

Endevco®

MODEL 2775B
SIGNAL CONDITIONER

**INSTRUCTION
MANUAL**

Legacy Product Not For Sale

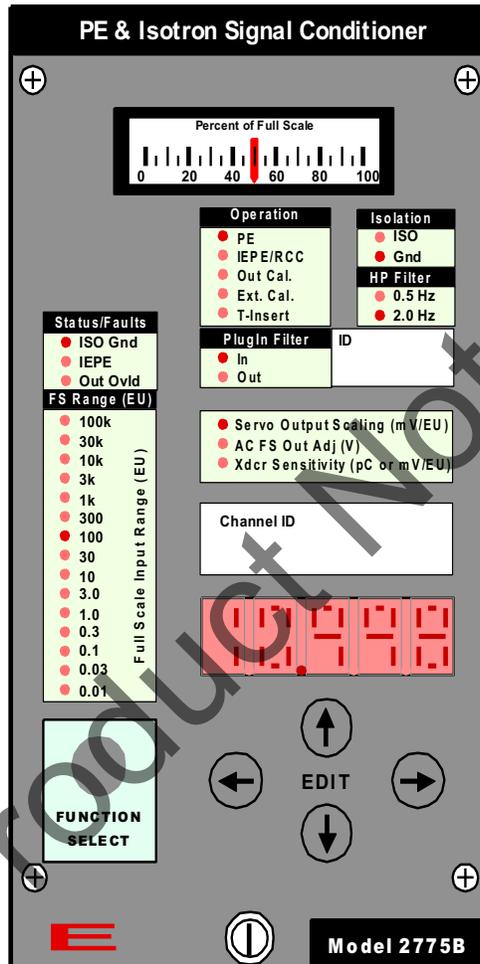
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1.0 EQUIPMENT DESCRIPTION

The ENDEVCO® Model 2775B PE and ISOTRON Signal Conditioner is a low noise/high gain amplifier designed for use with piezoelectric accelerometers (PE), ISOTRON (IEPE) accelerometers, and remote charge converters (RCC). The front panel displays the settings and status of the 2775B.

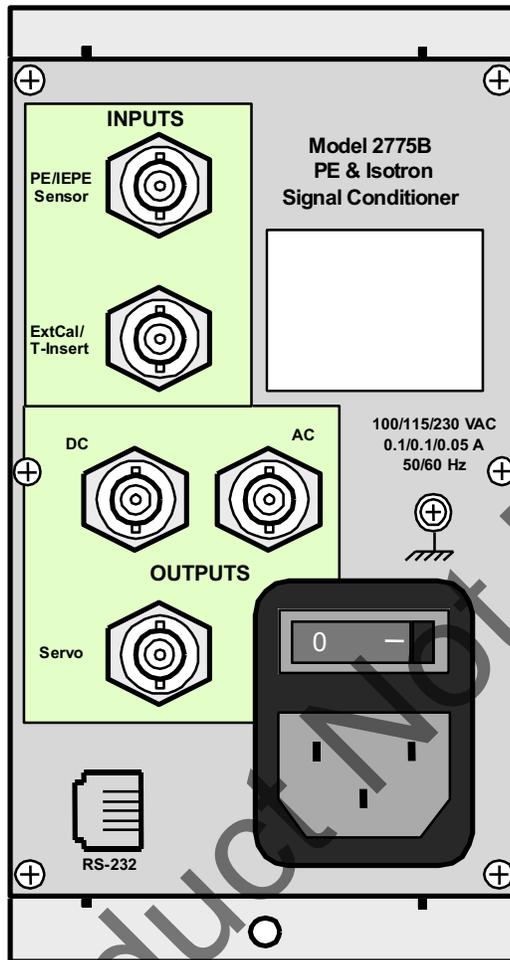


2775B Front Panel

The 2775B provides three standard BNC outputs:

- AC: Adjustable full scale output from 1 to 10 Volts peak in .5 Volt increments. Up to 40 mA available to drive large capacitive loads.
- DC: Fixed at 10 Volts DC full scale. An internal switch selects DC equivalent of the AC output (Adjustable full scale output from 1 to 10 Volts DC in .5 Volt increments).
- SERVO: Selectable scaling of 0.1, 1.0, 10.0, 100.0, or 1000.0 mV/EU

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2775B Rear Panel

PE/IEPE/RCC and External Calibration/T-Insert inputs are via two BNC connectors on the rear panel.

The PE/ISOTRON full scale input range is from 0.01 to 100,000 EU providing gains up to 10,000. 4.3 mA or 8.5 mA constant current is available for IEPE/RCC devices.

The Model 42344 plug-in card provides a two-pole Butterworth filter in a low pass high pass, or band pass configuration.

The Model 35818 plug-in card provides single or double integration for velocity and displacement outputs.

This unit is powered by 90-240 VAC/50Hz-400Hz.

The 2775B is manually programmed from the front panel or remotely controlled through a standard RS-232 serial interface.

One to six (6) 2775B units can be installed in the ENDEVCO Model 4948A 19" rack.

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1.1 KEY FEATURES

- PE, ISOTRON, and RCC inputs
- External Calibration Signal Input
- Built in T-Insert for PE devices
- Calibration Oscillator to check external data acquisition/recording devices
- AC, DC, SERVO outputs
- 0.16 to 120,000 Hz Bandwidth (-3dB corner)
- Input and output ground isolation front panel selectable
- 0.5 and 2.0 Hz high pass filters front panel selectable
- 4.7 or 9.4 mA constant current available for ISOTRON/RCC units.
- BNC input and output connectors
- Optional plug-in filter or integrator
- Fault indicator for: open/short at the ISOTRON input, common mode voltage overload, and DC output overload.
- Gain range from 0 to 10,000
- RS-232 Serial Interface
- Windows based configuration editor software available
- Servo output scaling choices: .1, 1, 10, 100, or 1000 mV/EU
- Full Scale Input Range: .01 to 100,000 EU

**MODEL 2775B
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The Endevco Model 2775B is manually programmed from the front panel using the FUNCTION SELECT and EDIT push-buttons along with a five character LED display. The following characteristics are programmed:

1. Servo Output Scaling (mV/EU)
2. AC FS Out Adj (V)
3. Xdcr Sensitivity (pC or mV/EU)
4. Full Scale Input Range (EU)
5. Operation
6. Plugin Filter
7. Isolation
8. HP Filter

The 2775B stores these settings in non-volatile RAM and recalls them at power up.

Three Status/Faults LEDs indicate the following:

- ISO Ground (Common Mode Voltage exceeds 6 VAC)
- IEPE (Open or short in the cable or accelerometer)
- Out Ovld (Percent of Full Scale or DC output > 100% or 10 VDC).

