

# 40/100G PCS Layer Tests

## Evaluating 40/100G Network Equipment Design

MT1100A  
Network Master Flex

MU100010A  
10G Multirate Module  
MU100011A  
100G Multirate Module  
MU100012A  
40/100G Module CFP2



The explosion in mobile data services, video streaming, and cloud computing is forcing today's Core and Metro communications networks to meet the need for more bandwidth by rapid deployment of 40/100G Ethernet and OTN. These high-bit-rate networks require especially high reliability due to the huge transmitted data volumes and diversity of client signals. Anritsu has developed its new MT1100A Network Master Flex as the ideal all-in-one transport tester supporting testing and evaluation of future high-speed networks.

### Introduction

Development of 40/100G network equipment demands evaluation of the PCS layer controlling the interface with the PHY layer. The PCS layer converts the sent data into multiple lanes and performs data distribution and rebuilding at each lane. Evaluating the lane mapping, skew, and alarms/errors in the PCS layer is a key stage in developing network equipment hardware.

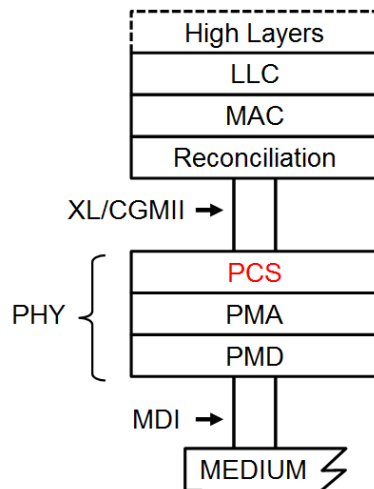


Fig. 1. PCS Layer

# Applications

The impact of abnormalities in the PCS layer on the network equipment can be monitored at the PCS layer level by connecting the MT1100A to the network equipment to test the PCS layer operation.

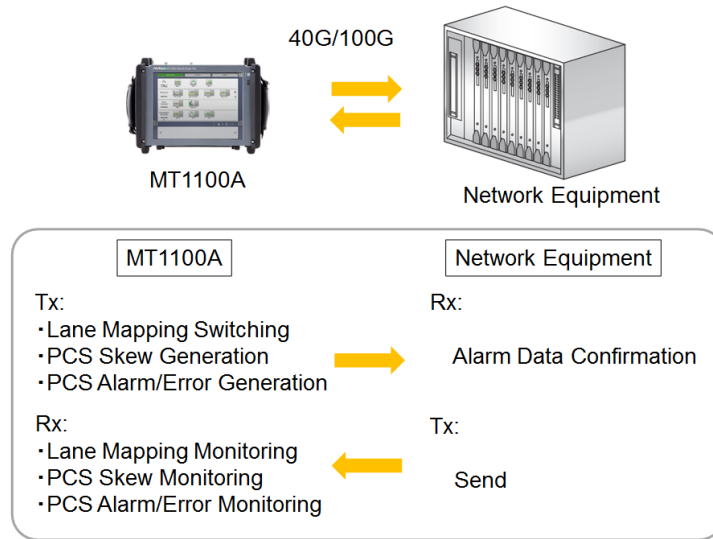


Fig. 2. Network Equipment PCS Layer Tests

# Measurement Examples

The order between each lane of the PCS layer is not fixed. The MT1100A intentionally switches the lane order when sending data to confirm that data is being received in the normal order at the network equipment side. Additionally, each lane order can be monitored from the network equipment.



Fig. 3. Lane Mapping Switching and Monitoring

Data transmission time differences (skew) occur between each lane of the PCS layer. The MT1100A can be used to intentionally insert skew into specific lanes to verify the network equipment skew tolerance. Skew from the network equipment can also be monitored.

\* The MT1100A does not support dynamic skew.

