows the 1 to 10 panels, and Table 4-9 describes the panels.

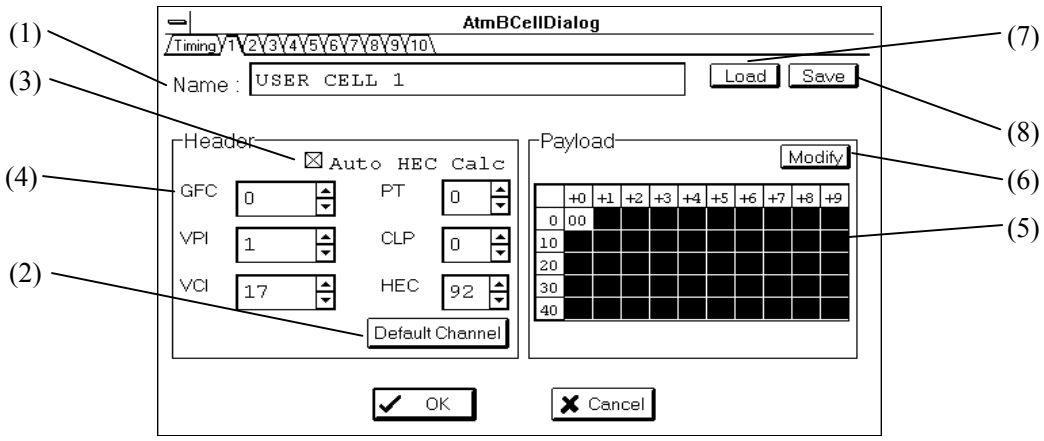


Figure 4-9 1 to 10 panels

Table 4-9 1 to 10 Panels Description

No.	Item	Description
1	Name	Specifies a background cell name.
2	Default Channel	Specifies the VPI/VCI value of the transmission cell specified on the Construction panel.
3	Auto HEC Calc.	Automatically calculates the HEC value.
4	GFC, VPI, VCI, PT, CLP, HEC	Specifies the header value of the background cell.
5		Displays and specifies the payload value of the background cell. Specify the value in the text box or in the Modify dialog box.
6	Modify	Opens the Modify dialog box.
7	Load	Opens the Load dialog box and calls the saved 1 to 10 panels settings.
8	Save	Opens the Save dialog box and saves 1 to 10 panels settings.

4.3.2.2.1 Modify Dialog Box

Figure 4-10 shows the Modify dialog box, and Table 4-10 describes the dialog box.

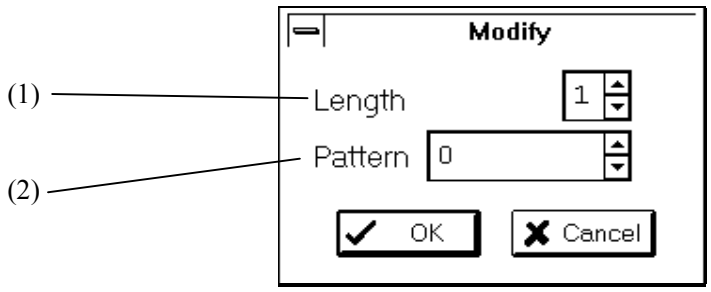


Figure 4-10 Modify Dialog Box

Table 4-10 Modify Dialog Box Description

No.	Item	Description
1	Length	Specifies the length of the payload repetition pattern.
2	Pattern	Specifies the payload repetition pattern.

4.3.3 OAM/Error Addition Cell Setup Dialog Box

4.3.3.1 OAM Panel

Figure 4-11 shows the OAM panel, and Table 4-11 describes the panel.

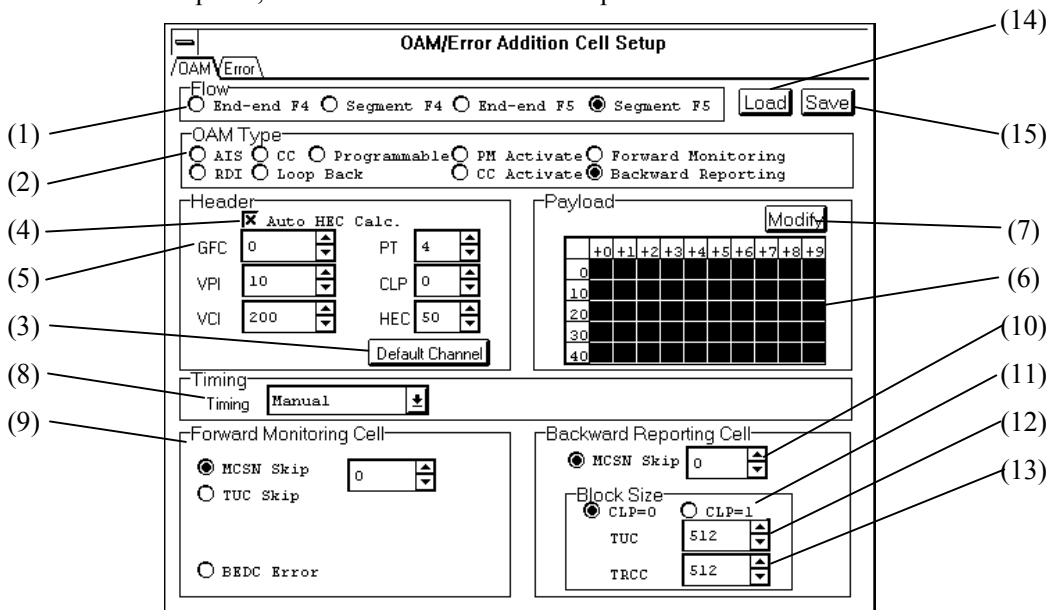


Figure 4-11 OAM Panel

Table 4-11 OAM Panel Description

No.	Item	Description
1	Flow	Selects the flow of the OAM cell to be sent.
2	OAM Type	Selects the type of the OAM cell to be sent. AIS :AIS cell RDI :RDI cell CC :CC cell Loop Back :Loopback cell PM Activate :PM activation/deactivation cell CC Activate :CC activation/deactivation cell Forward Monitoring :Forward monitoring cell Backward Reporting :Backward reporting cell Programmable :Any values may be specified in the payload of the cell except the CRC-10 field.
3	Default Channel	Specifies the VPI/VCI value of the transmission cell specified on the Construction panel.
4	Auto HEC Calc.	Automatically calculates the HEC.
5	GFC, VPI, VCI, PT, CLP, HEC	Specifies the header value of the OAM cell.
6		Displays and specifies the payload value of the OAM cell. Specify the value in the text box or in the Modify dialog box.
7	Modify	Opens the Modify dialog box.
8	Timing	Selects an OAM cell transmission timing.
9	Forward Monitoring Cell	Is effective when the OAM cell type is a forward monitoring cell. This is used to select errors for forward monitoring cells. MCSN Skip :Specifies the number of times the MCSN value is skipped. TUC Skip :Specifies the number of times the TUC value is skipped. CLP=0+1 :Number of times the TUC-0+1 value is skipped CLP=0 :Number of times the TUC-0 value is skipped BEDC Error :An error is added to the BEDC value.

No.	Item	Description
10	Backward Reporting Cell	Is effective when the OAM cell type is a backward reporting cell. This is used to select errors for backward reporting cells. NCSN Skip :Specifies the number of times the MCSN value is skipped
11	Block Size	Selects the CLP value of the user cell.
12	TUC	Specifies the TUC value increment.
13	TRCC	Specifies the TRCC value increment.
14	Load	Opens the Load dialog box and calls the saved OAM/Error Addition Cell Setup dialog box settings.
15	Save	Opens the Save dialog box and saves the OAM/Error Addition Cell Setup dialog box settings.

4.3.3.1.1 Modify Dialog Box

Figure 4-12 shows the Modify dialog box, and Table 4-12 describes the dialog box.

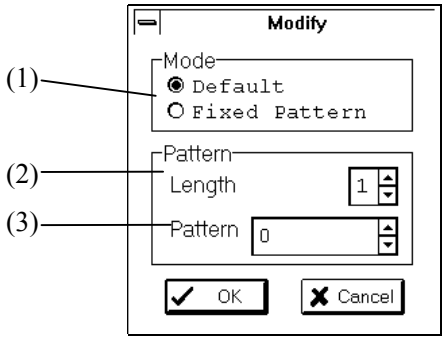


Figure 4-12 Modify Dialog Box

Table 4-12 Modify Dialog Box Description

No.	Item	Description
1	Mode	Selects one of the following OAM cell payload modification patterns. Default :Initial value Fixed Pattern :Specifies the repetition pattern and its length.
2	Length	Specifies the length of the OAM cell payload repetition pattern.
3	Pattern	Specifies the OAM cell payload repetition pattern.

4.3.3.2 Error Panel

Figure 4-13 shows the Error panel, and Table 4-13 describes the panel.

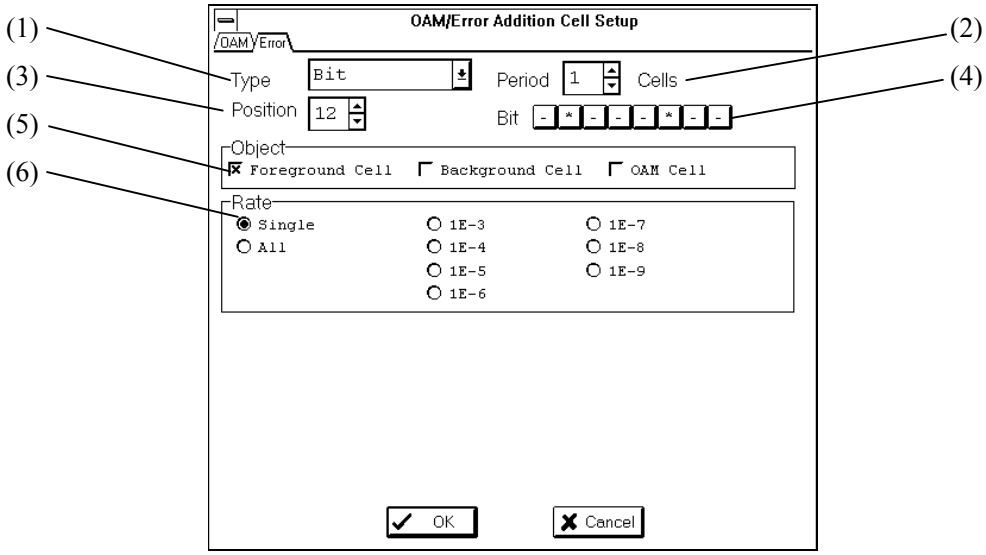


Figure 4-13 Error Panel

Table 4-13 Error Panel Description

No.	Item	Description
1	Type	Selects one of the following error types. OFF :No error Bit :Bit error Lost Cell :Cell loss
2	Period	Is effective when the error type is the bit error or the cell loss. Specify the number of single-burst bit errors or the number of single-burst lost cell.
3	Position	Is effective when the error is the bit error. Specify the position of the byte relative to the beginning of the cell in which bit errors are added.
4	Bit	Is effective when the error is the bit error. Specify the V mark in the position of the bit within the byte in which a bit error is added.
5	Object	Selects cell groups to which the error is added.
6	Rate	Selects an error rate.

4.4 Rx-Setup Panel

Figure 4-14 shows the Rx-Setup panel, and Table 4-14 describes the panel.

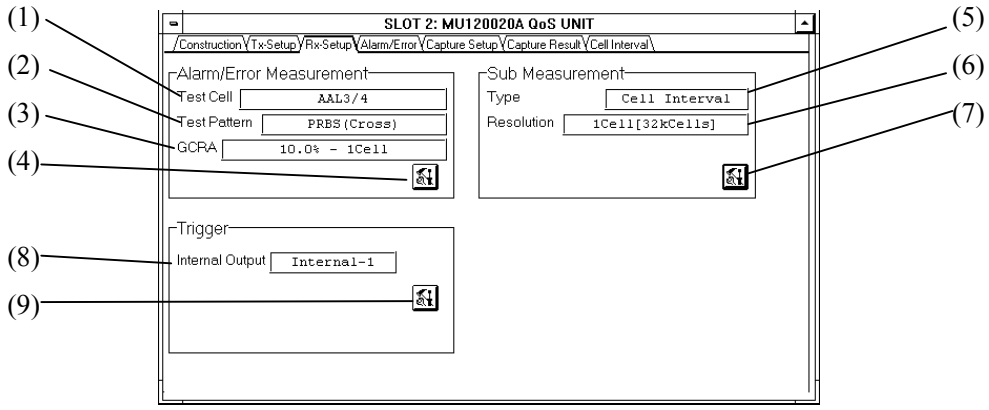


Figure 4-14 Rx-Setup Panel

Table 4-14 Rx-Setup Panel Description

No.	Item	Description
1	Test Cell	Displays the reception test cell type selected in the Alarm/Error Measurement Setup dialog box.
2	Test Pattern	Displays the test pattern selected in the Alarm/Error Measurement Setup dialog box.
3	GCRA	Displays the PCR and CDVT of the reception cell specified in the Alarm/Error Measurement Setup dialog box.
4		Opens the Alarm/Error Measurement Setup dialog box.
5	Type	Displays the sub measurement type selected in the Sub Measurement Setup dialog box. However the Sub measurement is not performed at “Repeat” in measurement mode.
6	Resolution	Displays the resolution and the measurement display window width selected in the Sub Measurement Setup dialog box.
7		Opens the Sub Measurement Setup dialog box.
8	Internal Output	Displays the internal trigger selected in the Trigger Setup dialog box.
9		Opens the Trigger Setup dialog box.

4.4.1 Alarm/Error Measurement Setup Dialog Box

Figure 4-15 shows the Alarm/Error Measurement Setup dialog box, and Table 4-15 describes the dialog box.

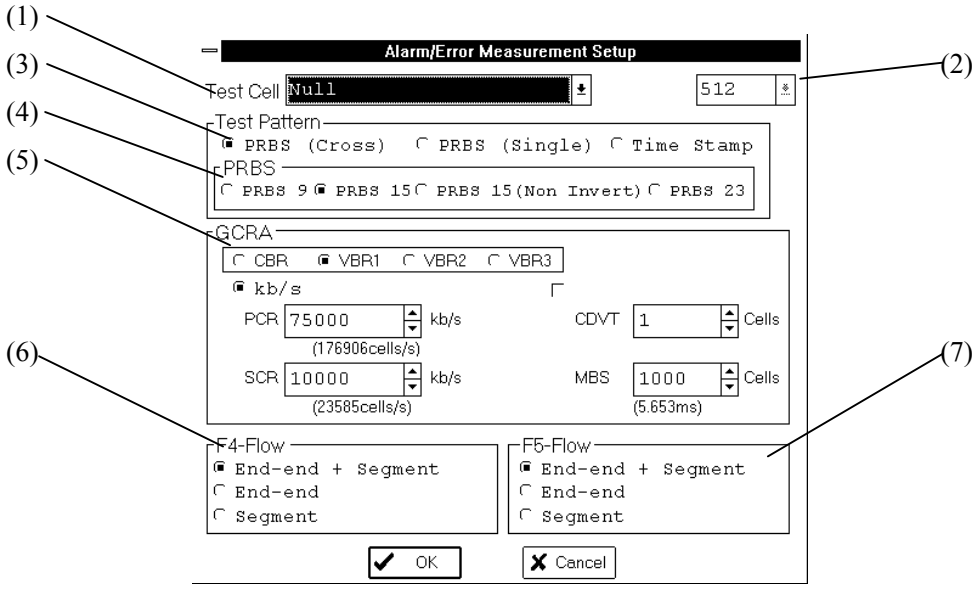


Figure 4-15 Alarm/Error Measurement Setup Dialog Box

Table 4-15 Alarm/Error Measurement Setup Dialog Box Description

No.	Item	Description
1	Test Cell	Selects a reception test cell type.
2	Block Size	Is effective when the reception test cell is an O.191 test cell, extended O.191 test cell, forward monitoring cell, or backward reporting cell. Select a cell block size.
3	Test Pattern	Selects the payload test pattern of the reception test cell.
4	PRBS	Selects the PRBS type of the reception test cell.
5	GCRA	Sets the parameters for the cell flow monitoring. When the service category selected to CBR, set the PCR and CDVT values. The unit of PCR set value is selected among Mb/s, Cells, /s and %. When the service category selected to VBR 1/2/3, set the PCR, CDVT, SCR, and MBS values. Then, under the PCR and SCR set values, the number of the received cells per unit time is displayed. Also, under the MBS set values, the time converted from the number of MBS cells is displayed.
6	F4-Flow	Selects one of the following reception cell F4 flows. End-end + segment :End-to-end or segment End-end :End-to-end Segment :Segment
7	F5-Flow	Is effective when you selected VP/VC for the reception channel on the Construction panel in the Channel Setup dialog box. Select one of the following reception cell F5 flows. End-end + segment :End-to-end or segment End-end :End-to-end Segment :Segment

4.4.2 Sub Measurement Setup Dialog Box

Figure 4-16 shows the Sub Measurement Setup dialog box, and Table 4-16 describes the dialog box.

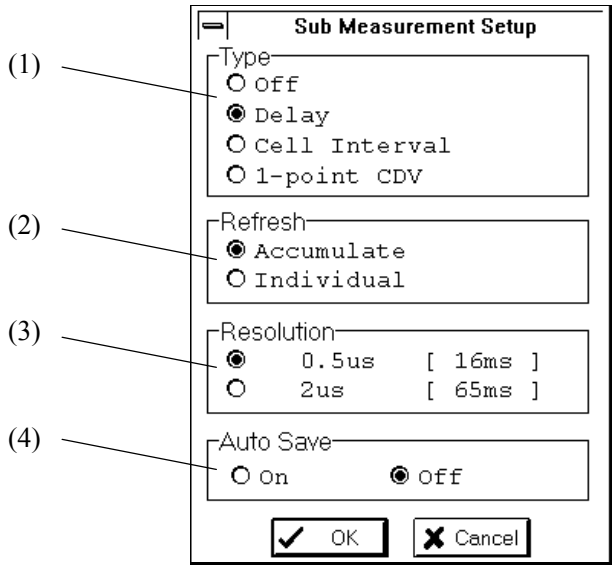


Figure 4-16 Sub Measurement Setup Dialog Box

Table 4-16 Sub Measurement Setup Dialog Box Description

No.	Item	Description
1	Type	Selects one of the following sub measurement types. Off :None Delay :Cell delay measurement Cell Interval :Cell interval measurement 1-point CDV :1-point CDV measurement
2	Refresh	Selects how to update the measurement results of cell delay measurement or cell interval measurement. Accumulate :Accumulates measurement results. Individual :Displays the measurement results of each time period.
3	Resolution	Selects the resolution and the measurement display window width for cell delay measurement or cell interval measurement.
4	Auto Save	The sub measurement result is automatically stored in the life after the measurement is finished.

4.4.3 Trigger Setup Dialog Box

Figure 4-17 shows the Trigger Setup dialog box, and Table 4-17 describes the dialog box.

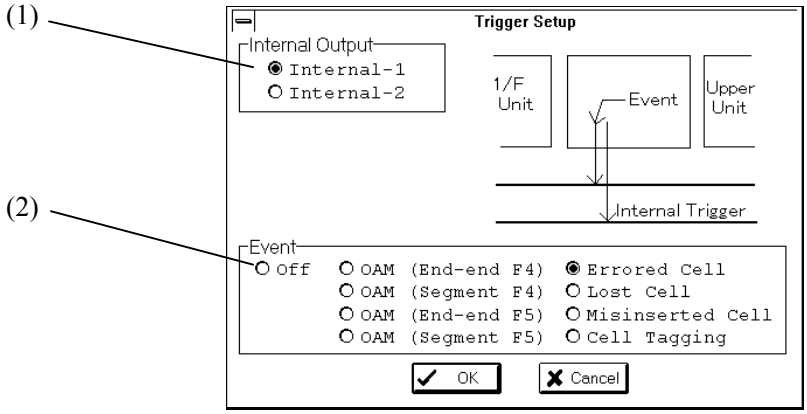


Figure 4-17 Trigger Setup Dialog Box

Table 4-17 Trigger Setup Dialog Box Description

No.	Item	Description
1	Internal Output	Selects one of the following internal triggers. Internal-1 :Infernal trigger 1 Internal-2 :Internal trigger 2
2	Event	Selects one of the following internal trigger events. Off : None OAM (End-end F4) :End-to-end F4OAM cell received OAM (Segment F4) :Segment F4OAM cell received OAM (End-end F5) :End-to-end F5OAM cell received OAM (Segment F5) :Segment F5OAM received Errored Cell :Cell error detected Lost Cell :Cell loss detected Misinserted Cell :Cell misinsertion detected Cell Tagging :Cell tagging detected

4.5 Alarm/Error Panel

Figure 4-18 shows the Alarm/Error panel, and Table 4-18 describes the panel.

