

## PCM Data Blade BLD-xxx

### Features

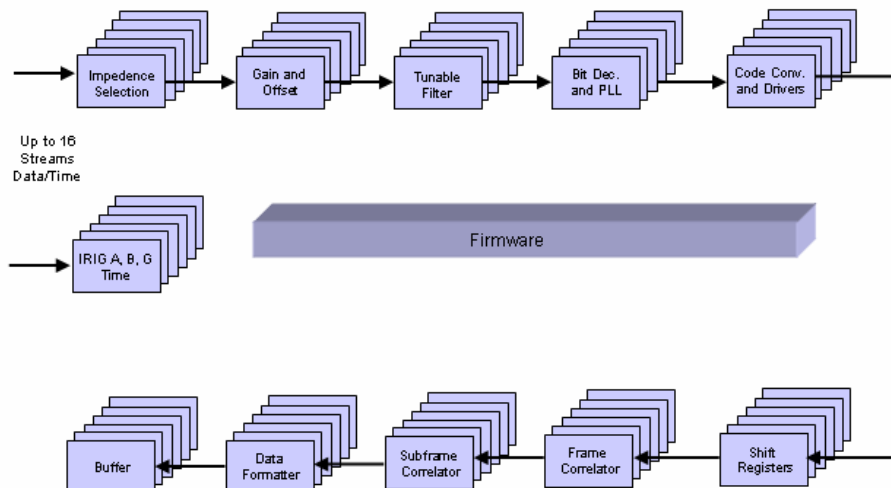
- Multistream PCM Bit Synchronizer and Decommutator
- Hot Swappable
- Fully compatible with all laptop and Windows® computers having USB ports
- Minimal integration required
- Ideal for multistream solutions with customer-furnished computers
- Full bit synchronization, decommutation, time tagging, and parameter processing/archiving
- BER performance to within 1dB of theoretical
- Operation to 30 Mbps, all PCM codes
- Supports IRIG-106 formats: Chapter 4 (Classes 1 and 2) and Chapter 8 Composite 1553



### Introduction

The PCM Data Blade offers instrumentation and telemetry engineers a multistream combination of high-performance, variable-rate PCM bit synchronization, and decommutation power that provides full IRIG-106 compatibility at data rates of up to 30 Mbps. The Data Blade combines the flexibility of a high-speed USB V2.0 I/O mechanism with proven PCM bit synchronization, PCM frame processing, and IRIG time tagging to create an affordable, compact, and easy-to-integrate system. Its patented bit synchronizer phase-lock loop and tracking features equal the performance levels of modern ground station solutions at a fraction of the cost.

The PCM Data Blade represents a breakthrough in reconfigurable PCM processing. By simply connecting the PCM Data Blade stream chassis to a PC using a USB 2.0 interface, users have at their command an integrated PCM processing front-end solution. Ease of USB integration, ample USB bandwidth, and robust error handling protocols make the PCM Data Blade an excellent solution for all multistream PCM telemetry applications in both airborne and laboratory environments. Since the PCM Data Blade enables users to add and remove PCM input modules on an as-needed basis without interrupting power, ground stations can be reconfigured from a common inventory of individual PCM input modules within minutes. This minimizes the need to configure entire facilities ground systems for worse-case scenarios.



Occupying only a small compact PCI (cPCI) 3U footprint, the PCM Data Blade can be coupled with any of our company's quicklook processing, instrumentation setup, and/or ground station processing software products to provide a best-value solution for system engineers and integrators

### Applications

The Data Blade enables users to reallocate telemetry front-end assets quickly and painlessly by moving them either physically or virtually to support multiple mission scenarios. With today's budget constraints and the constantly increasing demands on equipment, the Data Blade offers its users the option to buy only the number of streams needed and provides them with the ability to allocate these assets on a day-by-day or even hour-by-hour basis.

### Physical Allocation

In the past, it was necessary for test support centers to equip each of their display and support rooms with the maximum compliment of telemetry front-end gear. With the release of the Data Blade architecture, this is no longer necessary.

