

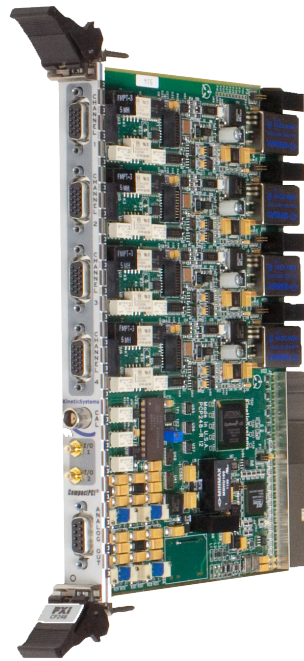
The CP248 is a single-width, 6U, CompactPCI/PXI module with 4 channels of Bridge Signal Conditioning feeding 4 independent 16-bit Analog to Digital Converters (ADC). This single-width solution incorporates both signal conditioning and ADC to eliminate the need for complex field wiring.

APPLICATIONS

Automotive test cells
Industrial Monitoring and Control
Vibration and Torque Measurements
Automatic Test Equipment (ATE)
Isolation to Prevent Ground Loops

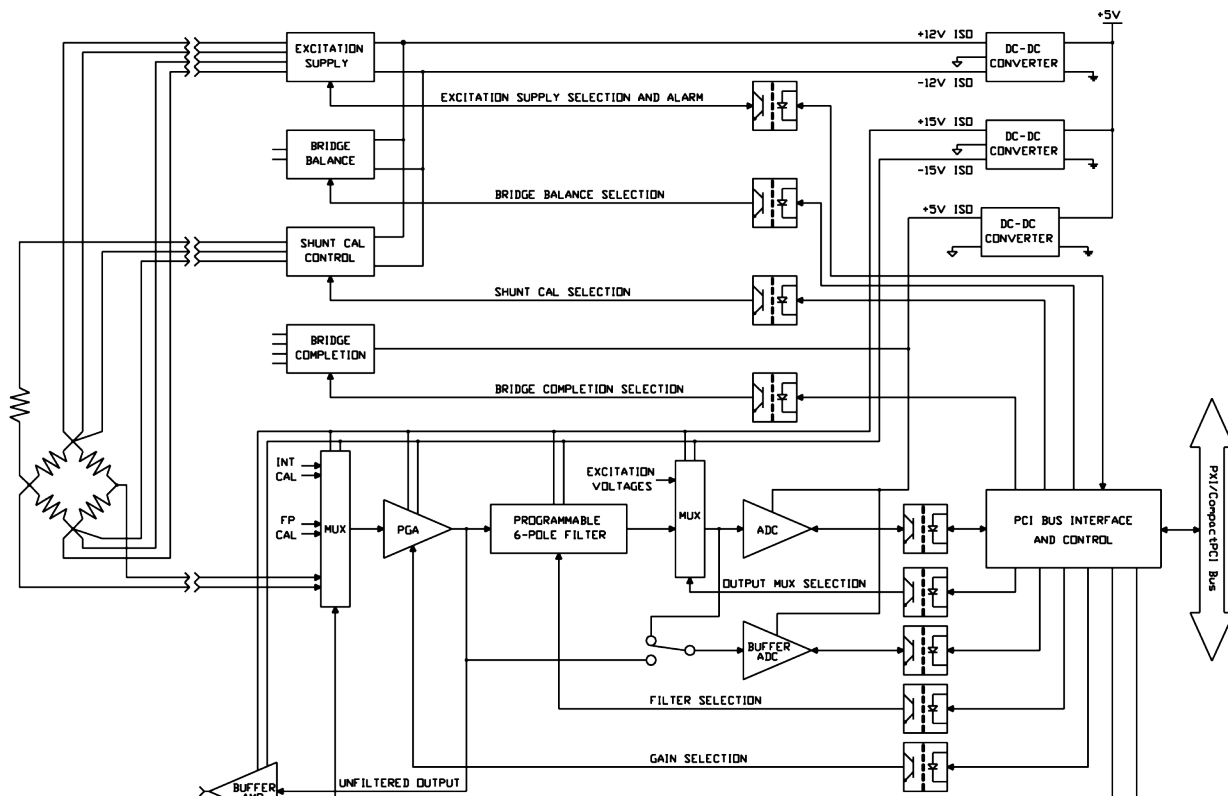
CP248

4 Channel Isolated cPCI/PXI Bridge Conditioner



FEATURES

- 16-Bit 250 Ks/s ADC per channel
- Isolated inputs and excitation
- 300 Volts common-mode
- Bridge Completion for 1, 2, or 4 active arms
- Voltage and current excitation
- Programmable shunt calibration, gain and excitation per channel
- 6 pole, low pass filter with programmable cutoff from 20 Hz to 50 kHz
- Programmable bridge balance
- Filtered and wideband analog outputs



CP248 Block Diagram (1 of 4 channels shown)

GENERAL DESCRIPTION

The CP248 is a single-width, 6U, CompactPCI/PXI module with 4 channels of Bridge Signal Conditioning feeding 4 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 CP248 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 CP248s together to expand the simultaneously sampled channel count.

Two buffered outputs are provided with the CP248. One buffered output is a pre-filter that is at the sensor input ground potential. The second buffered output is an isolated version of the input signal at chassis potential. This second output can be selected to be either pre-filter or post-filter.

