SUNRISE TELECOM®

SunSet MTT®

Basic Color Chassis

Data Sheet

The SunSet MTT Basic Color Chassis features a family of plug-in modules, providing a wide variety of testing capabilities for the Access Network

The Modular Test Toolkit (MTT) product family features the SunSet MTT as the industry's premium handheld platform for access network service installation, verification, and troubleshooting applications. Equipped with a high resolution color display, the ruggedized SunSet MTT Basic Color Chassis is ideal for Metro, FTTx, and Transport field service applications.

FEATURES

- Color display
- Easy-to-use-interface
- Supports many SSMTT/SSxDSL test modules

BENEFITS

- Handheld and portable
- Convenient and cost-effective
- Ideal for field Metro, FTTx, and Transport MTT modules

APPLICATIONS

With a variety of plug-in test modules, the SunSet MTT supports multiple access network applications.*

SPECIFICATIONS

Connectors

Serial Port: 8-DIN, RS-232C (V.24) DTE
DC Power Jack

General

Size: 4.5" (W) x 3.3" (H) x 11" (L) [11.4 cm x 8.3 cm x 28 cm]
Weight: 3.3 lb [1.5 kg]
Display: Backlit 240 x 320 dot STN indoor/outdoor Color Screen
LEDs: 13 bi-color
Battery: Rechargeable, field replaceable NiMH pack
Charger: Universal 100-240 VAC adapter with IEC connector
Operating Temperature: 32°F to 122°F [0°C to 50°C]
Storage Temperature: -4°F to 158°F [-20°C to 70°C]
Humidity: 5% to 85% noncondensing

ORDERING INFORMATION

SSMTT-C	SunSet MTT Basic Color Chassis. Supports Plug-in Modules with a high resolution color display. CLEI: TET1VZ0EAA CPR: 099604

** See module data sheets for more information*

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E1 Modules

SSMTT-27/SSMTT-27L

Data Sheet

The E1 Module is part of a family of plug-In modules for the SunSet MTT® and xDSL test sets

The SSMTT-27 E1 Module, part of the SunSet Modular Test Toolkit (MTT) family of products, is a rugged, battery-operated handheld test solution designed to assist field technicians with new link installation, routine maintenance, and troubleshooting problems in the E1 network. The E1 interface defined by ITU has been widely deployed and has become a dominant part of the digital telecommunication network in various applications including Cellular, Access, Switching, and Data networks. The E1 module comes with two versions, Dual E1 and Single E1, to fit your testing requirements. Both out-of-service and in-service testing can be performed with this module.

KEY FEATURES

- Dual E1 BER testing (Dual E1 module)
- ITU-T G.821, G.826, M.2100 measurement
- Pulse mask and Histogram analysis
- View received data/FAS/MFAS words
- Error injection/alarm generation
- Level and frequency measurements
- Send frame word including Sa bit
- VF analysis and emulation
- Jitter measurement, jitter transfer and tolerance testing
- Wander measurement
- GSM, GPRS
- Frame relay and Propagation delay
- ISDN PRI and V5.1/5.2
- MFC-R2, DTMT

BENEFITS

- Lightweight and flexible modular design
- Eliminates the need for multiple instruments
- Complete solution for Installation, Maintenance (I&M), and troubleshooting of E1 services
- Leverages existing MTT platform
- Cost-effective and future-proof
- Supports various applications on E1 with over 20 software options that can be easily upgraded in the field

APPLICATIONS

Frame Relay

- LMI analysis
- Fox test (CIR verification)
- Ping test
- Statistic analysis
- Support UNI and NNI interfaces

GSM/GPRS

- Bidirectional channel monitoring at Abis and A interface
- Voice decode of full rate, enhanced full rate, half rate speech
- GSM protocol analysis at Abis interface
- TRAU testing (speech generation)
- GPRS statistic analysis at Abis and Gb interfaces

ISDN Primary Rate

- Call emulation (speech/data)
- Detailed protocol analysis (ETSI, AUSSI, DASS2, DPNSS, Q.SIG)
- Auto supplementary service test
- Sequential call and Bulk call

V5.x

- Protocol analysis on all 3 timeslots simultaneously
- Statistic analysis (bidirectional)

MFC-R2, DTMF, SS5, Pulse

- Call analysis (bidirectional)
- Call emulation (ITU, user defined)

SPECIFICATIONS

Module Type

SSMTT-27 Dual E1
Line 1 Tx, Line 1 Rx, Line 2 Tx, Line 2 Rx
Connectors: BNC (f), RJ-48 (f)

