

**ATM QUALITY ANALYZER  
MP1220A**

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

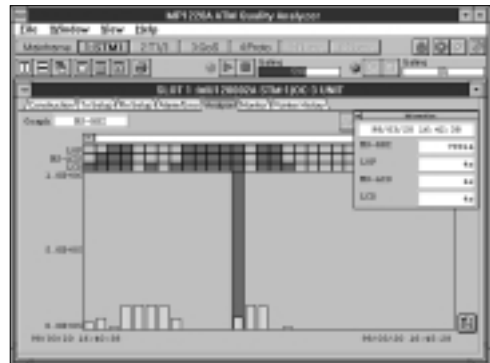
*For Construction and Maintenance of ATM Networks*



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**

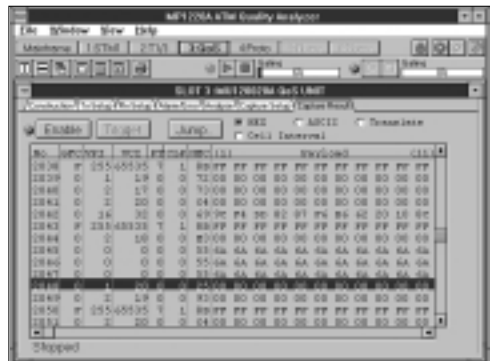
- Supports various interfaces from 1.5 Mbps (T1) to 622 Mbps (STM-4c/OC-12c)
- 150 Mbps real-time analysis up to CPCS layer
- Simultaneous measurement of two channels (up/down stream)
- Automated inspection measurement of 1023 network channels
- Uses test signals conforming to ITU-T O.191 recommendations
- Small, lightweight, and portable



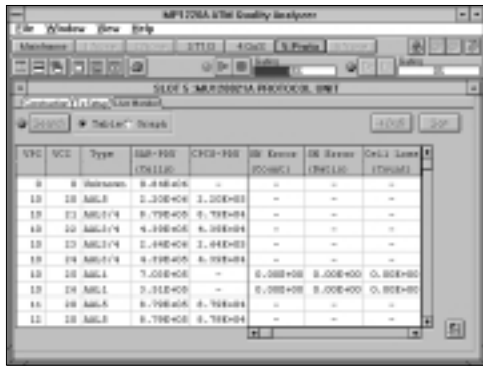
Graphical display of alarm/error history



Measurement items for test cells



Cell capture display (hexadecimal)



Automatic evaluation and measurement of AAL type for 1023 channels

## Specifications

### • MP1220A ATM Quality Analyzer

Display	10.4 inch TFT color LCD with touch panel (analog resistive membrane)
Memory storage	3.5 inch 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) x 221.5 (H) x 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 Mbps
Frames	SDH/SONET
Output signal	Connector: FC (replaceable), 1.31 μm band (SM) Clock: Internal (±10 ppm), external, receive Level: -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 Mbps, 155.52 Mbps), -28 to -8 dBm (622.08 Mbps) 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 Mbps
Frames	SDH/SONET
Output signal	Connector Optical: SC 1.31 μm (SM); Electrical: BNC 75 Ω Clock: Internal (±10 ppm), external, receive Optical level: -15 to -8 dBm Electrical level: 1 ±0.1 Vp-p (CMI) Code Optical: NRZ, Electrical: CMI Optical safety: IEC825-1 Class 1, 21CFR1040.10 Class I

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Input signal	<p>Connector                      Optical: SC 1.31 <math>\mu\text{m}</math> (SM/MM); Electrical: BNC 75 <math>\Omega</math>                      Frequency range: <math>\pm 100</math> ppm                      Optical level: <math>-28</math> to <math>-8</math> dBm (SM)                      Electrical level: <math>1 \pm 0.1</math> 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</p>
Functions	<p>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, <math>\pm</math>justification, NDF, history record                      Auxiliary output: Receive clock output, trigger output</p>

