Product Introduction

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MD1260A 40/100G Ethernet Analyzer

MD1260A 40/100G Ethernet Analyzer Product Introduction



Anritsu Corporation

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Slide 1



Key Features and Benefits

Software upgradeable interfaces for 40GE, 100GE, OTU3, and OTU4 with CFP modules

Compact body with easy-to-use simple GUI using 12.1-inch touch-panel; light 7-kg weight; reliable solid-state flash drive

Operation log function generates remote commands automatically from GUI operation to cut development period for automatic tests

Unique!

Ethernet tolerance tests using worst-case conditions, such as frame length up to 32,700 bytes, exceeding full-wire rate and clock offset up to \pm 120ppm at CAUI

OTU4 GMP mapping with Ethernet client and payload offset to verify MUX/DEMUX and clock tolerance between OTU4 and Ethernet Unique! Random error injection following 0.182 to verify GFEC decoder performance, and support to verify proper FEC using OTN through mode Unique!

Evaluation kit and CFP MDIO analysis to isolate faults between CFP and transmission equipment on production line Unique!

Various BER tests, such as physical, virtual, lambda layer and packet BER, as well as PCS layer tests, for troubleshooting network equipment and optical modules

Supports two rack-mount kits for production lines

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~ All-in-One Compact 40/100G Ethernet Analyzer ~

The MD1260A is All-in-One Compact 40/100G Ethernet Analyzer. It is a measuring instrument for assuring the quality of high-speed networks forming the foundation of next-generation applications for cloud computing.



~ All-in-One Compact 40/100G Ethernet Analyzer ~

- □ I/F Upgrade according to budget and schedule
- Excellent operability with rugged, compact, lightweight construction, and silent design
- □ Simple and easy-to-use operation
- 40G/100GbE Testing with Ethernet and IP layer traffic generation and analysis
- OTU3/OTU4 Testing
- **PCS** layer testing with status monitoring by each lane
- Various BER tests
- Unique capabilities



I/F Upgrade According to Budget and Schedule

Excellent Scalability

One MD1260A supports 40GbE, 100GbE, OTU3, and OTU4. Each interface is optional and can be added easily at customer site when necessary.





Anritsu has a plan to release above CFPs. These CFPs will be released if CFP module is released from module venders officially.



Excellent operability with rugged, compact, lightweight construction, and silent design

Excellent Operability

Operation is easy with a large 12.1-inch touch panel and intuitive GUI, and drive crashes are a thing of the past due to the rugged solid-state Flash drive. The small footprint and light weight offer easy portability to even the most difficult test sites. The silent design provides a quiet, comfortable working environment.



What's New on Ver.3.2

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Protocol Header Editing Enhancement

ARP, ICMPv4, ICMPv6 headers editing screens are added

New on Ver.3.2!

Frame Counat			X			
Ethernet	Click button to add to frame:		ОК			
ARP	MPLS-TP (Up to 5 labels)	Frame Format		X		
	PBB (B-TAG+I-TAG) PBB (I-TAG	ion Ethernet	Click button to add to frame:	ОК		
	VLAN (Up to 2 tags)	IPv4	MPLS-TP (Up to 5 labels)			×
	MPLS (Up to 3 labels)	ICMPv4 Echo	PBB (B-TAG+I-TAG) PBB (I-TAG	Ethernet 6 - Click button	to add to frame:	
	IPv4 IPv6		VLAN (Up to 2 tags)		P (Up to 5 labels) Control Word	Carrol
	ICMPv4 ICMPv6		MPLS (Up to 3 labels)		AG+I-TAG) PBB (I-TAG only)	Galcel
Test Pattern			IPv4 IPv6		(Un to 2 tars)	
	Custom Header (Cannot be combined with other headers)					
	Recent Used Frame Formats:		10101-04	MPLS		
	Etherne	. + I Test Pattern	Custom Header (Cannot be combined with other headers)	IPv4		
	Ethe	met	Recent Used Frame Formats:	ICMPv4	ICMPv6	
			Ethernet	Test Pattern Custom Hea	ader (Cannot be combined	
Click button to	Romovo All	1000	Ether			
				Recent Used Fr	ame Formats: Ethernet + IPv4	
		Click button to	Romovo All		Ethernet	
				Click button to		
	ARP		ICMPv4		ICMPv6	
						-
Discover V	Vhat's Possible™		5110e 8			IIIIUS
			MD1260A-E	E-L-1		

MAC Address Resolving

The destination MAC address on the sending stream can be resolved.

Stream Control/Header	
Stream 1 Name Ethernet + IPv4	On OK
Control Header	Cancel
Frame Format Ethernet + IPv4	
Ethernet IPv4 Modifiers Header Pattern	MAC Resolve
Destination MAC Address 0000000 - 00000A Fixed MAC Resolve	Resolve Type Resolve and Ping Setup Stream All Streams Exceute
Source MAC Address 0000000 - 000001 Fixed	Resolve Target Gateway IP Address
Type hex 0800	Gateway IP Address (IPv4) 192 . 168 . 0 . 254
	(IPv6) 0000 : 0000 : 0000 : 0000 : 0000 : 0000 : 0000 : 0000 : 0000
	No. Name Destination IP Address Resolve Result Ping Status Result
	1 Ethernet + IPv4 192.168.0.100 00-00-00-00 4/4 Done
	3
	8
	11
	14
,	

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New on Ver.3.2!

New on Ver.3.2! New result counter items added on "All Lanes" PBB, ARP/NDP-related and Ping-related items are added on the test counters in "All Lanes" tab.

 Test Frames 	Distribution	• All Lanes • I	ndividual • O	pt Chart Captı	ire ^o Protocol	Settings
				Counter Elapsed	Time 00:00:00	Stream
				Transmit Duration	0:00:000.000 000 000	
FCS Errors	0	0	0	0	▲ Gauges (Current)	
Fragments	0	0	0	0	Ty Pata	Lane Map
Oversize & FCS	0	0	0	0	Tx nate	
Undersize	0	0	0	0		Relative S
Oversize (>1,518)	0	0	0	0	40 50 60 70	Relative o
Good Frames	0	0	0	0		
Rate (bit/s)	0		0			Error/Ala
Rate (%)	0.0000		0.0000		110	
Pause Frame			0	0	0.0000	
Trigger Condition			0	0		Counter/Ca
Broadcast	0	0	0	0	By Bate (%)	
Broadcast Bytes		0		0	Tox Trace (M)	
Multicast Frames	0	0	0	0	50 60	Port
Multicast Bytes		0		0	30 80	
MPLS-TP (CW On)	0	0	0	0	20 🔵 90 -	
PBB	0	0	0	0	10 100	MDIO
ARP Request	0	0	0	0	110.	
ARP Reply	0	0	0	0	addad	
PINGv4 Request	0	0	0	0		Clock
PINGv4 Reply	0	0	0	0	Errored Frame (%)	
NDP (NS)	0	0	0	0		
NDP (NA)	0	0	0	0	40 50 60	Transcen
PINGv6 Request	0	0	0	0		
PINGv6 Reply	0	0	0	0	80	
Bit Errors					100.5	
Bit Errors (Rate)					0.0000	
Pattern Sync						

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GARP/NS Packet Send/Reply

GARP packets for IPv4 and NS/NA packets for IPv6 in the set streams up to 16 can be configured, sent and replied.