SSMTT-27L Single E1
Line 1 Tx, Line 1 Rx, Reference Clock
Connectors: BNC (f), RJ-48 (f)

Status/Alarm Indicators

Dual-color LED indicators
  Current status and alarm history
Audible alarm

Test Pattern Generator

Fixed, PRBS, and User programmable

Error/Alarm Injection

E1 General

Bit error test rates: 2.048 Mbit/s, N (contiguous) and M (non-contiguous) × 64 kbit/s (N & M = 1 to 31)
Framing: Unframed, PCM-30, PCM-31, with or without CRC-4; conforms to ITU-T G.704

E1 Transmitters

Clock source
  Internal, External, Received, Tx offset
Pulse shape: Conforms to ITU-T G.703

E1 Receivers

Frequency: 2.048 Mbit/s ± 6000 bit/s
Impedances
  Terminate, monitor: Line 1 & 2, 75Ω unbalanced 120Ω balanced
  Bridge: High impedance
Input sensitivity
  Terminate, bridge: +6 to -43dB
  Monitor: -15 to -30dB resistive

Measurements

Error report
ITU-T G.821, G.826, M.2100 Analysis
Alarm statistics
Frequency, clock slips, wander
Signal level
Programmable measurement
Print on event, at timed interval, at end of test

Other Measurements

Pulse mask analysis
Histogram analysis
Propagation delay
  Maximum delay measurement (at 2.048 Mbit/s): 8 seconds
View received data
View timeslots 16 and 0
Save test results of measurement runs, error and alarm events

E1 Voice Frequency

Built-in microphone for talk
Monitor speaker or optional headphones
Signal-to-noise ratio measurement
Noise measurements
Tone generation
Level and frequency measurement
Coder offset and peak code measurements

Jitter Measurement (SWMTT-27JM)

Jitter amplitude measurement in UI
Jitter frequency range
  Wideband jitter measurement (with 20 Hz to 100 kHz filter)
  Highband jitter measurement (with 18 kHz to 100 kHz filter)
PASS/FAIL threshold: Per ITU-T G.823 or User defined
Jitter histogram
Measurement storage

Jitter Generation (SWMTT-27JG)

Jitter amplitude/frequency: Per ITU-T O.171
Modulation source type: sinusoidal

Jitter Tolerance Measurement
PASS/FAIL template: Per ITU-T G.823 (from 10 Hz to 100 kHz)
Measurement storage

Jitter Transfer Measurement
PASS/FAIL template: Per ITU-T G.735, G.736, and G.737 (from 10 Hz to 100 kHz)
Measurement storage

Wander Measurement (SWMTT-27WM)

TIE amplitude measurement in ns
Wander frequency range: 12 µHz to 10 Hz
Test interface: 2.048 Mbit/s
Reference clock: 2.048 MHz, 2.048 Mbit/s (L2-Rx)
Real time measurements: TIE
Off-line MTIE/TDEV Analysis

Frame Relay Basic (SWMTT-27FRA)

LMI standards: ITU-T Q.933, ANSI T1.617, LMI (DLCI 1023, GOF Vendors), NO LMI
Modes: UNI DTE, UNI DCE

LMI Analysis
Results: Link OK total, Link errored total, Timeout error, Response sequence number, Wrong message
PVC status

PING Test
Results: Number of PINGs, Number of PINGs sent, PING status (Received, Unreached, Errored), Round trip time (Current, Average, Maximum, Minimum)
InARP support
Echo PING
IP encapsulation conforms to RFC1490

FOX Test

Results: PVC status, Current rate, Errored frames, RSN error, SSN error, Frame Check Sequence (FCS) Error, Count of frame received with FECN, with BECN, with DE, Count of transmit frames, Count of received frames

Statistic Analysis

E1 monitoring
Frame relay performance and statistics
DLCI analysis and statistics

Frame Relay NNI (SWMTT-27FRNNI)

LMI standards: ITU-T Q.933, ANSI T1.617, LMI (DLCI 1023, GOF Vendors), NO LMI
Modes: NNI USER, NNI NETWORK

LMI Analysis, PING Test, FOX Test, Statistic Analysis - *as described in Frame Relay Basic section*

GSM Voice and TRAU Access (SWMTT-27GV)

Standards: Conforms to ETSI Recommendations for GSM Phase 2+ GSM 08.60

Channels Monitoring

Bidirectional drop/monitor of 8 and 16 kbit/s GSM channels/subchannel
Automatic frame type detection
Identify signalling channel for A-bis, A-ter and A links
Voice decoded bidirectionally

