

# MU120138A 10 Gigabit Ethernet Module

MD1230B, MP1590B

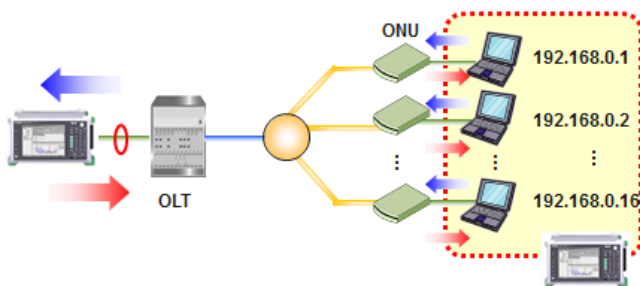
Data Quality Analyzer, Network Performance Tester

## 10GbE Multiport Solution

The rapid evolution of Access Networks using FTTH and high-speed mobile services is accelerating growth in traffic volumes, bringing increasing demand for expanded network bandwidth using 10 Gigabit Ethernet (GbE) technologies. In addition, QoS assurance is a key topic in supporting the increasingly diverse range of network services now on offer. Anritsu's Data Quality Analyzer MD1230/ Network Performance Tester MP1590B has established a worldwide reputation in supporting development of high-density and high-accuracy 10 GbE modules for the growing 10G market.

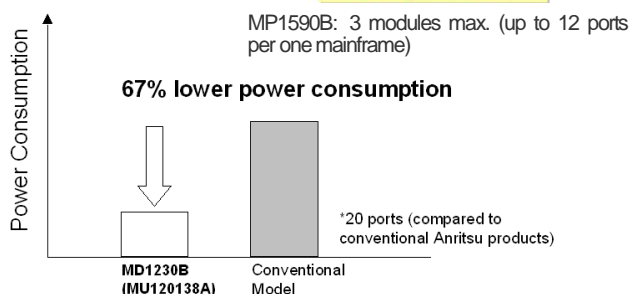
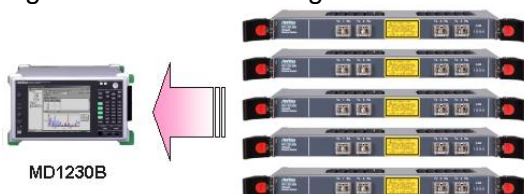
### Next-Generation 10GEPON Measurements

Anritsu supports end-to-end measurement environments with excellent cost-performance modules for next-generation 10GEPON markets using a mixture of 10G and 1G technologies. Multiport PON systems are measured easily and efficiently at low cost per port.



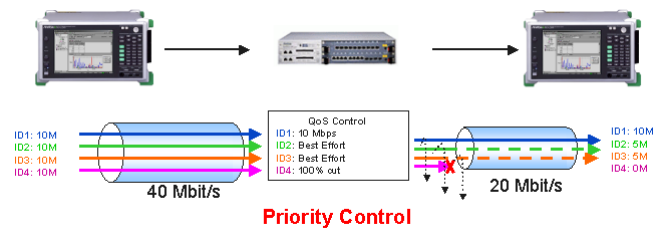
### 'Green IT' 10GbE I/F Modules

Compared to other products, Anritsu's MU120138A 10 Gigabit Ethernet Module has twice the port density in just half the benchtop space. Using these modules, one MD1230B supports twenty 10GbE ports, or five times as many ports as conventional instruments, with huge power savings as well exceptionally low investment cost per port, making these modules an ideal measurement solution for the new 'green IT' environmental age.



### QoS Measurements using Multiflow Counter

Multiple applications are supported by flexible QoS measurements using the Multiflow counter function, offering the perfect measurement solution for next-generation networks (NGN) requiring assured high-level service quality.



### Link Tests

The Link Flap phenomenon can be simulated by repeatedly forcing Link On and Off from the measuring instrument to automate verification of abnormal connections.

### Clock Measurements

The Clock Measurement option is useful for verifying the clock function of connected equipment. By monitoring the frequency of the received signal and shifting the frequency by  $\pm 100$  ppm, clock-related transmission quality parameters, such as verification of clock status and evaluation of equipment clock tolerance, are measured easily.

### BER Measurements

Genuine, high-reliability, Ethernet-frame BER measurements are made easy by generating different patterns in each frame using long-cycle PRBS23 and PRBS31 pseudorandom patterns.