2.1 FUNCTION SELECT

Pressing the Function Select pushbutton puts the 2775B in the query/programming mode. This is indicated by one of the "FS Range" LEDs blinking in the "Full Scale Input Range (EU)" selection block. Subsequent presses of the Function Select pushbutton cycles through the eight functions available. While the LED is blinking the current setting of that function is edited using the four edit keys. While the LED is blinking next to Servo Output Scaling (mV/EU), AC FS Out Adj (V) and Xdcr Sensitivity (pC or mV/EU) the current value is displayed in the five character LED front panel display. The four Edit keys are used to edit the settings.

The following functions are selected for programming:

1. Xdcr Sensitivity (pC or mV/EU)
 - Range 0.0001 to 10000
2. AC FS Out Adj (V)
 - Range 1.0 to 10.0 with 0.5V increment
3. Servo Output Scaling (mV/EU)
 - Select 0.1, 1.0, 10.0, 100, or 1000.0
4. Full Scale Input Range (EU)
 - Select 0.01 to 100k
5. Operation
 - Select PE, IEPE/RCC, Out Cal., Ext Cal., or T-Insert

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6. Plugin Filter
 - Select In or Out
7. Isolation
 - Select ISO or Gnd
8. HP Filter.
 - Select 0.5 Hz or 2.0 Hz

If no buttons are pressed for 20 seconds the “Function LED” will stop blinking and the unit will return to normal operation.

In the normal mode of operation the LED display will show the sensor sensitivity. Each “Function LED” will remain OFF or ON during the normal mode of operation depending on the setting selected by the user for that function.

2.1.1 SERVO OUTPUT SCALING (mV/EU)

Used to select one of five fixed servo output-scaling settings. Press the FUNCTION SELECT button until the LED next to SERVO OUTPUT SCALING (mV/EU) is flashing. The up-down EDIT keys are used to select the servo output scaling in millivolts per engineering unit. The front panel will display the scaling selected. The choices are:

- 0.1 mV/EU
- 1.0 mV/EU
- 10.0 mV/EU
- 100.0 mV/EU
- 1000.0 mV/EU

The SERVO OUTPUT SCALING (mV/EU) LED remains OFF during normal operation.

2.1.2 AC FS OUT ADJ (V)

Sets the full scale output voltage at the AC output (and DC output when selected) from 1.0 to 10.0 volts peak in 0.5 volt increments. This voltage level is present at the AC output when the amplifier is in OUT CAL mode.

With the full scale output voltage set to 10.0, and the full scale input range set to 100, the AC output is scaled to 100mV/EU.

INPUT IN ENGINEERING UNITS	% OF FULL SCALE	OUTPUT IN VOLTS PEAK
100	100	10
80	80	8
60	60	6
40	40	4
20	20	2
10	10	1

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If the Full Scale Output Range is incremented to the point where the Amplifier's Gain is greater than 10000, the 2775B will display an error message (FSIEr) to indicate that the Full Scale Input Range has been modified to meet the Gain < 10000 constraint.

The AC FS Out Adj. LED will remain OFF during normal operation.

2.1.3 SENSOR SENSITIVITY SELECT

Enter the sensitivity of the transducer in mV/EU for Voltage input, or pC/EU for Charge input. The Model 2775B automatically sets the gain level to achieve the required output scaling (FSO/FSI). The left-right EDIT keys select the number position in the LED display, and the up-down EDIT keys increment or decrement the selected number.

The user can enter five significant digits ranging from 0.0001 to 10000.

The Sensor Sensitivity Select LED will remain ON during normal operation.

2.1.4 FS INPUT RANGE (EU) SELECT

Select the maximum signal amplitude in Engineering Units (EU) applied to the sensor. The user selects a FS Range value from 0.01 EU to 100,000 EU limited by the gain ≤ 10000 constraint. If the maximum signal amplitude is not known, enter a higher than expected value to reduce the risk of clipping the signal.

The Full Scale Input Range is modified automatically if either Sensor Sensitivity or Full Scale Output Range causes the unit to compute the amplifier's gain > 10,000.

The FS Input Range Select LED will remain ON during normal operation.

2.1.5 MODE OPERATION SELECT

Enables the operational mode required. The up-down EDIT keys are used to select the operation type. The following LEDs light sequentially each time the up-down EDIT keys are pressed:

- "PE": Piezo-Electric (PE) input is enabled.
- "IEPE/RCC": BNC Sensor Input is routed to the charge converter front-end through a series 1000 pF capacitor to accept sensors/devices with millivolt (AC) type output. ISOTRON current excitation is enabled during this mode of operation.
- "Out Cal.": Sets a 170 Hz signal with an amplitude (V-pk) equal to the value entered in "Full Scale Output Range".
- "Ext. Cal": External AC voltage signal applied to "Cal Input" is routed to the front-end charge amplifier through a 1000 pF series capacitor. Sensor Input is disconnected from the amplifier when this calibration mode is selected and the ISOTRON current excitation is disabled during this mode of operation.

Example of operation:

1. Connect a signal generator to the "ExtCal T-Insert" BNC connector on the rear panel.
2. Press "Function Select" until one of the five "Operation" LEDs is flashing.
3. Press the up or down "Edit" key until the LED next to Ext Cal is flashing.

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4. Multiply the "Full Scale Input Range" by the "Xdcr Sensitivity" setting on the front panel. Example: 100 EU times 11.586 pC/EU equals 1158.6. Set the mV output of the signal generator connected in step one to this value: 1158.6 mV. The frequency can be anywhere within the pass band of the amplifier, however 1000 Hz is recommended.
5. Verify the AC, Servo, and DC outputs are at full scale.
- "T-Insert": External AC voltage signal applied to "Cal Input" is routed to the low side of the PE/charge sensor's input. Sensor Input stays connected to the amplifier during this mode of operation.

A Model 2272 whose sensitivity is 11.586pC/g with a capacitance of 2789pF and a 3090C-120 with a capacitance of 316pF was used for this example.

1. Attach the accelerometer to the cable and attach the cable to the PE/PEE Sensor input BNC on the rear panel of the 2775B
2. Input the sensor's sensitivity of 11.586
3. Select 100 as the Full Scale Input Range
4. Press the Function Select button until one of the LEDs in the Operation section is flashing.
5. Press the up or down edit button until the T-Insert LED is flashing.
6. Add the accelerometer's capacitance 2789pF to the cable's capacitance 316pF. Total capacitance = 3105pF. This information is located as shown below on your accelerometer shipping box and cable.



Use the value written here

Typical piezoelectric accelerometer label located on the shipping box



Use the value written here

Typical label attached to a cable

To simulate a full scale output the following formula is used:

- Voltage applied to the ExtCal/T-Insert connector for full scale output = FSI * sensor sensitivity/capacitance of cable plus capacitance of accelerometer (step 6 above).

Example 1:

- $E = 100 * 11.586/3105$
- $E = .373V$
- Full scale input is set to 100. A sensitivity of 11.586pC/g requires 1158.6pC to simulate 100g's. We are using the accelerometer and cable as a capacitor with a value of 3105pF. Putting .373V across 3105pF results in 1158.6 pC.

