PCI-BUS RECEIVER

RECEIVER OVERVIEW

The PCI-bus receiver is a member of the *JR3* family of serial receivers. It interfaces the PCI-bus to any of *JR3's* high speed, serial, six axis force and torque transducers. It has a form factor which allows it to plug directly into any PCI bus slot.

The PCI-bus receiver directly interfaces to the force sensor through a small 6 or 8 wire cable. The PCI-bus receiver uses the cable to provide power to the sensor, as well as to receive the high speed serial data from the sensor. The PCI-bus receiver contains circuitry to monitor and adjust the power supply voltage to the sensor. The automatic power supply adjustment means that the sensor cable requirements are very forgiving. Long, small gage wires can be used with success. And since the PCI-bus receiver receives power directly from the computer bus, no external power supply is required.

The PCI-bus receiver uses an Analog Devices ADSP-2184, a 40 Mips digital signal processing chip. This chip has the ability to provide decoupled and filtered data at 8 kHz per axis. This data rate is an order of magnitude faster than previously available in the industry. Some of the signal processing functions performed by the PCI-bus receiver include: decoupling, coordinate transformation (translation and rotation), low-pass filtering, vector magnitude calculation, maximum and minimum peak capture, threshold monitoring, and rate calculations.

The PCI-bus receiver communicates to the host computer through shared memory in the PCI bus address space. The interface adheres to PCI Local Bus Revision 2.2 Target Only specifications.

 JR3 has serial sensor receivers available with a variety of interfaces. These include PCI-bus, ISA-bus, VMEbus, and Stäubli Unival. *JR3* also has many other interface options available. Please call our Applications Engineers to discuss your particular needs.

JR3 PART NO. 1583

Power Requirements:

The PCI-bus receiver requires no external power. It draws power directly from the PCI bus. The receiver uses the following voltages and currents:

+5V - 870 mA typical
+12V - 25 mA typical (w/o sensor)
-12V - 5 mA typical (w/o sensor)

The sensor will also draw anywhere from 200 to 400 mA from the +12V, and possibly as much as 100 mA from the -12V.

Shared Data Space:

The *JR3* PCI receiver's 16 bit wide DSP memory is mapped into the 32 bit wide PCI bus. The *JR3* PCI receiver is then simply accessed as memory on the PCI bus. Some of the data available and the addresses of that data are listed in the following table:

Addr	Data	Addr	Data
0x60	Shunts	0x68	Default Full Scale
0x70	Min Full Scale	0x78	Max Full Scale
0x80	Full Scale	0x88	Offsets
0x90	Filter 0	0x98	Filter 1
0xa0	Filter 2	0xa8	Filter 3
0xb0	Filter 4	0xb8	Filter 5
0xc0	Filter 6	0xc8	Rates
0xd0	Minimums	0xd8	Maximums

JR3, Inc. has been designing and manufacturing six axis loadcells since 1983. We have manufactured six axis loadcells ranging in diameter from 2 to 13 inches, and with load capacities from 2 to 25,000 lbs and 0.25 to 22,000 ft-lbs. Please feel free to call our applications engineers to discuss your particular needs.

Address Selection:

The PCI-bue receeiver occupies a 512k-byte block in the PCI address space. The PCI bus is a plug and play bus, there is no user configuration necessary.

Outline of PCI-bus Receiver
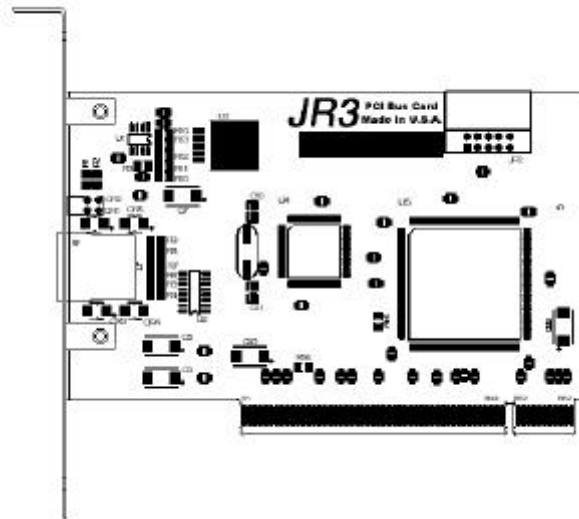
Commands:

The PCI-bus receiver implements several commands which realize some of its more advanced features. Some of those commands, and their command numbers are:

3:	Bit Set
4:	Bit Reset
5:	Use Coordinate Transform
6:	Use Stored Offset
7:	Set Offsets
8:	Reset Offsets
9:	Set Vector Axes
10:	Set Full Scales
11:	Read and Reset Peaks
12:	Read Peaks

Coordinate Transforms:

The PCI-bus receiver allows the force and moment data coordinate axes to be arbitrarily translated and rotated to any desired location and orientation. This allows the user to align the force and moment data with his coordinate axes, greatly simplifying data usage.

Digital Filters:

The PCI-bus receiver implements digital low-pass filters. Data for all 6 filters as well as unfiltered data is available at all times. These 6 filters have cut-off frequencies which are 1/4 of the preceding filter. The frequencies are ratioed from the sampling frequency of the sensor. For the typical 8 kHz sensor, the cutoff frequencies are 500, 125, 32, 8, 2 and 0.5 Hz.
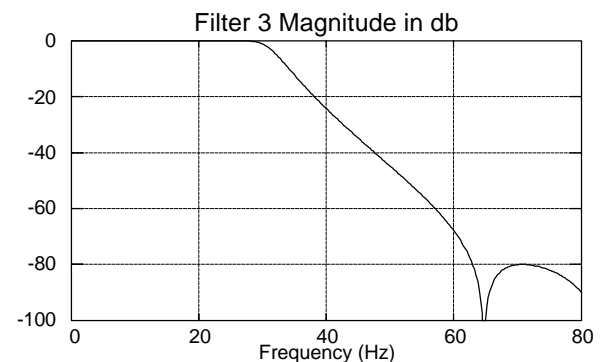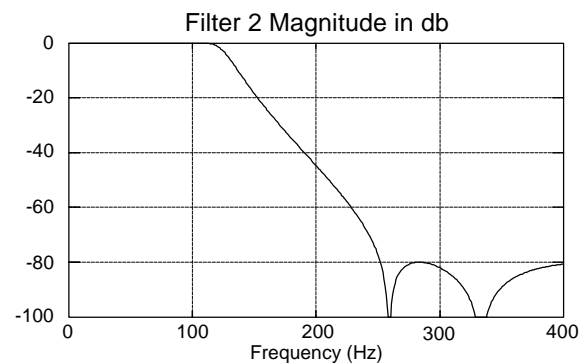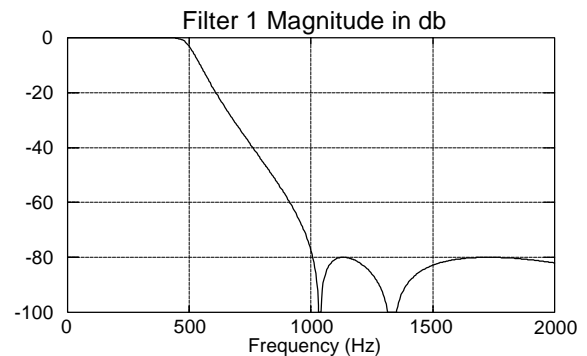
Vector Magnitudes:

The PCI-bus receiver implements two vector calculations for each set of data. These vectors can be calculated from any combination of force or moment data. Like the filter data, these numbers are available at all times.