Advancing beyond

Automated Scenario Tests for 400ZR Deployment

Network Master Pro MT1040A Optical Spectrum Analyzer MS9740B

1. Introduction





Data center operators are deploying 400ZR optical transceivers for interconnects to change the 400ZR output optical frequency. Therefore, before network commissioning, they must first use an Optical Spectrum Analyzer (OSA) to confirm that the transceiver is transmitting an optical signal at the expected frequency. And then they should execute Ethernet Frame tests.

Although manual measurement supports flexible parameter settings, operators are forced to search the many screens for each parameter setting. As a result, the work documentation must be referenced step-by-step to make settings in the correct sequence and switch the fiber connection between the 400G test module and the OSA at the correct timing.

On the other hand, measurement using a scenario decreases the number of operations, such as parameter settings and test executions. On-screen measurement guidance also cuts the number of operation errors.

This document explains how to use a scenario to automate testing using the Network Master Pro MT1040A and the OSA MS9740B when deploying 400ZR and helps reduce data center interconnect operation costs.

2. Test Items

Table 1 lists the 400ZR scenario test items.

Tester	Test Items					
MS9740B	400ZR transmitter output optical frequency					
	Ethernet Frame Tests					
	Client Side: Bit Error Rate (BER), Frame Loss, Error Frame					
MT1040A	Line Side: Chromatic Dispersion (CD), Optical Signal to Noise Ratio (OSNR),					
	State of Polarization Rate of Change (SOPROC), Differential Group Delay (DGD),					
	Carrier Frequency Offset (CFO)					

Table 1 Test Items.

3. Scenario Registration

- 1. After unzipping the downloaded file, copy the file named 400GZR.obcfg to a USB memory stick and insert the stick into the MT1040A.
- 2. Start *Scenario.Mgr* by touching the *icon* on the MT1040A *Utilities* screen.

3. Select the scenario to register at the 🍊 icon at the screen top-right.



Starting Scenario.Mgr

Selecting Scenario Figure 2 Setting Screens. **Registering Scenario**

4. How to Execute Scenario

This section describes a scenario execution sequence. The test is executed automatically after setting some parameters and measuring the 400ZR optical signal frequency using the OSA.



Figure 3 400ZR Scenario Sequence.

I. Touch 400GZR on the MT1040A Utilities screen and then touch the start 🕑 icon on the Application Selector screen.



Start 400ZGR

Touch Start Icon

II. Set the transceiver channel number*1, frame size, and frame rate parameters, and then touch OK.

*1: The channel number is defined on page 89 of the OIF Implementation Agreement 400ZR (https://www.oiforum.com/wp-content/uploads/OIF-400ZR-01.0_reduced2.pdf).



Channel Setting Screen

Frame Size Setting Screen

Frame Rate Setting Screen

III. Select a measurement time of 1 min/10 min/1 hour and touch OK to set the transceiver automatically (requires a few minutes).



Measurement Time Setting Screen

Transceiver Automatic Setting Screen

IV. Follow the displayed guidance to connect the optical fiber to the MS9740B and touch OK.



- V. Follow the displayed guidance to set the MS9740B parameters to measure the signal center frequency. On the MS9740B front panel:
 - 1) Touch *F1*.
 - 2) Touch f6 to set Freq.
 - 3) Touch F5.
 - 4) Touch *f1* to set *Threshold* analysis.
 - 5) Touch Auto measure.

Then, after the MS9740B displays the measured center frequency fc (Unit: THz) of the optical signal, touch OK on the MT1040A.



VI. Input the center frequency fc (Unit: THz) displayed on MS9740B and touch OK.

			Application Select	or	100	. 0					Application	Selector		Ш	1
Results folder: 40	Input the	recorded	Spectrum F	requency (Unit:THz) X		0	Pess	Its folder: 4005ZN		जिसाजी विग	aranza 🖉 🔳			G
Applicat	*				193100		U		Application name	Port	Comment	Statun	Result file name		E
Custon Applica	Min: 143100				Max 243100		2		Custom Application		400G ZR Transceiver Installation Test	Testing			
	CUA	7		9	•		3								3
	K-	4	5	6	-×										
	+	1	2	3	-				Time			Description			
2022-11-10								- 24	2022-11-16 13:46:21	-	OSFP-00 St	ans [1-POR	1]		
2022-11-16	Texture		0		Copy All			35	2022-11-16 13:46:23	*CHAN	EL MONTOR INTERRUPT FI	A65	Pass		
2022-11-10	1.		_				×	28	2022-11-16 13:46:23	10000	Measurement Test				X
2022-11-10			Cance		Ok				2022-11-16 13 46 23	Starts	neasurement, Duration O	9.09.01.00		-	
400	GZR v1.0		TEST			B 📥 00 23	10	239	400GZR v1.0		TEST	1	*** • • • • • • • • • •	13 47	111

Input Center Frequency

Center Frequency Pass/Fail Check

VII. Follow the guidance displayed on the MT1040A, connect the optical fiber to the test network, and touch OK.



VIII. The test scenario starts automatically after completing the above steps.



Test Results Screen

IX. The test result files are saved automatically in the path Internal/Scenario_logs/400ZR/_YYYY-MM-DD@HH-MM-SS_Pass/Fail.



Table 2 Test Result Files.

