PCI-9524

24-Bit Precision Load Cell Input Card



Introduction

The PCI-9524 is a robust, multi-purpose module designed for turnkey material test systems (MTS). Equipped with four strain gauge-based full-bridge transducer input channels, four general purpose analog input channels, and a 3-axis motion controller, the PCI-9524 delivers a complete hardware solution for MTS manufacturers. The PCI-9524 easily integrates physical quantity measurement and implements strategy of software-based close-loop control in a single module package. For transducer measurement, the PCI-9524 supports sensitivity from 1.0 mV/V to 4.0 mV/V and provides a 1/200000 accuracy of measurement of full scale. These features make the PCI-9524 suitable for precise measurement in large-scale transducers.

The PCI-9524 is also equipped with four, 24-bit general purpose analog input channels that allow accurate measurements of the LVDT (Linear Variable Differential Transducer) and Linear wire potentiometer signals to achieve high-resolution of displacement.

With motion control capability and 16-bit DA channels, the PCI-9524 comes with three stepper/servo motor axes and two channels of hydraulic system control function. The built-in incremental encoder feedback channels enable the PCI-9524 to implement the stratagem of MTS' software-based closed-loop control.

The impressive PCI-9524 features permit easy implementation of required control or measurement functionalities with just a single module, saving precious development and integration time for MTS manufacturers, CNC machines, and civil testing equipment.

Features

- **Transducer Inputs for precise measurement**
  - **4-CH full-bridge load cell transducer inputs**
  - **Accuracy up to 1/200,000 counts at full-scale**
  - **Sensitivity from 1.0 mV/V to 4.0 mV/V**
  - **2.5/10 VDC excitation voltage, software selectable**
  - **Internal 24-bit A/D resolution**
- **Motion control interface for stepper and hydraulic system control**
  - **3-axis PWM output with OUT/DIR and CW/CCW mode**
  - **2-CH 16-bit analog outputs**
  - **A-B phase encoder input with 24-bit counter**
- **General-Purpose Analog Inputs for accurate measure ments of LVDT[1] and linear wire potentiometer signals**
  - **4-CH analog input with 24-bit resolution**
  - **Programmable gains of ±1.25 V, ±2.5 V, ±5 V, ±10 V**
  - **Up to 30 kS/s sampling rate (single channel)**

Note 1: LVDT: Linear Variable Differential Transducer

Supported Operating System

- Windows 7/8 x64/x86, Linux

Driver and SDK

- LabVIEW, MATLAB, C/C++, Visual Basic, Visual Studio.NET

Specifications

4-channel Load Cell Transducer Input

- Excitation voltage: 2.5 V/10 VDC
- Internal A/D resolution: 24-bit
- Update speed when Auto-zero Disabled
  - · Up to 30 KSPS (single channel)
  - · Up to 1,638 SPS (multi-channel)
- Update speed when Auto-zero Enabled
  - · Up to 819 SPS (single channel or multi-channel)

  Transducer sensitivity: 1.0 mV/V to 4.0 mV/V
- Number of channels: 4
- Accuracy: 1/200000 of full scale (with remote sense & auto zero enabled)
- Onboard 256 samples A/D FIFO

PWM Output & Encoder Input

- Number of axis: 3

  Pulse output options: OUT/DIR and CW/CCW (26LS31, differential line driver, driving current: up to 20 mA)
- Maximum output frequency: 500 kHz
- Encoder Input: 24-bit up/down counter for incremental encoder feedback

General Purpose Analog Input

- Resolution: 24-bit
- Programmable range: ±1.25 V, ±2.5 V, ±5 V, ±10 V
- Number of channels: 4
- Sampling rate: 30 kS/s (non-multiplexing)
- Onboard 256 samples A/D FIFO

Isolated Digital Input

- Number of channels: 8
- Maximum input range (non-polarity): 0 V to 24 V
- Input resistance: 2.7 KΩ

Isolated Digital Output

- Number of channels: 8
- Output type: Power MOSFET
- Sink current: Up to 300 mA/channel

Analog Output

- Resolution: 16-bit
- Output range: ±10 V
- Number of channels: 2
- Update rate: Up to 5 kS/s
- Onboard 1 K samples D/A FIFO
- Driving capability: 5 mA

Hardware Timer Interrupt

- Base clock: 10 MHz
- Resolution: 32-bit
- Interrupt Frequency: 10 MHz/N ; N=1~(2^{32}-1)

General Specifications

- 5V power output current:
  - · ISO5VDD: max. 160 mA
  - · ISOPWR: max. 16 mA
- I/O connector: Two 68-pin SCSI-VHDCI female
- Operation Temperature: 0 to 45°C
- Power requirements: 5 V @ 2 A
- Dimensions (not including connectors): 156 mm x 116 mm (6.14" x 4.57")

Ordering Information

PCI-9524
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