Anritsu Advancing beyond

# Network Master™ Series

## Network Master Pro MT1040A

| | |
|---|---|
| 400G (QSFP-DD) Multirate Module | MU104014A |
| 400G (OSFP) Multirate Module | MU104015A |
| 100G Multirate Module | MU104011A/MU100011A |
| 10G Multirate Module | MU100010A |
| OTDR Module | MU100020A/MU100021A/MU100022A/MU100023A |

Network Master Pro


# 400G

## - anywhere, anyspeed, any test

# Network Master Pro MT1040A

## Small

Battery powered for 400G Ethernet measurements

Easy-to-use GUI with 9-inch touchscreen for better operability

## Flexible

One unit supports multiple standards, including OTN, eCPRI/RoE, Fibre Channel

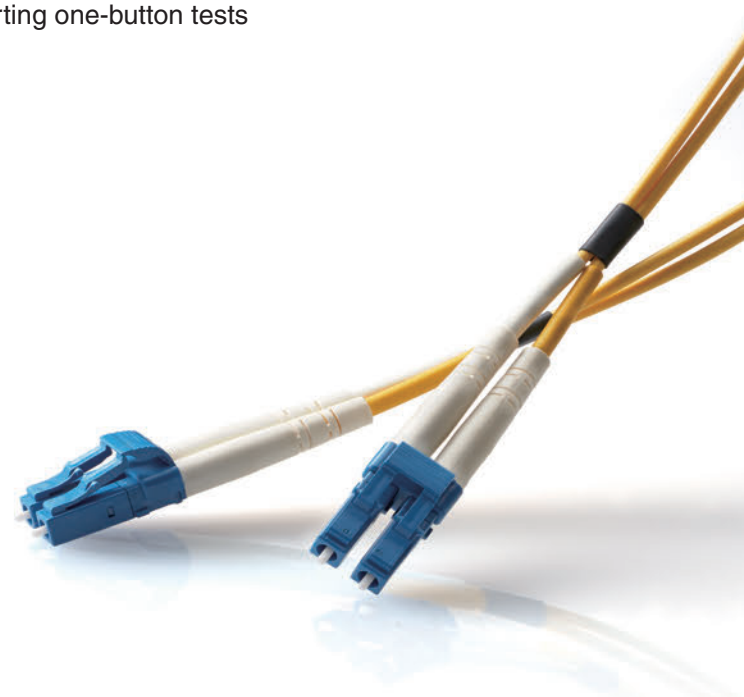
Optical fiber line measurement in combination with OTDR module

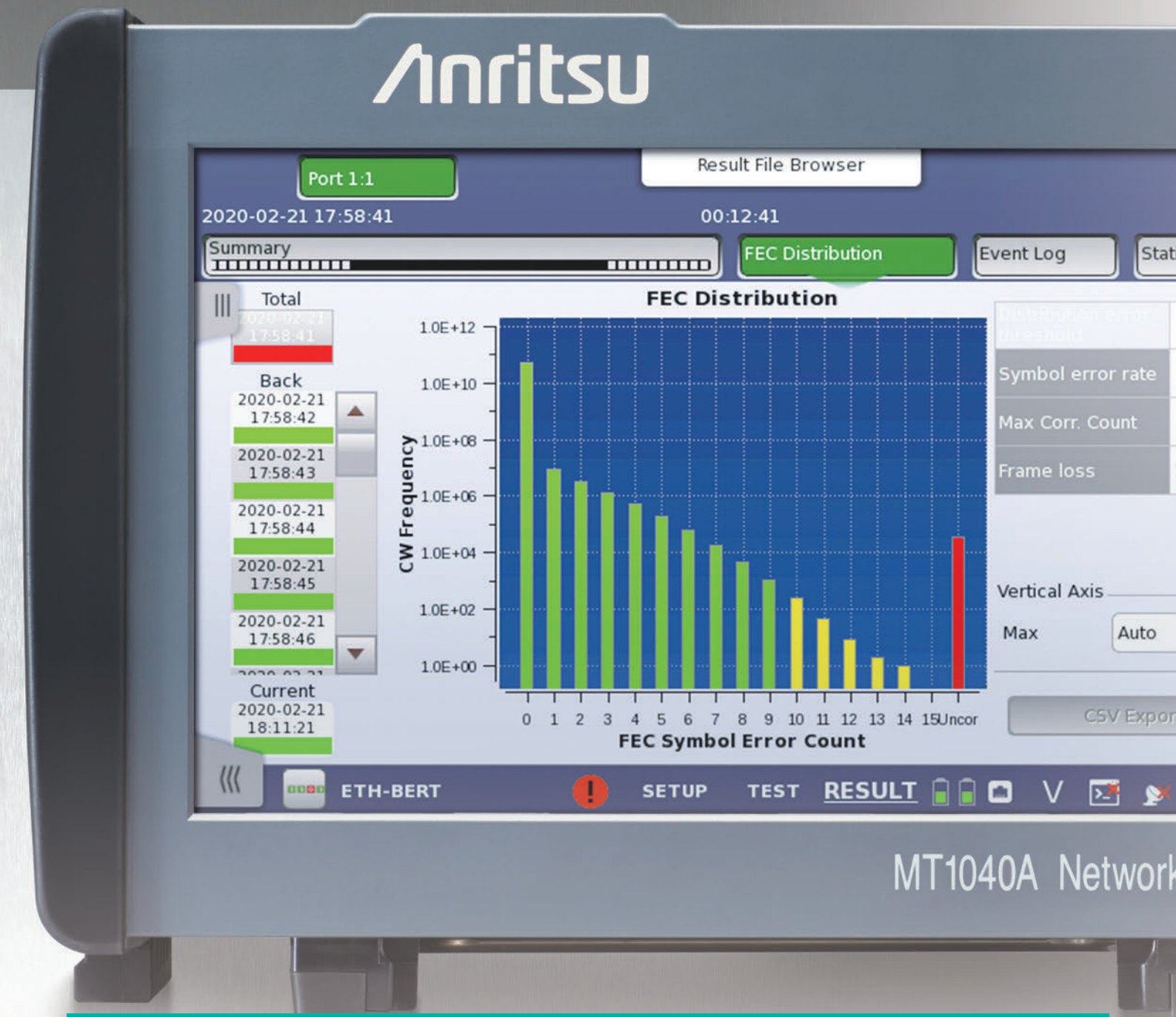
## Powerful

Built-in 400G Ethernet FEC analysis function

Simple optical module check function

More efficient work with automated-measurement tools supporting one-button tests






## Small ... Compact and Lightweight

With a built-in, large 9-inch touchscreen, the Network Master Pro MT1040A is the ideal instrument for 400G Ethernet tests.

**Measurement Modules**

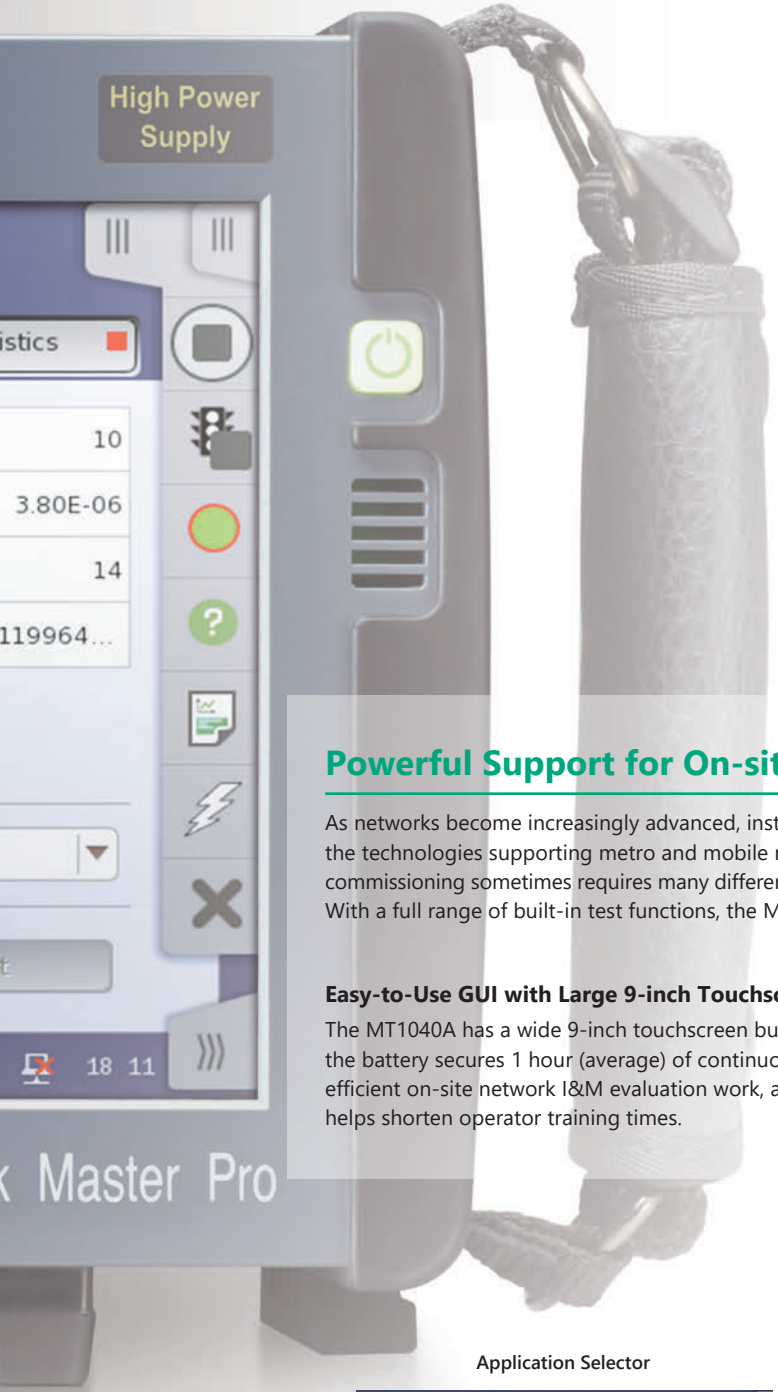
| | QSFP-DD/QSFP56 | OSFP | QSFP28/QSFP+ | SFP28/SFP+/SFP | RJ45 |
|---|---|---|---|---|---|
| MU104014A | 1 port | | 2 ports | 2 ports | 2 ports |
| MU104015A | | 1 port | 1 port | 2 ports | 2 ports |
| MU104011A | | | 2 ports | 2 ports | 2 ports |

**400G (QSFP-DD) Multirate Module MU104014A**

**400G (OSFP) Multirate Module MU104015A**

**100G Multirate Module MU104011A**

Testing is supported by installing the Activate for 400G Dual/100G Quad Option MT1040A-020 and two measurement modules.





The MT1040A is both AC and battery powered
(with more than 1 hour of 400G tests while on battery power).

## Powerful Support for On-site I&M Work

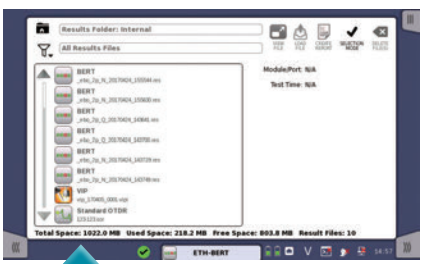
As networks become increasingly advanced, installation and maintenance (I&M) engineers need a good understanding of the technologies supporting metro and mobile networks, data centers, etc., and tester operation. Additionally network commissioning sometimes requires many different measurements, which imposes a heavy load on operators working on-site. With a full range of built-in test functions, the MT1040A helps lighten operators' workloads.

