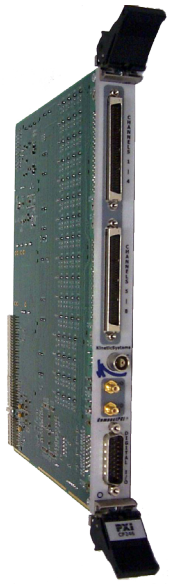
KineticSystems

CP246

8-Ch Bridge Signal Conditioner with ADC

The CP246 is a single-width, 6U, CompactPCI/PXI module with 8 channels of Bridge Signal Conditioning feeding 8 independent 16-bit Analog to Digital Converters (ADC). This single-width solution incorporates both signal conditioning and ADC to eliminate the need for complex field wiring. 16 multi-function digital I/O channels also included.



APPLICATIONS

Automotive Test Cells

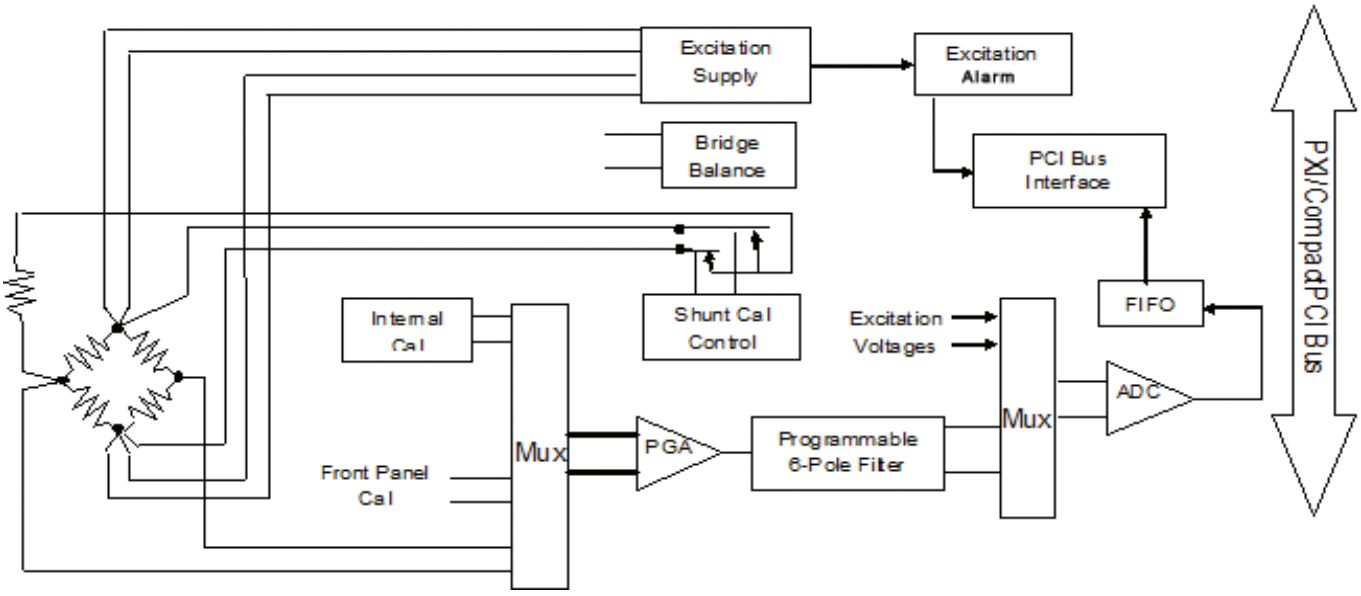
Industrial Monitoring and Control

Automatic Test Equipment (ATE)

General Purpose Digital Control or Monitoring

FEATURES

- Single slot solution for bridge conditioning and ADC
- 16-Bit 250 Ks/s ADC per channel
- Differential Inputs
- Bridge Completion for 1, 2, or 4 active arms
- Programmable shunt calibration, gain and excitation per channel
- 6 pole, low pass filter with programmable cutoff from 20 to 50 kHz
- Programmable bridge balance
- 16 multi-function digital I/O channels



CP246 Block Diagram (1 of 8 channels shown)

GENERAL DESCRIPTION

The CP246 is a single-width, 6U, CompactPCI/PXI module with 8 channels of Bridge Signal Conditioning feeding 8 independent 16-bit Analog to Digital Converters (ADC). This single-width solution incorporates both signal conditioning and ADC to eliminate the need for complex field wiring.

The CP246 supports 10 wire transducer connections and contains fully programmable gain, shunt calibration, bridge balance, excitation and filter on a per channel basis. The maximum sampling rate of each analog to digital converter is 250 Ksamples per second. The ADC per channel architecture generates simultaneously sampled signals. PXI trigger and/or the front panel expansion bus provide a means to connect multiple CP246s together to expand the simultaneously sampled channel count.