System Menu	Sync 🗆 S	tream 🗌 🗆	Error/Alarm Ins	Counter	🗖 Cap	oture	Link L	oopback Log	2012-10-26	▲ MD1260A
	off					\rightarrow		ror/Alarm		Top Menu
			<u> </u>							P -
• Test Frames Distribu	ition • All I	anes o Indi	vidual o On	t Chart Can	ture © F	rotoco		Settings		40GbE
		anoo		e onare oap	cure .					(Unit 05)
• ARP/IGMP • Ping								Stre	am	
			6							
Enable/Disable GARP/	'NS Send St	tart Ste	Setti	ngs Mode = Single	9			Lane M	apping	
No Name	Sou	urce MAC Addre	ss Soi	urce IP Address	ARP/	Ping	GARP/			_
					NA	Reply	NS	Relativ	Skew	
					Reply		Send		5 OKON	
1 Ethern	et + IPv4	00-00-00-00-00	0-01	192.168.	0.1 On	On	On			
2 Ethern	et + IPv4	00-00-00-00-00	0-02	192.168.	0.2 On	On	On	Error/	Alarm	
3 Ethern	et + IPv4	00-00-00-00-00	0-03	192.168.	0.3 On	On	On			
4 Ethern	et + IPv4	00-00-00-00-00	J-04	192.168.	0.4 On	On	On		10	
D Ethern	et + IPv4	00-00-00-00-00		192.168.	0.5 Un	0n	On On	Counter/	Capture	
C Ethern	et + IPv4	00-00-00-00-00	-00	192.100.	0.0 0		00			
2 Ethern	et + IPv4	00-00-00-00-00	-07	192.100.	0.7 01	00	00	Pe	rt	
9 Ethern	et + IPv4	00-00-00-00-00)_00	192.168	0.0 0.0	0n	0n			
10 Ethern	et + IPv4	00-00-00-00-00	-0A	192 168 0	10 On	On	On			
11 Ethern	et + IPv4	00-00-00-00-00	⊢0B	192.168.0	.11 On	On	On	MD	IO	
12 Ethern	et + IPv4	00-00-00-00-00	-0C	192.168.0	.12 On	On	On			
13 Ethern	et + IPv4	00-00-00-00-00	-0D	192.168.0	.13 On	On	On			
14 Ethern	et + IPv4	00-00-00-00-00	0-0E	192.168.0	.14 On	On	On	Clo	ck	
15 Ethern	et + IPv4	00-00-00-00-00	1-0F	192.168.0	.15 On	On	On			
16 Ethern	et + IPv4	00-00-00-00-00	0-10	192.168.0	.16 On	On	On	-		
								Irans	ceiver	
										Service
										Disruption
										More ->

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New on Ver.3.2!

Ping for 40G/100G

Ping, the first connectivity check on layer 3, is available for 40G/100G. Packet size can be swept on performing ping to find maximum responding size.

System Menu Sync Stream Error/Alarm Ins Off F	Counter Capture	Link Loopback Log	2012-10-26 MD1260A 11:16:53 Top Menu		
· · · · · · · · · · · · · · · · · · ·					
Test Frames Distribution @ All Lanes @ Individual @ O	at Chart Canture PProt	ocol Settings	40GbE		
			40002		
		Ping Settings			
		Ping Test			
Settings		ID Mada	4	d Count 1,455	UK
			4 	a Gount 1,433	Cancel
Settings		Packet Size	64 to 1518	sten 1	Cancer
Prode IPV4 Packet Size Discrement 64 to 1.518 (step 1) count 1.455	TPID (hex) PCE				
Source MAC Address 00-00-00-00-01	Outer	Source			
Source IP Address 192.168.0.0	Inner	MAC Address 000000	_ 000001	Com/Pasto from	
Target MAC Address				oopy/raste nom	
		IP Address 192 1	168 0 0		
Status Diag Na Dank From					
Tx ARP(Reg) / 1 1 1 192	168.0.100 65 255	Target			
NDP(NS) 2 192	.168.0.100 66 255	MAC Address	_ 000000	C Resolve Copy/Paste from	
Rx ARP(Reply) / 1 3 192	.168.0.100 67 255				
Ty Ding Request 23 5 192	168.0.100 68 255	IP Address 192 . 1	168 0 100		
Rx Ping Reply 33 6 192	168.0.100 70 255	11			
Time Min [ms] < 10 7	.168.0.100 71 255	VLAN			
Time Max [ms] (10 8 199	168.0.100 72 255	VLAN Stack 0	TPID (hex) PCP	ID Copy/Paste from	
Timeout 0 10 192	168 0.100 73 255		(0.4.1) [===] [
11 192	.168.0.100 75 255				
12 192	.168.0.100 76 255		(Inner)		
	168.0.100 77 255		1 1 1		
14 132	168.0.100 79 255	Detail ———			
		Timeout 10	s Paylo	ad Type 0/1 bit	

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New on Ver.3.2!

Zoom in counter

Zooms and displays the counted value of 1 item or 2 items.



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New on Ver.3.2!

OTN GFEC decode function

Now, MD1260A supports GFEC, ITU-T G.709 RS(255, 239), decode function on the receiver side.

Port/Clock			×
Port	Clock ———		
Mode Normal	Frequency Offset	0 ppm	ОК
	Payload Offset	0 Cm 15,179.3483 CnD 2.7864	Apply
Tx OTN OH Overwrite OTN Error OTN Skew Transceiver Rx DUT OTN Deskew Transceiver Tx	Clock Source Tx Reference Clock Output	Internal ^{**} 1/64	Cancel
GFEC Encode	10 MHz Output	Internal 10 MHz	
GFEC Decode			

* GFEC decode is not supported on OTU4 + 100GbE mapping.

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New on Ver.3.2!

Error Insertion Timing Enhancement

MD1260A supports various error insertion timing on the PCS errors. Alternate, Rate and All are added.





New on Ver.3.2!

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PCS Test Result in "Rate" added

PCS layer test result can be displayed in "Rate" or "Count".