### Easy-to-Use GUI with Large 9-inch Touchscreen

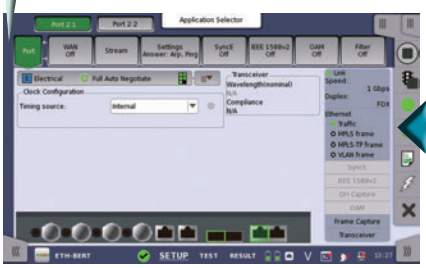
The MT1040A has a wide 9-inch touchscreen built-into the wide B5-size case. At on-site testing with no available AC supply, the battery secures 1 hour (average) of continuous, problem-free 400G interface measurements. The GUI is designed for efficient on-site network I&M evaluation work, and fast troubleshooting if a problem occurs. The intuitive user interface also helps shorten operator training times.

Application Selector


Test Results File Creation




Splitting the settings and results between three screens helps the operator find the required screen quickly.

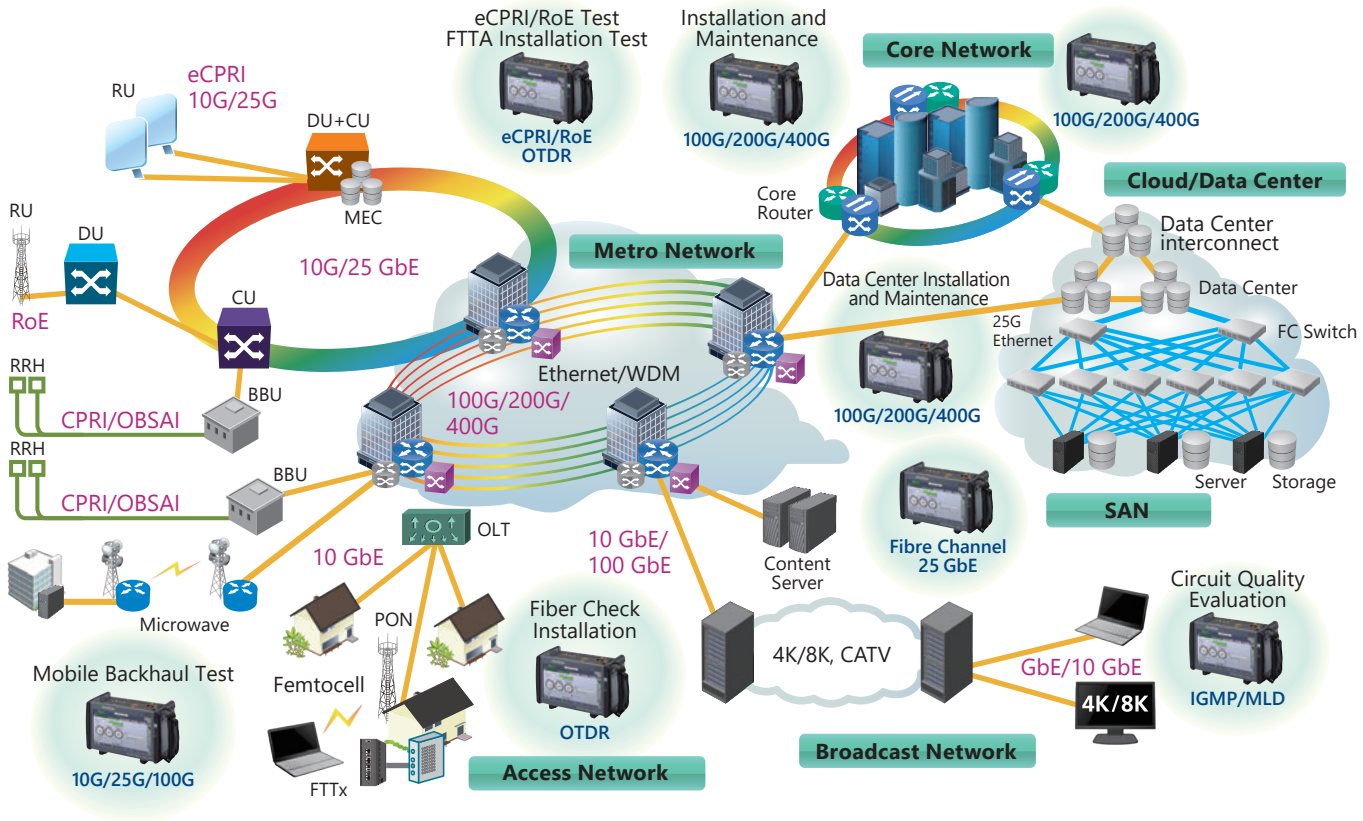


Test Port Setting

Test Condition Setting

Test Results Display

The Network Master supports all types of network I&M.



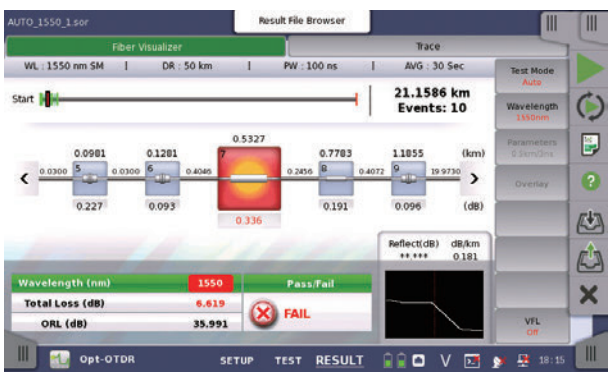

The modular design of the Network Master Pro MT1040A platform makes it easy to support I&M for different network configurations. Furthermore, options for each test function can be selected and added as necessary to match the work schedule, helping cut initial capital costs.

**Transport Module Interfaces and Protocols**

| Interface | Ethernet | OTN | SDH/SONET | Fibre Channel | eCPRI | CPRI/OBSAI |
|---|---|---|---|---|---|---|
| QSFP-DD/OSFP | 400 GbE | — | — | — | — | — |
| QSFP56 | 200 GbE | — | — | — | — | — |
| QSFP28 | 100 GbE | OTU4 | — | — | 100 GbE | — |
| QSFP+ | 40 GbE | OTU3 | — | — | 40 GbE | — |
| SFP28 | 25 GbE | — | — | — | 25 GbE | CPRI10 |
| SFP/SFP+ | GbE/10 GbE | OTU1x/OTU2x | STM1-64/<br>OC3-192 | 1G/2G/4G/8G/10G/<br>16G FC | GbE/10 GbE | CPRI<br>1/2/3/4/5/6/7/8/9<br>OBSAI<br>1x/2x/4x/8x |
| RJ45 | 10/100/1000M | — | — | — | 10/100/1000M | — |

### OTDR Module

This module helps detect fiber-cable faults, such as dust or scratches at fiber-connector end faces, and excessive optical reflections. The built-in Fiber Visualizer function featuring easy report creation and output helps improve work efficiency too.




Fiber Visualizer Screen

# Transport Application

### Ethernet Installation and Troubleshooting

Network operators are introducing new carrier-class technologies, such as VLAN, Q-in-Q, Ethernet OAM, etc., to their Ethernet service menus, increasing test complexity and test time for field technicians.
With connectivity, bandwidth, QoS (Quality of Service), and service-related test functions, the MT1040A is ideal for commissioning and troubleshooting Ethernet networks at speeds up to 400 Gbps.

- BER tests – include Frame Loss and Sequence Error tests
- FEC Analysis
- Automated RFC 2544 tests of Throughput, Frame Loss, Latency or Packet Jitter, Burstability
- Filters – to extract relevant parts of traffic
- Separate pass/fail threshold settings
- Multistream Tx/Rx function (QoS/CoS test)
- Stacked VLAN (Q-in-Q)
- Link Fault Signaling (LFS) Emulation (10 Gbps to 400 Gbps)

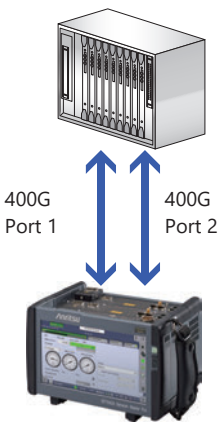
### Supports I&M for Various Transport Networks

Networks do not only use Ethernet technology. Consequently, in addition to supporting Ethernet, the MT1040A also supports mobile networks using eCPRI and CPRI, core networks using OTN and SONET/SDH, and various other networks such as fiber channel used by data centers and video streaming services. Adding various protocols also facilitates network I&M.

### Strong Support Ranging from 400 GbE Equipment Tests to Network I&M

Two measurement modules can be installed in the MT1040A by adding MT1040A-020. As a result, both 400G dual port and 100G 4 port measurements are supported.  Customized installed options facilitate applications ranging from equipment inspection to network I&M.

**Laboratory Equipment Tests**




**Functions, GUI, Automatic Measurement Scenario Sharing**

- Laboratory and on-site field tests with minimum advanced training
- Both separate and shared measurement modules

**On-site I&M Tests**


**400G Dual-port Tester**

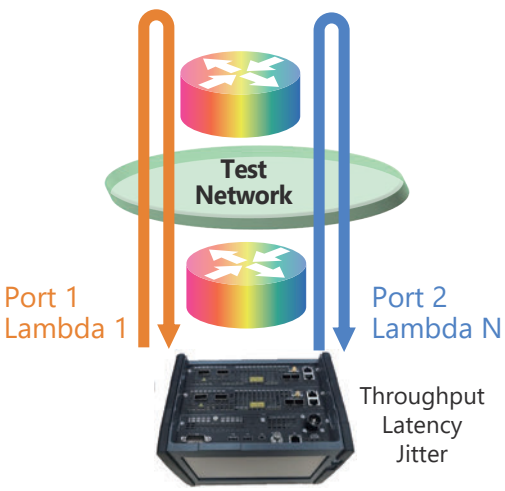
All-in-one, single-screen detailed laboratory network and equipment tests

**Compact 400G Tester**

Battery operation for on-site tests and tests between two sites

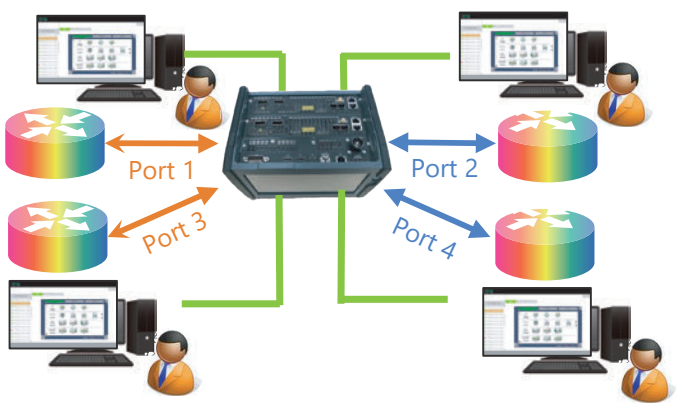
### Mutual Interference Test between Ports

Dual-port measurement comparing the performance between two ports on one screen supports easy interference-free testing.




### Multi User

Maximun four person can use the same MT1040A without restrictions. Each person controls MT1040A from local PC providing effective test tasks.

