Product Introduction

MD1260A
40/100G Ethernet Analyzer
MD1260A 40/100G Ethernet Analyzer
Product Introduction

Anritsu Corporation
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 ±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 O.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

Unique!

Supports two rack-mount kits for production lines
What is Anritsu’s MD1260A?

~ 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.
What is Anritsu’s MD1260A?

~ 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
Excellent Scalability

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

Upgrade

- OTU4 *
- 100GbE
- OTU3 *
- 40GbE


Option:
- OTU4
- 100G Ethernet
- OTU3
- 40G Ethernet

CFP:
- 100GBASE-LR4
- 100GBASE-SR10
- 40GBASE-LR4
- 40GBASE-SR4

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

- **Carrying Case**

  - 12.1-inch Touch panel
  - Compact: 221.5 (H) X 340 (W) X 200 (D) mm
  - Light: <8 kg
  - Silent design

  Carry the device to even the most difficult test sites with ease.
What’s New on Ver.3.2
40/100GbE Testing

- **Protocol Header Editing Enhancement**
  - ARP, ICMPv4, ICMPv6 headers editing screens are added

New on Ver.3.2!
MAC Address Resolving

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

New on Ver.3.2!
Zoom in counter

Zooms and displays the counted value of 1 item or 2 items.
OTN GFEC decode function

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

* GFEC decode is not supported on OTU4 + 100GbE mapping.
Error Insertion Timing Enhancement

MD1260A supports various error insertion timing on the PCS errors. Alternate, Rate and All are added.
PCS Test Result in “Rate” added

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

New on Ver.3.2!
Simple and Easy-to-Use Operation
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.
Simple and Easy-to-Use Operation

GUI (Main screen – statistics by lane)

Understand status from indicators
40/100GbE Testing
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.

Test Items

- Skew Generation and Monitoring
- PCS Layer Tests
- Throughput
- Frame Loss
- Latency
- Statistics
- BER
- RFC2544
- Service disruption time
40/100GbE Testing

Tolerance Tests

Generates worst-case condition to support equipment tolerance tests.

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
Multi-Flow

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

Frame gap capture

Call for Wireshark

Trigger setting
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.

<table>
<thead>
<tr>
<th>Results</th>
<th>Unit 1 -&gt; 1 (Flow 0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elapsed Time</td>
<td>00:00:12.502</td>
</tr>
<tr>
<td>Left Time</td>
<td>00:00:00.000</td>
</tr>
<tr>
<td>Tx Frames</td>
<td>1,860,385,882</td>
</tr>
<tr>
<td>Rx Frames</td>
<td>1,860,385,882</td>
</tr>
<tr>
<td>Tx - Rx</td>
<td>0</td>
</tr>
<tr>
<td>Service Disruption Time</td>
<td>00:00:00.000</td>
</tr>
</tbody>
</table>
Supported Protocols
Ethernet, MPLS-TP, PBB, VLAN, MPLS, IPv4, IPv6

Encapsulated Frame with MPLS-TP

MAC DA/SA  EtherType  MPLS-TP Header  PBB-Frame  FCS

B-DA /B-SA  B-TAG  I-TAG  C-DA /C-SA  C-TAG  T/L  User Data (IPv4/IPv6/Data)

ID can be incremented
1. MAC DA, SA
2. MPLS Label
3. B-DA, B-SA
4. B-VID
5. I-SID

Discover What’s Possible™
40/100GbE Testing

- **Supported Protocols**
  - MPLS-TP, PBB

- **MPLS-TP, PBB Network**
  - **LER/BEB**
  - **LSR/BCB**

- **User Network**
  - **LER/BEB**

- **MP1260A**
  - **Test Location**

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

**Definitions**
- LER: Label Edge Router
- LSR: Label Switch Router
- BEB: Backbone Edge Bridge
- BCB: Backbone Core Bridge

New on Ver.3.1!
40/100GbE Testing

- **Supported Protocols**
  - Easy-to-use stream configuration

- **Frame Format**
  - Click button to add to frame:
    - MPLS-TP (Up to 5 labels)
    - PBB (Control Word)
    - Ethernet
    - VLAN (Up to 4 tags)
    - MPLS (Up to 3 labels)