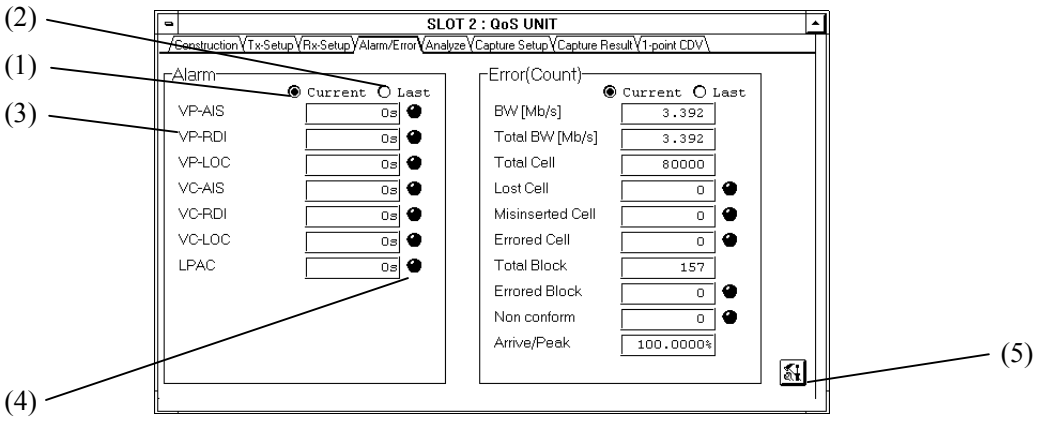


Figure 4-18 Alarm/Error Panel

Table 4-18 Alarm/Error Panel Description

No.	Item	Description
1	Current	Displays the measurement results accumulated from the start of measurement to the current time.
2	Last	Displays the measurement results accumulated from start to end.
3		Displays alarm/error measurement results. BW :Reception cell bandwidth of each second during measurement [Mb/s] Total BW :Reception cell bandwidth of the average during measurement [Mb/s] Total Cell :Total number of received cells PRBS Valid Cell :Total number of received valid cells (except invalid PRBS out-of-synchronization cells) Lost Cell :Number of lost cells Misinserted Cell :Number of misinserted cells Bit Error :Number of bit errors Errored Cell :Number of errored cells Tagging :Number of tagged cells Total (CLP=0) :Total number of user cells (CLP=0) Total (CLP=0+1) :Total number of user cells (CLP=0+1) Total (CLP=1) :Total number of user cell s (CLP=1) Lost (CLP=0) :Number of lost user cells (CLP=0) Lost (CLP=0+1) :Number of lost user cells (CLP=0+1) Lost (CLP=1) :Number of lost user cells (CLP=1) Mis (CLP=0+1) :Number of misinserted user cells (CLP=0+1) Error (CLP=0+1) :Number of errored user cells (CLP=0+1) Total Block :Total number of received blocks Errored Block :Total number of SECBs. Non conform :Number of non-conforming cells Arrive/Peak : (Arrival rate)/(Peak rate)
4	●	Turns on the LED when an alarm/error is detected. Red :Alarm/error detected Orange :You selected Current in (1), and an alarm/error was detected during current measurement. You selected Last in (2), and an alarm was detected during the previous measurement.
5		Opens the Layout dialog box.

4.5.1 Layout Dialog Box

Figure 4-19 shows the Layout dialog box, and Table 4-19 describes the dialog box.

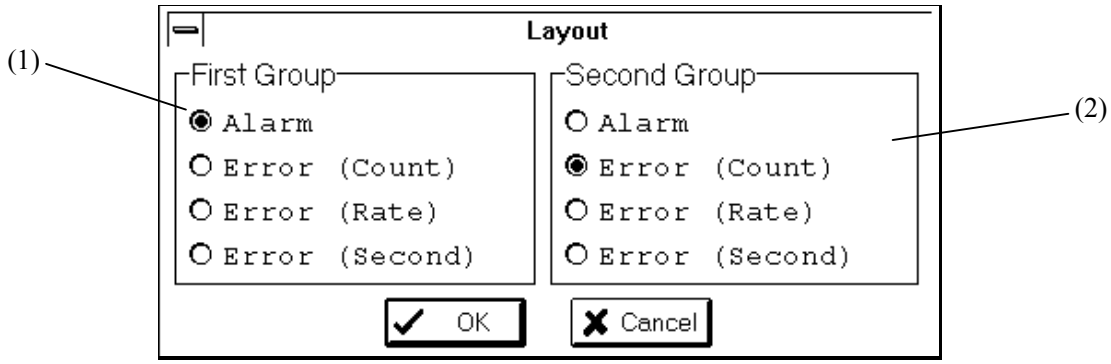


Figure 4-19 Layout Dialog Box

Table 4-19 Layout Dialog Box Description

No.	Item	Description
1	First Group	Selects from the first group the error/alarm measurement result items you want to display. Alarm :Alarm (in seconds) Error (Count) :Error (count) Error (Rate) :Error (rate) Error (Second) :Error (in seconds)
2	Second Group	Selects from the second group the error/alarm measurement result items you want to display. Alarm :Alarm (in seconds) Error (Count) :Error (count) Error (Rate) :Error (rate) Error (Second) :Error (in seconds)

4.6 Analyze Panel

Figure 4-20 shows the Analyze panel, and Table 4-20 describes the panel.

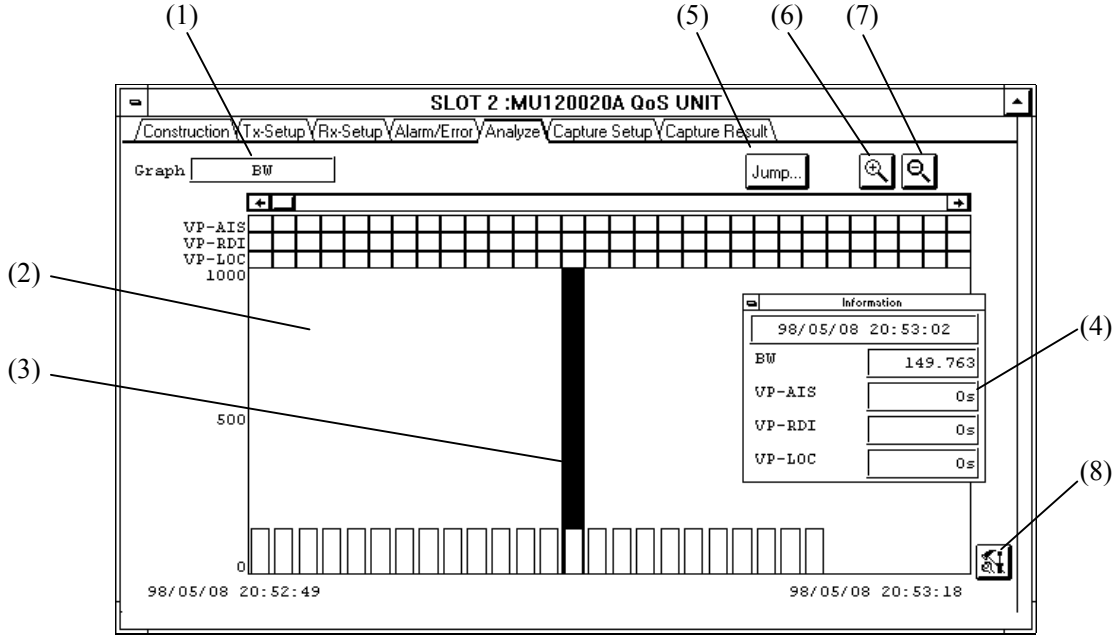


Figure 4-20 Analyze Panel

Table 4-20 Analyze Panel Description

No.	Item	Description
1	Graph	Displays the names of the graph display items specified in the Analyze Setup dialog box.
2		Displays a bar graph.
3		Is a marker indicating one bar in a bar graph. You can click on the bar or specify a bar in the Jump dialog box.
4		Is the information window in which marker position information is displayed.
5	Jump..	Opens the Jump dialog box.
6		Enlarges a bar graph with the marker position as the center.
7		Reduces a bar graph with the marker position as the center.
8		Opens the Analyze Setup dialog box.

4.6.1 Jump Dialog Box

Figure 4-21 shows the Jump dialog box, and Table 4-21 describes the dialog box.

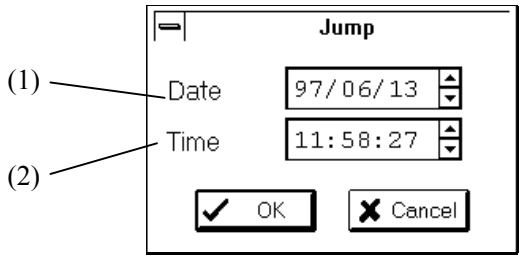


Figure 4-21 Jump Dialog Box

Table 4-21 Jump Dialog Box Description

No.	Item	Description
1	Date	Specifies the date to which the marker is to jump.
2	Time	Specifies the time to which the marker is to jump.

4.6.2 Analyze Setup Dialog Box

Figure 4-22 shows the Analyze Setup dialog box, and Table 4-22 describes the dialog box.

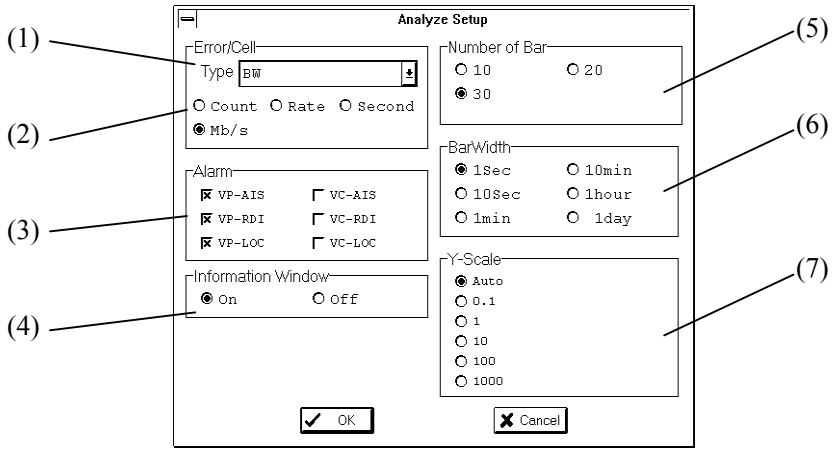


Figure 4-22 Analyze Setup Dialog Box

Table 4-22 Analyze Setup Dialog Box Description

No.	Item	Description
1	Type	Selects graph display item names.
2	Error/Cell	Selects the Y-axis unit used in the graph
3	Alarm	Specifies up to 3 types of alarm types used in the graph
4	Information Window	Activates/deactivates the information window.
5	Number of Bar	Specifies the number of bars that can be displayed on one screen.
6	Bar Width	Selects the width of a bar.
7	Y-Scale	Selects the Y-axis scale used in the graph.

4.7 Capture Setup Panel

Figure 4-23 shows the Capture Setup panel, and Table 4-23 describes the panel.

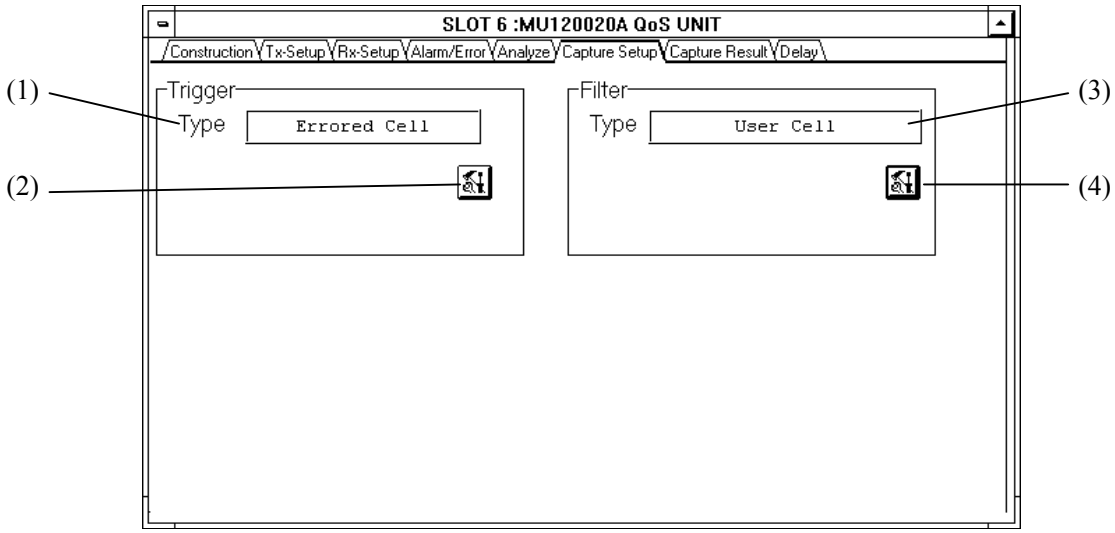


Figure 4-23 Capture Setup Panel

Table 4-23 Capture Setup Panel Description

No.	Item	Description
1	Type	Displays the capture end trigger type selected in the Trigger Setup dialog box.
2		Opens the Trigger Setup dialog box.
3	Filter	Displays the cell filter type selected in the Filter Setup dialog box.
4		Open the Filter Setup dialog box.

4.7.1 Trigger Setup Dialog Box

Figure 4-24 shows the Trigger Setup dialog box, and Table 4-24 describes the dialog box.

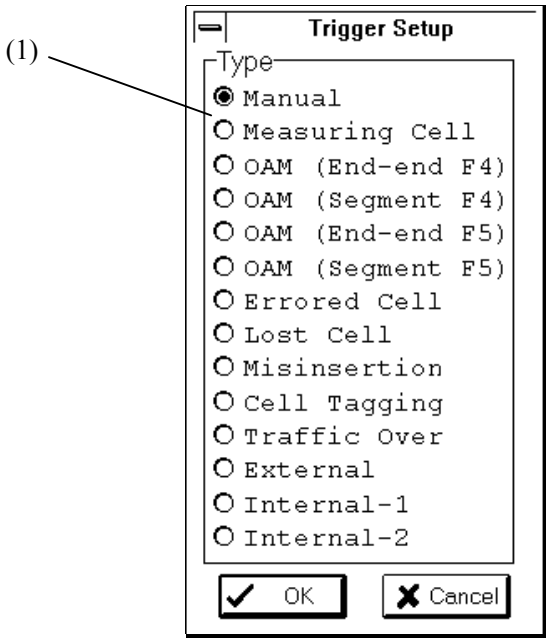


Figure 4-24 Trigger Setup Dialog Box

Table 4-24 Trigger Setup Dialog Box Description

No.	Item	Description
1	Type	Selects one of the following cell capture end triggers. Manual :Manual Measuring Cell :Measuring cell received OAM (End-end F4) :End-to-end F4OAM cell received OAM (Segment F4) :Segment F4OAM cell received OAM (End-end F5) :End-to-end F5OAM cell received OAM (Segment F5) :Segment F5OAM cell received Errored Cell :Cell error detected Lost Cell :Cell loss detected Misinserted Cell :Cell misinsertion detected Cell Tagging :Cell tagging detected Traffic Over :Non-conforming cell detected External :External input signal falling edge Internal-1 :Internal trigger signal 1 falling edge Internal-2 :Internal trigger signal 2 falling edge

4.7.2 Filter Setup Dialog Box

Figure 4-25 shows the Filter Setup dialog box, and Table 4-25 describes the dialog box.

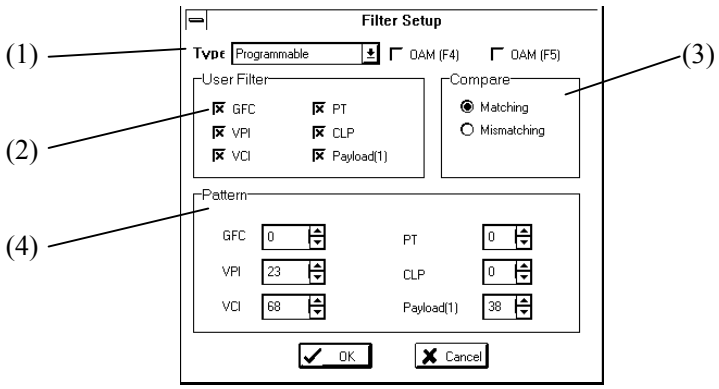


Figure 4-25 Filter Setup Dialog Box

Table 4-25 Filter Setup Dialog Box Description

No.	Item	Description
1	Type	Selects one of the following cell filter types. All Cells :Capture all cells. User Cell :Capture measurement channel cells. Programmable :Capture the header + payload (1) matching/mismatching cells
2	User Filter	Is effective when the cell filter type is the Programmable. Selects fields of capture cells.
3	Compare	Is effective when the cell filter type is the Programmable. Selects the matching/ mismatching of the cell.
4	Pattern	Is effective when the cell filter type is the Programmable. Specifies the field values of capture cells.

4.8 Capture Result Panel

Figure 4-26 shows the Capture Result panel, and Table 4-26 describes the panel.

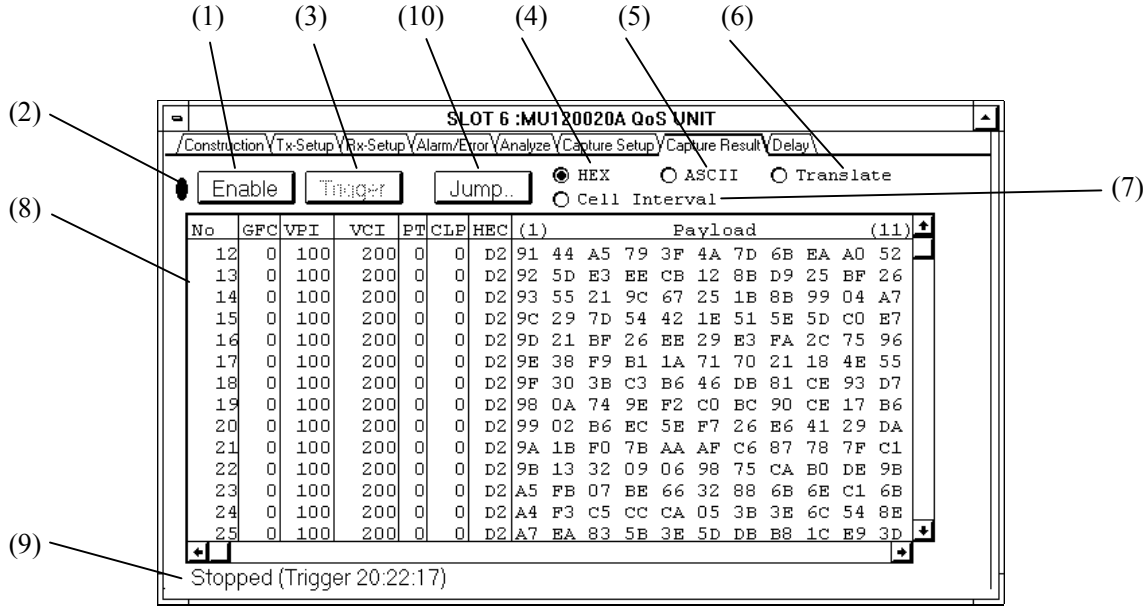


Figure 4-26 Capture Result Panel

Table 4-26 Capture Result Panel Description

No.	Item	Description
1	Enable/Stop	Displays whether or not cell capture is enabled. Enable :Pressing the button starts cell capture. Stop :Pressing the button stops cell capture.
2	●	Is turned on during cell capture operation and is turned off when the operation stops.
3	Trigger	Is effective when you selected Manual as the cell capture end trigger and when cell capture is being executed. Pressing this button generates the cell capture end trigger.
4	HEX	Displays the payload of the captured cell in the hexadecimal (HEX) format.
5	ASCII	Displays the payload of the captured cell in the ASCII format.
6	Translate	Displays the payload of the captured cell in the translation format.
7	Cell Interval	Displays the Interval between capture cells.

No.	Item	Description
8		Displays the contents of captured cells. The trigger cell (or the next cell when there is no trigger cell) is highlighted.
9		Capture status line. One of the following messages is displayed: Stopped :Cell capture stopped Waiting for Trigger :Waiting for the cell capture end trigger to begenerated Waiting for Capture End :Waiting for cell capture to end.
10	Jump..	Opens the Jump (Capture Result) dialog box.

4.8.1 Jump (Capture Result) Dialog Box

Figure 4-27 shows the Jump (Capture Result) dialog box, and Table 4-27 describes the dialog box.

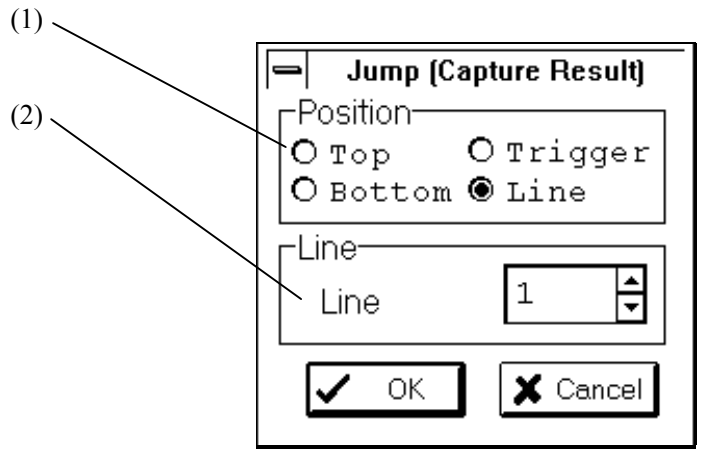


Figure 4-27 Jump (Capture Result) Dialog Box

Table 4-27 Jump (Capture Result) Dialog Box Description

No.	Item	Description
1	Position	Selects one of the following display positions at which captured cells are displayed. Top :First cell Bottom :Last cell Trigger :Trigger cell (or the next cell when there is no trigger cell) Line :Line specification
2	Line	Specifies the line on which the captured cell is displayed.

4.9 Delay Panel

Figure 4-28 shows the Delay panel, and Table 4-28 describes the panel.

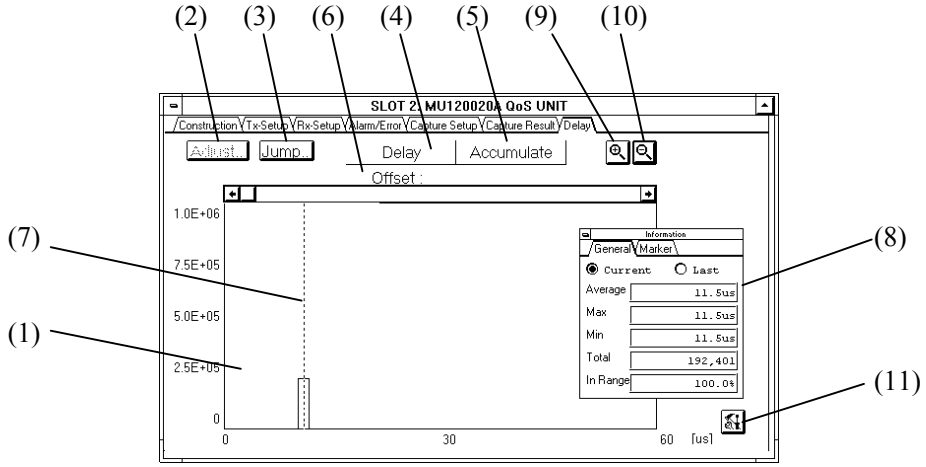


Figure 4-28 Delay Panel

Table 4-28 Delay Panel Description

No.	Item	Description
1		Displays the bar graph of the cell transfer delay measurement result.
2	Adjust..	Opens the Adjust dialog box.
3	Jump..	Opens the Jump dialog box.
4		Displays the name of the cell delay measurement type selected in the Delay Setup dialog box.
5		Displays the measurement result update method selected on the Rx-Setup panel in the Sub Measurement Setup dialog box.
6	Offset	Displays the offset value of the measurement display window for the absolute delay specified in the Adjust dialog box.
7		A marker indicating a bar in the bar graph. This may be specified by clicking on the bar or by typing a value in the Jump dialog box.
8		Information window containing information on cell transfer delay measurement results and the marker position.
9		Enlarges the bar graph with the marker as the center.
10		Reduces the bar graph with the marker as the center.
11		Opens the Delay Setup dialog box.

