

# LUMISTAR

## LS-11-M3 Portable Multimode Test Transmitter

### Data Sheet

#### Description:

The LS-11-M3 is Lumistar's third generation portable multi-mode test transmitter. The unit is designed for checkout and troubleshooting of telemetry receiving systems operating with FM, SOQPSK and Multi-H CPM modulation formats. Complete ground stations including the antenna with LNA, RF down-converter, IF receiver, bit synchronizer, and PCM decommutator can be tested with bit error rate tests or real time framed data presented via TM displays. 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 provides PRN patterns. 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 touch screen display. The unit can be controlled remotely through the USB Interface.



Operational parameters include the PCM format parameter database information (frame sync patterns, wavewords, etc...), transmitter carrier frequency, and output power level. Transmitter deviation in FM is automatically controlled to be in accordance with the IRIG Standard (0.35 peak). 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 comes with 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 Multi-mode Rf Test Transmitter with Internal Simulator
- Used for checkout and/or troubleshooting of complete RF data links
- Fully Programmable through USB for PCM format, transmitter frequency, and output power
- Local Touch Screen for easy manual 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/upper L-Band, S-Band, C band (other bands are optional)
  - Up to five bands available in a single unit (Model Number: LS-11-M35B)
- 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 of transmitter
- Master On/Off switch, Transmitter control switch, and Transmitter on/off indicator

# LS-11-M Simulator with Multi-Mode Modulator

## Data Sheet

<b>Specifications</b>	
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
<b>PCM Simulator Specifications</b>	
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 □-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 <sup>11</sup> or 2 <sup>15</sup> PRN bit pattern, plus one Forced Error per Pattern
<b>PCM Transmitter Specifications</b>	
RF Bands	S-Band (2200-2400MHz.): Model LS-11-M3S L-Band (1435-1540 MHz): Model LS-11-M3L 5 Band: (1435-1540/12200-2400/ 4400-4940/5091-5250 MHz)
Tuning Resolution	0.5 MHz
Modulation Type	ARTM Tier 0, 1, 2 (PCM/FM + SOQPSK + Multi-H CPM)
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	Automatically selected by Software
FM Deviation	Automatically selected to 0.35 peak