The CP248 bridge conditioner provides isolated inputs with operation up to $\pm 300V$ common-mode, bridge completion, isolated excitation supplies, anti-alias filters and amplification. On-board bridge completion handles 120Ω , 350Ω or 1000Ω bridges in $\frac{1}{4}$, $\frac{1}{2}$ 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. Software selectable filter cutoff frequencies are programmed on a per-channel basis and include 20Hz, 200Hz, 500Hz, 1kHz, 2kHz, 5kHz, 25kHz, 50kHz and filter bypass (wideband). Programmable gain settings of 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000 and 10000 are provided. Bridge offsets may be nulled using on-board 12-bit DACs.

SOFTWARE

The CP248 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.

CP248 BRIDGE SIGNAL CONDITIONING SPECIFICATIONS

Number channels:	4 Isolated differential inputs
Input:	
Input protection:	± 32 V differential, ± 300 V common-mode
Input impedance:	10 MΩ minimum, > 100 MΩ typical (DC-coupled)
Input coupling:	Programmable DC or AC
Analog Differential Input Range:	±10.24 Volts
Common-Mode Range:	300 Volts peak AC or DC
Analog Output Range:	±10 Volts peak @ 20mA max (isolated and non-isolated outputs)
Gain:	
Programmable:	Yes
Gain Selections:	1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000 and 10000
Filter:	
Filter type:	6 pole, Bessel or Butterworth (as ordering option)
Programmable:	Yes, on a per channel basis
Filter cutoff frequencies:	20 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 25 kHz, 50 kHz and filter bypass (wideband)
Excitation:	Independent isolated 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, 50 mA drive
Excitation current:	Programmable per channel for 0 to 50 mA in 4096 steps, 10 V
Line regulation:	0.003 %/V (0.005% for current excitation regulation)
Load regulation:	0.001 V/mA
Temperature Coefficient:	2 ppm/°C (2.8 ppm/ °C for current excitation)
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, range set by resistor value
Analog Input Connector Type:	4- 15 contact DSUB connectors
Analog Output Connector Type:	1- 9 contact DSUB connector

CP248 ANALOG TO DIGITAL CONVERTER SPECIFICATIONS

Number of ADC's:	4, 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 100 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:	50% nominal
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

CP248 OVERALL SPECIFICATIONS

Transfer Characteristics:	
Gain Non-Linearity:	0.005% FSR for gain settings ≤ 1000 0.006% FSR for gain settings = 2000 0.025% FSR for gain settings = 5000 0.035% FSR for gain settings = 10000
DC Accuracy, % Full Scale Range, after calibration utilizing DAS	
Gain=1:	0.005%
Gain=2:	0.005%
Gain=5:	0.006%
Gain=10:	0.006%
Gain=20:	0.011%
Gain=50:	0.0125%
Gain=100:	0.015%
Gain=200:	0.025%
Gain=500:	0.025%
Gain=1000:	0.030%
Gain=2000:	0.060%
Gain=5000:	0.150%
Gain=10000:	0.300%
Gain Stability - All gains:	Output 1 (sensor potential) ± 15 ppm/°C maximum Output 2 (chassis potential) ± 40 ppm/°C maximum
Offset Stability, RTI:	± 2µV/°C maximum @Gain=1000
Common Mode Rejection Ratio:	-105 dB minimum DC to 60 Hz for gain ≥ 10; 80 dB minimum at any gain DC to 60 Hz
Noise, RTI:	< 5 µV rms @ Gain=1000, External ADC Rate = 100 kHz < 1 µV rms @ Gain=1000, External ADC Rate = 100 kHz 200 Hz filter
Channel to Channel Crosstalk:	-110 dB minimum between adjacent channels DC to 2 kHz
Power Requirements:	
+5 V:	3250 mA
+3.3 V:	325 mA
+12 V:	400 mA
-12 V:	400 mA

Technical specifications contained within this publication are subject to change without notice.



Environmental and Mechanical:

Temperature range	
Operational	0°C to +50°C
Storage	-25°C to +75°C
Relative humidity	0 to 90%, 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 CP248-xy11: 4-Ch CompactPCI/PXI Bridge Signal Conditioner with ADC

X: Filter Option
B = 6-pole Bessel
K = 6-pole Butterworth

Y: Completion Resistors
A = 120Ω
B = 350Ω
C = 1000Ω

Related Products

Model T910-Axyz Cable: SMB to SMB; shielded
Model T910-Bxyz Cable: SMB to BNC; shielded
Model T910-Cxyz Cable: SMB to Unterminated

Model 5856-Nxyz Cable: 15-contact D to 15-contact DSUB
Model 5938-Z1A: 15-contact DSUB Mating Connector
Model 5938-Z2A: 15-contact DSUB Solder-Cup Connector

Model 5856-Lxyz Cable: 9-contact DSUB to Unterminated, Shielded Twisted Pair
Model 59XX-wxyz: 9-contact DSUB Mating Connector

Model DIN-15S-01: DIN Rail Mount Termination Panel
Model V755-ZA11: 15-position Front Panel Mount Screw Termination Panel

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@dynamicsignals.com

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

www.kscorp.com

Updated June 19, 2014 / Specifications contained within this data sheet are subject to change without notice.

KineticSystems is a product brand of DynamicSignals LLC, and ISO 9001:2008 Certified Company

Copyright © 2014 DynamicSignals, LLC. All rights reserved.