

# SUNRISE TELECOM®

# GigE Module

MTT-50

Dual port 10/100/1000BASE-T  
and 1000BASE-X

Data Sheet



Now with VoIP, packet Delay Variation and 100FX support.

The MTT-50 GigE Module is the perfect choice for service providers who are currently using Sunrise Telecom's Modular Test Toolkit (MTT) in the field. The MTT-50 ensures rapid and efficient installation and maintenance of business Ethernet and IP services and significantly reduces repair time while maintaining the quality of service that customers demand. A complete set of testing capabilities makes the MTT-50 ideal for the field technician who needs to verify end to end transport of Ethernet/IP traffic, perform BER tests, determine throughput, link utilization and verify Voice over IP services. An intuitive user interface enables technicians with limited Ethernet or IP experience to verify performance parameters. The modular design and the wide range of test functionalities provides all of the tools needed for verifying Service Level Agreements while lowering the operating costs associated with the need for multiple test sets.

## KEY FEATURES

- Full 10/100/1000 Mbps and Gigabit Ethernet line rate traffic generation
- 100M optical interface (100FX) available through SFPs
- Performs throughput, latency, frame loss, and back-to-back tests per RFC 2544 using Loopback or point-to-point without Loopback
- BER testing at Layer 1, Layer 2, and Layer 3 (IP) for Gigabit Ethernet and IP services
- Packet Delay Variation measurement per RFC3393 on BERT/RFC2544 modes
- IP verification with Ping, Trace Route, ARP Scan and IP Throughput across a routed network
- Generate up to 8 traffic flows with different MAC address, VLAN tag, and IP address configurations
- Class of Service (CoS) via VLAN P-bit and IP Type of Service (ToS/DSCP) traffic prioritization settings
- Optional Voice over IP testing: IP phone emulation, statistics and Voice Quality Measurements.
- Dual Port capability for network element prequalification testing
- Control/Respond Loopback feature to loop-up/down a far end MTT, STT or SunLite Ethernet modules
- Test Profiles for fast and efficient test set configuration and operation

## BENEFITS

- The flexible modular design leverages the existing MTT platform and eliminates the need for multiple instruments
- The MTT chassis are rugged, light weight and field tested, with over 47,000 units in the field
- The MTT chassis' long battery life can be extended with the new 2X battery
- Remote, real time troubleshooting and analysis
- Completely interoperable with MTT, STT and SunLite Ethernet modules

## APPLICATIONS

- Enables service providers and operators to turn-up and troubleshoot Ethernet and IP services
- Allows service providers to verify SLAs between themselves and their customers
- Automated SLA verification with RFC 2544 testing
- Layer 2 CoS settings for verifying Metro Ethernet services
- Test profile storing and loading for fast deployment of Ethernet services

## SPECIFICATIONS

### Connectivity

Ethernet (10BASE-T), Fast Ethernet

(100BASE-T and 100FX (SWMTT50-100X) )

Gigabit Ethernet 1000BASE-T (SWMTT50-1000T)

(per IEEE 802.3, 2000 Edition)

Gigabit Ethernet 1000BASE-X (SWMTT50-1000X)

(per IEEE 802.3, 2000 Edition)

Connector type:

Dual Duplex LC for 100FX and 1000BASE-X

Dual RJ-45 UTP (10/100/1000BASE-T)

Optical transceiver type: SFP field interchangeable

SA580-850 (1000BASE-SX)

Transmitter

- Wavelength: 850 nm multi-mode

- Power: -9.5 dBm to -4 dBm

Receiver

- Wavelength: 770 nm to 860 nm

- Signal: -21 dBm to 0 dBm max

Optical Power Measurement (OPM) function available

SA580-1310 (1000BASE-LX)

Transmitter

- Wavelength: 1310 nm single-mode

- Power: -9.5 dBm to -4 dBm

Receiver

- Wavelength: 1270 nm to 1600 nm

- Signal: -25.5 dBm to -3 dBm max

Optical Power Measurement (OPM) function available

SA580-1550 (1000BASE-ZX)

Transmitter

- Wavelength: 1550 nm single-mode

- Power: +3 dBm to -2 dBm

Receiver

- Wavelength: 1270 nm to 1570 nm

- Signal: -24 dBm to -3 dBm max

Optical Power Measurement (OPM) function not available

SSMTT-28-FXM (100FX)

