MODEL 6136
4-Channel Charge/IEPE Amplifier-Filter-Analog Output

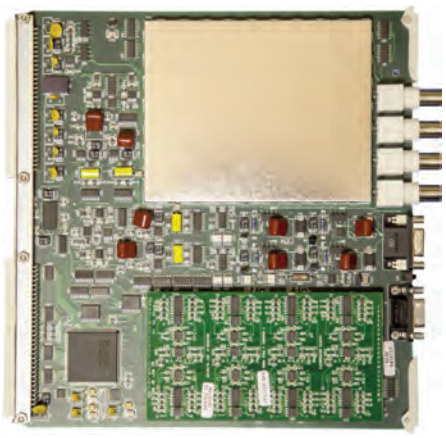
Model 6136 is a four-channel, programmable charge amplifier, filter and digitizer with a second input for piezoelectric sensors with integrated electronics (IEPE).

The high-performance charge amplifier can be used to measure dynamic acceleration, pressure, force and strain from piezoelectric transducers. Three charge-to-voltage input ranges optimize performance according to transducer sensitivity. A programmable time constant enables it to make quasi-static measurements. The charge amplifier has 2X overhead preventing its overload by signals in excess of full scale. A software controlled reset switch is provided that discharges the charge capacitor for immediate clearing of an overload signal.

The 6136 provides two modes of charge amplifier calibration. Voltage insertion mode injects dynamic signals in series with the transducer and input cable verifying the integrity of the input circuit. Charge calibration mode injects dynamic signals through a precision capacitor into the charge input simulating the output of a charge transducer. The voltage input for IEPE transducers has static or dynamic voltage substitution calibration. All static and dynamic calibration signals are provided by external sources that are easily removed to be sent out for periodic certification.

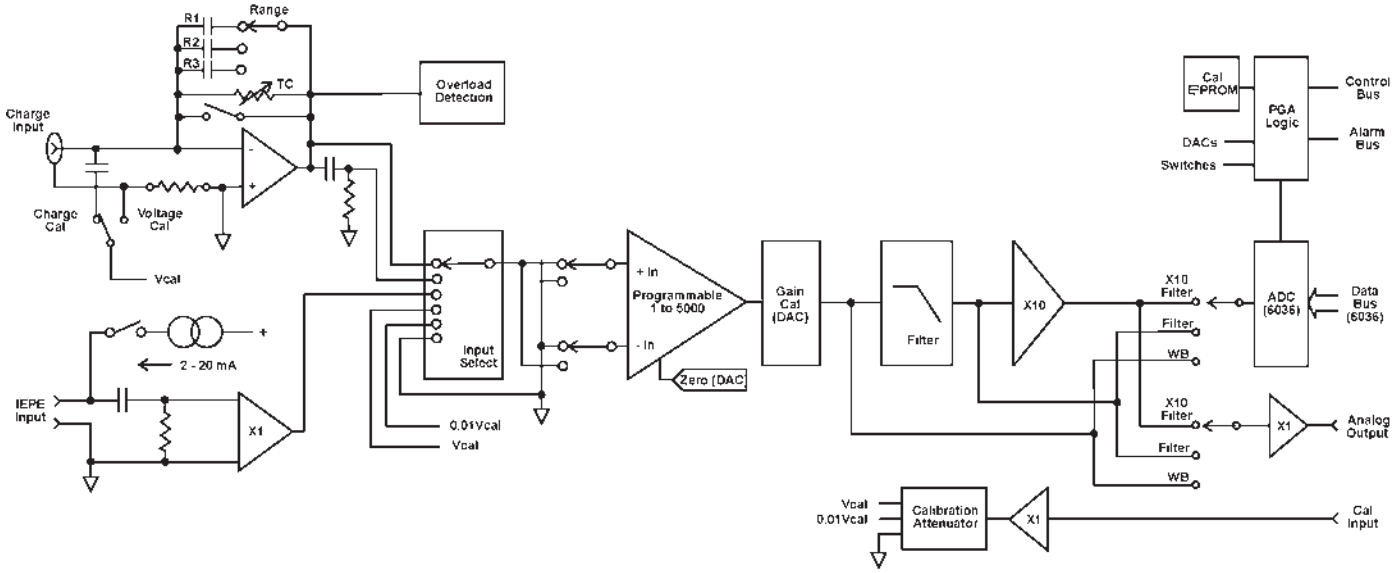
The IEPE input is for piezoelectric sensors with built-in charge amplifiers. It provides 2 to 20 mA excitation with 26 Volt compliance to the transducer. A voltage amplifier has gains of 1 to 5,000 with full bandwidth up to gain 1,000. The voltage amplifier is calibrated by static or dynamic voltage substitution.

The four-pole, low-pass Bessel filter has continuously programmable bandwidth from 50 Hz to 50 kHz. A post-filter gain of 1 or 10 can be selected independently for digitized and analog outputs. Each channel has a ±10 Volt calibrated analog output.



