

LUMISTAR

LS-11-F Portable FM Test Transmitter

Data Sheet

Description:

The LS-11-F portable FM test transmitter is designed for checkout and troubleshooting of telemetry receiving systems operating with FM modulation. For applications with any of the ARTM modulations (Tier 0, Tier I, or Tier II), please refer to the LS-11-M Data Sheet. Complete ground stations including the antenna with LNA, RF down-converter, 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 Data Simulator and Pseudorandom pattern generator that operates in a BERT mode. The device provides simulated clock and data (without transmitter enabled) and accepts external data for modulating the internal transmitter. Complete setup can be achieved locally through the keypad and two-line LCD display or remotely through the USB Interface. Operational

parameters include the PCM format parameter database information (frame sync patterns, wavewords, etc...), pre-modulation filter selection, transmitter carrier frequency, transmitter deviation, and output power level. Output power can be selected from approx. -60 to +5 dBm in 5 dB steps. The Test Transmitter contains a LiFePO₄ Battery (Lithium Iron Phosphate), which provides higher energy density at 1/4 the weight of legacy lead-acid batteries. The unit also provides an internal battery charger and will operate for up to twelve hours on battery power having received on a full charge.

Key Features:

- Small lightweight FM test transmitter with internal simulator
- Used for checkout and/or troubleshooting of complete RF data links
- Fully Programmable through USB for PCM format, pre-modulation filter, transmitter frequency, transmitter deviation, and output power
- Local 2 Line LCD Display and Keypad for Control and Status
- Up to four internally stored configurations available for quick local recall
- PCM simulator allows for common, unique, and waveform words
- Pseudo-random data generator for BERT mode and allows for adding forced errors
- Output power level control in 5 dB steps from -60 to +5 dBm (nominal)
- Standard bands are lower L-Band or S-Band (other bands are optional)
 - One band per unit
- Operational using AC power or battery, hot swappable
- Internal battery charger
- Supports data rates to 25 Mbps NRZ-L
- Accepts data from external PCM Encoder or Simulator for modulation
- Master On/Off switch, Transmitter control switch, and Transmitter on/off indicator

LS-11-F Simulator with FM Modulator

Data Sheet

Specifications	
Temperature (Operating)	0 to 50 °C
Temperature (Non-Operating)	-25 to +70 °C
Weight	Under 9 pounds (4.1 kg)
Size	6" (L) x 9" (W) x 7.5" (H)
Host Interface	USB
Input Power (Switchable)	110 VAC 60Hz or 220 VAC 50 Hz
Battery/Charger:	LiFePO4 (Lithium Iron Phosphate), internal charger
Transmitter Output Connector	Type N-Female, optional SMA
PCM Simulator Specifications	
PCM Format Selection	Four PCM format definitions in non-volatile memory
Front Panel Outputs	NRZ-L and PCM Data, 0-degree clock & minor frame strobe
Output Levels	Single-ended TTL
Output Data Rate (transmitter)	150 Kbps to 25 Mbps (NRZ codes)
Output Data Rate (simulator)	10 bps to 25 Mbps (NRZ codes)
PCM Codes	NRZ-L/M/S; Bi-Phase \square -L/M/S; DM-M/S; M2, RNRZ-L11-29
Common Word Length	Variable from 3 to 16 bits per word on a word-by-word basis
Viterbi (optional)	k=7 Convolutional Rate 1/2, 1/3
CRC Generator	CRC16/CCITT Forward/Reverse
Minor Frame Length	3 to 16,383 words per minor frame
Major Frame Length	Up to 1024 minor frames per major frame
Bit Order	MSB or LSB-first
Frame Sync Pattern	3 to 64 bits, Leads or Trails
Sub-frame Modes	FCC, SFID, NONE
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 sub commutated channel
Waveform Words	Five may be programmed to appear in every frame at the same location
Pseudo-random Generator	2^{11} or 2^{15} PRN bit pattern, plus one Forced Error per Pattern
PCM Transmitter Specifications	
RF Bands	S-Band (2200-2400MHz.): Model LS-11-FS L-Band (1435-1540 MHz): Model LS-11-FL
Tuning Resolution	0.5 MHz
Modulation Type	Wideband FM
Modulation Source	PCM Simulator/PRN or Front-Panel input
Output Power	-60 to +5dBm Max (<i>approximate</i>) in 5dB steps
Spurious Outputs	<50 dBc
Pre-Modulation Filter	Four selectable 4-Pole Bessel Filters with standard cutoffs at 0.5 MHz, 1 MHz, 2.5 MHz, 5MHz. Other cutoffs may be specified on order
FM Deviation	Up to 7MHz

