DELTA TELEMETRY SYSTEMS

DATA ACQUISITION

High Performance Compact Portable TM System

MODEL 4032AP

ACROAMATICS TELEMETRY SYSTEMS

KEY FEATURES

- Compact, Notebook Size
- < 7 lbs. total weight
- Capacity (2 PCIe slot 2500AP / 3 PCIe slot 2510AP)
- Features Model 1632AP-2 PCIe Card embedded, Windows OS Independent 106 Ch 4 class 1 & 2 low latency Dual-Stream Decom
- Full Function Bit Sync/Decom/ Time/Sim/Encoder, dual stream configuration
- 0-40+ Mbps Decom, IRIG Ch 4, 5,7, 8, 9, 10/11 & TMoIP 218-20
- Optional Range Quality tunable 40Mbps PCM Bit Sync
- Integrated onboard SSD Real-Time Raw and Processed Data Recording
- Dual-Stream 0-40 Mbps PCM Serial Rec/Playback configs
- Networked host processing & data services featuring new ADAT Desktop Display & Analysis SW
- CH 10 format Compliant Data File Import/Export Data Tools
- Fully Supported API

GENERAL DESCRIPTION

The Acroamatics Model 4032AP is a compact, dual-stream PCM frame sync and decommutation solution designed for portable telemetry ingest, processing, display, and recording. It supports serial PCM with or without synchronous clock, plus IRIG 218-10/218-20 TMoIP network PCM, in any IRIG-approved format, at data rates up to 40 Mbps.

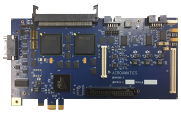
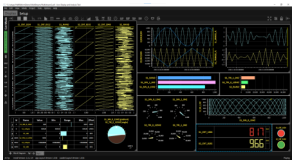
Formatted PCM data is processed and recorded to removable SSD media using powerful native real-time embedded Frame Sync/ Decom processors. Dynamic card-level soft decom techniques support real-time quick-look monitoring and post-test review for flight-line operations, instrumentation labs, range recording, and networked data analysis.

The 4032AP is available in a base dual-stream Frame Sync/Decom, IRIG time, and PCM simulation configuration, with optional integrated PCM Bit Sync (see Model 674DM). Its ultra-portable chassis is easy to transport with a laptop and interfaces smoothly with Windows 11 or Red Hat Enterprise Linux 8.x systems.

The included Acroamatics Telemetry System Software Suite (ATSS) with the ADAT dashboard provides wizard-based setup for bit sync and decom, time-correlated recording, Ethernet gateway IRIG 218-10/218-20 delivery, outputs to third-party applications, and direct post -mission playback, analysis, and data export.

For a modular end-to-end solution, pair the 4032AP with the portable Model 4066 single-channel multi-band RF receiver. The 4032AP is also compatible with Acroamatics multi-stream enterprise Model 2900AP and 2510AP, and portable 3022AP TDP systems.

RELATED PRODUCTS

Real-time PCIe PDSP	PCM Bit Sync Mezzanine	Decom PCM Processing Card	ADAT
 Model 1635AP	 Model 674DM	 Model 1632AP	

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TECHNICAL SPECIFICATIONS

OPTIONAL BIT SYNCHRONIZER

Model 674DM Dual bit Sync - companion mezzanine module included in Model 4032AP

PCM Signal Inputs:

Source:	Two each analog baseband user selectable PCM inputs Per Bit Sync Channel - #1 single ended, #2 RS-422
Isolation:	Greater than 60dB at 20MHz
Impedance:	Program selectable: Hi-Z/Lo-Z, Single Ended: 4kΩ/75Ω, Differential 10kΩ /150Ω
Signal Level:	Single Ended 0.2 to 20V P-P, Differential 0.2-10V P-P
DC Offset:	Program selectable: NRZ-L/M/S, Biø-L/M/S, DBiø-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 - 44 Mbps, NRZL, 8 bps - 44 Mbps Biø Codes
Capture Range:	3 times the programmed loopwidth, typical
Loop Bandwidth:	0.1% to 3.2%, program selectable in 0.1% increments
Sync Threshold:	0dB for NRZ-L and Biø-L codes
Sync Maintenance:	(LW=0.1%) —2dB NRZ-L and Biø-L codes
Sync Acquisition:	(LW=1.6%, SNR > 12dB) Typically less than 32 bit periods
Sync Retention:	(LW=0.1%, SNR >3dB) Retains sync through >1028 + consecutive dropouts, all modes
Bit Error Rate:	(LW=0.1%) to within 0.25 to 0.50 dB of ideal bit error rate performance curves, absolute (not average) in all modes