4.9.1 Adjust Dialog Box

Figure 4-29 shows the Adjust dialog box, and Table 4-29 describes the dialog box.

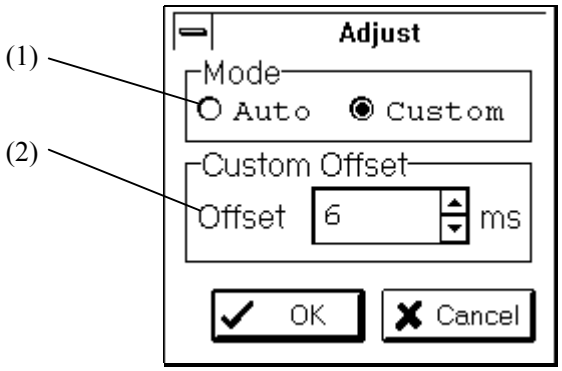


Figure 4-29 Adjust Dialog Box

Table 4-29 Adjust Dialog Box Description

No.	Item	Description
1	Mode	Selects one of the following adjustment methods for the offset of the measurement display window for the absolute delay. Auto :Automatic adjustment Custom :Adjustment by user
2	Offset	Is effective only when the user adjusts the measurement display window offset for the absolute delay. Specify an offset value.

4.9.2 Jump Dialog Box

Figure 4-30 shows the Jump dialog box, and Table 4-30 describes the dialog box.

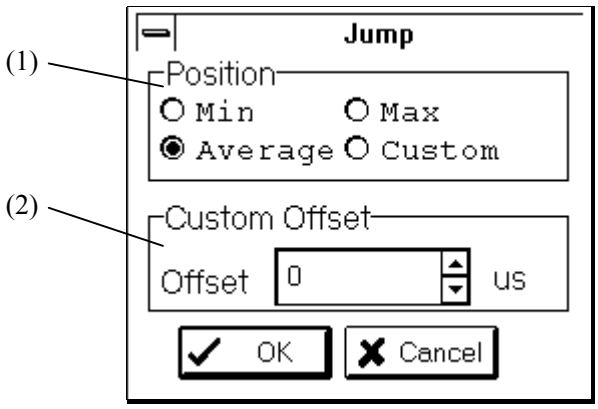


Figure 4-30 Jump Dialog Box

Table 4-30 Jump Dialog Box Description

No.	Item	Description
1	Position	Selects one of the following positions to which the marker is to jump. Min :Minimum Max :Maximum Average :Average Custom :User-specified position
2	Custom Offset	Specifies an offset value to which you want the marker to jump.

4.9.3 Delay Setup Dialog Box

Figure 4-31 shows the Delay Setup dialog box, and Table 4-31 describes the dialog box.

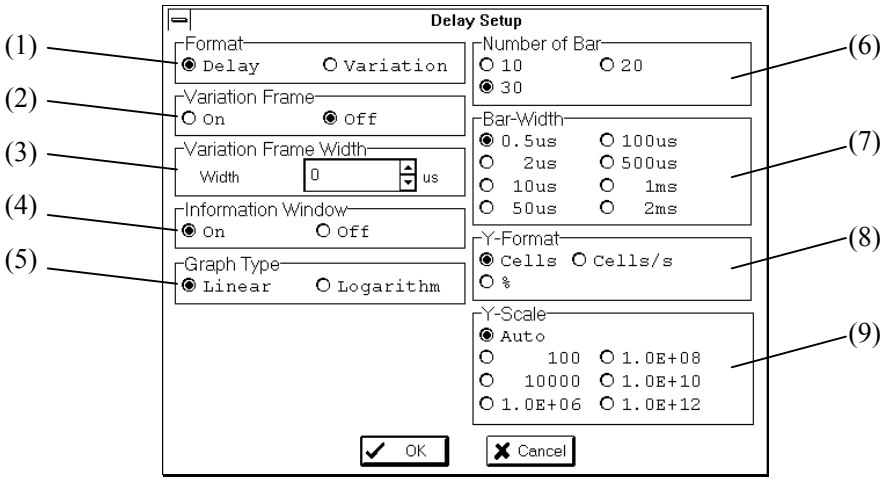


Figure 4-31 Delay Setup Dialog Box

Table 4-31 Delay Setup Dialog Box Description

No.	Item	Description
1	Format	Selects one of the following cell delay measurement types. Delay :Cell transfer delay Variation :Cell delay variation
2	Variation Frame	Is effective when you select Variation for the cell delay measurement type. Specify whether or not the variation frame is displayed.
3	Variation Frame Width	Is effective when you selects Variation for the cell delay measurement type. Specify a variation frame width.
4	Information Window	Specifies whether to display the information window.
5	Graph Type	Selects one of the following graph types:

No.	Item	Description
		Linear :Linear graph Logarithm :Logarithm graph
6	Number of Bar	Specifies the number of bars that can be displayed on one screen.
7	Bar-Width	Selects the width of a bar.
8	Y-Format	Selects the unit of the Y-axis in the graph.
9	Y-Scale	Selects the scale of the Y-axis in the graph.

4.10 Cell Interval Panel

Figure 4-32 shows the Cell Interval panel, and Table 4-32 describes the panel.

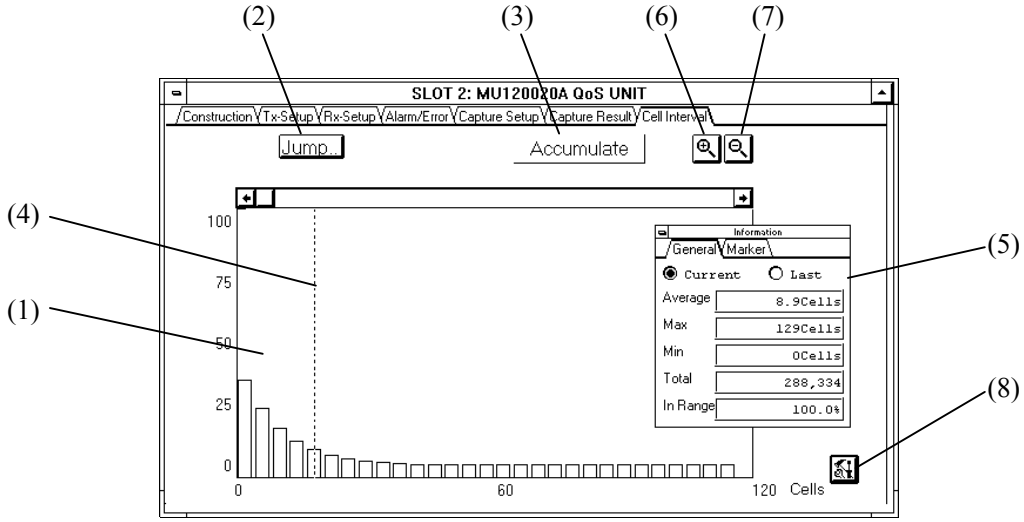


Figure 4-32 Cell Interval Panel

Table 4-32 Cell Interval Panel Description

No.	Item	Description
1		Displays the bar graph of the cell interval measurement result.
2	Jump..	Opens the Jump dialog box.
3		Displays the measurement result update method selected on the Rx-Setup panel in the Sub Measurement Setup dialog box.
4		A marker indicating a bar in the bar graph. This may be specified by clicking on the bar or by typing a value in the Jump dialog box.
5		Information window containing information on cell interval measurement results and the marker position.
6		Enlarges the bar graph with the marker as the center.
7		Reduces the bar graph with the marker as the center.
8		Opens the Cell Interval Setup dialog box.

4.10.1 Jump Dialog Box

Figure 4-33 shows the Jump dialog box, and Table 4-33 describes the dialog box.

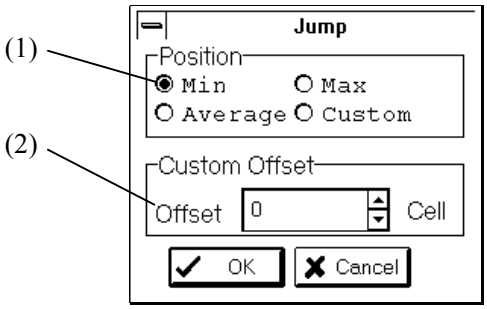


Figure 4-33 Jump Dialog Box

Table 4-33 Jump Dialog Box Description

No.	Item	Description
1	Position	Selects one of the following positions to which you want the marker to jump. Min :Minimum Max :Maximum Average :Average Custom :User-specified value
2	Custom Offset	Specifies the offset to which the marker is to jump.

4.10.2 Cell Interval Setup Dialog Box

Figure 4-34 shows the Cell Interval Setup dialog box, and Table 4-34 describes the dialog box.

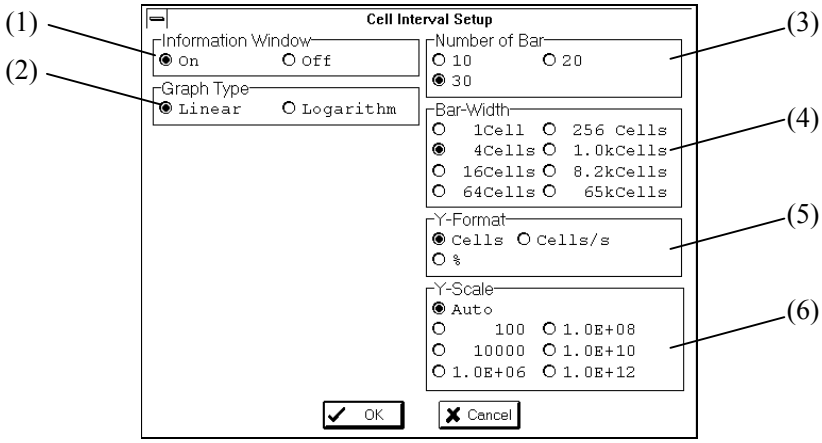


Figure 4-34 Cell Interval Setup Dialog Box

Table 4-34 Cell Interval Setup Dialog Box Description

No.	Item	Description
1	Information Window	Specifies whether to display the information window.
2	Graph Type	Selects one of the following graph types. Linear :Linear graph Logarithm :Logarithm graph
3	Number of Bar	Specifies the number of bars that can be displayed on one screen.
4	Bar-Width	Selects the width of a bar.
5	Y-Format	Selects the unit of the Y-axis in the graph.
6	Y-Scale	Selects the scale of the Y-axis in the graph.

4.11 1-point CDV Panel

Figure 4-35 shows the Cell Interval panel, and Table 4-35 describes the panel.

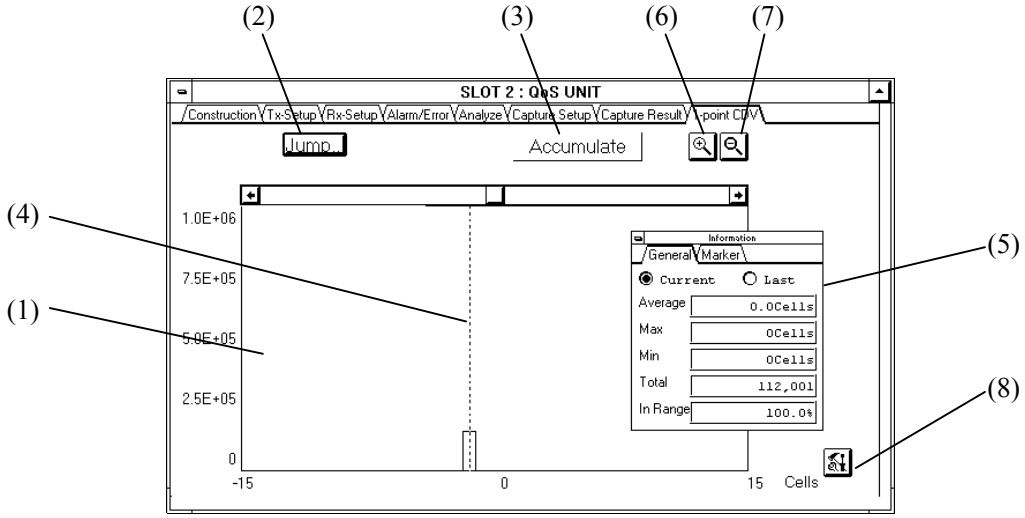


Figure 4-35 1-point CDV Panel

Table 4-35 1-point CDV Panel Description

No.	Item	Description
1		Displays the bar graph of the 1-point CDV measurement result.
2	Jump..	Opens the Jump dialog box.
3		Displays the measurement result update method selected on the Rx-Setup panel in the Sub Measurement Setup dialog box.
4		A marker indicating a bar in the bar graph. This may be specified by clicking on the bar or by typing a value in the Jump dialog box.
5		Information window containing information on 1-point CDV measurement results and the marker position.
6		Enlarges the bar graph with the marker as the center.
7		Reduces the bar graph with the marker as the center.
8		Opens the 1-point CDV Setup dialog box.

4.11.1 Jump Dialog Box

Figure 4-36 shows the Jump dialog box, and Table 4-36 describes the dialog box.

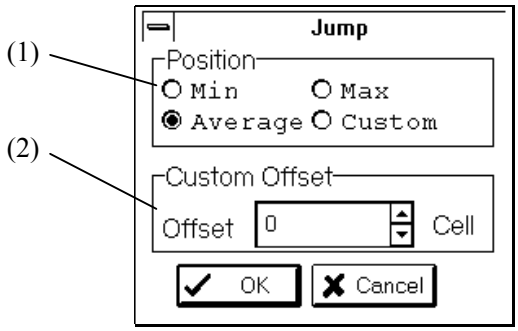


Figure 4-36 Jump Dialog Box

Table 4-36 Jump Dialog Box Description

No.	Item	Description
1	Position	Selects one of the following positions to which you want the marker to jump. Min :Minimum Max :Maximum Average :Average Custom :User-specified value
2	Custom Offset	Specifies the offset to which the marker is to jump.

4.11.2 1-point CDV Dialog Box

Figure 4-37 shows the Cell Interval Setup dialog box, and Table 4-37 describes the dialog box.

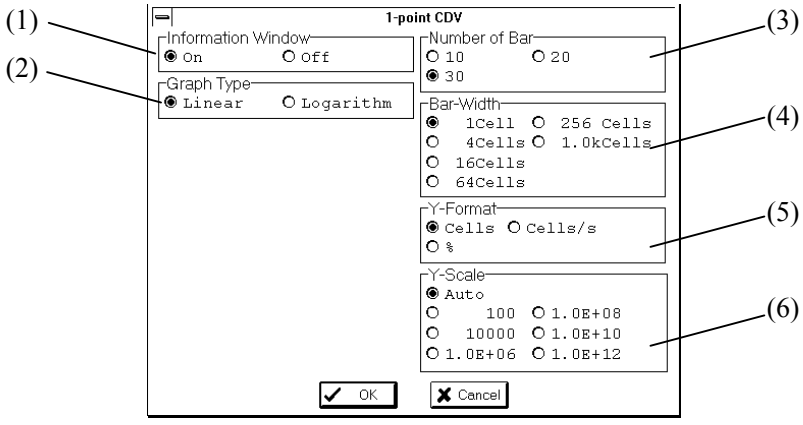


Figure 4-37 1-point CDV Dialog Box

Table 4-37 1-point CDV Dialog Box Description

No.	Item	Description
1	Information Window	Specifies whether to display the information window.
2	Graph Type	Selects one of the following graph types. Linear :Linear graph Logarithm :Logarithm graph
3	Number of Bar	Specifies the number of bars that can be displayed on one screen.
4	Bar-Width	Selects the width of a bar.
5	Y-Format	Selects the unit of the Y-axis in the graph.
6	Y-Scale	Selects the scale of the Y-axis in the graph.

4.12 Live Monitor Panel

Figure 4-38 shows the Live Monitor panel, and Table 4-38 describes the panel.

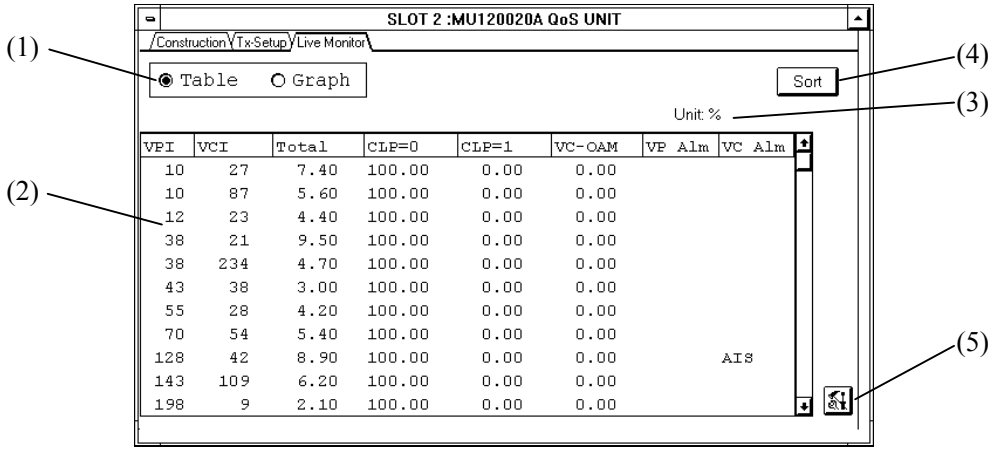


Figure 4-38 Live Monitor Panel

Table 4-38 Live Monitor Panel Description

No.	Item	Description
1		Selects one of the following live monitor result display formats: Table :Table format Graph :Graph format
2		Displays the live monitor results. VPI :VPI value VCI :VCI value Total :Total number of received cells CLP=0 :Total number of CLP=0 received cells CLP=1 :Total number of CLP=1 received cells VC-OAM(VP-OAM) :VC-OAM(VP-OAM) cells except AIS/RDI cells VP Alm :Whether or not VP-AIS/VP-RDI status exists VC Alm :Whether or not VC-AIS/VC-RDI status exists
3	Unit	Displays the live monitor result display unit selected in the Live Monitor Setup (Items) dialog box.
4	Sort	Opens the Live Monitor Setup (Sort) dialog box.
5		Opens the Live Monitor Setup (Items) dialog box.

4.12.1 Live Monitor Setup (Items) Dialog Box

Figure 4-39 shows the Live Monitor Setup (Items) dialog box, and Table 4-39 describes the dialog box.

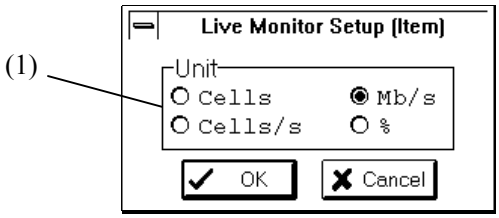


Figure 4-39 Live Monitor Setup (Items) Dialog Box

Table 4-39 Live Monitor Setup (Items) Dialog Box Description

No.	Item	Description
1	Unit	Selects the live monitor result display unit.

4.12.2 Live Monitor Setup (Sort) Dialog Box

Figure 4-40 shows the Live Monitor Setup (Sort) dialog box, and Table 4-40 describes the dialog box.

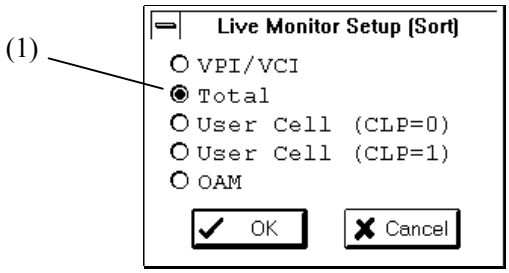


Figure 4-40 Live Monitor Setup (Sort) Dialog Box

Table 4-40 Live Monitor Setup (Sort) Dialog Box Description

No.	Item	Description
1		Selects the sequence in which live monitor results are displayed.

4.13 File Menu of MP1220A ATM Quality Analyzer Window

With the QoS unit inserted into the MP1220A ATM Quality Analyzer, you can open the following dialog boxes from the File menu of the MP1220A ATM Quality Analyzer window.

- Open dialog box
- Save dialog box
- Save As dialog box
- Print dialog box

4.13.1 Open Dialog Box

Figure 4-41 shows the Open dialog box, and Table 4-41 describes the dialog box.

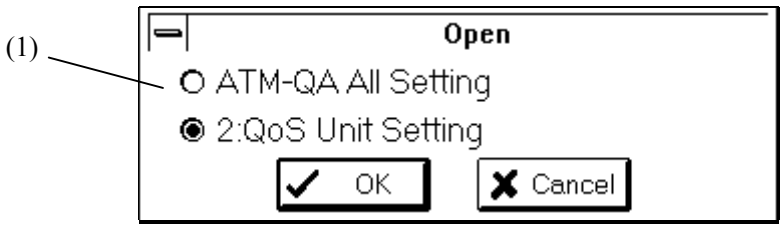


Figure 4-41 Open Dialog Box

Table 4-41 Open Dialog Box Description

No.	Item	Description
1		Specifies the file you want to open. ATM-QA All Setting :All the MP1220A ATM quality analyzer settings ∗:QoS Unit Setting :QoS unit setting

4.13.2 Save Dialog Box

Figure 4-42 shows the Save dialog box, and Table 4-42 describes the dialog box.