	🗢 Sys	stem I	Menu				Sync off	□ Stream	Error/Alarm Ins		unter	Capture		oopback Log 2012-10-2 or/Alarm 09:11:26	6 MD1260A Top Menu
³⁰⁰ 100	OFE														_
ж тоо - т	. –	-					1							0	let a
• I e	st h	ra	nes		st	۳þ	ution	🛚 All Lanes 🎴	individual ° Op	ot Char	t Captu	re 🔍 Prot	locol	Settings	100GbE (Unit 05)
	Rate Counter Elapsed Time 00:00:33													Stream	(0111100)
	-		Ttat	.e			_	High BER 🧿 Inva	alid Block Count		79		2,579		
Tx Lane ker Map	Ix Lane ker Map (ew (ns) ew (ns) al Lane Rx Lane er Lock er Lock ker Map ker Map							🗙 Invalid Syr	© Invalid Al	gn Marker	BIP I	Error	Lane Mapping		
Mar	Ins S	Physic		ic Hear	Sharr	Skew	ative S	Total (Accumulated)	5.00E-8	Total (Accum	ulated) 0.00E-6	Total (Accumu	ulated) 0.00E-12	Relative Skew	
				Syr	۹ß		Rela		Curre	nt/Accumul	ated			Errer (Alerre	
0 0	0.0)	0	•			0 0.0	1.01E-6	1.00E-6	0.00E-3	0.00E-5	0.00E-9	0.00E-11	Error/Alarm	<u> </u>
1 1	-	_ 0	1	•	> <	>	1 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
2 2		-	2	• •		2	2 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11	Counter/Capture	
3 3	-	- 1	3	•)	3 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
44	L -	-	4	• •)	4 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
5 5	i -	_ 2	5	•			5 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11	Port	
66	i -	-	6	•			6 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
77	-	. 3	7	•)	7 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
88	3 -	-	8	• •			8 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11	MDIO	
99	I -	- 4	9	•			9 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
10 10) -	-	10	• •		2 1	0 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
11 11	-	- J	11	•		1	1 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11	Clock	
12 12		-	12	0		2 13	3 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
13 13	- 1	- G	13	0		2 1:	2 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11	— •	
14 14	4 -	-	14	0		2 1.	4 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11	Transceiver	
15 15	i -	- '	15	•		2 1	5 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		Service
16 16	i -		16	0	2	2 1	7 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		Disruption
17 17	-	- 8	17	0		2 1	6 12.8	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
18 18	3 -		18	0 0	2	2 1:	9 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		
19 19	- 1	9	19	0		2 1:	8 0.0	0.00E-7	0.00E-9	0.00E-3	0.00E-5	0.00E-9	0.00E-11		More ->

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New on Ver.3.2!

Simple and Easy-to-Use Operation

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Simple and Easy-to-Use Operation

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GUI (Main screen - Ethernet statistics)

The MD1260A GUI is easy to read and use. The main screen shows statistics, and large buttons on the right side are for settings.

			Tra	insmit Duration 0:0	09:15.098 910 100	Stream	
		Гх		R×	Gauges (Current)	Lane Mapping	
		Current/Ac	cumulated		IX Rate (M)		
lock Status		•		•	50 60	Relative Skow	
requency (Hz)		103,125,000,000		103,125,000,000	30 80	Relative okew	
ifference (ppm)		0.0		0.0	20 90		
F	0	0	0	983,040	10 100	Error/Alarm	
F	0	0	0	0	R1959		
rror Signals			0	1,072,616		r	
rrored Bytes		0		16,792		Counter/Capture	
ood Bytes		1,605,163,920,932		1,605,150,398,514	Rx Rate (%) 📕		
CS Errors	0	0	0	29 <mark>1</mark>			
ragments	0	0	0	0 U	40 50 60 70	Port	
versize & FCS Errors	0	0	0	(30 80		
ndersize	0	0	0	Q	²⁰ 90 ⁻		
versize (>1,518)	0	0	0	Q	110	MDIO	
ood Frames	1,356,389	2,028,977,001	1,356,386	2,028,959,811	£1959		
ate (bit/s)	8,578,910,240		8,578,889,640				
ate (%)	8.7959		8.7959		Errored Frame (%)	Glock	
ause Frame			0	0			
rigger Condition			1,356,386	2,028,959,861	50 50	Transpasivor	
it Errors (bit)					30 70	Transceiver	
it Error Rate					20 🕥 80		
attern Sync Loss (s)	4				10 90		
					100.	Traf	fic motors
					0.0000	• II ai	ic meters
						A –	
D 'I I TM			Slide 18				

Simple and Easy-to-Use Operation

GUI (Main screen – statistics by lane)

XX 100	GbE											Inder	ct	and status
• Te	est F	ran	nes	s [Dis	tri	ibu	tion	All Lanes	🔹 Individual 🜼 C	FP Chart Captu	re		Settings
								1			Counter Flansed	Time from	1	ndicators
			AI	ignı	men	nt S	Stat	us 🟮	Hi-BER 🗿 I	nvalid Block Count 1	.125.899.906.842.624		1	Iuicatoi 5
<u>e</u> 9	6	ð	Q		×	Σ	9	6	🖪 Invalid	Svnc Header	Invalid Algn Marker	B BIP Frror		
Lar	Ë,	Lar	Lar	Ľ	Loc	Pili	Na	Ű,		oyno noudoi				Lane Mapping
T X	(ew	la I	Ä	er	er	Ìtal	ker	(ew						
	S	/sic		sad	ark	×	h arl	s,	Total (Accumula	ted)	Total (Accumulated)	Total (Accumulated)		
	Ins	Ph		Ť	N.	Ske	2	tive		20	20		20	Relative Skew
				ync	Algr			elat						
				Error (Alorm										
0)		0	۰	0	0	5	2.5	281,474,976,710,6	1	562,949. 1	844,424,	1	Error/Alarm
1	0.0	0	1	۰	0	0	6	2.6	72,339,069,014,63	1	72,620,5 1	72,902,0	1	
2	2		2	•	•	•	7	2.7	144,396,663,052,5	1	144,678, 1	144,959.	1	Counter/Capture
3	3 -	· 1	3	0	0	0	8	2.8	216,454,257,090,4	1	216,735, 1	217,017,	1	
4	1	~	4	•	•	•	9	2.9	288,511,851,128,4	1	288,793, 1	289,074,	1	
5	j –	2	5	0	0		10	3.0	360,569,445,166,3	1	360,850, 1	361,132,	1	Port
6	<u> </u>	2	6	•	•	•	11	3.1	432,627,039,204,2	1	432,908, 1	433,189,	1	
	<u> </u>	J		0	•	0	12	3.2	576 742 227 200 1	1	577.022	577 205	1	
8	<u> </u>	4	8	Ň	č	č	13	3.3	648 799 821 318 0	1	649.081	649.362	4	MDIO
9	י ר		9	ŏ	0	0	14	3.4 2.4	1 153 202 979 583	1	1 153 48	1 153 76	+	
11 1	1 -	5	11	ō	0	0	16	219 N	1,225,260,573,621,	1	1,225,54 1	1,225,82	1	Glock
12 12	>		12	0	0	0	17	819.1	1,297,318,167,659.	1	1,297,59 1	1,297,88	1	
13 1	3 -	6	13	0	0	0	18	819.2	1,369,375,761,697,	1	1,369,65 1	1,369,93	1	
14 1·	1		14	•	0	•	19	>819.2	1,441,433,355,735,	1	1,441,71 1	1.441.99	1	Transceiver
15 1	ī –	7	15	0	0	0	20	0.0	1,513,490,949,773,	1	1,513,77 1	1,514,05	1	
16 1	3		16	٥	0	0	21	0.1	1,585,548,543,811.	1	1.585.83 1	1,586,11	1	
17 1	7 - 7	8	17	0	0	0	22	0.2	1,657,606,137,849,	1	1,657,88 1	1,658,16	1	
18 1	3		18	•	•	•	23	0.3	1,729,663,731,886,	1	1,729,94 1	1,730,22	1	
19 1) –	9	19	•	0	0	24	0.4	1,801,721,325,924,	1	1,802,00 1	1,802,28	1	

