

PL3504 PowerLab 4/35

Data Acquisition Systems

Description

The PowerLab 4/35 is a data acquisition and analysis system for use in life science research. The system has 16 bit resolution and is capable of recording at speeds of up to 200 000 samples per second

(400 000 samples per second aggregate). Communication is via High Speed USB (2.0). It incorporates four input channels with both differential Pod and single ended BNC connectors. It also features 2 built-in analog outputs for stimulation or pulse generation (software controlled) and a trigger input. The PowerLab 4/35 is compatible with instruments, signal conditioners, and transducers sold by ADInstruments, as well as other third party products. It includes LabChart and Scope software.



Software Compatibility

The following versions of ADInstruments software are required to operate a PowerLab 4/35:

WINDOWS

- ◆ LabChart v7.2.1 or later
- ◆ Scope v3.9.2 or later

MACINTOSH

- ◆ LabChart v7.2.2 or later
- ◆ Scope v4.1.4 or later

PC and Mac Requirements

Please visit ADInstruments Software System Requirements page at www.adinstruments.com/downloads/ for Windows and Mac operating system compatibility information. For further assistance please contact your ADInstruments representative.

Applications

The PowerLab 4/35 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 input channels:	4																																							
Input configuration:	4 inputs configurable as simple ended or differential (through Pod port)																																							
Amplification range:	± 2 mV to ± 10 V full scale in 12 steps:																																							
	<table><thead><tr><th>Range</th><th>Resolution</th><th>Noise (rms)</th></tr></thead><tbody><tr><td>± 10 V</td><td>313 μV</td><td>1 LSB</td></tr><tr><td>± 5 V</td><td>156 μV</td><td>1 LSB</td></tr><tr><td>± 2 V</td><td>62.5 μV</td><td>1.5 LSB</td></tr><tr><td>± 1 V</td><td>31.3 μV</td><td>1 LSB</td></tr><tr><td>± 0.5 V</td><td>15.6 μV</td><td>1 LSB</td></tr><tr><td>± 0.2 V</td><td>6.25 μV</td><td>1.5 LSB</td></tr><tr><td>± 0.1 V</td><td>3.13 μV</td><td>1.5 LSB</td></tr><tr><td>± 50 mV</td><td>1.56 μV</td><td>2 LSB</td></tr><tr><td>± 20 mV</td><td>625 nV</td><td>2.4 μV</td></tr><tr><td>± 10 mV</td><td>313 nV</td><td>2.4 μV</td></tr><tr><td>± 5 mV</td><td>156 nV</td><td>2.2 μV</td></tr><tr><td>± 2 mV</td><td>62.5 nV</td><td>2.2 μV</td></tr></tbody></table>	Range	Resolution	Noise (rms)	± 10 V	313 μ V	1 LSB	± 5 V	156 μ V	1 LSB	± 2 V	62.5 μ V	1.5 LSB	± 1 V	31.3 μ V	1 LSB	± 0.5 V	15.6 μ V	1 LSB	± 0.2 V	6.25 μ V	1.5 LSB	± 0.1 V	3.13 μ V	1.5 LSB	± 50 mV	1.56 μ V	2 LSB	± 20 mV	625 nV	2.4 μ V	± 10 mV	313 nV	2.4 μ V	± 5 mV	156 nV	2.2 μ V	± 2 mV	62.5 nV	2.2 μ V
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Maximum input voltage:	± 15 V																																							
Input impedance:	~ 1 M Ω 100 pF																																							
Low-pass filters:	1 Hz – 1 kHz in 2:5:10 steps; 2 kHz, 25 kHz																																							
Input coupling:	DC or 0.15 Hz (software-selectable)																																							
Frequency response (–3 dB):	25 kHz on 10 V range																																							
DC drift:	Software corrected																																							
CMRR:	100 dB @ 100 Hz (differential mode, 100 mV – 2 mV Range)																																							
Input crosstalk:	75 dB minimum																																							

Pod Connectors

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

Sampling

ADC resolution:	16 bit (313 μ V resolution on 10 V range)
Linearity error:	± 2.5 LSB
Maximum sampling rates:	200 kHz on one or two inputs 100 kHz on 3 or 4 inputs