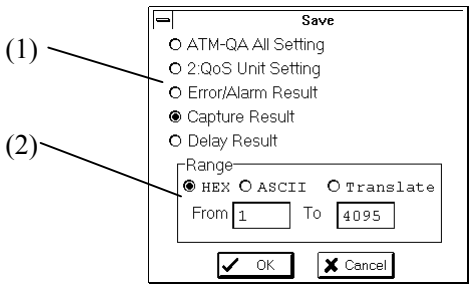


Figure 4-42 Save Dialog Box

Table 4-42 Save Dialog Box Description

No.	Item	Description
1		Specifies the file you want to save. ATM-QA All Setting :All the MP1220A ATM quality analyzer settings ∗:QoS Unit Setting :QoS unit setting Error/Alarm Result :Error/alarm measurement result Capture Result :Cell capture result Delay Result :Cell delay measurement result Cell Interval Result :Cell interval measurement result 1-point CDV :1-point CDV measurement result Live Result :Live monitor result
2	Range	Specifies the save range.

4.13.3 Save As Dialog Box

Figure 4-43 shows the Save As dialog box, and Table 4-43 describes the dialog box.

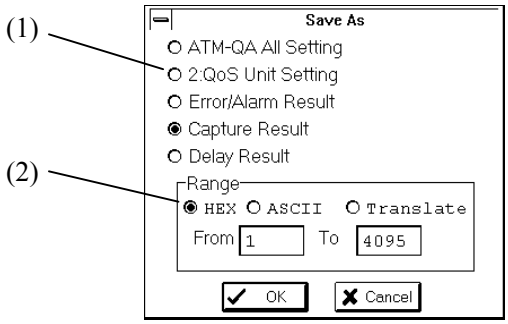


Figure 4-43 Save As Dialog Box

Table 4-43 Save As Dialog Box Description

No.	Item	Description
1		Specifies the file you want to "save as" (name and save). ATM-QA All Setting :All the MP1220A ATM quality analyzer settings ∗:QoS Unit Setting :QoS unit setting Error/Alarm Result :Error/alarm measurement result Capture Result :Cell capture result Delay Result :Cell delay measurement result Cell Interval Result :Cell interval measurement result 1-point CDV :1-point CDV measurement result Live Result :Live monitor result
2	Range	Specifies the save range.

4.13.4 Print Dialog Box

Figure 4-44 shows the Print dialog box, and Table 4-44 describes the dialog box.

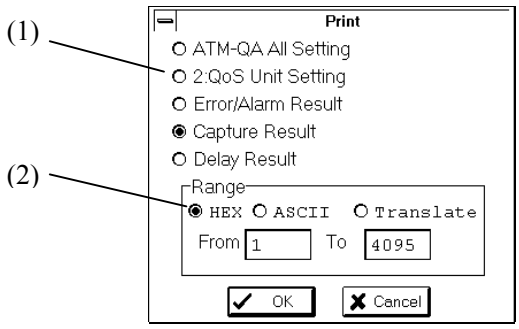


Figure 4-44 Print Dialog Box

Table 4-44 Print Dialog Box Description

No.	Item	Description
1		Specifies the file you want to print. ATM-QA All Setting :All the MP1220A ATM quality analyzer settings *:QoS Unit Setting :QoS unit setting Error/Alarm Result :Error/alarm measurement result Capture Result :Cell capture result Delay Result :Cell delay measurement result Cell Interval Result :Cell interval measurement result 1-point CDV :1-point CDV measurement result Live Result :Live monitor result
2	Range	Specifies the print range.

Section 5 MEASUREMENT

5.1 How to Send Cells

This section explains how to set up the contents of cells (foreground cell, background cell, and OAM cell), how to specify a transmission rate, and how to send them.

5.1.1 Specifying Transmission Channel Default Values

The following explains how to specify default values for a transmission channel (VPI/PCI). You can use the default values for the transmission channel when setting up transmission cells (foreground cell, background cell, OAM cell).

1. Open the Channel Setup dialog box on the Construction panel.

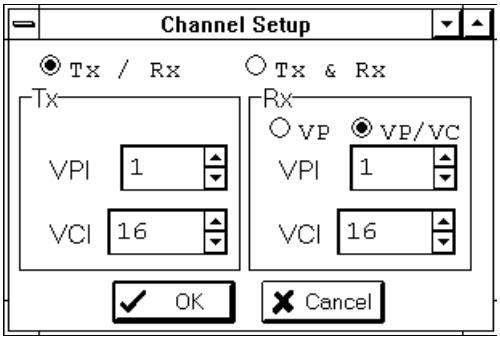


Figure 5-1 Channel Setup Dialog Box

2. With the Option button in the Channel Setup dialog box, specify whether or not the transmission channel and reception channel are to be set up independently.
3. Specify the default values for the transmission channel in the VPI and VCI text boxes in the Tx group box (or, "Tx & Rx" group box if you selected "Tx & Rx" in step 2).
4. To enable the settings of the Channel Setup dialog box, press the OK button; to cancel the setting, press the Cancel button.

5.1.2 Specifying Foreground Cells

The following explains how to specify the type of a foreground cell and its transmission timing.

1. Open the Foreground Cell Setup dialog box on the Tx-Setup panel and display the Cell panel.

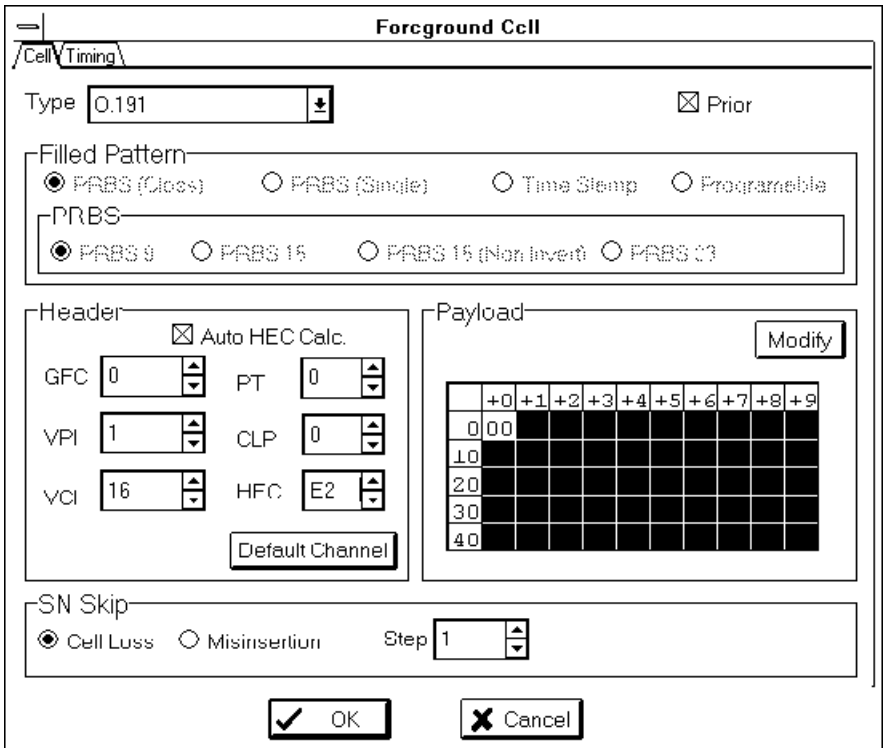


Figure 5-2 Cell Panel

2. From the Type drop-down list box, select the type of the cell to be sent. The parameters you will specify depend on the selected cell type. The following explains how to specify parameters when you select the O.191 test cell as the foreground cell.
3. Specify the O.191 test cell header value in the text box in the Header group box. Use the check box as necessary.
4. To skip the SN value during transmission of the O.191 test cell to generate a cell loss or a cell misinsertion, specify parameters in the SN Skip group box.
5. With the Prior check box, specify which transmission timing has priority: foreground cell transmission timing or the background cell transmission priority timing (this is specified in 5.1.3). If you turn on this check box, the foreground transmission timing has priority.
6. To enable the setting on the Cell panel, press the OK button; to cancel it, press the Cancel button.
7. Open the Foreground Cell Setup dialog box on the Tx-Setup panel and display the Timing panel.

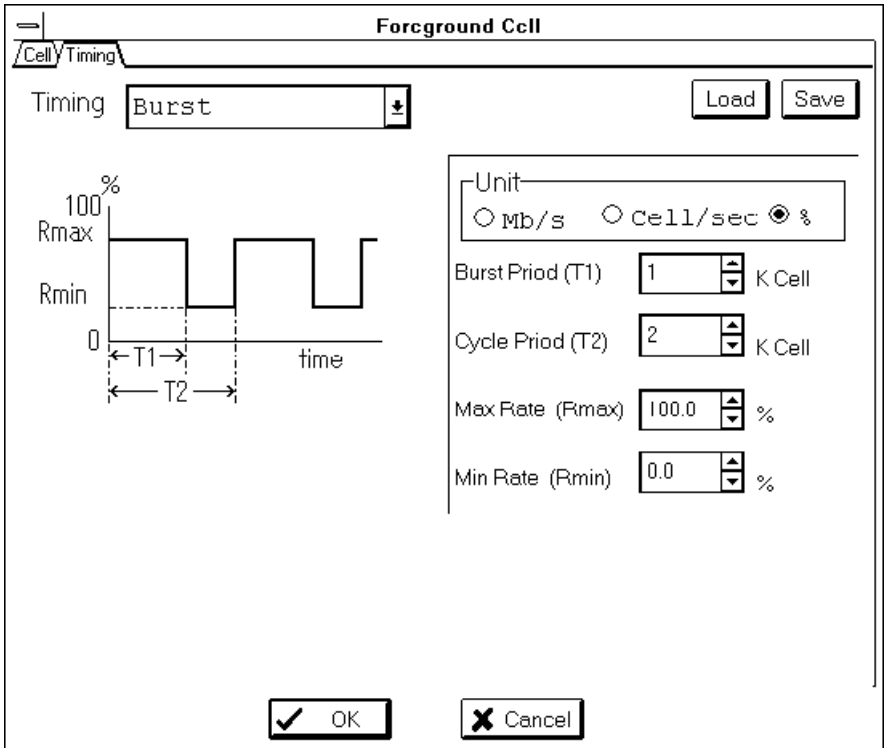


Figure 5-3 Timing Panel

8. From the Timing drop down list box, select the transmission timing of foreground cells.
9. The bit map and the text boxes corresponding to the selected transmission timing appears on the Timing panel. Specify the parameters for the selected transmission timing by the text boxes. Press the Option button in the Unit group box to select the unit of the setting value.
10. To enable the setting on the Timing panel, press the OK button; to cancel it, press the Cancel button.

5.1.3 Specifying Background Cells

The following explains how to specify the contents of background cells and their transmission timings.

1. Open the Background Cell Setup dialog box on the Tx-Setup panel and display the Timing panel.

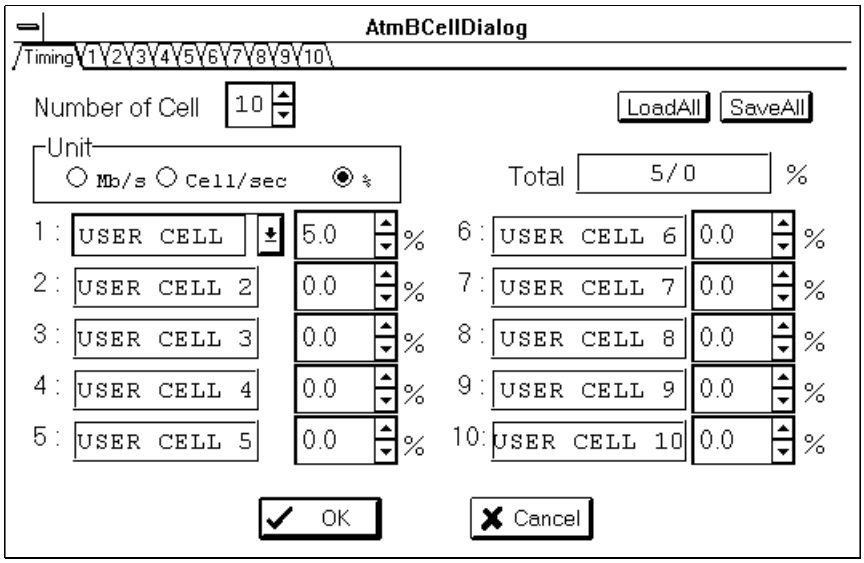


Figure 5-4 Timing Panel

2. In the Number of Background Cells text box, specify the number of background cell types to be generated. Up to 10 types may be specified.
3. In the transmission rate text box, specify the transmission cell rate of each background cell. You can also specify the unit of a setting value with the Option button in the Unit group box. Note that the background cell names are displayed to the left of the Cell Rate text box.
4. To enable the setting on the Timing panel, press the OK button; to cancel it, press the Cancel button.
5. Open the Background Cell Setup panel on the Tx-Setup panel and display the 1 panel.

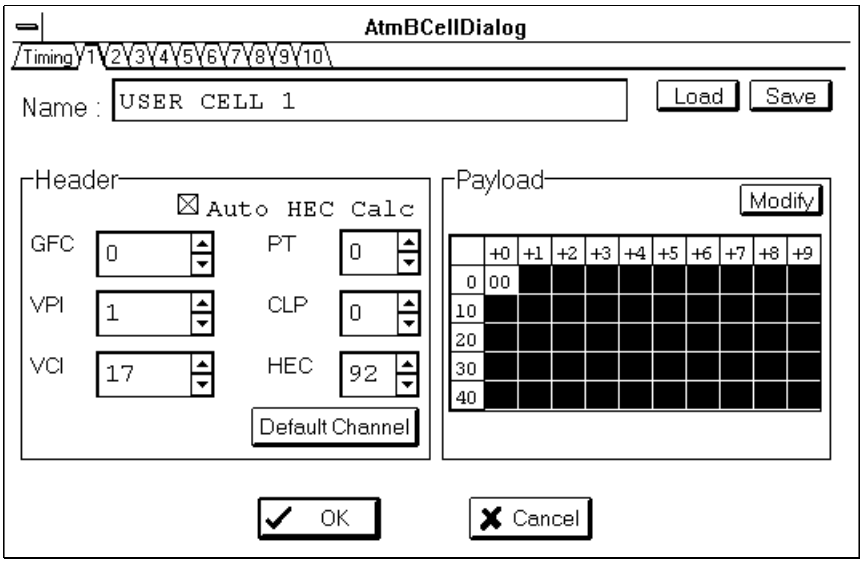


Figure 5-5 1 Panel

6. Specify the background cell name in the Name text box as necessary.
7. Specify the header value of the background cell in the text box in the Header group box. Use the check box as necessary.
8. Specify the payload value of the background cell in the text box in the Payload group box. To specify 1- to 4-byte patterns repeatedly, press the Modify button in the Payload group box; the Modify dialog box will appear.
9. To enable the setting on the 1 panel, press the OK button; to cancel it, press the Cancel button
10. Depending upon the number of background cell types to be generated, repeat steps 6 to 9 using 2 to 10 panels.

5.1.4 Specifying OAM Cells

The following explains how to specify the OAM cell type and its transmission timing.

1. Open the OAM/Error Addition Cell Setup dialog box on the Tx-Setup panel and display the OAM panel.

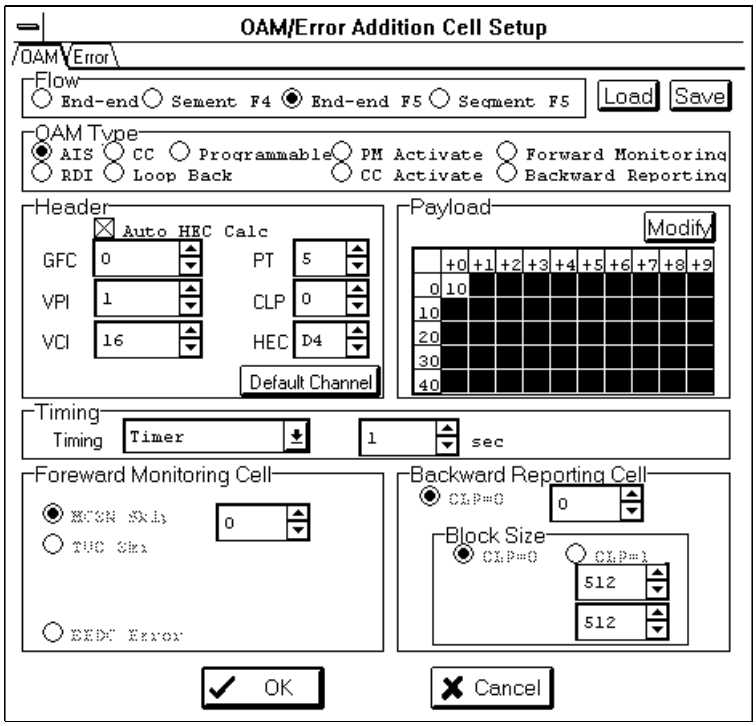


Figure 5-6 OAM Panel

2. From the Flow group box, select the OAM flow of the OAM cell to be sent.
3. From the OAM Type group box, select the type of the OAM cell to be sent. The parameters you will specify depend on the selected cell type. The following explains how to specify parameters when you select the AIS cell as the OAM cell.
4. In the text box in the Header group box, specify the OAM cell header value. Use the check box as necessary.

Note

The VCI value or PT value is determined according to the OAM flow you selected in step 2.

End-to-end F4 flow selected	: VCI = 4
Segment F4 flow selected	: VCI = 3
End-to-end F5 flow selected	: PT = 5
Segment F5 flow selected	: PT = 4

5. Specify the payload value of the background cell in the text box in the Payload group box. To specify 1- to 4-byte patterns repeatedly, press the Modify button in the Payload group box; the Modify dialog box will appear.

Note

Depending upon the type of the OAM cell you selected in step 3, the position of the bytes within the payload in which you can specify data varies.

6. Select the OAM cell transmission timing from the Timing drop down list in the Timing group box.
7. To enable the setting on the OAM panel, press the OK button; to cancel it, press the Cancel button.

5.1.5 Specifying Bit Errors/Cell Losses

The following explains how to add bit errors and cell losses into one or more cells to be sent by this unit.

1. Open the OAM/Error Addition Cell Setup dialog box on the Tx-Setup panel and display the Error panel.

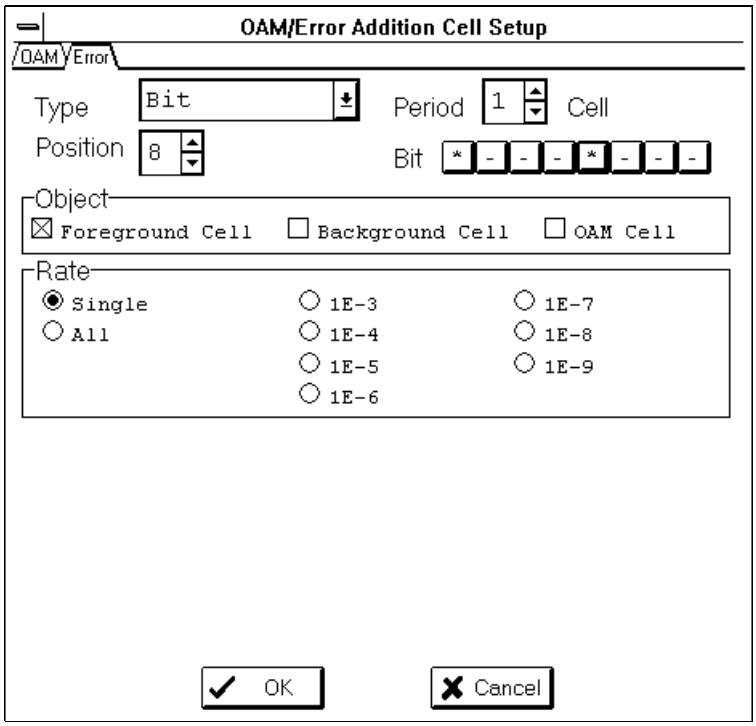


Figure 5-7 Error Panel

2. Select an error type from the Type drop down list box. The parameters you will specify depend on the selected error type. The following explains how to specify parameters when you select bit error addition as the error type.
3. From the Objet group box, select a cell group to which errors will be added.
4. In the Position text box, specify the position of the byte relative to the beginning of the cell in which bit errors are to be added.
5. Press the Bit button to select the position of a bit in which the bit error is to be added.
6. Select a bit error rate from the Rate group box.
7. Except when you have specified, in step 6, that the bit error is added to all the cells, specify the number of burst bit error cells in the Period text box.
8. To enable the setting on the Error panel, press the OK button; to cancel it, press the Cancel button.

5.1.6 Cell Transmission and Error Addition

The following explains how to send specified cells and how to add errors to those cells.