- **Header Setting**
  - Ethernet TAB
  - IPv6 TAB
  - MPLS-TP TAB

New on Ver.3.1!
40/100GbE Testing

- **Supported Protocols**
  - Easy-to-use stream configuration

**Supported Protocols**

- **Easy-to-use stream configuration**

**Modify Position**

**Header Setting**

**Modify Type**

**Modifers**

New on Ver.3.1!
**Multiflow Counter**

Up to 16 flows filtered and tested simultaneously and individually.
Filters: VLAN ID, MPLS label, MAC/IP address.
Multiflow Counter
Easy flow and filter configuration
Multiflow Counter
Displays results for up to 16 flows on screen

Individually displays measured Rate, Packet Loss, and Delay

Test Frames | Distribution | All Lanes | Individual | Opt | Chart | Capture | Counter Elapsed Time
--- | --- | --- | --- | --- | --- | --- | ---
ID | Tx Test Frame | Rx Test Frame | Sequence Error | Current | Latency (us) | Current | Accumulated | Maximum
--- | --- | --- | --- | --- | --- | --- | --- | ---
0 | 21,256,503 | 236,660,418 | 0 | 0 | 0.227 | 0.240 | 0.221
1 | 21,256,503 | 236,660,418 | 0 | 0 | 0.227 | 0.240 | 0.221
2 | 21,256,503 | 236,660,418 | 0 | 0 | 0.227 | 0.240 | 0.221
3 | 21,256,503 | 236,660,418 | 0 | 0 | 0.227 | 0.240 | 0.221
4 | 21,256,503 | 236,660,417 | 0 | 0 | 0.227 | 0.240 | 0.221
5 | 21,256,503 | 236,660,417 | 0 | 0 | 0.227 | 0.240 | 0.221
6 | 21,256,503 | 236,660,417 | 0 | 0 | 0.227 | 0.240 | 0.221
7 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
8 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
9 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
10 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
11 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
12 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
13 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
14 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221
15 | 0 | 0 | 0 | 0 | 0 | 0.227 | 0.240 | 0.221

LSP

PW x 1000

EF Class
AF Class
BE Class

PW#1
PW#2

EF Class
AF Class
BE Class

PW#999
PW#1000

Background Traffic

New on Ver.3.1!
Multicast Counter
Multicast and broadcast frames counted individually

Optical Power ON/OFF

>32,700 bytes
OTU3/OTU4 Testing
### OTN Tests

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

#### Test Items

- PCS Monitor
- Errors/Alarms Monitoring and Injection
- OH Monitor. OH edit and capture
- GFEC performance
MD1260A supports OTN mapping as follows.

- **OTU4**
  - ODU4(L) ➔ OPU4(L) (GMP) ➔ ODTU4.1 ➔ ODU0(L) ➔ OPU0(L) (GMP) ➔ GbE
  - ODU4(H) ➔ OPU4(H) (GMP) ➔ ODTUG4 (PT=21) ➔ ODTU4.8 ➔ ODU2e(L) ➔ OPU2e(L) (GMP) ➔ 100GbE

- **OTU3**
  - ODU3(L) ➔ OPU3(L) ➔ PRBS

- **MD1260A-002**
  - No Frame

- **MD1260A-005**
  - No Frame

- **MD1260A-006**
  - PRBS

- **MD1260A-007**
  - PRBS

- **MD1260A-004**
  - PRBS
Summary Screen

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

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

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

<table>
<thead>
<tr>
<th>Counter Elapsed Time</th>
<th>00:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLD</td>
<td></td>
</tr>
<tr>
<td>OTU4</td>
<td></td>
</tr>
<tr>
<td>ODU4</td>
<td></td>
</tr>
<tr>
<td>TCM</td>
<td></td>
</tr>
<tr>
<td>ODU0</td>
<td></td>
</tr>
<tr>
<td>GMP</td>
<td></td>
</tr>
<tr>
<td>GFP-T</td>
<td></td>
</tr>
<tr>
<td>Ethernet</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Tx Current/Accumulated</th>
<th>Rx Current/Accumulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>10B Error</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Errorred Bytes</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Good Bytes</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>FCS Errors</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Fragments</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Oversize &amp; FCS Errors</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Undersize</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Oversize (&gt;1,518)</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Good Frames</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Rate (bit/s)</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Rate (%)</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
</tbody>
</table>
Data Monitor

The monitor function measures some data streams, such as frame data and TTI. The data display is refreshed every second.
OTU3/OTU4 Testing

- **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.
Errors/Alarms Injection

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

Errors
BIP8 (SM, PM, TCMi),
BEI (SM, PM, TCMi),
FAS, Bit all (Random)
(TCMi: i = 1 to 6)

Timing: Single, Rate

Alarms
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
**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.
**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.

