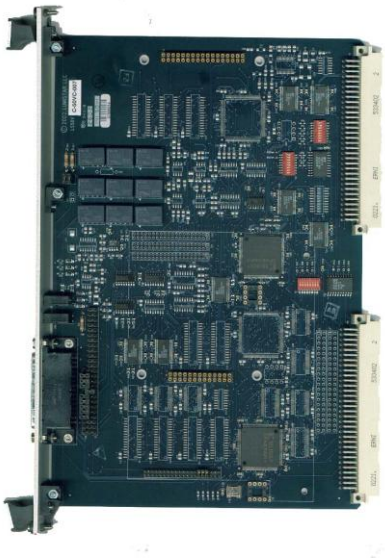
# LUMISTAR

## LS-50-V VME Multi-function PCM Decommutator

### Data Sheet

## Description:

**The Lumistar LS-50-V VME Multi-function PCM Decommutator offers the greatest flexibility in the industry by incorporating up to 10 functions typically encountered in test applications in a single VME card slot. Five functions are accomplished on the main board and additional functions are achieved through the use of low-profile daughter-boards. The main VME board shown below contains a PCM Simulator which can also operate as a BERT, PCM Decommutator, IRIG Time Code Reader, and IRIG Time Code Generator. Two unique daughter-boards are accepted by the LS-50-V but only one can be used at a time due to the physical size of the VME board. One of these is the LS-40-DB-10, LS-40-DB-20 or LS-40-DB25 *Bit Synchronizer Daughterboard*, and the other the LS-55 *Multi-function Decom Daughterboard*. The LS-40-DB accepts PCM inputs up to 10 or 25 Mbps (depending on the model selected) and corrects for corruption by noise, phase jitter, amplitude modulation, or baseline variations. The LS-55-DB allows the addition of a second multi-function board with 5 additional functions, including second decom, second simulator with BERT capability, time code reader, time code generator.**



**The IRIG Time Code Reader and Generator operate with IRIG A, B, or G time code formats. The Time Code Generator creates and outputs time information in accordance with IRIG Time Code Standards. The Time Code Reader is typically used to insert time information into the PCM minor frame block of data. The Lumistar LS-50 Decom can be used for extremely large formats (16,383 words per minor frame by 1,024 frames deep) and contains dual ping-pong data buffers with 128K bytes of memory. When used with the LS-55-DB, the second decom can be used for an independent PCM data stream or an embedded data stream in accordance with the IRIG-106 Standard. The PCM simulator generates common, unique, and waveform pattern data words. When used with the LS-55-DB daughterboard, the user can also generate complex data streams with embedded PCM data, or two totally independent data streams.**

## Key Features:

- **Multifunction PCM Decommutator – up to 10 functions in single VME card slot**
  - **PCM Simulator with BERT Mode**
  - **PCM Decommutator**
  - **IRIG Time Code Reader and IRIG Time Code Generator**
  - **Bit Error Tester**
- **Accepts LS-55-DB Multi-function Decom Daughterboard**
- **Accepts LS-40-DB Bit Synchronizer Daughterboard**

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## SPECIFICATIONS:

### *PCM DECOMMUTATOR:*

| | |
|---|---|
| Input Data Rate | 10 bps to 20 Mbps |
| Input Signals | NRZ-L data & 0 degree clock |
| Input Levels | Single-ended TTL & RS-422 |
| Word Length (VWL) | Variable from 3 to 16 bits per word on a word-by-word basis |
| CRC checker | CRC16/CCITT |
| Minor Frame Length | 2 to 16,383 words per minor frame |
| Major Frame Length | Up to 1024 minor frames per major frame |
| Bit Order | MSB or LSB-first (word-by-word basis) |
| Frame Sync Pattern | Up to 64 bits (any pattern with don't care bits (X) may be used) |
| Frame Sync Location | Beginning or end of the frame |
| Frame Sync Strategy | Adaptive mode (search-lock-verify) & burst mode (search-lock) |
| Sync Error Tolerance | 0 to 15 bits (selectable) |
| Sync Slip Window | 1 or 3 bits wide (selectable) |
| Data Polarity | Normal, inverted or automatic |
| Subframe Sync | FCC (FAC), SFID or URC (Optional) |
| URC Location | Any 64 bit window within the first minor frame not including the last bit in the minor frame |
| SFID Location | Any series of contiguous bits not including the last bit in the minor frame |
| System Output | Buffered output with status, time, & data |

### *IRIG A/B/G READER/GENERATOR:*

| | |
|---|---|
| Time Reader Input Format | IRIG A, B, or G |
| Input signal level | 1V p-p nominal |
| Latency | 2µsec (maximum) |
| Data Outputs | Automatic time tags for PCM data blocks (time accessible in register space) |
| Time Generator Output | IRIG A, B, or G |

### *BERT: (Requires bit sync user SW)*

| | |
|---|---|
| Pseudo-random patterns | 11 and 15 bit |
| Bit Error Rate | Would be indicated on Software |
| Error Count | Would be indicated on Software |
| Forced Error Capable | Yes |
| History Log | Would be indicated on Software |

### *PCM SIMULATOR:*

| | |
|---|---|
| Outputs | Data, 0 degree clock & minor frame strobes |
| Output Levels | Single-ended TTL & RS-422 |
| Output Data Rate | 64 bps to 20.0 Mbps (NRZ codes)<br>64 bps to 10.0 Mbps (all other codes) |
| PCM Codes | NRZ-L/M/S, BIϕ-L/M/S<br>DM-M/S, RNRZ-L ($2^{11}$-1, $2^{15}$-1) |
| Word Length (VWL) | Variable from 3 to 16 bits per word on a word-by-word basis |
| CRC Generator | CRC16/CCITT |
| Minor Frame Length | 2 to 16,383 words per minor frame |
| Major Frame Length | Up to 1024 minor frames per major frame |
| Bit Order | MSB or LSB-first on a word-by-word basis |
| Frame Sync Pattern | Up to 64 bits (any series of 0s or is 1s may be used) |
| Sub-Frame Sync | FCC (FAC), SFID & URC;<br>URC location may be any 64 bit window within the first minor frame not including the last bit in the minor frame |
| Common Words | May be a single value or selected from a group of one minor frame or 2048 words whichever is less. Data may be changed while operating. |
| Unique Words | Seven may be programmed in any mainframe, super-commutated, or subcommutated channel. Data may be changed while operating. |
| Waveform Words | Five may be programmed to appear in every frame at the same location. Data may be changed while operating. |

### *MECHANICAL:*

| | |
|---|---|
| VME Decom Form Factor | 6U |
| Daughterboard Form Factor | LS-40-DB for Bit Synchronizer<br>LS-55 for Universal Daughterboard |

### *ENVIRONMENTAL:*

| | |
|---|---|
| Temperature (Operating) | 0 to 50 $^{o}$C |
| Temperature (Non-Op) | -25 to +70 $^{o}$C |
| Humidity (Operating) | 10% to 90% Non-Condensing |
| Humidity (Non-Op) | Packaging must prevent contact with moisture and contaminants |
| Special Handling | Standard ESD methods required |

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 ***10-26-10***