40 Mbps PCM Bit Synchronizer

MBS-740

KEY FEATURES

- 3U rack-mount houses 1 to 4 PCM bit synchronizers
- Selects any center frequency to within 0.1% at 100 bps to 40 Mbps for NRZ codes and to 30 Mbps for bi-phase codes
- BER within 1.0 dB of theoretical over the entire operational range
- Second-order phase-locked loop extracts a stable clock from noisy and distorted input signals
- Provides fast acquisition of new signals and retention during temporary signal dropouts
- Automatic gain and offset controls track amplitude and offset variations and rapidly adapt to signal changes
- Easy-to-use menu-based setup from front panel touch-screen LCD
- Large signal lock indicators provide visible status from across the room
- Randomizing and derandomizing, forward or reverse sequence
- Web-based and local touch-screen interfaces for setup and control
- Includes SOA enabled API for cross platform software integration
- Configurable via standard browser

OVERVIEW

The MBS-740 PCM Bit Synchronizer is L-3's eighth generation external PCM bit synchronizer. It is part of a family of high-performance PCM telemetry products we have designed to provide high-speed bit and format synchronization with flexible data processing, distribution, display, and remote configuration capabilities.

PERFORMANCE

The MBS-740 provides a tunable bit rate capability with BER performance within 1.0 dB of theoretical over its full operating range of 100 bps to 40 Mbps for IRIG standard NRZ codes or to 30 Mbps for bi-phase codes. Accurate bit synchronization can be attained on data contaminated with noise and perturbations generally within 100 bits NRZ average acquisition (200 bits bi-phase). Outputs of clean serial NRZ-L data and synchronous clocks are provided at the rear panel BNC connectors of each bit synchronizer.

APPLICATIONS

Our MBS-740 performs input signal conditioning, bit synchronization, data reconstruction, code conversion, clock generation, and output conditioning to provide clean, synchronous serial data and clock signals. A self-contained PC-based rack-mount chassis houses from 1 to 4 bit synchronizer modules. Each bit synchronizer may be setup from the front panel using the touch-screen LCD display or remotely using Ethernet and standard browser, accessible via rear panel connectors on the chassis.

TECHNOLOGY

The MBS-740 is based on L-3's industry-leading PMC Bit Synchronizer, which has been successfully fielded in hundreds of installations in both PC and VME configurations worldwide. Mounted onto standard PCI carrier boards in a PC-based 3U rackmount chassis, these independent mezzanine modules form the basis of a precision test instrument ideal for lab test, bench test, systems integration, and operational telemetry acquisition requirements. SOA enabled design provides remote software interface, as well remote configuration capabilities.

Telemetry & RF Products

40 Mbps PCM Bit Synchronizer

MBS-740 SPECIFICATIONS

BIT SYNCHRONIZER

Inputs

PCM	2 single-ended, 1 differential (RS-422) per installed Bit Sync
IRIG Code Formats	NRZ-L/M/S, RNRZ-L, BiΦ-L/M/S
Derandomizer	Forward or reverse sequence =2n-1 (n = 11, 15, 17)
Bit Rate (all codes)	100 bps to 40 Mbps (NRZ codes) 100 bps to 30 Mbps (Bi-phase codes)
AC Offset	Up to100% of signal amplitude at sinusoidal frequencies up to 0.05% of bit rate
Signal Range	0.2 to 10V peak-to-peak
DC Common Mode Max	±6V (75 Ω impedance) ±10V (10 K Ω impedance)
Impedance	10 K Ω (High) or 75 Ω (Low), programmable for single ended inputs (SRC1 or SRC2) 100 Ω for differential input

Performance

Bit Error Rate	Within 1.0 dB of theoretical
Loop Bandwidth	0.1%, 0.2%, 0.4%, 0.8%, 1.6%, programmable
Acquisition Range	±2 x LBW @ Eb/No ≥ 12 dB
Acquisition Time (avg.)	NRZ: ≤ 100 bits @ Eb/No ≥ 12 dB BiΦ: ≤ 200 bits @ Eb/No ≥ 12 dB
Sync Retention (flywheel)	Sync will be maintained for at least 128 bits at 0.1% LBW @ Eb/No ≥ 12 dB
Sync Threshold	Eb/No ≥ 0 dB at 0.1% LBW
Tracking Range	±3 x LBW @ Eb/No ≥ 12 dB

Outputs

Clock & Data	TTL level, 50 Ω min. load
Data Format	NRZ-L
Data Polarity	Normal & inverted
Clock Phase	0°, 180°
Tape	TTL level, 50 Ω min. load
Codes	NRZ-L/M/S, RNRZ-L, BiΦ-L/M/S
Randomizer	Forward or reverse sequence = 2n-1 (n = 11, 15, 17)
Data Polarity	Normal & inverted

Functions

Bit Synchronizer Type	Second-order phase-locked loop
Tuning Resolution	0.1%
Programming Resolution	0.1% of bit rate
Status to Host (or display)	Bit Sync Lock, Signal Detect

Options (contact factory)

Input Codes	RZ, DM-M/S, M^2
Soft Bit Decisions	3 bits
Alternate Symbol	
Inversion FEC Modes	None, Standard, 171-Inverted
Randomizer/Derandomizer	n = 20, CCITT Recommendation V.35

CHASSIS

Front Panel Control

Display	Touch-screen LCD

Remote Control

SOA API	SOAP-based API for remote software control via Ethernet
Web Application	Configuration GUI accessible via Ethernet

Setup Formats

Storage	Disk Storage
Quantity	Limited by available disk space
Selection	Touch-screen LCD

Operating Environment

Temperature	0 to 50°C
Relative humidity (non-condensing)	95%

Physical Characteristics

Voltage	100-240 VAC, automatic selection
Frequency	50-60 Hz
Power consumption	100 watts
Rack-mount option	RETMA rack slides (length 22")
Height	5.25" (13.37 cm), 3U
Width	19" (48.4 cm)
Depth	23.5" (59.7 cm)
Weight	Less than 35 lbs

Compatibility

L-3's standalone bit synchronizer software (included)

Ordering Information

MBS-740-C	PCM Bit Sync Chassis
MBS-740-S	PCM Bit Sync Modules (up to 4 per chassis)

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ML612 Rev A 7/09