Analog Outputs

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

Trigger mode:	TTL level or contact closure, software selectable
Trigger threshold:	+1.3 V (rising edge), +1.1 V (falling edge)
Hysteresis:	0.6 V
Input impedance:	50 k Ω
Maximum input voltage:	\pm 12 V
Minimum pulse width:	5 μ s

Microprocessor and Data Communication

CPU:	PowerPC 405GPr @ 240 MHz
RAM:	16 MB SDRAM
Data communication:	USB 2.0

Expansion ports

I ² C expansion port:	Power and control bus for Front-end units. Supports up to 8 Front-ends but limited to PowerLab's free connectors. 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 Ω input impedance, 5V maximum

Physical Configuration

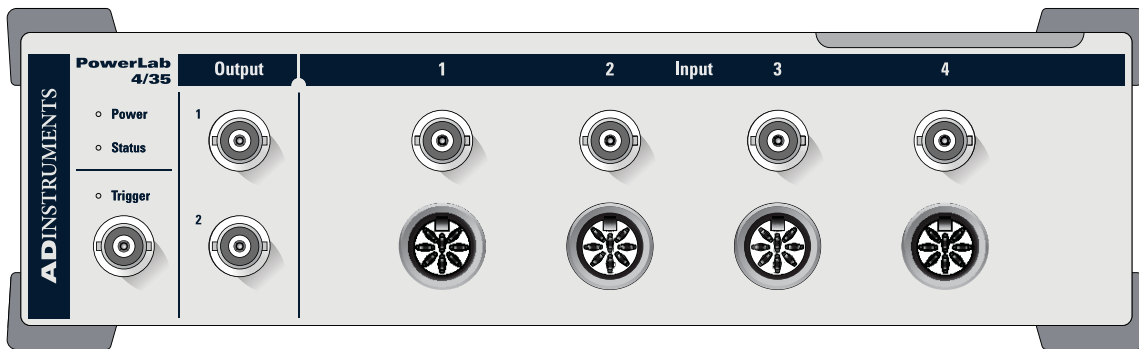
Dimensions (h x w x d):	70 x 240 x 260 mm (2.7" x 9.4" x 10.2")
Weight:	2.7 kg (5 lb 9 oz)
Operating voltage:	90-250 V (automatic)
Maximum power needs:	80 VA (full complement of Front-ends and Pods)
Operating temperature:	5 – 35 $^{\circ}$ C, 0 – 90% humidity (non-condensing)

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.

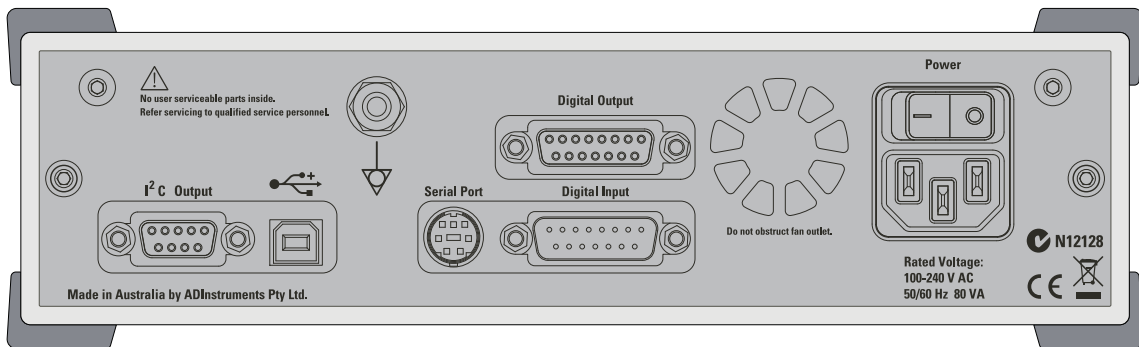
Caution

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

PowerLab 4/35 Diagrams



Front panel



Rear panel

Ordering Information

PL3504 PowerLab 4/35

Includes: PowerLab 4/35 4-Channel Data Acquisition System
 LabChart & Scope Software Installer CD
 Cable Kit including Power Cord, BNC to BNC test cable, USB Cable
 Getting Started with PowerLab Manual
 Finger Pulse Transducer

PL3504-DC-11A



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