LUMISTAR

LS-11-M Portable FM, SOQPSK, & CPM Test Transmitter

Data Sheet

Description:

The LS-11-M Portable FM, SOQPSK, and CPM test Transmitter is designed for checkout and troubleshooting of telemetry receivers operating with any of the ARTM modulations (Tier 0, Tier I, or Tier II). Complete ground stations including the antenna with LNA, RF down-converter and multi-mode IF receiver, bit synchronizer, and PCM decommutator can be tested and bit error tests performed. The design allows secure links to be tested with an external encryptor. The Test Transmitter contains an internal PCM Simulator with Pseudorandom generator that operates in a BERT mode when used with a Lumistar LS-50 Decom or LS-24-RTR Range Telemetry Receiver allowing bit error numbers to be displayed through software. Full flexibility also allows the use of the simulator only (without transmitter) or transmitter only with an external source modulating the transmitter. Complete setup can be achieved locally through the local keypad and display or remotely through the RS-232 Interface. Operational parameters include the modulation type, PCM format, transmitting frequency/power level and ext/internal data source. Output power can be selected from -60 to +5 dBm in 5 dB steps. The Test Transmitter contains an internal lead-acid battery and battery charger and will operate for up to 6 hours on a full charge.

Key Features:

- **Hand-held ARTM Tier 0/1/2 test transmitter with internal simulator**
- **Used for checkout and/or troubleshooting of complete RF data links**
- **FM, SOQPSK, and ARTM Multi-H CPM modulator with pre-modulation filtering**
- **Pseudo-random burst generator for BERT mode that allows forced errors**
- **RS-232 programmable for PCM format, transmitter frequency, and output power**
- **Local display and keypad**
- **Memory contains four format capability**
- **Simulator allows common, unique, and waveform words**
- **Output power level control in 5 dB steps from -50 to +5 dBm (nominal)**
- **Available in L-Band, S-Band or C Band**
- **Portable, hand-held, battery or AC power operated**
- **Internal battery charger**
- **Supports data rates from 1 Mbps to 20 Mbps - all IRIG codes**
- **Accepts modulation input from external PCM Encoder or Simulator**
- **On/Off switch, transmitter control switch, and transmitter status indicator**

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LS-11-M Simulator with FM, SOQPSK, & CPM Modulator

Data Sheet

SPECIFICATIONS:

General Specifications	
Form Factor	Zero case: 9" long x 6" wide x 7-1/2" deep with cover
Power Dissipation	Less than 10 watts
Battery Capacity	Up to 6 hours when fully charged
Temperature (Operating)	0 to 50 ^{o}C
Temperature (Non-Operating)	-25 to +70 ^{o}C
Host Interface	RS-232 19200 baud, 8-bit, 1 stop, ASCII without parity. Optional: 600, 1200, 2400, 4800, 9600, 38400, 115200 baud
Input Power (Switchable)	110VAC 60Hz/220 VAC 50 Hz
Transmitter Output Connector	Type N-Female
PCM Simulator Specifications	
Format Selection	Four formats stored in non-volatile memory
Front Panel Outputs	NRZ-L and PCM Data, 0-degree clock & minor frame strobe
Output Levels	Single-ended TTL
PCM Codes	NRZ-L/M/S; Bi-Phase -L/M/S; DM-M/S; M^2, RNRZ-L11/15, k=7 Convolutional Rate 1/2, 1/3
Word Length	Variable from 3 to 16 bits per word on a word-by-word basis
CRC Generator	CRC16/CCITT Forward/Reverse
Minor Frame Length	2 to 8,192 words per minor frame
Major Frame Length	Up to 1024 minor frames per major frame
Bit Order	MSB or LSB-first
Frame Sync Pattern	Up to 256 words (any series of 0s or is 1s may be used)
Major Frame Sync	FCC (FAC), SFID
Common Words	May be a single value or selected from a group of one minor frame
Unique Words	Seven may be programmed in any mainframe, super-commutated, or subcommutated channel
Test Output	32,767-bit PRN pattern
Waveform Words	Five may be programmed to appear in every frame at the same location
Pseudo-random Generator	11 or 15 bit pattern
Forced Error	One per pattern, On or Off
PCM Transmitter Specifications	
RF Bands (Other bands consult Lumistar)	C-Band (4400.5-4949.5 MHz & 5091.5-5149.5 MHz) LS-11-MC S-Band (2200.5-2394.5 MHz.) Model LS-11-MS Lower L-Band (1435.5-1534.5 MHz) Model LS-11-ML Upper L Band (1710.5 – 1849.5 MHz) Model LS-11-MU
Tuning Resolution	0.5 MHz
Carrier Frequency Accuracy	± 2.5 ppm over temperature (± 7.5 ppm over 5 years)
Modulation Type	ARTM Tier 0 (PCM/FM), ARTM Tier 1 (SOQPSK) ARTM Tier 2 (ARTM Multi-hCPM)
Modulation Source	PCM Simulator or Front-Panel input
Output Power	-60 to +5 dBm Max *(approximate)* in 5dB steps
Output Data Rate	1 Mbps to 20 Mbps
Pre-Modulation Filter	Automatic
FM Deviation	Automatic