

**Endevco Model 123**

**3-Channel**

**PE/IEPE Signal Conditioner**

**INSTRUCTION  
MANUAL**

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## Safety

Read this manual in its entirety before operating the Model 123 Signal Conditioner. Read all wiring and power hookup instructions and understand the requirements prior to using another manufacturer's products with the Model 123. Insure that any product being interfaced with the Model 123 is wired according to prevailing local safety and operational standards before operating.

The following symbols and terms may be found on the Model 123 and its manuals and indicate important information.



When found on the device, this symbol indicates that the operator should refer to the manual for important instructions on the proper use of this device. When found in the manual, this symbol indicates that the reader should understand the implications contained in the text before operating the device.



This symbol indicates that a shock hazard may be present. Read the instruction manual carefully and insure that the device is wired properly and that all settings have been checked prior to applying power to the device.

The **WARNING** label indicates important information that should be heeded for safe and proper performance of the device.

The **CAUTION** label is used to indicate that damage to the power supply or equipment connected to it could occur if directions are not followed. Warranty could be invalidated if the instructions in this manual are not followed.

### Disassembling the Instrument



**WARNING**

Turn Input Power Switch OFF before removing power cable from the instrument. Remove power cable from instrument before disassembling any part of the instrument.

### Grounding



**WARNING**

To avoid electrical shock, the power cord protective grounding conductor must be connected to power ground.

### Fuse Replacement



**CAUTION**

For continued fire protection, replace fuse only with the specific type and rating by qualified personnel (Reference Manual "Rear Panel" section). Disconnect the power cord before replacing fuse.

## Description

The Model 123 is a new microprocessor controlled 3-Channel Signal Conditioner for Piezoelectric (PE) or Integrated Electronic Piezoelectric (IEPE) sensors. The Model 123 incorporates a charge amplifier when used with PE sensors. An integral 0, 4, or 10mA, user selectable, current source with 20Vdc compliance voltage is utilized with IEPE sensors. A user friendly interface allows programming Input Sensitivity and Output Sensitivity, then allowing the instrument to calculate the amplifier gain. All gain selections are stored in non-volatile memory and reinitialized when power is applied. Gain can also be entered directly if desired.

The Model 123 utilizes a microprocessor SLEEP mode to eliminate high frequency clock noise and their associated harmonics. The microprocessor WAKES momentarily to acknowledge front panel switch depressions, then goes to SLEEP immediately after processing and executing the requested function. This allows the amplifiers to operate with minimum self generated noise and provides clean, clock free amplified signals. The Model 123 also uses low noise linear voltage regulators instead of switching regulators to minimize interference.

The Model 123 uses 12 bit DACs, for each channel, to set amplifier gains from 0.00 to 999.9 with 0.5% precision. Amplifier gains can be changed “on the fly” without damage to the instrument.

The Model 123 provides 1.5Hz to 230 kHz broadband frequency response, with optional plug-in, 4-pole Butterworth high pass and low pass filter modules available. Filter selection is provided via rear panel switches. Front panel LEDs display filter selections. Each channel can drive 10mA into a 1k ohm load.

The Model 123 channel-to-channel signal ground is non-isolated. However, signal ground is isolated from power ground. An internal DIP switch allows shorting signal ground to power ground.

A rear panel voltage selector switch allows selection of 100, 115 or 230 Vac, 50-60Hz, input power.

The Model 123 is designed for CE compliance for EMC emissions and immunity and for Product Safety.

The Model 123 is directly compatible with Endevco's line of PE and IEPE transducers.

## Wiring Information

### CH1, CH2 and CH3 Signal Inputs

Reference the rear panel drawing shown on page 7.

