2 Mbit/s Testing in the Palm of Your Hand

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SunLite E1

SUNRISE TELECOM

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Fulfill your 2.048 Mbit/s transmission testing needs by using the world's smallest full-feature 2.048 Mbit/s transmission test set, the SunLite E1. Among its capabilities are:

- 2.048 Mbit/s transmit, receive and external clock
- Bit error rate testing (ITU-T G.821)
- ITU-T G.826, M.2100 analysis
- Level and frequency measurements
- +6 to -43 dB receiver input sensitivity
- Term, PMP (Monitor), High Impedance
- Drop and insert capability (N or Mx64k)
- Programmable NFAS Word
- CAS signaling
- Histogram analysis
- Propagation delay
- Store up to 10 test results and 10 configurations
- 75Ω and 120Ω models
- Powered by rechargeable NimH battery pack

Put this economical, yet powerful SunLite E1 in your shirt pocket. For more information and the name of your local Sunrise Telecom distributor, visit www.sunrisetelecom.com.



... a step ahead

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www.sunrisetelecom.com



The SunLite E1 gives you the choice of 75 Ω unbalanced or 120 Ω balanced connectors.

A bright backlit LCD display is ideal for often encountered low light working conditions.

Bright LED indicators provide immediate circuit status and history at a glance.

With a single keystroke you can configure the SunLite E1 to your circuit and call up the menu for the test you wish to perform.

The speaker and microphone allow you to monitor the channel or to talk-and-listen.

The test set operates continuously from the charger.

SPECIFICATIONS

Connectors/Ports

2.048 Mbit/s E1 interfaces: Tx, Rx, Ext Clock Standard: BNC (f), 75 Ω unbalanced connectors Optional: BR2 (f) 120 Ω balanced connectors; Bantam (f) 120 Ω balanced connectors Serial Port: RS-232/V.24, RJ11, 6-pins connector

Charger: 1 mm, DC jack

Status/Alarm Indicators

- 13 super-bright LED indicators Current status and alarm history Signal: red, no signal; green, signal; flash red, history PCM-30 (bi-color), CRC-4 (bi-color), SYNC (bi-color)
 - TX: solid green, transmitter activated; flash green in selfloop mode; off, transmitter deactivated RUN: green, measurement running; off, measurement
 - stop
 - RAI: red, MFAS RAI or FAS RAI; flash red, history AIS: red, AIS; flash, history

 - CODE: red, code error; flash, history ERROR: red, CRC-4, E-bit, FAS E; flash, history
 - BIT: red, logical bit error; flash red, history Power/low batt: slow flash green, power on & battery fully charged; solid green, battery being charged; red, low battery

E1 General

- Bit Error test rates: 2.048 Mbit/s, N (contiguous) and M (non-contiguous) x 64 kbit/s (N & M=1 to 31)
- Drop and insert to internal test circuitry N or Mx64 kbit/s $\dot{\mu}/A\text{-law}$ decoded VF channel to built-in speaker Line Coding: HDB3 & AMI
- Framing: Unframed, PCM-30, PCM-30C, PCM-31, PCM-31C Conforms to ITU-T G.704

Test Pattern Generator

- General: 1111..., 0000..., 1010..., RICAR 3 PRBS: 2ⁿ-1, n= 9, 11, 15, 23. Conforms to ITU-T 0.151, 0.152, 0.153, and ANSI V.52, V.57
- Programmable: 3 patterns, up to 16 bits long each Test pattern inversion

Transmitter

Clock source

- Internal clock: 2.048 MHz ± 25 ppm
- Received: locked to received signal External: locked to Reference clock input signal
- Line coding: HDB3 & AMI
- Pulse shape: Conforms to ITU-T G.703. 75Ω/Unbal.: ±2.37 Vbp (±10%)
- Programmable Time slot 0: Programmable loop-up/loopdown code, programmable NFAS word
- Set idle channel code and ABCD bits (IDLE/NOT IDLE state) Transmit signal can be turned ON/OFF or internally looped Error injection
- BIT, CODE (single or rate of 1x10⁻⁷ to 1x10⁻²
- BIT+CODE (single or rate of 1×10^{-7} to 1×10^{-3}) CRC-4, FRAME, E-bit (single)
- 0-128 bit zero insertion in 8 bits steps

- Receiver Frequency range: 2.048 Mbit/s ± 6000 bit/s for SLE1
- Input Sensitivity Terminate Hi-Z: 6 to -43 dB with Automatic Line Build Out (ALBO)
- Monitor: -20 dB resistive loss with -6 dB cable loss Auto configuration for framing (PCM-30, PCM-30C, PCM-31, PCM-31C, Unframed), and test pattern Impedances
- Terminate, Monitor: 75 Ω unbalanced
- Hi-Z: >2000Ω
- Return loss performance according to ITU-T G.703 Jitter tolerance according to ITU-T G.823

External Clock Interface

Input Impedance: 75Ω Unbalanced Input Sensitivity: -20 dB resistive loss with -6 dB cable loss Line Coding: HDB3 & AMI

Measurements

- E1 signal level: +0 to -43 dB resolution: 1 dB
- Frequency measurement (Hz & ppm): Selectable frequency resolution (1Hz, 0.1Hz and 0.01Hz) Current, Max, Min Clock slips count
- Code errors: Error count and ratio
- Frame errors: FAS and CRC-4 errors count and error ratios Count of LOS, Loss of Sync (SYLS), LOF, AIS, FAS RAI, and MFAS RAI seconds
- Bit errors: ITU-T G.821 analysis with allocation, programmable HRX%
- ITU-T G.826 measurements ITU-T M.2100 measurements (in conformance with M.2101)
- E-bit errors: Error count and ratio
- Setup and test results printing
- Test duration programmable Print interval programmable: NOW, 5 min., 15 min., 1 hr., 24 hrs., LAST, EVENT, OFF

- Time stamped events printing Delay timer settable up to 99 hrs., 59 min. Audible alarm: Indicates an error or alarm, programmable ON/OFF

Alarm Generation: AIS, FAS RAI, MFAS RAI

Other Measurments

- Save 10 test results, available to screen view or print with user defined label
- Histograms: G.821 basic measurements, up to 60 days of histograms, 1 day resolution and the last 24 hrs. with 1 min. resolution. 2 HISTOGRAMS stored; CURRENT and SAVED
- Propagation Delay measurements in UI & µs, 1 µs resolution Range: From 100 µs to 10 seconds View Received Data

Voice Frequency Capability

Talk/listen by using the built-in microphone/speaker Companding: A-law or μ -law (selectable) Monitor and CAS modes ABCD bits display for a selected timeslot

CAS signaling monitoring (IDLE/NOT IDLE state) Set ABCD bits to 1 or 0 of selected timeslot Set CAS state IDLE/NOT IDLE Set Idle Channel code

Frame Word Settings Sa bits read, write with all 40 bits independently settable Selectable loopback/release commands Set Loop Up/Loop Down Sa4-8 bit code or transmit pattern

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No. of Concession, Name

Sunlite E1 SLE1-000009

SLE1-01 Clock Offset Optionn

Transmitter

- Frequency settable to 2.048 Mbit/s ± 24,400 ppm: 2.048 MHz
- Accuracy: ± 2 ppm (after external calibration)

Receiver

Frequency range: 2.048 Mbit/s ± 24,400 ppm Other measurements: Automatic stress automatically determines the receiving equipment's upper and lower frequency capture range

- SLE1-02 VF Measurment Option VF Measurement: 50 Hz to 3950 Hz, 1 Hz Resolution; +3 dBm0 to -60 dBm0, 1 dB resolution
- Send/Receive tone: 50 to 3950 Hz, res. 1 Hz; +3 to -60 dBm0, res. 1 dB Noise (S/N, psophometric, 3K) level measurement: +3 to
- -60 dBm0

Digital representation of sinusoidal signals in a selected timeslot: A-law and μ -law coding to ITU-T G.711 Coder offset and peak code measurement

General

Store and recall 10 instrument configurations

- 122x32 dots (4x20 characters, 6x8 dots size) graphic display screen with LCD backlight
- Internal Battery: NimH
- Battery operation time: 4 hrs, transmitter off Unit charging time: 7 hrs

Charger: 5V @ 2A, 90 to 265 VAC, 50-60 Hz Printer/Communication port: RS-232, RJ11, 6-PIN asynch Language selection: English, Italian, French, German

Environmental

Operating temperature: 0° C to 50° C Storage temperature: -20° C to +70° C Humidity: 5% to 90% non-condensing Dimensions: 175 mm (I) x 75 mm (w) x 35 mm (d) Weight: 0.4 kg (approx)



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