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Example 2

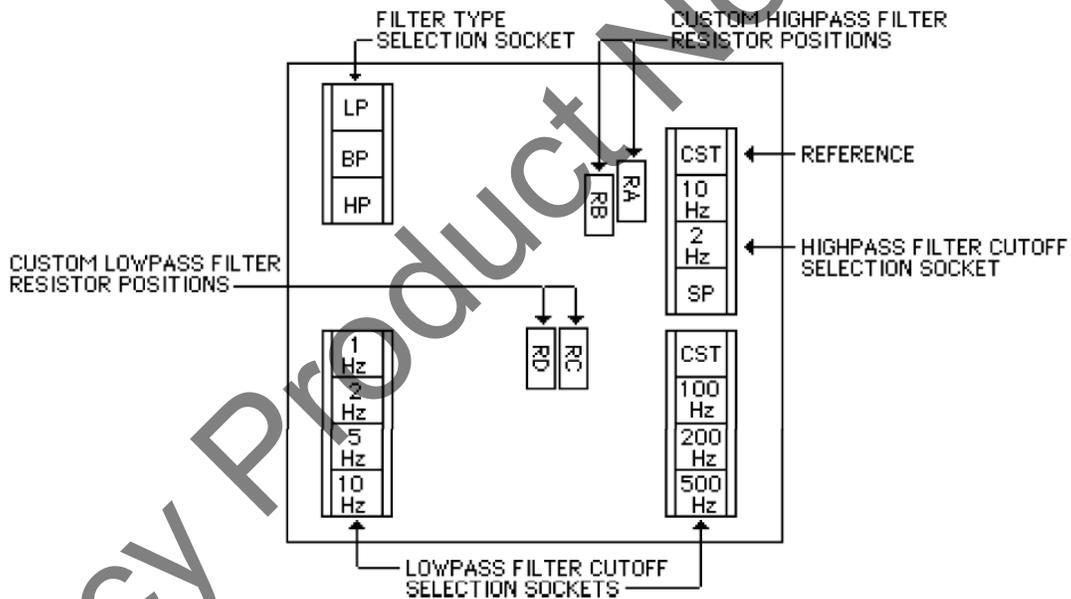
- $E = 1000 * 11.586/3105$
- $E = 3.73V$
- Full scale input is set to 1000. A sensitivity of 11.586pC/g requires 11586pC to simulate 1000g's. We are using the accelerometer and cable as a capacitor with a value of 3105pF. Putting 3.73V across 3105pF results in 11586 pC.

The "Function LED" corresponding to the Operation Selected will remain ON during normal operation.

2.1.6 PLUG-IN FILTER SELECTION

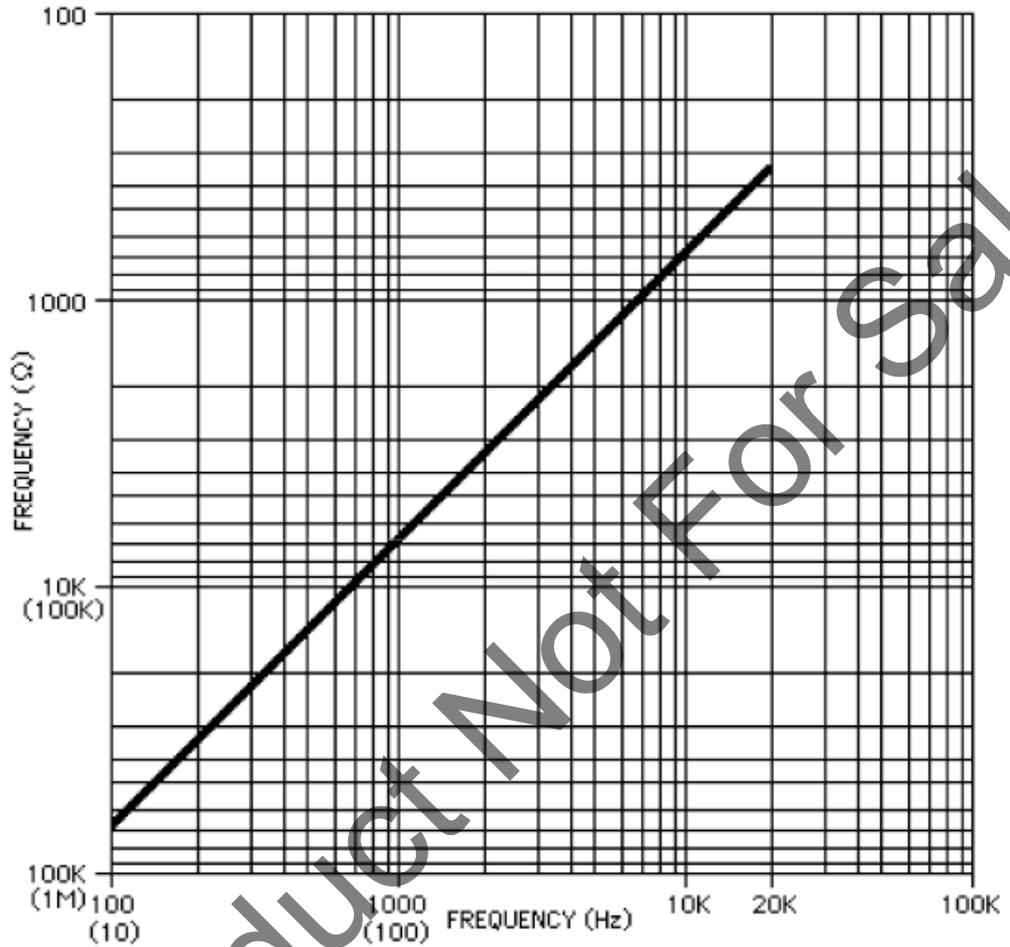
Enables or disables the plug-in lowpass filter card (model 42344) or plug-in integrator card (model 35818). For instructions on how to install the 42344 Filter Board refer to Appendix A. The up-down EDIT keys are used to select the plug-in filter. The following LED will be shown sequentially each time the up-down EDIT keys are pressed:

- "Out": Card disabled.
- "In": Card enabled.

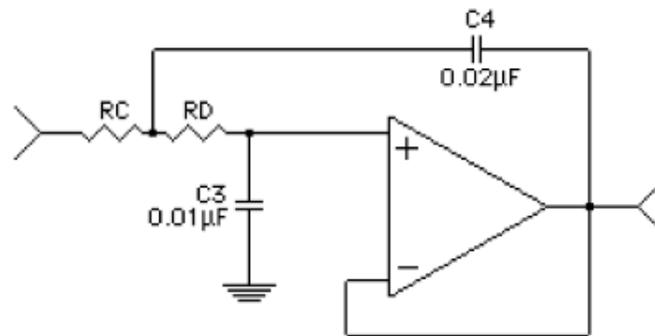


Fixed 42344 Filter Corner Options

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- NOTES:
1. SELECT 5% CORNER AND USE CHART TO FIND RESISTANCE.
 2. $R_C = R_D$ FOR 100 HZ TO 20 KHZ.
 3. USE FREQUENCIES IN PARENTHESIS FOR 100 HZ OR LESS.