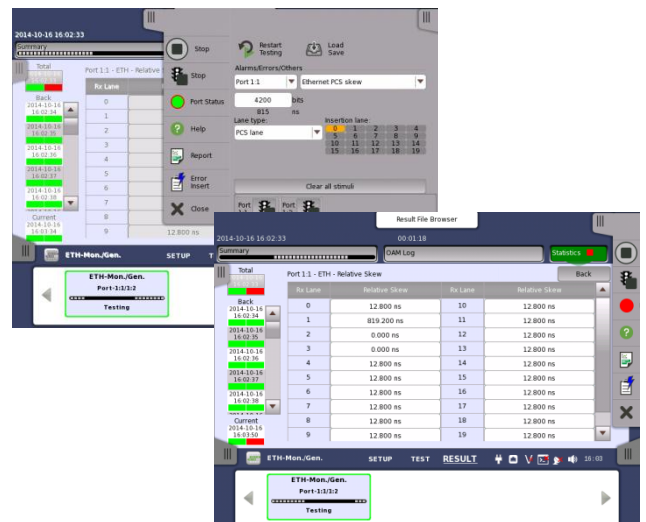


Fig. 4. Skew Generation and Monitoring

Information for rebuilding data is buried in each lane of the PCS layer. The MT1100A can be used to intentionally generate abnormalities in this information to confirm the network equipment abnormality fault detection. Additionally, it can monitor the absence of faults in data from network equipment. Color-coded faults are displayed for each lane to instantly evaluate what fault has occurred in which lane.

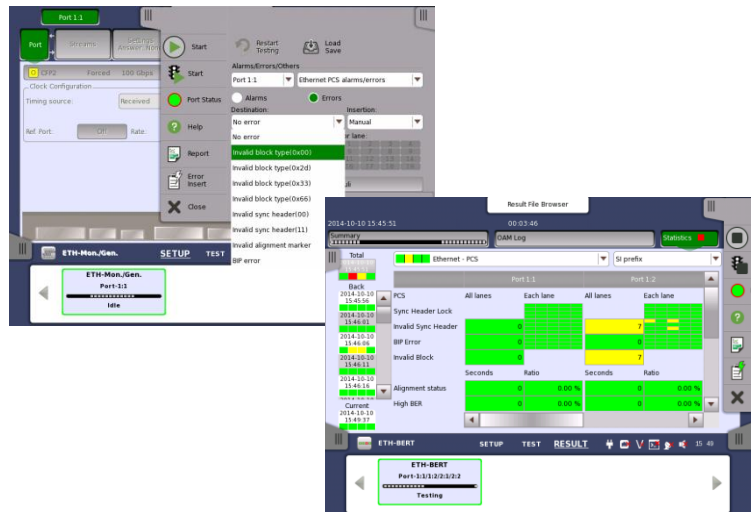


Fig. 5. PCS Alarm/Error Generation and Monitoring

#### Alarms and Errors:

- High BER
- Invalid Block
- Invalid Sync Header
- Invalid Alignment Marker
- BIP Error

## Product Features

- Lane Mapping Switching and Monitoring
- PCS Skew Generation and Monitoring
- PCS Alarm/Error Generation and Monitoring
- Fast Troubleshooting using Color-coded Indicators

## Summary

The MT1100A supports 40/100G PCS layer tests to evaluate the design of 40/100G network equipment, helping improve the quality of continuously evolving and expanding high-speed networks.

## Ordering Information

Mainframe	
MT1100A	Network Master Flex
Test Modules	
MU110011A	100G Multirate Module
MU110012A	40/100G Module CFP2
Power Supply Modules	
MU110001A	Battery and AC Power Supply Module
MU110002A	AC only High Power Supply Module
Options	
MU110011A-015	Ethernet 100G Single Channel
MU110011A-055	OTN 100G Single Channel
MU110012A-015	Ethernet 100G Single Channel
MU110012A-055	OTN 100G Single Channel

● **United States**

**Anritsu Company**

1155 East Collins Blvd., Suite 100, Richardson,  
TX 75081, U.S.A.  
Toll Free: 1-800-267-4878  
Phone: +1-972-644-1777  
Fax: +1-972-671-1877

● **Canada**

**Anritsu Electronics Ltd.**

700 Silver Seven Road, Suite 120, Kanata,  
Ontario K2V 1C3, Canada  
Phone: +1-613-591-2003  
Fax: +1-613-591-1006

● **Brazil**

**Anritsu Eletrônica Ltda.**

Praça Amadeu Amaral, 27 - 1 Andar  
01327-010 - Bela Vista - São Paulo - SP - Brazil  
Phone: +55-11-3283-2511  
Fax: +55-11-3288-6940