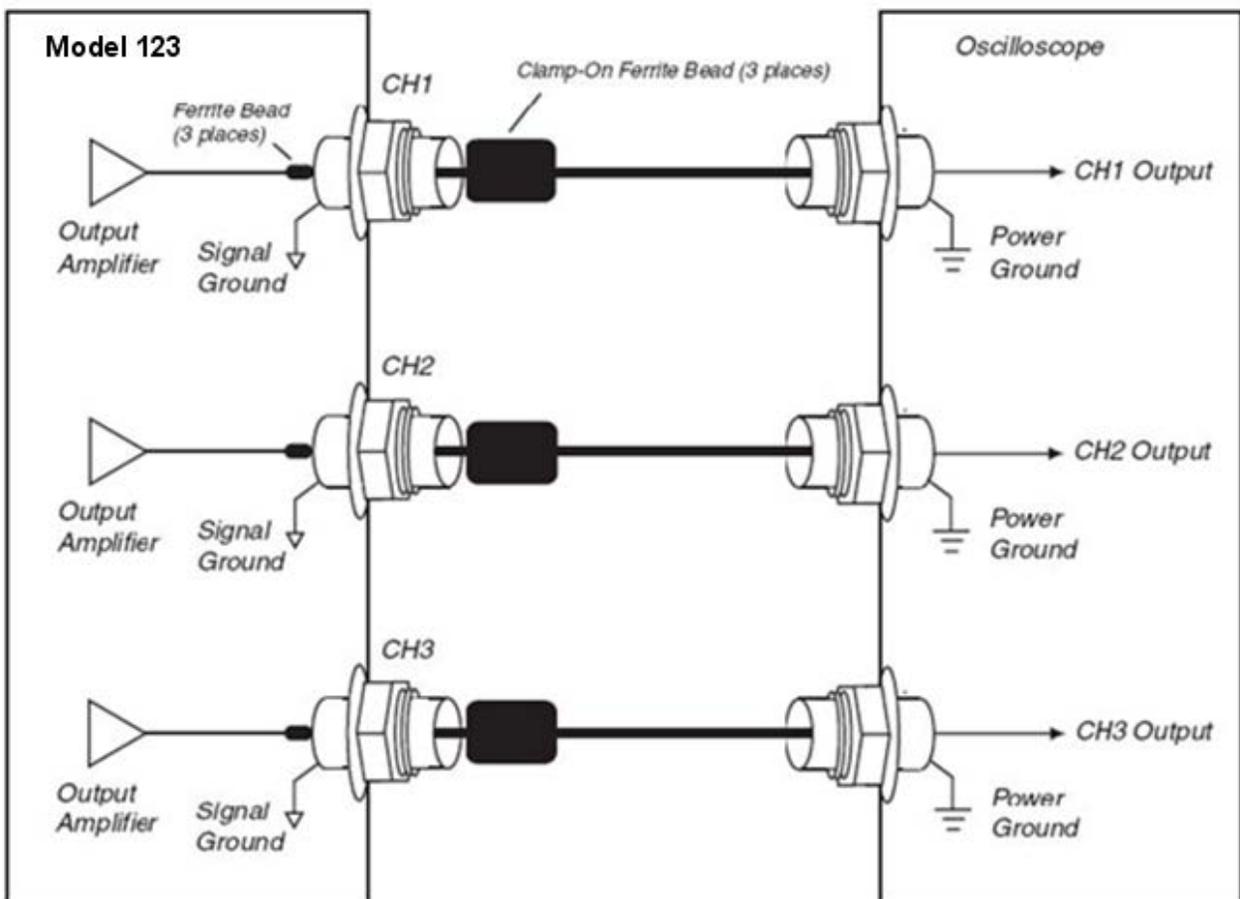
Before connecting power to the instrument, verify INPUT POWER (ON/OFF) switch is in the OFF position and the INPUT POWER SELECT switch is set to the correct voltage. Connect inputs and outputs prior to applying power to the instrument.

For connection to PE sensors set INPUT SELECT switch to PE position and connect to the BNC input for PE sensors.