1. Display the Tx-Setup panel.

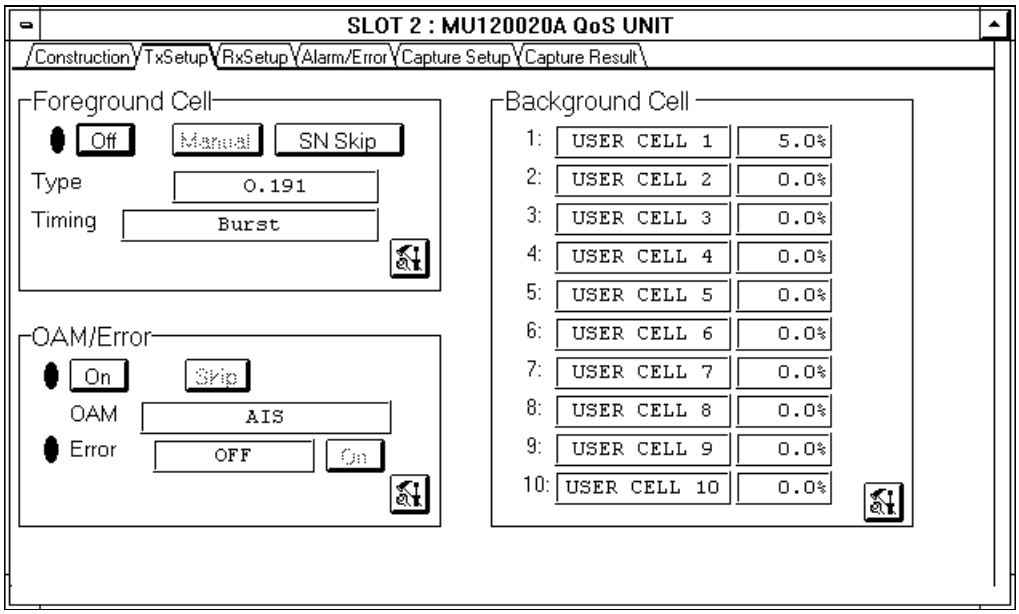


Figure 5-8 Tx-Setup Panel

2. Press the On/Off button in the Foreground Cell group box to send foreground cells and background cells. The LED to the left of the On/Off button is turned on during transmission.

Note

The display of the On/Off button and the LED may not be different from the timing that cells are actually being sent.

3. Press the On/Off button in the OAM/Error group box to send OAM cells. The LED to the left of the On/Off button is turned on during transmission.

Note

The display of the On/Off button and the LED may not be different from the timing that cells are actually being sent.

4. To skip the SN value of the O.191 test cell, press the SN Skip button in the Foreground Cell group. Each time you press the SN Skip button, the SN value is skipped. To add bit errors, press the Error On/Off button in the OAM/Error group box. The LED to the left of the On/Off button is turned on while bit errors are added.

Note

The display of the On/Off button and the LED may not be different from the timing that bit errors are actually being added..

5.2 How to Monitor Channels

The following explains how to display the live monitor setting and its results:

5.2.1 Specifying the Monitor Channels

The following explains how to specify monitor channels:

1. First, specify monitor channels. Monitor channels may be specified in one of two ways: the user manually specifies monitor channels or use monitor channel automatic search function.. In either case, up to 1023 channels may be specified. They are specified on the interface unit. For how to specify them, see the interface unit operation manual.

5.2.2 Starting/Stopping the Live Monitor

The following explains how to start and stop the live monitor.

1. Display the Live Monitor panel.

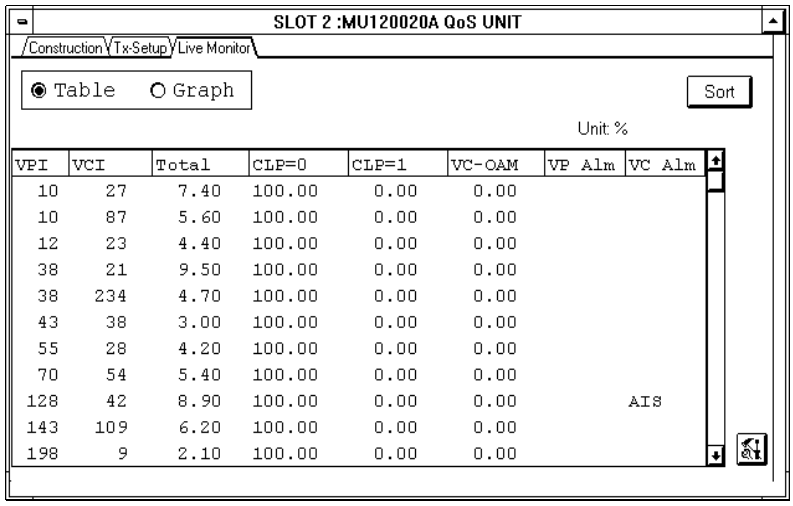


Figure 5-9 Live Monitor Panel

2. The monitor channels (VPI/VCI values) specified in 5.2.1 are displayed.
3. To start or stop the live monitor, use the Start button or Stop button on tool bar 2 in the MP1220A ATM Quality Analyzer dialog box. For more information, see the MP1220A ATM quality analyzer operation manual.

5.2.3 Displaying Live Monitor Results

The following explains how to display live monitor results:

1. The live monitor results are displayed on the Live Monitor panel. To change the monitor value unit, use the Live Monitor Setup (Items) dialog box. You can open this dialog box with the Set button,
2. Sort the monitor items as necessary. To sort monitor items, press the Sort button to open the Live Monitor Setup (Sort) dialog box.
3. Live monitor results are displayed in one of two formats: table format and graph format. You can switch between two formats with the Option button. Note that, when you select the graph format, VC-OAM (VP-OAM), VP Alm and VC Alm monitor results are not displayed.

5.3 How to Measure the Alarm/Error

The following explains how to specify alarm/error measurement and how to display alarm/error measurement results:

5.3.1 Specifying a Reception Channel

The following explains how to specify a reception channel:

1. Open the Channel Setup dialog box on the Construction panel.

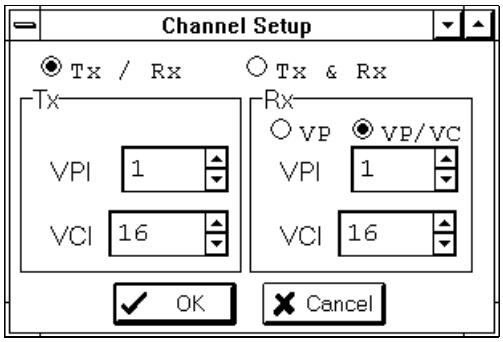


Figure 5-10 Channel Setup Dialog Box

2. Press the Option button in the Channel Setup dialog box to specify whether a transmission channel and a reception channels operate independently of each other.
3. Specify a reception channel in the VPI and VCI text boxes in the Rx group box. Note that, when you select VP with the Option button in the Rx group box, you cannot specify a VCI value. (Specify a reception channel in the Tx & Rx group box if you selected Tx & Rx in step 2).
4. To enable the setting on the Channel Setup dialog box, press the OK button; to cancel it, press the Cancel button.

5.3.2 Specifying Alarm/Error Measurement Conditions

The following explains how to specify alarm/error measurement conditions:

1. Open the Alarm/Error measurement Setup dialog box on the Rx-Setup panel.

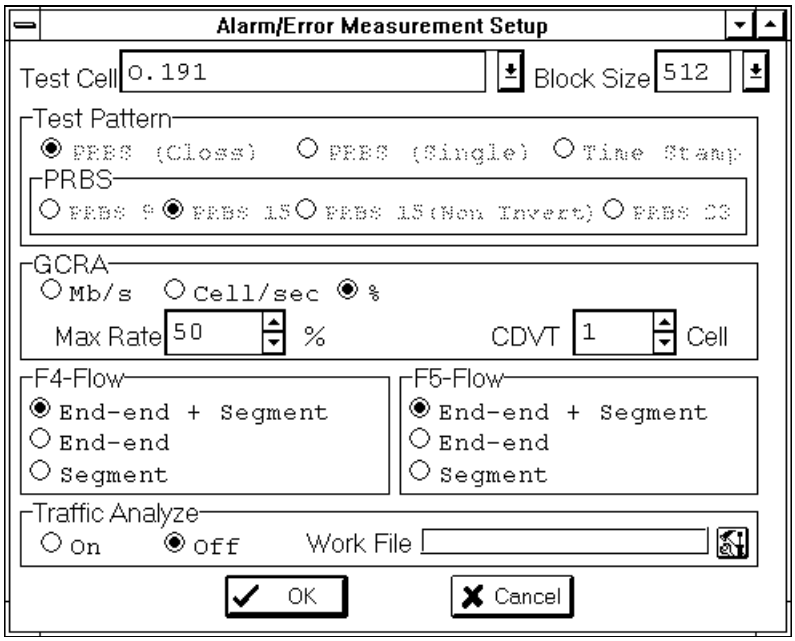


Figure 5-11 Alarm/Error measurement Setup Dialog Box

2. From the Test Cell drop down list box, select the type of reception cells for which error measurement is to be performed. The parameters you will specify depend on the selected cell type. The following explains how to specify parameters when you select the O.191 test cell as the error measurement cell.
3. Select a cell block size from the Block Size drop down list box.
4. In the PCR text box and CDVT text box in the GCRA group box, specify the PCR and CDVT to detect non-conforming cells.
5. Use the Option button in the F4-Flow group box or F5-Flow group box to select the OAM flow type to be used during alarm measurement.

Note

The F5 group is invalidly displayed if you selected VP measurement in 5.3.1.

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6. To enable the setting in the Alarm/Error measurement Setup dialog box, press the OK button; to cancel it, press the Cancel button.
7. Open the Layout dialog box on the Alarm/Error panel.

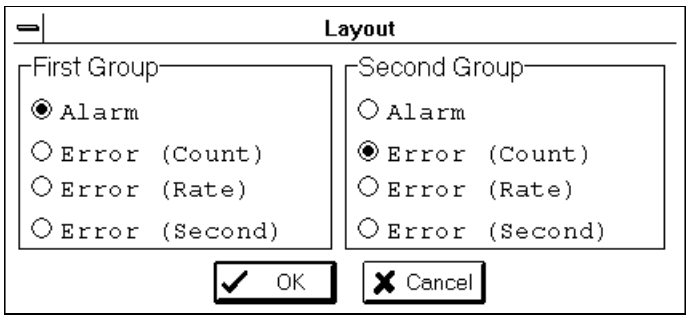


Figure 5-12 Layout Dialog Box

8. Specify alarm/error measurement results you want to display. Measurement results are displayed in two groups. In the First Group group box or Second Group group box, press the Option button associated with an item you want to display.
9. To enable the setting on the Layout dialog box, press the OK button; to cancel it, press the Cancel button.

5.3.3 Starting/Stopping Alarm/Error Measurement

The following explains how to start and stop alarm/error measurement:

1. To start or stop alarm/error measurement, press the Start button or Stop button on tool bar 2 in the MP1220A ATM Quality Analyzer dialog box. For more information, see the MP1220A ATM quality analyzer operation manual.

5.3.4 Displaying Alarm/Error Measurement Results

The following explains how to display alarm/error measurement results:

1. Display the Alarm/Error panel.

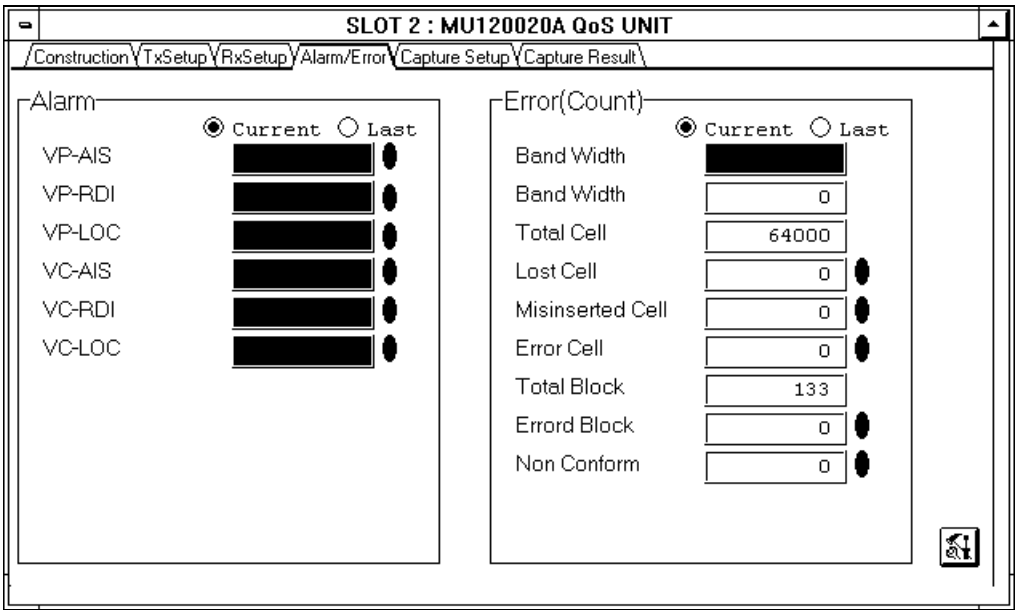


Figure 5-13 Alarm/Error Panel

2. Measurement results corresponding to the measurement result display items you specified on the Alarm/Error panel in 5.3.2 are displayed. To change the display mode, press the Option button associated with a mode you want to display in the group box.

5.4 How to Measure the Cell Transfer Delay

The following explains how to specify cell transfer delay measurement and how to display cell transfer delay measurement results:

5.4.1 Specifying a Reception Channel

Specify a reception channel. For the procedure, see 5.3.1.

5.4.2 Specifying Cell Transfer Delay Measurement Conditions

Specify cell transfer delay measurement conditions.

1. Open the Alarm/Error measurement Setup dialog box on the Rx-Setup panel.

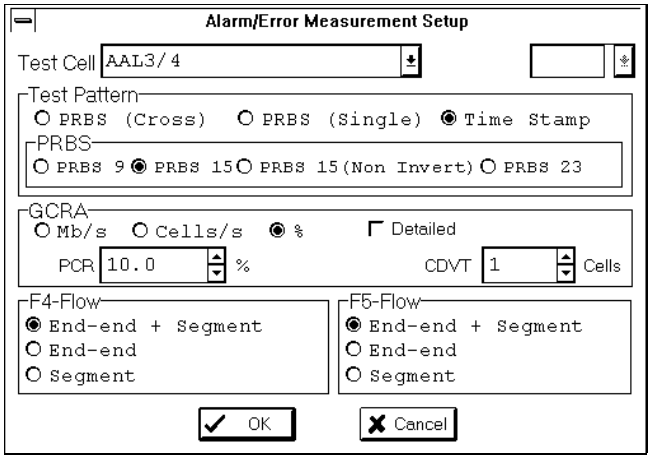


Figure 5-14 Alarm/Error measurement Setup Dialog Box

2. From the Test Cell drop down list, select the type of reception cells for which cell transfer delay measurement is to be performed.

Note

Cell transfer deley measurement can be performed only for O.191 test cells, extended O.191 test cells, Null cells, AAL1 cells, and AAL3/4 cells.

3. Select Time Stamp from the Test Pattern group box using Option buttons if you selected Null cells, AAL1 cells, or AAL3/4 cells in step 2.
4. To enable the setting on the Alarm/Error measurement Setup dialog box, press the OK button; to cancel it, press the Cancel button.
5. Open the Sub Measurement Setup dialog box on the Rx-Setup panel.

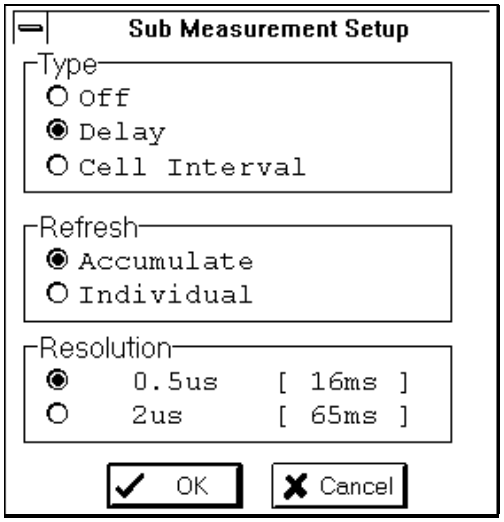


Figure 5-15 Sub Measurement Setup Dialog Box

6. Select Delay from the Type group box.
7. Select the measurement result update method for cell delay measurement from the Refresh group box.
8. From the Resolution group box, select a measurement resolution and a measurement display window width for cell delay measurement.
9. To enable the setting on the Sub Measurement Setup dialog box, press the OK button; to cancel it, press the Cancel button.
10. Open the Adjust dialog box on the Delay panel.

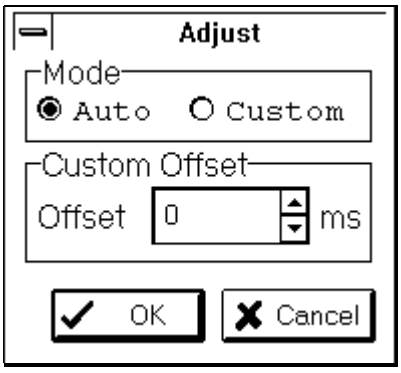


Figure 5-16 Adjust Dialog Box

11. From the Mode group box, select the adjustment method of the measurement display window offset value for the absolute delay time.
12. If you selected Custom in step 11, specify an offset value in the Custom Offset group box.
13. To enable the setting on the Adjust dialog box, press the OK button; to cancel it, press the Cancel button.
14. Open the Delay Setup dialog box on the Delay panel.

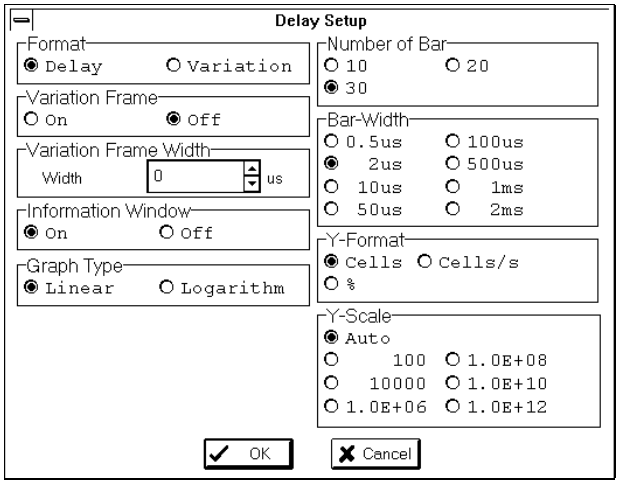


Figure 5-17 Delay Setup Dialog Box

15. To perform cell transfer delay measurement, select Delay using the corresponding Option button in the Format group box.
16. Select the graph type, number of bars that can be displayed on one screen, bar width, Y-axis unit, and Y-axis scale from the Graph Type group box, Number of Bar group box, Bar-Width group box, Y-Format group box, and Y-Scale group box, respectively.
17. To enable the setting on the Delay Setup dialog box, press the OK button; to cancel it, press the Cancel button.

5.4.3 Starting/Stopping Cell Transfer Delay Measurement

The following explains how to start and stop cell transfer delay measurement:

1. To start or stop cell transfer delay measurement, use the Start button or Stop button on tool bar 2 in the MP1220A ATM Quality Analyzer dialog box. For more information, see the MP1220A ATM quality analyzer operation manual.

5.4.4 Displaying Cell Transfer Delay Measurement Results

The following explains how to display cell transfer delay measurement results:

1. Display the Delay panel.

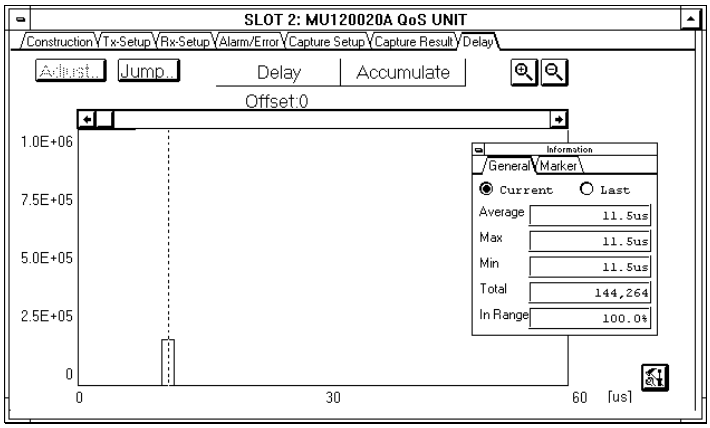


Figure 5-18 Delay Panel

2. Measurement results are displayed on the Delay panel. For details about measurement results, open the Delay Setup dialog box on the Delay panel and select On from the Information Window group box using the Option button. The information window will open on the Delay panel.

Average	**Displays the average cell transfer delay time.**
Max	**Displays the maximum cell transfer delay time.**
Min	**Displays the minimum cell transfer delay time.**
Total	**Displays the number of cells in the measurement display window.**
In Range	**Displays the ratio of the number of cells in the measurement display window to the total number of cells on the reception channel**.

3. To get the number of cells during a cell transfer delay time, display the marker at the position of the bar corresponding to the cell transfer delay time. Click on the bar or press the Jump button on the Delay panel. The Jump dialog box will open. The marker information is displayed on the Marker panel in the information window.

5.5 How to Capture Cells

The following explains how to specify cell capture parameters and how to display capture results:

5.5.1 Specifying Reception Channels

Specify reception channel parameters. For the procedure, see 5.3.1.

