



**Model 492B**

**ICP® sensor simulator, 100 Hz sine and square wave, 0 to 10 V pk-pk adj.**

**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](mailto:info@pcb.com)  
Web: [www.pcb.com](http://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](mailto:info@pcb.com)  
Repair inquiries: [rma@pcb.com](mailto:rma@pcb.com)

For a complete list of distributors, global offices and sales representatives, visit our website, [www.pcb.com](http://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	0	0	0	0	0	0
PCB板	X	0	0	0	0	0
电气连接器	0	0	0	0	0	0
压电晶体	X	0	0	0	0	0
环氧	0	0	0	0	0	0
铁氟龙	0	0	0	0	0	0
电子	0	0	0	0	0	0
厚膜基板	0	0	X	0	0	0
电线	0	0	0	0	0	0
电缆	X	0	0	0	0	0
塑料	0	0	0	0	0	0
焊接	X	0	0	0	0	0
铜合金/黄铜	X	0	0	0	0	0
本表格依据 SJ/T 11364 的规定编制。						
0：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 492B Transducer Simulator is designed to substitute for a transducer allowing the user to make adjustments to several variables such as power unit output current, to obtain optimum performance from the transducer/line/power system.

The 492B contains a built-in 100Hz. Sine or square wave generator with amplitude variable up to 10 volts pk-to-pk. This generator will simulate a transducer signal of known form and amplitude so that any attenuating effects of the line/system can be readily observed. A front panel jack is also provided for insertion of any other test signal to more closely simulate the actual expected signal.

The 492B can be easily hand held and is battery powered for field convenience.

2.0 DESCRIPTION

(See Figure 1)

The 492B contains an impedance converting amplifier similar to that found in ICP transducers. The input to this amplifier is fed via a buffer amplifier, by either a built-in 100Hz oscillator (activated by depressing the front panel "test" button) or by use of an external signal/pulse generator.

The square wave is useful for qualitative analysis of high frequency response of long lines while the external input jack can be used to more closely simulate the exact pulse or repetitive waveform expected in the actual measurement. The 100Hz sine wave is most useful in checking system continuity.

The output of the 100Hz internal signal is attenuated by a digital pot controlled by a calibrated digital dial located on the front panel. Full scale on this dial is set to produce a 10V pk-pk signal. Any lower voltage may be read directly from the potentiometer dial.

This calibrated output is especially useful for generating known amplitude signals for calibration of recorder channels, etc.

