Anritsu

MP1220A

ATM Quality Analyzer

1.5 Mbit/s (T1) to 622 Mbit/s (STM-4c/OC-12c)

For Constructing and Maintaining ATM Networks

The MP1220A is a portable measuring instrument for ATM networks;

it can measure the PDH/SDH physical layer, the ATM layer, and the AAL. It is the perfect instrument for troubleshooting ATM networks during construction and maintenance, and has a wide range of convenient applications in manufacturing inspection of ATM devices.

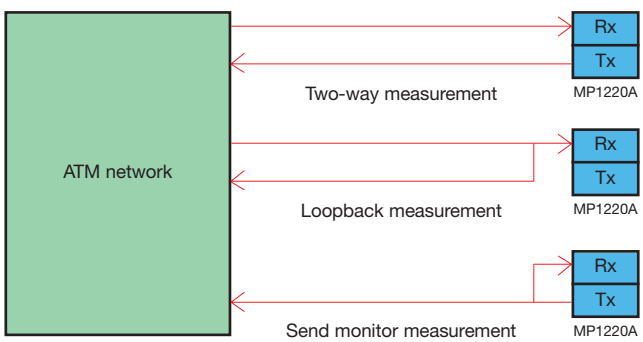
Features

- Supports various interfaces from 1.5 Mbit/s (T1) to 622 Mbit/s (STM-4c/OC-12c)
- 150 Mbit/s real-time analysis up to CPCS layer
- Simultaneous measurement of two channels (up/down stream)
- Automated inspection measurement of 1023 network channels
- Uses test signals conforming to ITU-T O.191 recommendations
- 10.4" large color LCD
- Simple touch-panel operation (graphical user interface)
- Portable

Application Examples

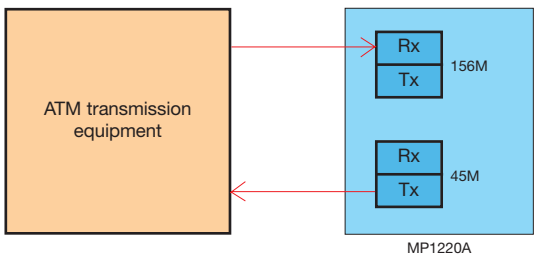
Measuring Networks

Monitoring the end-to-end network quality and identifying fault parts are easy. There are three measurement modes for use with all types of interface unit. In the two-way measurement mode, a test signal is impressed on the network, and the error rate, delay time, etc. are measured. In the loopback measurement mode, the received signal is measured during sending, and in the send monitor measurement mode, measurement is performed while monitoring the sent signal.



