Model 480B10

ICP® POWER UNIT WITH DOUBLE INTEGRATION

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 480B10 is a dual integrator portable power source for ICP® type voltage-mode accelerometers. This unit is powered by two 9V NEDA 1604 batteries which supply constant current to the voltage-mode accelerometer.

The unit also has a bias monitor meter to test transducer, cables, and connectors and batteries for trouble-free operation.

2.0 DESCRIPTION

The Model 480B10 contains two 9V batteries connected in series to provide an 18V power source. The transducer is operated by a constant current of 2 mA set by a constant-current diode. The front panel contains a color-coded bias monitor voltmeter, the "XDCR" jack, the signal output jack labeled "SCOPE", an "ON-OFF BATT TEST" rocker switch, a three-position switch to select acceleration, velocity or displacement, and a battery charger receptacle. The two precision integrating operational amplifiers with low pass filtering provide the outputs for velocity and displacement from the acceleration signal.

The various sensitivities when used with 100mV/g ICP sensors are:

Acceleration	100mV/g
Velocity	1000mV/in/sec.
Displacement	200mV/mil

Internal coupling capacitors decouple the signal information from the +9V to +12VDC transducer bias levels which may be 3 to 5V for low-noise electronics.

When conducting vibration measurements, amplitude levels are usually considered in the following formats:

Meas.	English Units	Metric Units
Acceleration	g's rms or g's peak	m/s^2 rms or m/s^2 peak
Velocity	in/sec peak	m/s peak
Displacement	mils peak to peak	mm peak to peak

Note: 1 mil = 0.001 inch

When analyzing voltage signals generated by the accelerometer and 480B10 measurement system, the system sensitivity should be expressed in units consistent with the desired format as follows:

Acceleration	mV rms/g rms or mV pk/g pk
Velocity	mV pk/in/sec pk
Displacement	mV pk-pk/mil pk-pk

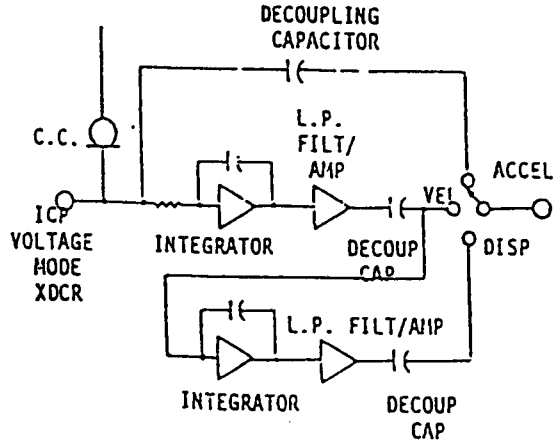
For example, the following system sensitivities can be derived when using a 100mV/g ICP voltage-mode accelerometer.

100mV rms/g rms
100mV pk/g pk
1000mV pk/in/sec pk
200mV pk-pk/mil pk-pk

and likewise for metric units.

The Model 480B10 may also be used with accelerometers of different sensitivities such as 10mV/g or 1000mV/g with corresponding change in acceleration, velocity and displacement sensitivities:

Acceleration	10mV/g	1V/g
Velocity	100mV/in/sec	10V/in/sec
Displacement	20mV/mil (pk to pk)	2V/mil (pk to pk)



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3.0 OPERATION

With no transducer connected to the Model 480B10, move power switch to "ON" position. The front panel voltmeter will read the battery voltage (+18 volts for fresh batteries). The voltmeter is scaled to read 20 volts full scale. (See Figure 2). When an ICP transducer is connected to the input "XDCR" jack, the meter will indicate approximately mid-scale (+11V nominal) if the transducer's built-in amplifier is functioning properly and cables are intact. Some transducers us a 5V turn on and in this case, meter will read at lower edge of green region.

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

Should the cable or transducer be shorted, the meter will indicate zero volts (red area). Immediately after connecting readout instrument, (oscilloscope, meter, recorder, etc.) to the output jack, the coupling capacitors will begin charging through the input resistance of the readout instrument. This charging will cause an apparent "drifting" of the output signal until the capacitor is fully charged. Such drifting is quite normal.

