



Model 482A20
8 Channel ICP® Power Supply
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.
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Depew, NY14043 USA
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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	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.

Model 482A20

1.0 INTRODUCTION

The Model 482A20 is a line-powered, eight-channel digitally controlled amplifier for ICP[®] transducer systems. Each channel features independent gain select (x1, x10, x100) and overload/fault display status.

This unit provides constant-current excitation to the transducer over the signal line and decouples the signal from the DC bias voltage.

2.0 CIRCUIT DESCRIPTION

The 482A20 power unit contains a regulated +24 VDC power supply and eight constant-current circuits to provide power for up to eight transducers. The current sources may be user adjusted for optimum performance.

The signal is first decoupled from the transducer bias level. It then goes to the fault detection circuit and a gain stage of 1, 10, or 100 then to the overload detection circuit and output BNCs (Figure 1).

The front panel (Figure 2) is graphically divided into eight channel areas. Each channel consists of a button to select gain, a red LED to display input fault, a yellow LED to display overload, and a green, yellow and orange LED to display gain. A power switch and the PCB logo also appear on the front panel.

The rear panel (Figure 3) consists of 8 input BNC connectors, 8 output BNCs, 2 current adjust screws and an AC power jack.

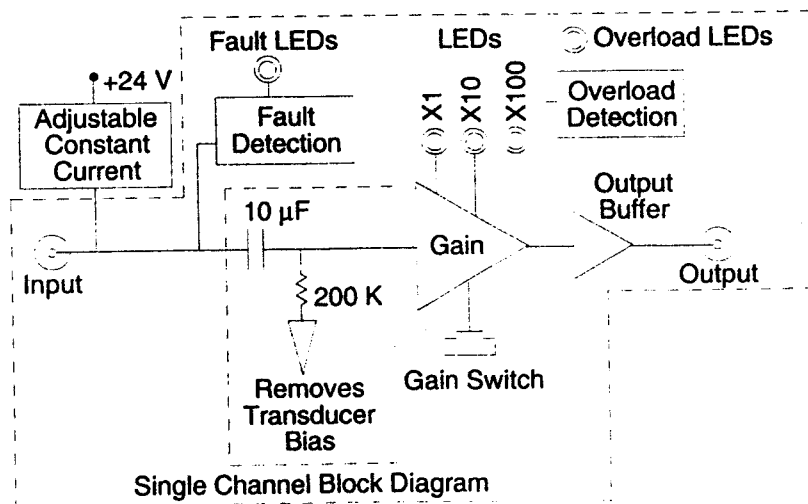


Figure 1
Schematic Diagram of 482A20

Model 482A20

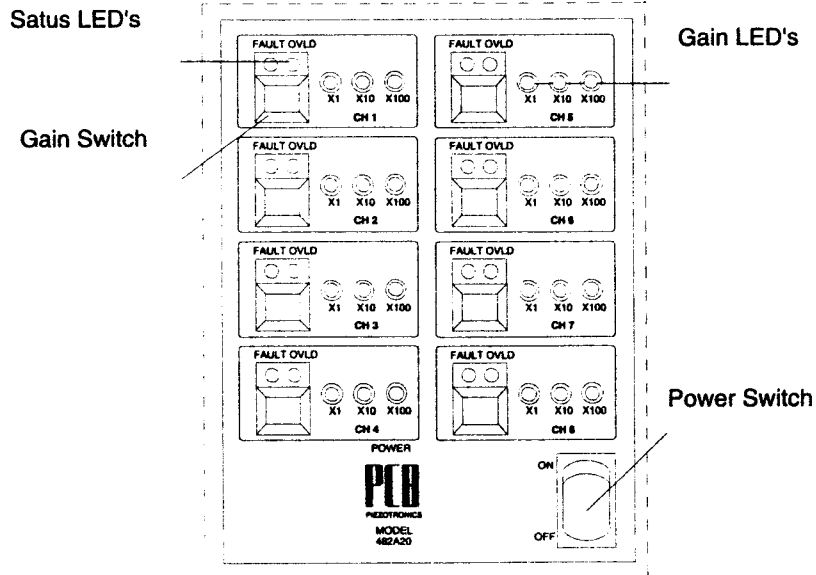


Figure 2
Front Panel of 482A20

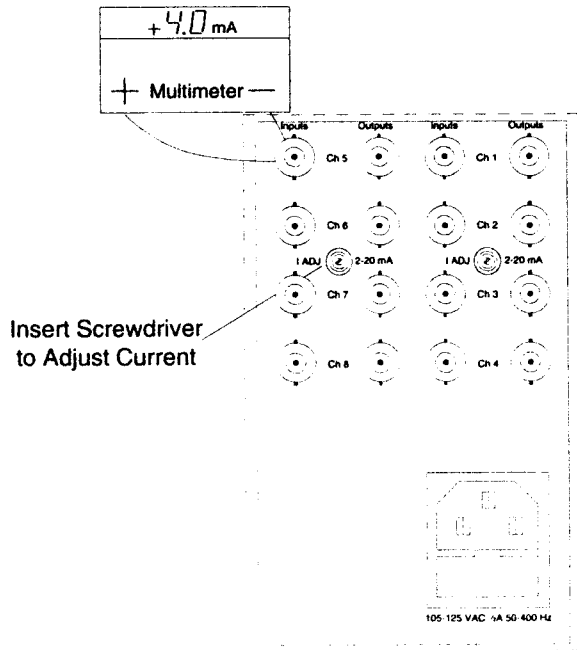


Figure 3
Rear Panel of 482A20

Model 482A20

3.0 OPERATION

Caution: Ensure unit is connected to proper power source, as damage from incorrect voltage might result. Power requirements are printed on rear panel.

Connect power cord (provided) into the rear panel AC power jack. Use front panel power switch to turn unit on. The switch will illuminate to indicate powered status.

