

Single/Dual PCM Bit Sync Card

MODEL 1631AP

ACROAMATICS
TELEMETRY SYSTEMS



KEY FEATURES

Compact PCIe card format

Supports Self-Test and Link Validation features

Remote Software Setup and Status GUI

Processes All IRIG Codes Set-up & Operations Software

Windows 10/11 or LINUX RHL
BERT/PRN BER Link Test Mode
Status Utilities support
management of up to 64 bit sync channels in a distributed network environment
Saved Set-ups for Rapid Loading and Mission Readiness
API Supports Rapid Customer Interface Development

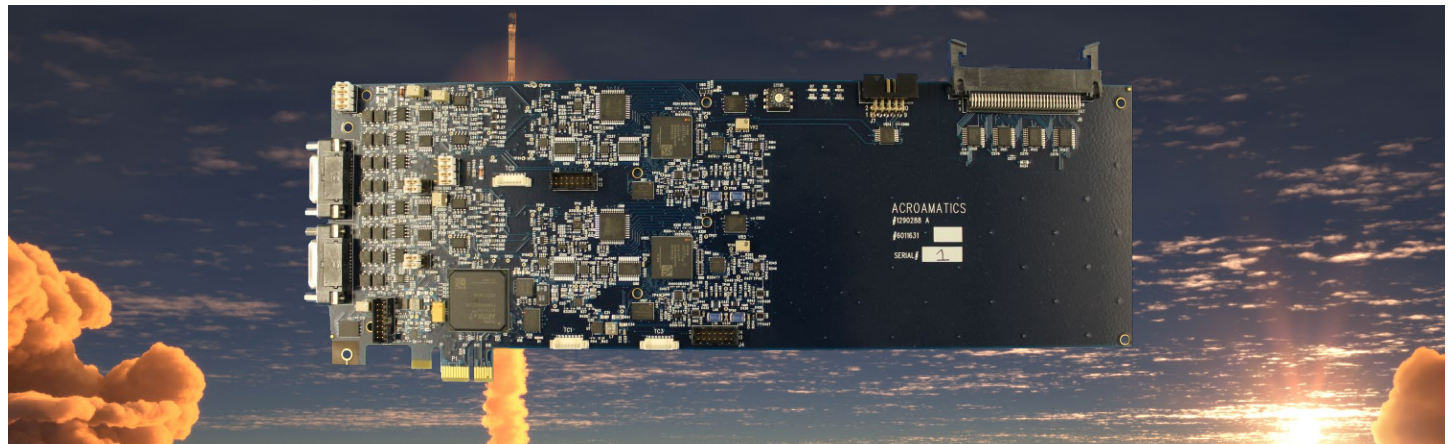
Two Independent Bit Syncs

PCIe Dual Decom

GENERAL DESCRIPTION

GUI Setup and Operation status of all Acroamatics Bit Synchronizers are controlled via a single interface, with drop down menus for individual cards. Software automatically recognizes all available bit synchronizers, as well as their features. Up to 20 unique setups are stored and available for instant bit sync configuration to up to 64 individual bit sync channels. The 1631AP Advanced PCM Bit Sync is a state-of-the-art compact PCIe card format dual channel design that provides a cost effective and modular high quality bit sync add-on to Acroamatics entire line of single slot PCI single card TM processing card products.

The 1631AP is compatible with both existing PCI legacy and our latest PCIe telemetry card components. Based on our 3rd generation bit sync design, it shares the latest techniques in FIR filtering, digital phase-locked loop, NCO clock reconstruction, and digital amplitude and offset control with its compact mezzanine cousin, the Model 1631AP. Incorporating a leading-edge FPGA, this modern design delivers a significantly reduced parts count, improved reliability, and expanded capabilities - including options normally found only in box level and multi-card bit sync/ encoder designs. The 1631AP supports self-test and link validation features such as Frame Sync Pattern Verification and BERT, and includes Viterbi and Convolutional encode/decode, randomization and related feature support.



RELATED PRODUCTS

Bit Sync	ADAT	Telemetry Data Processor	Recorder

Single/Dual PCM Bit Sync Card

MODEL 1631AP

TECHNICAL SPECIFICATIONS

Signal Inputs (Per Bit Sync)

Sources: Four (4) Inputs, Operator Program selectable, per Bit Sync Channel . 1-3 single-ended, # 4 Differential

Isolation: Greater than 60dB at 20MHz
Impedance : Program selectable: Hi-Z/Lo-Z. Single Ended: 4k Ω /75 Ω (std) or differential : 150 Ohm or Hi-Z (opt)
Signal Level: 0.2 to 20V p-p, Single-ended. Differential: 0.2 to 10V p-p, Differential (optional)
DC Offset: 20V max, Single-ended Hi-Z or 15V Max @ 75 Ω .

