

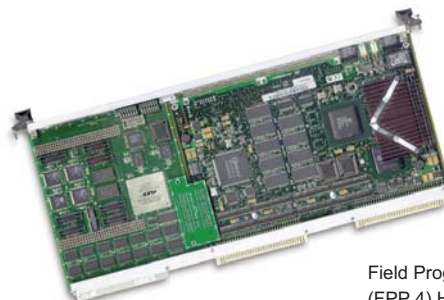
Ground Systems

CVSD Voice Input/Output

FVS523-64



CVSD Voice Input / Output Mezzanine



Field Programmable Processor 4 (FPP 4) Host

- Encodes an audio signal into a CVSD-encoded digital data stream
- Decodes CVSD encoded digital data streams to produce an audio signal
- Adheres to the IRIG 106-00, Chapter 5 Specification for decoding PCM embedded voice data
- Resides on a standard FPP 4, using only a fraction of the FPP 4's real-time processing ability
- Uses multiple module sets for multiple voice channels

The CVSD (Continuously Variable Slope Delta-modulation) Voice Input/Output (I/O) - with its host FPP 4 - extracts, expands, and outputs audio signals originally encoded in a standard IRIG 106-00, Chapter 5 PCM telemetry stream. The PCM stream is decommutated by the system's hardware or software decom, placing individual words on the MUXbus with a predefined tag. The CVSD I/O captures these words from the MUXbus and decodes them into the voice signal. Conversely, the module will ingest, compress, and encode a native audio signal to send CVSD-encoded digital data to the MUXbus. Data words can be placed into a frame by the system's Telemetry I/O module and be output as part of a PCM stream. All functions can occur simultaneously (i.e., decommutation, CVSD decoding, CVSD encoding, and PCM frame encoding).

For most applications, like aircraft test, the audio spectrum is limited, enabling maximum utilization of the CVSD I/O's data compression scheme. CVSD modulation is a method of digitizing a band-limited audio signal and transferring only its changes in single bits.

A CVSD modulator is a single-bit analog-to-digital converter (ADC). The output of this single-bit ADC is a serial bit stream, where each bit represents an incremental increase or decrease in signal amplitude and is determined as a function of recent sample history. The demodulator is a single-bit digital-to-analog converter producing the requisite voice signal.

CVSD I/O can occur simultaneously with the FPP host's processing activities, including data compression, EU conversion, and embedded asynchronous stream decommutation.



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FVS523-64 Specifications

Inputs

MUXbus	.16- or 32-bit data input; prime (raw), derived, processed data from all input sources
Maximum Parameters	.Up to 65,535, dependent on number and type of algorithms per parameter
Input Formats	.32-bit binary, 2's complement, 1's complement, sign magnitude, offset binary, 32-bit exponential (IEEE 754-1985 floating point format)
Interrupt	.VMEbus and MUXbus
VME Interrupt	.Level 1 to 7, 32-bit vector
Voice Audio Input	.20K OHM input impedance, transformer coupled. Range: 50mV to 3.5V P-P, 300-3000Hz

Processing

Processor	.350 MHz 32-bit Power PC 750
Memory:	
EPROM	.1 MB socketed, 8 MB surface-mount
Cache	.1 MB
NVRAM	.8 kB total; 4 kB user
Battery	.10-year removable
Main Memory	.64 MB SDRAM
Input FIFO	.4K words
Output FIFO	.4K words
Processor Performance:	
Floating Point (32-bit)	.SPECfp95: 10.5
Integer	.SPECint95: 15.4
Algorithm Library	.Over 150 algorithms included (e.g., nth-order polynomial, arithmetic, logical, compression, IRIG 106-00, Chapter 5 PCM decommutation and Chapter 8 MIL-STD-1553)
Max. Throughput Rate	.3.5 million parameters/sec
Algorithm Performance (nominal):	
1st-Order Polynomial	.2.55 M/sec
5th-Order Polynomial	.2.15 M/sec
Average Over n	.3.54 M/sec
In Limits	.2.71 M/sec
Bit Mask	.2.76 M/sec

I/O Options

Ethernet	.1 10/100 Mbps port
RS-232	.1 port
PMC Mezzanine	.2 modules
MUXbus Mezzanine	.1 module
MUXbus	.32-bit, 16-bit extended; 16-bit zero extended integers; 32-bit floating point for output, display, or further processing

Outputs

MUXbus	
Max. Number of Output Parameters per Module	.65,535
Voice Audio Output	.Speaker: 0 to 3.5V P-P into 8 OHMS. Adjustable by potentiometer Tape: Up to 3.5V P-P into 75 OHMS Balanced: Up to 3.5V P-P into 600 OHMS

CVSD Voice Decoder/Encoder

Data Rate	.20.6 to 42 kbps
Ordering	.MSB or LSB
CVSD Modulator/Demodulator	Twin Harris HC55564
Operation	.Full-duplex
Method	.IRIG 106-00, Chapter 5

Processing Functions

Real-Time Derived	
Processing	.Single or linked; serial or in parallel on multiple processors
Alarm Gathering	.Routed to MUXbus and/or graphics workstation for display
Data Gathering	.Transfer selected real-time MUXbus data to the VMEbus

Program Setup and Control

Keyboard and Mouse	.Fill-in-the-blank OSF/Motif™ displays with list-pick selections
ASCII Text File	.User-created description
API	.Application Programming Interface for remote setup (option)

General Requirements

System 550 Chassis	.1 9U slot
Maximum per Chassis	.14
Maximum per System	.32
Rear Panel	.4 slots: RS-232 (RJ-45 and DB-25), Ethernet (RJ-45), Mic. In, Balanced Out (both XLR), Speaker Out, Tape Out (both BNC)
Power	.5V @ 5.0 A
Environment	.See chassis data sheet
Dimensions	.365mm (9U) x 160mm (Eurocard std.)
Status Display	.8 LEDs and 8 character display

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