

## **ML880 PowerLab 16/30**

*Data Acquisition Systems*

---

### **Description**

The PowerLab 16/30 is a data acquisition and analysis system for use in life science research. The system has 16 bit resolution (hardware and software supported), and is capable of recording at speeds of up to 200



000 samples per second (400 kHz aggregate). Communication is via High Speed USB (2.0). It incorporates sixteen input channels, 4 with both differential Pod and single ended BNC connectors and 12 single ended BNC inputs. It also features a built-in analog output for stimulation or pulse generation (software controlled) and a trigger input. The PowerLab 16/30 is compatible with instruments, signal conditioners, and transducers sold by ADInstruments, as well as other 3rd party products. It includes Chart and Scope software.

### **Computer System Compatibility**

#### **PC Computers:**

Pentium level processor with USB interface running Windows® 2000 or XP.

#### **Macintosh Computers:**

Macintosh® with USB interface running OS X (10.1 or later)

### **Chart & Scope Compatibility**

The following versions of Chart and Scope software are required to operate a PowerLab 16/30:

#### **WINDOWS**

- ◆ Chart v5.2.1 or later
- ◆ Scope v3.7.4 or later

#### **MACINTOSH**

- ◆ Chart v5.2.1 or later
- ◆ Scope v3.7.4 or later

### **Applications**

The PowerLab 16/30 data acquisition system is suitable for research in the fields of human and animal physiology, pharmacology, neurophysiology, biology, zoology, biochemistry and biomedical engineering.

## Specifications

(As tested at the time of printing and are subject to change)

### Analog Inputs

Number of inputs:	16
Input configuration:	12 dedicated single ended inputs; 4 inputs configurable as single ended or differential (through Pod port)
Amplification range:	$\pm 2$ mV to $\pm 10$ V full scale in 12 steps
	$\pm 10$ V
	$\pm 5$ V
	$\pm 2$ V
	$\pm 1$ V
	$\pm 0.5$ V
	$\pm 0.2$ V
	$\pm 0.1$ V
	$\pm 50$ mV
	$\pm 20$ mV
	$\pm 10$ mV
	$\pm 5$ mV
	$\pm 2$ mV
Maximum input voltage:	$\pm 15$ V
Input impedance:	$\sim 1\text{ M}\Omega \parallel 100\text{pF}$
Low-pass filters:	1 Hz to 1 kHz in 2:5:10 steps; 2 kHz, 25 kHz
AC coupling:	DC or 0.15 Hz (software-selectable)
Frequency response ( $-3$ dB):	25 kHz on 10 V range
DC drift:	Software corrected
CMRR (differential):	80 dB
Input crosstalk:	75 dB minimum
Input noise:	$<350\ \mu\text{V}_{\text{rms}}$ referred to input on 10 V range

### Pod Connectors

General features:	Combined power, I <sup>2</sup> C and single-ended or differential analog input signals on one connector, supports Pods
Supply voltage:	$\pm 5$ V regulated
Maximum current:	50 mA per pod port
Communications:	2-wire I <sup>2</sup> C
Signal input:	Positive and negative analog inputs
Connector type:	8-pin DIN

### Sampling

ADC resolution:	16 bit (313 $\mu\text{V}$ resolution on 10 V range)
Linearity error:	2.5 LSB (from 0 to 70 °C)
Maximum sampling rates:	200 kHz on one or two inputs
	100 kHz on 3 or 4 inputs
	40 kHz on 5 to 8 inputs
	20 kHz on 9 to 16 inputs

## Analog Outputs

Number of outputs:	2
Output configuration:	Single-ended (outputs can be used as one differential output)
Output resolution:	16 bit (313 $\mu$ V resolution on 10 V range)
Maximum output current:	$\pm$ 50 mA
Output impedance:	0.5 $\Omega$ typical
Slew rate:	6 V/ $\mu$ s
Settling time:	10 $\mu$ s (to 1% of FSR)
Linearity error:	$\pm$ 4 LSB
Output range:	$\pm$ 200 mV to $\pm$ 10 V full scale in six steps
	$\pm$ 10 V
	$\pm$ 5 V
	$\pm$ 2 V
	$\pm$ 1 V
	$\pm$ 500 mV
	$\pm$ 200 mV

## External Trigger

Mode:	TTL level (isolated) or contact closure (non-isolated)
Trigger threshold:	1.3 V (rising edge), 1.1 V (falling edge)
Hysteresis:	0.3 V
Input impedance:	50 k $\Omega$
Maximum input voltage:	$\pm$ 12 V
Minimum pulse width:	5 $\mu$ s