### • MU120010A T1/T3 Unit

Bit rate	1.544 Mbps (T1), 44.736 Mbps (T3)
Frames	1.5M ESF (PLCP: on/off), 45M C-bit parity (PLCP: on/off), 45M M23 (PLCP: on/off)
Output signal	<p>Connector                      BNC: 75 <math>\Omega</math> unbalanced (T3); 8-pin modular: 100 <math>\Omega</math> balanced (ISO/IEC 10173, T1)                      Clock: Internal (<math>\pm 10</math> 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</p>
Input signal	<p>Connector                      BNC: 75 <math>\Omega</math> unbalanced (T3); 8-pin modular: 100 <math>\Omega</math> balanced (ISO/IEC 10173, T1)                      Frequency range: <math>\pm 130</math> ppm (T1), <math>\pm 20</math> 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</p>
Functions	<p>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</p>

### • MU120011A E1/E3/E4 Unit

Bit rate	2.048 Mbps (E1), 34.368 Mbps (E3), 139.264 Mbps (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	<p>Connector                      D-sub (9-pin): 120 <math>\Omega</math> balanced (E1); BNC: 75 <math>\Omega</math> unbalanced (E1/E3/E4)                      Clock: Internal (<math>\pm 10</math> ppm), external, receive                      Level: <math>3 \pm 0.3</math> Vo-p (E1 balanced), <math>2.37 \pm 0.237</math> Vo-p (E1 unbalanced), <math>1 \pm 0.1</math> Vo-p (E3), <math>1 \pm 0.1</math> Vp-p (E4)                      Code                      E1/E3: HDB3, E4: CMI</p>
Input signal	<p>Connector                      D-sub (9-pin): 120 <math>\Omega</math> balanced (E1); BNC: 75 <math>\Omega</math> unbalanced (E1/E3/E4)                      Frequency range: <math>\pm 100</math> ppm (E1/E4), <math>\pm 20</math> ppm (E3)                      Level: <math>3 \pm 0.3</math> Vo-p (E1 balanced), <math>2.37 \pm 0.237</math> Vo-p (E1 unbalanced), <math>1 \pm 0.1</math> Vo-p (E3), <math>1 \pm 0.1</math> 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</p>
Functions	<p>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</p>

### • MU120012A E1/E3 Unit

Bit rate	2.048 Mbps (E1), 34.368 Mbps (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	<p>Connector                      D-sub (9-pin): 120 <math>\Omega</math> balanced (E1); BNC: 75 <math>\Omega</math> unbalanced (E1/E3)                      Clock: Internal (<math>\pm 10</math> ppm), external, receive                      Level: <math>3 \pm 0.3</math> Vo-p (E1 balanced), <math>2.37 \pm 0.237</math> Vo-p (E1 unbalanced), <math>1 \pm 0.1</math> Vo-p (E3)                      Code: HDB3</p>

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Input signal	<p>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</p>
Functions	<p>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</p>

## • MU120015A ATM25M Unit

Bit rate	32.00 Mbps (25M)
Output signal	<p>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)</p>
Input signal	<p>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)</p>
Functions	<p>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</p>

## • MU120016A 6.3M Unit

Bit rate	6.312 Mbps (6.3M)
Output signal	<p>Connector: BNC, 75 Ω Clock: Internal (±10 ppm), external, receive Level: 2 ±0.3 Vo-p Code: B8ZS</p>
Input signal	<p>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</p>
Functions	<p>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</p>

## • MU120017A 6.3/25M Unit

Bit rate	6.312 Mbps (6.3M), 32.00 Mbps (25M)
Output signal	<p>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)</p>
Input signal	<p>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 be applied (6.3M). Code 6.3M: B8ZS, 25M: NRZI (4B/5B)</p>
Functions	<p>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</p>

## • 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
MP1220A	<b>Mainframe</b> ATM Quality Analyzer
	<b>Standard accessories</b>
J0017	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: 1 pc
Z0340B	Protective cover (without keyboard): 1 pc
Z0343A	Input pen: 1 pc
Z0345A	Accessory bag: 1 pc
	<b>Options</b>
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
	<b>Units</b>
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

\*1: Sold only to MP1220A users

Model/Order No.	Name
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
	<b>Optional accessories</b>
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