



950RTS Remote Test System



Specifications

DS-1 PCM Interface	Format	DS-1 AMI or B8ZS Line Code
	Framing Format	D4 Superframe, Extended Superframe or SLC-96®
	Input Frequency	1.544 Mbit/s ± 150 bit/s
	Compatibility	D1D, D2, D3/D4, SLC-96®
	Input Impedance	Terminated: 100 Ohms
	Input Level	200 mv to 6 V base-to-peak
	Jitter Tolerance	Exceeds Bell Publication 43802 requirements
	Output Level	3 V ± 0.2 V base-to-peak
	Output Imbalance	Positive and negative pulses are within 0.2 V base-to-peak
	Frame Loss Criteria	Loss of frame occurs when 2 out of 4 frame bits are in error for Superframe & SLC-96®. Loss of frame for ESF occurs when 2 out of 4 FPS bits are in error.
	Alarm Displays	Detects and displays Frame Loss, Carrier Loss, Excess 0s, Yellow Alarm and Blue Alarm

DS-1 Measurements	G.821	M.2100
	Bit Errors	% Severely Errored Seconds
	Bit Error Rate	Failed Seconds
	No Sync	% Failed Seconds
	Error Free Seconds	Available Seconds
	% Errored Free Seconds	% Available Seconds
	Errored Seconds	Unavailable Seconds
	% Errored Seconds	% Unavailable Seconds
	Severely Errored Seconds	Elapsed Test Time

DS-1 BERT	Test Patterns	2 ⁹ -1 (511) 2 ¹¹ -1 (2047) 2 ¹⁵ -1 2 ²⁰ -1 QRSS (2 ²⁰ -1 with zero suppression) 2 ²³ -1
	Stress Patterns	3 in 24 (100010001000000000000000) 1:7 (100000000) 1:1 (1010) All 1s 55 OCTETS Short User (3 - 32 bits) Long User (1 - 2048 OCTETS)
	Loopback	CSU Up/Down
	Error Injection	Single Logic BPVs
	Frame (D4 Mode)	CRC (ESF Mode)
	Test Length	Timed (15 minutes, 1 hour, 24 hours)

DDS

T1 Access to DDS/Switched 56/64 Kbit/s circuits

DS-0A formats (all subrates) + 19.2 Kbit/s

Standard network control and loopback codes
(alternating and latching loopbacks)

Primary and secondary channel (simultaneous)
testing (secondary channel synchronous formats only)

Primary Channel Test Patterns:

$2^{20} - 1$
 $2^{23} - 1$
32767 ($2^{15} - 1$)
2047
511
Short User (1 - 8 bits)
Stress patterns 1/2/3/4/5

Secondary Channel Test Patterns:

63
511
2047

Error injection:

Primary and secondary channel
Single bit
Burst fixed rate
6 bit
2:5 and 3:5 inverted bytes (DS-0A subrate)
DS-0B subrate framing bit

Error/alarm display additions:

DS-0A sync loss
DS-0A block error
Pri/Sec channel bit errors
Received network code

DS-0A block error correction

Fractional T1 Contiguous

N X 56 or N X 64 Kbit

Any combination of channels (1-31) sequential or
nonsequential (only restriction is increasing order)

V.54 CSU loopback codes

Patterns:

511
2047
32767 ($2^{15} - 1$)
 $2^{20} - 1$
 $2^{23} - 1$
Short User (1 - 32 bits)
Long User (1 - 2048 Octets)

Fractional T1 Non-contiguous

N x 56 or N x 64 Kbit

Sage Instruments' Fractional T1 option does *true*
Non-contiguous testing - each DS-0 can have
different delays from the others.

Display of DS-0 sync and error status - the user
does not have to go through each DS-0 individually
to determine which has failed.

Patterns:

511
2047
32767 ($2^{15} - 1$)
Short User (1 - 32 bits)
Long User (1 - 2048 Octets)

Any combination of channels (1-24)

Supervision and Signaling - T1

Supervision

DP, MR and DTMF Sender

Frequency Accuracy

Level

Resolution

Accuracy

Timing

+0.1% of Bell standard frequencies

Automatically adjusted to .7 dBm0 per tone

0.1 dB

+0.2 dB

MF: 70 ms Tone On and Tone Off (KP is 100 ms Tone On)

DTMF: 50 ms Tone On and Tone Off

**Level/Frequency/
Noise**

PCM Channel Encoder			
Analog Tone Generation	20 Hz to 3904 Hz selectable in 1.0 Hz steps		
Tone Level	+3.0 dBm to -50.0 dBm in 0.1 dB steps		
Frequency Response	0.1 dB (20 Hz to 3904 Hz)		
Basic Accuracy	<u>Accuracy</u>	<u>Level</u>	
	0.1 dB	+3.0 dBm0 to -30 dBm0	
	0.2 dB	-30 dBm0 to -40 dBm0	
	0.5 dB	-40 dBm0 to -50 dBm0	
PCM Channel Decoder			
Recovered Analog Tones	20 Hz to 3904 Hz		
Recovered Level	+3.0 dBm to -40.0 dBm (Average and rms)		
Basic Accuracy	0.1 dB with Digital Milliwatt		
	<u>Accuracy</u>	<u>Level</u>	
	0.1 dB	+3.0 dBm0 to -30 dBm0	
	0.2 dB	-30 dBm0 to -40 dBm0	
	0.5 dB	-40 dBm0 to -50 dBm0	
Frequency Response	0.1 dB @ 204 Hz to 3904 Hz with 0 dBm applied.		
Supervision	On-hook and Off-hook supervision.		
Signal-to-Total Distortion	<u>Input</u>	<u>7 5/6 Signaling</u>	<u>CCIS</u>
	0 to -30 dBm0	38 dB	40 dB
	-30 to -40 dBm0	36 dB	36 dB
	-40 to -50 dBm0	32 dB	32 dB
Gain Tracking Error	<u>Input</u>	<u>Maximum Deviation</u>	
	+3.0 to -30 dBm0	0.1 dB	
	-30 to -40 dBm0	0.2 dB	
	-40 to -50 dBm0	0.5 dB	
Intrinsic Noise	10 dBmC (with Idle Code received)		

**Return Loss
Measurement**

General			
Modes	ERL, SRL-Low, SRL-High, or Sinewave (OSC)		
Transmitted Signal	Meets the specifications of Bell Publication 41009 (Tables D, E, and F, page 13) and IEEE Standard P743-1995		
4-Wire Return Loss			
Transhybrid Loss Compensation	- 30 dB to +30 dB		
Transmitter Level	- 10 dBm0 relative to TLP		
Receiver Range	- 10 dB to +50 dB		
Resolution	1.0 dB		
Accuracy	±0.5 dB		

General

AC Power Supply	115/230 VAC ±10%, 50/60 Hz
DC Power Supply (optional)	40 - 56 VDC
Operating Temperature	0° C to 50° C
Storage Temperature	- 40° C to +70° C
Dimensions	28" H x 17.25" W x 12" D
Weight	75 lbs. depending upon options