LP Filter
2 Pole - 5% Corners

Use this chart and formula to use a custom lowpass corner frequency

The LED corresponding to the Plug-in Filter selection will remain ON during normal operation.

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2.1.7 ISOLATION SELECTION

Selects the isolation between the input and output common. The up-down EDIT keys are used to select the Isolation. The following LEDs will be shown sequentially each time the up-down EDIT keys are pressed:

- "Iso": Input common isolated from output common.
- "Gnd": Input common and output common connected together (no isolation).

The LED corresponding to the Isolation selection will remain ON during normal operation.

2.1.8 HIGHPASS FILTER

Selects either the 0.5 Hz or 2.0 Hz one-pole High-Pass filter. The up-down EDIT keys are used to select the filter corner. The following LEDs will light sequentially each time the up-down EDIT keys are pressed:

- "0.5Hz": Select 0.5Hz High-pass filter.
- "2.0": Select 2.0Hz High-pass filter.

The LED corresponding to the HPF selection will remain ON during normal operation.

2.2 SPECIAL MODES

The special modes are not frequently used and they may be selected by pressing the "Select Function" key while simultaneously pressing a combination of multiple EDIT keys. The unit must be in the normal mode of operation to enter any of the special modes of operation. After viewing or editing the Special Modes, user must press the "Select Function" to return to normal operation, or it will go back to normal operation automatically after 20 sec. without any activity. The table below shows the combination of the EDIT keys that need to be pressed to obtain the desired special mode.

Mode	EDIT keys
1. Addressing	RIGHT
2. Error List	LEFT
3. Reset	UP
4. Store Setup in EEPROM	DOWN
5. Test Display	UP & LEFT
6. Recall Default Setup	DOWN & RIGHT
7. Calibration	LEFT & RIGHT
8. Troubleshooting (TBD)	UP & DOWN
9. Not Assigned	UP & RIGHT
10. Not Assigned	DOWN & LEFT

2.2.1 ADDRESSING

Programs the baud rate (19200, 9600, 4800, 2400, or 1200) and address of the unit. Used during computer control through the RS-232 port.

This mode is selected by pressing the "Select Function" key while simultaneously

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pressing the RIGHT EDIT key. The first mode allows selection of the baud rate. Press the up down edit keys to scroll through the selections. Press the "Select Function" button again to change the unit address. The unit returns to normal operation after pressing the "Select Function" key one more time.

The new baud rate and address will be set and stored into the internal non-volatile memory when the unit returns to normal operation.

2.2.2 ERROR LIST

Displays a listing of all of the errors causing one of the failure LEDs to be ON.

This special mode is selected by pressing the "Select Function" key while simultaneously pressing the LEFT EDIT key. The unit returns to the normal mode of operation after pressing the "Select Function" key one more time.

After the error mode is selected, the first error code will be shown on the LED display. The user may scroll through the list by using the UP and DOWN EDIT keys.

- "ISOEr", Common Mode voltage between input ground and output ground exceeds 6 Vpk
- "IEPEr", Open or Short at IEPE
- "OVLEr" DC output exceeds 10 Vdc.
- "EEPEr", EEPROM write error
- "ECSEr", EEPROM Channel setup recall (checksum) error.
- "ECCEr", EEPROM Cal Constants recall (checksum) error.

2.2.3 RESET

Resets the unit (equivalent to a power-up initialization).

This special mode is selected by pressing the "Select Function" key while simultaneously pressing the UP EDIT key. The unit returns to normal operation immediately after initialization.

2.2.4 STORE SETUP IN EEPROM

Forces the unit to store all the function settings into non-volatile memory.

This special mode is selected by pressing the "Select Function" key while simultaneously pressing the DOWN EDIT key. The unit returns to the normal mode of operation immediately after writing all of the function settings into non-volatile memory.

2.2.5 TEST DISPLAY

Tests the front panel display board by causing a different pattern on the LED indicators and the LED display every time any one of the front panel buttons is pressed.

This special mode is selected by pressing the "Select Function" key while simultaneously pressing the UP and LEFT EDIT keys. The unit returns to normal operation after pressing the "Select Function" key one more time.

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2.2.6 RECALL DEFAULT SETUP

This special mode selection allows the user to recall the default function settings.

This special mode is selected by pressing the “Select Function” key while simultaneously pressing the DOWN and RIGHT EDIT keys. The unit returns to the normal mode of immediately after restoring all of the default function settings.

Function	Factory Default Setting
1. Mode Operation	PE
2. FS Range	1k (EU)
3. Sensitivity	1.0000 mV/EU
4. AC FS Out Scaling	1.0000 (V)
5. HP Filter	2.0 Hz
6. Plug-in Filter	Out
7. Servo	1.0
8. Isolation	Gnd

2.2.7 CALIBRATION

Allows the user to manually calibrate the unit.

This special mode is selected by pressing the “Select Function” key while simultaneously pressing the LEFT and RIGHT EDIT keys. When this special mode is selected the 100k “FS Range LED” will be blinking and the first calibration constant will be shown on the LED display. The settings of all of the functions will be saved in non-volatile memory when entering this mode.

The user selects which calibration constant is being set by subsequently pressing the “Select Function” key. Each press of the “Select Function” key will sequentially make one of the “FS Range LEDs” blink indicating that the calibration constant is selected for programming and the corresponding calibration constant will be shown on the LED display.

Pressing the “Select Function” push-button until the “0.01” FS Range LED is flashing places the unit back into Normal mode. The calibration constants will be stored into the internal non-volatile memory when the unit returns to the normal mode of operation. The settings for all of the functions will be restored using the new calibration constants when the unit returns to the normal mode of operation.

A checksum for the calibration constants is also stored in non-volatile memory. The unit will use this checksum at power up to verify that all calibration constants are good. The unit will declare an error if the checksum test for the calibration constants fails.

A cross-reference table between the calibration constants and the “FS Range LEDs” is shown below (the input select and gain settings for each calibration constant is also shown).

