

# Differences between MU150110A and MU120138A 10Gigabit Ethernet Function

**MP1590B**

Network Performance Tester



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# **Differences between MU150110A and MU120138A 10Gigabit Ethernet Function - Product Introduction -**

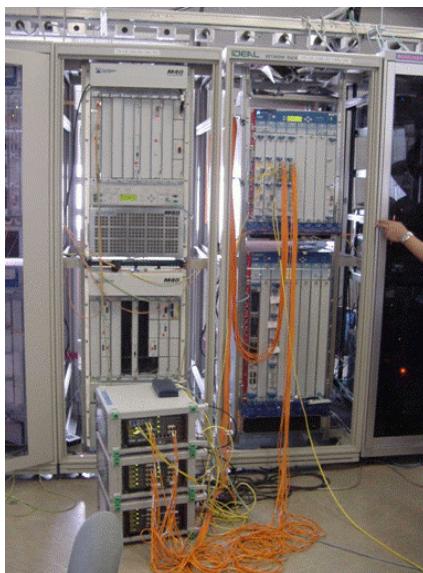
**June 2009**

**Anritsu Corporation**

# IP/Ethernet Test Solutions Supporting Broadband IP Networks

The evolution of broadband IP networks is expected to drive the spread and market expansion of 10Gigabit Ethernet. The multiport MU120138A was developed from this perspective.

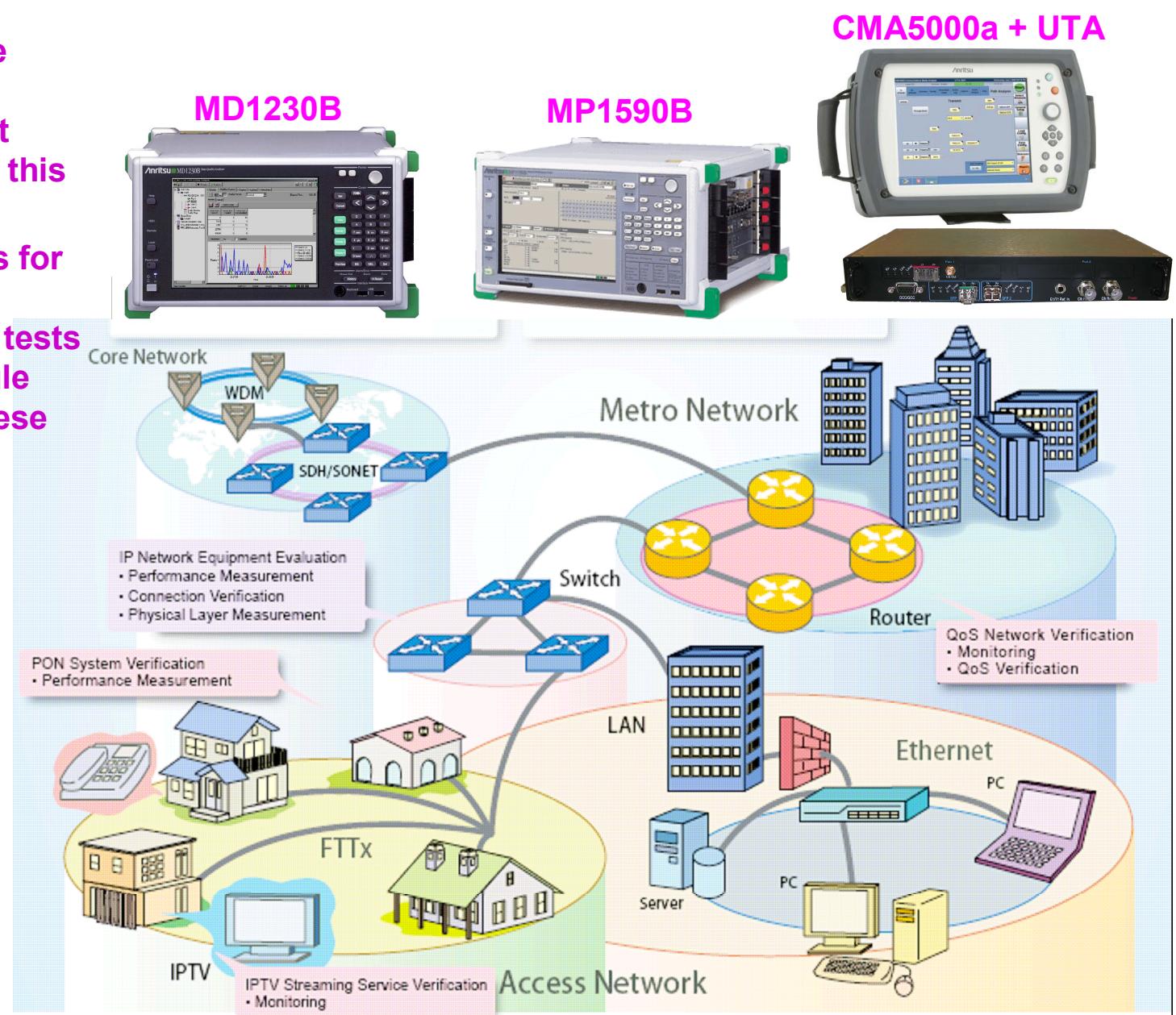
Additionally, both OTN/SDH tests for linking OTN/SDH networks with 10GbE and simultaneous 10GbE tests are also needed, requiring a single test instrument supporting all these tests.



