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

**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
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 ±300V common-mode, bridge completion, isolated excitation supplies, anti-alias filters 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. 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
  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:
  Programmable: Independent isolated excitation source for each channel
Excitation voltage: Programmable per channel for 0 to 10 volts in 4096 steps, 50 mA drive
Excitation accuracy:
  ±(1.7% of setting + .04v)
Excitation current:
  Programmable per channel for 0 to 50 mA in 4096 steps, 10 V
Excitation type:
  Voltage or Current
Excitation sense:
  Programmable per channel for local or remote
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

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

Updated August 22, 2017 / Specifications contained within this data sheet are subject to change without notice.

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