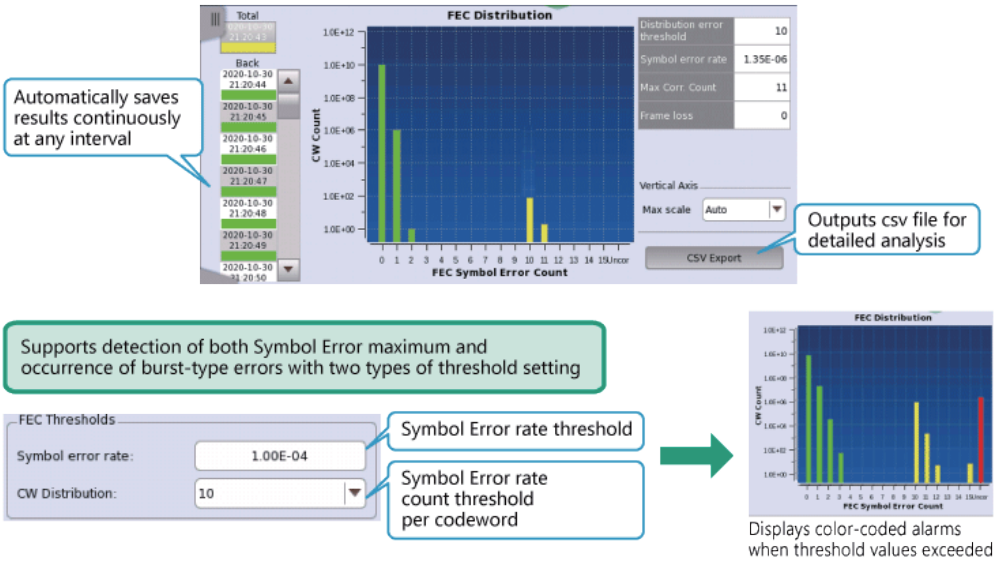


### 400G Ethernet FEC Analysis

Ethernet equipment interfaces use optical modules. With some exceptions, pass/fail verification of optical modules up to 100G is performed simply by measuring the bit error rate (BER) for a fixed period of repeated sending and receiving of signals to confirm the error-free status. Similarly, network throughput and latency are measured using a BERT.
However, the 400G Ethernet PMD layer is switching to PAM4 and FEC (Forward Error Correction) to correct errors occurring at optical transceivers and networks transmitting extremely fast signals, and to assure both communications quality and lower costs. FEC is a technology for correcting errors within the correctable range, and assures high reliability as well as extended transmission distance.

### MT1040A FEC Symbol Error Measurement

The MT1040A supports both visual monitoring and quantitative measurement of FEC Symbol Errors while communicating using Ethernet Frames. In addition, it supports two types of threshold setting and continuous saving of measurement results at any interval for stability evaluation and analysis of correlations with other events.

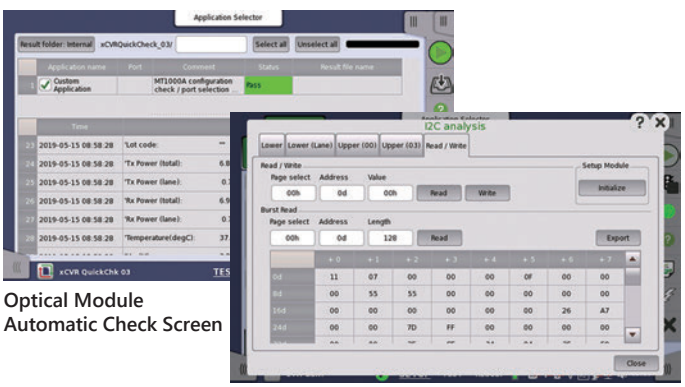



Periodic network monitoring using this function confirms the network load conditions, helping prevent problems.

### Easy Optical Module Tests

The MT1040A includes tools for optimized setting of directly connected optical modules. These tools support easy pass/fail tests of optical modules. Moreover, manual access to the optical module MDIO and I2C functions simplifies optical-module checks.

Optical-Module Check



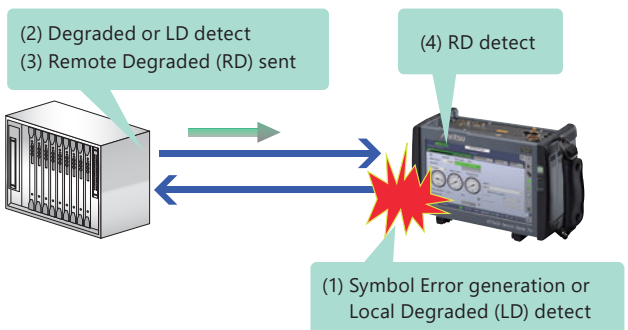

Optical Module Automatic Check Screen

I2C Analysis Screen

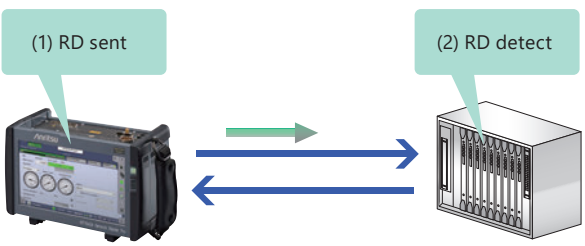
### 400G Degraded SER Function

The following functions are for testing the equipment 400G Degraded SER function.

(1) Degraded SER Alarm (RD/LD) Generation



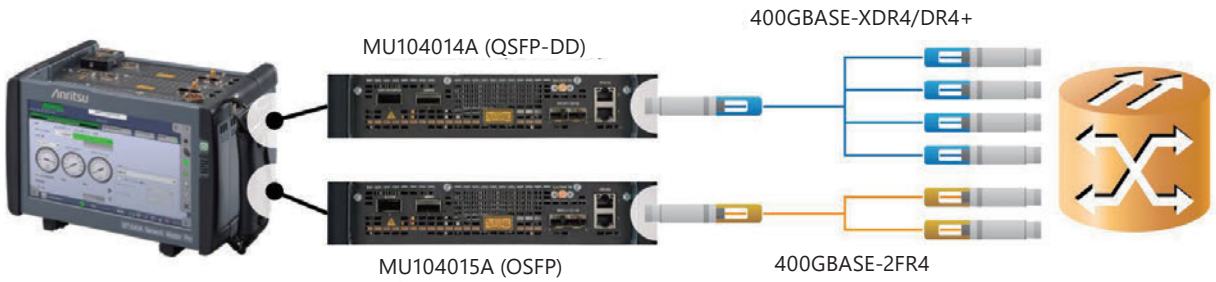

(2) Degraded SER Alarm Emulation

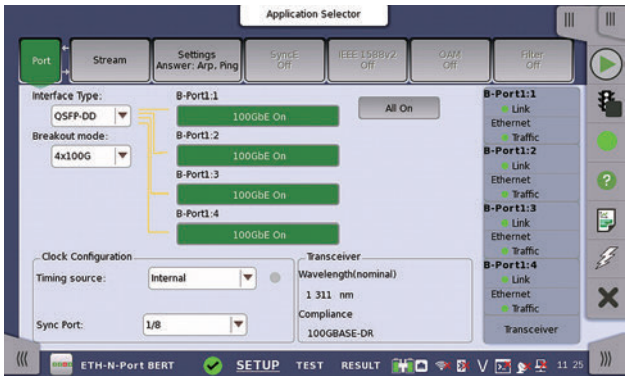


# Transport Application

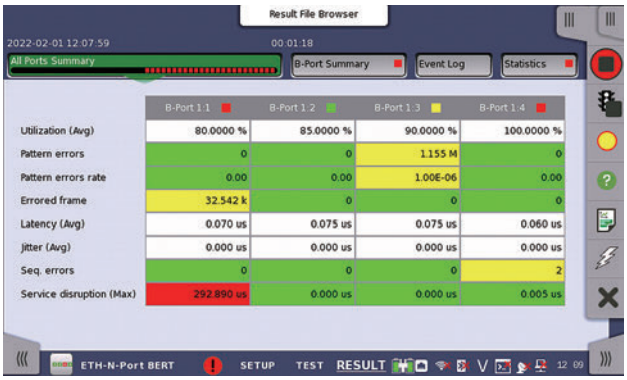
### N Port BERT Measurement

MT1040A supports 400GBASE-XDR4/DR4+ and 400GBASE-2FR4 breakout optical modules, which enable devise and ical module tests. One MT1040A tests two 400GBASE interfaces simultaneously using two installed 400G modules.



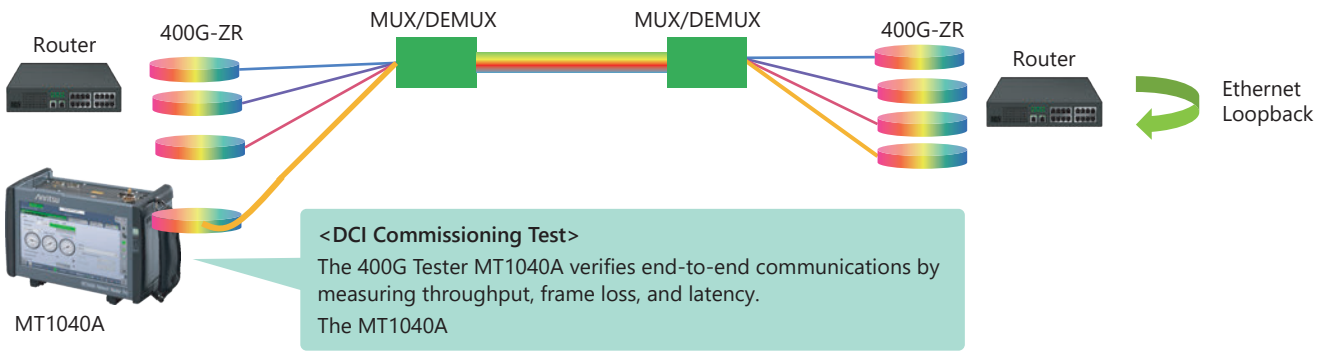

MAC Independent setup screen
VLAN, Q-in-Q, MPLS, IPv4, IPv6, UDP, TCP
Static/dynamic frame size




MAC Independent result screen
Service Disruption Time, Throughput, Latency, Jitter.
IPv4 ping to measure Round Trip Time

### 400GBASE-ZR Support

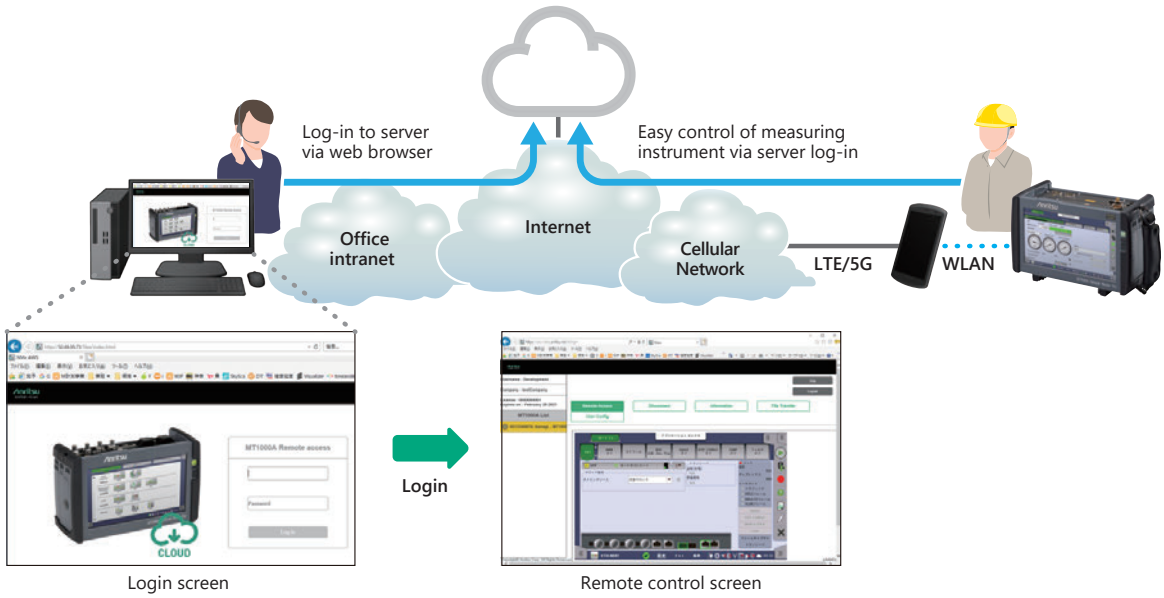
Assuring low-cost optical links between DCs is a key challenge for DC operators and service providers but deployment of 400G-ZR transceivers is one possible solution. With support for optical communications distances of about 100 km, the 400G-ZR multiplex wavelength transmissions using couplers, helping cut infrastructure deployment costs by eliminating the need for transponders between DCs.