5.5.2 Specifying Cell Capture

The following explains how to specify capture cells and a capture end trigger:

1. Display the Capture Setup panel.

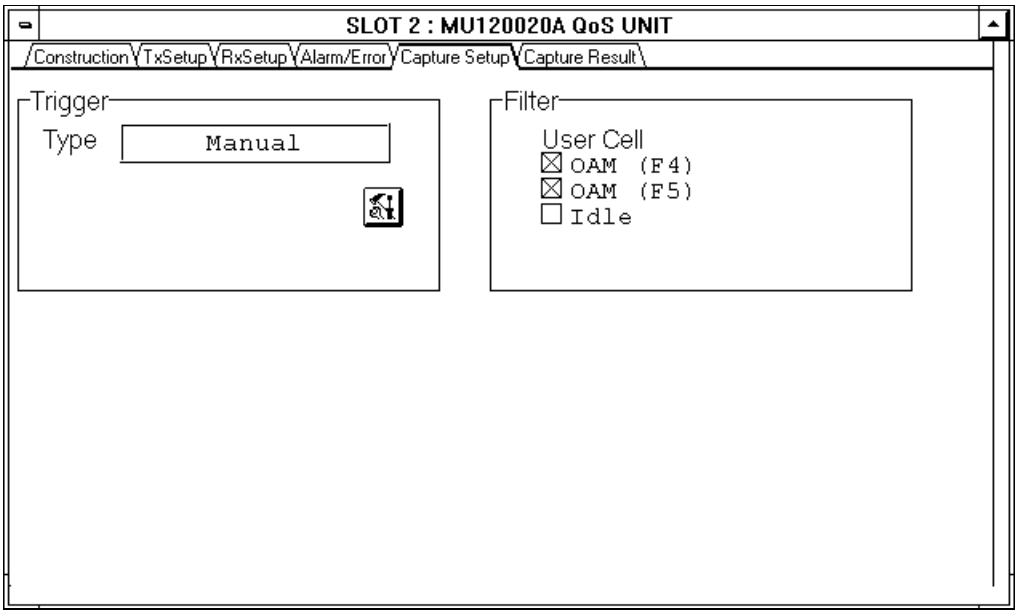


Figure 5-19 Capture Setup Panel

2. Select capture cells from the Filter group box.
3. Select a cell capture end trigger from the Trigger group box.

5.5.3 Starting/Stopping Cell Capture

The following explains how to start and stop the cell capture operation:

1. Display the Capture Result panel.

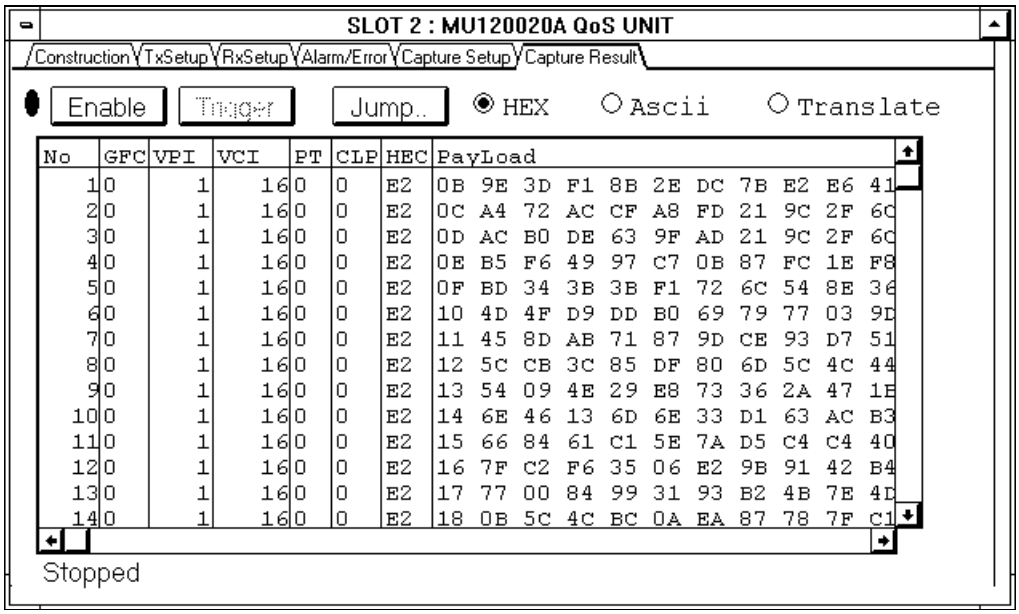


Figure 5-20 Capture Result Panel

2. To start or end the cell capture operation, press the Enable/Stop button. The LED to the left of the Enable/Stop button lights during the capture operation.
3. When you selected "Manual" as the cell capture end trigger in 5.5.2, press the Trigger button during the cell capture operation to generate the cell capture end trigger.
4. The cell capture operation status is displayed on the capture status line.

5.5.4 Displaying Cell Capture Results

The following explains how to display capture results:

1. When the cell capture operation ends, the contents of captured cells are automatically displayed on the Capture Result panel. The cell capture end trigger cell line (or the next line when no cell capture end trigger cell is captured) is highlighted.
2. With the Option button, select the display format in which the captured cells are to be displayed.
3. Press the Jump button to open the Jump (Capture Result) dialog box. You can specify a line you want to display in the Position group box.

Section 6 PERFORMANCE TEST

6.1 Performance Test

This section explains the performance test that is used to check if the unit is operating correctly. For the test procedure (how to insert the unit into the mainframe, turn on the mainframe, and open MU120020A QoS Unit window), see the MP1220A ATM quality analyzer operation manual. Before the performance test, use the internal self-loopback function of the interface unit to set up the unit so that the transmission signal can be received. For how to do it, see the interface unit operation manual.

Appendix D contains the performance test result sheet.

6.2 Alarm/Error Measurement Test

Send and receive O.191 test cells and VC-AIS cells to do the performance test.

1. Open the Channel Setup dialog box on the Construction panel and specify the same channel for transmission and reception.

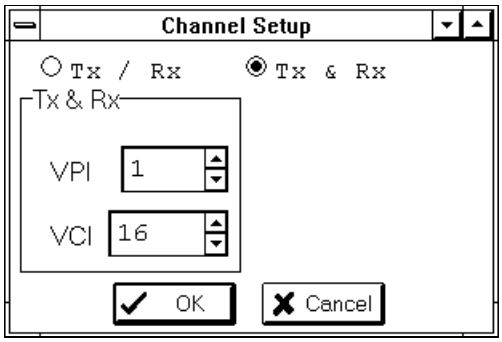


Figure 6-1 Channel Setup Dialog Box

2. Open the Foreground Cell Setup dialog box on the Tx-Setup panel to specify the following parameters:

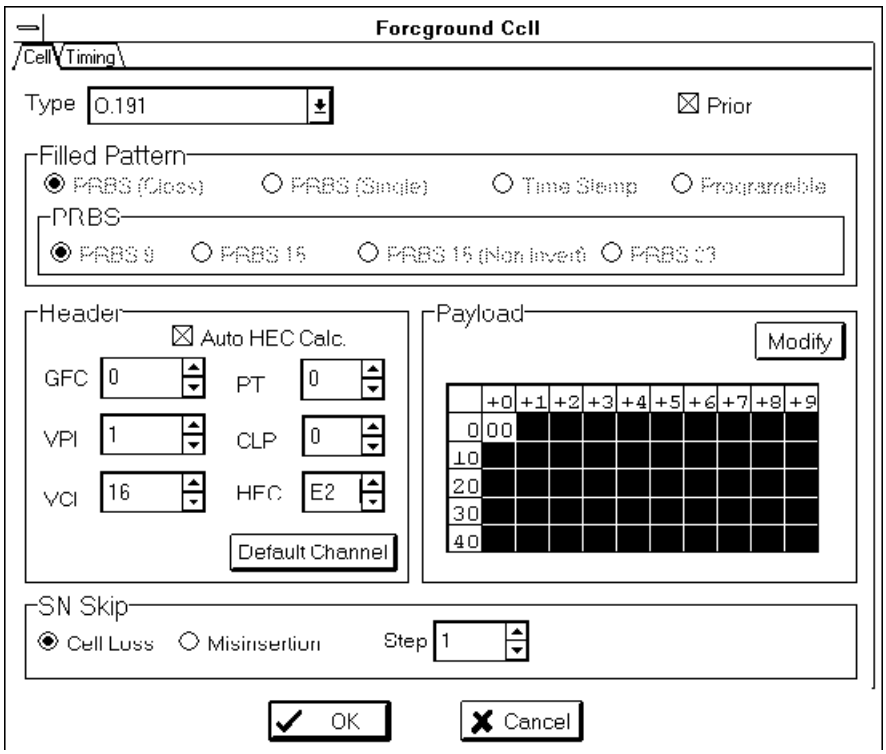


Figure 6-2 Cell Panel

3. Open the Foreground Cell Setup dialog box on the Tx-Setup panel. Then, display the Timing panel to specify the following parameters.

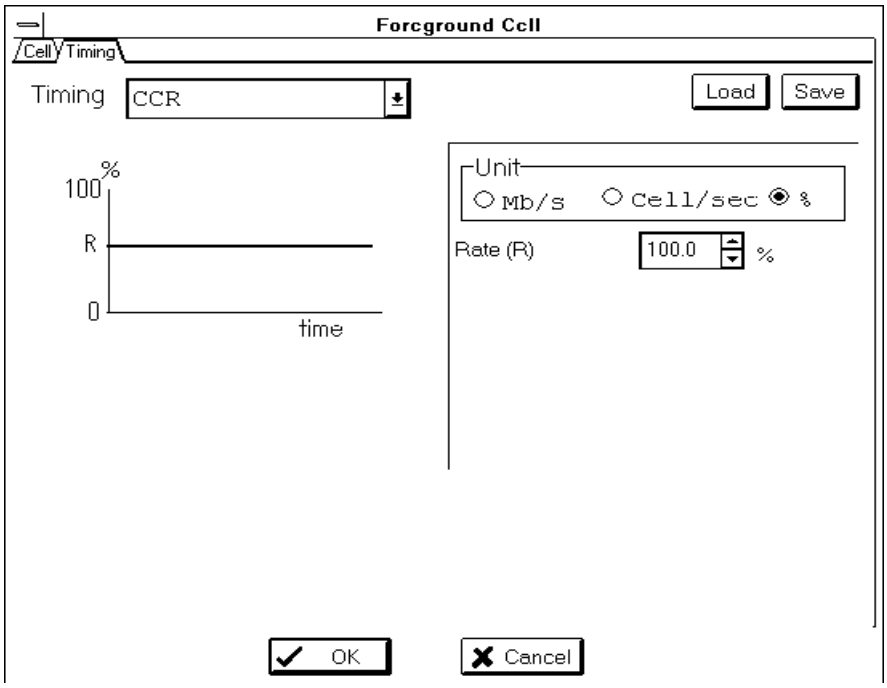


Figure 6-3 Timing Panel

4. Open the Background Cell Setup dialog box on the Tx-Setup panel. Then, display the Timing panel to specify the following parameters.

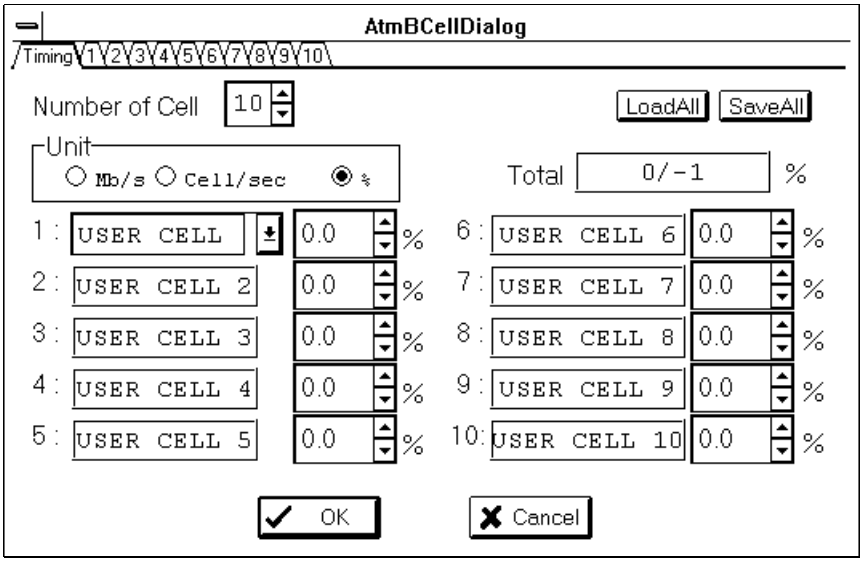


Figure 6-4 Timing Panel

5. Open on the Tx-Setup panel, and specify the following parameters on the OAM panel in the OAM/Error Addition Cell Setup dialog box:

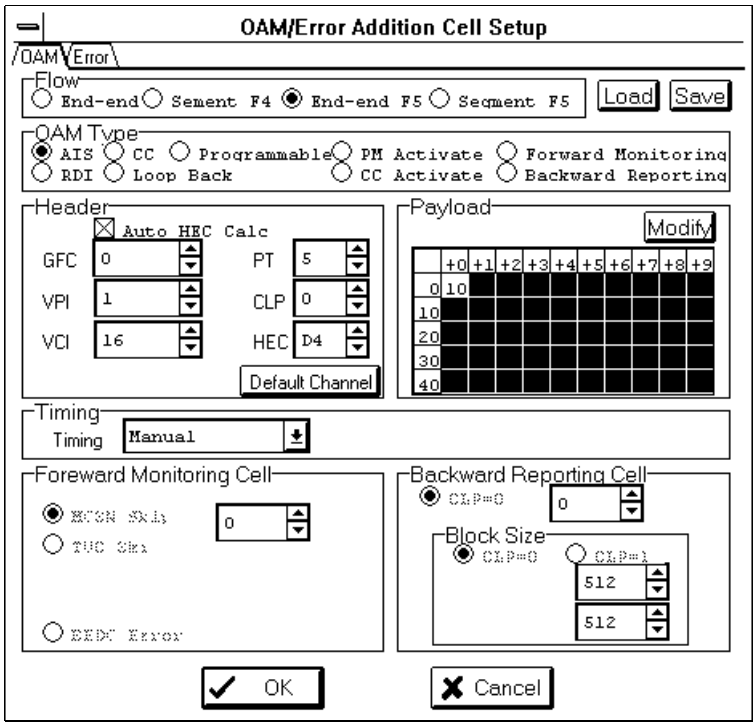


Figure 6-5 OAM Panel

6. Open the Alarm/Error Measurement Setup dialog box on the Rx-Setup panel and specify the following parameters:

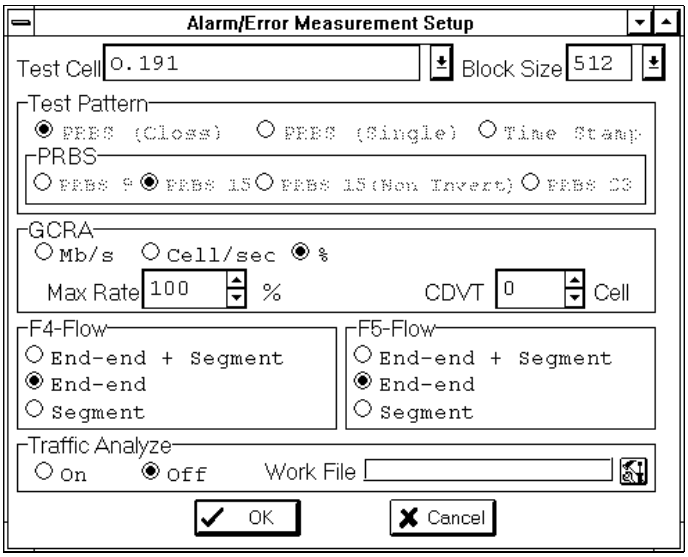


Figure 6-6 Alarm/Error Measurement Setup Dialog Box

7. Open the Layout dialog box on the Alarm/Error panel and specify the following parameters:

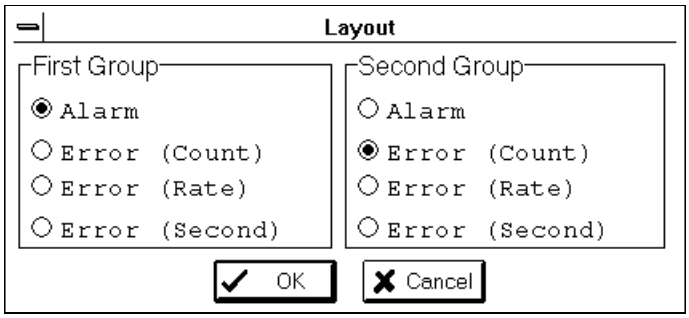


Figure 6-7 Layout Dialog Box

8. Send the O.191 test cell.
9. Display the Alarm/Error panel and select Current with the Option button.
10. Start alarm/error measurement. The unit should be operating normally when the following values are displayed:

VP-AIS	0[s]
VP-RDI	0[s]
VP-LOC	0[s]
VC-AIS	0[s]
VC-RDI	0[s]
VC-LOC	0[s]
Band Width	Maximum cell rate [Mb/s]
Band Width	Maximum cell rate [Mb/s]
Total Cell	Count increment
Lost Cell	0[cell]
Misinserted Cell	0[cell]
Errored Cell	0[cell]
Total Block	Count increment
Errored Block	0[block]
Non conform	0[cell]

11. Send one VC-AIS cell manually and, at the same time, skip the SN value of the O.191 test cell once. The unit should be operating normally when the following measurement results are displayed:

VP-AIS	0[s]
VP-RDI	0[s]
VP-LOC	0[s]
VC-AIS	1[s]
VC-RDI	0[s]
VC-LOC	0[s]
Band Width	Maximum cell rate [Mb/s]
Band Width	Maximum cell rate [Mb/s]
Total Cell	Count increment
Lost Cell	1[cell]
Misinserted Cell	0[cell]
Errored Cell	0[cell]
Total Block	Count increment
Errored Block	0[block]
Non conform	0[cell]

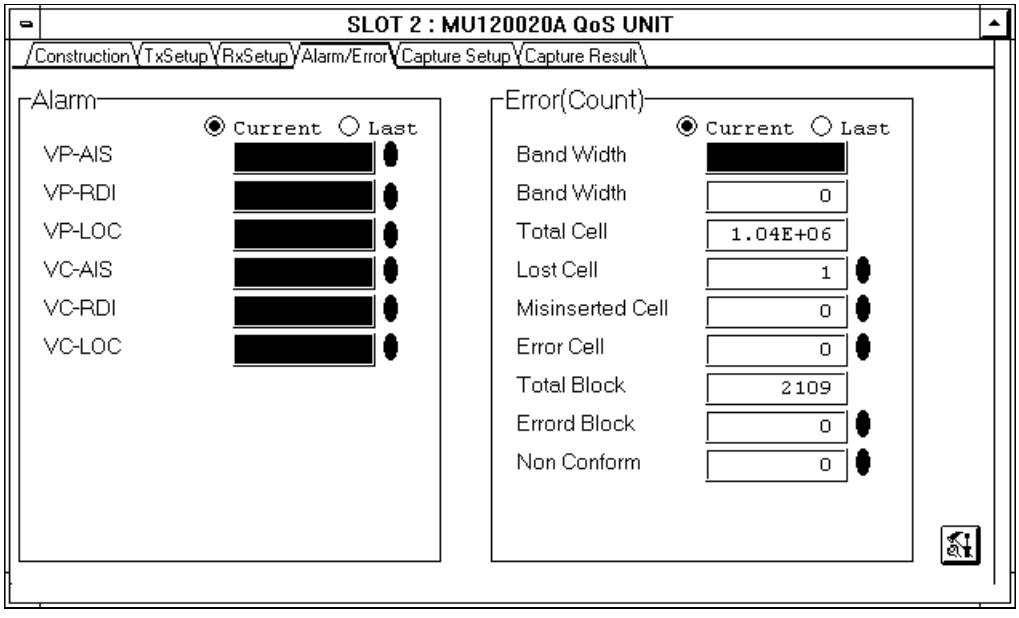


Figure 6-8 Alarm/Error Panel

6.3 Cell Interval Measurement Test

Send and receive O.191 test cells to do the performance test.

1. Set up the unit as described in steps 1 to 4 and 6 in 6.2.
2. Open the Sub Measurement Setup dialog box on the Rx-Setup panel and specify the following parameters:

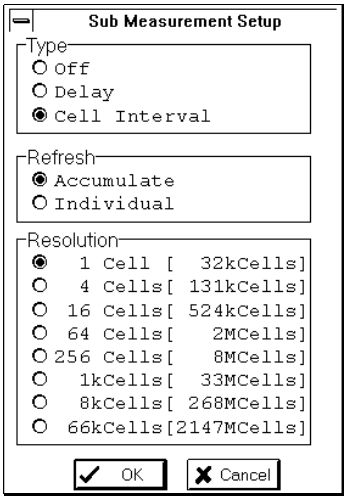


Figure 6-9 Sub Measurement Setup Dialog Box

3. Open the Cell Interval Setup dialog box on the Cell Interval panel and specify the following parameters:

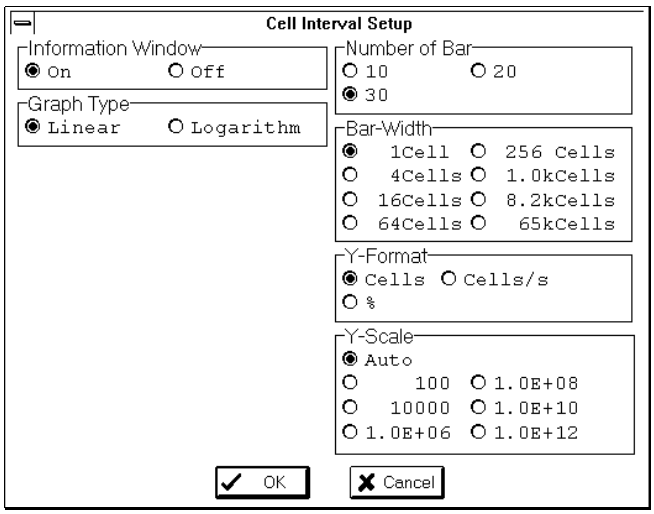


Figure 6-10 Cell Interval Setup Dialog Box

4. Send the O.191 test cell.
5. Display the Cell Interval panel.
6. Start cell interval measurement. The unit should be operating normally when the following measurement results are displayed:

Average	1.0[cell]
Max	1[cell]
Min	1[cell]
Total	Count increment
In Range	100.0[%]

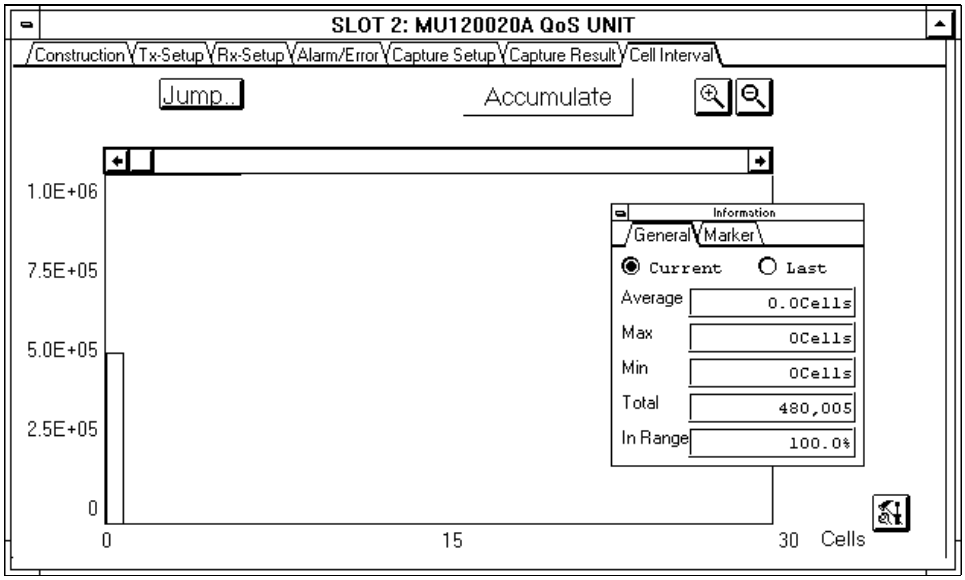


Figure 6-11 Cell Interval Panel

6.4 Cell Capture Test

Send and receive Null (programmable) cells to do the performance test.

