

Ground Systems

Bit Synchronizer Board

BSM720-PC



- 20 Mbps
- Locks onto a signal within 10 data transitions
- BER performance within 1.0 dB of theoretical
- Digital design requires no calibration
- Optional Viterbi Forward Error Correction (FEC) decoder and convolutional encoder
- TTL or RS-422 inputs
- Code converter to convert any input code to any output code

L-3's Bit Synchronizer creates a clock synchronized to a PCM data input stream and conditions the input stream, outputting a clean NRZ-L signal. The board supports data rates of up to 20 Mbps and can be supplied with an optional Viterbi decoder (BSM720-PC-V).



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BSM720-PC Specifications

Inputs

IRIG code formats	.NRZ-L, M, S; BiΦ-L,M,S; DBiΦ-M,S; DM-M,S; RZ; RNRZ-L; M2-M,S
Bit rate	.NRZ codes 10 bps–20 Mbps Other codes 10 bps–10 Mbps

PCM Data:

Single-ended	.Two separate BNCs
RS-422	.DB-25 to triax
AC offset	.Up to 100% of signal amplitude at frequencies up to 0.1% of bit rate
DC offset	.±20V @ high impedance; ±8V @ low impedance
Impedance	.Single-ended: 10 kΩ or 75 Ω, < 50 pf nominal
Usable input range	.0.25 to 20V peak-to-peak

Outputs

DB-25 Connector (TTL or RS-422):

NRZ-L	.Data in NRZ-L format
Clock	.NRZ-L data and clock: 0°, 90°, 180°, or 270°
Tape	.User selects analog tape output in any of the above IRIG formats
Convolutional encoder	.Rate 1/2 or 1/3, K=7

Functions

Bit decisions and synchronization	.Output clock and data to PCM decommutator
IRIG code conversion	.Output to analog tape or other external equipment through rear panel connector
Detector type	.Integrate/Dump or Filter/Sample
Tuning resolution	.0.1%
Track range	.0.1 to 15.0% adjustable in 0.1% increments
Capture range	.±(½ track range + ¼ loop bandwidth)
Loop bandwidth	.Selectable to 0.1, 0.3, 1, 2 or 3%

Bit Error Rate:

NRZ codes	.Within 1.0 dB of theoretical up to 5 Mbps; within 1.5 dB up to 10 Mbps; within 2.0 dB up to 20 Mbps
All other codes	.Within 1.0 dB of theoretical up to 2.5 Mbps; within 1.5 dB up to 5 Mbps; within 2.0 dB up to 10 Mbps
Acquisition time	.Within 10 data transitions, NRZ-L, SNR ≥ 15 dB, LBW = 3%, TR = 10%
Minimum transition density	.3.12% with input 8 dB SNR
Sync threshold	.Minimum SNR for sync acquisition is 0 dB for transition density ≥ 50%
Viterbi BER improvement	.5.2 dB @ 10-5 BER, rate ½; 5.5 dB, rate 1/3

Flywheeling with Continuous 1s or 0s

NRZ codes	.Sync is maintained through strings as long as 512 bits once every 2,047 bits
Other codes	.Indefinite after sync is achieved
Conditions	.SNR ≥ 12 dB; LBW = 0.1%, track range = 0.5%; no jitter, AM, or baseline perturbations; ≤ 0.1% difference between the programmed bit rate and input frequency

Flywheeling with Data Dropouts

NRZ codes	.Sync is maintained through dropouts as long as 512 bits once every 2,047 bits
Other codes	.Sync is maintained through dropouts as long as 128 bits once every 2,047 bits
Conditions	.SNR ≥ 12 dB; LBW = 0.1%, track range = 0.5%; no jitter, AM, or baseline perturbations; ≤ 0.1% difference between the programmed bit rate and input frequency

Power

+5V supply	.2.0 A typical ±5% with Viterbi; 1.7 A typical ±5% without Viterbi
+12V supply	.110 mA typical ±5%
-12V supply	.250 mA typical ±5%

Physical Characteristics

Mechanical	.ISA-compatible card; requires one ISA slot
Size	.¾ length
Operating temperature	.0° to 55° C
Relative humidity	.< 90% (non-condensing)

Compatibility

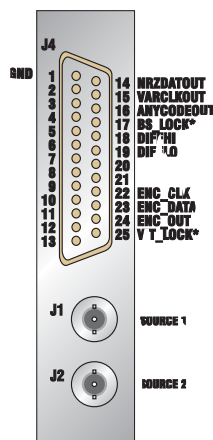
VTS Software	
Windows 2000, XP	

Ordering Information

BSM720-PC	.ISA Bit Synchronizer (20 Mbps)
BSM720-PC-V	.ISA Bit Synchronizer (20 Mbps) with Viterbi Decoding

Connector Pin Assignments

Single-ended input is through two standard BNC connectors at the computer's rear panel. RS-422 input and other I/O is through the DB-25 connector. A matching DB-25 cable makes RS-422 available on triax and other signals on BNC connectors. Outputs are switchable between TTL or RS-422.



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