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Function LED (FS Range)	Calibration Constant	Output	Input Select	Gain
100k	k1 for $1000 \leq \text{Gain} \leq 10,000$	AC	IEPE	2000
30k	k2 for $100 \leq \text{Gain} < 1000$	AC	IEPE	200
10k	k3 for $10 \leq \text{Gain} < 100$	AC	IEPE	20
3k	k4 for $1 \leq \text{Gain} < 10$	AC	IEPE	2
1k	k5 for $0 \leq \text{Gain} < 1$	AC	IEPE	0.2
300	k6 for $1 \leq \text{Gain} < 10$	AC	PE	2
100	k7 for $1 \leq \text{Gain} < 10$	DC	IEPE	2
30	k8 for $100 \leq \text{Servo Gain} < 1000$	Servo	IEPE	200
10	k9 for $10 \leq \text{Servo Gain} < 100$	Servo	IEPE	20
3.0	k10 for $1 \leq \text{Servo Gain} < 10$	Servo	IEPE	2
1.0	k11 for $0 \leq \text{Servo Gain} < 1$	Servo	IEPE	0.2
0.3	k12 for $0 \leq \text{Servo Gain} < 1$	Servo	IEPE	0.2
0.1	k13 for $1 \leq \text{Servo Gain} < 10$	Servo	IEPE	2
0.3	k14 for $10 \leq \text{Servo Gain} < 100$	Servo	IEPE	20
0.1	k15 for FSO=2	AC	OUTCAL	2
PE	k16 for $1 \leq \text{Servo Gain} < 10$	Servo	PE	2

2.2.7.1 AC Output Gain Calibration

Calibration constants k1 through k6 calibrates the gain of the unit at the AC output. This is accomplished by applying a 300 Hz calibration signal into the IEPE input for k1, k2, k3, k4, and k5 and into the PE input through a 1000pF series capacitor with input for k6, and adjusting the calibration constant displayed on the LED display until the desired output (input signal multiplied by gain) is obtained. The amplitude of the input signal should be set to 3.0 mVRMS for k1, 30 mVRMS for k2, 300 mVRMS for k3, 3.0 VRMS for k4, 7.0 VRMS for k5, 3.0 VRMS for k6

2.2.7.2 Percent of Full Scale DC Output Gain Calibration

Calibration constants k7 is used to calibrate the gain of the unit at DC output at 10 Vpk FSO. This is accomplished by applying a 300 Hz calibration signal into the IEPE input for k7, and adjusting the calibration constant displayed on the LED display until the desired output DC (input signal multiplied by (gain*1.414)) is obtained. The amplitude of the input signal should be set to 3.00 VRMS for k7.

2.2.7.3 SERVO Output Gain Calibration

Calibration constants k8 through k14 are used to calibrate the gain of the unit at SERVO output. This is accomplished by applying a 300 Hz calibration signal into the IEPE input for k8, k9, k10, k11, k12, k13, and k14, and into the PE input through a 1000 pF series capacitor for k16, and adjusting the calibration constant displayed on the LED display until the desired output (input signal multiplied by gain) is obtained. The amplitude of the input signal should be set to 30 mVRMS for k8, 0.300 VRMS for k9, 3.00 VRMS for k10, 7.00 VRMS for k11, 7.00 VRMS for k12, 3.00 VRMS for k13, 300 mVRMS for k14 and 3.0 VRMS for k16.

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2.2.7.4 OUTCAL Gain Calibration

Calibration constant k15 is used to calibrate the Programmable gain DAC of the unit at OUTCAL mode. This is accomplished by enabling the internal oscillator signal, and adjusting the calibration constant displayed on the LED display until the desired output (equal to Full Scale Output Range=2Vpk) is obtained.

2.2.8 TROUBLESHOOTING MODE (TBD)

This special mode selection allows the user to control any digital I/O port for troubleshooting purposes.

This special mode is selected by pressing the “Select Function” key while simultaneously pressing the UP and DOWN EDIT keys. Pressing the “Select Function” push-button while the “Monitoring State” function LED is flashing places the unit back into Normal mode.

2.3 FAULT INDICATIONS

There are three (3) fault indicators (red LEDs) located on the front panel.

The IEPE fault LED will turn on if the ISOTRON input is either open or short circuited while the input select function for the corresponding channel is set to ISOTRON.

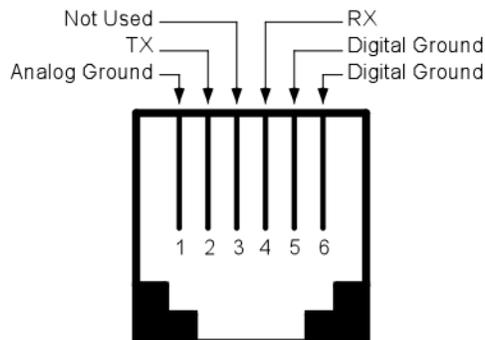
The ISO Ground LED will turn on (red) for at least 1 sec. when operating in the isolated mode and the voltage between input common and the output common exceeds 6 V +/- 3%..

The DC Output Overload LED will turn on when the DC percent FS output is greater than 10 Vdc +/- 3%.

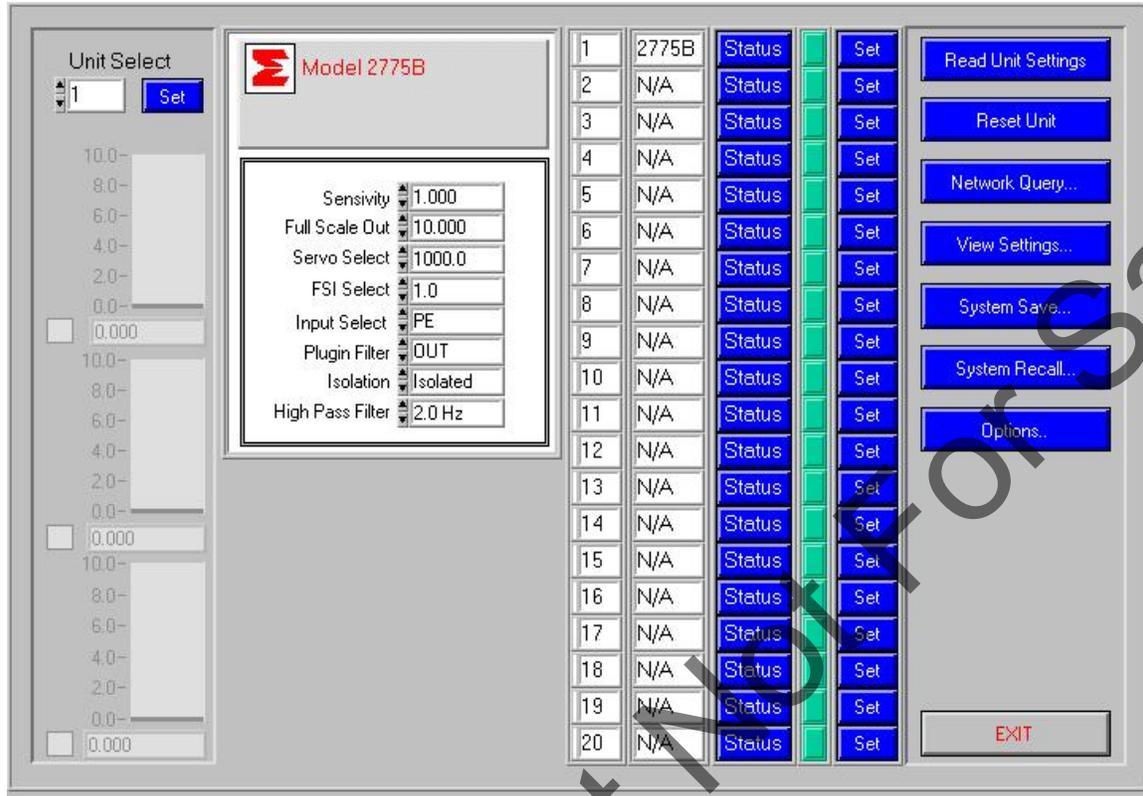
When there is any other unit fault such as: memory loss, calibration constant loss, etc., then that unit will be called major fault and all 3 fault indicators LEDs turn on (RED).

