High-Accuracy PCI Thermocouple/Multifunction Data Acquisition System

Includes a PCI Plug-n-Play Card, Screw-Terminal/Signal Conditioning Pod, Cable, and Extensive Software Support

- 14 Thermocouple Input Channels
- Supports Thermocouple Types J, K, S, T, B, E, N, R
- 7 Differential Voltage Inputs, with 13 Programmable Ranges from ±156 mV to ±10 V Input
- 200K Readings per Second—No Averaging Required
- 24 Digital I/O lines
- 4 Frequency/Pulse Counting Input Channels
- 4-Channel, 16-Bit/100 kHz Analog Outputs

- 100% Digital Calibration
- DaqView Software for Effortless Setup, Acquisition, and Real-Time Data Viewing
- Drivers for DASYLab, LabVIEW, Visual Basic, C++

The OMB-DAQTEMP14A data acquisition card provides a total hardware/software/signal conditioning solution for high-accuracy, high-speed temperature, voltage, frequency, and pulse counting measurements, plus digital I/O and analog output.

A diversified software package is included with the OMB-DAQTEMP14A, including DaqView software, plus drivers for DASYLab, LabView, and Windows-based languages including Visual Basic and C++.

OMB-DAQTEMP14A, $1499, shown smaller than actual size, with screw terminal/signal conditioning pod included.

OMB-DAQTEMP14A hardware consists of a plug-n-play PCI board, a 0.9 m (3') cable, and a screw terminal/signal conditioning pod. Cold-junction compensation is built in to the OMB-DAQTEMP14A, allowing for highly accurate thermocouple measurements, with channel-to-channel variation and noise typically less than 0.2°C, and absolute accuracy typically better than 1.0°C. This is accomplished by having a separate low-noise, bandwidth-limited amplifier per thermocouple channel. The OMB-DAQTEMP14A has 14 thermocouple input channels. All power for the OMB-DAQTEMP14A is derived from the PC, so there is no need for external power supplies or transformers.

In addition to thermocouple inputs, the OMB-DAQTEMP14A features 7 differential voltage input channels, with 16-bit resolution and programmable full scale input ranges from ±156 mV to ±10 V. The 4 frequency input channels can measure frequency or count pulses up to 10 MHz. Two timer output channels can generate square outputs up to 1 MHz.

Twenty-four digital I/O lines are also included, which can be programmed in 8-bit groups as either inputs or outputs.

* In order to provide maximum temperature stability, the thermocouple channels have a 4 Hz filter.
The 16-bit/100 kHz analog outputs can be used to generate waveforms, with a virtually infinite waveform output length possible from PC memory.

All inputs and outputs are accessible via convenient screw terminals located on the signal conditioning pod. The user can easily remove the cover of the signal conditioning pod to gain access to the screw terminals for signal connections.

**DAQVIEW SOFTWARE**
The included DaqView software allows the user to verify signal connections, acquire and save data to disk, and graphically view real-time data within moments of installing the system. Easily set up all hardware, acquisition, and display parameters, without programming, via a simple, spreadsheet-style screen. DaqView is a full-featured acquisition and display application that provides all the functionality needed for many data logging applications.

**OMB-DAQVIEW-XPLUS**
DaqViewXL is an optional Excel add-in that provides complete data acquisition functionality. Seamlessly integrated into Excel’s tool palette, DaqViewXL has the same comprehensive acquisition and display capabilities as DaqView. Excel is an ideal tool for test engineers because it provides a variety of graph and charting functions for presenting data in a graphical format, as well as mathematical and analysis functions such as FFTs. Excel’s ability to retrieve and manipulate previously acquired data in a spreadsheet format and DaqViewXL’s advanced data acquisition functions form a comprehensive data acquisition solution.