When the unit is turned on, the gains of all eight channels are set to the settings they contained when the unit was turned off. If the unit is first being turned on since arriving from the factory, all gains will be set to x1. (NOTE: units with serial numbers 129 thru 138 will power up with all gains set to x1). If it is desired to power up to factory settings, press and hold the gain button of channels 1 & 5 while turning the unit on. Release the gain buttons once the LEDs begin to sequence. The unit then goes through a test of the gain LEDs. At this time, all the gain LEDs should light up. The fault and overload LEDs are independent of the LED test, and will go on or stay off at power up, depending on what is connected to the input. If it is believed that a fault or an overload LED is not working properly, the following test should be performed; Turn the unit off and disconnect all inputs. Wait at least two minutes and then turn the unit back on. All the fault LEDs should be lit and the overload LEDs should turn on for a few seconds and then turn off. If this does not happen, consult the factory for assistance.

The unit is functionally ready when the LED sequencing is complete.

When an ICP transducer is connected to an input, its fault LED should turn off after the transducer turns on. If the fault LED fails to turn off, either the cabling or transducer is faulty and should be replaced. (Note: Some ICP transducers require up to five minutes turn-on-time. Consult transducer manual for turn-on time.)

When the input is first connected, the overload LED will illuminate for a short period. With higher gains it will remain lighted longer.

During this time, the output signal drifts to a "zero" offset. At higher gains, the output may be saturated until the DC level gets very close to zero.

3.1 Non-volatile Power-up Configuration

The factory default gain setting for all channels is x1. The unit has the capability of returning the unit to the configuration (gain) that unit was in prior to the power-down state. The unit will automatically store the configuration for recall after the next power-up is executed each time the user changes a gain.

Model 482A20

The factory default configuration setting may be re-installed by two easy methods. The user may actually setup the unit, gain ~~and switch setting~~, to the default. The other method automatically sets the default by reading the front panel control at power-up. In order to enable the function, press and hold the gain select button of channel 1 and channel 5 while the unit is OFF. While holding the buttons, turn unit ON. The LEDs will begin to perform the power-up sequence. Once the sequence has begun, release the buttons. After the sequence has finished, the factory default settings are enabled.

NOTE: Serial numbers 129 through 130 DO NOT store the last configuration, the factory default setting is always the power-up configuration.