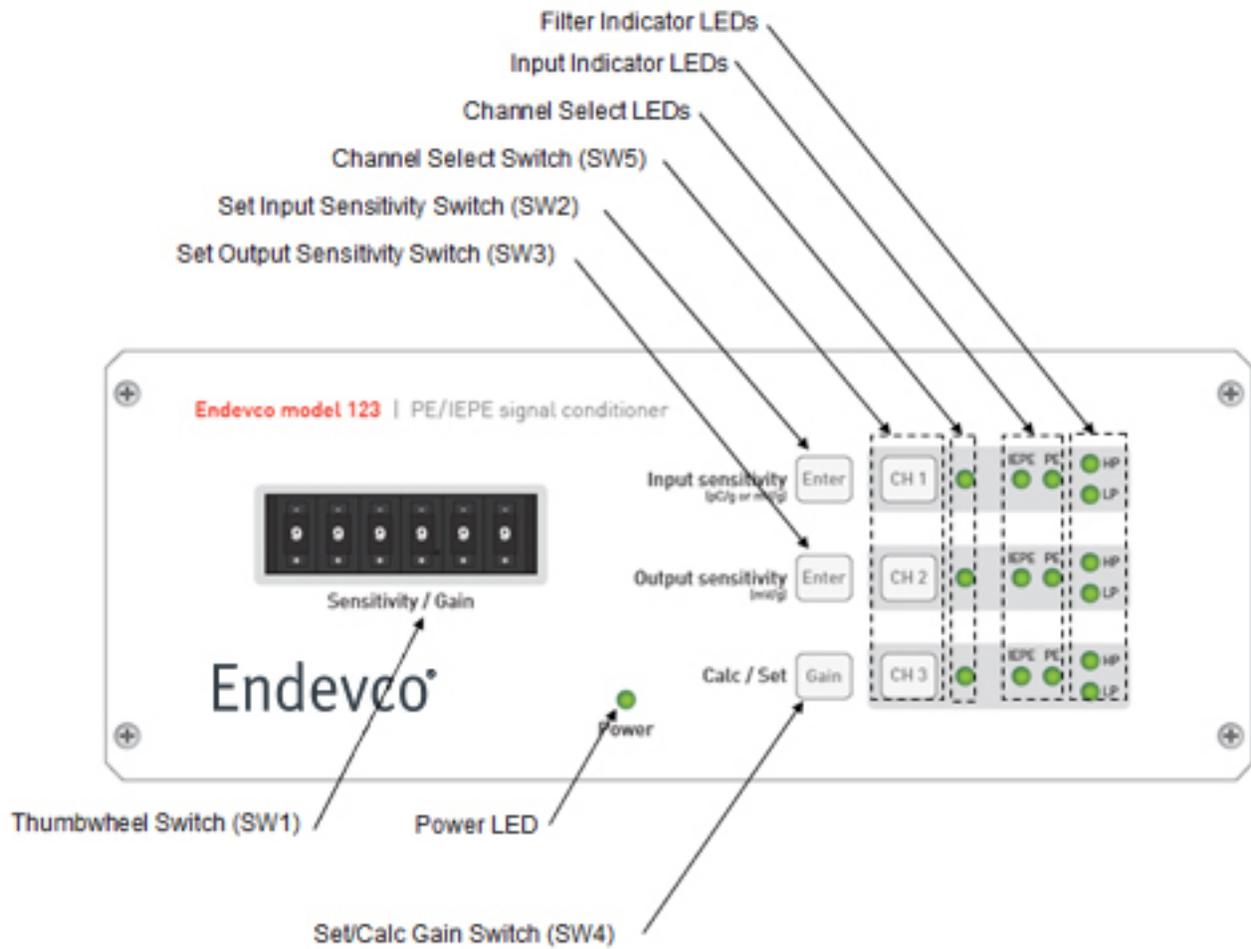
For connection to IEPE sensors set INPUT SELECT switch to IEPE position and connect to the BNC input for IEPE sensors. Select 4mA or 10mA source current for IEPE sensor excitation.