Transmitter

- Wavelength: 850 nm multi-mode

- Power: -3 to -9.5 dBm

Receiver

- Wavelength: 830 nm to 860 nm

- Signal : -17 dBm to 0 dBm max

SSMTT-28-FXS (100FX)

Transmitter

- Wavelength: 1310 nm single-mode

- Power: -8 to -15 dBm

Receiver

- Wavelength: 1260 nm to 1600 nm

- Signal : -28 dBm to -8 dBm max

### Operation Mode

Dual port-to-point mode

Monitor mode

Management and point-to-point mode

Auto-negotiation enabled or disabled

Auto-negotiation parameters: pause flow control, asymmetric pause

### BER/Throughput Testing

End-to-end testing with two test sets

Single-ended testing with loop on the other end

Single test set bench testing

Dual port operation of tests mentioned above

### Traffic Generation

Layer 1, Layer 2, or Layer 3 traffic

Configurable source and destination MAC address

Configurable 802.1q VLAN tag and 802.1p priority

Configurable MPLS tags (SWMTT50-L3)

Configurable source and destination IP address

(IPv4) (SWMTT50-L3)

Configurable IP header fields (ToS, TTL, Protocol, and Fragment

Offset) for QoS verification testing (SWMTT50-L3)

Up to 8 independent traffic flows (MAC address, IP address, VLAN tag)

(SWMTT50-MULTI)

Test patterns: All 1s, All 0s, ITU-T PRBS (2e31, compatible 2e23,

compatible 2e31, normal or invert, or user defined (2 bytes)

Frame length 48 to 1518 bytes or Jumbo frame (up to 11000 bytes)

Frame rate 0% to 100% bandwidth utilization with steps of 0.1%

Traffic shaping: Constant, Ramp, or Burst

Error/Alarm injection: Bit, CRC, IP Checksum error and rate injection

Test duration

### Measurements

Performance statistics: Transmitted and received bandwidth

utilization (Min, Max, Average), frame rate (Min, Max, Average),

transmitted and received line rate and data rate (kbps)

Frame statistics: Total number of transmitted & received frames,

total number of received VLAN tagged, MPLS, TCP/UDP, frames,

number of lost, out of sequence frames, oversized, multicast,

flow control, broadcast and unicast frames, inter-frame delay

measurement (Min, Max, Avg, Variation), frame size distribution,

Packet Delay Variation (Min, Max, Avg)

Link statistics: Bit, CRC, IP checksum distribution count and rate,

loss of signal, loss of synchronization, and out of service

seconds counters

Events recorder with timestamp

### Loopback Mode

Automatically loops all incoming frames with or without swapping

the source and destination MAC address fields and IP address

source and destination fields

Manual or controller/responder mode

## IP Features (SWMTT50-L3)

### **PING Test**

- Step by step results showing connectivity to the router
- Summary and detailed result screens
- Statistics on PING messages
  - Number of sent/received/missing/unreached messages
  - Current/average/max/min round trip delay
- Following parameters can be configured:
  - IP mode (Static/DHCP mode)
  - VLAN settings
  - Local IP address
  - Destination IP address
  - Gateway address
  - Number and rate of PING messages
  - Frame length

### **Trace Route**

- Trace the IP route over the IP network up to 30 hops
- Gateway, Router IP address traceability

### **ARP scan**

- Discover the MAC address of devices on the network by sending ARP requests to a range of IP addresses

### **VLAN scan**

- Discover the VLAN IDs that are configured on an interface

## RFC 2544

- Throughput, latency, frame loss rate, and back-to-back frames tests conform to RFC 2544 standard using Loopback or point-to-point without Loopback. PDV measurement per RFC3393
- User configurable frame sizes (64 - 11000 bytes)
- Configurable PASS/FAIL threshold
- Tests can be run individually or in sequence
- Available for Layer 2, and Layer 3 testing, including
  - Ethernet routed circuits
- Configurable IP header fields (ToS, TTL, Protocol, and Frame Offset) for QoS verification testing
- RFC2544 test report in CSV format

## Monitoring and Analysis

- In-service monitoring with or without splitter
- Measurements
  - Signal and Frame Synchronization
  - Bandwidth Utilization
  - Rx Frames Count
  - CRC Error
- Events recorder with timestamp