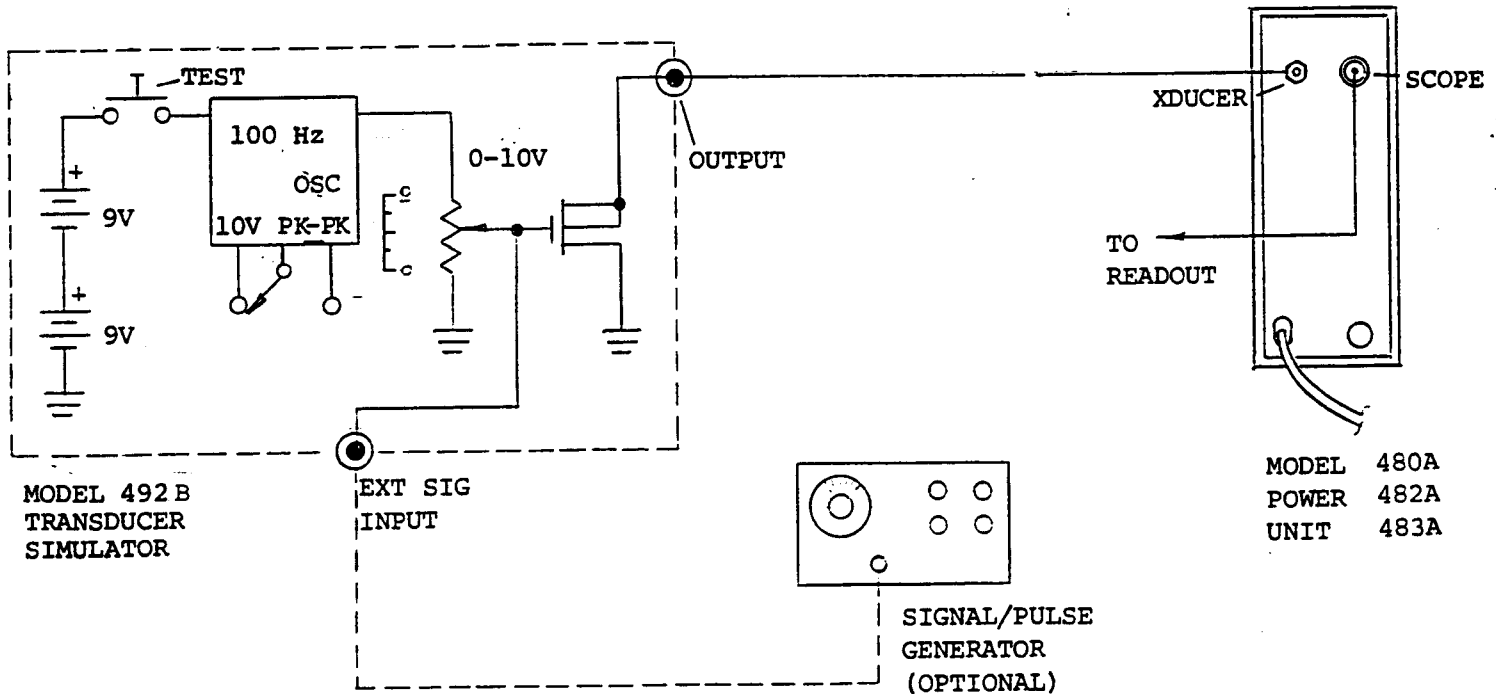


FIGURE 1 BLOCK DIAGRAM, TRANSDUCER SIMULATOR

### 3.0 OPERATION

Connect the Model 492B to a power unit such as the 480A, the 482A or 483A exactly as you would any ICP transducer. A meaningful output from the 492B cannot be obtained without externally powering the internal impedance converting amplifier similar to those in ICP transducers. Connect the power unit to the output jack of the 492B using standard 002A coaxial cable (or system cable already in place) to the "XDCR" jack of the power unit.

To activate the internal 100Hz oscillator, simply press the "test" button on the front panel of the 492A. The signal will be impressed on the line as long as the "test" button is depressed.

To simulate a pulse or other type of waveform, connect the output of a waveform generator to the "Ext sig input" jack. Some of the more elaborate generators have the capability of synthesizing almost any type of pulse or repetitive waveform that could be expected to be generated by the transducer in actual use.

By adjusting the output current of the power unit over the range of 2 to 20mA, the optimum setting can be found for driving the particular line in use by observing the oscilloscope trace.

In many instances, it will be advantageous to match the very low output impedance of the transducer to the exact impedance of the line by use of a Model 073A matching resistor. For very long lines, the use of the Model 073A will be necessary.

If this is the case, connect the 073A in the circuit, close to the Model 492B (or transducer) end of the line and by using the 492B as described previously, trim the value of the variable resistor and adjust the output current of the power unit to obtain optimum performance, i.e., minimum attenuation and/or distortion of the transducer signal. For very long lines, this output current will generally need to be 20mA constant current.

Locate the output current adjust potentiometer in the manual for your particular power unit, e.g., 482A, 483A. Battery operated such as the Model 480A do not contain the adjustable current feature.

To use the 492B to calibrate the readout channel, dial the desired peak-to-peak voltage on the digital pot. Dial (0 to 10V max.) and depress the test button, then adjust the sensitivity of the readout instrument to obtain the desired calibration. Disconnect the input to the "ext sig input" jack when using the internal 100Hz test signal as there is no provision for interrupting this signal input when the "test" pushbutton is depressed.

### 4.0 MAINTENANCE AND REPAIR

The batteries in the Model 492B are used only when the "test" button is depressed, therefore to maximize battery life, depress the "test" button sparingly.

Weak batteries are indicated by a reduction in amplitude and/or distortion on the squarewave output.

Replace batteries (2-9V transistor radio) by removing a screw at the rear panel and lifting the unit out of the plastic case. The batteries are secured by clips and are easily removed.

MANUAL NUMBER: 19851  
MANUAL REVISION: NR



# SPECIFICATIONS

## TRANSDUCER SIMULATOR

Model No.  
492B

Revisions  
-E- Rev # 22826

### ELECTRICAL

Gain (isolation amplifier)		Unity (1.0)
Oscillator Frequency (sine or sq. wave)	Hz	100 (+/-5%)
Oscillator Voltage (pk to pk)	volts	10
Amplitude Linearity	%FS	1.0
Batteries (2 supplied)	volts	9, NEDA #1604 (alkaline)

### PHYSICAL

Size: H x W x D	inch	2.9 x 4.0 x 1.6
Weight	lbs.	0.6
Connectors (2)	jacks	BNC

### SUPPLIED ACCESSORIES:

None

Drawn	<i>[Signature]</i>	9-13-05	Spec No. 492-2010-80
Engineer	<i>[Signature]</i>	10-3-05	
Sales	<i>[Signature]</i>	10/3/05	Sheet 1 of 1
Approved	<i>[Signature]</i>	10/4/05	