Just as USB drives and cameras can be easily and conveniently connected and disconnected to and from desktops, so too can Data Blades. Data Blades are hot swappable so the cumbersome power down and power up cycle is eliminated. Reallocation of assets is now as simple as any user could want. The dynamic allocation and hot-swapping support of Data Blades means that users can install a chassis with each display and support room and dynamically move the individual Data Blades among the centers.

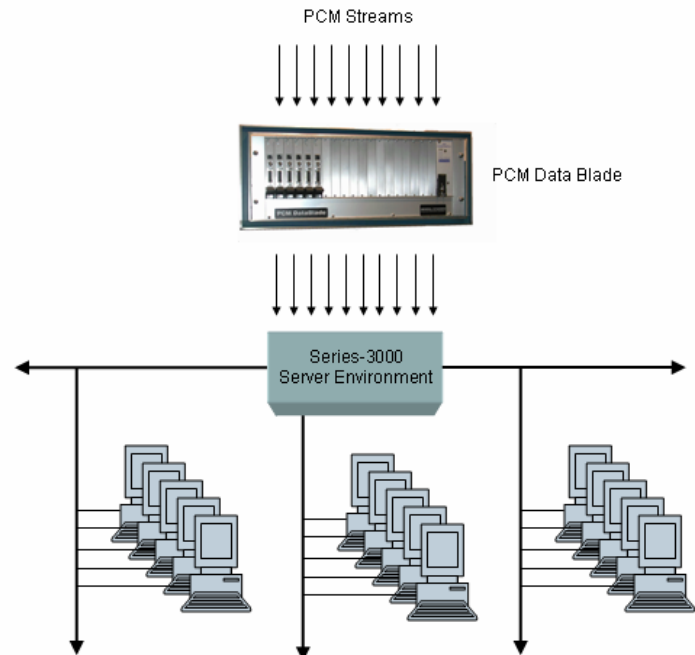
### Virtual Allocation

Merging the power of network environments and telemetry data now means not having to invest in redundant assets to maximize telemetry front-end hardware at each data center. Great savings can be realized by having the necessary telemetry front-end hardware installed at only one location. By using routers and network switches, data can be allocated and distributed over high-speed networks to maximize the infrastructure.

### Hybrid Development

Data Blade is built around the universal cPCI standard and is fully compliant to the PCI Industrial Computers Manufacturers Group (PICMG). Therefore, its use in third-party hardware and software environments is well suited for Data Blade applications. In applications such as telecommunications and embedded compute applications, the Data Blade provides the universal interface that integrators expect for embedded applications.

The Data Blade with its single-slot design provides two benefits—conserving valuable system space in the chassis and enabling usage via a carrier board in proprietary, legacy systems. Additionally, its 3U form factor enables vertical mounting, which allows natural forced air convection cooling to enhance reliability.