Baseline Variation: Tracks sinusoidal offsets to 100% p-p signal amplitude at 0.1% bit rate
PCM Codes: Program selectable: NRZ-L/M/S, Bi ϕ -L/M/S, DBi ϕ -M/S, DM-M/S, MDM-M/S, RZ
Derandomizer: Program selectable: RNRZ 9/11/15/17/23, forward/reverse

Synchronization

Bit Rate Range: 8 bps - 40 Mbps, All PCM Codes
Tuning Resolution: 0.1% of bit rate
Capture Range: 3 times the programmed loopwidth, typical
Tracking Range: \pm 12% typical, with programmable limiter
Loop Bandwidth: 0.1% to 3.2%, program selectable in 0.1% increments
Sync Threshold: 0dB for NRZ-L and Bi ϕ -L codes
Sync Maintenance: (LW=0.1%) -2dB NRZ-L and Bi ϕ -L codes
Sync Acquisition: (LW=1.6%, SNR > 12dB) Typically less than 50 bit periods
Sync Retention : (LW=0.1%, SNR > 3dB) Retains sync through > 1024 consecutive dropouts
Bit Error Rate: (LW=0.1%) to within 0.50 dB of ideal bit error rate performance curves

Data/Clock Outputs, NRZ-L Per Bit Synchronizer

NRZ-L Data: One each, NRZ-L data/clock pair, RS422/TTL (jumper, selectable) - operator program output selectable to INTERNAL (direct to host decom card via internal bus) or EXTERNAL (output pair directed to card external output BNC or Triax cables)
Data Clock: 0 $^\circ$, 90 $^\circ$, 180 $^\circ$, 270 $^\circ$, operator program selectable
Data Polarity: Program selectable: normal/inverted

Data / Clock Outputs, Code (Dual PCM Encoder) Per Bit Sync

Data Source: Program selectable: Recovered Data (Bit Sync NRZ-L Data/Clock - DEFAULT) or External data/clock (PROGRAM SELECTABLE)
Output: Three each: One each TTL data/clock (0 $^\circ$ & 180 $^\circ$, selectable) Code (selectable) PCM and Clk, One each TTL data R NRZL, One each
Randomizer: Program selectable: RNRZ 9/11/15/17/23, forward, reverse
PCM Codes: Program selectable: NRZ-L/M/S, Bi ϕ -L/M/S, DBi ϕ -M/S, DM-M/S, MDM-M/S, RZ

External Data/Clock PCM Encoder Input Per Bit Sync

Signal Type: Jumper selectable: RS422 or TTL
Impedance: 120 Ω RS422, 75 Ω TTL
Data Code: Program selectable: NRZ-L/M/S, Bi ϕ -L/M/S, DBi ϕ -M/S, DM-M/S, MDM-M/S, RZ
Data Clock: Program selectable: Normal/Inverted, 1x or 2x

Convolution Encoder/Decoder

Viterbi Decoder: Rate 1/2, k=7: includes differential decoding, V.35 descrambling, and G2 invert (others available)
Symbol Formats: Serial, parallel, and staggered parallel (others available)
Convolutional Encoder: Rate 1/2, k=7: includes differential encoder, V.35 scrambler, and G2 inverter (others available)
Symbol Formats: Serial, parallel, and staggered parallel (others available)

Format Generators/Synchronizer

Format Generator: Programmable frame length, sync pattern and mask
Synchronizer Source: Recovered data, external data, or test generator
Synchronizer Strategy: Pattern match in "search", programmable error limits for "check" and "lock" states
Other Features: Bit slip enable, auto polarity enable, data source/ambiguity resolution

Bit Error Rate Tester

Transmitter Pattern: PRN sequence: PN7, PN9, PN11, PN15 (forward/reverse)
Pattern Clock Source: Program selectable: Bit Rate Clock or External Clock
Blanking: Program selectable: 64, 128, 256 bits
BER Sample Period: Program selectable: 1E3 to 1E9 bit periods, or continuous accumulate
Variable Output: 50mV to 5V P-P
Other Features: Automatic pattern synchronization, forced error ON/OFF

Physical/Remote Interface

Format: Standard PCIe X1 format, half length
Cooling Requirements: 30 Linear FPM
Power Requirements: +5VDC @ 1.25A, \pm 12VDC @ 0.25A
Dimensions: 4.20" (10.67cm) H x 12.375" (17.53cm) W x .55" (1.4cm) D
Temperature: Operating 0 to +40 $^\circ$ C, non-operating -40 to +86 $^\circ$ C
Relative Humidity: Up to 90% non-condensing
Shock: Operating 6G, Non-operating 25G
Vibration: Operating 0.5G, 5 to 2000 Hz, Non-Operating 0.8G, 5 to 500 Hz

Recognizing that no standard product fits every mission, Delta Telemetry Systems is ready to deliver tailored solutions for your unique application requirements.

Specifications subject to change without notice.