2.4 RS-232 SERIAL COMMUNICATION

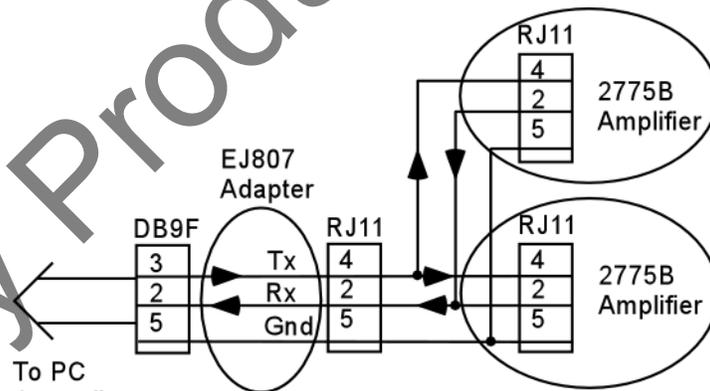
The unit has a standard RS-232 serial interface available through a RJ-11 connector located on the rear panel.



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This is the Optional 35933A Controller software screen view



Serial Communication Block Diagram

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3.0 UNPACKING AND OPERATION

3.1 UNPACKING

The Endevco Model 2775B is shipped with its instruction manual and power cord in one package. Carefully unpack and check all items for shipping damage. Report any damage to the carrier immediately. If the shipping container or cushioning material appears damaged, keep it until the contents of the shipment are checked mechanically and electrically. Save the original packing materials for future shipments of the hardware. Check each item of the shipment against the packing list. Verify that all ordered optional accessories are included. Notify Endevco of any discrepancy.

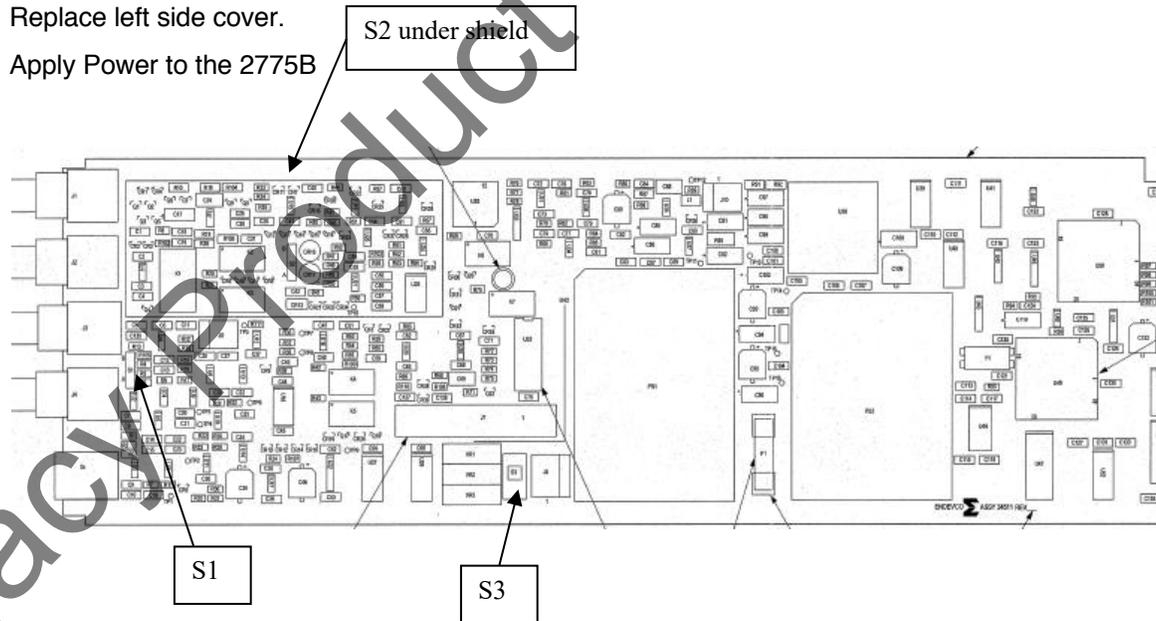
3.2 OPERATION

There are three internal switches that must be set prior to use. Remove the 2775B left side cover to gain access to the switches.

- S1: DC Output. Select DC output (signal proportional to input) or % FS DC output. Internal switch (S1 at A position) sets for % DC FS Output. (Default)
- S2: ISOTRON constant excitation current. Selects between 4.3mA and 8.5mA. 4.3mA default
- S3: Output signal ground and case ground isolation. Selects the grounds shorted or isolated. Ground isolated default

Replace left side cover.

Apply Power to the 2775B



Connect the accelerometer/RCC cable to the “PE/IEPE Sensor” BNC on the rear panel.

Using the “Select Function” and “Edit” pushbuttons, set the following eight functions as described in section 2.

1. Xdcr Sensitivity (pC or mV/EU)
 - Range 0.0001 to 10000

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2. AC FS Out Adj (V)
 - Range 1.0 to 10.0
3. Servo Output Scaling (mV/EU)
 - Select 0.1, 1.0, 10.0, 100, or 1000.0
4. Full Scale Input Range (EU)
 - Select 0.01 to 100k
5. Operation
 - Select PE, IEPE/RCC, Out Cal., Ext Cal., or T-Insert
6. Plugin Filter
 - Select In or Out
7. Isolation
 - Select ISO or Gnd
8. HP Filter.
 - Select 0.5 Hz or 2.0 Hz

Connect the desired output BNC connector to the data acquisition equipment and commence the test.

Legacy Product Not For Sale

**MODEL 2775B
INSTRUCTION MANUAL****4.0 SAFETY**

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. ENDEVCO assumes no liability for the customer's failure to comply with these requirements.

4.1 GROUND THE INSTRUMENT

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor ac power cable. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards.

4.2 DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a safety hazard.

4.3 KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

4.4 DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

4.5 DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to ENDEVCO for service and repair to ensure that safety features are maintained.

