GDP SPACE SYSTEMS

High Performance PCI Single Board Data System
Model 1622P

Features:

- Third Generation half-length PCI 0-40 Mbps "all-in-one" Telemetry Processor

- State-of-the-Art Bit Sync, Advanced IP capable PCM Decom, IRIG Time & SIM

- Low-latency card level TM processing, data recording

- OS agnostic card level "soft decom" processing

- Designed for IA compliant, trouble-free integration and upgrade

- Ideal for use in applications ranging from production data validation to mission critical range safety

- Acroamatics GUI Telemetry System Software (ATSS) included - Lifetime Support!

- Includes IADS Server, Lab Windows, and integrated TMATS support

- IRIG Chpt 4, 5 (CVSD) & 8 PCM processing

- NASA CCSDS & packet TM decommutation

- Model 474DM Tunable High Performance Digital Bit Sync

- 0-64 Mbps Programmable PCM Simulator & PCM Stream Reconstructor

ILIAD   LabVIEW   ACRO TopSET   MATLAB   IADS

IRIG Chapter 4/5/8/9/10   CVSD   **TMATS**

General Description
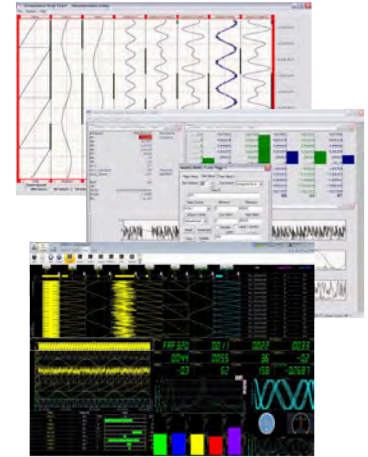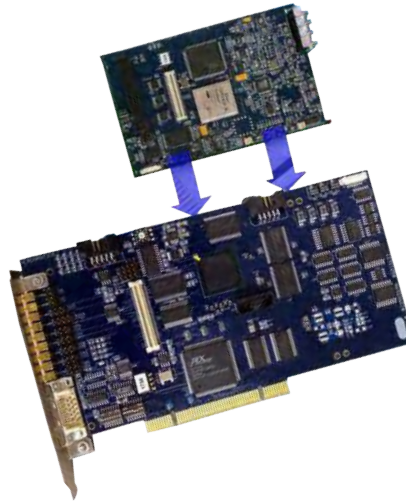
The newly designed Model 1622P delivers new higher rate processing speeds and new capabilities, yet retains 100% "drop-in" compatibility with existing Acroamatics PCI TDP family products. We've utilized the latest in PGA component technology to ensure both low power consumption and improved reliability - ensuring integrators and end-users trouble-free, upgrade friendly performance well into the next decade.

We've also added lots of new features to the new 1622P, including those that enable users and integrators to easily exchange data and set-up files with legacy Acroamatics TDP systems and card sets, to add list based display and storage events, to easily record and regenerate PCM streams, along with IADS Server, IRIG Chpt 9 TMATS, Lab Windows, and ILIAD instrumentation analysis and display software support.

Most importantly, the new 1622P retains Acroamatics signature card level, real-time stored program processing technology. All 1622P TM processing tasks are performed within its card level processors maintaining a 100% Windows independent and deterministic telemetry decommutation environment.

The compact 1622P provides both main frame and six software programmable "soft decom" driven sub-frame decommutators - each with multiple onboard data and conditional stored memory program locations. The Model 1622P is designed to support transparent use of standard Windows driven PCI bus and system peripherals in support of data recording, data display and networked data distribution - making it both an extremely reliable as well as a very effective all-in-one telemetry processing solution.

BIT SYNCHRONIZER
Model 474DM (option)
Signal Inputs

Source	1 single ended or RS-422 (specify on order). Unit may be configured with dual program selectable inputs optionally.
Isolation	Greater than 60dB at 20MHz
Impedance	Program selectable: Hi-Z/Lo-Z. Single Ended: 4kΩ/75Ω
Signal Level	0.2 to 20V 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, MDM-M/S, RZ
Derandomizer	Program selectable: RNRZ 9/11/15/17/23, forward/reverse

Synchronization

Bit Rate Range	8Hz-40MHz, All PCM 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 ideal bit error rate performance curves, absolute (not average) in all modes

REAL TIME FRAME SYNC / DECOMMUTATION / PCM SIMULATION / IRIG TIME
Function

Sources	Program selectable, front panel NRZ-L Data and 0° Clock and internal bit sync decom inputs standard (with bit sync option) To five program selectable decom inputs supportable on an optional basis.
Impedance	50 Ohm input impedance, TTL compatible
Bit Rate	From 0 to 40 Mbps, burst 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	Mainframe synchronization 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 are capable of decommutating sub-frames within subframes. Subframes synchronize to fixed recycle patterns, complement frame sync patterns, and various ID patterns. Both recycle and ID patterns may be assembled from multiple word locations. Recycle patterns may be up to 32 bits long.
ID Sync	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	16 testable flags store the results of select input stream bit and word comparisons to control 4022 CTS PCI card level real-time user input 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 processed in specialized card resident real-time processors, independent of any Windows (or similar) operating system. Processing latency is minimal, and related solely to access to rate parameter data. Decommutated data are available to the system internal PCI bus as memory-mapped frame buffers, Current Value table (CVT), or as a data stream selectively transferred by PCI bus DMA. 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 complete suite of GUI Windows compatible system set-up and operating programs in support of user decom and mission system data management, data display, alarming, limit setting, recording, analog and networked data I/O processes and local operator status display, and networked remote system management and data operations.
Frame Quality	Frame quality word is generated containing bit sync and frame sync status for downstream data validation.
2 Serial PCM Outputs	Two program controlled RS-422 compatible serial output channels are supported.