# Strong Support for I&M Field Technicians

### Easy Connections Anywhere Using SORA (Site Over Remote Access)*

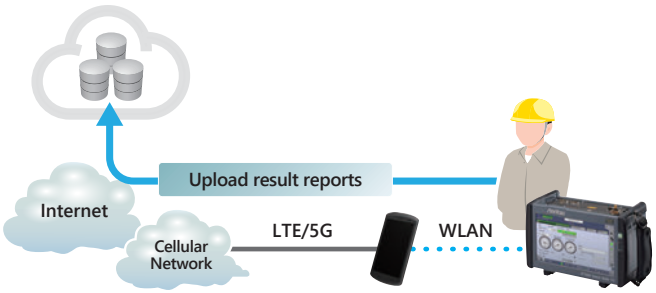
Using the Site Over Remote Access MX109020A (SORA hereafter) software measuring instruments can be remotely controlled easily anywhere.
The SORA cloud-based service allows office users to log-in to an Internet webpage to control the measuring instrument from the office via a smartphone.




Login screen　　Remote control screen

### Uploads Measurement Reports to Cloud Storage

Can upload measurement-result reports to cloud storage via SORA Linking with the SEEK tool for automatic scenario creation facilitates automation of related processes such as settings, measurement start, pass/fail evaluation, measurement results reporting, etc. The connection between the tester and storage uses secure SSH or HTTPS.



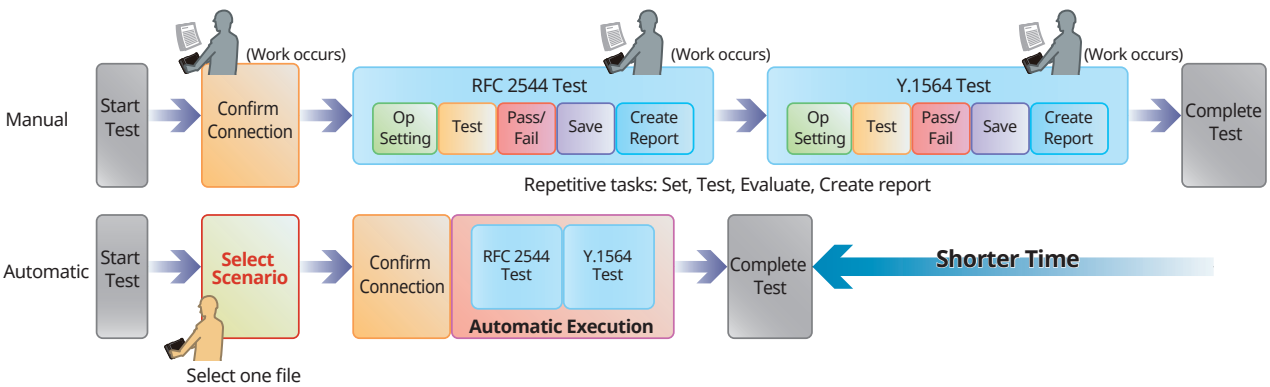

* This service can be used in countries and regions where the MT1040A WLAN/Bluetooth option has been approved. For details, contact Anritsu.
* To connect using SORA, you must purchase an option license for the main unit as well as a subscription license.
  Refer to the MX109020A leaflet and product introduction for more details. You must agree to the service contract before purchasing SORA.
  Refer to the service contract at the following URL: https://www.anritsu.com/en-AU/test-measurement/support/downloads/manuals/dwl20059.

### One Button Testing

The MT1040A has automatic test functions for simple and efficient network commissioning. These MT1040A automated test functions run scenario files created in advance on a PC to perform tests automatically using preset measurement items, procedures, and pass/fail evaluation conditions. Since the scenario also handles report creation, evaluation and results, inexperienced workers can run accurate tests without operation mistakes and re-tests.


Setting Test Equipment: Manual
Executing Test: Manual
Evaluating Results: Based on data

Setting Test Equipment: **Not necessary**
Executing Test: **Not necessary**
Evaluating Results: **Not necessary**



# Network Master Pro MT1040A Mainframe Specifications

| User Interfaces | |
|---|---|
| Display | 9-inch active TFT display (800 × 480 pixels) and touch screen |
| Supported Languages | English, Chinese, Japanese, French, Russian, Spanish, Finnish, Korean, German |

| Service Interfaces | |
|---|---|
| USB Data Interface | MT1040A operates as host: USB 2.0 type A (2 Ports)<br>MT1040A operates as device: USB 2.0 type Mini-B (1 port) |
| Ethernet Interface | Ethernet 10M/100M/1000M, RJ45 Connector: 1 port |
| WLAN Interface*1 | IEEE802.11a/b/g/n (2.4 GHz/5 GHz) |
| Bluetooth Interface*2 | Bluetooth (BT2.1+EDR/3.0/4.2 (BLE)) (File access only) |

*1: Available for certified countries and regions including USA, Japan and EU countries. Please visit the Anritsu web site for updated information.
*2: Although this product has not been approved by Bluetooth SIG, the supported frequencies are in the range assigned to Bluetooth® communications.

| Other Interfaces | |
|---|---|
| AUX Connector | For connection of G0325A GPS receiver |
| Internal Clock | Accuracy: ±4.6 ppm or less, STRATUM3 compliant |
| Ext. Clock Input | For connection of external clock signals:<br>SETS (E1: 2.048 Mbps), BITS (DS1: 1.544 Mbps) or 2.048 MHz TTL signal in accordance with ITU-T G.703, 10 MHz<br>Connector: BNC (50Ω) |

| Miscellaneous | | | |
|---|---|---|---|
| Storage Capacity | | 7 Gbyte | |
| Battery | | 11.25 V rechargeable and replaceable intelligent Li-ion battery × 2<br>Operating time: 1 hours (typ., in case of 400 GbE)<br>Charging time: 9 hours (Max.) (2 pcs)<br>Remaining capacity indication: % | |
| Mains Adapter | | G0418A (MT1040A Standard Accessory) | G0419A (MT1040A-020 Accessory) |
| | | Input: 110 VAC to 240 VAC, 50 Hz/60 Hz<br>Rated output: 19 VDC, 13.2 A max.<br>Power consumption: 250 W max. | Input: 110 VAC to 240 VAC, 50 Hz/60 Hz<br>Rated output 18 VDC, 22.2 A max.<br>Power consumption: 420 W max. |
| Dimensions and Mass | | 262 (W) × 167 (H) × 68 (D) mm (Exclude Projection, MT1040A)<br>262 (W) × 167 (H) × 134 (D) mm (Exclude Projection, MT1040A + MU104014A)<br>262 (W) × 167 (H) × 154 (D) mm (Exclude Projection, MT1040A + MU104014A + MU100020A)<br>262 (W) × 167 (H) × 187 (D) mm (Exclude Projection, MT1040A + MU104014A + MU104014A)<br>≤4.7 kg (including MT1040A, MU104014A and battery)<br>≤5.5 kg (including MT1040A, MU104014A, MU100020A and battery)<br>≤6.5 kg (including MT1040A, MU104014A, MU104014A and battery) | |
| Environmental | | Operating<br>Temperature: 0°C to +50°C, Humidity: ≤85% RH (non-condensing)<br>Charging<br>Temperature: 0°C to +40°C, Humidity: ≤85% RH (non-condensing)<br>Storage<br>Temperature: –30°C to +60°C, Humidity: ≤90% RH (non-condensing, without battery and AC adapter)<br>–20°C to +40°C, Humidity: ≤90% RH (non-condensing, with battery and AC adapter) | |
| CE | EMC | 2014/30/EU, EN61326-1, EN61000-3-2 | |
| | LVD | 2014/35/EU, EN61010-1 | |
| | RoHS | 2011/65/EU, (EU) 2015/863, EN IEC 63000: 2018 | |

MT1040A Interface


MT1040A + MU104014A


MT1040A + MU104014A + MU104015A

# Network Master Pro MT1040A Multirate Module Specifications

| Model | | | 400G (QSFP-DD) Multirate Module MU104014A | 400G (OSFP) Multirate Module MU104015A | 100G Multirate Module MU104011A |
|---|---|---|---|---|---|
| | | |  |  |  |
| Physical Interface | RJ45 Connector | 10/100/1000BASE-T | 2 | 2 | 2 |
| | SFP Slots | SFF-8431, SFF-8472 compliant,<br>IEEE 802.3ae-2002, IEEE802.3-2008 compliant | 2 | 2 | 2 |
| | QSFP Slots | SFF-8436, SFF-8472, SFF-8665 compliant,<br>IEEE 802.3ba-2010 compliant | 1 | 1 | 2 |
| | QSFP-DD/<br>QSFP56 Slots | QSFP-DD Hardware Specification for QSFP Double Density 8X Pluggable Transceiver – Rev 4.0 compliant<br>OIF-CEI-56G-VSR compliant, CMIS - Rev4.0 compliant,<br>OIF-C-CMIS-01.1 compliant | 1 | 0 | 0 |
| | OSFP Slots | Rev2.0: Specification for OSFP Octal Small Form Factor Pluggable Module compliant<br>OIF-CEI-56G-VSR compliant | 0 | 1 | 0 |

Bit Rate*1

| Standard | Bit Rate | Interfaces |
|---|---|---|
| 10BASE-T | 12.5 Mbit/s | RJ45 |
| 100BASE-TX | 125 Mbit/s | RJ45 |
| 1000BASE-T | 1.25 Gbit/s | RJ45 |
| 10GBASE-T | 10.3125 Gbit/s | RJ45 (SFP+) |
| 100BASE-X | 125 Mbit/s | SFP |
| 1000BASE-X | 1.25 Gbit/s | SFP |
| 10GBASE-X | 10.3125 Gbit/s | SFP+ |
| 25 GbE | 25.781250000 Gbit/s × 1 Lane | SFP28 |
| 40 GbE | 10.312500000 Gbit/s × 4 Lane | QSFP+ |
| 100 GbE | 25.781250000 Gbit/s × 4 Lane | QSFP28 |
| 200 GbE | 53.125000000 Gbit/s × 4 Lane (26.5625 Gbd PAM4 × 4 Lane) | QSFP56 |
| 400 GbE | 53.125000000 Gbit/s × 8 Lane (26.5625 GBd PAM4 × 8 Lane) | QSFP-DD |
| 400 GbE | 53.125000000 Gbit/s × 8 Lane (26.5625 GBd PAM4 × 8 Lane) | OSFP |
| OTU1 | 2.666057143 Gbit/s | SFP |
| OTU2 | 10.709225319 Gbit/s | SFP+ |
| OTU1e | 11.049 107143 Gbit/s | SFP+ |
| OTU2e | 11.095727848 Gbit/s | SFP+ |
| OTU1f | 11.270089286 Gbit/s | SFP+ |
| OTU2f | 11.317642405 Gbit/s | SFP+ |
| OTU3e1 | 11.142743644 Gbit/s × 4 Lane | SFP+ |
| OTU3e2 | 11.145838894 Gbit/s × 4 Lane | SFP+ |
| OTU3 | 10.754603390 Gbit/s × 4 Lane | QSFP+ |
| OTU4 | 27.952493392 Gbit/s × 4 Lane | QSFP28 |