TRAU Access

Settings: Timeslot, Type, Link Direction, Idle Code, Time Alignment
Measurement Results

GSM A-bis Protocol Analysis (SWMTT-27GA)[2]

Standards: Conforms to ETSI Recommendations for GSM Phase 1, 2, and 2+ GSM 04.08, GSM 08.56, and GSM 08.58
Mode: Monitor
Capture and store messages for decoding and protocol analysis
Capture layer 1 events
Filters: PRE and Post
Message storage capacity

GPRS over Gb Analysis (SWMTT-27Gb)[2]

Standards: Conforms to ETSI Recommendations for GSM Phase 2+ GSM 08.14 (Frame Relay), GSM 08.16 (Network Service), GSM 08.18 (BSSGP), GSM 04.08 (GMM/SM)
Mode: Monitor
Frame relay statistics
  Frame relay performance
  DLCI analysis and statistics
GPRS statistics

GPRS over A-bis Analysis for Ericsson BSS[2] (SWMTT-27GEC)

Standards: Conforms to ETSI Recommendations for GSM Phase 2+ GSM 04.08, GSM 08.56, and GSM 08.58
Supports Ericsson GPRS A-bis proprietary extensions
GPRS channel monitoring
GPRS statistics

GPRS over A-bis Analysis for Nokia BSS[2] (SWMTT-27GNK)

Standards: Conforms to ETSI Recommendations for GSM Phase 2+ GSM 04.08, GSM 08.56, and GSM 08.58
Supports Nokia GPRS A-bis proprietary extensions
GPRS channel monitoring
GPRS statistics

GPRS over A-bis Analysis for Nortel BSS[2] (SWMTT-27GNT)

Standards: Conforms to ETSI Recommendations for GSM Phase 2+ GSM 04.08, GSM 08.56, and GSM 08.58
Supports Nortel GPRS A-bis proprietary extensions
GPRS statistics

ISDN Primary Rate Testing (SWMTT-27PR)

Modes: TE emulation, NT emulation, monitor[2]

Call Setup

Call type: Speech, Data-64, Data-56, Nx64 kbit/s, 3.1 kbit/s Audio, 7 kbit/s (ETSI and AUSSI only)
Perform a BERT test with a data call towards loopback number, in self-call mode (G.821 measurements) or end-to-end mode
DTMF dialing (SPEECH call)
Keypad facilities

Automatic Supplementary Services Test

Automatic Tele Services Test

Sequential Call

Bulk Call

Protocol Analysis

Capture & store D-channel messages for decoding & protocol analysis
Capture Layer 1 events (alarms), capture and decode Layer 2 and 3 protocol messages
Filters: PRE and Post
Message storage capacity

Model	ETSI	AUSSI	QSIG	DASS2	DPNSS
Protocol Analysis	✓	✓	✓	✓	✓
Call Emulation	✓	✓		✓	✓
Auto Supplementary Services	✓	✓			
Auto Tele Services Test	✓	✓			
Sequential Call	✓	✓		✓	✓

V5.x Protocol Analysis (SWMTT-27V5A)[2]

Standards
  Supports ITU-T/ETSI V5.1, V5.2, and LAPV5
  V5.1 conforms to ETS 300 324 and ITU-T G.964
  V5.2 conforms to ETS 300 347 and ITU-T G.965
  LAPV5 conforms to ETS 300 125 and ITU-T Q.920, Q.921
Mode: Monitor
Capture and store messages for decoding and protocol analysis
Filters and trigger
Message storage capacity

Layer 2 and 3 Statistic Analysis (bidirectional)

V5.2 3 C Paths Monitoring (SWMTT-27V5TS3)

Monitor and capture 3 C paths simultaneously (3 timeslots)
All features on SWMTT-27V5A still apply

VF Call Analysis and Emulation (SWMTT-27VFA, SWMTT-27VFE)

Modes: Analysis, Emulation
Standards: Conforms to ITU-T Q.422, Q.441, Q.140 series
Programmable ABCD states

VF Call Analysis (SWMTT-27VFA)[2]

Bidirectional analysis of MFR1, MFR2/MFR2C, SS5, DTMF, Pulse (DP)
Bidirectional CAS (ABCD signalling) transition analysis
Automatic trigger
Tracer with timestamp
Digits are recorded and decoded in user defined labels
MFR2/DTMF digit decode and analysis
Pulse (DP) digit analysis
Measurement storage

VF Call Emulation (SWMTT-27VFE)

Programmable dial 1 to 15 digits
Receive or call modes
Call setup with on-line call progress status
User call emulator
SS5: Conforms to ITU-T Q.140 series