REAL TIME FRAME SYNC/DECOMMUTATION

Model 1632AP-2 Dual Channel Low Latency Frame Sync, Decom, IRIG Time, and Output Distribution

PCM Input:

PCM Input Sources:	0 - 40 Mbps clk/data inputs supported for each decom channel. TTL NRZ-L Data and 0° Clock. When configured with optional Model 474DM bit syncs, program selectable internal bit sync input paths are provided.
Impedance:	50 Ohm input impedance, TTL compatible
Bit Rate:	From 0 to 44 Mbps, burst, jam, and streaming mode compatible
Polarity:	Programmable, automatic polarity correction
Word Length:	Programmable, 1 to 32 bit word length for each input
Word Orientation:	Programmable, MSB/LSB orientation for each input word
Parity:	Selectable leading, trailing, or no parity checking for each word

Synchronization:

Mainframe Sync:	Provides for programmable sync pattern and mask, complement pattern recognition, and variable length frame decommutation. The pattern may be up to 64 bits in length.
Subframe Sync:	Six independent synchronizers (per decom channel) are capable of decommutating sub-frames within subframes. Subframes synchronize to fixed recycle patterns, complement frame sync patterns, and various ID patterns.
ID Sync:	Both recycle and ID patterns may be assembled from multiple word locations. Recycle patterns may be up to 32 bits long. Two types of ID synchronization are supported: JAM patterns of arbitrary values, and incrementing or decrementing frame counters with limit checking. ID sync words may be up to 16 bits in length.
Sync Strategy:	Programmable Search-Check-Lock sync strategy, bit error tolerance, and bit slip window provide reliable frame synchronization.
Asynchronous Formats:	Subframe synchronizer may be programmed to decommutate embedded formats having unique frame sync patterns and format structures.
Format Switching 1:	6 testable flags store the results of select input stream bit and word comparisons to control real-time format switching. Frame Sync / Decom format switching is loss-less and immediate. Multiple card resident micro-coded decom processing programs are stored in local decom memory in support of such conditional format switching events.

Outputs:

Standalone Data Output:	Data is available to the host computer as memory-mapped frame buffers, Current Value Table (CVT), or as a data stream selectably transferred by via DMA independently from each decom channel. Data is 32 bits with programmable MSB/LSB output word justification, sign extension, or zero insertion for LSB output. Acroamatics Telemetry System Software (ATSS) suite provides a host of Windows compatible (XP and Windows 7 compatible) which support user decom set-up, mission set-up management, and a host of real-time data display, alarming, recording, discrete/analog, and networked data I/O processes and local operator status display, and remote system management and data operations support.
I-Buss Data Output:	When used in a system configured with additional 1632AP and PCI 1615AP PDSP EU & Distribution card, the messages containing thirty two bits of data, twelve bits of fine time (microseconds), two bits of status, and 17 bits of data identification. I-bus data can be formatted in either MSB or LSB justified form. LS-justified data can also be sign extended. I-bus timing and decom data is shared in real-time with other I-bus connected cards to insure deterministic time coherent extended decom and EU processing. The 1615AP PCI module is capable of merging data from any of up to four 1632AP cards in asystem to support single file merged “raw” and EU multi-stream data recording and formatted data distribution of data fromup to 8 high rate TM streams, supporting display and networked data communications processes. Decom and bit syncdata quality status words are shared for downstream data validation and real-time TDP system status reporting.
2 Serial PCM Outputs:	Two program controlled serial outputs, one per Model 4032AP PCM decom channel.