| Standard | Bit Rate | Interfaces |
|---|---|---|
| STM-1/OC-3 | 155.52 Mbit/s | SFP |
| STM-4/OC-12 | 622.08 Mbit/s | SFP |
| STM-16/OC-48 | 2488.32 Mbit/s | SFP |
| STM-64/OC-192 | 9953.28 Mbit/s | SFP+ |
| CPRI1 | 614.4 Mbit/s | SFP |
| CPRI2 | 1228.8 Mbit/s | SFP |
| CPRI3 | 2457.6 Mbit/s | SFP |
| CPRI4 | 3072.0 Mbit/s | SFP |
| CPRI5 | 4915.2 Mbit/s | SFP+ |
| CPRI6 | 6144.0 Mbit/s | SFP+ |
| CPRI7 | 9830.4 Mbit/s | SFP+ |
| CPRI8 | 10137.6 Mbit/s | SFP+ |
| CPRI9 | 12165.12 Mbit/s | SFP+ |
| CPRI10 | 24330.24 Mbit/s | SFP28 |
| OBSAI 1x | 768 Mbit/s | SFP |
| OBSAI 2x | 1536 Mbit/s | SFP |
| OBSAI 4x | 3072 Mbit/s | SFP |
| OBSAI 8x | 6144 Mbit/s | SFP+ |
| 1GFC | 1.0625 Gbit/s | SFP |
| 2GFC | 2.125 Gbit/s | SFP |
| 4GFC | 4.25 Gbit/s | SFP |
| 8GFC | 8.5 Gbit/s | SFP |
| 10GFC | 10.51875 Gbit/s | SFP+ |
| 16GFC | 14.025 Gbit/s | SFP+ |

| Miscellaneous | | |
|---|---|---|
| LED (RJ45) | | Yellow: Link, Green: Activity (Blink) |
| Variable Frequency | | According to bit rate<br>–200 ppm to +200 ppm, 0.1 ppm step (operation not assured if optical module specifications exceeded) |
| Sync Clock | | Connector: SMA Female<br>Port 1 only: Divided Clock output synchronized to QSFP-DD/OSFP/QSFP28/SFP28 Tx Data<br>1/8 or 1/16 Clock according to bit rate (Examples: 200 GbE/400 GbE: 3.22265 GHz @ 1/8 Clock; 1.61133 GHz @ 1/16 Clock)<br>Min - Max: 350 mVp-p to 900 mVp-p<br>50Ω/AC (Single ended) |
| Laser Safety*2 | | IEC 60825-1: 2007 Class 1M<br>QSFP28: 100GBASE-SR4 / QSFP+: 40GBASE-SR4<br>SFP28: 25GBASE-SR<br>IEC 60825-1: 2007 Class 1<br>QSFP-DD: 400GBASE-LR4/DR4/FR4/DR4+ / OSFP: 400GBASE-FR4/DR4/2FR4<br>QSFP56: 200GBASE-LR4/FR4 / QSFP28: 100GBASE-LR4/DR/FR1<br>QSFP+: 40GBASE-LR4 / SFP28: 25GBASE-LR<br>SFP+: 10GBASE-LR/ER/ZR<br>SFP: 4G FC (SX), 4G FC (LX), 4G FC (EX)<br>OC-48 LR-1/STM L-16.1, OC-48 LR-2/STM L-16.2<br>100BASE-FX/LX, 1000BASE-SX/LX/ZX<br>FDA 21CFR1040.10 and 1040.11*3<br>21 CFR1040.10 Excludes deviations caused by conformance to Laser Notice No. 50 dated June 24, 2007 |
| Dimensions and Mass | | 261.6 (W) × 164 (H) × 52.8 (D) mm max. (excluding projections)<br>2.0 kg max. (without optical modules) |
| Environmental | | Operating: 0°C to +40°C, ≤85% RH (non-condensing)<br>Storage: –30°C to +60°C, ≤90% RH (non-condensing) |
| CE | EMC | 2014/30/EU, EN61326-1, EN61000-3-2 |
| | LVD | 2014/35/EU, EN61010-1 |
| | RoHS | 2011/65/EU, (EU) 2015/863, EN IEC 63000: 2018 |

*1: The frequency accuracy depends on the accuracy of the MT1040A internal clock or the external clock of MT1040A.
Refer to the external interfaces in MT1040A specifications.

*2: Safety measures for laser products
This product complies with optical safety standards in 21CFR1040.10, 1040.11 and IEC 60825-1; the following descriptive labels are affixed to the product.

*3: Excludes deviations caused by conformance to Laser Notice No. 50 dated June 24, 2007


# Ordering Information

Please specify the model/order number, name and quantity when ordering.
The names listed in the table below are Order Names. The actual name of the item may differ from the Order Name.

### MT1040A Mainframe

| Model/Order No. | Name | |
|---|---|---|
| MT1040A | Network Master Pro | |
| **Standard Accessories** | | |
| MT1040A-006 | High Power Supply*1: | 1 pc |
| | Line Cord*2: | 1 pc |
| B0745A | Softcase: | 1 pc |
| B0771A*3 | MT1040A Rear Panel kit: | 1 pc |
| G0418A | AC Adaptor: | 1 pc |
| G0423A | Two LiION Batteries: | 1 pc |
| W4039AE | Quick Reference Guide: | 1 pc |
| Z1746A | Stylus: | 1 pc |
| Z2077A | Utilities ROM: | 1 pc |
| Z2082A | Handle: | 1 pc |

### Software Options*4

| Model/Order No. | Name |
|---|---|
| MT1040A-003*5 | Connectivity for WLAN/Bluetooth |
| MT1040A-011 | Site Over Remote Access Connect |

### Option for Two Transport Modules*6

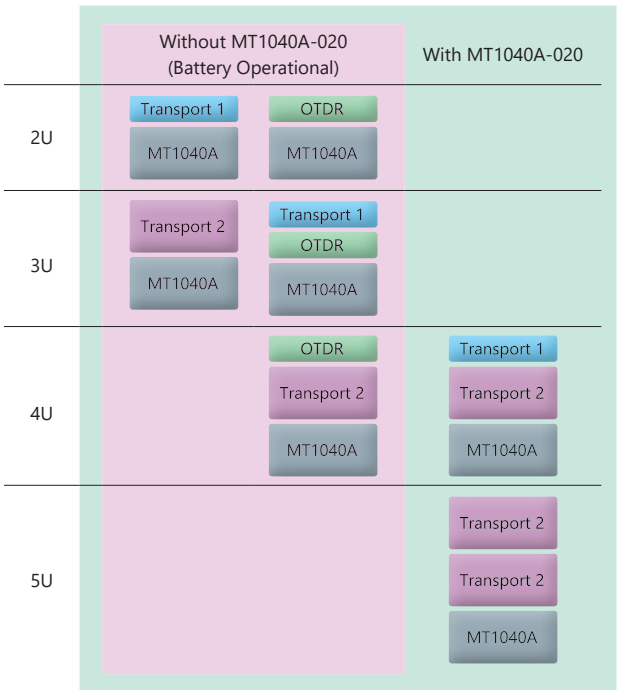
| Model/Order No. | Name |
|---|---|
| MT1040A-020 | Activate for 400G Dual/100G Quad Option |
| **Standard Accessories** | |
| G0419A | AC Adapter (400 W) |

*1: The presence of the MT1040A-006 option can be recognized at the top right of the front panel. To retrofit to the already shipped item, please contact us.


Without MT1040A-006 With in MT1040A-006

*2: One line cord is attached to the area to shipment.
*3: Composed of B0720A, B0730A, B0731A, B740A and B0741A.
*4: These options can be retrofitted. The Model/Order No. of retrofit options is "-3**".
Example
MT1040A-003 Connectivity for WLAN/Bluetooth becomes MT1040A-303 Connectivity for WLAN/Bluetooth Retrofit.
When retrofitting an option, please either specify one of the following media along with the relevant option, or Web download.
Z1849A: DVD-ROM for Retrofit Options
Z1850A: USB Stick for Retrofit Options
*5: WLAN is available for certified countries and regions including USA, Japan and EU countries. Please visit the Anritsu web site for updated information.
*6: Can be added to main unit in which MT1040A-006 already installed. However, battery operation is not possible when using two transponder modules together.

Depending on module combination, it is necessary to order MT1040A-020 Activate for 400G Dual/100G Quad Option.




Transport 2
400G (QSFP-DD) Multirate Module MU104014A
400G (OSFP) Multirate Module MU104015A
100G Multirate Module MU104011A

Transport 1
10G Multirate Module MU100010A
100G Multirate Module MU100011A

OTDR
1310/1550 nm SMF MU100020A
1310/1550/850/1300 nm SMF/MMF MU100021A
1310/1550/1625 nm SMF MU100022A
1310/1550/1650 nm SMF MU100023A

# Ordering Information

### Optional Accessories*7

| Model/Order No. | Name |
|---|---|
| **Operation Manuals** | |
| W4038AE | MT1040A Transport Module Operation Manual |
| Z1821A*8 | Utilities in USB Stick |
| **Mechanical Parts and Cases** | |
| B0720A | Rear Panel |
| B0730A | Screw 2U |
| B0731A | Screw 3U |
| B0740A | Screw 4U |
| B0741A | Screw 5U |
| B0769A*9 | Screw Kit for MT1040A |
| B0772A*10 | Soft Case 5U |
| B0733A | Hard Case |
| B0773A*10 | Hard Case 5U |
| **Cables** | |
| J1571A | Optical Cable SM LC/PC-SC/PC 3 m |
| J1575A | Optical Cable SM LC/PC-FC/PC 3 m |
| J1579A | Optical Cable SM LC/PC-LC/PC 3 m |
| J1581A | Optical Cable MM LC/PC-LC/PC 3 m |
| J1583A | Optical Attenuator 10 dB LC/PC-LC/PC |
| J1584A | RJ45 Cable 3 m |
| J1585A*11 | RJ48 to Crocodile Clips Cable 3 m |
| J1586A*11 | RJ48 to Crocodile Clips Cable 20 dB ATT 3 m |
| J1588A*12 | BNC Cable 2.5 m |
| J1589A*12 | BNC to 1.6/5.6 Cable 2.5 m |
| J1591A*11 | RJ48 to Two 3-pin Banana Plug Cable 2.5 m |
| J1597A*11 | RJ48 Balanced PDH Cable Crossed 3 m |
| J1598A*13 | Bantam Cable 3 m |
| **Application Parts** | |
| G0306B*14 | Video Inspection Probe |
| G0324A | Battery Charger |
| G0325A | GPS Receiver |
| G0382A*14 | Autofocus Video Inspection Probe |

*7: Optional Accessories cannot be repaired.
*8: Include MT1040A Operation Manual and the Remote Script Manual.
*9: Composed of B0730A, B0731A, B740A and B0741A.
*10: Refer to page 18 for dimensions and external view.
*11: E1 interface cable.
*12: E1, E3, E4, DS3, STM-1e, STS-3 interface cable. Impedance: 75Ω
*13: DS1 interface cable.
*14: This fiberscope uses the VIP function in the MT1040A Utility menu.
Different tip types are used by the G0382A and G0306B.