PRODUCT DESCRIPTION

Module Size (W x L x H): 5.0 x 3.5 x 0.9 in (12.6 x 9 x 2.2 cm)
Operating Temperature: 32˚ to 122˚F (0˚ to 50˚C)
Storage Temperature: -4˚ to 158˚F (-20˚ to 70˚C)
Humidity: 5% to 85% noncondensing

ORDERING INFORMATION

SSMTT-27	Dual E1 Module
SSMTT-27L	Single E1 Module
SSMTT-27-BNC	BNC connector option for SSMTT-27
SSMTT-27L-BNC	BNC connector option for SSMTT-27L
SSMTT-27-RJ	RJ-48 connector option for SSMTT-27
SSMTT-27L-RJ	RJ-48 connector option for SSMTT-27L
SWMTT-27JM	Jitter Measurement option
SWMTT-27JG	Jitter Generation option
SWMTT-27WM	Wander Measurement option *Requires hardware with Wander ready*
SWMTT-27FRA	Frame Relay Basic
SWMTT-27FRNNI	Frame Relay NNI *Requires SWMTT-27FRA*
SWMTT-27GV	GSM Voice & TRAU Access
SWMTT-27GA	GSM A-bis Protocol Analysis[2]
SWMTT-27Gb	GPRS Gb Analysis[2] *Requires SWMTT-27FRA Frame Relay option*
SWMTT-27GEC	GPRS A-bis Analysis – Ericsson BSS[2] *Requires SWMTT-27GA GSM A-bis option*
SWMTT-27GNK	GPRS A-bis Analysis – Nokia BSS[2] *Requires SWMTT-27GA GSM A-bis option*
SWMTT-27GNT	GPRS A-bis Analysis – Nortel BSS[2] *Requires SWMTT-27GA GSM A-bis option*
SWMTT-27PR	ISDN Primary Rate Testing *Requires at least one ISDN protocol option*
SWMTT-27PRE	ETSI/ITU-T. Conforms to ETS 300 102, 300 402 and ITU-T Q.921 & Q.931[3]
SWMTT-27PRU	AUSSI. Conforms to AUSTEL Standard 014[3]
SWMTT-27PRQ	Q.SIG. Conforms to ECMA 141, 142/143, 165, ETS 300 402, 300 171/172, 300 239 and ITU-T Q.921, Q.931[3]
SWMTT-27PRP	DPNSS. Conforms to BTNR 188 series[3]
SWMTT-27PRD	DASS2. Conforms to BTNR 190 series[3]
SWMTT-27V5A	V5.x Monitoring[2]
SWMTT-27V5TS3	3-timeslot V5.2 Monitoring[2] *Requires SWMTT-27V5A*
SWMTT-27VFA	VF Call Analysis[2]
SWMTT-27VFE	VF Call Emulation

Notes:
[1] *Dual E1 Rx/Tx for SSMTT-27; Single E1 Rx/Tx for SSMTT-27L*
[2] *Not available in SSMTT-27L (Single E1)*
[3] *SWMTT-27PR is required for all other ISDN options*

SUNRISE TELECOM®

TI ADSL2+ ATU-R Module

SSMTT-19A

Data Sheet

The ATU-R Module is part of a family of plug-in modules for the SunSet MTT® and xDSL test sets

The SSMTT-19A TI ADSL2+ ATU-R Module, part of the SunSet Modular Test Toolkit (MTT) family of products, is a rugged, battery-operated handheld test solution geared for the Tier 1 technician tasked with fast and efficient ADSL2+ service verification. The TI ADSL2+ ATU-R module addresses the testing needs of service providers who are migrating to ADSL2+ for its superior bandwidth, extended reach and, as a result, its ability to deliver triple-play services—the right solution for customers whether they need a simple, low cost tool or a more powerful diagnostic solution.

FEATURES

- Link turn-up with far end DSLAM
- Pass through modem emulation
- Detailed modem/link status
- Link measurement
- Network connectivity verification
- Advanced features, including Trace Route, ATM OAM, and Network Statistics

BENEFITS

- Lightweight
- Handheld
- Leverages existing MTT platform
- Cost-effective and future-proof
- Portable design for easy site-to-site transport
- One-button configuration and measurement simplifies and shortens testing time

APPLICATIONS

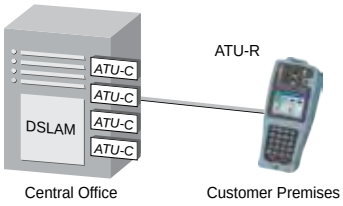
- ADSL, ADSL2, ADSL2+
- Network connectivity verification