**Specifications**

**GENERAL**
Supply Voltage Range: 4.75 to 5.25 Vdc (from PCI bus)
Power Consumption: 5.5 W
Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Relative Humidity: 0 to 95%, non-condensing
Vibration: MIL STD 810E
PCI Board Dimensions: 165 W x 15 D x 108 mm H (6.5 x 0.6 x 4.2")
Signal Conditioning/Screw Terminal Pod Dimensions: 86 W x 240 D x 42 mm H (3.4 x 9.44 x 1.65")

**A/D SPECIFICATIONS**
Type: Successive approximation
Resolution: 16-bit
Conversion Time: 5 µs
Maximum Sample Rate: 200 kHz
Non-Linearity (Integral): ±1 LSB
No missing codes

**VOLTAGE INPUTS**
Channels: 7 differential inputs, programmable on a per-channel basis for unipolar or bipolar
Ranges: Software or sequencer selectable on a per-channel basis;
0 to 10 V, 0 to 5 V, 0 to 2.5 V, 0 to 1.25 V, 0 to 0.625 V,
0 to 0.3125 V, ±10 V, ±5 V, ±2.5 V, ±1.25 V, ±0.625 V,
±0.3125 V, ±0.156 V

<table>
<thead>
<tr>
<th>T/C Inputs</th>
<th>Voltage Inputs</th>
<th>Frequency Output</th>
<th>Pulse Outputs</th>
<th>Analog I/O</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMB-DAQTEMP14A</td>
<td>14</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Voltage Accuracy: One year, 0 to 35°C (32 to 95°F)(exclusive of noise). For full scale input ranges from 2.5 to 10 V, accuracy is 0.015% of reading + 0.005% of range. For full scale input ranges from 312 mV to 1.25 V, accuracy is 0.015% of reading + 0.008% of range. For full scale input of 156 mV, accuracy is 0.02% of reading + 0.008% of range.

Bandwidth: 500 kHz
Settling Time: 5 µs to 1 LSB for full scale step
Temperature Coefficient: ±(10 ppm + 0.3 LSB)/°C
Input Impedance: 20 MΩ (differential)
Bias Current: <1 nA at 0 to 35°C (32 to 95°F)
Common-Mode Rejection: 86 dB, DC to 60 Hz for gains 8; >100 dB for gains ≥16
Maximum Input Voltage: ±11 V relative to analog common
Overvoltage Protection: ±35V
Crosstalk: 100 dB, DC to 60 Hz; 86 dB @ 10 kHz
THERMOCOUPLE INPUTS
Channels: 14 differential T/C inputs
T/C Types: J, K, S, T, E, B R, N, or mV input
Input Voltage Range: ±100 mV
Input Impedance: 40 MΩ
Input Bandwidth: 4 Hz
Input Bias Current: 10 nA
CMRR: 100 dB typ.
Overvoltage Protection: ±40 V
Voltage Accuracy: ±(0.2% rdg + 50 µV)
T/C Accuracy: See table below; valid for one year, 18 to 28°C (64 to 82°F)
Minimum T/C resolution: 0.1°C for all T/C types

INPUT SEQUENCER
Temperature, voltage, digital, and frequency inputs can be scanned synchronously, based on either an internal programmable timer or an external clock source. Analog and digital outputs can be synchronized to either of these clocks.

Scan Clock Sources: 2
1. Internal, programmable from 5 µs to 5.96 hours in 5 µs steps
2. External, TTL-level input up to 200 kHz max

External Acquisition Scan Clock Input
Maximum Rate: 200 kHz
Clock Signal Range: 0 to 5 V
Minimum Pulse Width: 50 ns high, 50 ns low

TRIGGERING
Trigger Sources: 6, individually selectable for starting and stopping an acquisition. Stop acquisition can occur on a different channel than start acquisition; stop acquisition can be triggered via modes 2, 4, 5 or 6 described below. Pre-trigger is supported with fixed or variable pre-trigger periods.

1. Single-Channel Analog Hardware Trigger
Any voltage or T/C input channel can be software programmed to be the analog trigger channel.