**MODEL 2775B
INSTRUCTION MANUAL**

5.0 ROUTINE MAINTENANCE AND HANDLING

5.1 INTRODUCTION

The 2775B is a self-contained electronic instrument that requires minimal maintenance.

The 2775B is designed to require no component-level repair by the user. However, detailed schematics are available upon request.

The periodic maintenance function performed by the user is quality calibration. Any component failures simply require the user to return the failed 2775B amplifier to ENDEVCO for repair/replacement.

Should a faulty unit be returned to Endevco, it is suggested that the original or equivalent packaging be used. This will reduce damage to the equipment during shipment.

5.2 FACTORY SERVICE

ENDEVCO maintains factory service repair for all ENDEVCO instruments. To obtain repair or replacement of a defective instrument, place a call to ENDEVCO to obtain a return material authorization number (RMA), then return the instrument to the factory at the following address:

ENDEVCO

email: applications@endevco.com

Web Site: <http://www.endevco.com>

To return an instrument, please:

Ensure proper packaging, preferably the original shipping cartons.

Prepay shipping and insurance charges.

Attach the Return Material Authorization (RMA) number from ENDEVCO and include any information that may be pertinent to the description of the failure/problem.

5.3 WARRANTY

ENDEVCO warrants each new electronic instrument to be free from defects in material and workmanship. Please refer to the appropriate Warranty Policies for the terms and warranty period. Instruments returned under warranty will be repaired or replaced at no charge, if the failure is due to defective material or workmanship; and the unit is returned within the time period and conditions of Endevco's warranty policy.

5.4 OUT-OF-WARRANTY RETURNS

Enclose a purchase order not to exceed \$300.00, authorizing repair/calibration along with a full explanation of the failure or symptoms observed to help in fixing the problem. The instrument will be repaired/calibrated, returned and invoiced for the actual repair charges. If the instrument cannot be repaired for \$300.00 or less, ENDEVCO will submit a written quotation for the cost of the repair and/or replacement of the unit.

**MODEL 2775B
INSTRUCTION MANUAL**

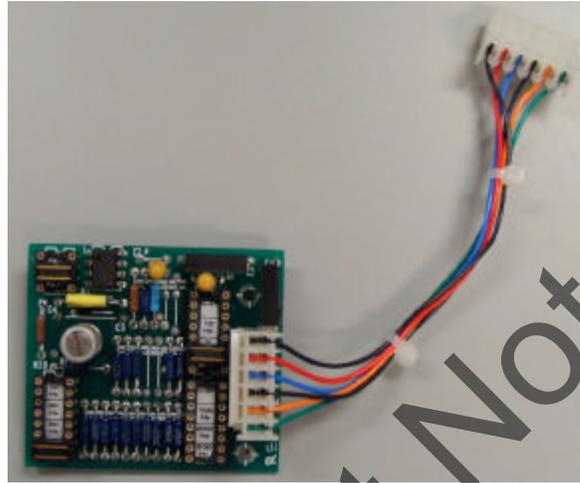
6.0 ORDERING INFORMATION & ACCESSORIES

Description	Endevco Part No.	Quantity Supplied
Power Cord	EW599	1
Signal Conditioner (Instruction Manual)	IM2775B	1
Programmable Filter & Cable Assy	42344	Opt
Filter/Integrator	35818	Opt
Adapter	EJ21	1
Serial DB9F to RJ-11 Adapter, P1724A	EJ807	Opt
Cable (7 ft. 6P4C, with RJ-11 Modular Plugs, Straight Pinning)	EW1027	Opt
RJ-11 Splitter – 2	EJ963	Opt
Chassis, Signal Conditioner	4948A	Opt
Model 13X Controller Software	35933	Opt
Model 13X Controller Software (Instruction Manual)	IM33933	Opt
Panel Assembly	40150	Opt
Cable, 6P4C Straight w/RJ11 (2 ft.)	EW1077	Opt

**MODEL 2775B
INSTRUCTION MANUAL
APPENDIX A:
INSTALLING 42344 FILTER BOARD**

A.1 DESCRIPTION

The Endevco Model 42344 Programmable Filter consists of the filter and cable assembly, which are used with the 2775B Signal Conditioner. This appendix shows how to install the 42344 Filter Card. For instructions on how to use the card once it is installed in the 2577B Signal Conditioner, please refer to sections 2.1.6 and 3.2.



Picture 1. 42344 Programmable Filter and Cable

Prior to connecting the filter cable to the 2775B connector it is important to understand the cable wiring and polarizing key position. In Figure A below, notice that either end of the connectors can be attached (Green cable on top or bottom), but the polarizing key must line up so the cable is going in the correct direction.

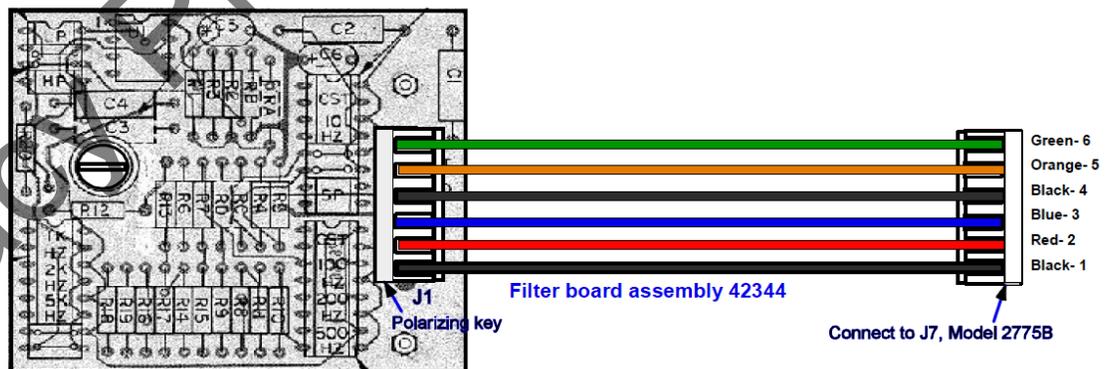
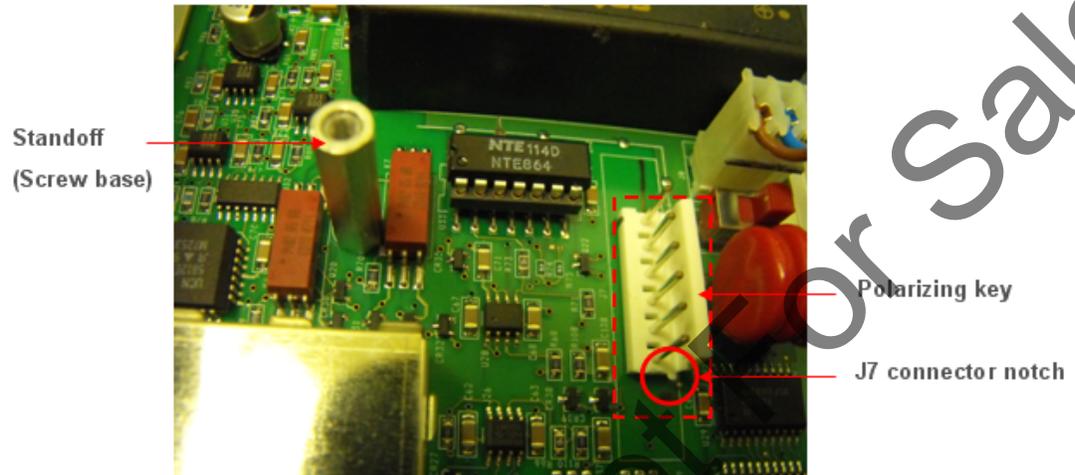