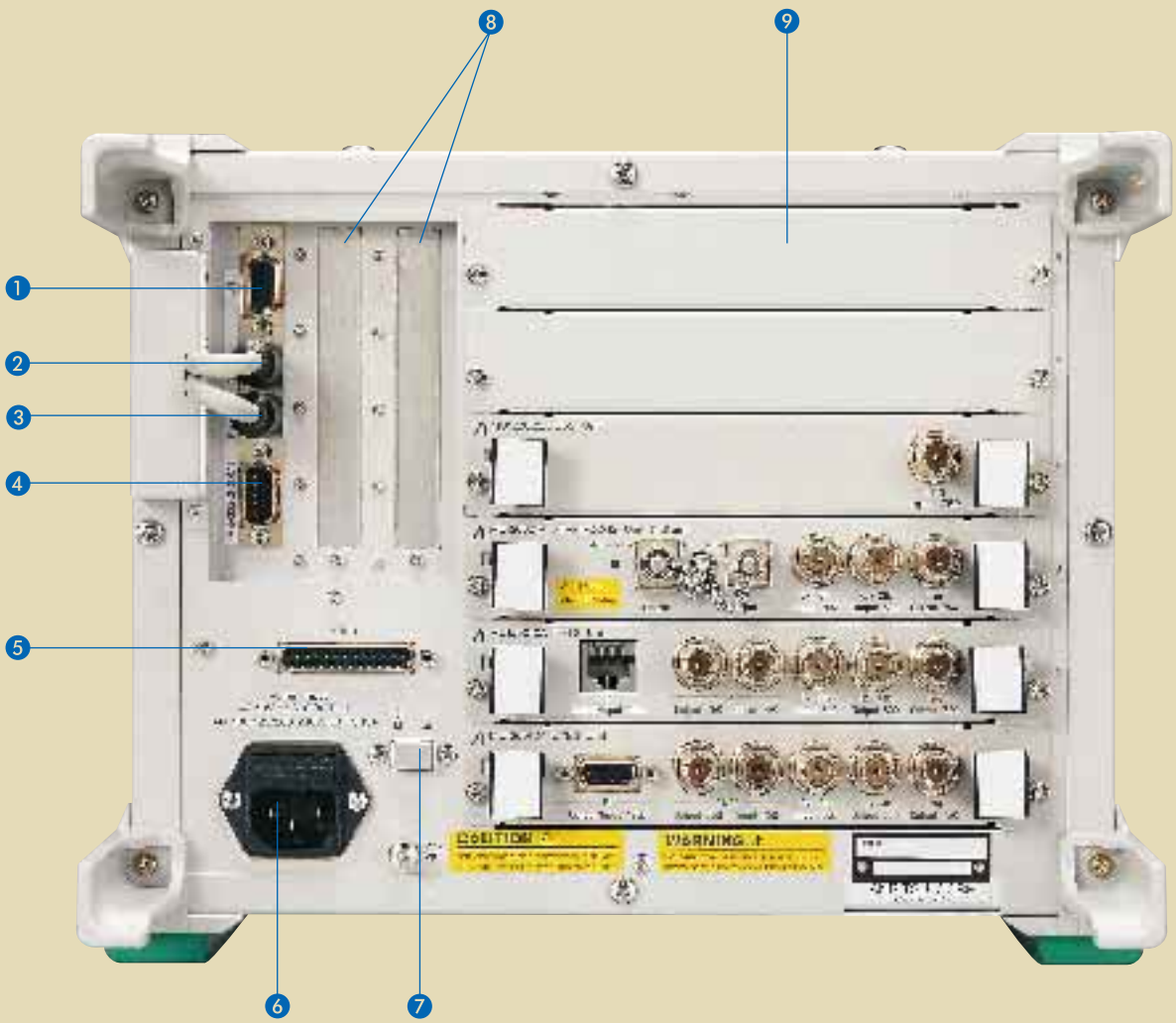
Measuring Equipment

The various built-in physical interfaces make it easy to test and measure equipment with various interfaces, such as ATM transmission equipment.



Simple Touch-Panel Operation

The MP1220A has a 10.4″ TFT color LCD touch panel for simple Graphical User Interface based operation.

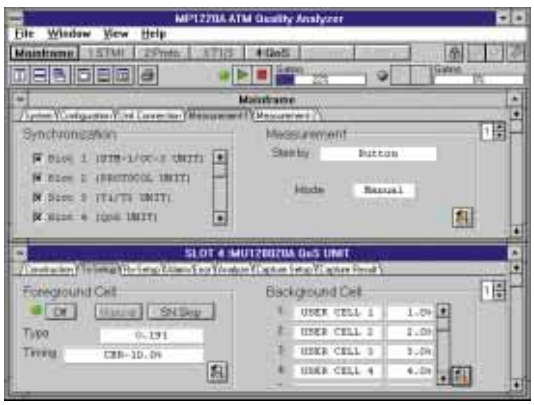


1. Connector for external monitor
2. PS/2 mouse connector
3. Keyboard connector
4. RS-232C connector (9-pin)
5. Connector for external printer
6. AC power inlet
7. Power switch
8. Slot for remote control option
9. Slots for expansion units (6 max.)

Graphical User Interface (GUI)

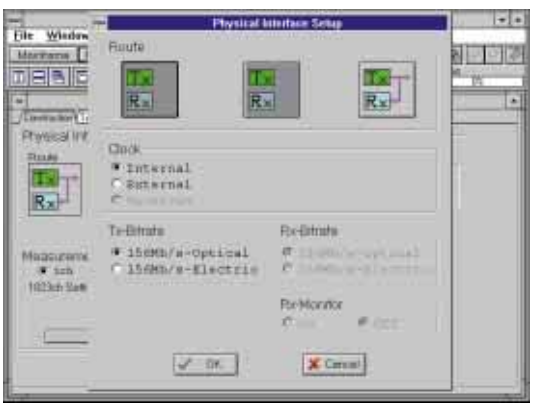
Basic Operations

The MP1220A is operated using the touch-sensitive LCD which is divided into setting and display screens corresponding to each unit.



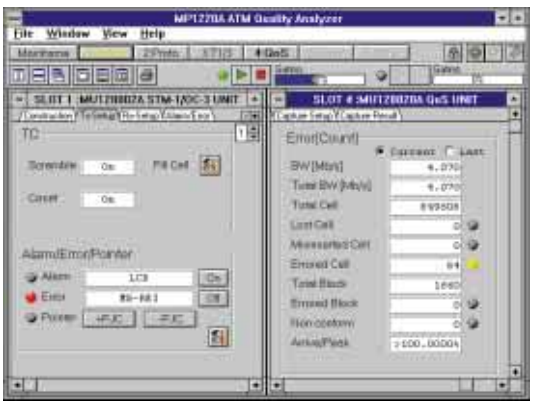
Screen composition for optional expansion units

Some special setting items have simple and easy-to-understand screens. In addition, dialog boxes are displayed on-screen during setting to assist with setting details.

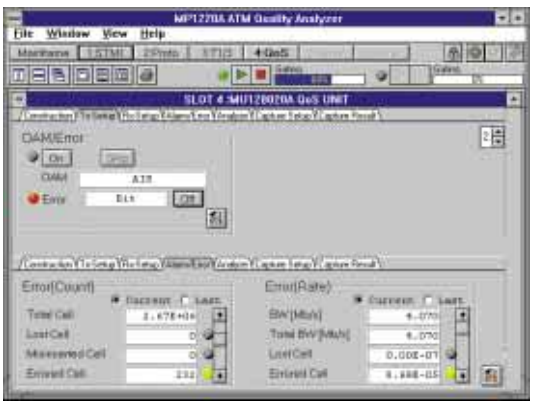


Dialog box for setting details

The screen layout is simple even when two screens are displayed simultaneously. And the GUI makes it easy to monitor the measurement results of the ATM layer while adding errors by interface units. Furthermore, screens can be divided in half.



