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Model 482B11

Line Powered Signal Conditioner for ICP® Sensors

Installation and Operating Manual

**For assistance with the operation of this product,
contact PCB Piezotronics, Inc.**

Toll-free: 800-828-8840
24-hour SensorLine: 716-684-0001
Fax: 716-684-0987
E-mail: info@pcb.com
Web: www.pcb.com





Repair and Maintenance

PCB guarantees Total Customer Satisfaction through its "Lifetime Warranty Plus" on all Platinum Stock Products sold by PCB and through its limited warranties on all other PCB Stock, Standard and Special products. Due to the sophisticated nature of our sensors and associated instrumentation, **field servicing and repair is not recommended and, if attempted, will void the factory warranty**.

Beyond routine calibration and battery replacements where applicable, our products require no user maintenance. Clean electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the material of construction. Observe caution when using liquids near devices that are not hermetically sealed. Such devices should only be wiped with a dampened cloth—never saturated or submerged.

In the event that equipment becomes damaged or ceases to operate, our Application Engineers are here to support your troubleshooting efforts 24 hours a day, 7 days a week. Call or email with model and serial number as well as a brief description of the problem.

Calibration

Routine calibration of sensors and associated instrumentation is necessary to maintain measurement accuracy. We recommend calibrating on an annual basis, after exposure to any extreme environmental influence, or prior to any critical test.

PCB Piezotronics is an ISO-9001 certified company whose calibration services are accredited by A2LA to ISO/IEC 17025, with full traceability to SI through N.I.S.T. In addition to our standard calibration services, we also offer specialized tests, including: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For more information, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

Returning Equipment

If factory repair is required, our representatives will provide you with a Return Material Authorization (RMA) number, which we use to reference any information you have already provided and expedite the repair process. This number should be clearly marked on the outside of all returned package(s) and on any packing list(s) accompanying the shipment.

Contact Information

PCB Piezotronics, Inc.
3425 Walden Ave.
Depew, NY14043 USA
Toll-free: (800) 828-8840
24-hour SensorLine: (716) 684-0001
General inquiries: info@pcb.com
Repair inquiries: rma@pcb.com

For a complete list of distributors, global offices and sales representatives, visit our website, www.pcb.com.

Safety Considerations

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the precautions required to avoid injury. While our equipment is designed with user safety in mind, the protection provided by the equipment may be impaired if equipment is used in a manner not specified by this manual.

Discontinue use and contact our 24-Hour Sensorline if:

- Assistance is needed to safely operate equipment
- Damage is visible or suspected
- Equipment fails or malfunctions

For complete equipment ratings, refer to the enclosed specification sheet for your product.

Definition of Terms and Symbols

The following symbols may be used in this manual:



DANGER
Indicates an immediate hazardous situation, which, if not avoided, may result in death or serious injury.



CAUTION
Refers to hazards that could damage the instrument.



NOTE
Indicates tips, recommendations and important information. The notes simplify processes and contain additional information on particular operating steps.

The following symbols may be found on the equipment described in this manual:



This symbol on the unit indicates that high voltage may be present. Use standard safety precautions to avoid personal contact with this voltage.



This symbol on the unit indicates that the user should refer to the operating instructions located in the manual.



This symbol indicates safety, earth ground.

PCB工业监视和测量设备 - 中国RoHS2公布表

PCB Industrial Monitoring and Measuring Equipment - China RoHS 2 Disclosure Table

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
住房	O	O	O	O	O	O
PCB板	X	O	O	O	O	O
电气连接器	O	O	O	O	O	O
压电晶体	X	O	O	O	O	O
环氧	O	O	O	O	O	O
铁氟龙	O	O	O	O	O	O
电子	O	O	O	O	O	O
厚膜基板	O	O	X	O	O	O
电线	O	O	O	O	O	O
电缆	X	O	O	O	O	O
塑料	O	O	O	O	O	O
焊接	X	O	O	O	O	O
铜合金/黄铜	X	O	O	O	O	O