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Slide 20



Ethernet Tests

General Ethernet/IP frame tests are supported. It supports the unique function for 40/100GbE skew adjustment evaluation between lanes in addition to basic Ethernet measurements, such as Throughput, Frame Loss, latency, RFC2544, Service disruption time measurement, BER and Statistics.



D Tolerance Tests

Generates worst-case condition to support equipment tolerance tests.



40/100GbE Frame

Test parameters

Skew margin (819.2 ns max.)
 Load generation exceeding full wire rate
 Frame length (60 to 32,700 bytes)
 Clock tolerance tests (±120 ppm)*

*: at CAUI/XLAUI



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□ Multi-Flow

Up to 16 flows can be generated at random while saving traffic levels.

Stre	an	n					St	ream Cont	trol/Header				
							S	Stream 5	Name Teat Stream4 Auto Off				
Con	tro	l Unit	Rate (%) Total: 87.999996	821 % Type Random			Control	Header				
_								Eromo Sizo	Sec. [Perstern] 64 = 1518 hade				
Dura	atic	n	Continuo	ous					Tranuom . byte				
т									Traffic Control				
Test	tΡ	attern	PRBS31	lest	Frame Enable/Disable	low ID	_	Burst	Off name dap byte				
	4	le. Sia	ze (byte)	Rate (%)	Name	Error FID	Enable/[Number of Fr	ames frame				
		1	64-1518	1.000	Teat Stream1	- 0							
		2	64-1518	3.000	Teat Stream2	- 1	EOS Emer	Inc					
		3	64-1518	5.000	Teat Stream3	- 2	FCS Error	Ins	Stream Control/Header				
		4	64-1518	7.000	Teat Stream3	- 3			Stroom 5 News Teat Stream4				
		5	64-1518	10.00	Teat Strea	- 4	Selection		Header				
		6	64-1518	12.00	Teat Stream5	- 5			Control Header				
		7	64-1518	15.00	Teat Stream6	- 6			Source MAC Address 000000 - 000000				
		8	64-1518	17.00	Teat St	- 7	T						
		9	64-1518	10.00	Anrits Nam				P DRed				
		10	64-1518	8.000	Anrits	- 9	Cantual/Has	- day	Destination MAC Address 000000 - 000000				
느느		11	64-1518	5.000	Anritsu 003	- 10	Control/ Hea	auer	Fixed				
닏닏		12	64-1518	5.000	Anritsu 004	- 11			TPID Priority VID				
브		13	64-1518	5.000	Anritsu 005	- 12	Copy/Paste	e to	VLAN (Outer) Off 88A8 0 0				
느느		14	64-1518	5.000	Anritsu 006	- 13	[
닏닏		15	64-1518	5.000	Anritsu 007	- 14	Move to)					
		16	64-1518	5.000	Anritsu 008	- 15			Source Address Destination Address IP 192 168 0 1 192 168 1				
									TOS 00 Protocol 17				
		1.4		- I - TM		1/1 A NI			Header 00 00 00 00 00 00 00 00 00 00 00 00 00				
JISCO	νc	er W	nat's Pos	SSIDIE		VLAN.			0A 01 Import				
									Open Folder				
						11260A-E-L-	1						

Capture

Supports Ethernet frame capture Captured data including frame gap is summarized and displayed in detail. Captured data are decoded and displayed by Wireshark[™] on the MD1260A GUI.

🐹 100GbE



□ Service Disruption Time Measurements (SDT)

Measurement of the total time when no frames are received (period of packet loss) is supported. For example, SDT occurs when route switching occurs due to a fiber break.

Results	
	Unit 1 -> 1 (Flow 0)
Elapsed Time	00:00:12.502
Left Time	00:00:00.000
Tx Frames	1,860,385,882
Rx Frames	1,860,385,882
Tx – Rx	0
Service Disruption Time	00:00:00.000



Supported Protocols Ethernet, MPLS-TP, PBB, VLAN, MPLS, IPv4, IPv6

Encapsulated Frame with MPLS-TP

New on Ner. 3.1! Ver. 3.1!





- MP1260A supports MPLS or PBB-based network performance tests
- MD1260A tests throughput and latency at both UNI and NNI



Supported Protocols Easy-to-use stream configuration



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New on Ner.3.1! Ver.3.1!

Supported Protocols Easy-to-use stream configuration





Multiflow Counter

New on Ner.3.1! Up to 16 flows filtered and tested simultaneously and individually Filters: VLAN ID, MPLS label, MAC/IP address



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Multiflow Counter Easy flow and filter configuration



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/Inritsu

Multiflow Counter Displays results for up to 16 flows on screen



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New on Ner.3.1!

Multicast Counter Multicast and broadcast frames counted individually



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Slide 33



New on Ner.3.1! Ver.3.1!

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OTN Tests

General testing using OTU3 and OTU4 signals is supported along with basic OTN measurements, such as errors/alarms and BER. Mapping



Test Items



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Supported Mapping

MD1260A supports OTN mapping as follows.





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Given Summary Screen

The Summary Screen shows the status of all layers (physical layer to client data layer) at a glance.



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□ Statistics

Details of errors for each layer in the "Statistics" TAB can be confirmed after checking the whole status at a summary screen.