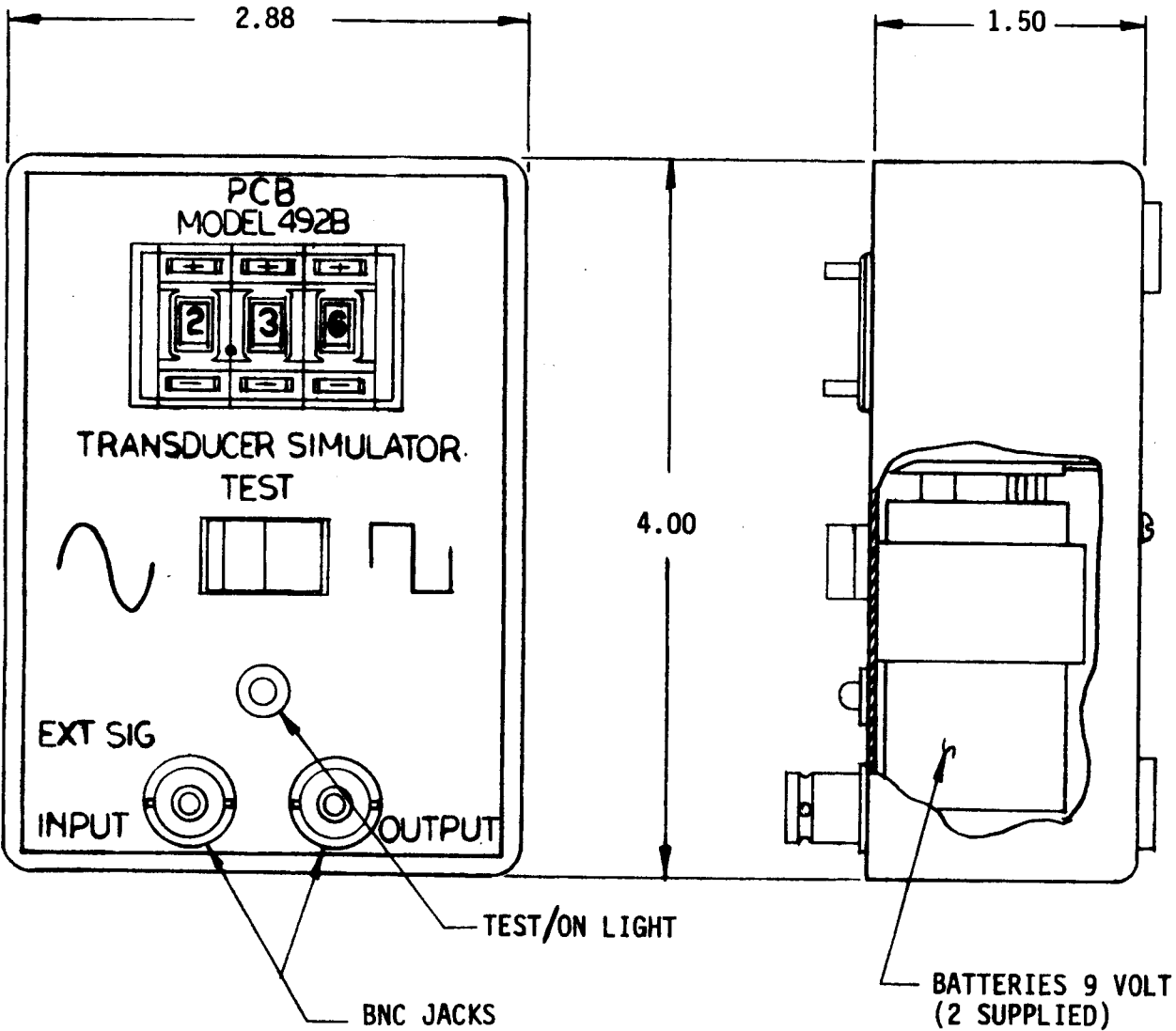
492-2010-95

APPLICATION

QTY.	NEXT ASSY.	USED ON	VAR

REVISIONS

SYM.	DESCRIPTION	EO	DATE	APP'D



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES.

TOLERANCES  
 FRACTIONS ± 1/64  
 DECIMALS XX ± .01  
 XXX ± .005  
 ANGLES ± 1/2 DEG.  
 BREAK SHARP EDGES  
 90° - 90°

MATERIAL  
 HEAT TREAT  
 EXCEPT AS NOTED  
 FIN ✓

DRAWN	RG	10-18	MFG.	10/27
CHECKED	EOP	10-22	ENGR.	R.F. 10/27
APP'D			RELEASE NO.	

TITLE  
 OUTLINE DRAWING  
 MODEL 492B  
 TRANSDUCER SIMULATOR

pcb piezotronics, inc.  
 BUFFALO, NEW YORK 14225  
 CODE IDENT. NO. 492-2010-95  
 DWS. NO. 492-2010-95  
 SCALE FULL SHEET I. OF I