---

**OTU3/OTU4 Testing**

- 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.
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.

Trigger Items:
Alarms:
  LOF, OOF, ODU-AIS, ODU-OCI, ODU-LCK
Errors:
  SM-BIP8, PM-BIP8, Any Error
### Delay Measurements

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

#### OTU3/OTU4 Testing

<table>
<thead>
<tr>
<th>Mode</th>
<th>Repeat</th>
<th>Period</th>
<th>Delay Time (μs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>PM</td>
</tr>
<tr>
<td>Current</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>History 1</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>History 2</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>History 3</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>History 4</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>History 5</td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delay Time (μs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCM4</td>
</tr>
<tr>
<td>Current</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>History 1</td>
</tr>
<tr>
<td>History 2</td>
</tr>
<tr>
<td>History 3</td>
</tr>
<tr>
<td>History 4</td>
</tr>
<tr>
<td>History 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx Delay Frame</td>
<td>7</td>
</tr>
<tr>
<td>Rx Delay Frame (PM)</td>
<td>7</td>
</tr>
<tr>
<td>Rx Delay Frame (TCM1)</td>
<td>7</td>
</tr>
<tr>
<td>Rx Delay Frame (TCM2)</td>
<td>7</td>
</tr>
<tr>
<td>Rx Delay Frame (TCM3)</td>
<td>7</td>
</tr>
<tr>
<td>Rx Delay Frame (TCM4)</td>
<td>7</td>
</tr>
<tr>
<td>Rx Delay Frame (TCM5)</td>
<td>7</td>
</tr>
<tr>
<td>Rx Delay Frame (TCM6)</td>
<td>7</td>
</tr>
</tbody>
</table>
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.

Random error injection in “through mode” can verify DUT FEC capability.
Various BER Tests
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.
Various BER Tests

- **No Frame BER Tests**
  Frame-less physical layer tests are supported to evaluate electrical and lambda level performance.

- **Bit Rates**
  - 5.15625 G x 20 Lane (100GbE, PCSL)
  - 10.3125 G x 10 Lane (100GbE, Physical)
  - 10.3125 G x 4 Lane (40GbE)
  - 5.59049 G x 20 Lane (OTU4, Logical)
  - 11.1809 G x 10 Lane (OTU4, Physical)
  - 10.7546 G x 4 Lane (OTU3)

- **Test Patterns**
  PRBS7, PRBS9, PRBS15, PRBS23, PRBS31
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.

<table>
<thead>
<tr>
<th>No frame</th>
<th>OTN and Ethernet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambda 1 (0,1,2,3,4)</td>
<td>Lambda 1 (0,1,2,3,4)</td>
</tr>
<tr>
<td>Lambda 2 (5,6,7,8,9)</td>
<td>Lambda 2 (5,6,7,8,9)</td>
</tr>
<tr>
<td>Lambda 3 (10,11,12,13,14)</td>
<td>Lambda 3 (10,11,12,13,14)</td>
</tr>
<tr>
<td>Lambda 4 (15,16,17,18,19)</td>
<td>Lambda 4 (15,16,17,18,19)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current</th>
<th>Accumulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambda 1 (0,1,2,3,4)</td>
<td>Lambda 1 (0,1,2,3,4)</td>
</tr>
<tr>
<td>Lambda 2 (5,6,7,8,9)</td>
<td>Lambda 2 (5,6,7,8,9)</td>
</tr>
<tr>
<td>Lambda 3 (10,11,12,13,14)</td>
<td>Lambda 3 (10,11,12,13,14)</td>
</tr>
<tr>
<td>Lambda 4 (15,16,17,18,19)</td>
<td>Lambda 4 (15,16,17,18,19)</td>
</tr>
</tbody>
</table>

Choose “Lambda Group” from here. Group members change with each connection.
PCS Layer Testing
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.
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.