• LLD	• OTU4	ODU4	• тсм	ODU0	© GMP	• GFP-T	• Ethernet						·	-
Status MSIM 💿														
			sec	ond		fra	ame							
Alarm				Cu	rrent/Accumula	ited								
ODU-AIS			0.000000	_		- 1		-		Counte	r Flansed T	ime 00-		
ODU-OCI			0.000000					0.0010						
ODU-LCK			0.000000		0104	• 0D04			O GMP	GFP-		rnet		
			0.000000				sec	⊳nd			frame			
			0.000000					0		المعمار				
				Alarm				Cu	rrent/ Accum	iulated				
			COL				0.000	-	0.000		-			
Error				OOF			0.000000	0	000000		0	0		
PM-BIP8			0				0.000000	U			U	U	-	Counter Flapsed Time
PM-BEI			0				0.000000			• • • • • • • • • • • • • • • • • • • •			0.00	
				ODU-LCK			0.000000		0104	• 0D04	ОТСМ	0000	• GMP	GFP-1 Ethernet
				PM-TIM				Status						
				PM-BDI			0.000000	Invalid GFP-	-TFrame 🍳	<u> </u>				
				PLM							sec	ond		
					>		0.000000	Alarm			Current/A	cumulated		
				CSF				SSF			0 000		0 000	
							cou	CSF			0.000		0.000	
				Error										
				EAS		_	0	Error			Current/A	cumulated		
				PM-RIP8			0	Superblock (CRC		0		0	
				PM-BEI			0	Correctable	cHEC		0		0	
							-1	Uncorrectab	le cHEC		0		0	
								Correctable			0		0	
								CSE Signal	INE THEC		0		0	
								CSF Sync			0		0	
											•			

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Statistics - Ethernet

The statistics counter also supports the Ethernet client signal in OTN frames.

			Counter El	apsed Time 00:1									
• LLD • OTU4 •	ODU4 • TCM		MP GFP-T	• Ethernet									
		Tx		Rx									
		Current/Accumulated											
10B Error			0	0									
Errored Bytes		0		0									
Good Bytes		0		0									
FCS Errors	0	0	0	0									
Fragments	0	0	0	0									
Oversize & FCS Errors	0	0	0	0									
Undersize	0	0	0	0									
Oversize (>1,518)	0	0	0	0									
Good Frames	0	0	0	0									
Rate (bit/s)	0		0										
Rate (%)	0.0000		0.0000										

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Data Monitor

The monitor function measures some data streams, such as frame data and TTI. The data display is refreshed every second.

он	П	Т	FTF		Frame	;	Stuff		OTU4)DU0				Pause			
Positi	on <	<	1		> >>											1		
		^			^													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
F6	F6	F6	28	28	28	8A	00	00	00	00	00	00	00	00	4B			
3825	3826	3827	3828	3829	3830	3831	3832	3833	3834	3835	3836	3837	3838	3839	3840			
00	00	00	00	00	00	01	00	00	01	00	00	01	00	00	B6			
7649	7650	7651	7652	7653	7654	7655	7656	7657	7658	7659	7660	7661	7662	7663	7664			
00	00	01	00	00	01	00	он		тп	FTF		Frame	Stu	ıff	OTU4	ODU0		Pause
11473	11474	11475	11476	11477	11478	11479												
00	00	00	00	00	00	00	HEX		ASCII									
									SM	-TTI		P	M-TTI		TCM	11-TTI	T	CM2-TTI
							0 SAPI				[0]=0 IS=	"JPN"					
						- 1					NS	="MD126	50A	"				
							16 DAPI					']=0 1S= S=™MD12€	="JPN" 50A	TT				
							32 Opera	tor										
							Specif	ic										

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□ OTU4 GMP Mapping with GE/10GE/100GE Client Signal

It supports GMP mapping with Ethernet client signal at OTU4 for GE, 10GE and 100GE client signal types. It also supports all error and alarm testing at OTU, ODU, GMP, GFP-T and client layer, as well as a client-signal adjustable clock offset as OTN frame payload.



The MD1260A monitors dynamic GMP conditions. It supports the client signal adjustable clock offset, which is the OTN frame payload. GMP behavior according to client signal speed can be evaluated.

• LLD • OTU4	ODU4 OTCM	ODU0 G	MP GFP-T	• Ethernet		GM	P dat	a monit	or
OTU4 ODU0		Tx Current/Ac	oursulated	Rx	Frame Stuff	OTU4 ODU	JO	Pa	luse
Inc 1 Dec 1 Inc 2 Dec 2 Inc >2 Dec >2 Inc Over Dec Over Offset (ppm) CRC& Error	3,015 3,015 0 0 0 0 0	2,618,681 2,618,681 0 0 0 0 0	3,015 3,015 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2,618,681 2,618,681 0 0 0 0 0 0 0 0	Cm(1): 14521	8 Stuff Position L (< < 1 1 22 136 159 272 299 408 430 543 566 679 700 815 833 951 977	st / 6 46 181 317 453 589 724 860 996 996	Max Max > >> 68 91 204 227 340 362 476 498 611 634 747 770 883 905 1018 1041	/lin 114 249 385 521 656 792 928 1064
GMP statistics	result		7600 9500 11400 13300 15105			1222 124 1358 1380 1493 1510 1629 1655 1765 178 1901 1923 2036 2056 2172 219 2308 2330 2443 2466 2579 2600 2715 2733 2851 2851	1267 1267 1403 1539 1674 1810 1946 2081 2217 2353 2489 2624 2760 2896	11290 1312 1290 1312 1426 1448 1561 1584 1697 1720 1833 1855 1968 1991 2104 2127 2240 2262 2376 2398 2511 2534 2647 2670 2783 2805 2918 2941	1335 1471 1606 1742 1878 2014 2149 2285 2421 2556 2692 2828 2964

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Content Errors/Alarms Injection

Various errors and alarms for the selected mapping can be injected to confirm alarm detection and release conditions.



Errors/Alarms Injection screen

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Errors BIP8 (SM,PM,TCMi), BEI (SM,PM,TCMi), FAS, Bit all (Random) (TCMi: i = 1 to 6) Timing: Single, Rate <u>Alarms</u> OTU: LOF, LOM, SM: TIM, BIAE, BDI, IAE,

ODU: AIS, OCI, LCK, PM: TIM, BDI, TCMi: BDI, IAE, TIM, LTC, BIAE, (TCMi: i = 1 to 6)

Timing: All, Alternate, Burst

/inritsu

OH Manipulation

All OTN OH including TCMi and TTI, FTFL can be monitored and edited. These are displayed as a multi-frame image and as decoded words.



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MD1260A-E-L-1

□ OH Capturing (OTN frame, OH and GMP)

OH, OTN Frame and GMP can be captured for 512 OTN frames. Each OH group (FAS, GCC0/1/2, TCMi,....) can be displayed as a multi-frame image, making it easy to see the change in OH values.