本表格依据 SJ/T 11364 的规定编制。

O： 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

X： 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

铅是欧洲RoHS指令2011/65/ EU附件三和附件四目前由于允许的豁免。

CHINA RoHS COMPLIANCE

Component Name	Hazardous Substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Chromium VI Compounds (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
PCB Board	X	O	O	O	O	O
Electrical Connectors	O	O	O	O	O	O
Piezoelectric Crystals	X	O	O	O	O	O
Epoxy	O	O	O	O	O	O
Teflon	O	O	O	O	O	O
Electronics	O	O	O	O	O	O
Thick Film Substrate	O	O	X	O	O	O
Wires	O	O	O	O	O	O
Cables	X	O	O	O	O	O
Plastic	O	O	O	O	O	O
Solder	X	O	O	O	O	O
Copper Alloy/Brass	X	O	O	O	O	O

This table is prepared in accordance with the provisions of SJ/T 11364.

O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement of GB/T 26572.
Lead is present due to allowed exemption in Annex III or Annex IV of the European RoHS Directive 2011/65/EU.

1.0 INTRODUCTION

The Model 482B11 is a line-operated signal conditioner for the ICP® transduction system with a 3-position switch for gains for 1, 10 and 100.

The unit provides constant current excitation to the built-in transducer amplifier (or in-line adaptor amplifiers) and decouples the signal from the DC bias voltage. (See guide G-0001 for more detailed coverage of the ICP concept.)

The unit also contains provision for fault monitoring as well as provisions for varying the constant current output over the range of 2 to 20 mA. The constant current output is factory set at 4mA.

2.0 DESCRIPTION

The Model 482B11 signal conditioner contains a well-regulated 24 VDC power supply and one constant current circuit to provide power for one transducer channel.

The rear panel contains BNC jacks for transducer connection ("XDCR") and for signal output ("SCOPE") connection.

The signal information is decoupled from the transducer bias level by a coupling capacitor and brought out to the "output" jack through the gain amplifier.

The bias monitor consists of a color-coded front panel voltmeter. The meter permanently monitors the transducer bias level. The green area indicates the proper bias for operation. If the meter indication is red, this indicates a short in the transducer, cable or connections. If the meter pointer moves to the yellow, it is reading the supply voltage and is indicating an open circuit.

3.0 INSTALLATION

See the installation drawing supplied as part of this manual for outline dimensions, as well as jack and control locations.

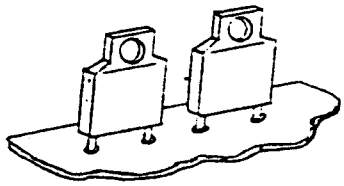
Install power unit in proximity to the readout instrument. It is necessary only to provide access at the rear panel for electrical connections. No ventilation is required for these units. PCB Model 400A03 Rack Mounted Adaptor will hold up to 8 Model 482B11s.

4.0 OPERATION

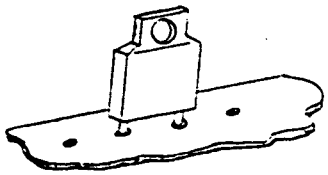
Plug 3-wire line cord into a VAC power source and switch to "on."

To convert from 115VAC to 230VAC operation see Figure 1. Unplug unit from power source and remove the top cover of the unit. Remove the two suitcase jumper wires illustrated in Figure 1A and place one as shown in Figure 1B for 230VAC operation. With no transducer connected to the "XDCR" connector, the front panel bias indication meter will indicate full scale (yellow) which corresponds to open circuit power supply voltage.

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1-A (115VAC operation)



1-B (230VAC operation)

Figure 1 Converting to 230VAC operation

When an ICP transducer (or adaptor or in-line amplifier) is connected to the input jack of an channel, the front monitor meter will indicate approximately midscale (green) if the transducer or amplifier is funtioning properly.

It will not read midscale if the transducer bias is 3V to 5V.

If a transducer cable is faulty (open) or if the transducer's built-in amplifier is open, the meter will indicate in the yellow (full scale) area.

Should a cable or transducer be shorted, the meter will indicate zero volts. (red).