<b>Number of Streams</b>		Up to 16
<b>Bit Sync</b>	Codes	NRZ-L/M/S, RNRZ-L, BIØ-L/M/S, DM-M/S, MDM-M/S, RZ
	Level	500 mV to 10V peak-to-peak
	Derandomizer	5 lengths; 9, 11, 15, 20, and 23; forward and reverse directions
	Impedance	50 ohms, 75 ohms (default), and 10K ohms, programmable
	Source & Type	One external data input, single-ended or differential (RS-422)
	Polarity	Normal or inverted
	Operating Range	100 bps to 30 Mbps, all PCM codes
	Bit Error Rate	Within 1.0 dB of theoretical curve up to maximum data rate
	Acquisition Range	Up to $\pm 5\%$ of programmed data rate
	Acquisition Time	Within 50 bits (average) at $E_b/N_o = 15$ db and $F_o = 0.5\%$ given random data 50% transition density
	Sync Maintenance	Retains sync with NRZ codes at $E_b/N_o = 3$ dB with 128-bit transition gaps occurring every 512 bits with random data
	Bit Slippage	Maintains phase with BIØ codes at $E_b/N_o = 12$ dB with over 2000 continuous 1's or 0's; at $E_b/N_o = 0$ db with random data (NRZ & BIØ)
	Loop Bandwidth	0.02 to 5.00%, continuously programmable with 0.02% resolution
	Tracking Range	Up to $\pm 20\%$ of programmed data rate
	Baseline Variation	No degradation beyond 1 dB from theoretical performance curve with superimposed wave form equal to 100% of the peak-to-peak signal input at 0.1% of the bit rate
<b>Decommutation</b>	DC Offset	100% of input signal level up to $\pm 10V$
	Operating Range	100 bps (direct Decom input) to 30 Mbps
	Sync Pattern Length	4 to 64 bits, programmable
	Sync Pattern Errors	0 to 16 bits, programmable
	Sync Word Mask	Any bits masked, programmable
	Sync Strategy	1 to 16 pattern matches (lock and drop), programmable
	Bit Slip	0, $\pm 1$ , $\pm 2$ , $\pm 3$ bits, programmable
	Data Word Length	4 to 32 bits, programmable
	Orientation	MSB/LSB orientation, programmable
	Commutation	Super-, sub-, irregular, programmable
	Time	Independent time tag of each minor frame
	Minor Frame Length	Up to 65,536 words/minor frame, programmable
	Major Frame Length	Maximum of 33,554,432 bits or 4096 minor frames
	Major Frame Sync	SFID, FCC, URC, or unique frame sync
	SFID ID Word	1 to 16 bits, programmable
	SFID Counter	Any word within minor frame, programmable
	Direction/Start	Up or down, 0 or 1, programmable
	Frame Format ID	Any word within the minor frame; up to 16 different formats supported
<b>IRIG Time</b>	Input Codes	A, B, and G; 1/4x, 1/2x, 1x, 2x, 4x, programmable
	Amplitude	.5V to 10V peak-to-peak from mark; 3:1 mark-space relationship
	Flywheel	Indefinite flywheel if no signal is present; auto-reseed/resync when signal is re-acquired
	Remote Seed	Programmable seed start-time from USB control interface

<b>Output/Control</b>	Interface	USB-2.0 interface, time stamped data output, all samples
	Setup	OMEGA-SERV or OMEGA-FIRE, each featuring the Common Database, or user-developed software
	Bit Sync	External NRZ-L data and clock outputs (programmable 0° or 180°), single-ended (TTL into 50 ohms) or differential (RS-422 compatible)
<b>Power</b>	AC	110-220 VAC, 50/60 Hz, dual-redundant power supplies
	Consumption	Typically 5W per stream
<b>Physical</b>	Connectors	BNC or TNC for chassis-based PCM data and IRIG time inputs 15-pin D-subminiature connector for front panel I/O IEC-320 connector for +110/220 VAC power
	Power Switch	Remote on/off or auto-on with USB connector
	LED	RED/YELLOW/GREEN = No setup YELLOW = Input levels low RED = Bit Sync not locked GREEN = Bit Sync locked
	Housing	19" rack mount, 4U, 12" deep Operation from 0 °C to 50 °C
	<b>Environment</b>	
<b>Accessories</b>	Documentation	User manual, installation and program information
<b>Ordering Codes</b>	BLD-1X2-X1	PCM Data Blade, Bit Sync/Decom, with IRIG Time, 3U Compact PCI
	BLD-2X1-X1	DAC Data Blade, 16 Channels, 3U Compact PCI
	BLD-3X1-X1	PCM Data Blade, PCM Output, 3U Compact PCI
	BLD-X2X-XX	Rear Card-edge Signal I/O
	CHS3K-1XXB-A01	PCM Data Blade Chassis, 3U Compact PCI, Rack-mountable
	Options:	
	CHS3K-X00B	Chassis w/ Front Card-edge Connectors; Data In, IRIG Time In
CHS3K-X20B	Chassis w/ Rear Panel Signal I/O – DB-15 D-Subconnectors	