1. Set up the unit as described in step 1 in 6.2.
2. Open the Foreground Cell Setup dialog box on the Tx-Setup panel and specify the following parameters on the Cell panel:

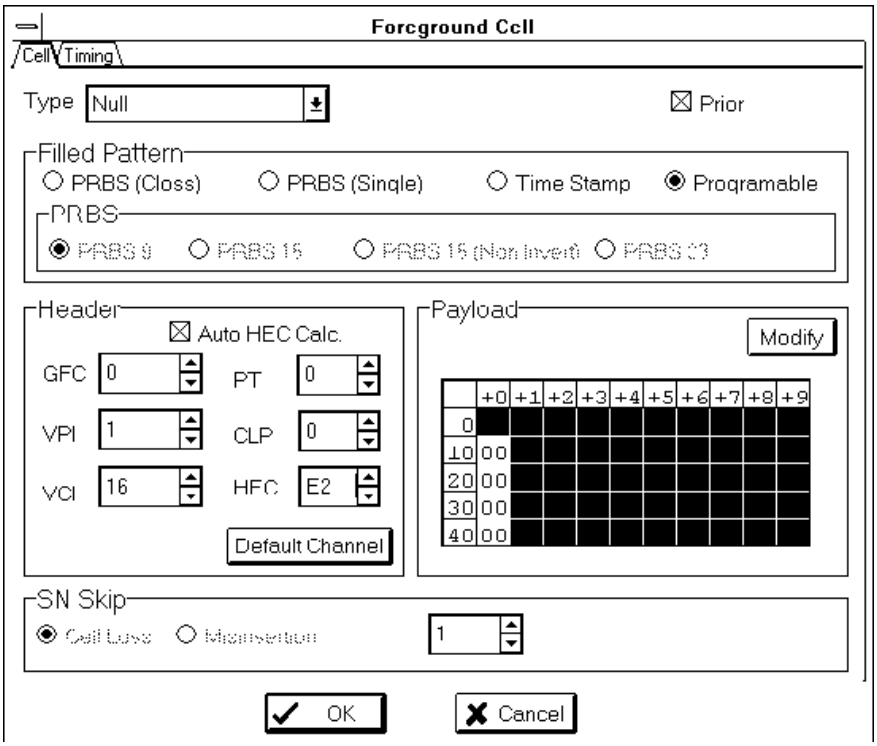


Figure 6-12 Cell Panel

3. Specify the parameters as described in steps 3 to 4 in 6.2.

4. Open the Filter Setup dialog box on the capture Setup pannel and specify the following parameters:

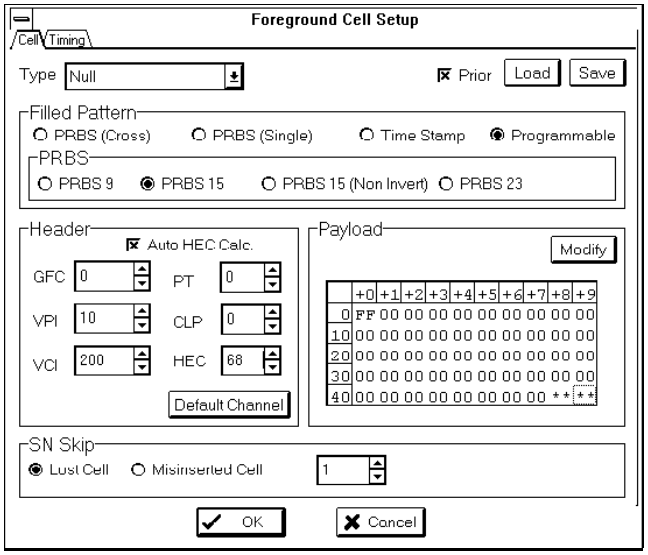


Figure 6-13 Filter Setup Dialog Box

5. Open the Trigger Setup dialog box on the Capture Setup panel and specify the following parameters:

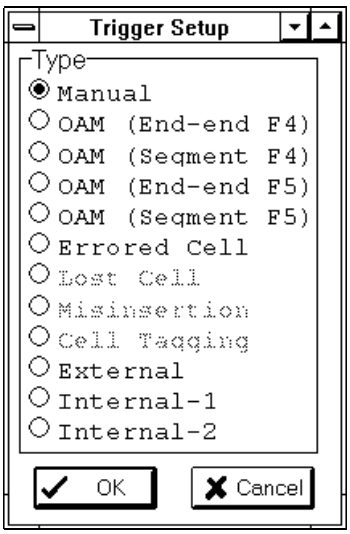


Figure 6-14 Trigger Setup Dialog Box

6. Send Null (programmable) cells.
7. Display the Capture Result panel and start the cell capture operation. Push the Trigger button to stop the cell capture operation. The contents of the captured cells are displayed. The unit should be operating normally when all the cells satisfy the following:

GFC	0 (H)
VPI/VCI	VPI/VCI of specified transmission / reception channel.
PT	0 (H)
CLP	0 (H)
HEC	Value correctly calculated
Payload	The first byte contains FF (H). Other bytes contain 00 (H).

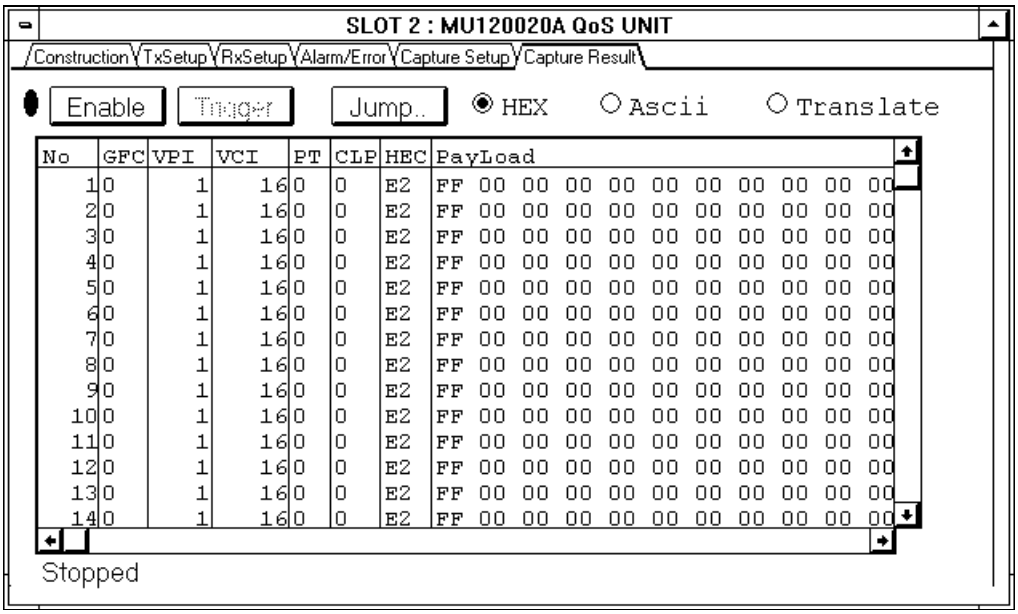


Figure 6-15 Capture Result Panel

Section 7 MAINTENANCE

7.1 Daily Maintenance

1. To remove contaminants, wipe the unit with a cloth moistened with detergent.

2. To remove dirt and dust, vacuum the unit.

3. Tighten the screws on the parts with the specified tool.

7.2 Storage

Note the following when storing the unit for a long time:

1. Remove dust and contaminants before storing the unit.

2. Store the unit in a place where the temperature is between -20℃ and 60℃.

3. Do not store the unit in a place for a long time where there is direct sunlight or much dust.

4. Do not store the unit in a place for a long time where there is a possibility that the unit is exposed to water or active gas.

5. Do not store the unit in a place where the unit may be oxidized or there is vibration.

7.3 Transportation

If you have the transportation pads that came with the unit, use them to pack the unit: otherwise, follow the instructions given below. To avoid damage to the unit, put on clean gloves and gently pack the unit.

1. Clean the unit with a dry cloth to remove contaminants or dust.

2. Check for loose or lost screws.

3. Use protective pads on projected or fragile parts. Wrap the unit with a polyethylene sheet. Then, pack it using a humidity-protective paper.

4. Put the packed unit in a corrugated cardboard box, and close the box with a tape. Store the unit in a wooden box as necessary.

7.4 Calibration

The unit should be calibrated only by the manufacturer. For optimum performance, calibrate the unit regularly.

APPENDIX

APPENDIX A TRANSMISSION CELL

Table A-1 lists the cells the unit sends. Table A-2 lists the header values.

Table A-1 List of Transmission Cells

Cell group	Cell type
Foreground cell	O.191 test cell
	extended O.191 test cell
	OAM test cell
	Null (PRBS/time stamp/programmable) cell
	AAL1 (PRBS/time stamp/programmable) cell
	AAL3/4 (PRBS/time stamp/programmable) cell
	Upper unit cell
Background cell 1	Null (programmable) cell
	Upper unit cell
Background cells 2 - 10	Null (programmable) cell
OAM cell	AIS cell
	RDI cell
	CC cell
	Loopback cell
	PM activation/deactivation cell
	CC activation/deactivation cell
	Forward monitoring cell
	Backward reporting cell
	OAM (programmable) cell

Table A-2 Header Values

Field Name	Value				
	Background/fore-ground cell	End-to-end F4 OAM cell	Segment F4 OAM cell	End-to-end F5 OAM cell	Segment F5 OAM cell
GFC	Any value				
VPI	Any value				
VCI	Any value	0004 (H)	0003 (H)	Any value	
PT	Any value			5 (H)	4 (H)
CLP	Any value				
HEC	Any value or automatically-calculated value				

1. O.191 test cell/Extended O.191 test cell

● Cell format

O.191test cell

Header	SN (4 bytes)	TS (4 bytes)	Unused (37 bytes)	TCPT (1 byte)	CRC-16 (2 bytes)

Scramble range (generation polynomial : $X^9 + X^5 + 1$)

Extended O.191 test cell

Header	SN (4 bytes)	TS (4 bytes)	Header copy (4 bytes)	Unused (33bytes)	TCPT (1 byte)	CRC-16 (2 bytes)

Scramble range (generation polynomial : $X^9 + X^5 + 1$)

● Payload values

Field name	Value	Remarks
SN	Automatic setting The SN value may be skipped. Mode : Single Range : 0 - 2^{32} - 1 (step 1)	Sequence number
TS	Automatic setting	Time stamp Resolution : 10[ns], Precision : 100[ns]
Header copy	Automatic setting	Value of 4-byte header except HEC field
Unused	00 (H)	
TCPT	00 (H) (O.191 test cell) 80 (H) (Extended O.191 test cell)	
CRC-16	Automatic setting	CRC-16 calculation result after scrambling the fields from the SN field to the TCPT field Generation polynomial : $X^{16} + X^{12} + X^5 + 1$

2. OAM test cell

● Cell format

Header	OAM Type (1 byte)	SN (4 bits)	SNP (4 bits)	PRBS (46 bytes)

● Payload value

Field name		Value	Remarks
OAM Type		30 (H)	OAM cell/function type
SN		Automatic setting The SN value may be skipped. Mode : Single Range : 0 - 15 (step 1)	Sequence number
SNP	CRC (3 bits)	Automatic setting	Generation polynomial : $X^3 + X + 1$
	Even parity (1 bit)	Automatic setting	
PRBS		Automatic setting	Cross PRBS15 Generation polynomial : $X^{15} + X^{14} + 1$

3. Null (PRBS/time stamp/programmable) cell

● Cell format

Null (PRBS) cell

Header	PRBS (48 bytes)

Null (time stamp) cell

Header	Unused (24 bytes)	TS (4 bytes)	Unused (20 bytes)

Null (programmable) cell

Header	Programmable (48 bytes)

● Payload value

Field name	Value	Remarks
PRBS	Automatic setting	Single/cross PRBS9 Generation polynomial : X^9+X^5+1 Single/cross PRBS15 Generation polynomial : $X^{15}+X^{14}+1$ Single/cross PRBS23 Generation polynomial : $X^{23}+X^{18}+1$ Single/cross PRBS15(Non Invert) Generation polynomial : $X^{15}+X^{14}+1$
TS	Automatic setting	Time stamp Resolution : 10[ns], Precision : 100[ns]
Unused	00 (H)	
Programmable	Any value	

4. AAL1 (PRBS/time stamp/programmable) cell

● Cell format

AAL1 (PRBS) cell

Header	SN (4 bits)	SNP (4bits)	PRBS (47 bytes)

AAL1 (time stamp) cell

Header	SN (4 bits)	SNP (4bits)	Unused (23 bytes)	TS (4bytes)	Unused (20 bytes)

AAL1 (programmable) cell

Header	SN (4 bits)	SNP (4bits)	Programmable (47 bytes)

● Payload value

Field name		Value	Remarks
SN	CSI (1 bit)	Any value	CS indicator
	Sequence counter (3 bits)	Automatic setting	Sequence number
SNP	CRC (3 bits)	Automatic setting	Generation polynomial : X^3+X+1
	Even parity (1 bit)	Automatic setting	
PRBS		Automatic setting	Single/cross PRBS9 Generation polynomial : X^9+X^5+1 Single/cross PRBS15 Generation polynomial : $X^{15}+X^{14}+1$ Single/cross PRBS23 Generation polynomial : $X^{23}+X^{18}+1$ Single/cross PRBS15 (Non Invert) Generation polynomial : $X^{15}+X^{14}+1$
TS		Automatic setting	Time stamp Resolution : 10[ns], Precision : 100[ns]
Unused		00 (H)	
Programmable		Any value	

5. AAL3/4 (PRBS/time stamp/programmable) cell

● Cell format

AAL3/4 (PRBS) cell

Header	ST (2 bits)	SN (4 bits)	MID (10bits)	PRBS (44 bytes)	LI (6 bits)	CRC-10 (10 bits)

AAL3/4 (time stamp) cell

Header	ST (2 bits)	SN (4 bits)	MID (10bits)	Unused (22 bytes)	TS (4 bytes)	Unused (18 bytes)	LI (6 bits)	CRC-10 (10 bits)

AAL3/4 (programmable) cell

Header	ST (2 bits)	SN (4 bits)	MID (10bits)	Programmable (44 bytes)	LI (6 bits)	CRC-10 (10 bits)

● Payload value

Field name	Value	Remarks
ST	Automatic setting	Segment type
SN	Automatic setting	Sequence number
MID	Any value	Multiplexing identifier
PRBS	Automatic setting	Single/cross PRBS9 Generation polynomial : X^9+X^5+1 Single/cross PRBS15 Generation polynomial : $X^{15}+X^{14}+1$ Single/cross PRBS23 Generation polynomial : $X^{23}+X^{18}+1$ Single/cross PRBS15 (Non Invert) Generation polynomial : $X^{15}+X^{14}+1$
TS	Automatic setting	Time stamp Resolution : 10[ns], Precision : 100[ns]
Unused	00 (H)	
Programmable	Any value	
LI	2C (H)	SAR-PDU payload length indicator
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

6. Upper unit cell

●Cell format

Format of cell sent by an upper unit

●Header value and payload value

Header value and payload value sent by an upper unit

7. AIS cell/RDI cell

●Cell format

Header	OAM Type (1 byte)	Defect Type (1 byte)	Defect Location (16 bytes)	Unused (28 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

●Payload value

Field name	Value	Remarks
OAM Type	10 (H) (AIS cell) 11 (H) (RDI cell)	OAM cell/function type
Defect Type	Any value	
Defect Location	Any value	
Unused	6A (H)	
Reserved	00 (H)	
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

8. CC cell

●Cell format

Header	OAM Type (1 byte)	Unused (45 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

●Payload value

Field name	Value	Remarks
OAM Type	14 (H)	OAM cell/function type
Unused	6A (H)	
Reserved	00 (H)	
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

9. Loopback cell

●Cell format

Header	OAM Type (1 byte)	Loopback Indication (1 byte)	Correlation Tag (4 bytes)	Loopback Location ID (16 bytes)	Source ID (16 bytes)	Unused (8 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

●Payload value

Field name	Value	Remarks
OAM Type	18 (H)	OAM cell/function type
Loopback Indication	Any value	
Correlation Tag	Any value	
Loopback Location ID	Any value	
Source ID	Any value	
Unused	6A (H)	
Reserved	00 (H)	
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

10. PM activation/deactivation cell/CC activation/deactivation cell

● Cell format

PM activation/deactivation cell

Header	OAM Type (1 byte)	Message ID (6 bits)	Direction of Action (2 bits)	Correlation Tag (1 byte)	PM Block Size A-B (4 bits)	PM Block Size B-A (4 bits)	Unused 2 (42 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

CC activation/deactivation cell

Header	OAM Type (1 byte)	Message ID (6 bits)	Direction of Action (2 bits)	Correlation Tag (1 byte)	Unused 1 (1 byte)	Unused 2 (42 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

● Payload value

Field name	Value	Remarks
OAM Type	81 (H)	OAM cell/function type
Message ID	Any value	
Direction of Action	Any value	
Correlation Tag	Any value	
PM Block Size A-B	Any value	
PM Block Size B-A	Any value	
Unused 1	00 (H)	
Unused 2	6A (H)	
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

11. Forward monitoring cell

● Cell format

Header	OAM Type (1 byte)	MCSN (1 byte)	TUC -0+1 (2 bytes)	BEDC -0+1 (2 bytes)	TUC -0 (2 bytes)	TSTP (4 bytes)	Unused (34 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

● Payload value

Field name	Value	Remarks
OAM Type	20 (H)	OAM cell/function type
MCSN	Automatic setting The MCSN value may be skipped. Mode : Single Range : 0 - 255 (step 1)	Monitoring cell sequence number
TUC-0+1	Automatic setting The TUC-0+1 value may be skipped. Mode : Single Range : 0 - 65535 (step 1)	Total user cell number (CLP=0+1)
BEDC -0+1	Automatic setting A 1-bit error (BEDC-0+1 value) may be inserted. Mode : Single	Block error detection code (CLP=0+1)
TUC -0	Automatic setting The TUC-0 value may be skipped. Mode : Single Range : 0 - 65535 (step 1)	Total user cell number (CLP=0)
TSTP	FF (H)	Time stamp
Unused	6A (H)	
Reserved	00 (H)	
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

12. Backward reporting cell

● Cell format

Header	OAM Type (1 byte)	MCSN (1 byte)	TUC -0+1 (2 bytes)	Unused (2 bytes)	TUC -0 (2 bytes)	TSTP (4 bytes)	Unused (29 bytes)	TRCC -0 (2 bytes)	BLER -0+1 (1 byte)	TRCC -0+1 (2 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

● Payload value

Field name	Value	Remarks
OAM Type	21 (H)	OAM cell/function type
MCSN	Automatic setting The MCSN value may be skipped. Mode : Single Range : 0 - 255 (step 1)	Monitoring cell sequence number
TUC-0+1	Automatic setting TUC-0+1 value skip specification Range : 0 - 65535 (step 1)	Total user cell number (CLP=0+1)
TUC -0	Automatic setting The TUC-0 value skip specification Mode : Single Range : 0 - 65535 (step 1)	Total user cell number (CLP=0)
TSTP	FF (H)	Time stamp
TRCC-0	Automatic setting TUCC-0 value skip specification Range : 0 - 65535 (step 1)	Total received cell count (CLP=0)
BLER -0+1	Any value	Block error result (CLP=0+1)
TRCC-0+1	Automatic setting TRCC-0+1 value skip specification Range : 0 - 65535 (step 1)	Total received cell count (CLP=0+1)
Unused	6A (H)	
Reserved	00 (H)	
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

13. OAM (programmable) cell

● Cell format

Header	OAM Type (1 byte)	Programmable (45 bytes)	Reserved (6 bits)	CRC-10 (10 bits)

● Payload value

Field name	Value	Remarks
OAM Type	Any value	OAM cell/function type
Programmable	Any value	
Reserved	00 (H)	
CRC-10	Automatic setting	Generation polynomial : $X^{10}+X^9+X^5+X^4+X+1$

APPENDIX B ALARM DETECTION/RELEASE CONDITION

1. VP-AIS (VC-AIS) status

The following explains detection/release conditions for VP-AIS (VC-AIS) status:

Table B-1 VP-AIS (VC-AIS) Status Detection/Release Conditions

Detection condition	VP-AIS (VC-AIS) cell received
Release condition	VP-AIS (VC-AIS) cell not received for 2.5 seconds or VP-CC (VC-CC) cell or user cell received

2. VP-RDI (VC-RDI) status

The following explains detection/release conditions for VP-RDI (VC-RDI) status:

Table B-2 VP-RDI (VC-RDI) Status Detection/Release Conditions

Detection condition	VP-RDI (VC-RDI) cell received
Release condition	VP-RDI (VC-RDI) cell not received for 2.5 seconds

3. VP-LOC (VC-LOC) status

The following explains detection/release conditions for VP-LOC (VC-LOC) status:

Table B-3 VP-LOC (VC-LOC) Status Detection/Release Conditions

Detection condition	VP-CC (VC-CC) cell or user cell not received for 3.5 seconds
Release condition	VP-CC (VC-CC) cell or user cell received