Adust gain selector to proper setting. The internal coupling capacitor will begin charging. This charging will cause an apparent "drifting" of the output signal until the capacitor is fully charged, a normal condition.

The small amount of leakage through the coupling capacitor will normally result in a ±30 mV maximum offset.

4.1 COUPLING TIME CONSTANT, AC COUPLED

The coupling time constant is the product of the coupling capacitor (22 uF) and the internal resistance of the 482B11 (100kohm) which results in a 2-second time constant.

TC(sec) =C (farads) x R (ohms)

TC = 22 uF x 100k ohm

TC = 2 sec

4.2 GALVANOMETERS

Low current galvanometers can be driven by the 482B11 series power units, but a series resistor is needed to range the galvanometer.

This may be provided as a part of the galvanometer input. To determine the approximate value of the necessary series resistor, divide the full scale transducer output

voltage by the full-scale galvo current, e.g., for a transducer with 5 volt F.S. output signal and a galvo which requires 5 mA full-scale input current:

$$R = \frac{5V}{5mA} = 1k \text{ ohm}$$

Remember that the low resistance load will affect the low frequency response of the system and may cause some signal loss.

This signal conditioner will maintain good frequency response due to the fact it contains a buffer amplifier.

4.3 SETTING THE CONSTANT CURRENT

To set the constant current, remove the protective outer case by removing the four screws in the rubber feet at the bottom surface. Locate the current adjust potentiometer. (See Figure 2).

Connect a 0-30mA DC meter (or multimeter) to the "XDCR" jack.

The constant current value is read directly on the multimeter when connected as shown.

Vary the setting of the current adjust pot to set current to a new level.

CAUTION

Do not exceed 20mA. Operating an ICP transducer or amplifier above 20mA may be harmful to the unit.

Use care to avoid shorting components with metal screwdriver blades.

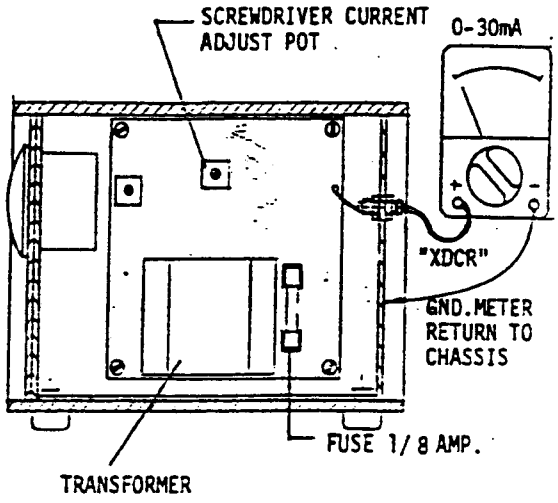


Figure 2 Current adjust pot location

5.0 MAINTENANCE AND REPAIR

Aside from the current setting, there are no other adjustments to perform in the Model 482B11 unit.

No maintenance is required for these units, but should trouble occur, it is suggested that the factory be contacted for assistance.

If it is determined that the unit should be returned, please include a brief note describing the problem.

MANUAL NUMBER: 19182
MANUAL REVISION: NR

Model Number	LINE POWERED SIGNAL CONDITIONER FOR ICP® SENSORS	Revision: E
482B11		ECN #: 40512