G0382A

G0306B

### 400G (QSFP-DD) Multirate Module MU104014A

| Model/Order No. | Name | |
|---|---|---|
| MU104014A | 400G (QSFP-DD) Multirate Module | |
| **Standard Accessories** | | |
| B0768A*15 | ESD Box: | 1 pc |
| W4039AE*16 | Transport Module Quick Reference Guide: | 1 pc |

### Protocol Options*4

| Model/Order No. | Name |
|---|---|
| **Ethernet/eCPRI/RoE** | |
| MU104014A-012 | Ethernet up to 25G Dual Channel |
| MU104014A-013 | Ethernet 40G Single Channel |
| MU104014A-014 | Ethernet 40G Dual Channel |
| MU104014A-015 | Ethernet 100G Single Channel |
| MU104014A-016 | Ethernet 100G Dual Channel |
| MU104014A-020*17 | TCP Throughput |
| MU104014A-031 | Ethernet 200G Single Channel |
| MU104014A-033 | Ethernet 400G Single Channel |
| MU104014A-034 | Ethernet 4×100G N Port BERT |
| **OTN** | |
| MU104014A-052 | OTN up to 10G Dual Channel |
| MU104014A-053 | OTN 40G Single Channel |
| MU104014A-054 | OTN 40G Dual Channel |
| MU104014A-055 | OTN 100G Single Channel |
| MU104014A-056 | OTN 100G Dual Channel |
| MU104014A-063*18 | ODU Multiplexing/Multi Stage |
| **CPRI/OBSAI** | |
| MU104014A-074 | CPRI/OBSAI up to 25G Dual Channel |
| **SDH/SONET** | |
| MU104014A-082 | SDH/SONET up to 10G Dual Channel |
| MU104014A-084*19 | STM-256/OC-768 Client Signal |
| **Fibre Channel** | |
| MU104014A-092 | FC up to 16G Dual Channel |

*15: The following combination of module patterns can be installed.

| | QSFP-DD/QSFP56/QSFP28/QSFP+ | SFP28/SFP+/SFP | OSFP |
|---|---|---|---|
| Pattern 1 | 4 | 0 | 1 |
| Pattern 2 | 3 | 2 | 1 |
| Pattern 3 | 2 | 4 | 1 |
| Pattern 4 | 1 | 6 | 1 |

*16: Accessory only when purchasing MU104014A main unit.
*17: Requires to MU104014A-012.
*18: Requires that at least one of the following option is installed:
MU104014A-052, MU104014A-053, MU104014A-054, MU104014A-055, MU104014A-056
*19: MU104014A does not have a physical interface of the option.
The option is required for client signal mapped in the OTN.

# Ordering Information

### 400G (OSFP) Multirate Module MU104015A

| Model/Order No. | Name | |
|---|---|---|
| MU104015A | 400G (OSFP) Multirate Module | |
| **Standard Accessories** | | |
| B0768A*15 | ESD Box: | 1 pc |
| W4039AE*16 | Transport Module Quick Reference Guide: | 1 pc |

**Protocol Options*4**

| Model/Order No. | Name |
|---|---|
| **Ethernet/eCPRI/RoE** | |
| MU104015A-012 | Ethernet up to 25G Dual Channel |
| MU104015A-013 | Ethernet 40G Single Channel |
| MU104015A-015 | Ethernet 100G Single Channel |
| MU104015A-020*20 | TCP Throughput |
| MU104015A-033 | Ethernet 400G Single Channel |
| MU104015A-035 | Ethernet 2×200G N Port BERT |
| **OTN** | |
| MU104015A-052 | OTN up to 10G Dual Channel |
| MU104015A-053 | OTN 40G Single Channel |
| MU104015A-055 | OTN 100G Single Channel |
| MU104015A-063*21 | ODU Multiplexing/Multi Stage |
| **CPRI/OBSAI** | |
| MU104015A-074 | CPRI/OBSAI up to 25G Dual Channel |
| **SDH/SONET** | |
| MU104015A-082 | SDH/SONET up to 10G Dual Channel |
| MU104015A-084*22 | STM-256/OC-768 Client Signal |
| **Fibre Channel** | |
| MU104015A-092 | FC up to 16G Dual Channel |

*20: Requires to MU104015A-012.
*21: Requires that at least one of the following option is installed:
MU104015A-052, MU104015A-053, MU104015A-055
*22: MU104015A does not have a physical interface of the option.
The option is required for client signal mapped in the OTN.

### 100G Multirate Module MU104011A

| Model/Order No. | Name | |
|---|---|---|
| MU104011A | 100G Multirate Module | |
| **Standard Accessories** | | |
| B0768A*15 | ESD Box: | 1 pc |
| W4039AE*16 | Transport Module Quick Reference Guide: | 1 pc |

**Protocol Options*4**

| Model/Order No. | Name |
|---|---|
| **Ethernet/eCPRI/RoE** | |
| MU104011A-012 | Ethernet up to 25G Dual Channel |
| MU104011A-013 | Ethernet 40G Single Channel |
| MU104011A-014 | Ethernet 40G Dual Channel |
| MU104011A-015 | Ethernet 100G Single Channel |
| MU104011A-016 | Ethernet 100G Dual Channel |
| MU104011A-020*23 | TCP Throughput |
| **OTN** | |
| MU104011A-052 | OTN up to 10G Dual Channel |
| MU104011A-053 | OTN 40G Single Channel |
| MU104011A-054 | OTN 40G Dual Channel |
| MU104011A-055 | OTN 100G Single Channel |
| MU104011A-056 | OTN 100G Dual Channel |
| MU104011A-063*24 | ODU Multiplexing/Multi Stage |
| **CPRI/OBSAI** | |
| MU104011A-074 | CPRI/OBSAI up to 25G Dual Channel |
| **SDH/SONET** | |
| MU104011A-082 | SDH/SONET up to 10G Dual Channel |
| MU104011A-084*25 | STM-256/OC-768 Client Signal |
| **Fibre Channel** | |
| MU104011A-092 | FC up to 16G Dual Channel |

*23: Requires to MU104011A-012.
*24: Requires that at least one of the following option is installed:
MU104011A-052, MU104011A-053, MU104011A-054, MU104011A-055, MU104011A-056
*25: MU104011A does not have a physical interface of the option.
The option is required for client signal mapped in the OTN.

# Ordering Information

### 10G Multirate Module MU100010A

| Model/Order No. | Name |
|---|---|
| MU100010A | 10G Multirate Module |
| **Standard accessories** | |
| W3935AE | MT1000A Transport Module Quick Reference Guide: 1 pc |
| B0692A*1 | ESD Box (for optical modules) |

*1: Up to four SFP+/SFPs can be stored.

Module Options*2

| Model/Order No. | Name |
|---|---|
| **Low Rate** | |
| MU100010A-001*3 | Up to 2.7G Dual Channel |
| **Ethernet** | |
| MU100010A-011 | Ethernet 10G Single Channel |
| MU100010A-012 | Ethernet 10G Dual Channel |
| MU100010A-020*4 | TCP Throughput |
| **OTN** | |
| MU100010A-051 | OTN 10G Single Channel |
| MU100010A-052 | OTN 10G Dual Channel |
| MU100010A-061*5 | ODU Multiplexing |
| MU100010A-062*5 | ODU Flex |
| **CPRI/OBSAI** | |
| MU100010A-071 | CPRI/OBSAI Up to 5G Dual Channel |
| MU100010A-072 | CPRI/OBSAI 6G to 10G Single Channel |
| MU100010A-073 | CPRI/OBSAI 6G to 10G Dual Channel |
| **Fibre Channel** | |
| MU100010A-002 | FC 1G 2G 4G Dual Channel |
| MU100010A-091 | FC 8G 10G Single Channel |
| MU100010A-092 | FC 8G 10G Dual Channel |
| **SDH/SONET** | |
| MU100010A-081 | STM-64 OC-192 Single Channel |
| MU100010A-082 | STM-64 OC-192 Dual Channel |

*2: These options can be retrofitted.
The Model/Order No. of retrofit options is "-3**".
Example
MU100010A-001 Up to 2.7G Dual Channel becomes MU100010A-301 Up to 2.7G Dual Channel Retrofit.
In addition, specify one of the following media along with the required option.
Z1849A: DVD-ROM for Retrofit Options
Z1850A: USB Stick for Retrofit Options

*3: Includes OTN (OTU1), Ethernet (10 Mbps, 100 Mbps, 1 Gbps), SDH up to STM-16, SONET up to OC-48, PDH (E1, E3, E4), and DSn (DS1, DS3)

*4: Requires that at least one of the following options is installed:
MU100010A-001, MU100010A-011, MU100010A-012

*5: Requires that at least one of the following options is installed:
MU100010A-001, MU100010A-051, MU100010A-052

### 100G Multirate Module MU100011A

| Model/Order No. | Name |
|---|---|
| MU100011A*1 | 100G Multirate Module |
| **Standard accessories** | |
| W3935AE | MT1000A Transport Module Quick Reference Guide: 1 pc |
| B0763A*2 | ESD Box (for Optical modules): 1 pc |

*1: MT1000A-006 is required for MU100011A.

*2: One CFP4 plus either up to two QSFP28s or up to four SFP/SFP+s can be stored.

Module Options*3

| Model/Order No. | Name |
|---|---|
| **Standard** | |
| MU100011A-001*4 | Up to 10G Single Channel |
| MU100011A-003*4 | Up to 10G Dual Channel |
| **Ethernet** | |
| MU100011A-013*5 | Ethernet 40G Single Channel |
| MU100011A-015*5 | Ethernet 100G Single Channel |
| MU100011A-017*6 | Ethernet 25G Single Channel |
| MU100011A-020*7 | TCP Throughput |
| MU100011A-021*8 | SyncE Wander |
| MU100011A-023*9 | RS-FEC for 100GBASE-SR4 |
| **OTN** | |
| MU100011A-053 | OTN 40G Single Channel |
| MU100011A-055 | OTN 100G Single Channel |
| MU100011A-062*10 | ODU Flex |
| MU100011A-063*10 | ODU Multiplexing/Multi Stage |
| **Fibre Channel** | |
| MU100011A-004 | Up to 10G FC Single Channel |
| MU100011A-005 | Up to 10G FC Dual Channel |
| MU100011A-091 | FC 16G Single Channel |
| **eCPRI/RoE/CPRI/OBSAI** | |
| MU100011A-071 | CPRI/OBSAI Up to 10G Single Channel |
| MU100011A-072 | CPRI/OBSAI Up to 10G Dual Channel |
| MU100011A-073 | CPRI 12/25G Single Channel |
| MU100011A-074 | CPRI 12/25G Dual Channel |
| MU100011A-075*6 | eCPRI/RoE 25G Dual Channel |
| **SDH/SONET** | |
| MU100011A-083*11 | STM-256/OC-768 Client Signal |

*3: These options can be retrofitted.
The Model/Order No. of retrofit options is "-3**".
Example
MU100011A-001 Up to 2.7G Dual Channel becomes MU100011A-301 Up to 2.7G Dual Channel Retrofit.
In addition, specify one of the following media along with the required option.
Z1849A: DVD-ROM for Retrofit Options
Z1850A: USB Stick for Retrofit Options

*4: Only one of these option can be installed.
Included OTN(OTU1, OTU1e, OTU1f, OTU2, OTU2e, OTU2f), Ethernet up to 10 Gbps, SDH up to STM-64 and SONET up to OC-192.

*5: FEC is always Off.

*6: FEC selectable On/Off.

*7: Requires that at least one of the following option is installed:
MU100011A-001, MU100011A-003

*8: In addition to the MT1000A-005, at least one of the following options is required: MU100011A-001, MU100011A-003, MU100011A-017

*9: Requires to MU100011A-015

*10: Requires that at least one of the following option is installed:
MU100011A-001, MU100011A-003, MU100011A-053, MU100011A-055

*11: MU100011A does not have a physical interface of the option.
In combination with MU100011A-053, can be used as a client signal by OTN.

### Maintenance Service*

| Model/Order No. | Name |
|---|---|
| MT1040A-ES210 | 2 Years Extended Warranty Service |
| MT1040A-ES310 | 3 Years Extended Warranty Service |
| MT1040A-ES510 | 5 Years Extended Warranty Service |
| MU104014A-ES210 | 2 Years Extended Warranty Service |
| MU104014A-ES310 | 3 Years Extended Warranty Service |
| MU104014A-ES510 | 5 Years Extended Warranty Service |
| MU104015A-ES210 | 2 Years Extended Warranty Service |
| MU104015A-ES310 | 3 Years Extended Warranty Service |
| MU104015A-ES510 | 5 Years Extended Warranty Service |

| Model/Order No. | Name |
|---|---|
| MU104011A-ES210 | 2 Years Extended Warranty Service |
| MU104011A-ES310 | 3 Years Extended Warranty Service |
| MU104011A-ES510 | 5 Years Extended Warranty Service |
| MU100010A-ES210 | 2 Years Extended Warranty Service |
| MU100010A-ES310 | 3 Years Extended Warranty Service |
| MU100010A-ES510 | 5 Years Extended Warranty Service |
| MU100011A-ES210 | 2 Years Extended Warranty Service |
| MU100011A-ES310 | 3 Years Extended Warranty Service |
| MU100011A-ES510 | 5 Years Extended Warranty Service |

*: Available for new purchases only.