3.2 Gain

The amplification of each channel can be selected by pressing its corresponding gain button. The gain increments in a circular fashion, through the amplification factors of x1, x10, x100, and back again to x1.

3.3 Overload Detection

Since the output waveform will begin to clip or distort at signal levels greater than 20 Vpp, the yellow overload LED will detect a 20 Vpp or greater output signal.

3.4 Constant Current Adjust

The constant-current excitation is factory set at 4 mA. If there is a need to drive longer cable (greater than 100 ft.), the constant current supplied to the transducer must be increased.

To adjust the current, connect a DC millimeter meter to one of the input jacks (channels 1 - 4) on the back of the unit as shown in Figure 3. Adjust the current by turning the current adjust screw located on the rear panel. The meter reading is the constant current value. Channels 1 - 8 are adjusted simultaneously when the current adjust screw is turned. Repeat the procedure for channels 5 - 8. In order to maximize accuracy, make sure all channels have sensors attached.

The optimum current setting is best determined by experimentation with your particular test setup. A good rule of thumb is to use the lowest current consistent with satisfactory results to minimize self-heating and noise.

NOTE: Do not exceed the maximum safe operating current for the transducer in use. Consult with transducer's specification sheet.

3.5 110/220 Volt Operation

If the unit is required to operate on a voltage other than the voltage stated on the back panel, follow the procedure below to adapt the unit:

NOTE: REMOVE power cord before attempting this.

Model 482A20

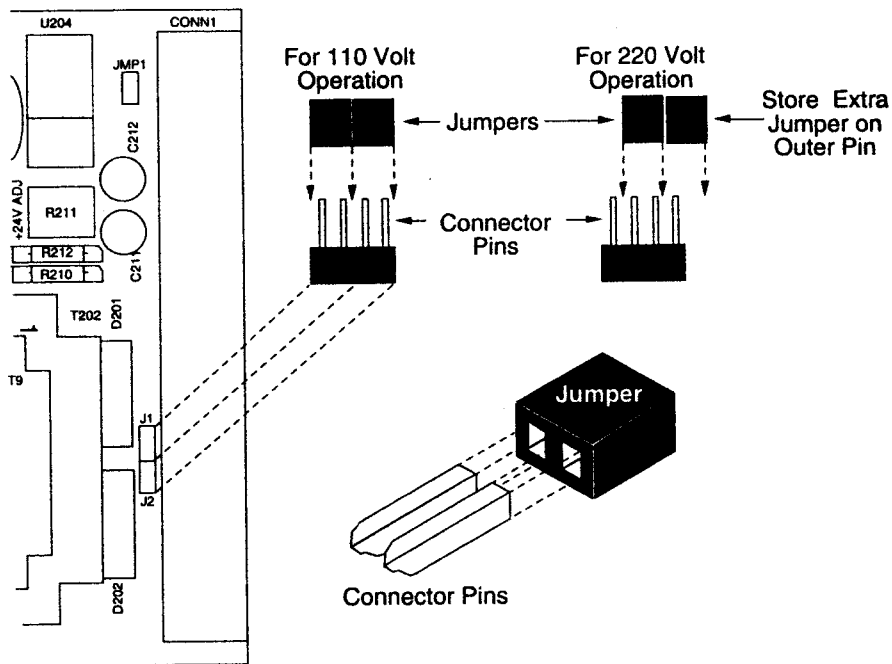


Figure 4
Converting unit between 110 volt and 220 volt

First, with the front panel of the unit facing you, remove the top 2 and bottom 2 black plastic clips from the right side of the unit by carefully sliding them off with a flathead screwdriver. Next, using a Phillips' screwdriver, remove the four exposed screws from the unit. Carefully separate the two halves of the unit. Slide the top board out. Locate the jumper(s) shown in Figure 4. Configure the jumpers to suit your voltage needs. Re-assemble the unit.

CAUTION: Be sure to apply the correct voltage to the unit once the change has been made; otherwise, permanent damage may result.

