

Brownlee Precision Model 410

The Model 440 adds controls for a highpass filter, notch filter, digital volt meter, auto zero, and input impedance on each channel.

Gain, Lowpass Filter, and Highpass Filter generally step through the following values

1.0, 1.1, 1.2, 1.3, ... 1.9,
2.0, 2.2, 2.4, 2.6, ... 4.8,
5.0, 5.5, 6.0, 6.5, ... 9.5,
and multiples of 10 thereof.

Gain

Range: 0.1 to 10,000

Steps: 0.1, 0.15, 0.2, 0.25, 0.3,
0.4, 0.5, 0.6, 0.7, 0.8, 0.9, then as
above for gains 1.0 to 10,000

Gain Accuracy: < 2% error.

Lowpass Filter

Range: 20 Hz to 50 kHz (8 pole),
plus 80 kHz (2 pole) and wideband.

Steps: as above for frequencies
20 Hz to 15 kHz, then 18,
20, 22, 25, 33, 40, 50, 80
(all kHz), and wideband.

Characteristic: 8 pole Bessel
(8 pole Butterworth may be
substituted on any or all channels;
contact AutoMate Scientific).

Wideband Frequency Response:
500 kHz min. all gains.

High performance four-channel amplifier and signal conditioner in one quiet package.

**Brownlee Precision Model 440 Amplifier**

The Brownlee Precision Model 440 incorporates four channels of sophisticated amplifier and filter circuitry in a friendly, easy to use instrument. Each channel consists of a high gain/low noise amplifier, an 8-pole Bessel lowpass filter, a highpass filter, a line notch filter, and output offset controls. A control knob sets the amplifier parameters, and the values are displayed on a bright LED alphanumeric readout.

- **Key Features**

- Clear front panel controls for all settings
- Gains from 0.1 to 10,000 in fine, calibrated steps
- Single-ended or differential inputs
- 8 pole Bessel lowpass filter with range 20 Hz to 50 kHz
- Highpass filter with frequency range .01 Hz to 100 Hz
- Output offset control to shift output up to ± 10 Volts
- Auto-Zero feature to reset the output to the baseline level
- Notch filter to suppress line noise
- Digital Voltmeter on channels 1 and 2
- Powerful output which can directly drive transducers
- Wide bandwidth: greater than 500 kHz on all gains



Precise

The Brownlee Precision Model 440 is a rugged, flexible, and precise laboratory amplifier. It was designed with particular attention to the needs of electrophysiology research. These requirements include: high gain, low noise, clean pulse response, adjustable filtering, removal of offset levels, high input impedance, and ease of use.

The 8 pole Bessel lowpass filter is ideal for removing high frequency noise while accurately amplifying the shape of input pulses. Overshoot and ringing are negligible, even with fast rise and fall times and at high gains. There are 108 different cutoff frequencies available over a range from 20 Hz to 50 kHz.

The input bias current is also very low at 20 pA. The input resistance may be set for 1 M or $10^{12}\Omega$. These characteristics make the amplifier almost "invisible" to the source, allowing the direct connection of many types of electrodes.

Easy To Use

The Model 440's front panel interface preserves the simplicity and "feel" of older analog instruments while taking advantage of the benefits of digital circuitry.

Changing an amplifier setting is as easy as pushing a parameter button ("Gain" for example) and turning the control knob up or down until reaching the desired setting. Unlike a potentiometer however, the settings increment or decrement through discrete, calibrated steps. The bright LED alphanumeric readout displays the exact value ("Gain=850" for example).

Multiple setups may be stored for each channel in memory. All the input and output BNC connectors are conveniently located on the front panel. Each channel functions independently and is internally shielded to prevent crosstalk.

If the input signal has a drifting DC offset voltage, it can be removed using the Highpass Filter. The Output Offset control can shift the output baseline level from -10 V to +10 V in 100 mV steps. This is helpful if the output level must match the input range of a computer's A/D board, for example.

The Model 440's powerful output stage can drive ± 100 mA, and is stable even driving capacitive loads. A notch filter is available to remove line noise.

Ordering Information

Part No.	Brownlee Precision Model 410 Amplifier
04-40	BP 440 - High performance 4-channel amplifier and signal conditioner

U.S./Canada prices shown. International prices add 20%. Email or visit web store for latest prices.

Highpass Filter (AC Coupling)

Range: .01 Hz to 100 Hz

Steps: DC, AutoZero DC, then as above

Input

Selection: A, -B, A-B, or Grounded

Impedance: 1 M Ω or $10^{12}\Omega$, 20 pF

Bias Current: 20 pA

Offset Voltage: 15 μ V max.

Voltage Range: ± 10 V

CMRR: > 70 dB all gains

Noise: 1.5 μ V_{rms}
(10 μ V_{peak to peak}) @ 10 kHz

Output

Voltage Range: ± 10 V

Current Capability: ± 100 mA

Slew Rate: 10 V/ μ S

Output Offset Control Range: ± 10 V
in 100 mV steps

Noise: 500 μ V_{rms}
(3 mV_{peak to peak}) @ 10 kHz

Auto-Zero

Pressing "Auto-Zero" will reset the output to the baseline level (when the Highpass Filter is on) and self-calibrate the amplifier's internal offset voltages.

DVM

Channels 1 and 2 include a handy Digital Voltmeter to quickly and easily measure the input level.

