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ADINSTRUMENTS

Single, Quad and Octal Bridge Amps

Signal Conditioners

Description

The ML221, ML224 and ML228 Bridge Amps are designed to allow the PowerLab to connect to most DC bridge transducers, including commonly available force transducers, temperature probes, light meters, displacement transducers, pressure transducers, and similar devices. When connected to PowerLab the Bridge Amps use a low-drift instrumentation amplifier and offers software-controlled zeroing.



(ML221)



(ML224)



(ML228)

CE

The overload light on the front of the amplifier provides an indication of whether the attached transducer is operating correctly or incorrectly.

Compatibility

The Bridge Amps are compatible with PowerLab /SP, /25, /30 series or later.

The ML221, M224 and ML228 will only operate with Chart version 5.4.2 or later for Windows and Mac. The ML221, ML224 and ML228 will also only operate with Scope for Windows (3.7.8 or later) or Scope for Mac (4.0.3 or later).

The following are some of the transducers suitable for use with the Bridge Amps:

MLT003/D Hand Dynamometer
MLT0015 High Grade Isotonic Transducer
MLT500/D Force Transducer (0 - 500 g)
MLT844 Physiological Pressure Transducer
MLT0201 Force Transducer (5 mg - 25 g)
MLT1030/D Wide Range Force Transducer
MLT0202 Sensitive Force Transducer (0-25 g)
MLT0380/D Reusable BP Transducer
MLT1020 IR Plethysmographs
MLT050/D Force Transducer (0-50 g)
MLT409/D Skin Temperature Probe
MLT415/D Nasal Temperature Probe
MLT0210/D Teaching Force Transducer

For transducers with Grass connectors, a MLAC11 Grass Adapter Cable is required.

Applications

Used for measuring force, displacement and physiological pressures. Ideal for multi-channel isolated tissue studies.

Specifications

Input

Number of inputs:	1 (Single), 4 (Quad) or 8 (Octal) (8-pin DIN)
Input configuration:	Differential
Amplification range:	±200 µV to ±5 V full scale in 14 steps (combined PowerLab and Bridge Amp) ±5 V ±2 V ±1 V ±500 mV ±200 mV ±100 mV ±50 mV ±20 mV ±10 mV ±5 mV ±2 mV ±1 mV ±500 µV ±200 µV
Amplification accuracy:	±0.5% (combined PowerLab & Bridge Amp)
Maximum input voltage:	±10 V
Input impedance:	2 x 1 MΩ (Single-ended) 2 MΩ (Differential)
Low-pass filtering:	1 Hz to 2 kHz in eight steps (software selectable)
Frequency response (-3 dB):	2 kHz maximum at all gains with the 2 kHz filter selected.
CMRR (differential):	100 dB at 50 Hz (typical).
Input noise:	<1µV_{rms} referred to input at highest gain

Excitation and Zeroing

Excitation voltage range:	0-20 volts DC (±10 V referred to ground), adjusted by external resistor
Transducer drive current:	±45 mA maximum
Zeroing circuitry:	Software-controlled, either manual or automatic
Internal offsetting range:	±10 V (1 V - 5 V range) ±1 V (100 mV - 500 mV range) ±100 mV (200 µV - 50 mV)

Internal offset resolution:	16 bit (internal DAC) ± 32 000 steps about 0V. 1, 2, 5 V -310 µV/step 100 mV, 200 mV, 500 mV - 31µV/step 200 µV to 50 mV - 3 µV/step

Control Port

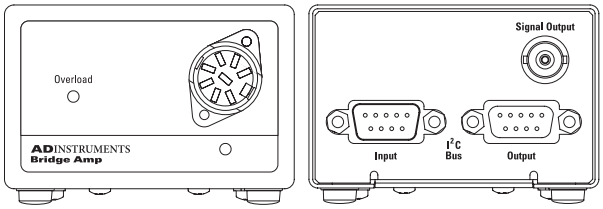
I^2C port:	Power and control bus for front-end units. Supports a number of front-ends dependent on the PowerLab. Interface communications rate of ~50 Kbits/s.