MANUAL NUMBER: 20254
MANUAL REVISION: NR

Model Number 482A20	8 CHANNEL ICP® POWER SUPPLY		Revision: G ECN #: 40512										
Performance Channels Sensor Input Type(s) Voltage Gain(± 1 %)(Selectable) Frequency Range(-5 %)(x1, x10 Gain) Frequency Range(-5 %)(x100 Gain) Cross Talk(maximum)(Gain x1, x10) Cross Talk(maximum)(Gain x100)	<u>ENGLISH</u> 8 ICP® x1, x10, x100 0.225 to 100,000 Hz 0.225 to 50,000 Hz -72 dB -53 dB	<u>SI</u> 8 ICP® x1, x10, x100 0.225 to 100,000 Hz 0.225 to 50,000 Hz -72 dB -53 dB	<p style="text-align: center;">OPTIONAL VERSIONS</p> <p>Optional versions have identical specifications and accessories as listed for the standard model except where noted below. More than one option may be used.</p> <p>NOTES: [1]Unit set to 230VAC with internal jumpers when ordered as model F482A20. [2]Units supplied with current set at 4Ma I 0.6Ma. [3]Typical. [4]Units with serial number 139 or greater will power up to the same settings it had at power down. [5]Starting at serial number 524 and above.</p>										
Environmental Temperature Range(Operating) Electrical Power Required Power Required(Alternate) Excitation Voltage(± 1 V)(To Sensor) DC Offset(All Gains) Constant Current Excitation(To Sensor)(To Sensor) Output Impedance Overload Threshold(± 1 Vpk) Broadband Electrical Noise(1 to 10,000 Hz)(Gain x1) Spectral Noise(1 Hz) Spectral Noise(10 Hz) Spectral Noise(100 Hz) Spectral Noise(1 kHz) Spectral Noise(10 kHz) Broadband Electrical Noise(1 to 10,000 kHz)(Gain x10) Spectral Noise(1 Hz) Spectral Noise(10 Hz) Spectral Noise(100 Hz) Spectral Noise(1 kHz) Spectral Noise(10 kHz) Broadband Electrical Noise(1 to 10,000 Hz)(Gain x100) Spectral Noise(1 Hz) Spectral Noise(10 Hz) Spectral Noise(100 Hz) Spectral Noise(1 kHz) Spectral Noise(10 kHz) Output Voltage Swing(Maximum)	+32 to +120 °F 90 to 130 VAC/50 to 400Hz/500Ma 210 to 250 VAC/50 to 400Hz/250Ma +24 VDC ± 50 mV 2 to 20 mA <50 Ohm ± 10 Vpk 10 µV/rms 2.0 µV/√Hz 0.18 µV/√Hz 0.1 µV/√Hz 0.15 µV/√Hz 0.1 µV/√Hz 55.0 µV rms 11.0 µV/√Hz 1.0 µV/√Hz 0.36 µV/√Hz 0.4 µV/√Hz 0.31 µV/√Hz 500.0 µV rms 105.0 µV/√Hz 7.0 µV/√Hz 3.2 µV/√Hz 3.5 µV/√Hz 2.4 µV/√Hz 10 Vpk	0 to +50 °C 90 to 130 VAC/50 to 400Hz/500Ma 210 to 250 VAC/50 to 400Hz/250Ma +24 VDC ± 50 mV 2 to 20 mA <50 Ohm ± 10 Vpk 10 µV/rms 2.0 µV/√Hz 0.18 µV/√Hz 0.1 µV/√Hz 0.15 µV/√Hz 0.1 µV/√Hz 55.0 µV rms 11.0 µV/√Hz 1.0 µV/√Hz 0.36 µV/√Hz 0.4 µV/√Hz 0.31 µV/√Hz 500.0 µV rms 105.0 µV/√Hz 7.0 µV/√Hz 3.2 µV/√Hz 3.5 µV/√Hz 2.4 µV/√Hz 10 Vpk		<p>SUPPLIED ACCESSORIES: Model 017AXX Power Cord (1)</p>									
Physical Electrical Connector(ICP® Sensor Input) Electrical Connector(Output) Size (Height x Width x Depth) Weight	BNC Jack BNC Jack 6.2 in x 4.25 in x 10.5 in 6.1 lb	BNC Jack BNC Jack 158.0 mm x 108.0 mm x 267.0 mm 2.8 kg	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Entered: AP</td> <td style="width: 25%;">Engineer: AK</td> <td style="width: 25%;">Sales:</td> <td style="width: 25%;">Approved: JWH</td> <td style="width: 20%;">Spec Number:</td> </tr> <tr> <td>Date: 2/5/2013</td> <td>Date: 2/5/2013</td> <td>Date:</td> <td>Date: 2/5/2013</td> <td style="text-align: center;">482-1200-80</td> </tr> </table> <p style="text-align: right;">Phone: 716-684-0001 Fax: 716-684-0987 E-Mail: info@pcb.com</p>	Entered: AP	Engineer: AK	Sales:	Approved: JWH	Spec Number:	Date: 2/5/2013	Date: 2/5/2013	Date:	Date: 2/5/2013	482-1200-80
Entered: AP	Engineer: AK	Sales:	Approved: JWH	Spec Number:									
Date: 2/5/2013	Date: 2/5/2013	Date:	Date: 2/5/2013	482-1200-80									
<p><i>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.</i></p> <p>ICP® is a registered trademark of PCB Group, Inc.</p>													