### CH1, CH2 and CH3 Signal Outputs

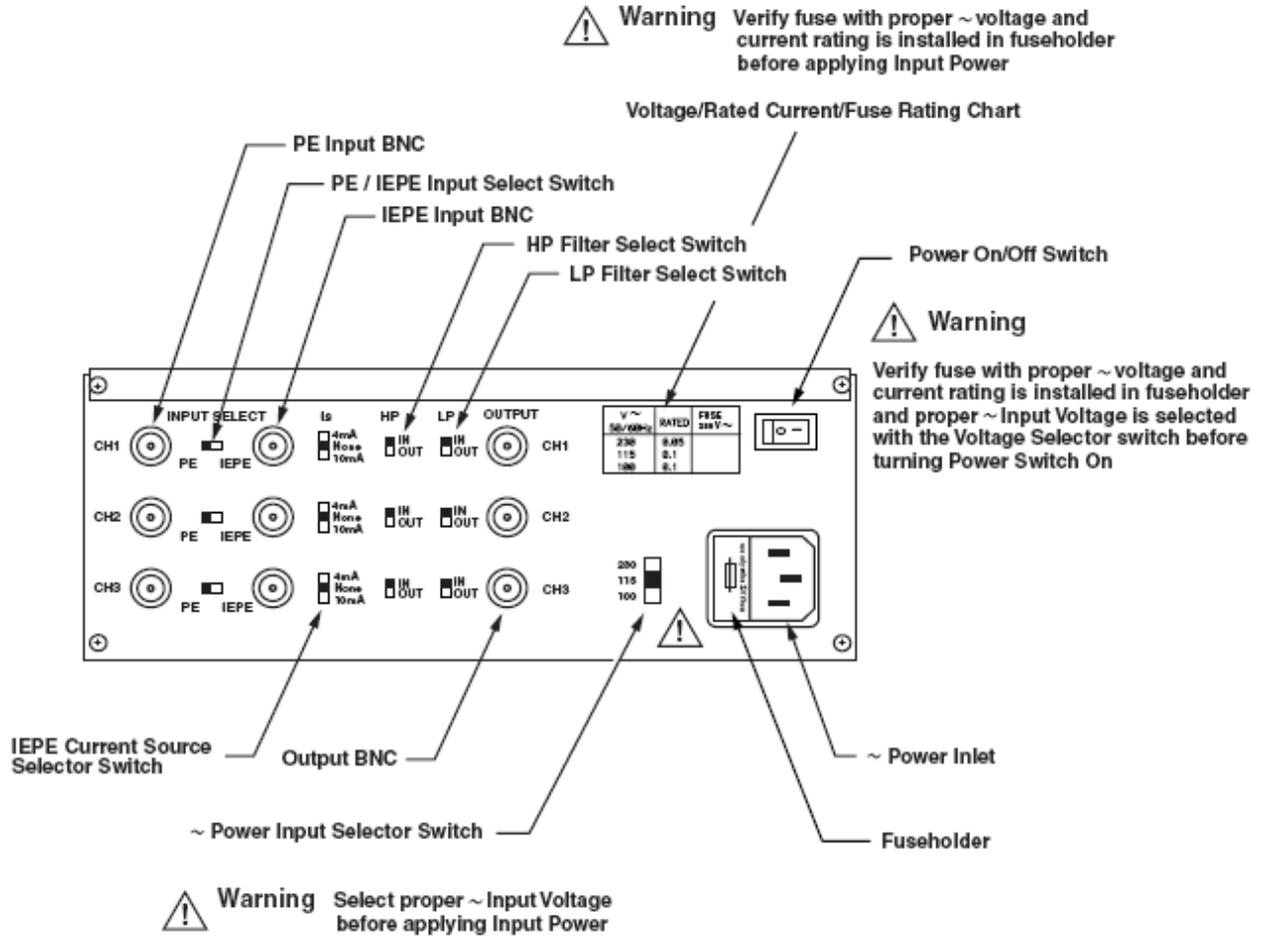
Typical Hookup to an Oscilloscope



Front Panel



Rear Panel



## Setting up the Model 123

Verify the POWER ON/OFF switch is in the OFF position and the POWER INPUT SELECTOR SWITCH is set to the proper input power voltage prior to making any input or output connections to the instrument.

