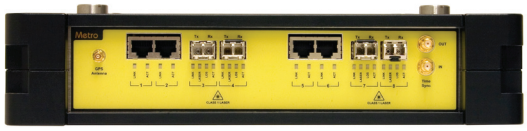
SUNRISE TELECOM®

Fibre Channel on STT Metro

Data Sheet



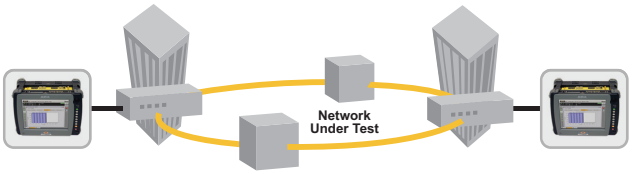
The Fibre Channel on STT Metro is part of a family of test modules for the STT Platform

By combining throughput, and accurate statistics with versatile traffic generation options, the Fibre Channel on STT Metro is ideal for the turning up and maintenance of Storage Area Network (SAN) services such as Fibre Channel and FICON. A complete set of testing capabilities makes the STT Metro ideal for the technician who needs to verify end-to-end transport of Fibre Channel and FICON traffic, perform BER tests, determine throughput, link initialization, buffer-to-buffer credit, and round trip delay.

The intuitive user interface of the Fibre Channel on STT Metro, allows technicians with limited SAN testing experience to verify performance parameters for Fibre Channel and FICON services. The test functionalities of the STT Metro provides all of the tools needed for verifying Service Level Agreements (SLAs) between service providers and their customers.

KEY FEATURES

- Full Fibre Channel (1.0625, 2.125 and 4.25 Gbps) line rate traffic generation
- BER testing at FC-0, FC-1 and FC-2 for Fibre Channel and FICON services
- Round trip delay measurements
- Fibre Channel buffer-to-buffer credit optimization and management
- Fibre Channel Fabric login and N_Port login for connecting and testing through a Fibre Channel switch fabric
- Fibre Channel bidirectional monitoring for live traffic
- Automated benchmarking test suite based on RFC2544
- Test profiles for fast and efficient test set configuration and operation
- Frame capture with decoding



SAN Testing Application:
End-to-end Fibre Channel Transport verification

BENEFITS

- 2 to 4 independent test ports for stressing network services and elements
- Eliminates the need for multiple instruments to run Ethernet and Fibre Channel service testing on the same optical port
- Complete solution for Installation & Maintenance (I&M) of Fibre Channel and FICON services
- Pre-determination of service qualification with Buffer-to-Buffer Credit Optimization
- Service Level Agreement (SLA) verification of Fibre Channel network
- Simultaneous turn-up of multiple ports and services, maximizing efficiency
- Remote access and network probing capability

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TEST FEATURES

- Enables service providers and operators to turn-up and trouble-shoot Fibre Channel and FICON services
- Allows service providers to verify SLAs between themselves and their customers
- FC-2 header configuration parameters for specific Fibre Channel traffic testing
- Simple Windows style graphical user interface that is consistent with STT Ethernet modules

SPECIFICATIONS

Connectivity

Fibre Channel per ANSI INCITS 230
Data rate: 1.0625 Gbps/2.125 Gbps/4.25 Gbps
Optical transceiver type: SFP field interchangeable

SA584-850
1.0625 / 2.125 / 4.25 Gb/s Fibre Channel
Transmitter
- Wavelength: 830 to 860 nm multi-mode
- Power: -9 dBm to -2.5 dBm max.

Receiver
- Wavelength: 770 to 860 nm
- Power: -20 to 0 dBm max.

SA584-1310
1.0625 / 2.125 / 4.25 Gb/s Fibre Channel
Transmitter
- Wavelength: 1285 nm to 1345 nm single-mode
- Power: -3 dBm max.

Receiver
- Wavelength: 1260nm to 1600 nm
- Power: -22 to 0 dBm max.

Operation Mode

Point-to-Point BER and Throughput Test
Link Initialization enabled or disabled (Fibre Channel, FC-2 Layer)
Monitor mode
Loopback
RFC2544
Buffer-to-Buffer Optimization

BER Testing (Fibre Channel/FICON)

Traffic Generation
Fibre Channel and FICON: FC-0/FC-1/FC-2 testing
End-to-end testing with two ports or two test sets
Single-ended testing with loop on the other end
Configurable FC-2 header
FC-2 Fabric Login and N_Port Login
Test Patterns
Framed: all 1s, all 0s, Alt1010, 2e31, 2e23, 2e20, 2e15 and user defined (32 bits)
Unframed: high frequency, mixed frequency, and low frequency patterns or user defined (4 bytes)
Frame length: 28 to 2140 bytes
Frame rate: from 1% to 100% bandwidth
Buffer-to-Buffer credits: 1 to 65535 (with Link Initialization enabled)
Traffic shaping: Constant, Ramp or Burst
Error injection: BIT and CRC single errors injection, running disparity errors. SOF, EOF and No R_RDY injection when link Initialization is enabled at FC-2 testing.
Test duration