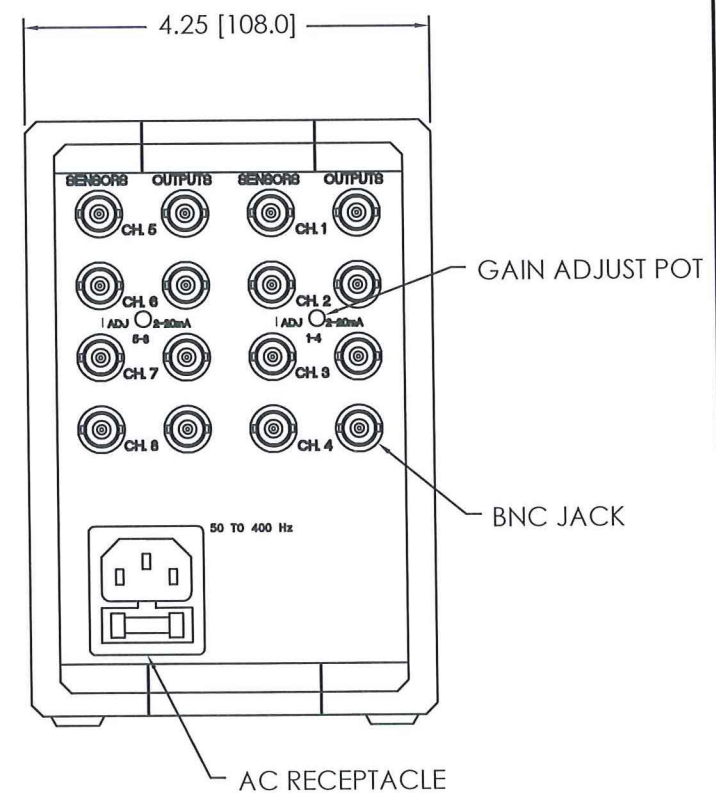
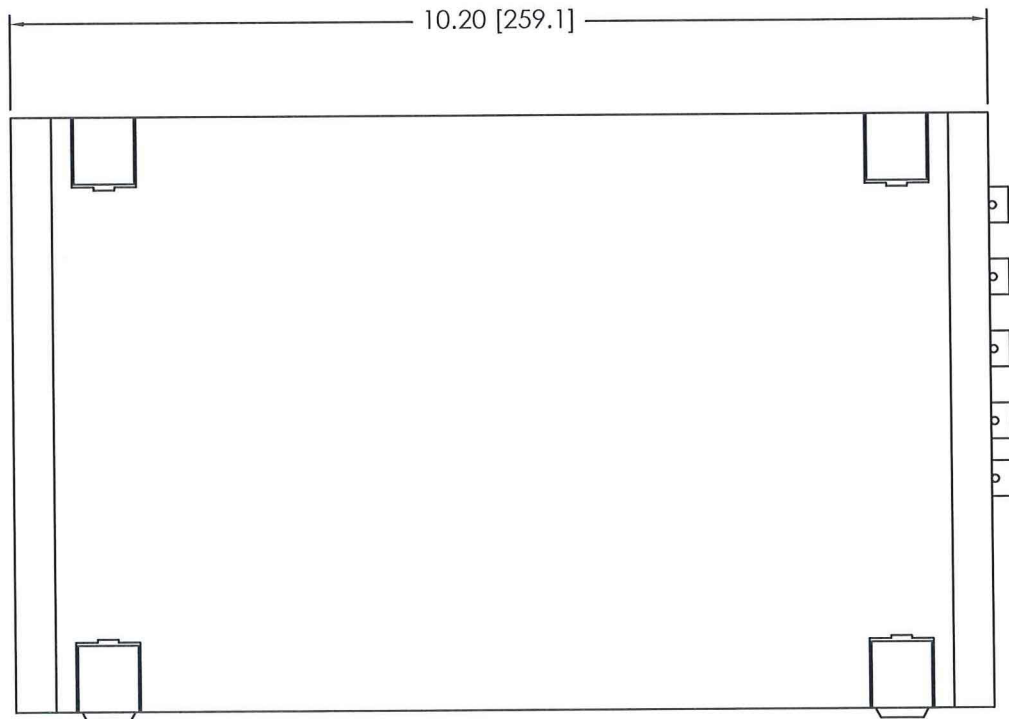
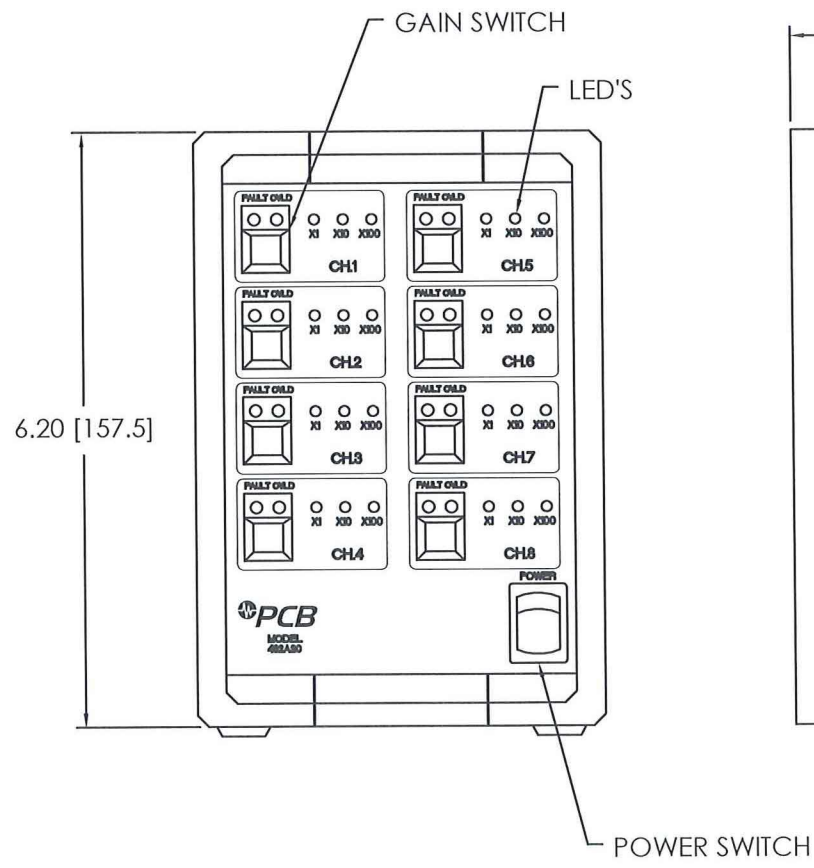


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482-1200-95

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REVISIONS		
REV	DESCRIPTION	ECO
B	REMOVED BNC'S	40512



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

DRAWN		CHECKED		ENGINEER	
JDM	2/13/13	<i>gm</i>	2/13/13	DK	2/13/13
TITLE OUTLINE DRAWING MODEL 482A20 VIBRATION MONITOR					

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CODE IDENT. NO. 52681	DWG. NO. 482-1200-95
SCALE: 2X	
SHEET 1 OF 1	