	эн		Setting	s L	ayer: 0	TU4	Trigger	:Manu	al, Top				Mar	nual Ti	rigger						
οτι	J4	Frame	< 1		> /	512	Trigger	:Manu	al	Pos	GMP C	aptur	e Vie	wer							\mathbf{X}
	1	2	3	4	5	6	7	8	9	10	Frame	<	1		>		Trigger Position 1	Jump to T	rigger		Close
			F۶	45			MFAS		SM		No.	OI JC1	H JC2	CRC JC3	Valid/ JC1	Invalid JC2	Status	Cm(t)	CnD Sum JC4/JC5	CRC JC6	^
1	F6	F6	F6	28	28	28	27	00	25	00	1	E3	00	0	0	٥	Cm(t) Unchange	14,528	0	0	
•											2	E3	00	•	0	•	Cm(t) Unchange	14,528	0	•	
		RES	PM&	TCM/		TCM6		_	тсмб		3	E3	00	•	•	•	Cm(t) Unchange	14,528	0	•	
	_	_		ACT							4	E3	00	0	0	•	Cm(t) Unchange	14,528	0	•	
2	00	00	00	00	00	25	01	00	25	01	5	E3	00	•	•	•	Cm(t) Unchange	14,528	0	•	
1										-	6	E3	00	0	0	•	Cm(t) Unchange	14,528	0	•	
		TCM	8		TC M2			TCM1			7	E3	00	0	•	•	Cm(t) Unchange	14,528	0	•	
	_										8	E3	00	0	•	•	Cm(t) Unchange	14,528	0	•	
3	00	25	01	00	25	01	00	25	01	00	9	49	AA	•	•	•	Cm(t) Inc 1	14,529	0	•	
1											10	B6	51	0	•	•	Cm(t) Dec 1	14,528	0	•	
	(GCC1	GC	C2		APS	/PCC				11	E3	00	0	•	•	Cm(t) Unchange	14,528	0	•	
	_										12	E3	00	•	0	•	Cm(t) Unchange	14,528	0	•	
4	00	00	00	00	00	00	00	00	00	00	13	E3	00	0	0	0	Cm(t) Unchange	14,528	0	•	
										L	14	E3	00	0	0	0	Cm(t) Unchange	14,528	0	•	
											15	E3	00	0	•	•	Cm(t) Unchange	14,528	0	•	
											16	E3	00	0	0	•	Cm(t) Unchange	14,528	0	•	
											17	E3	00	0	•	0	Cm(t) Unchange	14,528	0	•	
											18	E3	00	0	•	0	Cm(t) Unchange	14,528	0	•	
											19	E3	00	0	•	•	Cm(t) Unchange	14,528	0	•	
											20	E3	00	•	•	•	Cm(t) Unchange	14,528	0	•	-

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APS Time Measurements

The Automatic Protection Switch time measurement supports various trigger settings. The maximum detectable period is 10.0 s with 0.1-ms resolution.

	2	APS Settings	×
		Mode Repeat OK	
Start Trigger	LOF	Start Trigger - Stop Trigger -	
Stop Trigger	LOF	Start Trigger (OTU4) LOF Error/Alarm	ly
Error Free Period	1 ms		cel
Threshold	1ms	Stop Trigger (OTU4)	
Count	7	Error Free Period 1ms	
_		Switching Time	
	Switching Time	Threshold 1 ms	
Current			
Max			
Min		116.8 Higger items.	
Average		Alarms:	
History 1			
History 2			CK
History 3		116.8 Frrors:	
History 4		116.8	
History 5		SM-BIP8, PM-BIP8, Any Error	

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Delay Measurements

Delay measurements defined by the latest ITU-T G.709 standards are supported.

Settings	Start	Stop		Expor	Open Folder
Mode Re	epeat Period 1s	3			
		Delay Ti	me (us)		
	PM	TCM1	TCM2	TCM3	
Current	1.2	1.2	1.2	1.2	
Max	1.2	1.2	1.2	1.2	
Min	1.2	1.2	1.2	1.2	
Average	1.2	1.2	1.2	1.2	
History 1	1.2	1.2	1.2	1.2	
History 2	1.2	1.2	1.2	1.2	
History 3	1.2	1.2	1.2	1.2	
History 4	1.2	1.2	1.2	1.2	
History 5	1.2	1.2	1.2	1.2	
		Delay Time (us)		Trigger	Count
	TCM4	TCM5	TCM6	Tx Delay Frame	7
Current	1.2	1.2	1.2	Rx Delay Frame (PM)	7
Max	1.2	1.2	1.2	Rx Delay Frame (TCM1) 7
Min	1.2	1.2	1.2	Rx Delay Frame (TCM2	2) 7
Average	1.2	1.2	1.2	Rx Delay Frame (TCM	3) 7
History 1	1.2	1.2	1.2	Rx Delay Frame (TCM4	1) 7
History 2	1.2	1.2	1.2	Rx Delay Frame (TCM	i) 7
History 3	1.2	1.2	1.2	Rx Delay Frame (TCM6	i) 7
History 4	1.2	1.2	1.2		

1.2

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1.2

History 5

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1.2



Through Mode

Three types of through mode are supported at the OTN rate. In the through mode, the MD1260A can inject errors or alarms and can manipulate the OTN OH on real network data to evaluate network behavior while monitoring. **Transparent mode**



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Various BER Tests

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Packet BER Tests

The MD1260A supports packet-based BER testing. Pure-PRBS cannot be used for total BER evaluations of a network, routers or switches. It requires a packet, such as a frame.



No Frame BER Tests

Frame-less physical layer tests are supported to evaluate electrical and lambda level performance.



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Various BER Tests

Lambda BER Tests

Both lambda layer testing and BER tests at the physical and virtual lane are supported, displaying BER results (count, rate) and pattern sync loss for each lambda.

OTH and Ethernet

	No frame				UTN ar	ia Ethernet		
Results				Results				
Elapsed Time::	Pattern Sync Loss (s)	Bit Error Count	Bit Error Rate	Elapsed Time 00:00:34	Invalid Syne	c Header Invalid A	lign Marker	BIP Error
Current				Current				
Lambda 1 (0,1,2,3,4)				Lambda 1 (0,1,2,3,4)		Virtual Lane Mapping		×
Lambda 2 (5,6,7,8,9)		<u> </u>		Lambda 2 (5,6,7,8,9)			Lambda 1	
Lambda 3 (10,11,12,13,14)				Lambda 3 (10,11,12,13,14)		0	ок
Lambda 4 (15,16,17,18,19)			NUCLEAR CONTRACTOR	Lambda 4 (15,16,17,18,19)	>>	1	
Accumulated				Accumulated		LaneNo	2	Cancel
Lambda 1 (0,1,2,3,4)		Statement (Statement)		Lambda 1 (0 1 2 3 4)		· · · · · · · · · · · · · · · · · · ·	4	
Lambda 2 (5,6,7,8,9)			<u>menenene</u>	Lambda $2(56789)$			Lambda 2	
Lambda 3 (10,11,12,13,14)		(<u>1111)</u>		Lambda 3 (10 11 12 13 14)		5	Clear
Lambda 4 (15,16,17,18,19)		013131313131313	0.000000000	Lambda J (15 16 17 18 10	2)		6	
	Choc Grou conn	ose "Lan p memb ection.	nbda Gro ers chai	oup" from here nge with each	-	× × ×	9 Lambda 3 10 11 12 13 14 Lambda 4 15 16 17 18	
Discover What's Pos	ssible™		Slide	9 52		× /	19	U
			MD1260	A-E-L-1				

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Monitoring Status by Each Lane

The MD1260A can monitor the status of each lane, including BIP error, skew, skew stability, marker map, etc. The status of these parameters can be seen at a glance.