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PCM SIMULATOR/ENCODER

Model 1632AP Dual Programmable 1 bps - 64 Mbps PCM Simulator/Encoder

Dual Programmable PCM Format Simulator/Encoder Functions:

Format:	Storage Stores two complete, selectable PCM formats. Performs asynchronous frame insertion and format switching
Subframe Capability:	Generates up to three subframes within mainframe. Generates subframe within subframe
Frame Length:	Up to 65,536 words for the mainframe and 16,384 per subframe
Data Sources:	1M unique user programmable fixed value word registers and 64K unique user defined dynamic function word register onboard library. Two 16-bit module up/down counters. Two 16-bit external inpouts. One 16-bit pseudo-random number generator. One 16-bit program counter. Two complete user-defined 1M data word onboard stream simulation memories, with dynamic switching.
Word Length:	Programmable for each data source: static data words 1 to 32 bits; all others 1 to 16 bits
Word Orientation:	Program selectable: MSB/LSB for each data word
Parity Generation:	Program selectable: leading, trailing, or no parity for each data word
Dynamic Data:	Memories 2 unique, user-defined 256kB RAM's. Presettable to ramp, sine, triangle and square wave functions or user-defined input functions. Selectable data type: 1's complement, 2's complement, signed magnitude, offset binary, Programmable time base.

PCM Outputs:

Bit Rate:	Program selectable: 1Hz to 64MHz, tunable to 0.1% of programmed rate
Clock:	0° clock
Data:	NRZ-L
Output Codes:	Program selectable: NRZ-L/M/S, Biø-L/M/S, DBiø-M/S, MDM-M/S, RNRZ 11/15/17/23
PCM Output:	TTL compatible NRZ-L data and 0° clock

IRIG TIME CODE TRANSLATOR/GENERATOR

Model 1632AP Integrated IRIG A/B/G/NASA 36 IRIG Time Code Reader & Generator

Amplitude:	0.5 to 20 Vpp, Single-ended
Impedance:	12K Ohms minimum
Input Codes:	Translates IRIG G, A, B and NASA-36
Input:	Frequency 125 Hz to 400,000 Hz
Modulation:	Index 2:1 through 5:1
Polarity:	Program selectable, Invert or Normal Polarity
Internal Time:	Base 40MHz crystal oscillator

Operational:

Generate Mode:	Time is generated from the onboard crystal oscillator and is presettable from the Host
Translate Mode:	Time is read from an external source
Translate Failsafe Mode:	Mode The internal timing is based on the input carrier. This mode enables the system to translate time as the input carrier rate varies during playback of an analog recording.
Frame Bypass:	Automatic frame bypass compares previous time frame with current one, and Time accumulator updated when they agree.

SYSTEM SOFTWARE ATSS FEATURING ACROAMATICS DISPLAY AND ANALLYSIS TOOL (ADAT)

Acroamatics Telemetry Software Suite (ATSS)

Processing Environment:	OS independent application processing. Dynamic "Change on the Fly" capable conditional format switching. Embedded PCI Module based "soft decom" on functionally dedicated, card based processors
Standards Compliant:	Win 11 Pro or RHEL 8.x. IRIG Chapter 4, 5, 8, 9 and 10/11, 218-10/20. TMATS Import, NASA CCSDS, IADS, ADAT, Dewesoft, LabVIEWS, MatLab and similar analysis software tool data export.
Data Display Types:	ADAT Display and Analysis Tool widget based user configurable data display and analysis system dashboard application. ADAT supported in both Windows 10/11 or RHEL 8.x, IADS supported in Win 11.
Data Recording:	The ATSS Data Recording Client provides local operator control of the 4032AP record function, and accommodates operation as a standalone application or in conjunction with the ATSS software managed real-time telemetry processing environment.
Networking:	The Model 4032AP CTS supports both local and remote networked turn-key operation

Options:

Configuration options include based dual stream multi-function PCM Decom/Simulator/IRIG Time, addition of range quality Model 674DM PCM Bit Sync, or complete TDP cardset including dual stream decom, bit sync, and system derived processor and networked distribution solution.

General:	12" x 9.20" x 2.5"; weight: 7 lbs (typ.)
Power:	12-24 VDC, AC adapter 110/220V provided
Attributes	External battery option available on request. Dual 1 TB 2.5" solid state drives, Dual ENET & USB-3, and local HDMI interfaces

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.

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