FEATURES
- High-speed USB 2.0 Multifunction DAQ
- Sustained sampling rates up to 500kHz
- 16-bit or 12-bit resolution A/D converter
- Flexible, software configured functionality
- 64 single-ended or 32 differential analog inputs
- 8 input ranges, 4 unipolar and 4 bipolar; per 4 channel programmable
- Autocal and oversampling for real-time accurate data
- A/D starts via software, timer, or external trigger
- 2 x 16-bit analog outputs; 4kHz update rate
- 16 high-current digital I/O lines
- 16-bit programmable counter/timer
- I/O via two DB37F and one DB25F connectors
- Rugged gold-zinc plated steel enclosure has connector pin assignments, signal names and arrangements
- Power drawn from USB port in most applications

FACTORY OPTIONS
- Hi gain version (for thermocouple and other low level measurements)
- Reference junction sensor w/ two 37-pin terminal blocks
- Extended Temperature Operation -40 to +85 C
- OEM version (no enclosure) w/USB/104 form-factor

FUNCTIONAL DESCRIPTION
The DAQ-PACK M Series is a highly integrated multi-function data acquisition and control solution interfaced via USB. The unit is a USB 2.0 high-speed device, offering the highest speed currently available on the USB 2.0 bus.

Available with a 16- or 12-bit analog to digital converter, the unit is capable of sustained sampling speeds up to 500kHz (divided equally by the total number of channels configured for use) for the 64 single-ended or 32 differential analog inputs. Groups of four channels at a time can be software configured for different ranges. A unique, real-time internal calibration system allows the card to continually compensate for offset/gain errors giving a more accurate reading. Additional features include 2 x 16-bit analog outputs, 16 digital I/O lines, and a programmable 16-bit counter. The counter can be configured in a variety of modes and has the ability to use external signals to trigger and control the scanning of its analog inputs.

This small, compact, multifunction data acquisition unit provides the user with the solid foundation that is needed to start acquiring, measuring, analyzing and monitoring in a variety of applications. The DAQ-PACK M Series can be used in many real-world applications such as embedded equipment monitoring, precision PC-based and portable environmental measurements, and mobile data acquisition.

The DAQ-PACK M Series is designed to be used in rugged industrial environments but is small enough to fit nicely onto any desk or testing station. The compact enclosure is silk-screened with diagrammatic connector pin identification and pin assignments to easily reference and make all signal connections.

ACCESSORIES
The DAQ-PACK M Series is available with optional cables and screw terminal boards for easy-to-use, out of the box connectivity.

<table>
<thead>
<tr>
<th>ADAP25M</th>
<th>ADAP37M</th>
<th>CAB37MF-xx</th>
<th>STB-37</th>
<th>CAB25MF-xx</th>
<th>STB-25</th>
<th>DIN-SNAP(-6)</th>
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</thead>
<tbody>
<tr>
<td>DB25 male screw terminal for digital I/O</td>
<td>DB37 male screw terminal for analog I/O</td>
<td>37-pin M to F ribbon cable for analog I/O</td>
<td>Screw terminal board, standoffs or DIN-SNAP</td>
<td>25-pin male to female ribbon cable for DIO</td>
<td>Screw terminal board</td>
<td>SNAP-TRACK DIN-RAIL STB mount</td>
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<td>Quantity: 1</td>
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SOFTWARE
The module utilizes a high-speed custom function driver optimized for a maximum data throughput of 1MBps that is 50-100 times faster than the USB human interface device (HID) driver used by many competing products. This approach maximizes the full functionality of the hardware along with capitalizing the advantage of high-speed USB 2.0. The DAQ-PACK M Series is supported for use in most USB supported operating systems and includes a free Linux (including Mac OS X) and Windows compatible software package. This package contains sample programs and source code in Visual Basic, Delphi and Visual C++ for Windows. Third party support includes a Windows standard DLL interface usable from the most popular application programs, and includes example LabVIEW VIs. Embedded OS support include Windows Xpe.