3.1 OUTPUT VOLTAGE LIMITATIONS

Certain ICP transducers are capable of a 10V peak output voltage swing. The Model 480B10 with it's 18V supply will allow the positive-going side of the signal to go to +5V. The negative-going side of the signal is capable of -10V assuming a 2V turn on for the transducer.

3.2 CURRENT DRIVE LIMITATIONS

In the interest of battery life, the current output of the Model 480B10 is fixed at 2mA. This current will adequately handle high frequency signals in cables up to approximately 100 feet long. Longer cables can be driven, but with sacrifice of high-frequency response. Line power units providing 20mA current are required for long cable driving.

Since location of the 480B10 power unit in the circuit does not affect signal/noise ratio, it should be placed near the readout instrument.

3.3 BATTERY TEST

The Model 480B10 incorporates a momentary battery test rocker switch as part of the ON/OFF switch.

When the rocker switch is depressed, the meter switches from the "XDCR" jack to the battery high side.

Normal circuit operation is not affected by this action and releasing the rocker returns the meter to the transducer bias monitor function.

Replace or recharge batteries when meter pointer does not move to "BATT OK" mark on the meter when power is "ON" and "BATT TEST" rocker is depressed. A slightly low reading will limit the usable range of the transducer but will not cause damage to either the transducer or the 480B10.

3.4 CHANGING THE BATTERIES

Following is a procedure for removing the batteries when the front panel fault meter indicates they should be replaced: Remove the one screw at the rear panel of the 480B10 and remove the unit from its plastic case. Unsnap battery connectors and remove batteries. Connect new 9V alkaline batteries in place and slide into battery clips.

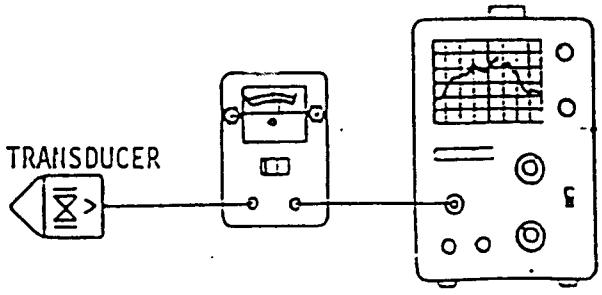
Used normally, the life expectancy of the batteries is over 30 hours. Turn unit off when not using to conserve battery life.

Note: Use Eveready 522 or equivalent battery.

3.5 BATTERY CHARGING

Plug 488B02 charger into front panel jack, and with unit off, recharge for 14 hours. Charger supplies 10mA constant current to batteries.

Caution: Do not use charger unless unit has rechargeable batteries installed (VARTA TR7/8 or Eveready N88). The standard 488B is for 110V; the prefix "F" is 220V (F488B).



4.0 MAINTENANCE AND REPAIR

Aside from battery replacement, no maintenance is required for these units. In case of difficulty, contact the factory for assistance.

If the unit must be returned for repairs, please include a brief note describing the problem. A quotation for repair of out-of-warranty equipment will be supplied.