FEATURES

- Dual inputs, charge & IEPE
- 0.04 to 10,000 mV/pC charge gain
- 2-20mA current source for IEPE transducers
- 1 to 5,000 voltage gain with ±0.05% accuracy
- 100 kHz bandwidth
- Charge & voltage insertion calibration
- Continuously programmable, 4-pole low-pass filter
- Buffered 10 Volt analog outputs
- Two alarms with programmable upper & lower limits



4080 Pike Lane ■ Concord, CA 94520 ■ Tel (925) 827-9010 ■ Fax (925) 827-9023 ■ PIsales@pacificinstruments.com

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SPECIFICATIONS

INPUT

CHARGE INPUT

Charge.....Three ranges: 250,000 pC, 10,000 pC and 500 pC full scale.
Accuracy.....±0.2%
Gain .....0.04 mV/pC to 1,000 mV/pC with 0.05% resolution. Gains to 10,000 mV/pC with lower accuracy
Time Constant .....Programmable short, medium and long for each input range.
Hi-Pass Filter .....Frequency response is greater than 0.5 Hz.. May be bypassed for quasi-static measurements.
Stability.....±0.01%/°C.
Linearity .....0.1% of full scale at 1 kHz.
Noise (10 kHz).....0.02 pC RMS plus 0.006 pC RMS per 1000 pF of source capacitance referred to input.
Max. Input.....Over two-times the full scale charge input without charge converter overload.
Overload .....Overload flag set when output of charge converter exceeds full scale.
O.L. Reset .....Program command provides immediate recovery when using long time constants.
Source Imped. .....Less than 30,000 pF. Greater than 10 Meg Ohms
Input Protection ....±15 Volts differential, ±15 Volts common mode without damage.
Charge Cal .....Signal from external calibration source applied through a 2,200 pF capacitor to the charge input and calibrated to ±0.2%..
Series Cal .....Signal from external calibration source applied in series with the input transducer for testing transducer, cable, connections and amplifier.

IEPE INPUT

Configuration .....Voltage input, AC-coupled, 2-wire with shield.
Excitation .....Current source 2 to 20 mA, 6 mA supplied.
Input Impedance....100K Ohms.
Range.....±2 mV to ±10 Volts.
Gain .....Programmable from 1 to 5,000 with 0.05% resolution.
Gain Steps.....Calibrated gains of 1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 500, 1,000, 2,000, 3,000 and 5,000 with ±0.1% accuracy or variable gain.
Gain Stability .....±0.02% for 30 days, ±0.005%/°C.
Linearity .....±0.01% for gains <1,000, ±0.02% for gains 1,000 and above.
Noise (10 kHz).....2.0 µV RMS referred to input.
Input Protection ....±30 Volts differential, ±15 Volts common mode without damage.
Voltage Cal.....Signal from external calibration source is applied to the amplifier input through a programmable attenuator.

AMPLIFIER

Common Mode.....70 dB plus gain in dB to 110 dB, DC to 60Hz.
CM Voltage .....±10 Volts.
Zero.....Automatic zero to ±1.0 mV.
Zero Stability .....±1mV at constant temperature, ±0.2mV/°C.
Noise.....0.3 mV RMS referred to output.
Bandwidth .....0.5 Hz to 100 kHz (-3 dB) for gains to 1,000.
Slew Rate .....3 V/uS.
Analog Output.....±10 Volt full scale at 20 mA with programmable filtered or wideband response.

FILTER

PROGRAMMABLE FILTER

Type .....Four pole, low-pass Bessel (24 dB/octave).
Frequency.....Continuously programmable from 50 Hz to 50 kHz, with 1 Hz (lower frequencies) to 10 Hz (higher frequencies) resolution, ±2% accuracy.
Gain .....Post-filter gain of 1 or 10 may be selected independently for each output.
Other .....Other filter characteristics and cut offs available.

DIGITIZER (6036)

See Model 6036 for the following Digitizing Capabilities:

Sample.....±50 nS channel-to-channel time correlation.
Resolution .....16 bits, two's complement output.
Rate .....Programmable up to 200 kS/s digitizer per channel.
Linearity .....±1½ LSB (±0.004%)
Continuity .....Monotonic to 15 bits.
Alarms.....Two alarms each with upper and lower limits that are programmable from negative to positive full scale. Limits checked on each ADC sample.

CALIBRATION

Input .....Differential, 2-wire with shield. Located on the rear panel of enclosure.
Impedance.....50K Ohms when any channels on module are selected for calibration. 10,000 Meg Ohms when channels not selected.
Attenuator.....Programmable 1.0 and 0.01 attenuation. Attenuator accuracy at DC is ±0.02% for 1.0 and ±0.01% for 0.01. Rear panel connector is provided to monitor the calibration attenuator output.

MECHANICAL

Mounting .....Occupies one slot in Series 6000 enclosures.
Connectors.....Input connectors are BNC for charge and 15-pin Type D for IEPE inputs. Outputs are a 9-pin Type D. Type D mating connectors are supplied.
Temperature.....0°C to +50°C operating.

ORDERING INFORMATION

6136-PF20/30K-BE4...4-Ch Charge-IEPE PF 20Hz-30kHz 4-Pole Bessel
6136-PF50/50K-BE4...4-Ch Charge-IEPE PF 50Hz-50kHz 4-Pole Bessel.

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