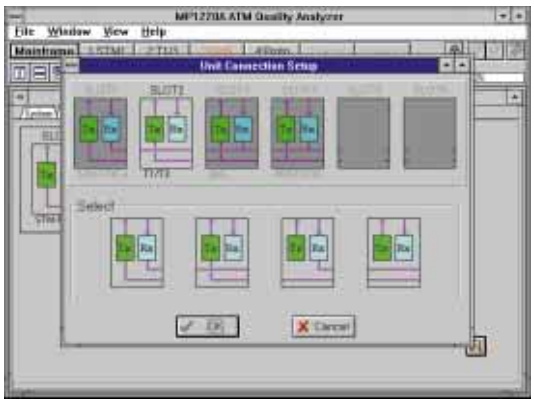
Screen split into left and right halves



Screen split into top and bottom halves

General Settings

The transmitter and receiver can be connected via different interfaces by setting the signal path between different units making it easy to test equipment with different types of interface.

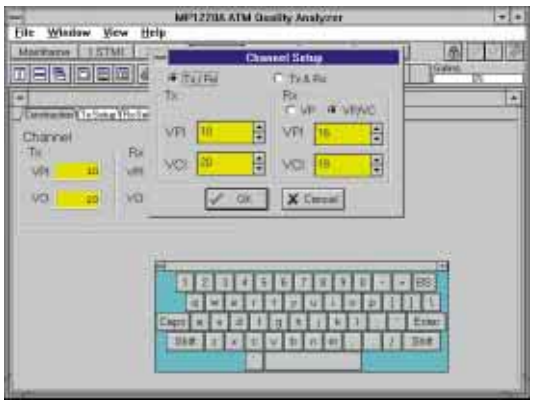


Setting signal path for different units

Any of three measurement methods can be selected: (1) Until the Stop button is pressed after the Start button has been pressed, (2) Automatic measurement stop after a specified time interval has elapsed, and (3) Repeated measurement for a specified period. In addition, the measurement start time can also be set.

Selecting measurement method

A keyboard is displayed on the screen even if an external keyboard is not connected to permit alpha-numeric input. Of course, the protective cover with keyboard (sold separately) can also be used for input.



Inputting characters from screen

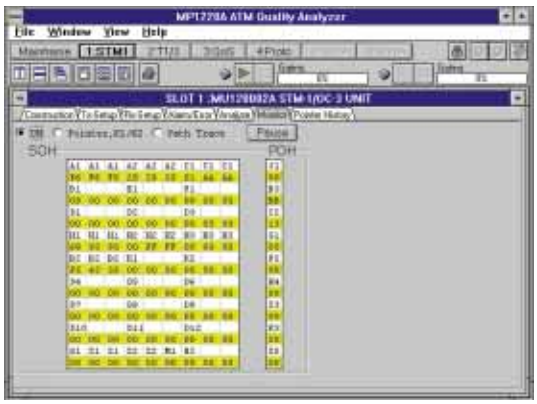
Interface Units

Settings and measurements related to the physical layer, such as addition of various alarms and errors, cell scrambling, and setting empty cell patterns, can be performed.

Adding various alarms and errors

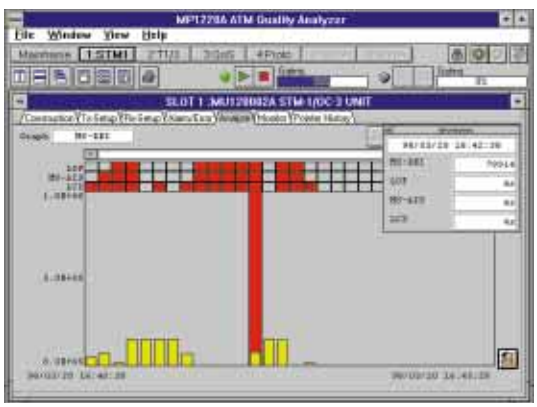
Simultaneous display of settings and results

The SDH/SONET interface unit can set and monitor the overhead and pointer values.



Display of overhead contents

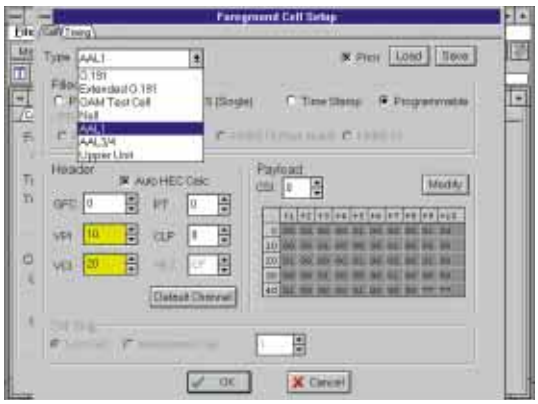
Alarms and errors occurring during measurement can be saved and analyzed using an-easy-to-understand bar graph function. And the analysis function is not restricted to use with the interface units, it can also be used with the QoS and Protocol units.



Graphical display of alarm/error history

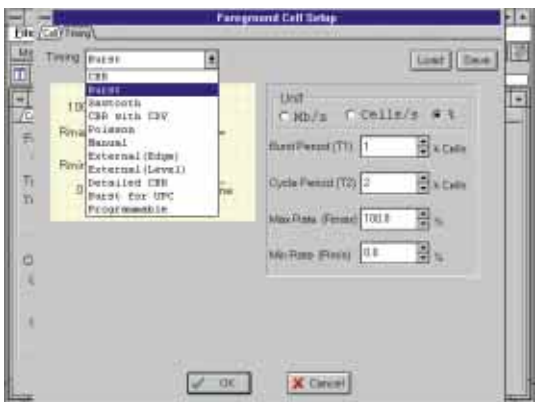
QoS Unit

The QoS can set and measure various ATM layer parameters. In addition to being useful for performing measurement using test cells conforming to the ITU-T O.191 recommendations, other test cells including AAL1, and AAL3/4 can be used.