## Voice over IP SW Suite Features

- Protocols:
  - SIP (SWMTT50-SIP)
  - H.323 (SWMTT50-H323)
- CODEC:
  - G.711 $\mu$
  - G.711a
  - G.723.1 – 5.3k, 6.3k
  - G.726 – 16k, 24k, 32k, 40k
  - G.729a
  - G.729ab
- IP Phone Emulation
  - Place and Receive Calls
  - Transmission of Pre-Installed Audio Files for Voice
- Traffic Simulation
- Call Events and Messages
- Call Statistics
  - RTP Packet Count, Lost, Dropped
  - Packet Jitter
- Voice Quality Measurements
  - Mean Opinion Score (MOS):
    - Listening and Conversational Quality
  - R-Factor: Listening and Conversational Quality, GAP, and BURST

## Other Features

### **Multiple User Profiles**

- Up to 10 different test configuration profiles may be saved
- Test profiles saved and loaded with the press of a button
- Profiles can be shared across multiple chassis for fast and efficient test set configuration and operation

### **Results and Reports**

- Test results are saved in .CSV format for easy retrieval, sharing, and analysis of data. PDF reports are created on PC by importing CSV files.

## Physical Layer

### **Cable test**

- Measure the length of copper Ethernet cable pair (meters or feet)

### **Optical power measurement**

- Report Tx/Rx Power, wavelength of the optical ports

## PRODUCT DESCRIPTION

- Module Size:
  - 5.0 W × 3.5 L × 0.9 H in (12.6 × 9 × 2.2 cm)
- Operating Temperature:
  - 32° to 113°F (0° to 45°C)
- Storage Temperature:
  - 4° to 158°F (-20° to 70°C)
- Humidity:
  - 5% to 85% noncondensing

## ORDERING INFORMATION

SSMTT-50 . . . . . GigE Module  
Basic Package includes dual 10/100Base-T ports, Single Streams Layer 1/Layer 2 Ethernet Testing and 1-Year Standard Warranty in Hardware and Software. RJ-45 Interface Upgradable to 10/100/1000 Base-T; Optical Interface Upgradable to 1000Base-X; SFP Modules Sold Separately.

### Rebate Program

MTT-28 and MTT-29 modules are eligible for a rebate program. Refer to the online rebate form for details

### Software Options

SWMTT50-1000T . . . Dual Port 1000Base-T  
(enable 1000Base-T on RJ-45 interfaces)

SWMTT50-1000X . . . Dual Port 1000Base-X  
(enable 1000Base-X on optical interfaces)

SWMTT50-L3 . . . . . Layer 3, MPLS and Advanced IP Features

SWMTT50-MULTI . . . Multiple Streams

SWMTT50-100X . . . Dual Port 100 Base-FX/LX

SWMTT50-SIP . . . . . VoIP Analysis - SIP and MOS

SWMTT50-H323 . . . VoIP Analysis - H323 and MOS

### Accessories

SA148 . . . . . SFP Optics Container

SA265 . . . . . Cable, 100Ω, CAT5e, RJ45 (M) to RJ45 (M), Cross-over, 6 ft.

SA266 . . . . . Cable, 100Ω, CAT5e, RJ45 (M) to RJ45(M), 6 ft.

SA508 . . . . . Optical Patch Cord, SMF, LCUPC to SCUPC, 6 ft.

SA558 . . . . . Optical Patch Cord, LCUPC to LCUPC, Duplex, SMF, 6 ft.

SA561 . . . . . Optical Patch Cord, LC-SC duplex, MMF, 62.5/125 um, 6 ft.

SA562 . . . . . Optical Patch Cord, SMF, LC-SC duplex, 6 ft.

SA580-850 . . . . . 850 nm LC SFP Field Interchangeable Optical Transceiver

SA580-1310 . . . . . 1310 nm LC SFP Field Interchangeable Optical Transceiver

SA580-1550 . . . . . 1550 nm LC SFP Field Interchangeable Optical Transceiver

SSMTT-28-FXM . . . . . 850nm MMF LC Field Interchangeable Optical Transceiver

SSMTT-28-FXS . . . . . 1310nm SMF LC Field Interchangeable Optical Transceiver

**Note:** The MTT GigE Module is supported on most MTT platform host chassis including the MTT-ACM series and MTT-C. It is not supported on XDLS Full, MTT-EX and MTT-B chassis.



For more information or a directory of sales offices: [info@sunrisetelecom.com](mailto:info@sunrisetelecom.com) | [www.sunrisetelecom.com](http://www.sunrisetelecom.com)  
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