● **Mexico**

**Anritsu Company, S.A. de C.V.**

Av. Ejército Nacional No. 579 Piso 9, Col. Granada  
11520 México, D.F., México  
Phone: +52-55-1101-2370  
Fax: +52-55-5254-3147

● **United Kingdom**

**Anritsu EMEA Ltd.**

200 Capability Green, Luton, Bedfordshire, LU1 3LU, U.K.  
Phone: +44-1582-433200  
Fax: +44-1582-731303

● **France**

**Anritsu S.A.**

12 avenue du Québec, Bâtiment Iris 1- Silic 612,  
91140 VILLEBON SUR YVETTE, France  
Phone: +33-1-60-92-15-50  
Fax: +33-1-64-46-10-65

● **Germany**

**Anritsu GmbH**

Nemetschek Haus, Konrad-Zuse-Platz 1  
81829 München, Germany  
Phone: +49-89-442308-0  
Fax: +49-89-442308-55

● **Italy**

**Anritsu S.r.l.**

Via Elio Vittorini 129, 00144 Roma, Italy  
Phone: +39-6-509-9711  
Fax: +39-6-502-2425

● **Sweden**

**Anritsu AB**

Kistagången 20B, 164 40 KISTA, Sweden  
Phone: +46-8-534-707-00  
Fax: +46-8-534-707-30

● **Finland**

**Anritsu AB**

Teknobulevardi 3-5, FI-01530 VANTAA, Finland  
Phone: +358-20-741-8100  
Fax: +358-20-741-8111

● **Denmark**

**Anritsu A/S**

Kay Fiskers Plads 9, 2300 Copenhagen S, Denmark  
Phone: +45-7211-2200  
Fax: +45-7211-2210

● **Russia**

**Anritsu EMEA Ltd.**

**Representation Office in Russia**

Tverskaya str. 16/2, bld. 1, 7th floor.

Russia, 125009, Moscow  
Phone: +7-495-363-1694  
Fax: +7-495-935-8962

● **United Arab Emirates**

**Anritsu EMEA Ltd.**

**Dubai Liaison Office**

P O Box 500413 - Dubai Internet City  
Al Thuraya Building, Tower 1, Suit 701, 7th Floor  
Dubai, United Arab Emirates  
Phone: +971-4-3670352  
Fax: +971-4-3688460

● **India**

**Anritsu India Private Limited**

2nd & 3rd Floor, #837/1, Binnamangla 1st Stage,  
Indiranagar, 100ft Road, Bangalore - 560038, India  
Phone: +91-80-4058-1300  
Fax: +91-80-4058-1301

● **Singapore**

**Anritsu Pte. Ltd.**

11 Chang Charn Road, #04-01, Shriro House  
Singapore 159640  
Phone: +65-6282-2400  
Fax: +65-6282-2533

● **P.R. China (Shanghai)**

**Anritsu (China) Co., Ltd.**

Room 2701-2705, Tower A,  
New Caohejing International Business Center  
No. 391 Gui Ping Road Shanghai, 200233, P.R. China  
Phone: +86-21-6237-0898  
Fax: +86-21-6237-0899

● **P.R. China (Hong Kong)**

**Anritsu Company Ltd.**

Unit 1006-7, 10/F., Greenfield Tower, Concordia Plaza,  
No. 1 Science Museum Road, Tsim Sha Tsui East,  
Kowloon, Hong Kong, P.R. China  
Phone: +852-2301-4980  
Fax: +852-2301-3545

● **Japan**

**Anritsu Corporation**

8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan  
Phone: +81-46-296-1221  
Fax: +81-46-296-1238

● **Korea**

**Anritsu Corporation, Ltd.**

5FL, 235 Pangyoyeok-ro, Bundang-gu, Seongnam-si,  
Gyeonggi-do, 463-400 Korea  
Phone: +82-31-696-7750  
Fax: +82-31-696-7751

● **Australia**

**Anritsu Pty. Ltd.**

Unit 21/270 Ferntree Gully Road, Notting Hill,  
Victoria 3168, Australia  
Phone: +61-3-9558-8177  
Fax: +61-3-9558-8255

● **Taiwan**

**Anritsu Company Inc.**

7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan  
Phone: +886-2-8751-1816  
Fax: +886-2-8751-1817

Please Contact: