SunSet™ E10

SUNRISE TELECOM

. . . a step ahead

SPECIFICATIONS

Connectors/Ports
2.048 Mbit/s bidirectional E1 interfaces
Line 1 Tx, Line 1 Rx, Line 2 Tx, Line 2 Rx
    75Ω unbalanced BNC (f)
    75Ω (optional): Replaces BNC with 1.6/5.6 mm (f)
    120Ω (optional): Replaces BNC with BR2 (f), balanced
Serial port: 8-DIN, RS232C (V.24), DTE
Datacom interface: 30 pin HDI (High Density Interface)
    connector (optional)
DC input for charging internal battery

Status/Alarm Indicators
Power and low battery LED indicators
16 dual-color LED indicators for Line 1 & Line 2
Current status and alarm history for: Signal, code error,
    PCM-30, PCM-31, AIS, alarm, CRC detected, any error
Pattern Sync and bit error LED indicators

Test Pattern Generator
General: 1111, 0000, 1010, 100100 (1-in-3), 1-in-4, 1-in-
    8, 3-in-24, FOX
PRBS: 2^n-1, n=6, 7, 9, 11, 15, 20, 23
Selectable QRS or $2^{20}-1$ ITU
Conforms to ITU-T O.151, O.152, O.153
Programmable: 10 patterns, 2048 bits long with user
    definable labels
Test pattern inversion

E1 General
Bit Error Test rates: 2.048 Mbit/s, N (contiguous) and M
    (noncontiguous) x64 kbit/s (N & M=1 to 31)
Full duplex bidirectional hitless in-service drop & insert
Drop and insert to internal test circuitry, datacom
    interface (optional), Nx64 kbit/s test pattern; or 64
    kbit/s A-law decoded VF channel to built-in speaker/
    microphone
Automatic configuration
Line Coding: HDB3, AMI
Framing: Unframed, PCM-30, PCM-31, with or without
    CRC-4, conforms to ITU-T G.704
Programmable Send Frame Words: Manual/auto E-bits,
    MFAS word bit 5, bit 6 (MFAS RAI), bit 7, bit 8, MFAS
    ABCD, FAS RAI, Display and Print Send and Receive
    FAS/NFAS and MFAS/NMFAS words, auto CRC-4
    generation, freely settable Sa4, Sa5, Sa6, Sa7, and Sa8
    bits to 1 or 0 for 8 frames
Set idle channel code and ABCD bits

E1 Transmitters
Clock source
    Internal: 2.048 MHz (± 5 ppm)
    External: Through Line 1 Rx or Line 2 Rx, AMI or
        HDB3. Through Multiport, sinusoidal, 50% duty
        cycle; requires optional SS251 Datacom Module
    Loop: Recovered through Line 1 Rx or Line 2 Rx
        signal, selectable AMI or HDB3

Pulse shape: $3.0V_{bp}$ (± 10%) at 120Ω, $2.37V_{bp}$ (± 10%) at
    75Ω. Conforms to ITU-T G.703.

Error/Alarm Injection
Code and/or bit error: Programmable burst of 1 to 9999
    errors manually, or continuous rate of $2x10^{-3}$ to $1x10^{-9}$
CRC-4, FAS, E-bit: Single error
Generate AIS, TS16-AIS (PCM-30), MFAS RAI (PCM-30),
    FAS RAI (PCM-30 & 31) alarms

E1 Receivers
Frequency: 2.048 Mbit/s ± 6000 bit/s
Input sensitivity
    Terminate, Bridge: +6 to -43 dB with Automatic Line
        Build Out (ALBO)
    Monitor: -15 to -30 dB resistive
Impedances
    Terminate, Monitor: 75Ω or (optional) 120Ω
    Bridge
Jitter tolerance to ITU-T G.823

Measurements
Error Type: Code, bit, CRC-4, FAS, MFAS, E-bit errors,
    slips
Typical error type reports: Error count, error rate, ES, %ES,
    SES, %SES, UAS, %UAS, EFS, %EFS, AS, %AS, DM, %DM
ITU-T G.821 Analysis, error type reports: Bit error and
    rate, ES, %ES, SES, %SES, EFS, %EFS, UAS, %UAS, AS,
    %AS, DM, %DM
ITU-T G.826 Analysis, CRC-4 block based; error type
    reports: EB, BBE, %BBE, ES, %ES, SES, %SES, UAS,
    %UAS, AS, %AS, DM, %DM

SunSet™ E10

M.2100/550 pass/fail analysis: Programmable time period

Alarm statistics: LOS sec, LOF sec, AIS sec, FAS RAI sec, MFAS RAI sec

Frequency (Max hold, Min hold, Current), clock slips, wander

Signal level (V_{bp+}, V_{bp-} in V and dBdsx) +7 to –36 dB

Block Errors, Block Error Rate

Print on event, can be enabled or disabled

Print at timed interval (selectable over 1 to 9999 minutes) or at end of test

Programmable time and date for start and stop

Other Measurements

Pulse mask analysis
   Scan period, 500 ns
   On screen pulse shape display with G.703 Pulse Mask verification
   Displays pulse width, rise time & fall time in nanoseconds, %overshoot, %undershoot
   Pulse shape storage and printing

Histogram analysis
   Graphical display of accumulated errors (Bit, Code, CRC, FAS/MFAS) and alarms (LOS, AIS, LOF, FAS RAI, MFAS RAI) events for L1 Rx and L2 Rx
   Stores and prints 60 days by hour and 60 hours by minute
   Storage of one complete histogram & current

Propagation delay
   Round trip signal transmission delay
   Measures in microseconds and UIs (Unit Intervals)

View received data
   View live traffic 4096 bits long (16 full frames/one multiframe) in PCM-30 or PCM-31
   Displays 8 timeslots per screen
   Stores 64 scrollable screens, hold screen, print
   Information displayed in ASCII, reverse ASCII, Binary, and HEX

View timeslot 16 (MFAS, NMFAS ABCD) in PCM-30: 16 Frames

View timeslot 0 (FAS, NFAS, CRC, MFAS/CRC words, E-bits Sa4 to Sa8, A-bit) in PCM-30 & 31: 16 Frames

Save test results, error and alarm events (1000 events) available to screen view or print

Voice Frequency Capability

Tone generation: 50 to 3950 Hz, res. 1Hz; +3 to -60 dBmO, res. 1 dB

Level and frequency measurement: 50 to 3950 Hz, +3 to -60 dBmO

Talk and listen, ABCD bits monitor & transmit in selected channel

Built-in microphone for talk

Monitor speaker for line 1, 2, or both with volume control

Bidirectional, full duplex, hitless in-service drop/insert

Simultaneously view bidirectional 30 channels ABCD bits

Programmable idle channel ABCD bits and code

Programmable IDLE and SEIZE ABCD

Companding: A-Law

View channel data 1 byte long (binary format)

Datacom Interface (SS251)

V.35, X.21/V.11, RS232/V.24, RS449/V.36, G.703 codirectional DTE, DCE Emulation

30-pin High Density Interface (HDI) connector to test set: Includes adapters for DCE and DTE V.35, X.21/V.11, RS232 (V.24), RS449 (V.36); G.703 codirectional. 3-pin CF connectors for Tx and Rx.

RS232/V.24 Async data rates: 50, 150, 300 and 600 bit/s; 1.2, 2.4, 4.8, 9.6, 14.4, 19.2 and 38.4 kbit/s, 6/7/8 data bits, 1/2 stop bits, odd/even/none parity.

RS232/V.24 Sync data rates: 300 and 600 bit/s; 1.2, 2.4, 4.8, 9.6, 14.4, 19.2, 38.4, 48, 56 and 64 kbit/s

G.703 codirectional data rate: Nx64 kbit/s (N=1 to 8)

RS449 DTE/DCE data rates: 300 bit/s to 48 kbit/s, Nx56, Nx64 (N=1 to 32)

V.35 DTE/DCE data rates: 300 bit/s to 48 kbit/s, Nx50.6, Nx64 (N=1 to 32)

X.21 DTE/DCE data rates: 300 bit/s to 48 kbit/s, Nx56, Nx64 (N=1 to 32)

Send test patterns
   RS232/V.24 Async DCE and DTE: 2047, 511, 127, 63, 1111…., 0000…. and FOX
   All other interfaces: All available patterns

Automatic pattern synchronization

G.821 measurements

Measurement of Data Loss, Data Loss Seconds, Slips, Slip Seconds. Pattern Sync Loss and Pattern Sync Loss Seconds

Bit error injection

Histograms for Bit Error, ES, SES, UAS

Datacom Timing Analysis (Resolution: 300 ms)
   Change of state of the following control leads is recorded and displayed (Table or Graphic Mode):
   – RS232/V.24 (Async, Sync, DTE, DCE), V.35 (DCE, DTE), RS449/V.36 (DTE, DCE): RTS, CTS, DTR, DSR, DCD, RL, LL
   – X.21 (DTE, DCE): C, I
   Transmit control leads (selectable on/off)
   – RS232/V.24 Sync and Async DTE: RTS, DTR, RL, LL
   – RS232/V.24 Sync and Async DCE: CTS, DSR, DCD
   – V.35 DTE: RTS, DTR, RL, LL
   – V.35 DCE: CTS, DSR, DCD
   – RS449/V.36 DTE: RTS, DTR, RL, LL
   – RS449/V.36 DDE: CTS, DSR, DCD
   – X.21 DTE: C
   – X.21 DCE: I
   Storage Capability
   – Graphical Mode: Last 40s of change
   – Table Mode: 100 pages

Tx data clock selectable (internal or receive)

Receiver ranges: V.35 (high 0.2 to 7.0V, low -7.0 to -0.2V), RS449/V.36 (high 0.2 to 6.0V, low -6.0 to -0.2V), RS232/V.24 (high +3.0 to +25.0V, 1 low -25.0 to -3.0V)

Transmitter ranges: V.35 (± 0.44 to ± 0.66V differential output), RS449/V.36 (± 2.0 to ± 5.0V differential output), RS232/V.24 (+12 to +15V high, -12 to -15V low)

Modes
   Datacom: Via HDI-30 multiport
   E1-Mux: Hitless 2048 kbit/s and Nx64 kbit/s E1 drop and insert, via V.35, RS449/V.36, X.21/V.11; DCE only
   Hitless 64 kbit/s E1 drop and insert via RS232 DCE sync
   Hitless Nx64 kbit/s drop and insert, N = 1 to 8 via G.703 codirectional
   Emulates terminal multiplex or add/drop multiplex
   Muxtest: Tests 2.048 Mbit/s/Nx64 kbit/s terminal multiplex

MFR2/DTMF/DP Dialing & Analysis (SW251)

Programmable dial 1 to 32 digits, 10 sets, alphanumeric label
Programmable dial tone level -5 to -20 dBm, res. 1 dB
Programmable dial tone period and interdigit timing
Programmable dial pulse %break/period
MFR2/DTMF freq/level/twist/tone period/interdigital period received digit decode and analysis
DP %break/PPS/period received digit analysis
Bidirectional CAS (ABCD signalling) transition analysis

VF Noise Measurements (SW252)

Signal to noise ratio measurement
Noise measurements with 3.1 kHz flat, psophometric weighting, 1010 Hz notch with flat filters

SS7 Analysis (SW253)

Supports ITU-T Q.700 series, Chinese (14 or 24 bits), Italian standards
Bidirectional analysis to bit level, layers 2, 3 & 4
Configurable analysis channels (Line 1/2)
SU traffic analysis
Statistical counters for FISU, LSSU, MSU, SNM, SNT, TUP, ISUP and SCCP messages. %FISU, %LSSU, %MSU and retransmission counts on FIB and BIB (% based on number of messages)
MSU tracer
Supports TUP, ISUP, SCCP, SNM, SNT messages
User programmable trace filter; OPC, DPC, SI, CIC, H0/H1, address signal (called number) Layer 2 FISU/LSSU filter; BSN/BIB, FSN/FIB.
Real time view of bidirectional messages. Messages are translated into clear text up to layer 4 down to bit level or are displayed in hex format. Trace storage holds up to 2100 messages.
View trace buffer with or without display filter
Print, clear buffer
LSSU analysis
Captures and display of LSSUs, FISUs, BSN/BIB, FSN/FIB. Status cause display in hex format and decode to bit level.
Message decode performance: 99% of messages captured at 15% channel utilization, 91 bytes per message

ISDN PRI Analysis & Call Setup (SW254)

Bidirectional Primary rate interface analysis & call setup, layers 2 & 3
Protocol analysis
Supports ITU-T Q.921/Q.931, ETSI
User programmable trace filter: Call reference number, Called number, Caller number, SAPI, TEI. C/R bit, timeslot, message group, type code, SIC type. View bidirectional message flow. Messages are translated into clear text up to layer 3 or are displayed in hex format. Trace storage holds up to 2100 messages.
Trace buffer view, print, and clear
Emulates both TE & NT mode
Generates and receives voice, data calls
    Capable of 2 calls
    Supports self call
Talk/listen, send/receive tones

DPNSS/DASS2 Analysis & Call Setup (SW260)

Supports BTNR 188 & BTNR 190 standards
Bidirectional Primary rate interface analysis layers 2 & 3
Protocol analysis
User programmable trace filter: C/R bit, timeslot, message group, type code, SIC type, DA number. View bidirectional message flow. Messages are translated into clear text up to layer 3 or are displayed in hex format. Trace storage holds up to 2100 messages.
Trace buffer view, print, and clear
Call Setup/Call Receiving
Emulates PBX A or PBX B for DPNSS and PBX or ET for DASS2
Generates and receives voice calls
Talk/listen

X.50 64 kbit/s Testing (SW255)

Conforms to ITU-T X.50 Division 2 and 3
Bit error rate testing with ITU-T G.821 analysis
Test rate: Nx600 bit/s, N = 1 to 8 within 64 kbit/s signal
Hitless bidirectional E1 64 kbit/s channel drop/insert to multiport
Standard or random selection of octets
View and transmit housekeeping bits A to H, and status S-bit
Programmable idle pattern, BERT and IDLE S-bit, X.50 signal (ABCD bits)
Bit or Frame Error Injection
Histogram analysis
Modes
    Datacom (64 kbit/s, X.50 Formatted signal)
    Muxtest (Test 2.048 Mbit/s/64 kbit/s multiplex)
    MUX (Emulate 2.048 Mbit/s/64 kbit/s multiplexed within X.50 format)
    E1 (Send/Receive X.50 formatted channels inside 2.048 Mbit/s signal)

C-bit Frame Testing (SW257)

Send and receive C-bits 2 through 15 (ESCAPE, 2 MB loops, loop 2 or loop 3, loop 2 instruction, loop 3 instruction, HDB3 command, loop acknowledge, not defined, local fault, remote/line fault, C frame loss, spare, spare, spare)
Bit level decoding
Loopback channel

GSM A & A-bis Analysis (SW258A)

A-bis interface
    Supports GSM 16 kbit/s or 64 kbit/s A-bis interface to GSM 08.58, 04.08, 08.56
    A-bis traffic statistics include counters for RLM, DCM, CCM, TRXM and total number of messages for both L1 and L2
    A-bis Layer 2 traffic statistics include counters for supervisory, unnumbered, information and total number of frames for both L1 and L2
    Programmable trace filter; layer 2 messages, SAPI, TEI, message discriminator, message type, channel number, timeslot number
    Bidirectional message tracing with up to 2100 message storage
    Trace buffer view, print, and clear
    Message decode performance: 99% of messages captured at 15% channel utilization

A interface
    Supports GSM A interface Phase 1 to GSM 08.08, 08.06, 04.08, 04.11, 04.80
    Programmable trace filter; LSSU, DPC, OPC
    Bidirectional message tracing with up to 2100 message storage
    Trace buffer view, print, and clear

GSM MAP (B...G Interface) Analysis (SW258B)
Supports GSM 09.02 Phase 2
Programmable trace filter; LSSU, DPC, OPC, caller number, called number, TCAP originating & destination transaction ID, invoke ID.
Bidirectional message tracing with up to 2100 message storage
Trace buffer view, print, and clear
Message decode performance: 100% of messages captured at 15% channel utilization

MAP Dialogue Information Decoded Messages
map-open, map-accept, map-close, map-refuse, map userAbort, map-providerAbort

MAP Operation Decoded and Error Messages
MAP-Mobile Service Operations:

UpdateLocation	CancelLocation
PurgeMS	SendIdentification
PerformHandover	PrepareHandover
SendEndSignal	ProcessAccessSignalling
ForwardAccessSignalling	PerformSubsequentHandover
PrepareSubsequentHandover	SendAuthenticationInfo
CheckIMEI	SendParameters
InsertSubscriberData	DeleteSubscriberData
Reset	ForwardCheckSS-Indication
RestoreData	

MAP-Operation and Maintenance Operations:

ActivateTraceMode	DeactivateTraceMode
TraceSubscriberActivity	NoteInternalHandover
SendIMSI	

MAP-Call Handling Operations:

SendRoutingInfo	ProvideRoamingNumber

MAP-Supplementary Service Operations:

RegisterSS	EraseSS
ActivateSS	DeactivateSS
InterrogateSS	ProcessUnstructuredSS-Data
ProcessUnstructuredSS-Request	UnstructuredSS-Request
UnstructuredSS-Notify	RegisterPassword
GetPassword	BeginSubscriberActivity

MAP-Short Message Service Operations:

SendRoutingInfoForSM	ForwardSM
ReportSM-DeliveryStatus	NoteSubscriberPresent
AlertServiceCentreWithoutResult	AlertServiceCentre
InformServiceCentre	ReadyForSM

MAP-Errors:

SystemFailure	DataMissing
UnexpectedDataValue	FacilityNotSupported
UnknownSubscriber	NumberChanged
UnknownBaseStation	UnknownMSC
UnidentifiedSubscriber	UnknownEquipment
RoamingNotAllowed	IllegalSubscriber
IllegalEquipment	BearerServiceNotProvisioned
TeleserviceNotProvisioned	InvalidTargetBasestation
NoRadioResourceAvailable	NoHandoverNumberAvailable
SubsequentHandoverFailure	TracingBufferFull
NoRoamingNumberAvailable	AbsentSubscriber
CallBarred	ForwardingViolation
CUG-Reject	IllegalSS-Operation
SS-ErrorStatus	SS-NotAvailable
SS-SubscriptionViolation	SS-Incompatibility
UnknownAlphabet	USSD-Busy
PW-RegistrationFailure	NegativePW-Check
NumberOfPw-AttemptsViolation	SubscriberBusyForMT-SMS
SM-DeliveryFailure	MessageWaitingListFull

GSM Voice and TRAU Analysis (SW258C)
Supports GSM 06.10, 08.60
Drop/Monitor 16 kbit/s GSM channel at 13 kbit/s voice rate to built-in speaker
Selectable subchannel (1 to 4) and timeslot (1 to 31)
Codification RPE LTP at 13 kbit/s
Monitor/Decode/Programmable C1 to C21, T1 to T4 control bits
Frame type decode of 16 kbit/s subchannel (Voice, Data, Idle, O&M, Signalling, Unknown)
Identify Uplink or Downlink direction
Identify 64 kbit/s or 16 kbit/s signalling timeslot
THRU mode, pass E1 & TRAU for all subchannels & Insert record-able encoded 13 kbit/sps voice message
Transmit mode, user definable framing/control bits & Insert recordable encoded 13 kbit/sps voice message
Tx/Rx Test (out-of-service) & in-service monitor
BERT (G.821) on 16 kbit/s subchannel: Bit error/rate, ES, SES, EFS, UAS, LOSS
Send test pattern on 16 kbit/s: 2047, All 1, All 0, Alt 1010

MFR2C/SS5 Analysis & Call Setup (SW259)
MFR2/Compelled
    Conforms to ITU-T Q.400 series standards (MFR2)
    Supports forward and backward call setups
    Talk/listen, send/receive tones, or noise measurement on dialed channel
    Automatic seizure and seizure acknowledgment
    Programmable idle, seizure, and seizure ack CAS (ABCD) states
    Bidirectional MFR2 dial digits decoding with timestamp & CAS (1000 events)
SS5
    Conforms to ITU-T Q.140 series standards
    Supports 2400 Hz, 2600 Hz, 2400+2600 Hz SS5 line signalling
    Call setup with on-line call progress status display
    Talk/listen, send/receive tones, or noise measurement on dialed channel
    Bidirectional SS5 dial digit and control tones decode with timestamp
    Control frequencies decode; SOCOTEL - 1700 Hz, 1900 Hz, AON - 425 Hz, 500 Hz, Echo suppressor/canceller - 2100 Hz

Signalling Emulation (SW261)

10 sets of stored user signalling emulation setups

Each signalling emulation holds up to 50 total events

Programmable send and receive signalling (CAS), digits (MFR2, DP, DTMF), wait and timeout periods

Send period from 0 to 9999 ms, timeout for response from 0 to 9999 ms, program up to 20 digits (MFR2, DP, and/or DTMF)

General

CE mark

Languages: English, French, Italian, Spanish

2 Mbyte Field upgradable PCMCIA memory card

512 kbyte internal NVRAM data buffer

Dynamic memory allocation for protocol analysis

16 lines x 32 character LCD with backlight

Internal Battery: 6-cell NiMH battery pack

Battery operation time: 4 hours nominal (3.5 hours nominal with optional SS251 Datacom Module installed)

Printer/Communication port
    8-DIN, RS232 (V.24) serial port

Text: Standard ASCII scape sequence code

Graphics: Standard Bit-image Graphics Mode (dot matrix)

Remote: VT102 terminal emulation remote control (optional)

Operating Temperature: 0℃ to 50℃

Storage Temperature: -20℃ to 70℃

Humidity: 5% to 90% noncondensing

Size: 10.5 cm x 6 cm x 27 cm

Weight: 1.2 kg (approx)

ORDERING INFORMATION

Test Set

SSE10   SunSet E10 with 75Ω unbalanced BNC (f) connectors. Includes NiMH internal battery, Universal Charger (SS138), Users' Manual (SS257) and Software cartridge.

Alternate connectors may be specified at time of order:

-A   Replace all 75Ω BNC (f) with 1.6/5.6 mm 75Ω unbalanced connectors

-B   Replace all 75Ω BNC (f) with BR2 (f) 120Ω bal connectors

SS251   Datacom Module Includes HDI-30 to DB-37 (f) Adapter Cable, DCE and DTE adapters for V.35, X.21/V.11, RS232/V.24, RS449/V.36; G.703 codirectional Tx/Rx, 3-pin CF

Modularized Datacom

SS251DC   Installs datacom module hardware in E10 (function disabled)

SW251DC   Software for datacom testing (Requires SS251DC)

SS251DCC   Full datacom cables and adapter package. Includes 1 ea. SS306, SS252, SS253, SS254, SS255, & SS256

Software Options

SW100   Remote Control
    Includes printer cable (SS115B) and null modem adapter (SS122A). VT 100/102 terminal emulation required.

SW251   MFR2/DTMF/DP Dialing & Analysis
SW252   VF Noise Measurements
SW253   SS7 Analysis
SW254   ISDN PRI Analysis & Call Setup
SW255   X.50 64 kbit/s Testing
SW257   C-bit Frame Testing
SW258A   GSM A & A-bis Analysis
SW258B   GSM MAP (B...G Interface) Analysis (SW258A required)
SW258C   GSM Voice and TRAU Access
SW259   MFC/SS5 Analysis & Call Setup
SW260   DPNSS/DASS2 Analysis & Call Setup (SW254 required)
SW261   Signalling Emulation
SW2502   2 Mb Software Replacement Cartridge

Accessories

SS101   Carrying Case
SS104B   Cigarette Lighter Battery Charger
SS107   Cable, Dual Bantam to Dual Bantam, 2 m
SS108   Cable, Single Bantam to Single 310, 2 m
SS109   Cable, Single Bantam to Probe Clip 8, 2 m
SS112   Cable, Dual Bantam to RJ-48 (m), 2 m
SS115B   DIN-8 to DB-9 Printer Cable
SS116   Instrument Stand
SS117A   Printer Paper, 5 rolls, for SS118B/C
SS118B   High Capacity Thermal Printer
    Includes cable (SS115B) and 110 VAC charger.
S118C   High Capacity Thermal Printer
    Includes cable (SS115B) and 220 VAC charger.
SS122B   Null Modem Adapter
    DB9 (f) to DB9 (f) with Full Handshaking. Included with Remote Control.
SS122C   Null Modem Adapter
    DB25 (f) to DB25 (f) with Full Handshaking
SS123A   SunSet Jacket. Provides additional weather protection for SunSets (SS123B Carabiner Hook included).
SS130A   19"/23" SunSet Rack Mount-Removable
SS130B   19"/23" SunSet Rack Mount - Permanent
SS138D   SunSet AC Adapter, 100 - 240 VAC, 50/60 Hz input, output 15 VDC @ 2A.
SS139   6-Cell NiMH Battery Pack.   7.2 VDC, 1.8 Ahr
SS210   Conversion Cable, BNC (m) 75Ω to 3-pin banana (m) 120Ω, 2 m
SS211   Cable, BNC (m) 75Ω to BNC (m) 75Ω, 2 m
SS212   Conversion Cable, BNC (m) 75Ω to Bantam 120Ω, 2 m
SS214   3 ea. Female to Female Adapter Plugs
    Changes 3-pin banana male to female
SS217   Cable, 1.6/5.6 mm (m) 75Ω to 1.6/5.6 mm (m) 75Ω, 2 m
SS218   Conversion Cable, 1.6/5.6 mm (m) 75Ω to 3-pin (m) 120Ω, 2 m
SS219   Conversion Cable, BNC (m) 75Ω to BR2 120Ω, 2 m
SS220   Cable, BNC (m) 75Ω to 1.6/5.6 mm (m) 75Ω, 2 m
SS221   Cable, 3-pin banana (CF) 120Ω to 3-pin banana (CF) 120Ω, 2 m
SS223   Cable, BR2 120Ω to 3-pin banana 120Ω, 2 m
SS224   Conversion Cable, BNC (m) 75Ω to 3-pin banana (CF) female 120Ω, 35 cm
SS227   Conversion Cable, BNC (m) 75Ω to probe clips 120Ω, 2 m, Impedance matched
SS252   V.35 DTE (SS252T) and DCE (SS252C) Interface Adapters DB37 to ISO 2593 34 pin connectors

SS253	X.21/V.11 DTE (SS253T) and DCE (SS253C) Interface Adapters DB37 to ISO 4903 DB15 connectors
SS254	RS232/V.24 DTE (SS254T) and DCE (SS254C) Interface Adapters DB37 to ISO 2110 DB25 connectors
SS255	RS449/V.36 DTE (SS255T) and DCE (SS255C) Interface Adapters. DB37 to ISO 4902 DB37 connectors
SS256	G.703 64 codirectional to banana 3-pin Adapter. DB37 to CF 3-pin banana TX and RX connectors
SS257	SunSet E10 User's Manual, English (Spanish, specify SS257SP)
SS257-TM	SunSet E10 Service Manual
SS261	External Clock Input Cable DB-37 to BNC (m) 75Ω
SS262	RS530 DTE (SS262T) and DCE (SS262C) Interface Adapter. DB37 to ISO 2110 DB25 connectors.
SS306	HDI-30 Datacom Cable. HDI-36 to DB37 Interface Cable, 2 m
SSE10W	SunSet E10 Extended 3-Year Warranty