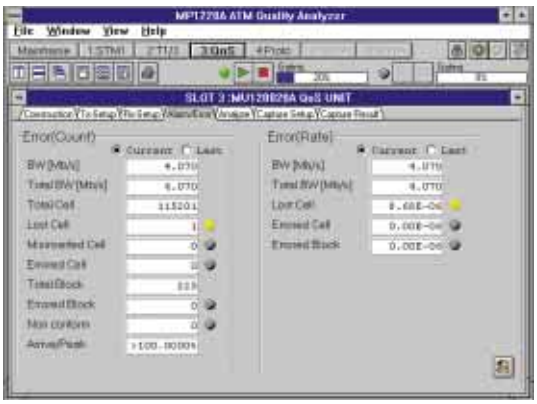
List of various test cells

The test cells can be generated with various traffic patterns including CBR, burst, sawtooth, Poisson distribution, and manual. In addition to the test cells, up to 10 types of background cells can be output to perform testing under more realistic network conditions.



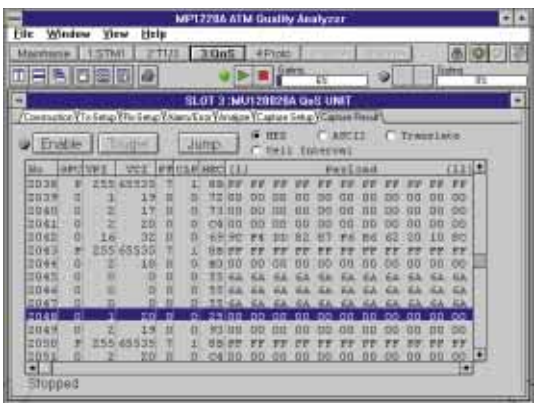
Various traffic patterns

Furthermore, different items can be measured for each selected test cell.

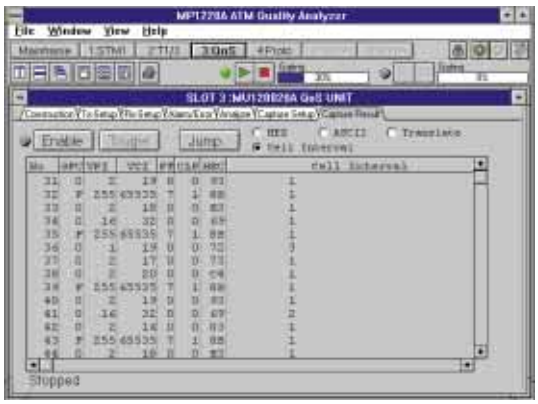


Measurement items for test cells

This unit has a capture function for saving a maximum of 4095 received cells in memory and displaying them. In addition to specifying all cells and cells of specific channels with the capture filter, it is also possible to specify cells where the header byte (GFC, CLP, etc.) and 1st payload byte. OAM cell reception and cell loss errors can be specified as the capture trigger. The capture results can be displayed as hexadecimal code or characters, etc., and can also be translated and displayed. Furthermore, the captured cell-to-cell interval can be displayed.

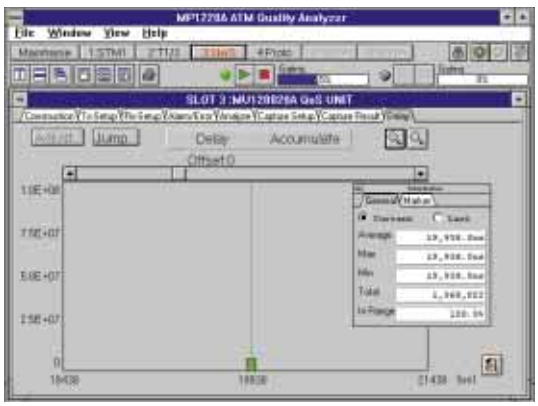


Cell capture display (hexadecimal)



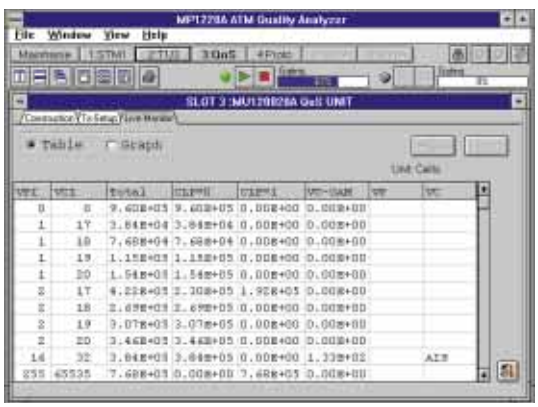
Cell capture display (cell interval)

In addition to alarms and errors, any one of the delay time/2-point CDV, cell interval, or 1-point CDV can be selected and measured. The measurement results are displayed as easy-to-read bar graphs.



Measurement results as bar graph

Up to 1023 received channels can be measured simultaneously and the traffic on the entire network can be determined by displaying and real-time monitoring of the flow of cells on each channel.