PCM Format Simulator 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	1024 static registers Two user-defined dynamic data memories. Two 16-bit module up/down counters. Two 16-bit external inputs. One 16-bit pseudo-random number generator One 16-bit program counter
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 16kB RAM's. Presettable to ramp, sine, triangle and square wave functions or user-defined input. Selectable data type: 1's complement, 2's complement, signed magnitude, offset binary. Programmable time base. |

PCM Simulator Outputs

Bit Rate	Program selectable: 1Hz to 64MHz, tunable to 0.1% of programmed rate
Clock	0° clock
Data	NRZ-L. TTL (RS-422 optional)
Output Codes	Program selectable: NRZ-L/M/S, Biø-L/M/S, DBiø-M/S, DM-M/S, MDM-M/S, RNRZ 11/15/17/23
Sim-encoded Data Mode	The Model 1622P supports transparent playback of recorded PCM stream data directly from disk. Output is via the PCM SIMULATOR OUT output and is both code and output data rate selectable (see PCM Simulator section for additional details)

IRIG Time Code Reader/Generator/Translator

Amplitude	0.5 to 20 Vpp, Single-ended
Impedance	12K Ohms minimum
Input codes	Translates IRIG G, A and B
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 pre settable 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 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.

SYSTEM SOFTWARE ATSS/TMATS/IADS/ILIAD

Acroamatics Telemetry Software Suite (ATSS)

Processing Environment	Real-time, Windows OS independent processing. Dynamic "Change on the Fly" capable conditional format switching. Embedded PCI Module based "soft decom" on functionally dedicated, card-based micro-coded processors.
Standards Compliant	IRIG Chpt 4, 5, 8, 9 and 10 compatible TMATS import, NASA CCSDS, Integral IADS Data Services, LabVIEWS, and Matlab.
Data Display Types	Scalable multi display/page, 32 pages - Horizontal and vertical strip chart, tabular, bar graph, 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 4022 CTS record function, and can operate as a standalone application or in conjunction with ATSS software managed real-time telemetry processing operations.
Networking	The Model 4022 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.

Physical

Format	Standard PCI: Half length single slot
Cooling Requirements	30 Linear FPM
Power Requirements	+3.3VDC @ 600mA max, +5 VDC @ 600 max, ±12 VDC @ 20mA (including optional mezzanine bit sync)
Dimensions	4.20" (10.67cm) H x 9.4" (23.80cm) W x .55" (1.4cm) D
Temperature	Operating: 0° to +40° C, Non-Operating: -40° to +86° C
Relative Humidity	Up to 90% non-condensing
Shock	Operating: 6G, Non-Operating: 50G
Vibration	Operating: 0.5G, 5 to 2000Hz, Non-Operating: 1.2G, 5 to 500Hz

Ordering Information

1622P	Half-length advanced PCI "all-in-one" Telemetry Processor Card
474DM (option)	Model 474DM 8 Hz to 40 MHz Advanced Digital Bit Sync Mezzanine Module, companion to the Model 1622P
474DM-FSB	Bit Sync OPTION BERT/PCM Link Error test option for the Model 474DM Bit Sync Mezzanine
474DM-VT	Bit Sync OPTION Viterbi decoder option for the Model 474DM

Related Products

Model 1622P	Half-length advanced PCI "all-in-one" Telemetry Processor Card for single & multi-stream TDP system applications
Model 1611P	PCI Advanced Digital Bit Synchronizer Card, for single and multi-stream bit sync system applications
Model 1605P	PCI Advanced Programmable Data Stream Processor (PDSP) Card. Real-time multi-stream derived embedded TM Processor
Model 482M	32 Channel DAC Mezzanine companion to the 1605P PDSP
Model 2425P	64 Channel DAC Multiplexer Unit. 1u rackmounted fibre driven (to 1,000 ft) remote DAC output, multi-unit ops to 1026 channels
Model 750IP	PCM Simulator. Three channel programmable 64 Mbps IP SIM module. To 9 independent programmable simulators per PCI slot.
Model 4022CTS	Compact Telemetry System, 2.25" H x 11.75" W x 9.2" D, 6 lbs self contained notebook sized Portable Telemetry Processing Unit.
Model 2628P	2u Rackmount PCI Chassis, dual-slot PCI Telemetry Data Processing System chassis
Model 2900P	4u Rackmount PCI 12-slot Telemetry Data Processing (TDP) System chassis, 88 channel BNC I/O, removable HDD & more
Model 2900AP	4u all-aluminum lightweight Rackmount PCI 12-slot Telemetry Data Processing (TDP) System chassis, 88 channel BNC I/O
Model 2950P	Touch-screen enabled 4u rackmount multi-stream Bit Sync and multi-purpose TDP System chassis, 88 channel BNC I/O
Model 2430	3u rackmount Single/Dual Stream 8 Hz to 40 MHz Range Telemetry Bit Synchronizer unit
ATSS	Acroamatics Telemetry System Software Suite, including GUI system telemetry processing database and hardware set-up (TDPSet) and operations suite supporting data display (lateral strip-chart, 8-stream vertical strip chart, bar graph, annunciator & tabular), archival mission data recorder, advanced PCM Simulator, real-time networked data communications, remote system display and operations clients, and more.

Specifications subject to change without notice.