

## Model 136 DC amplifier

### Features

- Three-channel DC differential voltage amplifier
- 200 kHz bandwidth (-3dB corner)
- Auto-zero and shunt calibration
- Gain range 0 to 1000
- Four selectable excitation voltage levels
- RS-232 serial interface
- 12 VDC power option
- Built-in 4-pole Butterworth lowpass filter

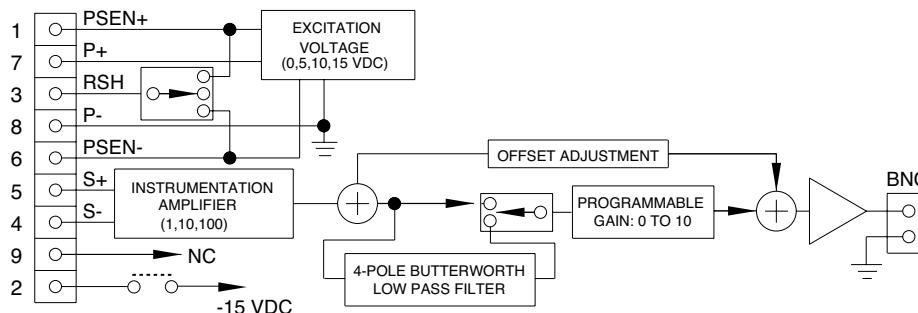


### Description

The Endevco® model 136 is a three-channel, DC amplifier that is manually or computer programmable. Manual control is accomplished at the front panel by means of a "select channel" push-button, three (3) "channel LEDs", one "select function" push-button, five "function LEDs", a four character LED display, showing the state of each function/channel, and four "edit" push-buttons to change the entries in the LED display. There are three LEDs used as fault status indicators for the auto zero function. Computer control is accomplished using the standard RS-232 port and optional application software.

There are two modes of operation, Normal and Programming/Setup. Both modes of operation utilize the front panel LED display. In the Normal mode, there are two states, Monitoring mode and No-Monitoring. In the Monitoring mode the LED display indicates the RMS reading of the signal present at the output of the selected channel. The Non-Monitoring mode turns off the LED display for lower noise applications and to minimize power consumption. In the Programming mode, the unit is ready for manual programming or editing of existing channel setups. The unit will automatically return to the Normal mode of operation after 20 seconds of inactivity of the front panel or after pressing the "select function" push-button while the "monitoring state" function LED is flashing.

The rear panel contains (on a per-channel basis) a BNC output connector, a 9-pin "D" input connector, the RS-232 connector, and the input power connector. Three model 136 units may be configured in a 19-inch rack mount adapter. The standard unit is powered by 90-264 VAC, 50/60 Hz. The -1 option is powered by 9 to 18 VDC, making it ideal for portable use or for automobile test applications.



Technical Illustration

# Model 136 DC amplifier

# Endevco

## Specifications

### Inputs

Input impedance	1 Meg Ohm minimum
Input range: differential	0 to $\pm 10$ VDC or peak VAC, 9 pin "D" connector for each bridge sensor
Common mode	$\pm 10$ VDC or pk VAC, inclusive of signal 50 Vpk without damage
Common mode rejection	70 dB minimum, 200 $\Omega$ or less input imbalance, DC to 60 kHz
Input imbalance adjustment	$\pm 100$ mVDC, $100 \leq \text{gain} \leq 1000$ $\pm 1$ VDC, $10 \leq \text{gain} \leq 100$ $\pm 10$ VDC, $0 \leq \text{gain} \leq 10$

### Outputs

AC/DC voltage	Single-ended, short circuit protected
Output impedance	0.2 ohm maximum
Linear output	10 V pk
Current output	10 mA, minimum
Output DC bias stability temp	$\pm 5 \mu\text{V}/^\circ\text{C}$ RTI or $\pm 0.1 \text{ mV}/^\circ\text{C}$ RTO
Output DC bias stability time	$\pm 20 \mu\text{V}$ RTI or $\pm 5 \text{ mV}$ RTO, whichever is greater, for 24 hours, after a 1 hour warmup
Excitation voltage	0, 5.0, 10.0, or 15.0 VDC, front panel or computer selected; 1 selection for all 3 channels
Excitation voltage accuracy	$\pm 1\%$
Excitation current	30 mA maximum, short circuit protected
Noise and ripple	1 mV rms maximum, 10 Hz to 50 kHz, with 1 kOhm load

### Transfer characteristics

Gain	Programmable from 0 to 1000
Range	0.0025, $0 \leq \text{gain} \leq 10$
Resolution	0.025, $10 \leq \text{gain} \leq 100$ 0.25, $100 \leq \text{gain} \leq 1000$
Accuracy	$\pm 0.5\%$ of full scale maximum, DC to 1kHz, filters disabled
Linearity	0.1% of full scale, best fit straight line at 1 kHz reference
Stability	$\pm 0.2\%$ of full scale, $0^\circ\text{C}$ to $+50^\circ\text{C}$
Noise	20 $\mu\text{V}$ rms RTI plus 1 mV rms RTO, whichever is greater, DC to 50 kHz, with a 1 kOhm source resistance unit in Non-monitoring state, 10 kHz internal lowpass filter enabled
Broadband frequency response	DC to 200 kHz -3dB referenced to 1 kHz
Filter characteristics/type	4-pole Butterworth
Corner frequency (-3 dB)	10 kHz $\pm 12\%$ [other corners available by changing internal module 31875: 10 Hz to 80 kHz]
Crosstalk between channels	80 dB RTI

### Power requirements

Voltage	Standard unit: 90-264 VAC 50 to 60 Hz; -1 option: 9-18 VDC
Power dissipation	10 Watts typical
Isolation	No isolation channel to channel or signal ground to caseground

### Physical characteristics

Dimensions	5.57" x 2.52" x 12"
Weight	4 lbs typical
Case	Black aluminum cover, medium grey plastic bezel

### Accessories

IM136	Instruction manual
EW599	Power cord
31875-1000	10 kHz, 4-pole, Butterworth lowpass filter module

### Optional accessories

35933	Application software
EJ847	RJ11 (6X4) straight wired inline coupler
EW1077	RJ11 4 conductor modular flat cable, straight wired, 2 feet long
EW1027	RJ11 4 conductor modular flat cable, straight wired, 7 feet long
EJ807	Serial DB9F/RJ11 adapter

### Optional accessories continued

EJ822	Modular splitter adapter-1 (6x4) male to 3 (6x4) female
136-1	9 - 18 VDC input power option
31875-XXXX	Lowpass filter modules [see 31875 data sheet]
31979	Rack mount kit
EHM1471	Blank panel
EHM1413	Desktop DC power supply
EHM1409	Automotive power plug
29719-2	DB9M connector kit

**Warning!** Use of RJ11 cable other than that specified herein will cause catastrophic failure of the unit.

### Notes:

- Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 800-982-6732 for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

Continued product improvement necessitates that Endevco reserve the right to modify these specifications without notice. Endevco maintains a program of constant surveillance over all products to ensure a high level of reliability. This program includes attention to reliability factors during product design, the support of stringent Quality Control requirements, and compulsory corrective action procedures. These measures, together with conservative specifications have made the name Endevco synonymous with reliability.

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