System Menu	⊂ Stream	□ Error/Ala	milns ⊏ Coui	nter 🛛 🗖 Mon	itor Link	Loopback 12/15/2009	▲ MD1235A
						ror/Alarm 00:23:46	Top Menu
						'	
100GDE							
 Individual 						Settings	100GbE
			_				
			E	apsed Time	00:00:10	Test Pattern	
≩ັຊັຊັຊີ ຊີ 🖬 Invali	d Svnc Header	Invalid Alig	nment Marker	BIP Err	or		
کد ا er ا ew (La	,					Europa (Alaura	
Sk an Sk ar star		Total		Total		Error/Alarm	
ative set of the set o		Total		Total			
ທີ່ຢູ່ <u>ສ</u> ີຼອ 123,456 ,	789,012,345,678	123,456,78	9,012,345,678	123,456,789,0	012,345,678	Counter	
E Current	/ Accumulate	Current / A	ccumulate	Currei	nt		-
0 🖪 💶 🔍 0 123.	1 1	0	1	B	1	Port	
1 💶 🔍 🖪 1 240.	8 10	4	1	0	0		
2 💿 🖪 💶 2 63.0	57 12	32	99	0	0		
3 🖪 🗖 🔍 3 578. 🛛 💈	31 213	75	24	0	0	MDIO	
4 🗖 🔍 🖪 4 270. 8,6	24 7,636	7,837	6,165	0	0		<u> </u>
5 O 🖪 💶 5 646. 6,1	92 98,018	26,012	35,612	0	0		and the second se
6 🖪 🗖 🍳 6 536. 485,1	87 497,357	855,036	510,527	8	17,273	Clock	
7 🗖 🦉 🖪 7 463. 750,7	82 321,615	9,180,339	6,463,179	0	0		
8 💿 🖪 💶 8 734. 36,708,5	23 59,362,108	4,846,795	81,023,698	•	0		
9 🖪 🗖 🍳 9 17.8 664,145,5	04 802,225,440	894,314,686	635,959,154	0	0	Transceiver	
10 = 0 🖪 10 209. 2,059,094,2	24 9,223,358,312	9,242,049,053	9,516,973,754	0	0		
11 <u>25.</u> 80,373,110,0	63 51,111,396,123	48,831,573,874	49,849,594,664	0	0		
12 🖪 💶 🔍 12 560. 521,297,181,2	58 660,051,503,452	689,053,364,331	485,379,628,139	•	0		-
13 💶 🔍 🖪 13 26.5 4,186,523,589	,30 9,995,537,535,287	3,780,826,120,63	9,960,197,401,233		0		<u> </u>
14 0 3 14 129. 3,923,376,067	54 76,903,808,931,82	42,205,359,018,4	23,916,671,308,68	0	0		and the second value of th
15 🖪 💶 🔍 15 127. 992,076,539,4	34, 715,827,148,407,6	746,627,881,191,	198,823,096,230,6	0	0		
16 5,102,990	28 8,941,191,101,912	6,960,748,538,84	4,376,598,692,033	•	0		
17 🔍 🖪 💶 17 343. 4,648,350,412	,02 99,486,107,891,42	34,107,988,374,3	68,935,434,846,20	0	0		
18 🖪 📮 🔍 18 117. 58,896,955,80	1,1 732,725,862,180,8	629,418,755,648,	759,061,457,356,4	•	0		
	,49 7,815,451,798,960	5,099,961,813,53	321,787,679,567,9	0	0		More ->



Lane Mapping Edit

The mapping of the alignment marker at the transmit side can be set to any combination for evaluating the re-alignment performance of the alignment marker at the receiver side.

				• Test Frames Dis	tribution •	All Lanes • Individua	al CFP Chart Cap	oture	S	ettings
Lane Ma	pping				X	BER 😑 Invalid Block Co	Counter Elaps unt 0	ed Time 00:12:31 129,830		Stream
T× Lane	PCS Lane Marker	T× Lane	PCS Lane Marker	Preset Ascent	ок	Invalid Sync Header	📕 Invalid Algn Marke	ər 💶 BIP Error		Lane Mapping
0	Lane 2	10	Lane 3	Descent	Apply	al (Accumulated)	Total (Accumulated) 441	Total (Accumulated) 10		Relative Skew
2	Lane 10	12	Lane 14	Random	Cancer	0	Current/Accumulated	2 0 ***********************************		Error/Alarm
3	Lane 4	13	Lane 5	Rotation		0 0 0	0 0 89 0 0 0	0 0 0 2 0 10 0 0 0		Counter/Capture
4	Lane 7	14 15	Lane 15			0 0 0	85 0 0 0 91 0	2 0 10 0 0 0 2 0 14		Port
6	Lane 9	16	Lane 18	Allow to Overlap		0 0 0	0 ••0 0 •• 0 •91 0	0 0 0 0 0 0 2 0 12		MDIO
7	Lane 6	17	Lane 12			0	• 0 0			Clock
8	Lane 1	18	Lane 10		or edit	ing alignn	nent mark			Transceiver
9	Lane 8	19	Lane 13		appin	g				
				19 <mark>3 -</mark> 9 19 0 🗖	• 3 0.0	0	0 0 0 0	0 0 0 0 0 0		

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Skew Generation and Monitoring

Both skew generation and monitoring are supported. The skew can be set at multiple lanes at the transmit side.



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Evaluation using 10 Lane Extender

The external electrical I/F output (CAUI/XLAUI) supports standalone CFP tests and fault isolation between the CFP and transmission equipment. Moreover, this extender can evaluate devices and modules under development with CAUI and XLAUI interfaces.











SMP type connector ×46

Line→	12	11	10	9	8	7	6	5	4	3	2	1
Top side	RefCLK	Tx	Тх	Tx	Тх	Тх	Rx	Rx	Rx	Rx	Rx	Rx
	р	9 p	7p	5p	3p	1p	10p	8p	6p	4p	2p	0р
	RefCLK	Tx	Тх	Tx	Тх	Тх	Rx	Rx	Rx	Rx	Rx	Rx
	n	9n	7n	5n	3n	1n	10n	8n	6n	4n	2n	0n
Bottom		Tx	Тх	Tx	Тх	Тх	Тх	Rx	Rx	Rx	Rx	Rx
side		10p	8p	6p	4p	2p	0 p	9 p	7p	5p	3p	1p
		Tx	Тх	Tx	Тх	Тх	Тх	Rx	Rx	Rx	Rx	Rx
		10n	8n	6n	4n	2n	0n	9n	7n	5n	3n	1n

Notes:

1. Each I/O of Tx10p, Tx10n, Rx10p, and Rx10n is not connected with MD1260A when MZ1223C is installed in MD1260A.

2. Tx/Rx indicates transmission signal/reception signal. p/n indicates Positive/Negative sides for a differential interface.