The CP246 bridge conditioner inputs provide bridge completion, an excitation supply, anti-aliasing filtering and amplification. On-board bridge completion handles 120Ω, 350Ω or 1000Ω bridges in ¼, ½ and full configurations. The per-channel excitation sources are programmable from 0 to 10 volts in 4096 steps and contain alarm circuitry to monitor excitation supply health. Each channel can be programmed for either voltage or current excitation. The on-board filters can be ordered as either Bessel or Butterworth. Standard filter cutoff frequency selections include 20Hz, 200Hz, 1kHz, 2kHz or 5kHz, 10 kHz, 20 kHz and 50kHz. The filter may also be bypassed for wideband applications. The gain settings are also programmable from 1 to 2000 in a 1,2,5 progression. Bridge may be nulled using the on-board 12-bit DAC.

In addition to the signal conditioning and ADC's, the CP246 provides 16 multi-function digital I/O channels. Any of these channels can be configured as a digital input, a digital output or selectively attached to a frequency in, counter in, or timer out channel.

SOFTWARE

The CP246 comes with a Plug and Play driver for configuring and using the device and application examples to illustrate its basic functionality.

In addition, KineticSystems includes a copy of SoftView, a simple yet powerful tool that integrates KineticSystems' entire line of PXI/Compact PCI instruments under a single software package.

SoftView highlights include:

- Instrument Identification, configuration and operation
- Out-of-the-box solution to explore and evaluate an instrument's capability
- Manage multiple instruments simultaneously
- Data collection, manipulation via a powerful formula engine, and display from digital and analog input channels
- Ability to drive digital and analog outputs
- Not just a Soft Front Panel for an instrument, but for an entire system

APPLICATION EXAMPLE

An SDK and application examples are provided to allow for custom application development.

KineticSystems

CP246 BRIDGE SIGNAL CONDITIONING SPECIFICATIONS

Number channels:	8 Differential
Input:	
Input protection:	± 35 V, continuous
Input impedance:	20 MΩ minimum, > 100 MΩ typical
Input coupling:	Programmable DC or AC
Analog Input Range:	±10.24 Volts
Gain:	
Programmable:	Yes
Gain Selections:	1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 and 2000
Filter:	
Filter type:	6 pole, Bessel or Butterworth (as ordering option)
Programmable:	Yes, on a per channel basis
Filter cutoff frequencies:	Ordering option of 20 Hz, 200 Hz, 1 kHz, and 2 kHz, or 5 kHz, 10 kHz, 20 kHz, and 50 kHz. The filter may be bypassed for an extended frequency response to a –3dB point of 200 kHz. (Other options available on request)
Excitation:	Independent excitation source for each channel.
Excitation type:	Voltage or Current
Excitation sense:	Programmable per channel for local or remote.
Excitation voltages:	Programmable per channel for 0 to 10 volts in 4096 steps.
Excitation current:	Programmable per channel for 0 to 50mA in 4096 steps.
Line regulation:	0.003 %/V
Load regulation:	0.00025 V/mA
Temperature Coefficient:	2 ppm/°C
Bridge Completion	
Programmable:	yes
Bridge Configuration:	¼, ½ and Full Bridge
Completion Resistance:	120 Ω, 350 Ω or 1000 Ω
Shunt Calibration:	
Programmable:	yes
Shunt Resistor Location:	Internal or External (User Selected and Supplied)
Bridge balance:	
Programmable:	yes
Bridge Offset Null:	Utilizing 12–bit DAC
120Ω Bridge:	± 24 mV
350Ω Bridge:	± 70 mV
1000Ω Bridge:	± 200 mV

Analog Input Connector Type: 1 (2)- 68P High Density SCSI connector(s)

CP246 ANALOG TO DIGITAL CONVERTER SPECIFICATIONS

Number of ADC's:	8, one per bridge input channel
ADC Type:	Successive Approximation
Resolution:	16 bits, monotonic over operating temperature range
Missing Codes:	None, guaranteed
Maximum Sample (Conversion) Rate:	250 kSamples/second (per channel)
Sample Clock:	
Programmable:	Yes
Source(s):	Internal or External
Internal Selections:	.01 Hz to 250 kHz in 1 microsecond increments
External Source(s):	Front-panel mounted SMB or PXI trigger signals.
SMB Input:	
Level	TTL Level Signal
Polarity	Programmable
Duty Cycle	40%-60%
Connection	Through front panel mounted SMB connector
PXI Trigger	1 of 8 trigger lines or Star trigger
External Trigger	
Source:	Front panel mounted SMB or PXI trigger signals
SMB Input:	
Level	TTL Level Signal
Polarity	Programmable
Minimum Pulse Width	30 nanoseconds
PXI Trigger	1 of 8 trigger lines or Star trigger
Limit Checking:	
Type:	Min/Max or Level/Slope
Resolution:	8 bits
Action:	Trigger transient, Assert front panel trigger out, PXI trigger signal or generate a PXI/cPCI interrupt