Measurements
Performance statistics: transmitted and received bandwidth utilization (Current, Min, Max, Average), frame rate (Current, Min, Max, Average)
Frame statistics: total number of transmitted and received frames, number of lost frames, out of sequence frames, number of undersized frames, number of oversized frames, number of transmitted and received R_RDY frames, and number of buffer-to-buffer credit used and remaining
Link statistics: bit errors, CRC errors, 8B/10B symbol and disparity errors, loss of signal and loss of signal seconds counters, loss of synchronization, loss of pattern synchronization and link failure counters
Events recorder with timestamp
Optical Power Measurement

Buffer-to-Buffer Credit Optimization

The best estimate of buffer-to-buffer credit configuration between two nodes to reach specified throughput, average frame size and latency on the existing link length.

Loopback

Intelligent loopback at layer FC-0/1 and FC-2

RFC2544

Ethernet type benchmarking methodology: throughput, Latency, Frame Loss, Back-to-Back Frames

Port Login

Fabric and N_Port login at FC-2 layer

Frame Capture and Analysis

Available in all Fibre Channel test modes

Round Trip Delay Measurement

With 1 micro-second resolution latency measurement

Monitoring and Analysis

Fibre Channel
In-service monitoring with or without splitter
Measurements
Signal and Frame Synchronization
Rx Data Rate (Min, Max, Average)
Rx Frames received, Rx Frames per second (Min, Max, Average)
CRC, Symbol, Disparity errors
Loss of Signal and Loss of Synchronization
Optical Power Measurement
Events recorder with timestamp.

PRODUCT DESCRIPTION

Upgrades: sw upgradable via LAN or USB memory device
Operating Temperature: 0° to 40° C (32° to 104° F)
Storage Temperature: -20° to 70° C (-4° TO 158° F)
Humidity: 5% to 90% noncondensing

Stand-Alone Operation
Power input stand-alone AC operation with 100 to 240 VAC, 50/60 Hz unversal charger
Communication: 10/100BASE-T and RS-232 Serial Port

65mm Chassis
Weight: 2.5 kg (6.6 lb)
Size: 320 x 220 x 65 mm (12.6 x 8.7 x 2.6 in)

ORDERING INFORMATION

For questions about applications and accessories for the Fibre Channel on STT Metro, please contact your local distributor or sales representative.

Please refer to STT Metro data sheet (document no. C-0063) for more ordering information

Fibre Channel Option

STT-3511	1G/2G/4G Fibre Channel Testing per Two Optical Ports. [*SA584 SFP Modules support 4G Fibre Channel. Sold separetely.]*
SA584-850	850 nm SFP Optical Transceiver plug-in for Gigabit Ethernet and 1G/2G/4G Fibre Channel. LC Connector.
SA584-1310	1310 nm SFP Optical Transceiver 1310 nm Single-mode transceiver plug-in for Gigabit Ethernet and 1G/2G/4G Fibre Channel. LC Connector.

ABOUT STT PLATFORM

The Scalable Test Toolkit (STT) is an advanced, modular, and flexible testing solution that addresses Layer 1 through Layer 7 requirements, from fiber optics to Quality of Service. Designed to meet the challenges of designing, installing, maintaining, and troubleshooting core, metro, and access networks, the STT combines an innovative test platform with revolutionary test features, supporting a complete suite of capabilities and technologies for the converging global communications market.

All STT modules are equipped with a unique standalone feature that allows them to operate at 100% of their capabilities outside of the platform, maximizing test resources.

- **STT ONE.** OTN, EoS (Ethernet over SDH/SONET), NGN (VCAT, LCAS and GFP), legacy SDH/SONET and PDH/T-carrier testing. Transport testing from 1.5/2 Mbit/s up to 10/10.7 Gbit/s. Advanced next generation network testing, GigE frames drop/insert from SDH/SONET via GFP-T port, In-service real time monitoring of SDH/SONET tributaries (Channel Master), APS testing. Legacy networks testing: VF, Pulse Mask.

- **STT DTM.** Measures Polarization Mode Dispersion (PMD) and Chromatic Dispersion (CD).

- **STT xWDM.** OSA for the O, E, S, C and L bands. Channel drop and tunable laser for the C and L bands.

- **STT Metro.** 10/100/1000M Ethernet testing. Throughput and Bit Error testing across Layers 1, 2, and 3. Stacked VLAN (Q-in-Q) and MPLS. RFC 2544 benchmark testing. GPS antenna port for one-way latency measurements. IP connectivity testing. Bidirectional monitoring of live networks. Packet capture with decoding up to Layer 7.

- **STT 10G Ethernet.** 10 GigE LAN/WAN Ethernet testing. Throughput and Bit Error testing across Layers 1, 2, and 3. Advanced test features Stacked VLAN (Q-in-Q) and MPLS. RFC 2544 benchmark testing and packet capture and decode up to Layer 7.

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