Lumistar LS-68-M Data Sheet

Multi-Channel PCM Processing and Recording System with UDP Streaming

The Lumistar LS-68-M Modular Multi-Channel processing and recording Telemetry Processing System offers an ultra-small, low-cost, high-performance, multi-channel COTS solution for PCM data synchronization, decommutation and simulation applications. Building on the legacy of the Lumistar LS-45, LS-50, LS-55 and LS70 series of products, the LS-68-M enhances the feature sets of each of these product lines and supplies them in a format requiring no hardware drivers in an "OS-less" environment. The LS-68-M utilizes a high-speed Gigabit Ethernet interface for primary controls and data streaming.

The LS-68-M employs the most current sophisticated Digital Signal Processing (DSP) technologies. In essence, the LS-68-M acts as a configurable network device offering three real-time UDP network streaming ports that can support a multitude of PCM Frame Synchronizer/Decommutator and Real-Time PCM Simulator combinations. Licensing options allow the user to utilize the processing platform in a configuration containing three PCM Frame Synchronizer/Decommutators for one application and then redefine the same platform for a different application needing two PCM Frame Synchronizer/Decommutators along with a single Real-time PCM Simulator.

The LS-68-M supports up to three PCM frame synchronizers, up to two "real-time" PCM Simulators, and an IRIG/1PPS/PTP time synchronization engine. PCM Frame Synchronizer/Decommutators are IRIG 106 Class I and II compliant. Data can be supplied to the processing platform as single-ended or high-speed differential clock and data inputs. The resulting data can be streamed via IPv4 UDP data packets. If the user requires analog PCM inputs, the LS-68-M can offer up to two fully AGC / baseline controlled PCM bit synchronizer channels with software selectable input impedance.

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The LS-68-M can also provide a very powerful "real-time" PCM simulation capability. This interface allows data to be streamed to the unit which will then serialize and transmit the PCM after output encoding the data. This functionality can be used for replaying archived data as well as adding the ability for a host of data modification processes.

The LS-68-M contains an IRIG, 1PPS and PTP (IEEE-1588) time synchronization reader to time-tag incoming data. The time reader can synchronize IRIG A, B and G formats. Included as a standard feature is an IRIG and 1PPS generator for occasions where one or more LS-68-Ms are being used in locations where a time source may not be available. There is an optional battery backed Real-time clock and calendar option available for those who want to have relative time adherence even in environments where no such source exists.

The LS-68-M can be equipped with optional on-board data storage for each of the defined channels. In the case that the channel has been defined as a Frame Synchronizer/Decommutator this storage will be used to record real-time data for post event download. In the case that the channel has been defined as a PCM simulator, this on-board storage can be uploaded with a playback file and the onboard firmware will play the resulting file as a simulated PCM stream.

SPECIFICATIONS:

Synchronizer/Decommutator:

Single channel is standard. Up to two additional channels are optional. Each channel utilizes and available UDP network port.

Frame Synchronizer:

Date Rate: up to 50Mbps (NRZ)
Frame Sync Pattern (FSP): 7 to 64 bit
FSP Polarity: Normal, Inverted, Auto
FSP Window: selectable tolerance
FSP BER: Programmable tolerance
Input Sources: SE TTL, Differential RS422+, Bit Sync *(optional)*

Decommutator:

IRIG Class I and II
Variable Word Length: 3 to 16 bits
Minor Frame Length: 3 to 65536 Words
Major Frame Length: 1 to 65536 Minor Frames
Bit Order: MSB or LSB
Frame Sync Location: Leads, Trails
Sub Frame Sync: FCC, FAC, SFID, URC

PCM Bit Synchronizer *(optional)*:

Channels: Up to 2; one per decom
Bit Rate: Up to 50Mbps (NRZ), 25Mbps (Non-NRZ)
Inputs per channel: SE1, SE2, Differential, Simulator
Single-Ended (SE) Terminations: 50, 75, 110, 1K Ohm; SW select
Differential Terminations: 110, 5K Ohm; SW select
Input Range: +/-0.1Vpp to +/-10Vp-p