## Microprocessor and Data Communication

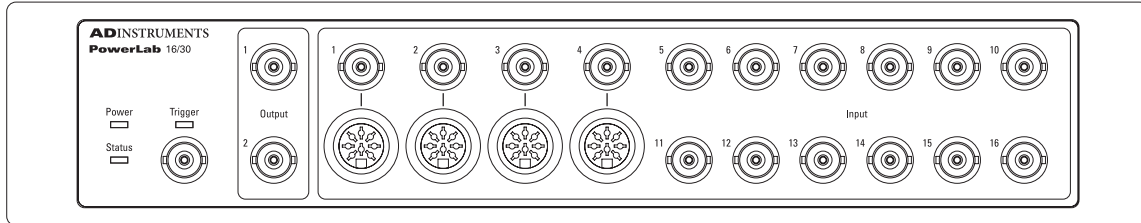
CPU:	240 MHz PowerPC 405GPr
RAM:	16MB SDRAM
Data communication:	USB 2.0
Expansion ports	
I <sup>2</sup> C expansion port:	Power and control bus for Front-end units. Supports up to 16 Front-end channels but limited to PowerLab's free inputs. Interface communications rate of up to 10 000 bits/s.
Digital output:	8 independent lines, TTL output level (8 mA maximum load per line)
Digital input:	8 independent lines, TTL input level, threshold 1.2 V, 10 k $\Omega$ input impedance, 5V maximum
Physical Configuration	
Dimensions (w x h x d):	300 x 60 x 300 mm
Weight:	4.8 kg
Operating voltage:	90-250 V (automatic)
Maximum power needs:	80 VA (full complement of Front-ends and Pods)
Operating temperature:	10 to 35 $^{\circ}$ C, 0 to 90% humidity (non-condensing)

WARRANTY: ADInstruments PowerLab Systems, Front-end and Pod Signal Conditioners are warranted against defects in materials and workmanship for a period of 3 years from the date of purchase. Third party products are covered by the manufacturer's warranty. Warranties are void if the product has been damaged due to negligence. Consumables and electrodes are not covered by a warranty. All questions regarding service and warranty should be directed to your nearest ADInstruments representative or one of the offices listed below.

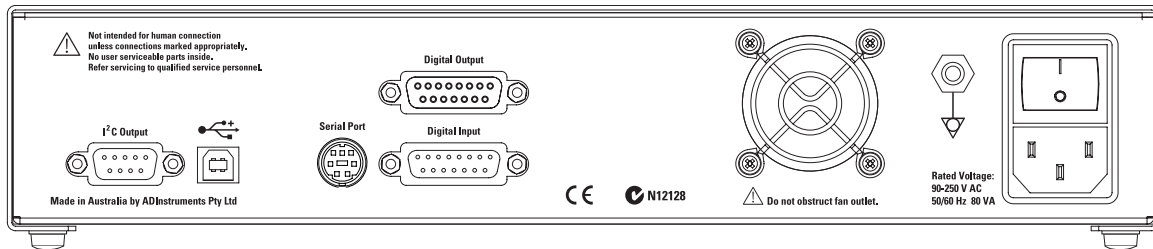
## Caution

Read "Statement of Intended Use" on our website or in "Getting Started with PowerLab" before use.

## PowerLab 16/30 Diagrams



Front panel



Back panel

## Ordering Information

ML880 PowerLab 16/30

Includes: PowerLab 16/30 16-Channel Data Acquisition System  
 Chart & Scope Software Installer CD  
 Cable Kit including Power Cord, BNC to BNC test cable, USB Cable  
 Getting Started with PowerLab Manual  
 Finger Pulse Transducer

ML880-DC-05A

**ADINSTRUMENTS.com**

ISO 9001:2000 Certified Quality Management System

### North America

Tel: +1 888 965 6040  
 Fax: +1 866 965 9293  
 info@adinstruments.com

### United Kingdom

Tel: +44 1865 891 623  
 Fax: +44 1865 890 800  
 info.uk@adinstruments.com

### Germany

Tel: +49 6226 970105  
 Fax: +49 6226 970106  
 info.de@adinstruments.com

### Asia

Tel: +86 21 5830 5639  
 Fax: +86 21 5830 5640  
 info.cn@adinstruments.com

### South East Asia

Tel: +60 3 8023 6305  
 Fax: +60 3 8023 6307  
 info.sea@adinstruments.com

### Japan

Tel: +81 52 932 6462  
 Fax: +81 52 932 6755  
 info.jp@adinstruments.com

### Australia

Tel: +61 2 8818 3400  
 Fax: +61 2 8818 3499  
 info.au@adinstruments.com

### Indian Subcontinent

Tel: +91 93 1225 2800  
 Fax: +91 11 2766 2591  
 info.in@adinstruments.com

### South America

Tel: +56 2 356 6749  
 Fax: +56 2 356 6786  
 info.cl@adinstruments.com

### International

Tel: +61 2 8818 3400  
 Fax: +61 2 8818 3499  
 info.au@adinstruments.com