



### Real-time PCIe Programmable Data Stream Processor and Distribution (PDSP) Model 1635AP

#### Features:

- Model 2900 and Portable TDP Low Latency System EU Data Processor
- Deterministic Windows OS Application Independent Multi-Stream Data Services
- Companion EU processor to Model 1632AP Multi-Function Decom Modules
- Up to 16 Stream Merged Recording, Derived Algorithm, EU, Output Data Formatter & Distribution
- If / Then / Else Derived, and to 7th Order Polynomial Processing at Rates to 6MS/sec
- **NEW** Dual 1635AP
- Optional Real-Time DAC/ADC
- Library of 400 Onboard Algorithms
- High Performance Program Driven Motorola SHARC® DSP Processor
- Real-time Output Data 'Strip-n-Ship' Output Serializer
- Multi-Stream Raw PCM Record

#### Related Products:

- Model 2900AP
- Model 3022AP
- Model 2500AP
- ATSS System Software Manual
- Model 482 D to A
- Model 1612P/1632AP PCM Decom
- Model 2425 DAC MUX

#### General Description



The **Model 1635AP** is a powerful low latency DSP based multi-stream telemetry Programmable Data Stream Processor (PDSP). With 3rd generation card embedded PDSP technology, the 1635AP serves as the hub of Acroamatics' industry leading real-time range Telemetry Data Processing (TDP) product line. The 1635AP supports EU, complex nested derived, and up to 7th level polynomial data processing at nearly three times the rate of its predecessor. With no reliance on Windows OS application based processing, the Model 1635AP boasts a dedicated high-speed 64-bit bus connection for the deterministic transfer of data from up to 8 Acroamatics companion Dual Stream PCM Decom modules.

In addition, the Model 1635AP offers programmable output data product formatting in support of IRIG compliant real-time raw and processed PCM recording and networked client data services. The 1635AP natively supports industry standard third party display and analysis applications such as IADS and DEWESoft. TMATS import/export and operator direct setup is supported, as are EXCEL spreadsheet and ACCESS based set-up and programming services.

The **Model 1635AP** also supports direct low latency DAC and Discrete output and analog data input via optional companion 32 channel 482M mezzanine card or fiber interfaced remote Model 2425 DAC Mux (to 1024 channels).



### Input Bus

The 1635AP interfaces data from up to eight independent 1632AP Dual Stream PCM Decom cards, IRIG time, Ethernet, Acroamatics approved PCI bus resident 3rd party data input cards, HOTLink® fibre port, and optional Model 482P DAC & Discrete Output mezzanine card. Each datum is distributed as two 32-bit words. The first word is the identifier - containing time, status, and an ID tag, and the second word is the data. Up to 131,072 unique ID tags are supported.

### Distribution

The 1635AP uses the ID tag value accompanying each datum to address a vector table in onboard memory that defines the processing, routing, and post-processing destination of each input measurement parameter.

### Device Bus

Provides an interface to such devices as digital-to-analog outputs, digital discrete outputs, a local feedback to the Input Bus, serial HOTLink® output, and PCIe bus host DMA channels.

### Host Interface

Provides controls for running the 1635AP as well as outputting and receiving data from the Device Bus. PCI bus host DMA channels provide a data path to and from host memory and devices.

### Processor

The 1635AP utilizes a dedicated Analog Devices SHARC® DSP processing engine operating at a 400 MHz clock rate to perform simultaneous multiplier and ALU operations in a single clock. The DSP is user-programmable with ADI software, which includes a "user defined" C program compiler capability.

### Input Data

Six 16-bit input types are supported: 2's Complement, 1's Complement, sign magnitude, offset binary, unsigned magnitude, and binary coded decimal. Three 32-bit types are supported: signed integers, IEEE, & MIL-STD floating point.

### Output Data

Five 16-bit output types are supported: 2's Complement, 1's Complement, sign magnitude, offset binary and unsigned magnitude. Four 32-bit types are supported: signed & unsigned integers, IEEE & MIL-STD floating point. Concatenated 64-Bit double precision processing is supported.

### Algorithms

A library of 400 telemetry algorithms is provided, plus sequential algorithm chaining and user-defined expression processing. Algorithms include integer-to-floating point and floating point-to-integer conversion, limit and bit testing, data packing, linear data scaling, 7th order conversion, table lookup conversion, "if / then / else" derived parameter calculation, and customized and IRIG recording and network data output data formatting.

### Throughput

Algorithm execution times range from one hundred nano-seconds to a few microseconds, with a maximum throughput rate in excess of 5 MSamples/sec, based on industry accepted algorithm and EU conversion project benchmark standards. Dual 1635AP rates to 10 MS/sec.

### Reconstructor/Playback

Operating as a streaming data reconstructor or data simulator, the 1635AP accepts digital data from select recorded files, reconstructs the original data stream, and outputs the "playback" PCM data stream at a continuous user specified streaming data rate and PCM output code (NRZL type).

### Serializer/Encoder "strip-n-ship"

Accepts data from the PCI bus via DMA or selected data from any Model 1632AP Dual Decom via low latency I-Bus interface and performs "real-time" serialization and output at operator defined bit rate and frame format. This capability supports low latency PCM retransmission, recording, or local processing of select merged PCM input stream(s) or select subsets of input data stream(s) data at a precisely controlled streaming rate PCM formatted NRZ-L encoded output. Latency of serialized data stream processing and output is relative to source input stream rates and select data sample, rates and conversions (EU processing to create derived output word content) requirements.

### Physical

Format	Standard PCIe X1 format, half length
Cooling Requirements	30 Linear FPM
Power Requirements	+3.3VDC at < 1.0 Amp + 12 VDC at 0.10 Amps
Dimensions	4.20" (10.67cm) H x 6.9" (17.53cm) 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	Operating: 6G, Non-Operating: 50G
Vibration	Operating: 0.5G, 5 to 2000Hz, Non-Operating: 1.2G, 5 to 500Hz

Specifications subject to change without notice.