Performance	**ENGLISH**	**SI**	
Channels	1	1	
Voltage Gain(± 1 %)	x1 x10 x100	x1 x10 x100	
High Frequency Response(-5 %)(Gain x1)	85 kHz	85 kHz	
High Frequency Response(-5 %)(Gain x10)	85 kHz	85 kHz	
High Frequency Response(-5 %)(Gain x100)	60 kHz	60 kHz	
Fault/Bias Monitor/Meter(meter)	24 VDC FS	24 VDC FS	
Environmental			
Temperature Range	+30 to +130 °F	-1.1 to +54.4 °C	
Electrical			
AC Power(50-400Hz)	105 to 125 VAC	105 to 125 VAC	[1]
AC Power	0.25 amps	0.25 amps	
Excitation Voltage(To Sensor)	+24 VDC	+24 VDC	
DC Offset(Maximum)	± 30 mV	± 30 mV	
Constant Current Excitation(To Sensor)	2 to 20 mA	2 to 20 mA	[2]
Discharge Time Constant	3 sec	3 sec	
Spectral Noise(1 Hz)	4.3 µV/√Hz	-107 dB	
Spectral Noise(10 Hz)	1.3 µV/√Hz	-118 dB	
Spectral Noise(100 Hz)	0.37 µV/√Hz	-129 dB	
Spectral Noise(1 kHz)	0.16 µV/√Hz	-136 dB	
Spectral Noise(10 kHz)	0.12 µV/√Hz	-138 dB	
Broadband Electrical Noise(1 to 10,000 Hz)(Gain x1)	29 µV	-91 dB	
Spectral Noise(1 Hz)	31 µV/√Hz	-90 dB	
Spectral Noise(10 Hz)	13 µV/√Hz	-98 dB	
Spectral Noise(100 Hz)	3.7 µV/√Hz	-109 dB	
Spectral Noise(1 kHz)	1.8 µV/√Hz	-115 dB	
Spectral Noise(10 kHz)	0.80 µV/√Hz	-122 dB	
Broadband Electrical Noise(1 to 10,000 Hz)(Gain x10)	198 µV	-74 dB	
Spectral Noise(1 Hz)	274 µV/√Hz	-78 dB	
Spectral Noise(10 Hz)	126 µV/√Hz	-88 dB	
Spectral Noise(100 Hz)	39 µV/√Hz	-96 dB	
Spectral Noise(1 kHz)	15 µV/√Hz	-104 dB	
Spectral Noise(10 kHz)	6.6 µV/√Hz	-113 dB	
Broadband Electrical Noise(1 to 10,000 Hz)(Gain x100)	2.2 mV	-71 dB	
Physical			
Electrical Connector(Input, sensor)	BNC Jack	BNC Jack	
Electrical Connector(Output)	BNC Jack	BNC Jack	
Size (Height x Width x Depth)	4.3 in x 1.8 in x 6.0 in	109.2 mm x 45.7 mm x 152.4 mm	
Weight	2 lb	907.2 gm	

All specifications are at room temperature unless otherwise specified.
In the interest of constant product improvement, we reserve the right to change specifications without notice.

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OPTIONAL VERSIONS

Optional versions have identical specifications and accessories as listed for the standard model except where noted below. More than one option may be used.

NOTES:

[1] Unit set to 230 VAC when ordered as model F482B11.
[2] User adjustable, factory set at 4 mA (± 0.5 mA).

SUPPLIED ACCESSORIES:

Model 017AXX Power Cord (1)