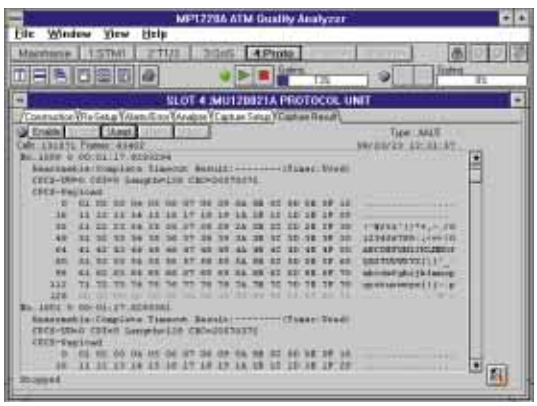
Simultaneous measurement and display of 1023 channels

Protocol Unit

This unit is used to measure different types of AAL errors.

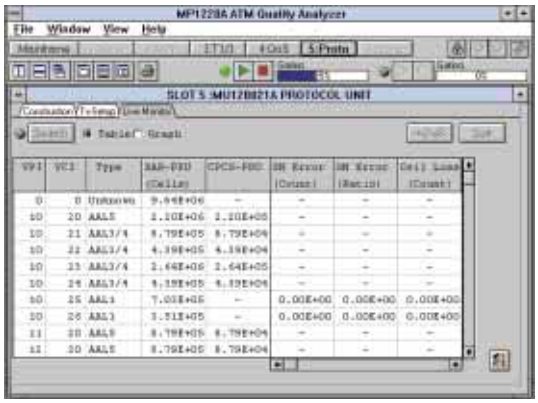
AAL-type measurement items

8 MB of memory is allocated to Send, Receive, and Send/Receive. When the entire memory is used to receive, more than 130,000 cells can be saved at one time. The saved cells are displayed together with the time stamp. In addition, it is possible to display the cells in the specified AAL type frame format.



Example of display with more than 130,000 cells

The AAL type can be evaluated automatically for up to a maximum of 1023 received channels and the main parameters can be measured.



Automatic evaluation and measurement of AAL type for 1023 channels

Specifications

● MP1220A ATM Quality Analyzer

Display	10.4” TFT color LCD with touch panel (analog resistive membrane)
Memory storage	3.5” Floppy disk drive (1.44 MB/720 KB) and hard disk drive (≥500 MB)
Buzzer	Alarm, error
External interface	RS-232C (D-sub 9-pin), printer (Centronics, D-sub, 25-pin), keyboard (PS/2, mini-DIN, 6-pin), mouse (PS/2, mini-DIN, 6-pin), VGA (analog RGB, D-sub, 15-pin)
Slots	6 (two channels max.)
EMC	EN55011:1991, Group 1, Class A EN50082-1:1992 Harmonic Current Emissions EN61000-3-2:1995 Class D
Safety	EN61010-1:1993 (Installation Category II, Pollution Degree II)
Dimensions and mass	284 (W) × 221.5 (H) × 365 (D) mm, ≤12 kg (excluding units)
Power supply	100 to 120/200 to 240 Vac (autoswitching), 50 to 60 Hz, ≤300 VA
Operating range	Operating: 5° to 50°C (excluding FDD), Storage: –20° to 60°C

● MU120001A STM-4/OC-12 Unit

Bit rate	51.84, 155.52, 622.08 Mbit/s
Frames	SDH/SONET
Output signal	Connector: FC (replaceable), 1.31 µm band (SM) Clock: Internal (±10 ppm), external, receive Level (fixed value): –15 to –8 dBm Code: NRZ Optical safety: IEC825-1 Class 1, 21CFR1040.10 Class I
Input signal	Connector: FC (replaceable), 1.31 µm band (SM) Frequency range: ±100 ppm Level: –34 to –8 dBm (51.84 Mbit/s, 155.52 Mbit/s), –28 to –8 dBm (622.08 Mbit/s) Code: NRZ
Functions	SOH/POH setting, SOH/POH monitoring, path trace, empty cell setting, cell scramble (de-scramble) on/off, coset on/off, HEC error correction on/off Error addition: Bit, B1, B2, B3, FEBE-L, FEBE-P, cell Alarm addition: LOS, LOF, AIS-L, RDI-L, AIS-P, RDI-P, LCD Error measurement: B1, B2, B3, MS-REI (FEBE-L), HP-REI (FEBE-P), HEC corrected cells, HEC uncorrected cells Alarm measurement: LOS, OOF, LOF, MS-AIS (AIS-L), MS-RDI (RDI-L), AU-AIS (AIS-P), HP-RDI (RDI-P), AU-LOP (LOP-P), LCD Pointers: Monitor, ±justification, NDF Auxiliary output: Receive clock output, trigger output

● MU120002A STM-1/OC-3 Unit

Bit rate	155.52 Mbit/s
Frames	SDH/SONET
Output signal	Connector Optical: SC 1.31 µm (SM), Electrical: BNC 75 Ω Clock: Internal (±10 ppm), external, receive Optical level (fixed value): –15 to –8 dBm Electrical level: 1 ±0.1 Vp-p (CMI) Code Optiacal: NRZ, Electrical: CMI Optical safety: IEC825-1 Class 1, 21CFR1040.10 Class I
Input signal	Connector Optical: SC 1.31 µm (SM/MM), Electrical: BNC 75 Ω Frequency range: ±100 ppm Optical level: –28 to –8 dBm (SM) Electrical level: 1±0.1 Vp-p (CMI)*, Cable loss: 0 to 12 dB, Monitor: 20 dB attenuated level of above level can be applied. Code Optical: NRZ, Electrical: CMI
Functions	SOH/POH setting, SOH/POH monitoring, path trace, empty cell setting, cell scramble (de-scramble) on/off, coset on/off, HEC error correction on/off Error addition: Bit, B1, B2, B3, FEBE-L, FEBE-P, cell Alarm addition: LOS, LOF, AIS-L, RDI-L, AIS-P, RDI-P, LOP-P, LCD Error measurement: B1, B2, B3, MS-REI (FEBE-L), HP-REI (FEBE-P), HEC corrected cells, HEC uncorrected cells Alarm measurement: LOS, OOF, LOF, MS-AIS (AIS-L), MS-RDI (RDI-L), AU-AIS (AIS-P), HP-RDI (RDI-P), AU-LOP (LOP-P), LCD Pointers: Monitor, ±justification, NDF, history record Auxiliary output: Receive clock output, trigger output