## Specifications

Model/Name	MU120138A 10 Gigabit Ethernet Module
Specification	10GBASE-SR, 10GBASE-LR, 10GBASE-ER (depends on SFP+ Module)
Number of Ports/Connector	4Ports/SFP+(LC)
Clock Measurement (Requires MU120138A-01 option)	Clock Accuracy: $\pm 4$ ppm Clock Shift: $\pm 100$ ppm (1-ppm steps) Frequency Monitor: Accuracy: $\pm 4$ ppm
Link Up/Down (Flap)	On/Off/Flap(Interval: On: 10 to 3600 s, Off: 1 to 3600 s, Count: 1 to 65536, Infinite) No/Go Check: None
Frame Setting	Frame Size: 48 to 10,000 bytes, settable as Auto, Fixed, Increment <sup>*1</sup> , or Random <sup>*1</sup> VLAN tag: Up to 10 layer VLAN tags appended. <sup>*2</sup> MPLS label: Up to 10 MPLS labels appended. <sup>*2</sup>
Gap Setting	Inter Frame Gap (IFG): Resolution of 0.8 ns, 7.2 ns to 120 s settable as Fixed or Random Inter Burst Gap (IBG): Resolution of 0.8 ns, 7.2 ns to 120 s settable as Fixed Inter Stream Gap (ISG): Resolution of 0.8 ns, 9.6 ns to 120 s settable as Fixed
BER Testing (Requires MD1230B-11/ MP1590B-11 option)	Test Pattern: Single PRBS9, Cross PRBS23, Cross PRBS31 Error Insertion: Cross PRBS Error Error Insertion Timing: Single, Rate(1.0E-9, 1.0E-8, 1.0E-7, 1.0E-6, 1.0E-5, 1.0E-4, 1.0E-3), Programmable Rate (1.0E-10 to 2.0E-3)
RFC Testing	RFC2544 (VLAN), RFC2889 (VLAN) (Requires MD1230B-10 option)
Multiflow Counter	TRx Frame count/rate, TRx bit rate, TRx byte count, TRx rate, Latency (Min, Max, Current, Avg.), Sequence Error Count / flow Real-time Mode: 255 flows/main frame (real-time display) Statistics Mode: 255 flows/module (results display at measurement end) Filters: Four combined for specified field (max. 16 bits wide)
Capture	Capture Buffer: 256 Mbytes/port Supports Preamble capture. Supports Ethereal <sup>®</sup> /Wireshark <sup>®</sup> Convert Function.
Distribution Measurement	Frame Arrival Time Variation: Resolution: 1 $\mu$ s, 10 $\mu$ s, 100 $\mu$ s, 1 ms, 10 ms, 100 ms, 1 s Latency Variation: Resolution: 50 ns, 100 ns, 1 $\mu$ s, 10 $\mu$ s, 100 $\mu$ s, 1 ms, 10 ms, 100 ms
Link Fault Signalling (Requires MU120138A-03 option)	LF, RF, User-Defined Signal Tx LF, RF Signal Counter, XGMII Signal Capture
Ethernet OAM (Requires MD1230B-28/ MP1590B-28 option)	Supports ITU-T Y.1731, IEEE 802.1ag Counter: LOC, AIS, RDI (Resolution: 0.1 ms) OAM Frame capture and protocol analysis
Protocol Emulation	IGMP, MLD (requires MD1230B-12/MP1590B-12 Option), MLDA (requires MD1230B-22 Option)
Supported Main Frame <sup>*3</sup>	MD1230B, MP1590B

\*: Ethereal<sup>®</sup> is registered trademarks of Ethereal, Inc. Wireshark<sup>®</sup> is registered trademarks of Gerald Combs.

\*1: Increment and Random settings can be specified for the frame size only when none is selected as the protocol.

\*2: VLAN tag and MPLS labels cannot both be used simultaneously.

\*3: MD1230B supports up to 5 MU120138A per one mainframe. MP1590B supports up to 3 MU120138A per one mainframe.

## External Appearance

### MU120138A 10 Gigabit Ethernet Module



## Ordering Information

Model/Order No.	Name
	<b>Plug-in Module</b>
MU120138A	10 Gigabit Ethernet Module
	<b>Options</b>
MU120138A-01	Clock Measurement
MU120138A-03	Link Fault Signalling

Model/Order No.	Name
	<b>Accessories</b>
G0238A	SFP+ SR 850nm
G0239A	SFP+ LR 1310nm
G0271A	SFP+ ER 1550 nm