4. VPAC status

Table B-4 VPAC Status Detection/Release Conditions

Detection condition	O.191 cell not received for 10 seconds
Release condition	O.191 cell cell received

APPENDIX C MEASUREMENT ALGORITHM

1. OAM test cell measurement

The following shows the OAM test cell measurement algorithm:

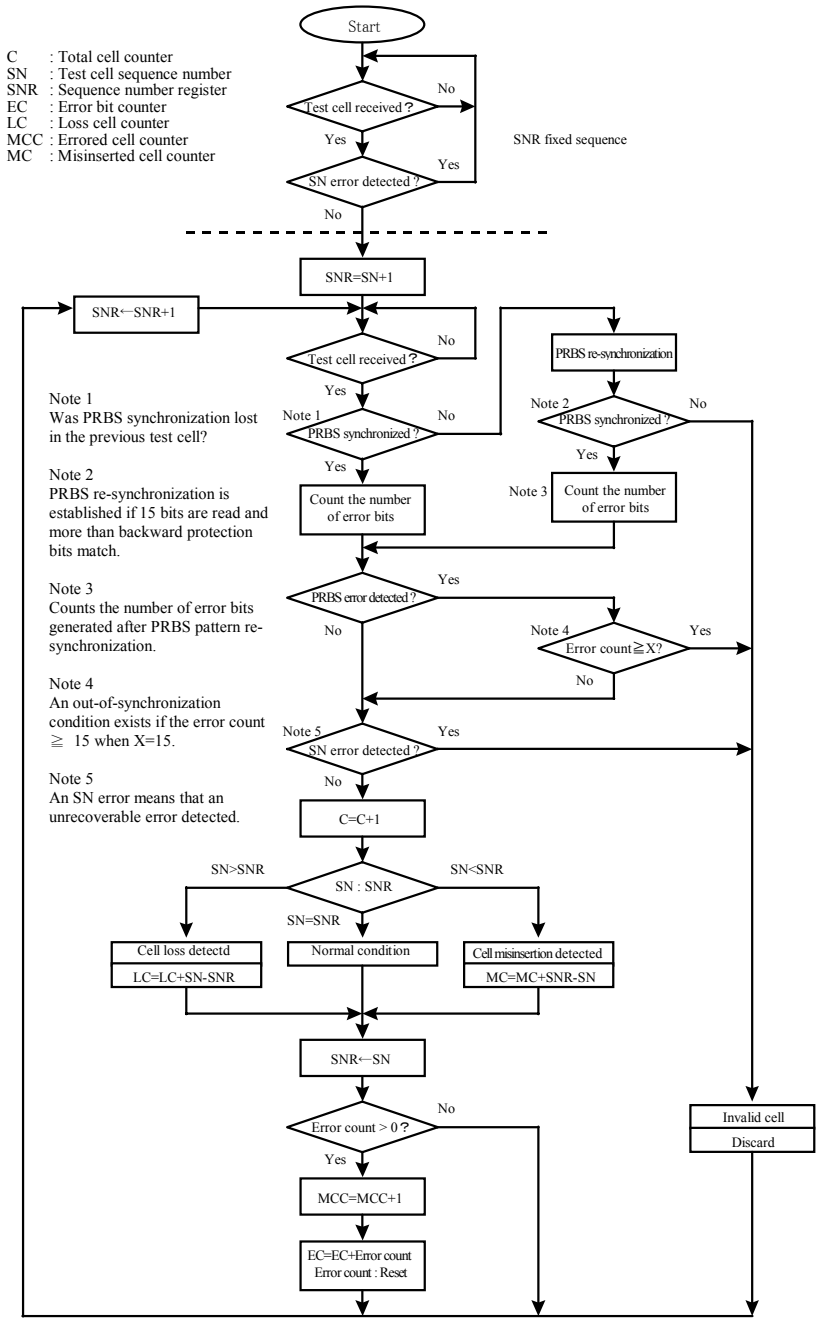


Figure C-1 OAM Test Cell Measurement Algorithm

2. O.191 test cell measurement

The following shows the O.191 test cell measurement algorithm:

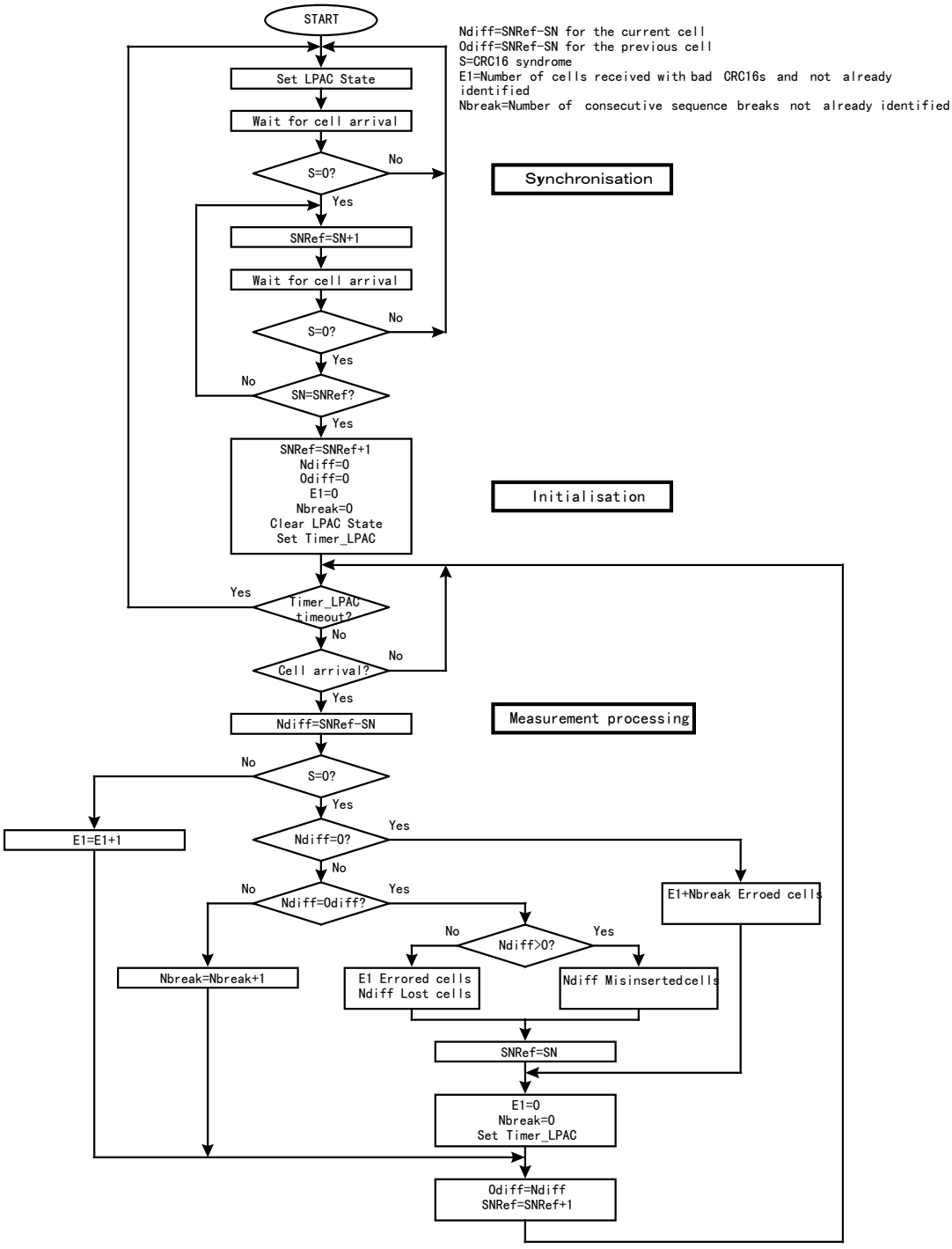


Figure C-2 O.191 Test Cell Measurement Algorithm

3. Null (PRBS) cell, AAL1 (PRBS) cell, and AAL3/4 (PRBS) cell measurement

The following shows the measurement algorithm for a Null (PRBS) cell, AAL1 (PRBS) cell, and AAL3/4 (PRBS) cell:

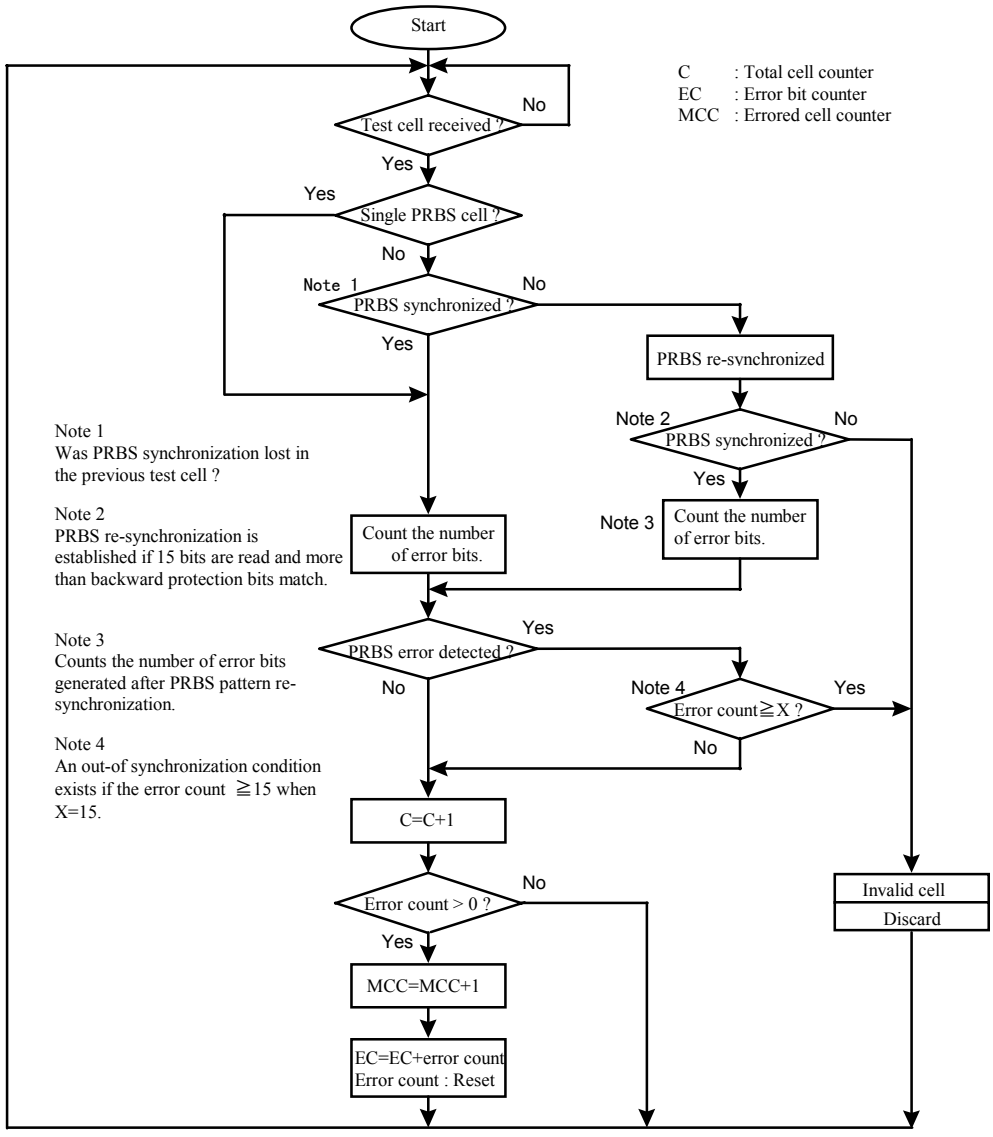
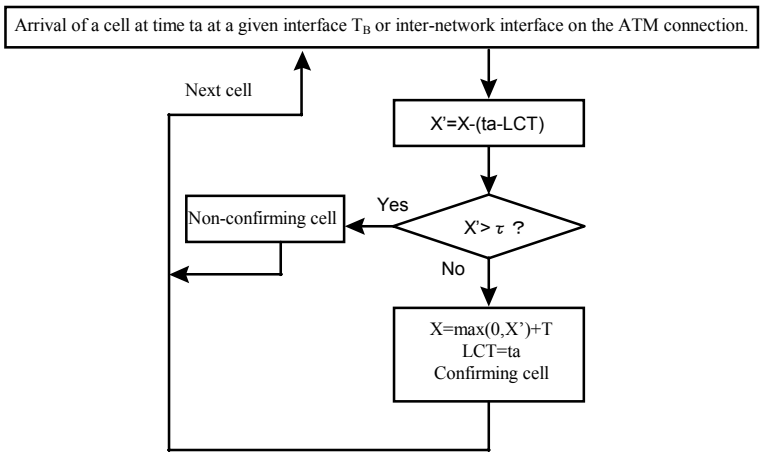


Figure C-3 Null (PRBS) cell, AAL1 (PRBS) cell, and AAL3/4 (PRBS) cell Measurement Algorithm

4. Non-conforming cell measurement

The following shows the algorithm for a non-conforming cell:

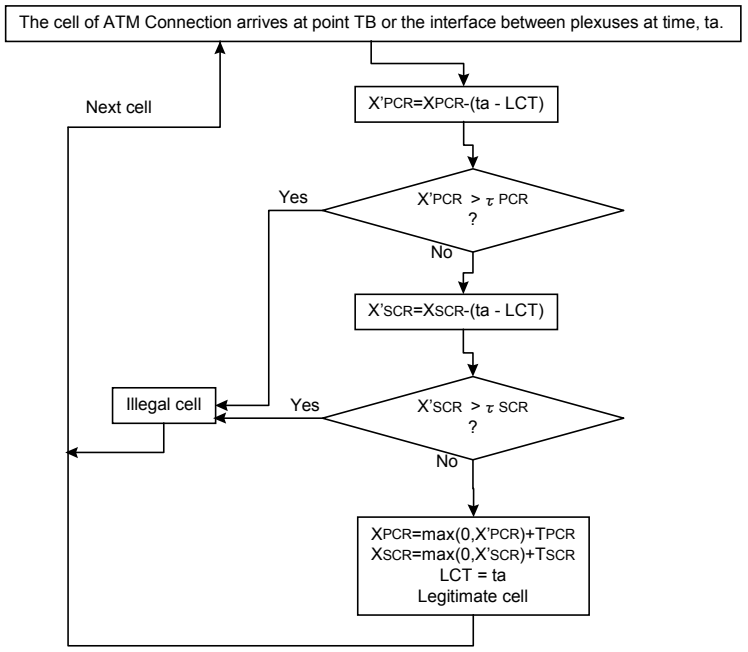


Continuous state leaky bucket algorithm

T : Peak emission interval
τ : CVD tolerance
ta : Time of arrival of a cell to the given interface
X : Value of the leaky Bucket counter
X' : auxiliary variable
LCT : Last Conformance Time

At the time of arrival ta of the first cell of the connection to cross the given interface, X=0 and LCT=ta

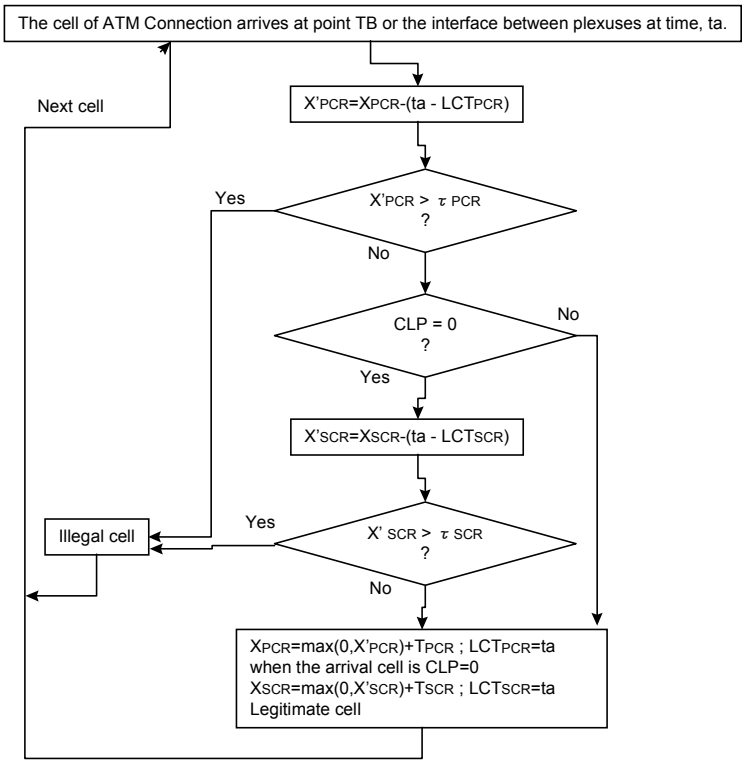
Figure C-4-1 Non-Conforming Cell Measurement Algorithm (CBR)



TPCR : Peak output interval towards the cell stream that CLP=0+1.
TSCR : Average output interval towards the cell stream that CLP=0+1.
τ PCR : CDVT (Cell Delay Variation) which corresponds to TPCR.
τ SCR : CDVT which corresponds to TSCR.
ta : Cell arrival time
XPCR,XSCR : The value of leaky bucket counter
X'PCR,X'SCR : Auxiliary variable
LCT : Last Conformance Time

XPCR=XSCR=0, LCT=ta
at the arrival time, ta, of the first cell of the connection

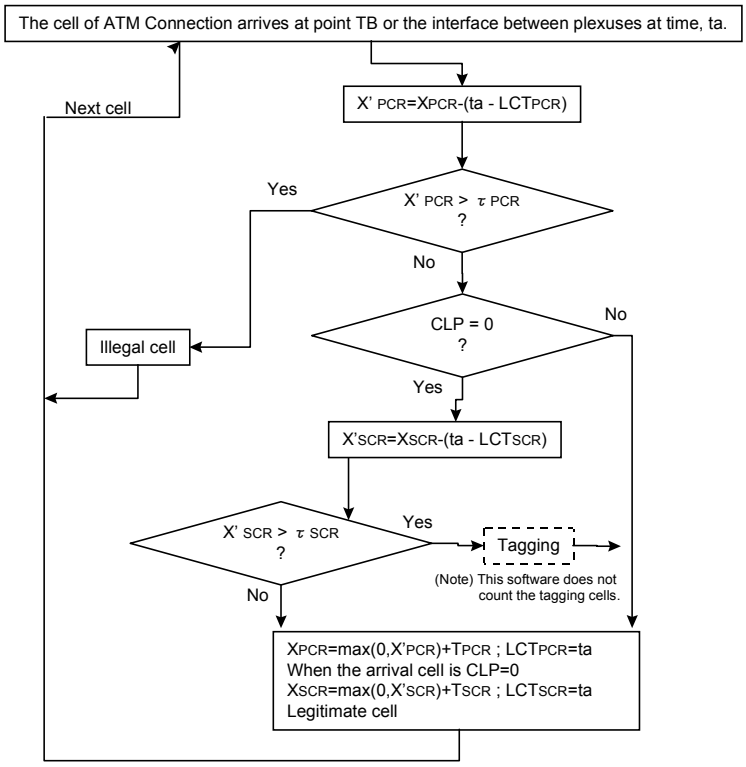
Figure C-4-2 Non-Conforming Cell Measurement Algorithm (VBR.1)



TPCR : Peak output interval towards the cell stream that CLP=0+1.
TSCR : Average output interval towards the cell stream that CLP=0.
τ PCR : CDVT which corresponds to TPCR.
τ SCR : CDVT which corresponds to TSCR.
ta : Cell arrival time
XPCR,XSCR : The value of leaky bucket counter
X'PCR,X'SCR : Auxiliary variable
LCTPCR,LCTSCR : Last Conformance Time

XPCR=XSCR=0, LCTPCR=LCTSCR=ta
at the arrival time, ta, of the first cell of the connection

Figure C-4-3 Non-Conforming Cell Measurement Algorithm (VBR.2)



TPCR : Peak output interval towards the cell stream that CLP=0+1.
TSCR : Average output interval towards the cell stream that CLP=0.
τ PCR : CDVT which corresponds to TPCR.
τ SCR : CDVT which corresponds to TSCR.
ta : Cell arrival time
XPCR,XSCR : The value of leaky bucket counter
X'PCR,X'SCR : Auxiliary variable
LCTPCR,LCTSCR Last Conformance Time

XPCR=XSCR=0, LCTPCR=LCTSCR=ta
at the arrival time, ta, of the first cell of the connection

Figure C-4-4 Non-Conforming Cell Measurement Algorithm (VBR.3)

APPENDIX D PERFORMANCE TEST RESULT SHEET

Unit name : MU120020A QoS Unit
Serial No. : _____
Test location : _____
Date : year____month____day___ (___)
Notice : _____

Report No. : _____
Test engineer : _____
Ambient temperature : _____°C
Relative humidity : _____%

Alarm/error measurement test

Item	Specification	Test result	Result
VP-AIS	0[s]		
VP-RDI	0[s]		
VP-LOC	0[s]		
VC-AIS	0[s] → 1[s]		
VC-RDI	0[s]		
VC-LOC	0[s]		
Band Width	Maximum cell rate [Mb/s]		
Band Width	Maximum cell rate [Mb/s]		
Total Cell	Count increment		
Lost Cell	0[cell] → 1[cell]		
Misinserted Cell	0[s]		
Errored Cell	0[s]		
Total Block	Count increment		
Errored Block	0[block]		
Non conform	0[cell]		

Cell interval measurement test

Item	Specification	Test result	Result
Average	1.0[cell]		
Max	1[cell]		
Min	1[cell]		
Total	Count increment		
In Range	100.0 [%]		

Cell capture test

Item	Specification	Test result	Result
GFC, PT, CLP	0 (H)		
VPI/VCI	VPI/VCI of specified transmission / reception channel		
HEC	Value correctly calculated		
Payload	The first byte contains FF (H). The other bytes contains 00 (H).		

APPENDIX D PERFORMANCE TEST RESULT SHEET