# Ordering Information

## Optical Transceivers Specification

When using any of the MT1040A/MU104014A/MU104015A/MU104011A modules for testing optical interfaces, perform the test by installing the optical modules matching the test standards in the QSFP-DD/OSFP/QSFP28/SFP/SFP+/SFP28 slots. The following table lists the modules and supported standards.

| MU104014A | MU104015A | MU104011A | MU100010A | MU100011A | Model/ Order No. | Name | Form Factor | 100M Ethernet | 156M STM-1 | 614M CPRI | 622M STM-4 | 768M OBSAI | 1GFC | 1.23G CPRI | 1.25G Ethernet | 1.54G OBSAI | 2GFC | 2.46G CPRI | 2.488G STM-16 | 2.67G OTU1 | 3.07G CPRI OBSAI | 4GFC | 4.92G CPRI | 6.14G CPRI OBSAI | 8GFC | 9.83G CPRI | 9.95G STM-64 | 10.1G CPRI | 10.3G Ethernet | 10GFC | 10.7G OTU2 | 11.05G OTU1e | 11.09G OTU2e | 11.27G OTU1f | 11.3G OTU2f | 16GFC | 25G Ethernet | 40G Ethernet | 40G OTN | 100G Ethernet | 100G OTN | 200G Ethernet | 400G Ethernet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ | ✓ | ✓ | ✓ | ✓ | G0332A | 100M FX 1310 nm MM SFP | SFP | 1310 nm, MM, 2 km | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0319A | Up to 2.7G 1310 nm 15 km SFP | SFP | | 1310 nm, SM, 15 km | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0320A | Up to 2.7G 1310 nm 40 km SFP | SFP | | 1310 nm, SM, 40 km | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0321A | Up to 2.7G 1550 nm 80 km SFP | SFP | | 1550 nm, SM, 80 km | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0328A | 1G/2G/4G FC 850 nm SFP | SFP | | | | | | 850 nm, MM, 0.5 km | | | | | | | | | 4GFC | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0322A | 1G/2G/4G FC 1310 nm SFP | SFP | | | | | | 1310 nm, SM, 10 km | | | | | | | | | 4GFC | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0323A | 1G/2G/4G FC 1550 nm SFP | SFP | | | | | | 1550 nm, SM, 40 km | | | | | | | | | 4GFC | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0315A | 10G LR/LW 1310 nm SFP+ | SFP+ | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0316A | 10G ER/EW 1550 nm 40 km SFP+ | SFP+ | | | | | | | | | | | | | | | | | | 1550 nm, SM, 40 km | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0318A | 10G ZR/ZW 1550 nm 80 km SFP+ | SFP+ | | | | | | | | | | | | | | | | | | 1550 nm, SM, 80 km | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0329A | 10G LR 1310 nm SFP+ | SFP+ | | | | | | | | 1310 nm, SM, 10 km | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | ✓ | G0356A | 8G FC/10G SR 850 nm SFP+ | SFP+ | | | | | | | | | | | | | | | | | | 850 nm, MM, 0.3 km | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | ✓ | G0386A | 16GFC SR 850 nm SFP+ | SFP+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 850 nm, MM, 0.5 km | | | | | | | |
| ✓ | ✓ | ✓ | | ✓ | G0387A | 16GFC LR 1310 nm SFP+ | SFP+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km | | | | | | | |
| ✓ | ✓ | ✓ | | ✓ | G0388A | 25G SR 850 nm SFP28 | SFP28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 850 nm, MM, 0.5 km | | | | | | |
| ✓ | ✓ | ✓ | | ✓ | G0389A | 25G LR 1310 nm SFP28 | SFP28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km | | | | | | |
| ✓ | ✓ | ✓ | | ✓ | G0359A | 40G SR4 850 nm QSFP+ | QSFP+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 850 nm, MM, 0.1 km | | | | | |
| ✓ | ✓ | ✓ | | ✓ | G0334A | 40G LR4 1310 nm QSFP+ | QSFP+ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km | | | | | |
| ✓ | ✓ | ✓ | | ✓ | G0366A | 100G SR4 850 nm QSFP28 | QSFP28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 850 nm, MM, 0.1 km | | | |
| ✓ | ✓ | ✓ | | ✓ | G0364A | 100G LR4 1310 nm QSFP28 | QSFP28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km | | | |
| ✓ | ✓ | ✓ | | ✓ | G0365A | 100G LR4 Dual Rate 1310 nm QSFP28 | QSFP28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km | | | |
| ✓ | ✓ | ✓ | | ✓ | G0426A | QSFP28 100GBASE-DR | QSFP28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 0.5 km | | | |
| ✓ | ✓ | ✓ | | ✓ | G0427A | QSFP28 100GBASE-FR1 | QSFP28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 2 km | | | |
| ✓ | | | | | G0421A | QSFP56 200GBASE-LR4 | QSFP56 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km | | |
| ✓ | | | | | G0420A | QSFP56 200GBASE-FR4 | QSFP56 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 2 km | | |
| ✓ | | | | | G0402A | QSFP-DD 400GBASE-DR4 | QSFP-DD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 0.5 km |
| ✓ | | | | | G0403A | QSFP-DD 400GBASE-FR4 | QSFP-DD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 2 km |
| ✓ | | | | | G0404A | QSFP-DD 400GBASE-LR4 | QSFP-DD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 10 km |
| | ✓ | | | | G0405A | OSFP 400GBASE-DR4 | OSFP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 0.5 km |
| | ✓ | | | | G0406A | OSFP 400GBASE-FR4 | OSFP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 2 km |
| | ✓ | | | | G0425A | QSFP 400GBASE-2FR4 | OSFP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 2 km |
| ✓ | | | | | G0428A | QSFP-DD 400GBASE-DR4+ | QSFP-DD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1310 nm, SM, 0.5 km |

# Ordering Information

## OTDR Module MU100020A/MU100021A/MU100022A/MU100023A

| Model Name | OTDR Module 1310/1550 nm SMF MU100020A | | OTDR Module 1310/1550/850/1300 nm SMF/MMF MU100021A | |
|---|---|---|---|---|
| Wavelength Model |  | |  | |
| Standard Accessories | J1693A Universal Connector 2.5 mm for OPM<br>J1694A Universal Connector 1.25 mm for OPM<br>W3811AE Quick Reference Guide | | | |
| Dynamic Range*1 | MU100020A-020 Standard Dynamic Range (1310/1550 nm: 39/37.5 dB)<br>MU100020A-021 Enhanced Dynamic Range(1310/1550 nm: 42/41 dB)<br>MU100020A-022 High-Performance Dynamic Range (1310/1550 nm: 46/46 dB) | | MU100021A-021 Enhanced Dynamic Range (1310/1550/850/1300 nm: 42/41/29/28 dB) | |
| Connector Polish*1 | MU100020A-010 UPC Polish | MU100020A-011*2 APC Polish | MU100021A-010 UPC Polish | MU100021A-011*2 APC Polish |
| Connector Type*3 | MU100020A-037 FC Connector<br>MU100020A-039 DIN 47256 Connector<br>MU100020A-040 SC Connector | MU100020A-025 FC Connector key width 2.0 mm<br>MU100020A-026 SC Connector | MU100021A-037*4 FC Connector<br>MU100021A-039*4 DIN 47256 Connector<br>MU100021A-040*4 SC Connector | MU100021A-025*5 FC Connector key width 2.0 mm<br>MU100021A-026*6 SC Connector |
| VFL*1 | MU100020A-002*7 Visual Fault Locator | | MU100021A-002*7 Visual Fault Locator | |
| Maintenance Service | MU100020A-ES210 2 Years Extended Warranty Service<br>MU100020A-ES310 3 Years Extended Warranty Service<br>MU100020A-ES510 5 Years Extended Warranty Service | | MU100021A-ES210 2 Years Extended Warranty Service<br>MU100021A-ES310 3 Years Extended Warranty Service<br>MU100021A-ES510 5 Years Extended Warranty Service | |

| Model Name | OTDR Module 1310/1550/1625 nm SMF MU100022A | | OTDR Module 1310/1550/1650 nm SMF MU100023A | |
|---|---|---|---|---|
| Wavelength Model |  | |  | |
| Standard Accessories | J1693A Universal Connector 2.5 mm for OPM<br>J1694A Universal Connector 1.25 mm for OPM<br>W3811AE Quick Reference Guide | | | |
| Dynamic Range*1 | MU100022A-022 High-Performance Dynamic Range (1310/1550/1625 nm: 46/46/44 dB) | | MU100023A-021 Enhanced Dynamic Range (1310/1550 nm, 1650 nm: 42/41 dB, 35 dB) | |
| Connector Tip Polish*1 | MU100022A-010 UPC Polish | MU100022A-011*2 APC Polish | MU100023A-010 UPC Polish | MU100023A-011*2 APC Polish |
| Connector Types*3 | MU100022A-037 FC Connector<br>MU100022A-039 DIN 47256 Connector<br>MU100022A-040 SC Connector | MU100022A-025 FC Connector key width 2.0 mm<br>MU100022A-026 SC Connector | MU100023A-037 FC Connector<br>MU100023A-039 DIN 47256 Connector<br>MU100023A-040 SC Connector | MU100023A-025 FC Connector key width 2.0 mm<br>MU100023A-026 SC Connector |
| Visual Fault Locator*1 | MU100022A-002*7 Visual Fault Locator | | MU100023A-002*7 Visual Fault Locator | |
| Maintenance Service | MU100022A-ES210 2 Years Extended Warranty Service<br>MU100022A-ES310 3 Years Extended Warranty Service<br>MU100022A-ES510 5 Years Extended Warranty Service | | MU100023A-ES210 2 Years Extended Warranty Service<br>MU100023A-ES310 3 Years Extended Warranty Service<br>MU100023A-ES510 5 Years Extended Warranty Service | |

*1: Factory installed option only and cannot be retrofitted.
*2: An APC connector cannot be specified for the MM port, which uses a UPC connector.
*3: One specified connector adapter supplied free of charge.
*4: One each of same connector adapter for SM port and MM port supplied free of charge. Cannot specify different connector adapters for each port.
*5: One connector adapter for SM port supplied free of charge. One connector adapter equivalent to Option 37 (FC/UPC) for MM port supplied free of charge.
*6: One specified connector adapter for SM port supplied free of charge. One connector adapter equivalent to Option 40 (SC/UPC) for MM port supplied free of charge.
*7: With built-in dedicated port for 2.5 mm universal optical Rx type visible light source; J1335A required to connect 1.25 mm fiber.

### Replacement Adapters

| Model/Order No. | MU100020A<br>MU100022A<br>MU100023A*8 | MU100021A | |
|---|---|---|---|
| **For UPC Polish** | | | |
| | SM port | SM port | MM port |
| J0617B (FC/UPC) | ✓ | ✓ | ✓ |
| J0618E (DIN/UPC) | ✓ | ✓ | ✓ |
| J0619B (SC/UPC) | ✓ | ✓ | ✓ |
| **For APC Polish** | | | |
| | SM port | SM port | MM port |
| J0739A (FC/APC) | ✓ | ✓ | N/A |
| J1697A (SC/APC) | ✓ | ✓ | N/A |

*8: There are two SM ports — one for 1310/1550 nm, and another for 1650 nm.