Physical Configuration

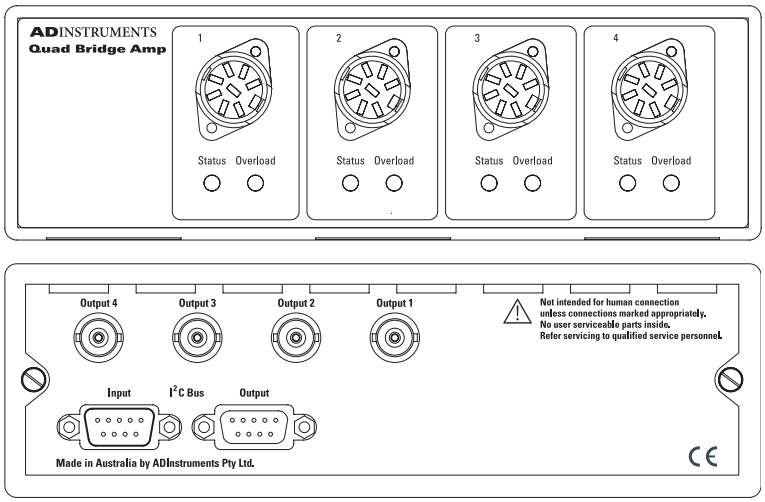
Model	Dimensions and weight
Single (ML221):	50 mm (h) x 76 mm (w) x 260 mm (d); 710 g
Quad (ML224):	200 mm (h) x 60 mm (w) x 250 mm (d); 1.5kg
Octal (ML228):	300 mm (h) x 60 mm (w) x 300 mm (d); 3.4kg
Power requirements:	(Without transducer attached)
Single (ML221):	0.8 W
Quad (ML224):	2.5 W
Octal (ML228):	5.0 W
Operating temperature range:	10 to 40 °C, 0 to 90% relative humidity (non-condensing)

ADInstruments reserves the right to alter these specifications at any time

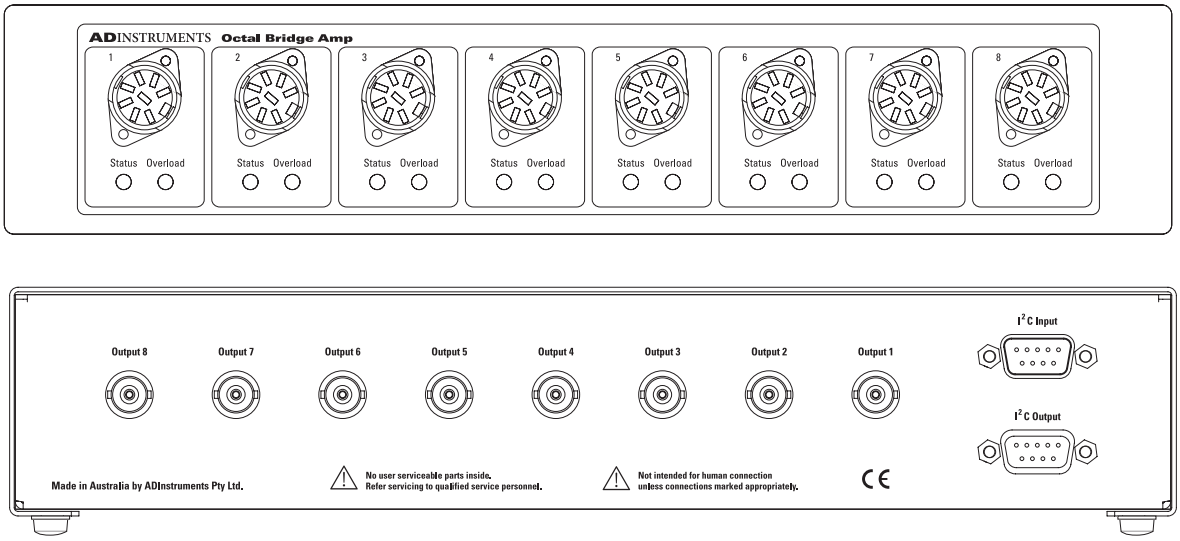
Front and Back Panels



ML221



ML224



ML228

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.

Ordering Information

ML221 Bridge Amp
ML224 Quad Bridge Amp
ML228 Octal Bridge Amp

ML221 Includes:
I²C Cable (9-pin plug to 9-pin receptacle)
BNC to BNC Cables (1)
DIN Connector Kits (1)
Bridge Amp Owner's Guide

ML224 Includes:
I²C Cable (9-pin plug to 9-pin receptacle)
BNC to BNC Cables (4)
DIN Connector Kits (4)
Bridge Amp Owner's Guide

ML228 Includes:
I²C Cable (9-pin plug to 9-pin receptacle)
BNC to BNC Cables (8)
DIN Connector Kits (8)
Bridge Amp Owner's Guide

A MLAC11 Grass Adapter Cable may be ordered as an optional extra for connecting transducers with grass connectors to the bridge amps.

ML221-ML228-DC-06A

ADINSTRUMENTS.com ISO 9001:2000 Certified Quality Management System

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