For editing alignment marker mapping

<table>
<thead>
<tr>
<th>Tx Lane</th>
<th>PCS Lane Marker</th>
<th>Rx Lane</th>
<th>PCS Lane Marker</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Lane 2</td>
<td>10</td>
<td>Lane 3</td>
</tr>
<tr>
<td>1</td>
<td>Lane 16</td>
<td>11</td>
<td>Lane 14</td>
</tr>
<tr>
<td>2</td>
<td>Lane 11</td>
<td>12</td>
<td>Lane 17</td>
</tr>
<tr>
<td>3</td>
<td>Lane 4</td>
<td>13</td>
<td>Lane 5</td>
</tr>
<tr>
<td>4</td>
<td>Lane 7</td>
<td>14</td>
<td>Lane 15</td>
</tr>
<tr>
<td>5</td>
<td>Lane 0</td>
<td>15</td>
<td>Lane 19</td>
</tr>
<tr>
<td>6</td>
<td>Lane 9</td>
<td>16</td>
<td>Lane 18</td>
</tr>
<tr>
<td>7</td>
<td>Lane 8</td>
<td>17</td>
<td>Lane 12</td>
</tr>
<tr>
<td>8</td>
<td>Lane 1</td>
<td>18</td>
<td>Lane 10</td>
</tr>
<tr>
<td>9</td>
<td>Lane 8</td>
<td>19</td>
<td>Lane 13</td>
</tr>
</tbody>
</table>
Skew Generation and Monitoring

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

100 G:
- Tx Lane: 0 to 819.2 ns (193.94 ps step)
- Physical Lane: 0 to 819.2 ns (96.97 ps step)

40 G:
- 0 to 819.2 ns (96.97 ps step)
Unique Features
**Unique Features**

- **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.

  Optical/Electrical Loop back

  J1502A SMP-SMA Cable, J1503A SMP-SMP Cable or J1540A SMP-GPPO Cable

  MZ1223C 10 Lane Extender

  SMP

  DUT

  Test Board

Discover What’s Possible™
Unique Features

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
Unique Features

- **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.

*: 100G LH evaluation adapter is a custom-made product.
Unique Features

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**
- **OH overwrite mode**
- **Analyzed mode**

Random error injection in “through mode” can verify DUT FEC capability.
**Unique Features**

- **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.

- **Hardware pin access**
- **CFP Internal Alarm/Warning** are decoded here.
- **Lambda lane individual TX_DIS switch**
Unique Features

- **Adapter for QSFP+**

  The Anritsu MD1260A measurement solution supports both optical and CFP modules. An adapter mounts the QSFP+ 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.

*** Operation Log Start
:UENTry:ID 1
*** Test Pattern Setting
:SOURce:STReam:HEADer:ETHer:SA
#H0123456789AB
:SOURce:STReam:HEADer:ETHer:TYPE #H1234
:SOURce:STReam:ERRor:TYPE FCS
:SOURce:STReam:FSIZEe:TYPE FIXED
:SOURce:STReam:FSIZEe:VALue 60
:SOURce:STReam:FSIZEe:RANGE 50,16376

*** Operation Log End

Remote commands list
Unique Features

- **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.
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.

Choose “Lambda Group” here. Group members change with each connection.
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.

- **Hardware pin access**
- **CFP Internal Alarm/Warning decoded here**
- **Lambda lane individual TX_DIS switch**
## List of Unique Features

<table>
<thead>
<tr>
<th>Unique Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>10GbE in OTU4</td>
</tr>
<tr>
<td>GbE in OTU4</td>
</tr>
<tr>
<td>Through mode</td>
</tr>
<tr>
<td>OTN Capture</td>
</tr>
<tr>
<td>Jumbo frame up to 32 k byte</td>
</tr>
<tr>
<td>Ethernet Capture</td>
</tr>
<tr>
<td>Multi-unit Sync</td>
</tr>
<tr>
<td>Remote Control Recording</td>
</tr>
</tbody>
</table>

Discover What’s Possible™

Anritsu

Slide 68

MD1260A-E-L-1