● MU120010A T1/T3 Unit

Bit rate	1.544 Mbit/s (T1), 44.736 Mbit/s (T3)
Frames	1.5M ESF (PLCP: on/off), 45M C-bit parity (PLCP: on/off), 45M M23 (PLCP: on/off)
Output signal	Connector BNC: 75 Ω unbalanced (T3) 8-pin modular: 100 Ω balanced (ISO/IEC 10173, T1) Clock: Internal (±10 ppm), external, receive Level: 2.4 to 3.6 Vo-p (T1), 0.36 to 0.85 Vo-p (T3) Code T1: B8ZS, T3: B3ZS
Input signal	Connector BNC: 75 Ω unbalanced (T3) 8-pin modular: 100 Ω balanced (ISO/IEC 10173, T1) Frequency range: ±130 ppm (T1), ±20 ppm (T3) Level: 2.4 to 3.6 Vo-p (T1), 0.36 to 0.85 Vo-p (T3) Monitor: 20 dB attenuated level of above level can be applied. Code T1: B8ZS, T3: B3ZS
Functions	Empty cell setting, cell scramble (de-scramble) on/off, coset on/off, HEC error correction on/off Error addition: Bit, FEBE, PLCP-BIP-8, PLCP-FEBE, cell Alarm addition: LOF, LOS, AIS, yellow, idle, PLCP-LOF, PLCP-yellow, LCD Error measurement: Code, CP, FEBE, CRC6, PLCP-BIP-8, PLCP-FEBE, HEC corrected cells, HEC uncorrected cells Alarm measurement: LOS, OOF, AIS, yellow, idle, PLCP-OOF, PLCP-yellow, LCD Auxiliary output: Receive clock output, trigger output

● MU120011A E1/E3/E4 Unit

Bit rate	2.048 Mbit/s (E1), 34.368 Mbit/s (E3), 139.264 Mbit/s (E4)
Frames	2M-CRC-4 off (PLCP: on/off), 2M CRC4 on (PLCP: on/off), 34M G.751 (PLCP: on), 34M GH.832 (PLCP: off), 139M G.832 (PLCP: off)
Output signal	Connector D-sub (9-pin): 120 Ω balanced (E1), BNC: 75 Ω unbalanced (E1/E3/E4) Clock: Internal (±10 ppm), external, receive Level: 3 ±0.3 Vo-p (E1 balanced), 2.37 ±0.237 Vo-p (E1 unbalanced), 1 ±0.1 Vo-p (E3), 1 ±0.1 Vp-p (E4) Code E1/E3: HDB3, E4: CMI
Input signal	Connector D-sub (9-pin): 120 Ω balanced (E1), BNC: 75 Ω unbalanced (E1/E3/E4) Frequency range: ±100 ppm (E1/E4), ±20 ppm (E3) Level: 3 ±0.3 Vo-p (E1 balanced), 2.37 ±0.237 Vo-p (E1 unbalanced), 1 ±0.1 Vo-p (E3), 1 ±0.1 Vp-p (E4) *Cable loss: 0 to 6 dB (E1), 0 to 12 dB (E3, E4) Monitor: 20 dB attenuated level of above level can be applied. Code E1/E3: HDB3, E4: CMI
Functions	Empty cell setting, cell scramble (de-scramble) on/off, coset on/off, HEC error correction on/off (E1, E3) Error addition: Bit, BIP-8, REI, PLCP-BIP-8, PLCP-FEBE, cell Alarm addition: LOF, LOS, AIS, RA, RA (MF), RDI, PLCP-LOF, PLCP-yellow, LCD Error measurement: CRC4, code, BIP-8, REI, PLCP-BIP-8, PLCP-FEBE, HEC corrected cells, HEC uncorrected cells Alarm measurement: LOS, OOF, AIS, MF loss (CRC), MF loss (sig), RA, RA (MF), RDI, PLCP-OOF, PLCP-yellow, LCD Trail trace: Monitor, setting Auxiliary output: Receive clock output, trigger output