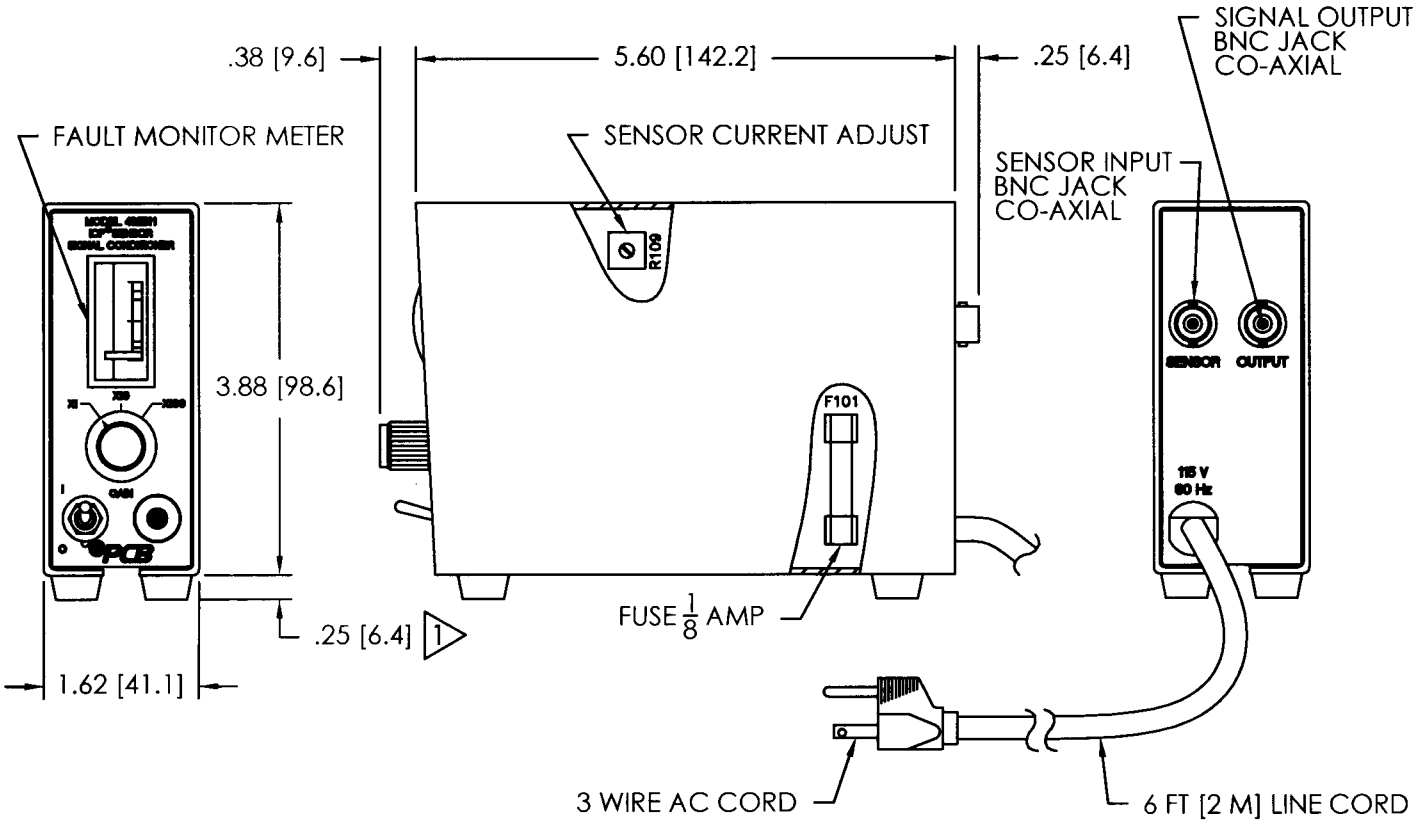
Entered: AP	Engineer: AK	Sales: JJM	Approved: JWH	Spec Number:
Date: 2/5/2013	Date: 2/5/2013	Date: 2/5/2013	Date: 2/5/2013	**482-2110-80**

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482-2110-95

REVISIONS			
REV	DESCRIPTION	ECN	APP'D
NR	RELEASED TO DRAFTING		DM 11-92
A	UPDATED ARTWORK	28210	



1 EXTERNAL COVER MAY BE REMOVED BY REMOVING SCREWS IN RUBBER FEET.

UNLESS SPECIFIED TOLERANCES	
DIMENSIONS IN INCHES DECIMALS XX ±.03 XXX ±.010 ANGLES ±2 DEGREES	DIMENSIONS IN MILLIMETERS [IN BRACKETS] DECIMALS X ±0.8 XX ±0.25 ANGLES ±2 DEGREES
FILLETS AND RADII .003 - .005	FILLETS AND RADII [0.07 - 0.13]
DD011 REV. D 01/17/08	

DRAWN	SMB	3/7/08	MFG	NSC	2/13/08
CHK'D			ENGR	CPH	1/29/08
APP'D	EB	2/3/08	SALES	JJM	3/7/08

TITLE
OUTLINE DRAWING
MODEL 482B11
ICP POWER SUPPLY

PCB PIEZOTRONICS INC.
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0001 EMAIL: SALES@PCB.COM

CODE IDENT. NO.	DWG. NO.
52681	482-2110-95
SCALE: .5X	SHEET 1 OF 1

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