CP246 MULTIFUNCTION DIGITAL I/O SPECIFICATIONS

Number of Multifunction Digital I/O Channels:	16 digital I/O channels.
(Channels may be configured as digital input, digital output or selectively attached to 2 frequency in, 2 counter in, or 2 timer out channels)	
I/O Type:	Single-ended TTL
Direction Control:	Yes
Input Termination:	Pulled-Up
Input switching Threshold:	
"0" level	0.8 V maximum
"1" level	2.0 V minimum
Output Voltage Level:	Programmable, 60/40 minimum
"0" level	0.4V maximum (i_{out} = 2.5 mA)
"1" level	2.7V minimum (i_{out} = 2.5 mA)
Low Level Output Current:	24 mA, maximum
High Level Output Current:	-24 mA, maximum
Input Current:	± 20 µA
Frequency Channels (2):	
Frequency Measuring Range:	0.06Hz to 1 MHz
Observation Window Period:	1 ms
Counter Channels (2):	
Counter Size:	32 bits
Timer Channels (2):	
Timer Size:	32 bits
Digital I/O Connector Type:	1 26 P Subminiature "D" connector

CP246 OVERALL SPECIFICATIONS

Transfer Characteristics:	
Linearity	Better than 0.005% FSR
Initial Accuracy, RTI (Referred to Input): After automatic calibration	
Gain=1	± (200 µV + 0.002% of reading)
Gain=2	± (200 µV + 0.002% of reading)
Gain=5	± (200 µV + 0.002% of reading)
Gain=10	± (100 µV + 0.002% of reading)
Gain=20	± (100 µV + 0.002% of reading)
Gain=50	± (100 µV + 0.002% of reading)
Gain=100	± (50 µV + 0.002% of reading)

Gain=200	± (50 µV + 0.002% of reading)
Gain=500	± (5 µV + 0.01% of reading)
Gain=1000	± (5 µV + 0.01% of reading)
Gain Stability:	
All gains	± 15 ppm/°C maximum
Offset Stability, RTI:	± 2µV/°C maximum @Gain=1000
Common Mode Rejection Ratio:	
	-110 dB, DC to 120 Hz
Noise, RTI:	< 5 µV rms @ Gain=1000, 20 Hz filter
Channel to Channel Crosstalk:	-95 dB
Power Requirements:	
+5 V	3790 mA
+3.3 V	350 mA
+12 V	400 mA
-12 V	400 mA
Environmental and Mechanical:	
Temperature range	
Operational	0°C to +50°C
Storage	-25°C to +75°C
Relative humidity	0 to 85%, non-condensing to 40°C
Cooling requirements	10 CFM
Dimensions	233.35 mm x 160 mm (6U CompactPCI/PXI module)
Front-panel potential	Chassis ground

ORDERING INFORMATION

Model CP246-WXYZ — **8-Ch CompactPCI/PXI Bridge Signal Conditioner with ADC**

W: Filter Option
- **A = 6-pole Bessel**
- **B = 6-pole Butterworth**

X: Trifilar Transformer Option
- **A = Without Trifilar Transformers**
- **B = With Trifilar Transformers**

Y: Filter Cutoff Frequency
- **1 = Filter Cutoff of 20 Hz, 200 Hz, 1kHz and 2 kHz**
- **2 = Filter Cutoff of 5 kHz, 10 kHz, 20 kHz and 50 kHz**

Z: Completion Resistors
- **1 = 120Ω**
- **2 = 350Ω**
- **3 = 1000Ω**

Related Products

Model 5868-Bxyz Cable: 68S High Density to Unterminated
Model 5868-Dxyz Cable: 68S High Density to 68P High Density
Model 5868-Exyz Cable: 68S High Density to 68S High Density
Model T910-Axyz Cable: SMB to SMB; shielded
Model T910-Bxyz Cable: SMB to BNC; shielded
Model T910-Cxyz Cable: SMB to Unterminated

Model 59XX-wxyz 26P Subminiature D Mating Connector; solder cup

Model V765-ZA11 Rack-mount Termination Panel
Model V792-ZA11 Rack-mount Isothermal Termination Panel

Specifications contained within this data sheet are subject to change without notice.

Updated January 19, 2009

900 N. State St.
Lockport, IL 60441-2200

Toll-Free (US and Canada):
phone 1-800-DATA NOW
1-800-328-2669

Direct:
phone +1-815-838-0005
fax +1-815-838-4424

Email:
mkt-info@kscorp.com

To find your local sales representative or distributor or to learn more about KineticSystems' products visit:

www.kscorp.com