

### What is 400ZR?

Optical fiber networks are evolving day-by-day to meet the demand for faster speeds, larger capacity, lower costs, and better stability. As one example, the Optical Internetworking Forum has defined the 400ZR digital coherent communications standard for Metro networks and Data Center Interconnects (DCI) in 2020. 400ZR limits the data transmission rate only to 400 Gbps without requiring transponders and aims to reduce the size of network equipment, cut power consumption, and assure multi-vendor interoperability.



400ZR uses optical fiber for point-to-point DCI connections (80 km max. distance without optical amplifiers) and supports Ethernetbased signal at 400 Gbps. Moreover, 400ZR optical transceivers use specific signal wavelengths. The quality of communications covering long distances at high data rates can be impacted by changes in properties such as the optical power and polarization. Naturally, enough margins for specifications and design must be established and followed to recover quickly from network faults and assure the quality of communications. Ascertaining these margins requires testing optical network performance at network demonstration and deployment. Additionally, the performance of each vendor's equipment must be tested to take advantage of lower costs provided by multi-vendor interoperability and larger supply chains.

## Key Issues in Use Case

#### Business:

Communications infrastructure operators and data center operators.

Key Challenges:

Efficient optical network deployment and maintenance.

**Solution:** 

Test scenario for automating 400G Ethernet tester and optical spectrum analyzer operation.

♦ Result:

Cuts operation workload by 60% compared to manual operation and reduces operator training needs by following on-screen guidance for required settings, etc.

The construction of new data centers is increaseing each year. This results in deploying more optical network and accelerating the shortage of experienced engineers. Consequently, training of new engineers and work efficiently is more important than ever.

- Understand new network-standard test procedures.
- Understand test equipment operation procedures and train new engineers.
- Evaluate Pass/Fail results accurately.
- Reduce "do-over" testing.

### **Solution to Solve Issues**

Using an automated test scenario makes optical network deployment more efficient and cuts engineer training costs. Test scenario saves the test operation sequence in the MT1000A/MT1040A internal memory and features the following automated tests.

# • Automated test scenario sets parameter settings, evaluates Pass/Fail results, and saves results using standalone test equipment.

Using a test scenario minimizes the number of required on-site test settings to simplify testing and prevent operation mistakes.





Automated Test Equipment Control

Color-Coded Pass/Fail Evaluation

#### Automated scenario testing displays on-screen guidance, explains procedures, and notifies warnings.

Following the on-screen guidance prevents operation mistakes and test "do-overs", and eliminates time-wasting referencing of the operation manual.



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Fiber Connection Timing Guidance

**Operation On-Screen Help Guidance** 

### • Automated scenario testing allows on-site engineers to benefit from experienced engineers' test know-how.

Training times for inexperienced engineers are cut by taking advantage of experienced engineers' valuable knowledge.

Test scenario is configured easily using the Scenario Edit Environment Kit (SEEK) software MX100003A with both a GUI and unique scripting language.

As an example, using the 400ZR automated test scenario with the Network Master Pro MT1040A and the Optical Spectrum Analyzer MS9740B cuts the number of operation procedures by about 60% compared to manual testing.

Anritsu's automated testing using scenarios facilitates accurate and efficient 400ZR network deployment and maintenance.



Click here to download the details and scenario of 400ZR testing.