SPECIFICATIONS

Chipset
TI AR7 TNETD7300A

ADSL Technologies
ADSL2+ (ITU-T G.992.5)
ADSL2 (ITU-T G.992.3)
Reach Extended ADSL2 (ITU-T G.992.3 Annex L)
G.dmt ADSL/POTS and S = 1/2 option (ITU-T G.992.1 Annex A and ANSI T1.413)
G.lite (ITU-T G.992.2)
ADSL2+ Extended Framing Parameters (ITU G.992.5 Amendment 1 and 2)

ATU-R Features
Modem Status Measurements
- Downstream Rate
- Upstream Rate
- SNR Margin
- Maximum Attainable Rate
- Capacity
- Attenuation
- Transmit Power
- Latency Path Mode: Fast or Interleaved



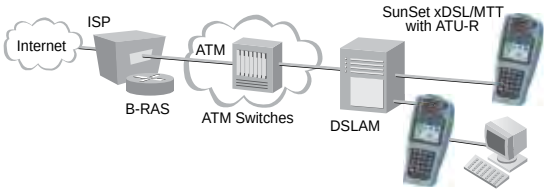
Link Measurements
- Counters for CRC, FEC, HEC events
- Errored Seconds, Severely Errored Seconds, Unavailable Seconds
- Block Error Rate
- Loss of Signal Seconds
- Retrains

Bits per Tone/SNR per Tone: Full graphical & tabular display
Event Tracer
- Event type with time stamp

Basic IP Features

Protocol Standards Supported
- RFC 1483/2684: LLC-Bridged (Static & DHCP), LLC-Routed
- RFC 2364: PPP over ATM
- RFC 2516: PPP over Ethernet
- Encapsulation: VC MUX/LLC SNAP

Basic PING Test
- PASS/FAIL results for PPP session and PING Test



10/100 Base-T Pass Through Modem Emulation

Transparent Bridging
Routed PPPoE, PPPoA, LLC-Routed
Encapsulation: VC MUX/LLC SNAP
DHCP Server
Network Address Translation

Advanced Features Software Suite (SWMTT-DSL-ADV)

PING
- To URL or IP address
- Adjustable packet size from 64 to 1500 bytes

PING Statistics
- Number of Messages Sent, Received, and Loss Rate %
- Roundtrip Delay for Average, Maximum, and Minimum

Trace Route
- Protocols Supported: ICMP and UDP
- Up to 30 Hops on the IP Network

VCC Scan

ATM OAM Test
- Automatic response to far end F4 & F45 OAM requests
- Transmit F5 End to End and Segment OAM commands

Network Statistics
- Ethernet
  - Transmit: Frames (Good, Broadcast, Multicast, Error), Collisions, Carrier Sense Errors, Total Bytes
  - Receive: Frames (Good, Broadcast, Multicast, Undersized), CRC Errors, Overruns, Total Bytes
- ATM
  - Transmit: Cells (Good, Idle), PDUs, Total Bytes, Total Errors
  - Receive: Cells (Good, Idle, Bad HEC, Dropped), PDUs, Total Bytes, Total Errors

Connectors

ADSL Line Interface: RJ-45 @ 100Ω
Ethernet Interface for Data: RJ-45 10/100 Base-T

PRODUCT DESCRIPTION

Module Size (WxLxH): 5.0 x 3.5 x 0.9 in (12.6 x 9 x 2.2 cm)
Operating Temperature: 32˚ to 122˚F (0˚ to 50˚C)
Storage Temperature: -4˚ to 158˚F (-20˚ to 70˚C)
Humidity: 5% to 85% noncondensing

ORDERING INFORMATION

SSMTT-19A	TI ADSL2+ ATU-R Module Includes basic PING Testing
SWMTT-DSL-ADV	Advanced Features Software Suite Bundle for SSMTT-19, SSMTT-44A, SSMTT-44B, and SSMTT-19A Supports the following features: ATM OAM, VCC Scan, Network Statistics, IP Statistics, IP Trace Route, Web Access Test*, and IP DTE*. **SSMTT-44A and -44B only*

Recommended Cables

SS161	Cable, RJ-45 (m) to 3 Probe Clips, 6'
SS167	Cable, RJ-45 (m) to RJ-45 (m), 6' with Ferrite Filter
SS168	Cable, RJ-45 (m) to RJ-11 (m), 6' with Ferrite Filter

For more information or a directory of sales offices: **info@sunrisetelecom.com** | **www.sunrisetelecom.com**