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Input Baseline Offset: +10V – (Vpp/2) to -10V + (Vp-p/2)
PCM Input Codes: NRZL-L/M/S, BIO-L/M/S, RZ, DM-M/S, M2-M/S
Randomized Codes: 2^11-1, 2^15-1, 2^17-1, 2^23-1

Time Synchronization:

Standard Features: IRIG, 1PPS Reader/Generator; PTP reader
Time Tag Formats: BCD or Seconds of Year (SOY)

Time Reader:

Input Sources: External IRIG, IRIG Generator, 1PPS, PTP
IRIG Formats: A, B and G; selectable codes
1PPS Input: TTL Logic Level *(Optional: LVTTL)*
PTP: IEEE-1588 Precision Time Protocol (PTP)
Input Impedance: 100 ohms, >10K; SW select
Input Rate Selection: 0.5x, 1x, 2x

Time Generation:

Output Sources: IRIG, 1PPS (TTL)
IRIG Formats: A, B and G; selectable codes
Output Rate Selection: 0.5x, 1x, 2x
Battery backed Real-Time Clock/Calendar *(optional)*

BERT:

One transmission/reception BERT for each Frame Synchronizer
PRN 2n-1 Patterns: 3, 4, 5, 6, 7, 9, 10, 11, 15, 17, 18, 20, 21, 22, 23
Other patterns: All 0's, All 1's, Alternating 1's and 0's, User Defined

PCM Simulation:

Single "Simple" PCM Simulator per Decommutator channel (default), Up to two "Real-time" capable simulators (each requires a UDP channel)
Data Rate: Up to 50Mbps (NRZ), Functionality:
Matches that of the Decommutator
Baseband PCM Outputs: "Real-time" Simulator Only
Baseband Filtering: 0.125, 0.25, 0.5, 1, 1.5, 2, 2.5, 3, 4, 6, 8, 10, 15, 20, 35MHz, Baseband Output Level: SW controlled
PCM Output Codes: NRZL-L/M/S, BIO-L/M/S, RZ, DM-M/S, M2-M/S
Randomized Codes: 2^11-1, 2^15-1, 2^17-1, 2^23-1

Interfaces:

Interfaces Provided: Ethernet, USB2.0, RS232

10/100/1000Mbps Ethernet Interface; Command/Status/Streaming
Protocols: IPv4, UDP, TCP, ARP, ICMP, IGMP, HTTP
Multicast Support: Yes

USB 2.0: Command/Status Only
Serial RS232: Command/Status Only

On-board Storage:

(Optional)

32GB per channel; 9 hours at 8 Mbps
(*Future upgrades to 512GB per channel*)

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Environmental:

Operational Temperature:	-20 to +70 Celsius
Storage Temperature:	-40 to +85 Celsius
Operating Humidity:	0 to 90% (Non-condensing)
Storage Humidity:	Protect from excessive moisture and contamination
Operational Scenario:	Ground, Mobile, or Airborne

Physical and Power:

Size:	4 x 6 x 1.13 Inches
Weight:	1.1 lbs / 0.5Kg
Case Materials:	T-6061 Aluminum
Power Source:	+9 to +42VDC; 20 Watts typ. *(mode dependent)*
Monitoring:	Continuous Temperature, Voltage and Current

Ordering Information:

Model Number Examples:

LS-68-M1	
LS-68-M2	Dual Channel PCM "Real-time" Simulator
LS-68-M3	Single Channel PCM Frame Synchronizer/Decommutator
LS-68-S1	with "Real Time" Simulator
LS-68-S2	
LS-68-M1S1	

Other Options:

Single Bit Synchronizer Channel:
Dual Bit Synchronizer Channel:
Viterbi Decoding:
Reed-Solomon Decoding
Data Archive Storage:

This is a partial list of all possible options. Pricing is dependent upon the selection of options. Please consult Lumistar Sales to define the exact model required.

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