3. Use J1502A, J1503A or J1540A when connecting to the DUT. If the cables other than J1502A, J1503A or J1540A are used, the required performance may not be obtained.

Cable selection:

Example: (10 Lanes) x (Tx and Rx) x (Differential) + (Ref Clock) x (Differential)

10 x 2 x 2 + 1 x 2 = 42 pcs

MZ1223C 10 Lane Extender

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□ 100 G LH Evaluation Adapter

This adapter is used instead of a 100G LH DWDM transmission module to connect 100 G transmission equipment. It evaluates 100G transmission equipment at the OTU4 level without a 100G LH DWDM transmission module. It has the 168-pin connector standardized by OIF MSA.



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Through Mode

Three types of through mode are supported at the OTN rate. In the through mode, the MD1260A can inject errors or alarms and can manipulate the OTN OH on real network data to evaluate network behavior while monitoring. **Transparent mode**



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□ MDIO Analysis

D

The MD1260A supports two types of MDIO access in the CFP module: by access, and by script type. Script-type access saves many steps to set or monitor to/from MDIO.

NVR1 NVR2 Module FAWS NW Lane FAWS Host Lane FAWS MDIO	CTRL
NVR1 NVR2 Module FAWS INV Lane FAWS Host Lane FAWS MDIO Field Name Lane 1 Lane Hardware Bias High Alarm 0 Dias High Warning 0 Dias High Warning 0 Bias Low Warning 0 0 Dias Low Alarm 0 Dias Low Alarm 0 0 0 TX Power High Alarm 0 0 0 0 0 0 0 TX Power Low Warning 0 <td< th=""><th>Hardware Pin Host Lane Network Lane (Tx) Network Lane (Rx) OK TX PRBS Generator Tx Rate Select(10G Lane Rate) Apply Off Ethernet(10.31G) Apply TX MCLK Control Tx Ref CLK 1/8 of Network REF CLK 1/64 Cancel TX Reset If TX FIFO Auto Reset TX FIFO Reset If X Deskew Enable Individual Network Lane TX_DIS Control Lane 3 Lane 0 Lane 1 Lane 2 Lane 3</th></td<>	Hardware Pin Host Lane Network Lane (Tx) Network Lane (Rx) OK TX PRBS Generator Tx Rate Select(10G Lane Rate) Apply Off Ethernet(10.31G) Apply TX MCLK Control Tx Ref CLK 1/8 of Network REF CLK 1/64 Cancel TX Reset If TX FIFO Auto Reset TX FIFO Reset If X Deskew Enable Individual Network Lane TX_DIS Control Lane 3 Lane 0 Lane 1 Lane 2 Lane 3
Lane Wavelength Unlocked Fault Lane APD Power Supply Fault Lane TX_LOSF Lane TX_LOL Lane RX_LOS Lane RX_LOL Lane RX_FIFO Status Laser Current (mA) CFP Internal Alarm/Warning are decoded here.	Lambda lane individual TX_DIS switch
MD1:	260A-E-L-1

□ Adapter for QSFP+

The Anritsu MD1260A measurement solution supports both optical and CFP modules. An adapter mounts the QFSP+ for insertion into the MD1260A CFP slot.





Operation Log Function

This is a powerful support tool for developing remote-control software. Operations using the MD1260A GUI are converted to remote commands automatically, saving development time. It eliminates the need to find required commands one-by-one.



Rack Mount Kit for Production Line

Two types of rack-mount kits are supported. The slide-out type is convenient when changing fibers or CFP modules on a production line.





*: Rack mount kit is a custom-made product.



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Lambda BER Tests

Both lambda layer testing and BER tests at the physical and virtual lane are supported, displaying BER results (count, rate) and pattern sync loss for each lambda.

	No frame				OTN and	Ethernet		
Results				Results				
Elapsed Time:: Current Lambda 1 (0,1,2,3,4) Lambda 2 (5,6,7,8,9) Lambda 3 (10,11,12,13,14) Lambda 4 (15,16,17,18,19) Accumulated Lambda 1 (0,1,2,3,4) Lambda 2 (5,6,7,8,9) Lambda 3 (10,11,12,13,14) Lambda 4 (15,16,17,18,19)	Pattern Sync Loss (s) Bit	Error Count Bi	t Error Rate	Elapsed Time 00:00:34 Current Lambda 1 (0,1,2,3,4) Lambda 2 (5,6,7,8,9) Lambda 3 (10,11,12,13,14) Lambda 4 (15,16,17,18,19) Accumulated Lambda 1 (0,1,2,3,4) Lambda 2 (5,6,7,8,9) Lambda 3 (10,11,12,13,14) Lambda 4 (15,16,17,18,19)	Invalid Sync He	eNo	ign Marker Lambda 1 0 1 2 3 4 Lambda 2 5 6 7 8	BIP Error K OK Cancel Clear
	Cho Gro con	ose "La up mem nection	imbda (ibers c	Group" here. hange with eac	ch	>> >>	9 Lambda 3 10 11 12 13 14 Lambda 4 15 16 17 18 19	
	221016		MD1260/	4-E-L-1			1163	U

MDIO Analysis

The MD1260A supports two types of MDIO access in the CFP module: by access, and by script type. Script-type access saves many steps to set or monitor to/from MDIO.

	Lane 1 Lane	Hardware Pin Host Lane Network Lane (Tx) Network Lane (Rx)
Dia Lith Alama		
Dias High Alarm		TX PRBS Generator Tx Rate Select(10G Lane Rate)
Dias High Warning Dias Lew Warning	pin access	S Off
TY Downer High Alarm		Cancel
TX Power High Worping		TX MCLK Control TX Ref CLK
TX Power Low Worning		1/8 of Network V REF CLK 1/64 V
TX Power Low Marming		
Lacor Tomp High Alarm		1
Laser Temp High Warping		TX Reset 🔽 TX FIFO Auto Reset 🗆 TX FIFO Reset
Laser Temp Low Warning		
Laser Temp Low Alarm		E TV Deskey Enchis
BY Power High Alarm		
BY Power High Warning		-Individual Network Lane TX, DIS Control-
BY Power Low Warning		
BX Power Low Alarm		
NETWORK LANE FALLET AND STATU	s \	
Lane TEC Fault		
Lane Wavelength Unlocked Fault		
Lane APD Power Supply Fault		
Lane TX LOSE	CFP Internal	
	•••••••••••••••••••••••••••••••••••••••	
Lane BX LOS	Alarm/Marning	
		individual TX DIS
Lane RX FIFO Status	deceded here	
Laser Current (mA)	aecoaea nere	switch
scover what's Possible		

List of Unique Features



Unique Features	
10GbE in OTU4	
GbE in OTU4	
Through mode	
OTN Capture	
Jumbo frame up to 32 k byte	
Ethernet Capture	
Multi-unit Sync	
Remote Control Recording	



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