1. Connect sensor to its proper inputs (PE/IEPE).
2. Connect outputs.
3. Disable the High Pass (HP) and Low Pass (LP) filters by selecting HP OUT and LP OUT on the rear panel.
4. Set the appropriate input type (PE/IEPE) on the rear panel.
5. If using IEPE sensors, set the appropriate IEPE current source value.
6. Connect AC power to the instrument.
7. Turn POWER ON/OFF switch ON.
8. Verify the following on the front panel.
  - a. POWER LED illuminates.
  - b. The appropriate PE or IEPE LEDS illuminate.
  - c. HP and LP filter LEDs are OFF.

## Calculating/Setting Gain

1. To allow the instrument to calculate the gain for CH1, perform the following.
  - a. Set the SENSITIVITY/GAIN (SW1) thumbwheel switch to the transducer sensitivity.  
**Example: If the PE or IEPE transducer has a sensitivity of 10.52 pC/g or mV/g, set the SENSITIVITY/GAIN thumbwheel switch to 0010.52.**
  - b. Depress CH1 (SW5) switch momentarily. The CH1 LED will illuminate.
  - c. Depress ENTER (SW2) switch for INPUT SENSITIVITY. The instrument will store the INPUT SENSITIVITY value for CH1 in non-volatile memory for use in calculating the gain setting. The CH1 LED will extinguish.
  - d. Set the SENSITIVITY/GAIN (SW1) thumbwheel switch for the desired output sensitivity.  
**Example: If an OUTPUT SENSITIVITY of 100mV/g is desired, set the SENSITIVITY/GAIN switch to 0100.0.**
  - e. Depress CH1 (SW5) switch momentarily. The CH1 LED will illuminate.
  - f. Depress ENTER (SW3) switch for OUTPUT SENSITIVITY. The instrument will store the OUTPUT SENSITIVITY value for CH1 in non-volatile memory for use in calculating the gain setting. The CH1 LED will extinguish.

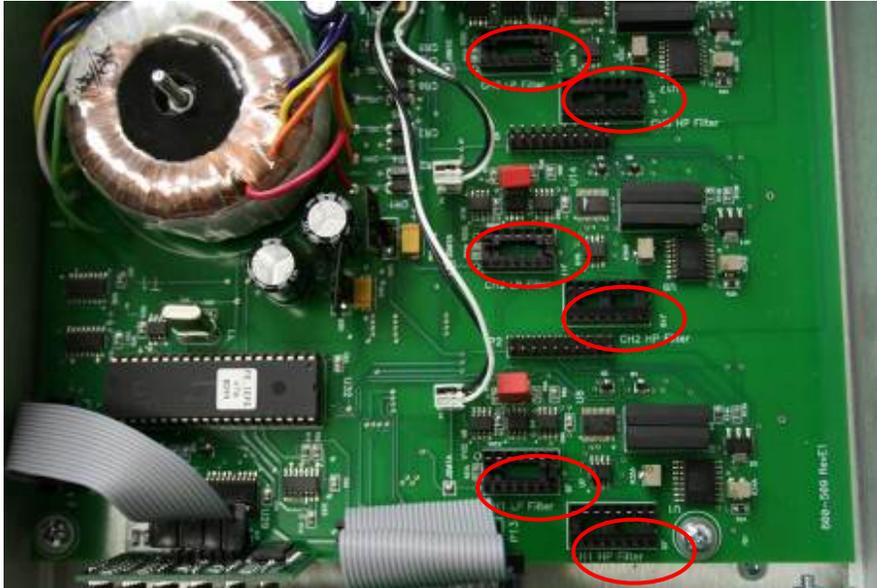
Note: The INPUT SENSITIVITY and OUTPUT SENSITIVITY for CH1 is entered and set. The instrument is now ready to calculate CH1's gain based on these settings. If these values are not updated, they will continue to be used whenever the instrument is asked to calculate CH1's gain.

