Features:

- Compact, Notebook Size (2.25" H x 11.75" W x 9.2" D)
- < 7 lbs.
- Card embedded Windows Independent 106 Ch 4 class 1 & 2 low latency Dual-Stream Decom Processing and PCM Simulation
- Laptop size Full Function Bit Sync/Decom/Time/Sim/Encoder
- 0-44 Mbps Decom, IRIG Chpt 4, 5, 8, 9, 10
- Range Quality tunable 44 Mbps Digital Bit Sync Option
- Integrated Real-Time Raw PCM and Processed Data Recording
- Dual-Stream 0-44 Mbps PCM Serial Rec/Playback
- Real-Time Processing/Data Services - per decom module
- CH 10 format Compliant Data File Import/Export Data Products
- Dynamic Programmable 64 Mbps PCM Simulator/Encoder
- Fully Supported API
- Dewesoft, IADS, ILIAD, MatLab, Lab Views 3rd party Display & Analysis Support

General Description

The Acroamatics' Model 4032 Compact Telemetry system is a remarkably size and cost-effective dual stream PCM storage and processing solution, capable of ingesting serial PCM with or without synchronous clock in any IRIG approved PCM code format. The Model 4032 enables users to process and record PCM data using powerful native “real-time” card embedded Frame Sync/Decom processors. Dynamic card-level “soft decom” processing techniques are optimized for real-time flight-line, instrumentation lab, range recording, processing, data display and networked data analysis. The 4032AP can be ordered in its base Frame Sync/Decom/IRIG Time/PCM Simulation configuration or with standard options such as mezzanine 474DM advanced PCM Bit Sync, CVSD audio, or with select high performance integrated GDP RF telemetry receiver/demod and TMoIP product interfaces.

The Model 4032AP chassis is very compact and portable, allowing transport with a laptop in a standard briefcase/tote. The Model 4032 is easily interfaced to any standard Windows 10 laptop or desktop, or can be operated directly using a standard local keyboard and monitor. The included Acroamatics Telemetry System Software suite (ATSS) supports integrated, wizard based bit sync and decom set-up, time correlated data recording, Ethernet “Gateway” PCM data delivery, output to third party processing applications, post-test analysis/playback (including serial PCM playback and simulations), native data frame display, and more.

When used in conjunction with provided Acroamatics Telemetry System Software (ATSS), the 4032AP delivers a seamless high performance dual-stream, telemetry ground station decom processing, display, and recording solution – with support for TMATS set-up and Chapter 10 data exchange. Optional advanced display and analysis software tools are supported by the Model 4032AP to enable cost-effective development for a variety field, lab, and data center application needs.
Bit Synchronizer

Model 474DM (Option - companion mezzanine module to Model 4032AP)

PCM Signal Inputs

Source: Two each analog baseband user selectable PCM inputs - #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: 20V max Hi-Z
PCM Codes: Program selectable: NRZ-L/M/S, Biø-L/M/S, DBiø-M/S, DM-M/S, MDMA-M/S, RZ
Derandomizer: Program selectable: RNRZ 9/11/15/17/23, forward/reverse

Synchronization

Bit Rate Range: 8 bps - 72 Mbps, NRZ-L, 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 4032AP Embedded Dual Channel Low Latency Frame Sync, Decom, and Output Data Formatter

PCM Input

PCM Input Sources: To four program selectable clk/data inputs supported for each decom channel. TTL NRZ-L Data and 0º Clock.
When configured with optional Model 474DM bit sync a fifth program selectable internal bit sync input path is provided.
Impedance: 50 Ohm input impedance, TTL compatible
Bit Rate: From 0 to 72 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.
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 selectively 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 a system to support single file merged “raw” and EU multi-stream data recording and formatted data distribution of data from up to 8 high rate TM streams, supporting display and networked data communications processes. Decom and bit sync data 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.
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 inputs. 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

PCM Output
- TTL compatible NRZ-L data and 0° clock.

IRIG Time Code Translator/Generator

Model 4032P 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 Carrier 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.

Translate Failsafe Mode
- The internal timing is phase-locked to the input carrier. In the event of a time dropout, the translator continues generating time without interrupt.

Frame Bypass
- Automatic frame bypass compares previous time frame with current one, and Time accumulator updated when they agree.

Specifications subject to change without notice.
### System Software ATSS/TMATS/IADS/ILIAD

**Acroamatics Telemetry Software Suite (ATSS)**

**Processing Environment**

**Standards Compliant**
Support for IRIG Chapter 4, 5, 8, 9 and 10. TMATS Import, NASA CCSDS, integral IADS Data Services, Dewesoft, LabVIEWS, Matlab and similar industry standard display, formatting, and analysis soft tools.

**Data Display Types**
Scalable multi display/page, 32 pages - Horizontal and vertical strip chart, tabular, bargraph, annunciator, controls / meters, each with dynamic limit checking, alarming, scalable, parameter and E/U annotation.

**Data Recording**
The ATSS Data Recording Client provides local operator control of the 4032AP CTS 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 networked system set-up and operation admin and real-time data communications. ATSS Remote operations software ($225 option) provides remote users all functions offered to the local user, including data recording, data display, system status and set-up GUI applications.

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### Options

**Tunable Bit Synchronizer**
The Model 474DM 8 Hz to 44 MHz High Performance range Quality tunable PCM Bit Synchronizer, includes full range of randomize/de-randomize, encoder/decoder, Viterbi and automated onboard BERT link test functions, with choice of periodic or accumulated error display, injection and multi PRN Synthesizer.

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### General

| Physical | Size: 11.7” x 9.20” x 2.25”; weight: 6.5 lbs (typ.) |
| Attributes | 128GB solid state drive, Dual ENET & USB-3, and local SVGA interfaces |

### Configuration Options:

- **4032AP-CTS**
  Basic Dual Stream Decom/PCM Sim/IRIG time with ATSS telemetry system software suite
- **4032AP-CTS/B**
  Adds integral high performance 474DM Bit Sync mezzanines
- **DEWESoft X2**
  Adds turn-key, local and networked data driven DEWESoft X2 display and analysis software support
- **1632AP-2**
  NEW Dual Stream 72 Mbps PCIe IRIG 106 Chpt 4 class 1 & 2, programmable Telemetry Decom/Output Data Formatter/PCM Simulator & Encoder/IRIG Time Code processing card.

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