### OTDR Module Application Parts

| Model/Order No. | Name |
|---|---|
| W3810AE | MT1000A MU100020A Network Master Pro Operation Manual (Printed Matter) |
| J1335A | MU/LC Connector Adapter<br>Converts ferrule connector diameter from 2.5 mm → 1.25 mm for visible light source (Option 002) |
| J1530A | SC Plug-in Converter (UPC(P)-APC(J))<br>SC/UPC → SC/APC Adapter |
| J1531A | SC Plug-in Converter (APC(P)-UPC(J))<br>SC/APC → SC/UPC Adapter |
| J1532A | FC Plug-in Converter (UPC(P)-APC(J))<br>FC/UPC → FC/APC Adapter |
| J1533A | FC Plug-in Converter (APC(P)-UPC(J))<br>FC/APC → FC/UPC Adapter |
| J1534A | LC-SC Plug-in Converter (for SM, SC(P)-LC(J))<br>SC/UPC → LC/UPC Adapter for SM fiber |
| J1535A | LC-SC Plug-in Converter (for MM, SC(P)-LC(J))<br>SC/UPC → LC/UPC Adapter for MM fiber |
| NETWORKS | PC Emulation Software for Data Analysis and Reporting |

## Method for Adding Measurement Modules

### Preparation 1: Version up the software for MT1040A

Install the latest software in the MT1040A.
This software can be obtained from the Anritsu web site.

### Preparation 2: Remove the battery pack from Mainframe

1) Disconnect the AC cable.
2) Use screw driver or Coin and remove the battery lid from MT1040A.

3) Remove the battery pack.

### Preparation 3: Replacing the connected modules

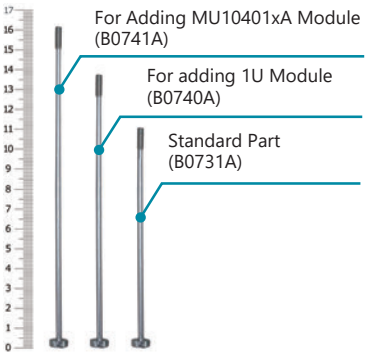
1) Place the instrument on its front on a plain surface.
   Loosen the screws (shown by the blue circle) on rear side of the connected module.

2) After loosing the four screws, lift up the connected module with holding both sides.
   If you cannot lift up, loosen the four screws again.
   You can see the panel as below.

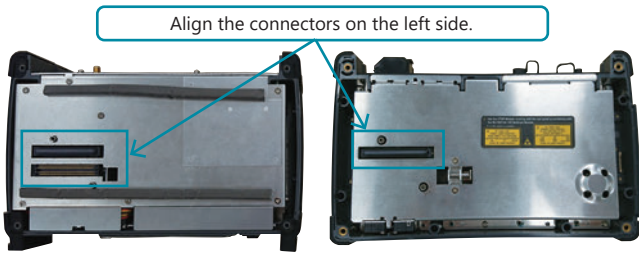
MT1040A Main Unit Back Panel

### Adding 1U module

1) Remove four screws of former module and replace to the next screws. Choose the bolts matching the added module. Use the B0740A for the 1U size module.

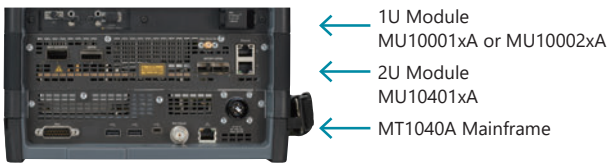



2) Align the module horizontally with the MT1040A as shown below.




MT1040A Main Unit Side　　Measurement Modules Side

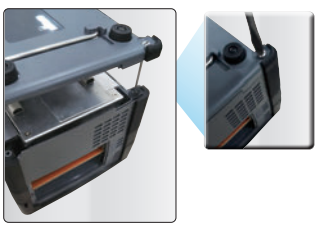
3) Install the OTDR module in the correct MT1040A slot as shown below.




Side View after Assembling Modules

Note: Align the four edges when installing the option; the module connector is easily damaged by misalignment.

4) Secure the module using the B0740A part chosen in step 1.
   After installing the module as shown in the figure on the right, check that there is no gap between the modules.



### After attaching the modules

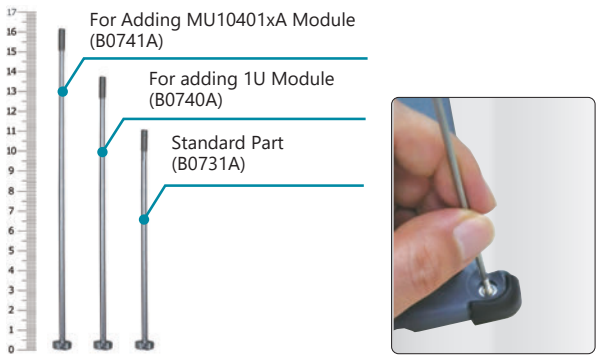
1) After attaching the modules, connect the AC cable or install the battery packs.

2) Turn on the MT1040A.
   Please check whether a new module is recognized at the system information.

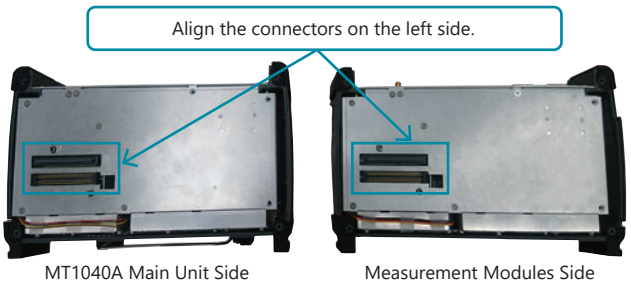
## Method for Adding Measurement Modules

### Adding Transport Module (MU10401xA)

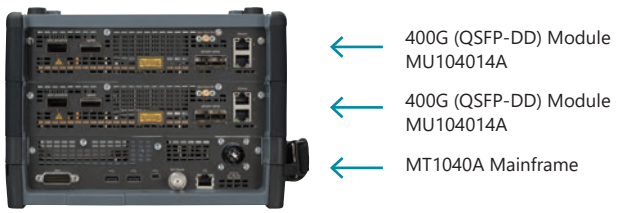
1) Confirm that the MT1040A-020 option is installed in the MT1040A main unit.
2) Choose the bolts matching the added module.
   Use the B0741A for the MU10401xA module




3) Align the transport module horizontally with the MT1040A as shown below.




4) Install the transport module in the correct MT1040A slot as shown below.



Side View after Assembling Modules

Note: Align the four edges when installing the option; the module connector is easily damaged by misalignment.

5) Secure the module using the B0741A part chosen in step 2.
   After installing the module as shown in the figure on the right, check that there is no gap between the modules.

### After attaching the modules

1) Connect the G0419A standard accessory of the MT1040A-020 option to the MT1040A. The G0418A will not start. Additionally, battery operation is not possible when two transport modules are installed.
2) Turn on the MT1040A.
   Please check whether a new module is recognized at the system information.

### Remote Software Service

The following licenses must be purchased to use the Site Over Remote Access MX109020A.

**Mainframe Option License**

| Model/Order No. | Name |
|---|---|
| MT1040A-003*1 | WLAN/Bluetooth Connect |
| MT1040A-011*2 | Site Over Remote Access Connect |

*1: WLAN is available for certified countries and regions including USA, Japan and EU countries. Please visit the Anritsu web site for updated information.
Although this product has not been approved by Bluetooth SIG, the supported frequencies are in the range assigned to Bluetooth® communications.
*2: Validity period is unlimited. An open TCP port may be required to allow the MT1040A to be connected from an in-company LAN to MX109020A, depending on the LAN security policy.

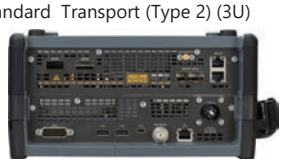
**Subscription Option License**

| Model/Order No. | Name |
|---|---|
| MX109020A*3, *5, *6, *7 | Site Over Remote Access Basic License |
| MX109020A-TL001*3, *4 | Site Over Remote Access 1 Year License |
| MX109020A-001*5 | Site Over Remote Access 8 Units |
| MX109020A-002*5 | Site Over Remote Access Unlimited Units |
| MX109020A-003*8 | Centralized Data Management |

*3: We recommend purchasing a 1-year license in addition to the basic license.
*4: When extending the usage period, we recommend purchasing in 1-year license periods
*5: Up to two measuring instruments can be remotely controlled simultaneously with the basic license.
This number can be increased to up to 8 units by purchasing the MX109020A-001 option, and up to 100 units by purchasing the MX109020A-002 option.
*6: You must agree to the service terms before purchasing SORA.
Refer to the service terms at the following URL: https://www.anritsu.com/en-AU/test-measurement/support/downloads/manuals/dwl20059
*7: This product cannot be used in some regions and countries; please read the service terms for more details.
*8: Users must provide their own storage at the upload destination.

### Accessories for MT1040A Dual-Module Configuration

The size of the MT1040A depends on the module configuration. Choose the appropriate case.

| Module Combination | Mounting Skrews | Soft Case | | Hard Case | |
|---|---|---|---|---|---|
| | | B0745A | B0772A | B0733A | B0773A |
| Short (2U) | B0730A |  |  |  |  |
| Standard Transport (Type 2) (3U)  | B0731A | | | | |
| + Transport (Type 1) or OTDR Module (4U)  | B0740A | | | | |
| Two Transport (type 2) Modules (5U)  | B0741A | | | | |
| | | | | 345 (W) × 238 (H) × 480 (D) mm, 3.5 kg | 495 (W) × 338 (H) × 663 (D) mm, 12.3 kg |


MT1040A

B0733A

B0773A

Size of Each Hard Case for MT1040A

## Related Products

### Network Master Pro MT1000A

| | |
|---|---|
| **10G Multirate Module** | **MU100010A** |
| **100G Multirate Module** | **MU100011A** |

Installing the MU100010A or MU100011A in the MT1000A supports commissioning and maintenance tests of communications networks operating at speeds from 1.5 Mbps to 100 Gbps.
In addition to Ethernet, OTN, eCPRI/RoE/CPRI/OBSAI, Fibre Channel and SyncE protocols used by mobile-network base stations are supported too.

| | |
|---|---|
| **OTDR Module 1310/1550 nm SMF** | **MU100020A** |
| **OTDR Module 1310/1550/850/1300 nm SMF/MMF** | **MU100021A** |
| **OTDR Module 1310/1550/1625 nm SMF** | **MU100022A** |
| **OTDR Module 1310/1550/1650 nm SMF** | **MU100023A** |

Installing an OTDR Module MU100020A/MU100021A/MU100022A/MU100023A provides the OTDR functions required for optical fiber I&M. Work efficiency is increased by all-in-one support for optical fiber tests and data communications network commissioning.
I&M tests of 1.5 Mbps to 100 Gbps communications networks can be executed by simultaneously installing the MU100010A or MU100011A. In addition to supporting Ethernet, OTN, etc., networks, Mobile base station CPRI and OBSAI, as well as SyncE protocols are also supported.

### MT9090A Series

**µOTDR Module** **MU909014/15**

Compact OTDR for full automatic verification of optical networks, FTTH-PON, Metro and Core.

**Gigabit Ethernet Module** **MU909060A**

Dedicated field test solution for installation and troubleshooting Ethernet links in access networks.

### CMA5 Series

**Light Source/Optical Power Meter**

For optical fiber installation and maintenance.

### ACCESS Master MT9085 Series

**For WAN/MFH/DCI/FTTH Optical Fiber I&M**

- Improved operability with powerful synergy of 8-inch touchscreen and hardware keys
- At-a-glance Pass/Fail evaluation using Fiber Visualizer
- All OTDR, OLTS, and Visible Light Source operations on one screen
- Short event dead zone of ≤0.8 m and high dynamic range of 46 dB max.
- Power meter option for measuring optical power up to +30 dBm

## Note

Anritsu Advancing beyond

Specifications are subject to change without notice.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2106

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