- g. Depress CH1 (SW5) switch momentarily. The CH1 LED will illuminate.
    - h. Depress GAIN (SW4) switch for CALCULATE/SET gain.
    - i. The instrument will calculate and set  $\text{Gain} = \text{Output Sensitivity} / \text{Input Sensitivity} = 100 / 10.52 = 9.51$ . This gain value is stored in non-volatile memory and recalled when input power is applied.
    - j. CH1 LED will extinguish.
  2. To simply set the gain to a desired value, perform the following.
    - a. Set the SENSITIVITY/GAIN thumbwheel switch to the desired gain.  
Example: If a gain of 10 is desired, set the SENSITIVITY/GAIN thumbwheel switch to 0010.00.
    - b. Depress CH1 switch momentarily. The CH1 LED will illuminate.
    - c. Depress and hold the GAIN switch for the CALCULATE/SET gain, for approximately 3 seconds. The CH1 LED will extinguish.
    - d. The gain for CH1 will be set to 10.00 and the value will be stored in non-volatile memory to be recalled when input power is applied.
  3. Use steps 1-2 to calculate or set gain for CH2 and CH3.

## Location and Installation of Filter Modules

1. Ensure all power is disconnected from the unit.

2. Remove the top cover by removing the two top screws on the rear of the unit.
3. After the top cover is removed, you should see filter sockets as indicated below (6 places). Each socket is labeled on the board with the channel number and LP/HP.



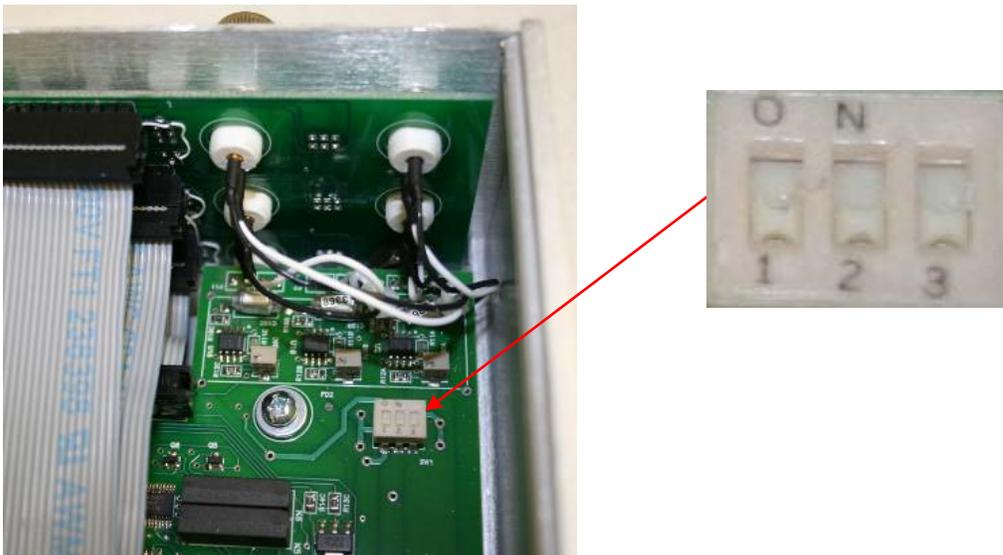
4. Install filter module like shown below (shown with LP Filter Module installed)



5. Filter modules for both LP and HP filters on all channels are installed in the same manner.

## Signal Ground/Power Ground Isolation

1. Ensure all power is disconnected from the unit.
2. Remove the top cover by removing the two top screws on the rear of the unit.
3. After the top cover is removed, you will see the DIP switch pictured below, near the back of the unit.
4. With the DIP switch set to the numbered side, signal ground is isolated from power ground (default, pictured below), for each channel. With the switch in the alternate position, signal ground is shorted to power ground.



## Included/Optional Accessories

Part Number	Description	
EW599	Powercord	Included
IM123	Instruction manual	Included
EJ21	BNC to 10-32 adaptor	Optional
31875-XXXX-Y	Low pass filter module	Optional
42875-XXXX	High pass filter module	Optional

## Outline Dimensions