● MU120012A E1/E3 Unit

Bit rate	2.048 Mbit/s (E1), 34.368 Mbit/s (E3)
Frames	2M-CRC-4 off (PLCP: on/off), 2M CRC4 on (PLCP: on/off), 34M G.751 (PLCP: on), 34M G.832 (PLCP: off)
Output signal	Connector D-sub (9-pin): 120 Ω balanced (E1), BNC: 75 Ω unbalanced (E1/E3) Clock: Internal (±10 ppm), external, receive Level: 3 ±0.3 Vo-p (E1 balanced), 2.37 ±0.237 Vo-p (E1 unbalanced), 1 ±0.1 Vo-p (E3) Code: HDB3
Input signal	Connector D-sub (9-pin): 120 Ω balanced (E1), BNC: 75 Ω unbalanced (E1/E3) Frequency range: ±100 ppm (E1), ±20 ppm (E3) Level: 3 ±0.3 Vo-p (E1 balanced), 2.37 ±0.237 Vo-p (E1 unbalanced), 1 ±0.1 Vo-p (E3) *Cable loss: 0 to 6 dB (E1), 0 to 12 dB (E3) Monitor: 20 dB attenuated level of above level can be applied. Code: HDB3
Functions	Empty cell setting, cell scramble (de-scramble) on/off, coset on/off, HEC error correction on/off Error addition: Bit, BIP-8, REI, PLCP-BIP-8, PLCP-FEBE, cell Alarm addition: LOF, LOS, AIS, RA, RA (MF), RDI, PLCP-LOF, PLCP-yellow, LCD Error measurement: CRC4, code, BIP-8, REI, PLCP-BIP-8, PLCP-FEBE, HEC corrected cells, HEC uncorrected cells Alarm measurement: LOS, OOF, AIS, MF Loss (CRC), MF Loss (Sig), RA, RA (MF), RDI, PLCP-OOF, PLCP-yellow, LCD Trail trace: Monitor, setting Auxiliary output: Receive clock output, trigger output

● MU120015A ATM 25M Unit

Bit rate	32.00 Mbit/s (25M)
Output signal	Connector: 8-pin modular jack, 100 Ω (RJ45) Clock: Internal (±10 ppm), external, receive Level: 2.7 to 3.4 Vp-p (1 symbol) Code: NRZI (4B/5B)
Input signal	Connector: 8-pin modular jack, 100 Ω (RJ45) Frequency: ±100 ppm Level: 2.7 to 3.4 Vp-p (1 symbol) Code: NRZI (4B/5B)
Functions	Empty cell setting, coset on/off Error addition: Code, cell Alarm addition: LOS Error measurement: Code, HEC uncorrected cell, illegal cell Alarm measurement: LOS Sync event: Send, measure Auxiliary output: Receive clock output, trigger output

● MU120016A 6.3M Unit

Bit rate	6.312 Mbit/s (6.3M)
Output signal	Connector: BNC, 75 Ω Clock: Internal (±10 ppm), external, receive Level: 2 ±0.3 Vo-p Code: B8ZS
Input signal	Connector: BNC, 75 Ω Frequency: ±30 ppm Level: 2 ±0.3 Vo-p *Cable loss: 0 to 6 dB Monitor: 20 dB attenuated level of above level can be applied. Code: B8ZS
Functions	Empty cell setting, cell scramble (de-scramble) on/off, coset on/off, HEC error correction on/off Error addition: Bit, CRC5, cell Alarm addition: LOS, AIS, RAI, LOF, LCD Error measurement: CRC5, HEC corrected cell, HEC uncorrected cell Alarm measurement: LOS, AIS, RAI, LOF, LCD Auxiliary output: Receive clock output, trigger output

● MU120017A 6.3/25M Unit

Bit Rate	6.312 Mbit/s (6.3M), 32.00 Mbit/s (25M)
Output signal	Connector BNC: 75 Ω (6.3M), 8-pin modular jack, 100 Ω (RJ45, 25M) Clock: Internal (±10 ppm), external, receive Level: 2 ±0.3 Vo-p (6.3M), 2.7 to 3.4 Vp-p (25M, 1 symbol) Code 6.3M: B8ZS, 25M: NRZI (4B/5B)
Input signal	Connector BNC: 75 Ω (6.3M), 8-pin modular jack, 100 Ω (RJ45, 25M) Frequency range: ±30 ppm (6.3M), ±100 ppm (25M) Level: 2 ±0.3 Vo-p (6.3M), 2.7 to 3.4 Vp-p (25M, 1 symbol) *Cable loss: 0 to 6 dB (6.3M) Monitor: 20 dB attenuated level of above level can bo applied (6.3M). Code 6.3M: B8ZS, 25M: NRZI (4B/5B)
Functions	Empty cell setting, cell scramble (de-scramble) on/off (6.3M only), coset on/off, HEC error correction on/off (6.3M only), sync event send (25M only) Error addition 6.3M: Bit, CRC5, cell 25M: Code, cell Alarm addition 6.3M: LOS, AIS, RAI, LOF, LCD 25M: LOS Error measurement 6.3M: CRC5, HEC corrected cell, HEC uncorrected cell 25M: Code, HEC uncorrected cell, illegal cell Alarm measurement 6.3M: LOS, AIS, RAI, LOF, LCD 25M: LOS Sync event (25M only): Send, measure Auxiliary output: Receive clock output, trigger output

● MU120020A QoS Unit

Foreground cells (test cells)	O.191, extended O.191, OAM test cell (PRBS 15), null, AAL1, AAL3/4, (For null, AAL1, AAL3/4, next pattern settable to payload. PRBS 9, PRBS 15, PRBS 15 (non-inverted), PRBS 23, time stamp, programmable)
Cell generation timing	CBR, burst, sawtooth waveform, CBR with CDV, Poisson distribution, manual, external edge, external level, detailed CBR, burst for UPC measurement, programmable
Background cell	CBR (10 types)
OAM cell	AIS, RDI, continuity check, loopback, programmable, forward monitoring, backward reporting, PM activation/deactivation, CC activation/deactivation
Capture	Capacity: 4095 cells Filter: All cells, specified cells, header + first byte of payload match/mismatch cells Trigger: Manual, OAM cell receive, cell error detect, cell loss detect, cell misinsertion detect, cell tagging, external input signal, etc. Display: Hexadecimal, ASCII, cell interval, translate
Single-channel	Error addition: Cell loss, cell error Error detection: Bit error, error cell, cell loss, cell misinsertion, non-conforming cell, etc. (measurement items differ according to test cell) Alarm detection: VP-AIS, VP-RDI, VP-LOC, VC-AIS, VC-RDI, VC-LOC Others: Bandwidth, total cells, cell delay measurement, 1 point CDV measurement, 2 point CDV measurement, cell interval measurement
1023 channel measurement (live monitor)	Detect and measure 1023 channels on line Measurement items: Total cell count, CLP=0 cell count, CLP=1 cell count, OAM cell count
Auxiliary input	Trigger input