File Name	Description				
Summarypdf	Test report (PDF format)				
Ethernet_BERT.res	MT1040A result file. This file can be loaded into the MT1040A				
Summaryobres					
CommandLog.txt	Internal logs for troubleshooting				
SequenceLog.txt					

5. Pass/Fail Conditions

The scenario automated test result is Pass when:

- ► The BER is zero.
- ► The number of Send and Receive Frames match.

6. How to Change Scenario Setting Parameters

Users can change the following MT1040A settings.

- ► ITU Grid spacing on MT1040A screen
- Optical frequency Pass/Fail threshold (Unit GHz)
- MT1040A display setting
- Physical layer test On/Off

Touch Scenario.Mgr at the MT1040A top menu, select the test name 400GZR vX.0, and touch Edit.



Settable parameters are listed in the red frame shown below.

sou	urce Assignment			h			
1	Custom Application	400G ZR Tra Installation T	insceiver Test				
rial	bles		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
rial	bles Nam	1e		Note	Va	lue	
rial	blesNam G_LAUNCH_GUI	ne		Note	Va	lue	
rial 1	bles Nam G_LAUNCH_GUI G_TUNABLE_SPACING	ne	Select S	Note	Va Hide 100GHz	lue	
rial 1 2 3	bles Nam G_LAUNCH_GUI G_TUNABLE_SPACING G_DELTA_FREQUENCY_	ie LUMIT	Select S	Note Spacing equency Limit(Unit:GHz)	Va Hide 100GHz	lue	

Table 3 Test Parameters.

File Name	Description
G_LAUNCH_GUI	Hide/Show MT1040A measurement screen during test
G_TUNABLE_SPACING	MT1040A screen ITU grid spacing
G_DELTA_FREQUENCY_LIMIT	Optical frequency (Unit GHz) Pass/Fail threshold
G_Skip_Media_Statistics_Test	Execute/Skip Physical layer test Yes: Execute Physical layer test No: Skip Physical layer test

Advancing beyond

United States

Anritsu Americas Sales Company

450 Century Parkway, Suite 190, Allen, TX 75013 U.S.A. Phone: +1-800-Anritsu (1-800-267-4878)

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

Mexico

Anritsu Company, S.A. de C.V. Blvd Miguel de Cervantes Saavedra #169 Piso 1, Col. Granada

Mexico, Ciudad de Mexico, 11520, MEXICO Phone: +52-55-4169-7104

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, Immeuble Goyave, 91140 VILLEBON SUR YVETTE, France Phone: +33-1-60-92-15-50

• 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. Spaces Eur Arte, Viale dell'Arte 25, 00144 Roma, Italy Phone: +39-6-509-9711

• Sweden Anritsu AB

Kistagången 20 B, 2 tr, 164 40 Kista, Sweden Phone: +46-8-534-707-00

Finland Anritsu AB

Anritsu AB Technopolis Aviapolis, Teknobulevardi 3-5 (D208.5.), Fl-01530 Vantaa, Finland Phone: +358-20-741-8100

• Denmark Anritsu A/S

Annisu A/3 c/o Regus Winghouse, Ørestads Boulevard 73, 4th floor, 2300 Copenhagen S, Denmark Phone: +45-7211-2200

• Russia Anritsu EMEA Ltd. Representation Office in Russia Tverskaya str. 16/2, bld. 1, 7th floor., Moscow, 125009, Russia Phone: +7-495-363-1694

Fax: +7-495-935-8962 • Spain

Anritsu EMEA Ltd.

Representation Office in Spain Paseo de la Castellana, 141. Planta 5, Edificio Cuzco IV 28046, Madrid, Spain Phone: +34-91-572-6761

Austria

Anritsu EMEA GmbH Am Belvedere 10, A-1100 Vienna, Austria Phone: +43-(0)1-717-28-710

• United Arab Emirates Anritsu EMEA Ltd. Anritsu A/S

Office No. 164, Building 17, Dubai Internet City P. O. Box – 501901, Dubai, United Arab Emirates Phone: +971-4-3758479

• India

Anritsu India Private Limited 6th Floor, Indiqube ETA, No.38/4, Adjacent to EMC2, Doddanekundi, Outer Ring Road, Bengaluru – 560048, India Phone: +91-80-6728-1300 Fax: +91-80-6728-1301 Specifications are subject to change without notice.

Singapore

Anritsu Pte. Ltd. 11 Chang Cham Road, #04-01, Shriro House, Singapore 159640 Phone: +65-6282-2400 Fax: +65-6282-2533

Vietnam
Anritsu Company Limited
16th Floor, Peakview Tower, 36 Hoang Cau Street, O Cho Dua Ward,
Dong Da District, Hanoi, Vietnam
Phone: +84-24-3201-2730

• 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: +81-46-296-6509 Fax: +81-46-225-8352

• Korea

Anritsu Corporation, Ltd. 5FL, 235 Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, 13494 Korea Phone: +82-31-696-7750 Fax: +82-31-696-7751

• Australia Anritsu Pty. Ltd.

Amitsu Fty, Ltd. Unit 20, 21-35 Ricketts Road, Mount Waverley, Victoria 3149, Australia Phone: +61-3-9558-8177 Fax: +61-3-9558-8255

2106

• Taiwan Anritsu Company Inc.

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

公知 Printed in Japan 30/NOV/2022 ddcm/CDT Catalog No. MT1040A/MT1000A_SEEK-E-F-4-(1.00)