**10GbE Performance Test Scene**

10GbE x 2, GbE x 24

MU120118B, MU120112A x 12



# 10Gigabit Ethernet Test Requirements

## ◆ 10GbE Test Needs (R&D/Manufacturing)

There are two main needs for 10GbE tests in the R&D/Manufacturing test fields.

- Evaluate Ethernet packets to perform load and QoS tests to evaluate performance of equipment such as L2 switches and routers.

- MD1230B + MU120138A common in this measurement field
- Multiple ports required for load testing
- Conventionally, MU120118B used for evaluation but need for lower-cost test solution



- Perform operation tests of Ethernet I/F in Ethernet transport network (R&D/Manufacturing)

- Conventionally supported by combination of MP1590B + MU120xxxA module
- For 10GbE, including (option) test functions in MU150110A eliminates need for MU120118B/C combination

Note: 10/100/1000Base-T and Gigabit Ethernet (optical) tests still require MU120xxxA modules, as previously.



# 10Gigabit Ethernet Test Requirements

## ◆ 10GbE Test Needs (Field/Network Tests)

The following 10GbE test functions are needed in the Field and Network test fields.

- Joint testing of OTN/SDH and Ethernet for field installation and maintenance, etc.
  - Field installation and maintenance work require handheld testers and CMA5000a + UTA (10Gig Option) common in these fields
  - IP tester such as MD1230B used for carrier/ISP network tests



# Target Markets

	MU150110A	MU120138A	MU120118B/C	CMA5000a + UTA with 10Gig Option	
					
System Vendor Lab	<b>Transport Network Equipment</b>	◎		○	○
	<b>L2SW, Router, Media Convertor</b>		◎	○	
Service Provider Lab	<b>Transport Network</b>	◎		○	○
	<b>IP Network</b>		◎	○	
Manufacturing	<b>Transport Network Equipment</b>	◎		○	○
	<b>L2SW, Router, Media Convertor</b>		◎	○	
Field Installation	<b>Transport Network</b>	○			◎
	<b>IP Network</b>			○	○
Filed Maintenance	<b>Transport Network</b>				◎
	<b>IP Network</b>				◎

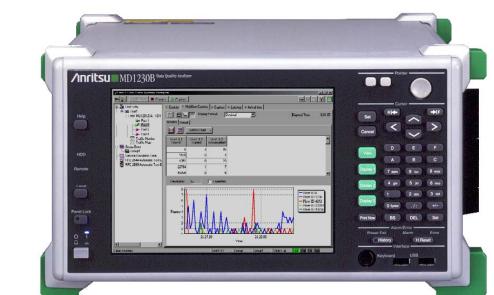
# MU150110A Multirate Unit

- ◆ **Plug-in Module for MP1590B**
  - Supports bit rates of 1.5M to 11.1G
- ◆ **Upper Compatible with MU150100A 10/10.7G Unit**
  - Inherits all MU150100A functions
  - Added 10G optical I/F (conventionally required MU150121A/123A or MU150135A)
- ◆ **SDH/SONET/PDH/DSn Measurements**
  - STM-0/OC-1 (52M) to STM-64/OC-192 (10G)
- ◆ **OTN Measurements**
  - OTU1 (2.6G), OTU2 (10.7G)
  - OTU1e (11.04G), OTU2e (11.09G)
  - ITU-T O.182 FEC Performance test
- ◆ **10GbE-LAN Measurements**
  - PCS (Physical Coding Sublayer) Measurement
  - Link Fault Signalling measurement
- ◆ **Multichannel Measurements**
  - Simultaneous measurement of all HO/LO channels across full 10G band
  - Error/Alarm, BER, APS, Delay Time measurements



# MU120138A 10 Gigabit Ethernet Module

- ◆ **Plug-in Module for MD1230B/MP1590B**
  - Uses SFP + optical module
- ◆ **Low-cost 10GbE Multiport Measurement Environment**
  - 4 ports/module
  - Low cost per port (US\$ 15 K (excl. SFP+))
- ◆ **10GbE Connection Compatibility/Quality Tests using L1 Measurements**
  - Clock tests (clock offset, clock monitor)
  - Link Flap
  - BER Measurement
- ◆ **10GbE QoS Measurements**
  - Multiflow counter (256 flows)
  - Throughout, Delay, Frame Loss measurements