Figure A. 42344 Programmable Filter Assembly

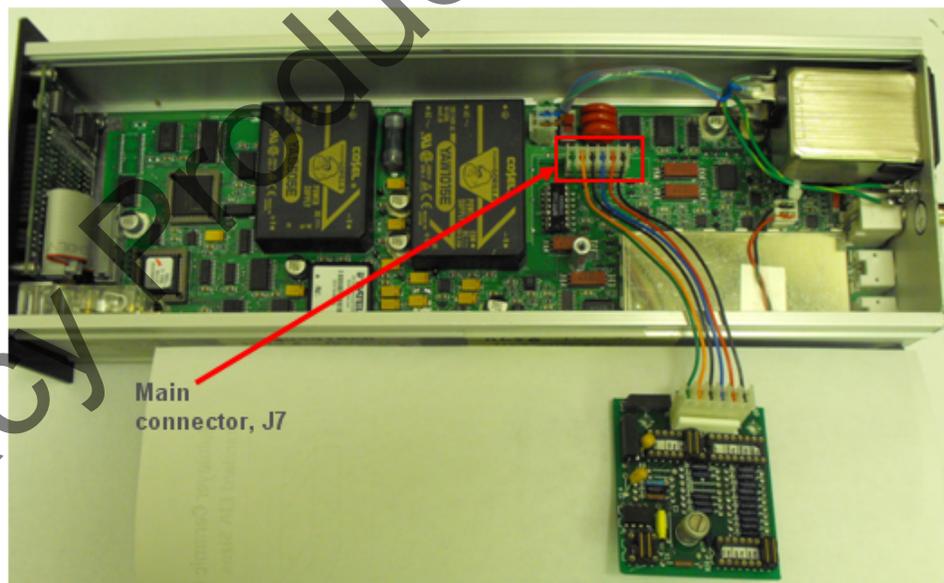
**MODEL 2775B
INSTRUCTION MANUAL****A.2 INSTALLING 42344 FILTER CARD IN 2577B SIGNAL CONDITIONER**

1. Locate the J7 connector notch on the 2775B board and the standoff (screw base).



Picture 2. 2775B – J7 connector and standoff

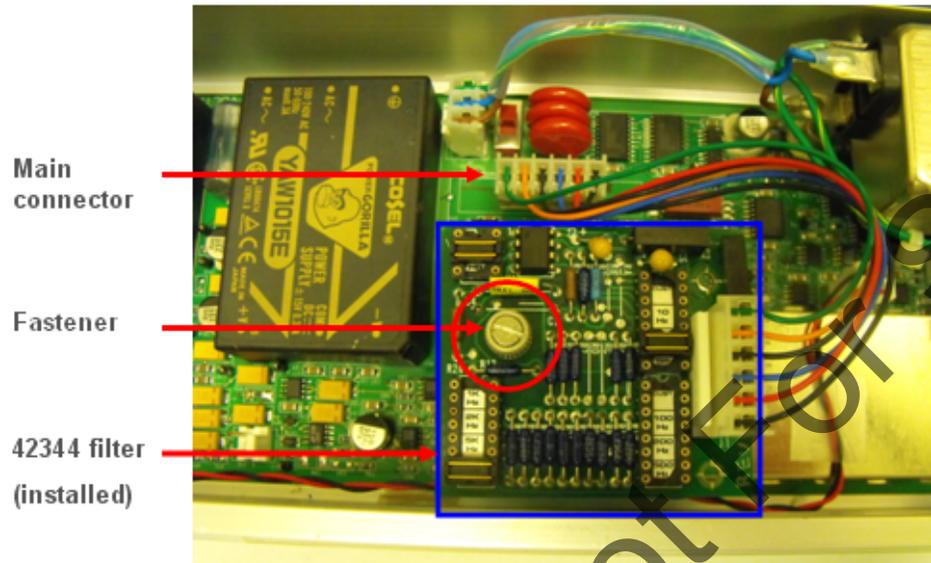
2. Attach 42344 filter board connector to 2775B board's J7 connector, insuring the correct orientation by matching notch and polarizing key.



Picture 3. Attaching 42344 cable

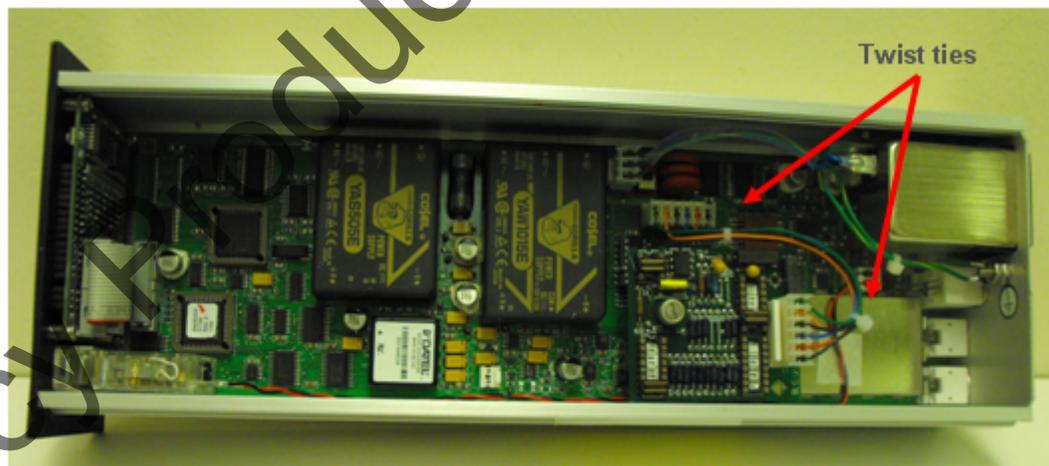
**MODEL 2775B
INSTRUCTION MANUAL**

3. Rotate the filter board a quarter turn clockwise, align fastener in 42344 filter board to standoff on 2775B, and screw down the filter board to the main board.



Picture 4. Screwing 42344 Filter into 2775B Signal Conditioner

4. Add twist ties for added support to keep filter board stable.



Picture 5. 2775B Signal Condition with 42344 Filter properly installed

5. Close cover of 2775B.