● MU120021A Protocol Unit

Send/receive memory	8 MB (≥130,000 cells, send: 8 MB, receive: 8 MB, send + receive: 4 + 4 MB selectable)
Cell send	Transmit from memory according to time stamp. Able to transmit in every 1 cell Able to edit AAL1, AAL3/4, AAL5 frame
Capture	Capacity: ≥130,000 cells (at 8 MB receive setting) Filter: All cells, all cells (excluding idle cells), up to 16 specified channels Trigger: Specified event, specified event occurrence times, sequential event (second event after first event) Event: Specified channel, SN abnormality, ST abnormality, CRC abnormality, specified pattern, external input signal, etc. Display: Cell, SAR, CPCS, time stamp
Single-channel measurement	AAL type automatic evaluation and measurement Error addition: Cell loss, cell error Measurement items: Cell count, CPCS-PDU count, assembled timer timeout PDU count, frame size error count, CPI error count, SN error count, ST error count, LI error count, about count, BE tag error count, BA size error count, AL error count, length error count, CRC error count, etc. (measurement items differ according to AAL type)
1023 channel measurement (live monitor)	Detect and measure 1023 channels on line. AAL type automatically detected and measured Measurement items: Cell count, CPCS count, etc. (measurement items differ according to AAL type)
External interface	Trigger input (capture event)

Ordering Information

Please specify model/order number, name and quantity when ordering.

Model/Order No.	Name	
	Main unit	
MP1220A	MP1220A ATM Quality Analyzer	
	Accessories	
	AC power cord:	1 pc
F0012	Fuse, 3.15 A:	2 pcs
W1304AE	MP1220A operation manual:	1 copy
W1305AE	MP1220A remote control operation manual:	1 copy
Z0339	Software recovery floppy disk*:	1 pc
Z0340B	Protective cover (without keyboard):	1 pc
Z0343A	Input pen:	1 pc
Z0345A	Accessory bag:	1 pc
	Options	
MP1220A-01	RS-232C control	
MP1220A-02	GPIB control	
MP1220A-03	Ethernet control	
MU120001A-38	ST connector	
MU120001A-39	DIN connector	
MU120001A-40	SC connector	
MU120001A-43	HMS-10/A connector	
	Units	
MU120001A	STM-4/OC-12 Unit	
W1308AE	MU120001A operation manual	
W1314AE	MU120001A remote control operation manual	
MU120002A	STM-1/OC-3 Unit	
W1309AE	MU120002A operation manual	
W1315AE	MU120002A remote control operation manual	
MU120010A	T1/T3 Unit	
W1310AE	MU120010A operation manual	
W1316AE	MU120010A remote control operation manual	
MU120011A	E1/E3/E4 Unit	
W1311AE	MU120011A/120012A operation manual	
W1317AE	MU120011A/120012A remote control operation manual	
MU120012A	E1/E3 Unit	
W1311AE	MU120011A/120012A operation manual	
W1317AE	MU120011A/120012A remote control operation manual	
MU120015A	ATM25M Unit	
W1312AE	MU120015A/120016A/120017A operation manual	
W1318AE	MU120015A/120016A/120017A remote control operation manual	
MU120016A	6.3M Unit	
W1312AE	MU120015A/120016A/120017A operation manual	
W1318AE	MU120015A/120016A/120017A remote control operation manual	
MU120017A	6.3/25M Unit	
W1312AE	MU120015A/120016A/120017A operation manual	
W1318AE	MU120015A/120016A/120017A remote control operation manual	
MU120020A	QoS Unit	
W1313AE	MU120020A operation manual	
W1319AE	MU120020A remote control operation manual	
MU120021A	Protocol Unit	
W1371AE	MU120021A operation manual	
W1372AE	MU120021A remote control operation manual	
MX122020A	Protocol Decoding Software	
W1648AE	MX122020A operation manual	
	Optional accessories	
J0008	GPIB cable, 2 m	
J0775D	Coaxial cord, 2 m (75 Ω)	
J0776D	BNC cord, 2 m (twin shield)	
J0635B	Optical fiber cord (FC/PC-FC/PC-2m-SM), 2 m	
J0660B	Optical fiber cord (SC/PC-SC/PC-2m-SM), 2 m	
J0796A	Replaceable optical connector (ST)	
J0796B	Replaceable optical connector (DIN)	
J0796C	Replaceable optical connector (SC)	
J0796D	Replaceable optical connector (HMS-10/A)	
J0796E	Replaceable optical connector (FC)	
J0844A	ISO 10173 cable (T1), 2 m	
J0838A	UTP category 3 cable (25M), 2 m	
Z0319A	PS/2 mouse	
Z0340A	Protective cover (with keyboard)	
Z0340B	Protective cover (without keyboard)	
B0414A	Hard case	
B0163	Soft case	

*Sold only to MP1220A users