# Target Markets

## ◆ MU150110A

- R&D/manufacturing of devices, modules, and equipment vendors related MSPP/MSTP/ROADM
- R&D/manufacturing of devices, modules and equipment vendors related OTN (10GbE over OTN)
- Design verification and maintenance of ASON/GMPLS network carriers and ISPs

## ◆ MU120138A

- R&D/manufacturing of 10GbE L2 switch vendors
- R&D/manufacturing of 10G PON system (OLT/ONU) vendors
- R&D/manufacturing of transport network equipment (MSPP, ROADM, etc.) vendors
- Lab, network design verification and troubleshooting of 10GbE dedicated lines and in-house LANs
- Lab, network design verification and troubleshooting of 10G PON system carriers and service providers

# Target Customers

## ◆ MU150110A

- SDH/SONET/OTN measurements in addition to 10GbE
- Detailed L1 analyses
- No IP measurements
- Low price

## ◆ MU120138A

- Multiple ports
- Low price per port
- High-function L1/L2 measurements
- 10GbE QoS measurements

## ◆ (Ref.) MU120118B/C

- Low price

# 10GbE Function Comparison (1/2)

Function		MU150110A		MU120138A		MU120118B/C		CMA5000a UTA	
		Priority		Priority					
Main Frame		MP1590B		MD1230B/MP1590B		MD1230B/MP1590B		CMA5000a	
<b>Interface</b>	<b>10 Gigabit Ethernet</b>	v 10GBASE-LR/ER (XFP module)	?	v 10GBASE-SR/LR (SFP+ module)	?	v 10GBASE-SR/LR/ER (XENPAK module)	?	v 10GBASE-SR/LR/ER (XENPAK module)	?
	<b>SDH/SONET</b>	v STM-0~STM-64 OC-1~OC-192						v STM-1~STM-64 OC-3~OC-192	
	<b>OTN</b>	v OTU1 (2.6G) OTU2 (10.7G) OTU1e (11.04G) OTU2e (11.09G)						v OTU1 (2.6G) OTU2 (10.7G) OTU1e (11.04G) OTU2e (11.09G)	
	<b>PDH/DSn</b>	v							
<b>Port Count</b>		v 1		v 4		?		v 2 (MU120118B) 1 (MU120118C)	v 1
<b>Price</b> <small>Excluding MSA optical modules such as XFP/SFP+/XENPAK</small>	<b>Standard Price</b> <small>Module only and excluding main frame</small>	v US\$48K (inc. 10.3G option)	?	v US\$60K	?	v US\$50K (MU120118B) US\$25K (MU120118C)	?	v US\$35K (inc. 10GE LAN-PHY application)	v US\$35K
	<b>Price Per Port</b>	v US\$48K		v US\$15K		v US\$25K		v US\$35K	
<b>Unique Layer 1 Functions</b>	<b>Clock Offset</b>	v ±100 ppm (0.1-ppm step)	?	v ±100 ppm (1-ppm step)	?	v ±100 ppm (XAUI) (1-ppm step)	?		
	<b>Link Flap</b>			v		v			
	<b>Unframe BER</b>	v		v		v			
	<b>Frequency</b>	v ±100 ppm		v ±100 ppm		v			
	<b>Optical Power</b>	v -20 to +3 dBm		v		v			
	<b>Link Fault Signalling</b>	v		v		v			
	<b>PCS</b>	v		v		v			
	<b>Jitter</b>	v		v		v			

# 10GbE Function Comparison (2/2)

Function		MU150110A	MU120138A	MU120118B/C	CMA5000a UTA
		Priority	Priority		
Tx Functions	IP Support		v		
	Stream Count	v 1	v 256		
	Frame Length	v 48~16,384 bytes (Auto, Fixed, Increment, Random)	v 48~10,000 bytes (Auto, Fixed, Increment, Random)	?	
	VLAN	v 1 stage	v 10 stage		
	MAC Address Increment	v	v		
	Test Frame Send	v	v		
	Error Insertion	v	v		
Measurement Functions	IP Support		v		
	Counter	v	v		
	Multiflow Counter		v		
	Capture		v		
	Latency	v	v		
	Delay Time Distribution		v	?	
	Through Mode	v	v		
	Packet BER	v	v		
	Sequence Error	v	v		
	Ethernet OAM		v		
	Auto-measurement		v RFC2544/2889		v RFC2544
Protocol Emulation			v ARP ICMP, ICMPv6, IGMPv2/IGMPv3, IGAP, MLD/MLDv2, MLDA	?	v ARP, ICMP
					v ARP, ICMP, OSPF, BGP-4, ICMPv6, OSPFv3, BGP4+, IGMPv2/IGMPv3, IGAP, MLD/MLDv2, MLDA, PIM-SMv2, MPLS (LDP/CR-LDP), MPLS (RSVP-TE)

# Note

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