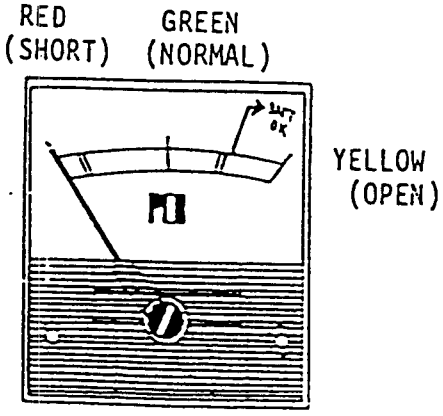


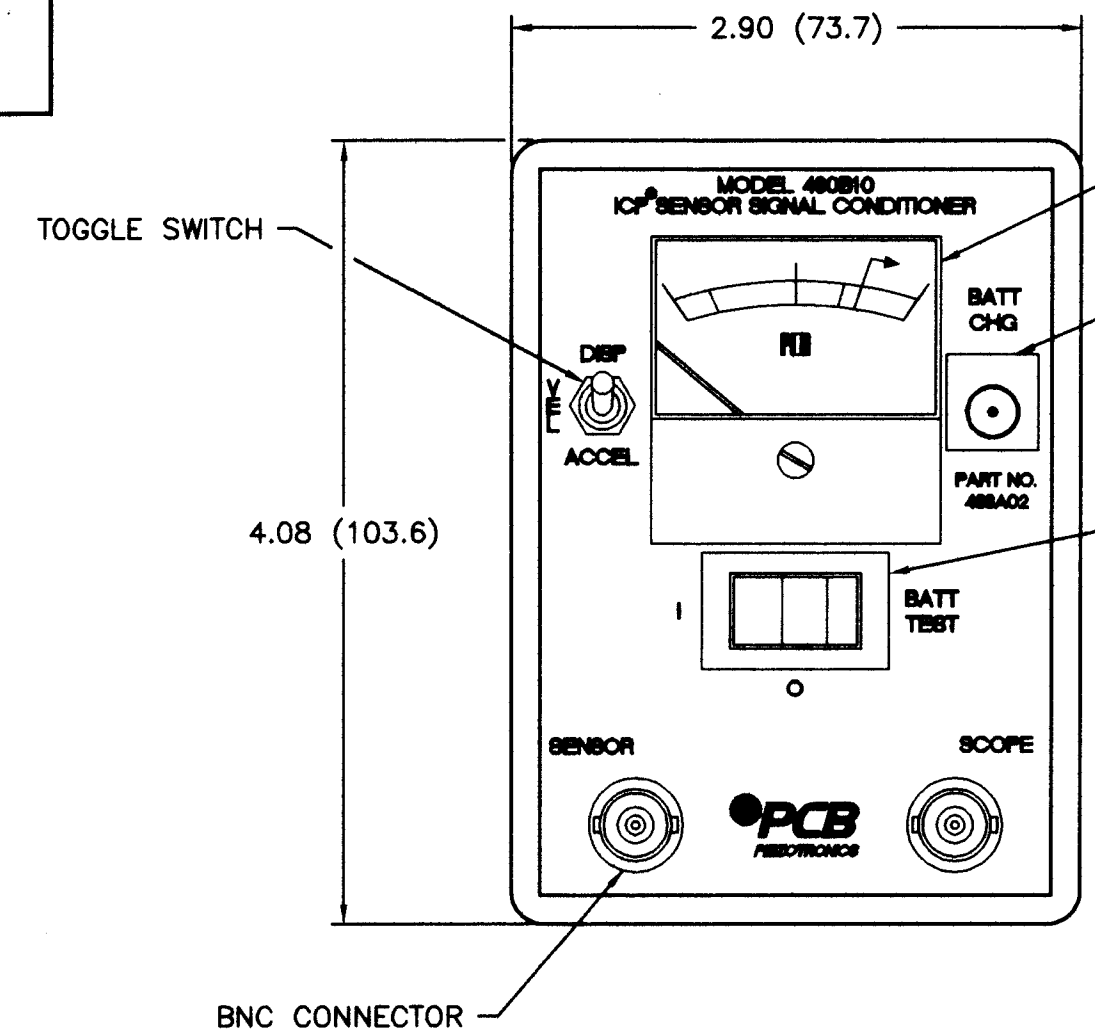
FIGURE 2 BIAS MONITOR METER

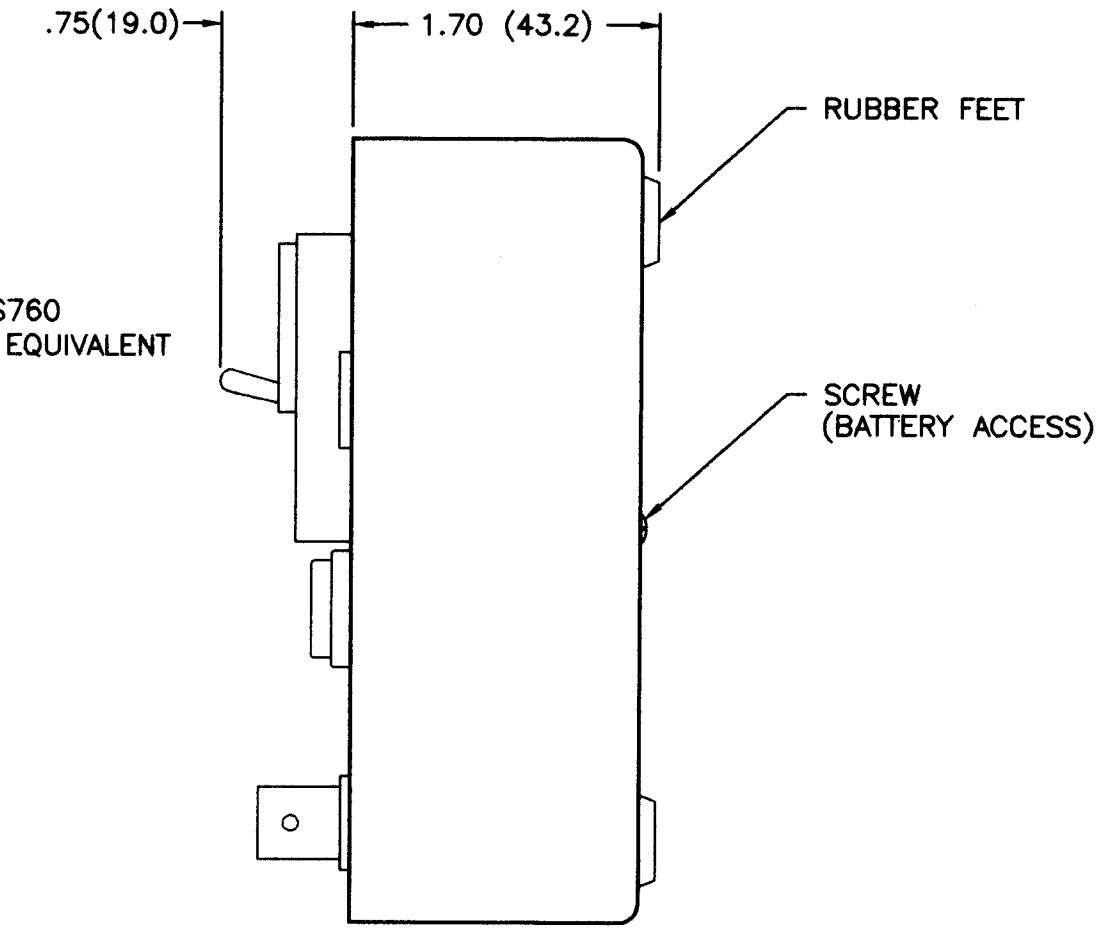
MANUAL NUMBER: 19861
MANUAL REVISION: NR

APPLICATION		
NEXT ASS'Y	USED ON	VAR

REVISIONS					
ZONE	REV	DESCRIPTION	ECN	DATE	APP'D
	A	REVISED LOGO ON F.P.	9907	12/23/98	

2263





UNLESS SPECIFIED TOLERANCES	
DIMENSIONS IN INCHES DECIMALS XX ±.01 XXX ±.005 ANGLES ±2 DEGREES	DIMENSIONS IN MILLIMETERS (IN PARENTHESIS) DECIMALS XX ±0.3 XXX ±0.13 ANGLES ±2 DEGREES
FILLETS AND RADII .003 – .005	FILLETS AND RADII (0.07 – 0.13)
DD012 REV. B 03/13/98	

DRAWN		12/30/98	MFG		12/30/98
CHK'D		12/30/98	ENGR		12/30/98
APP'D		12/30/98			

TITLE: OUTLINE DRAWING
MODEL 480B10
ICP SENSOR SIGNAL CONDITIONER

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

CODE IDENT. NO.	DWG. NO.	
52681	2263	
SCALE: FULL		SHEET 1 OF 1