2. Single-Channel Analog Software Trigger
Any voltage or T/C input channel can be selected as the software trigger channel. If the trigger channel is a thermocouple, then the driver automatically compensates for the delay required to obtain the reading, resulting in a maximum latency of one scan period.

3. Single-Channel Digital Trigger
A separate digital input is provided for digital triggering.
Input Signal Range: -15 to 15 V
Trigger Level: TTL
Min Pulse Width: 50 ns high, 50 ns low
Latency: 5 µs max

4. Digital Pattern Triggering
8- or 16-bit pattern triggering on the digital input port. Programmable for trigger on equal, above, below, or within/outside of a window. Individual bits can be masked for “don’t care” condition.
Latency: One scan period, max

5. Counter/Totalizer Triggering
Counter/totalizer inputs can trigger an acquisition. User can select to trigger on a frequency or on total counts that are equal, above, below, or within/outside of a window.
Latency: One scan period, max

6. Software Triggering
Trigger can be initiated under program control.

<table>
<thead>
<tr>
<th>Thermocouple Type</th>
<th>Min</th>
<th>Max</th>
<th>-100</th>
<th>0</th>
<th>100</th>
<th>300</th>
<th>500</th>
<th>700</th>
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<th>1100</th>
<th>1400</th>
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<tbody>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>0.9</td>
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</tbody>
</table>
ANALOG INPUT AND MULTIFUNCTION CARDS

All OMB-DAQTEMP14A systems include PCI measurement board, 0.9 m (3') cable, signal conditioning pod and software. All programming documentation is included on the CD-ROM supplied with the system. Additional I/O provided with every system includes 7 differential voltage inputs, 24 digital I/O, 4 counter inputs, 2 timer outputs and 4 analog outputs. Software included with the OMB-DAQTEMP14A includes DaqView, Windows drivers for Visual Basic and C++, and drivers for LabView and DASYLab.

Ordering Example: OMB-DAQTEMP14A, $1499, shown smaller than actual size, with screw terminal/signal conditioning pod (included).

To Order (Specify Model Number)

<table>
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<tr>
<th>Model Number</th>
<th>Price</th>
<th>Description</th>
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<tbody>
<tr>
<td>OMB-DAQTEMP14A</td>
<td>$1499</td>
<td>14 differential thermocouple inputs, 7 differential voltage inputs plus 4 analog outputs</td>
</tr>
<tr>
<td>OMB-DAQVIEW-XLPLUS</td>
<td>299</td>
<td>Data acquisition software for Microsoft Excel (provides a direct link from DaqView into Excel spreadsheets)</td>
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Available for fast delivery!

FREQUENCY/PULSE COUNTERS

Counter inputs can be scanned synchronously along with voltage, T/C, and digital scanned inputs, based on either internal programmable timer or an external clock source. Counters can be configured to clear when read, or to totalize and clear under program control.

Channels: 4 x 16-bit; cascadable as 2 x 32-bit
Frequency Measurement Rate: 10 MHz max
Input Signal Range: -15 to 15 V
Trigger Level: TTL
Minimum Pulse Width: 50 ns high, 50 ns low

Frequency/Pulse Generators
Channels: 2 x 16-bit
Output Waveform: Square wave
Output Rate: 1 MHz base rate divided by 1 to 65,535 (programmable)
High-Level Output Voltage: 2.0 V min @ -3.75 mA; 3.0 V min @ -2.5 mA
Low-Level Output Voltage: 0.4 V max @ 2.5 mA

DIGITAL I/O
Channels: 24
I/O Levels: TTL

Available for Fast Delivery!
More than 100,000 Products Available!

- **Temperature**

- **Flow and Level**
  Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

- **pH and Conductivity**
  Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

- **Data Acquisition**
  Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485, Ethernet and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

- **Pressure, Strain and Force**
  Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Pressure Transmitters, Strain Gauges, Torque Transducers, Valves

- **Heaters**