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### PRIMARY SPECIFICATIONS (full specs in DAQ-PACK manual)

**Analog Inputs**
- Successive approximation
- Resolution: 16-bit or 12-bit
- Sampling rate: 100k – 500ksps, depending on model
- Number of channels: 64 single-ended or 32 differential
- Unipolar ranges: 0-1V, 0-2V, 0-5V, 0-10V
- Bipolar ranges: ±1V, ±2V, ±5V, ±10V
- Calibration Hardware:
  - "16-, 12-64MA": Two on-board ref's + cal'd real-time output
  - "16-64ME": Two on-board references
  - "12-64M": Two on-board references
  - "12-64ME": None
- System Calibration Program provided to calibrate entire system
- Accuracy:
  - Uncalibrated: 0.094% Full-Scale (FS)
  - Calibrated(1): 0.0015% FS
- Input impedance: 1MΩ
- A/D Start Sources: Software, Timer, External Start Trigger
- Channel Oversampling: 0-255 consecutive samples/channel
- Overvoltage prot.: -40 to +55V
- Crosstalk: -60dB @ 500kHz

**Analog Outputs**
- Type / Resolution: Single-ended, 16-bit
- Uni., Bipolar Ranges: 0-5V, 0-10V, ±5V, ±10V (factory installed)
- Conv. / Settling: 4kHz / 4us typ., 7us max; ¼ - ¾ scale ±2LSBs
- Drive Current: ±25mA per channel

**Digital I/O**
- 16 inputs or outputs in groups of 8 (pulled-up)
- Conv. / Setting: 4kHz / 4us typ., 7us max; ¼ - ¾ scale ±2LSBs
- Drive Current: ±25mA per channel

**Counter/Timer**
- Available Counters: CTR0 (CTR1, CTR2 dedicated to A/D starts)
- Input Frequency: 10MHz (max)
- Counter size: 16-bit
- Clock: Internal 10MHz or Externally supplied

### Environmental
- Operating Temp.: 0° to +70°C, optional -40° to +85°C
- Storage Temp.: -40° to +105°C
- Humidity: 5% to 90% RH, without condensation
- Enclosure Dimensions: 4.680" x 3.660" x 2.820"
- Power Required: +5V at 320mA typical

### ORDERING GUIDE
- DPK-AI016-64MA: 16-Bit, 500kHz, w/Adv. Cal HW, 2 analog outs
- DPK-AII016-64MA: as above but with no analog outputs
- DPK-AII016-64ME: 16-Bit, 250kHz, w/Std. Cal HW, 2 analog outs
- DPK-AII016-64M: as above but with no analog outputs
- DPK-AII012-64MA: 12-Bit, 500kHz, w/Adv. Cal HW, 2 analog outs
- DPK-AII012-64MA: as above but with no analog outputs
- DPK-AII012-64M: 12-Bit, 250kHz, w/Std Cal HW, 2 analog outs
- DPK-AII012-64M: as above but with no analog outputs
- DPK-AII012-64M: 12-Bit, 100kHz, w/2 analog outputs
- DPK-AII012-64M: as above but with no analog outputs

### Model Options
- • -HG: High Gain (required for t/c measurement)
- • -MTC: Ext. Temperature Operation (-40° to +85°C)

### Optional Accessories
- USB-PWR-5V-2A: External Power Adaptor
- DIN-CLIP: Sturdy DIN-Rail mounting clip
- DAQ-M-PLATE: Gold-zinc plated panel mounting
- ADAP25M: DB25 male screw terminal for digital I/O
- ADAP37M: DB37 male screw terminal for analog I/O
- CAB37MF-xx: 37-pin M to F ribbon cable for analog I/O
- STB-25: Screw terminal board
- DIN-SNAP(-6): SNAP-TRACK DIN-RAIL STB mount