

Model 6030 is a two-channel, fully automated, high bandwidth, signal conditioning amplifier, filter and digitizer with dual inputs. The bridge input has voltage and current excitation, automatic balance, shunt calibration and programmable configuration for 1/4, 1/2 and full bridge transducers. The AC-coupled auxiliary input is for ICP, IES, dynamic strain and other voltage output transducers.

The 6030 employs an amplifier/digitizer-per-channel architecture, which provides high bandwidth and digitizing speed with excellent channel-to-channel time correlation. It offers the highest accuracy and completely eliminates crosstalk between channels. Using Pacific's PI660 software zero and gain calibration and correction are automatic.

The bridge inputs have programmable constant voltage or constant current excitation, automatic balance and a shielded 8-wire input that supports remote sensing, shunt calibration and programmable bridge completion for 120 and 350 Ohm gages. Strain gages other than 120 or 350 Ohms are accommodated by changing a completion resistor. A two-wire auxiliary input for ICP type transducers has 1-20 mA constant current excitation with AC signal coupling.

Two-step local and remote shunt calibration is standard. Four-step remote shunt with plug-in resistor card is optional. Voltage substitution is provided for gain calibration with programmable attenuation, which makes the distribution of calibration signals less susceptible to contamination by noise and offsets. The programmable attenuator has steps of 1, 0.1 and 0.01 with 0.02% accuracy and a post-attenuator output is available for verification and calibration.

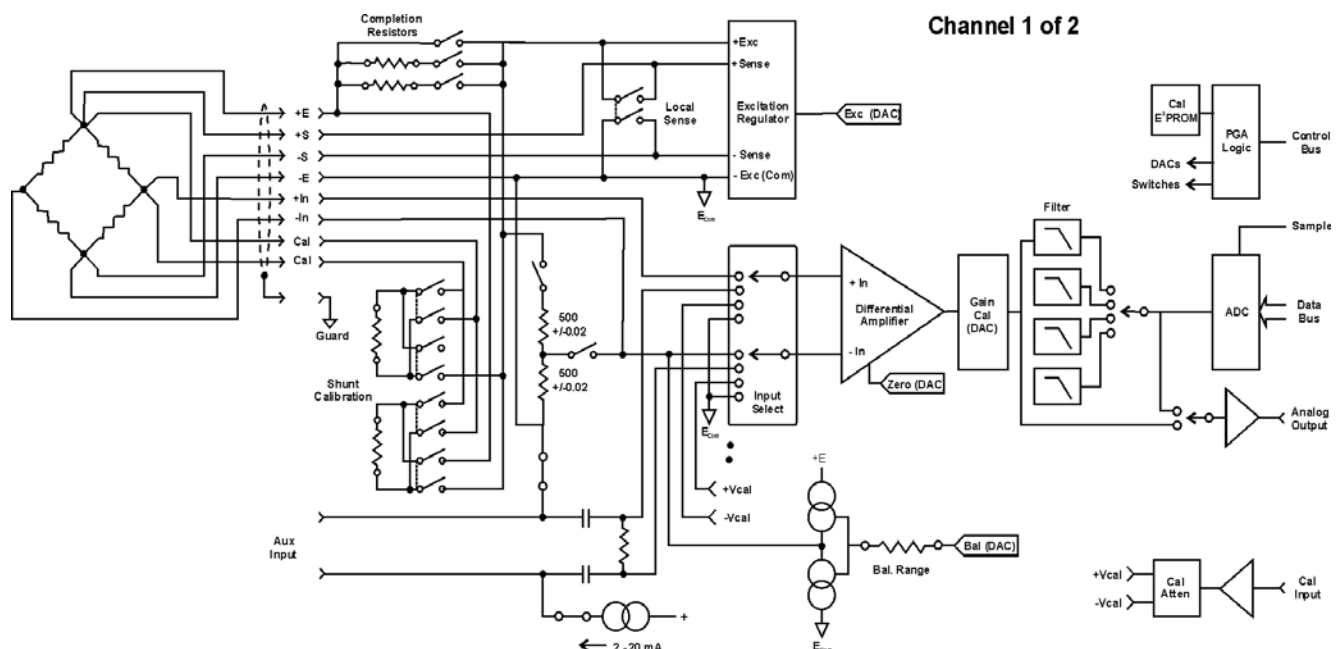
The differential instrumentation amplifier has programmable gains from 1 to 5,000 and automatic zero. Zero and gain calibration and correction are automatic using Pacific's PI660 software. Bandwidth is 50 kHz. The amplifier is followed by a low-pass filter that reduces alias errors in the sampled data. A high speed analog-to-digital converter digitizes the amplified and filtered signal for output to the 6000 data bus. In addition, each channel has a ±10 Volt calibrated analog output and a ±10 Volt monitor output.



FEATURES

- Dual inputs, strain gage or transducer and low-impedance charge
- Programmable bridge configuration, no jumper or wiring changes
- Voltage or current excitation with remote sensing
- Automatic zero and balance
- Voltage substitution and two or four step shunt calibration
- Gains 1 to 5,000 with 50 kHz or 100 kHz bandwidth
- Four eight-pole low-pass filters, optional high resolution filter
- 100K Samples per second with 16-bit resolution
- Dual 10 Volt analog outputs

The standard filter is a programmable four-frequency, eight-pole Bessel low-pass. A programmable, four-pole Bessel, low-pass filter with 1 Hz or 5 Hz frequency resolution is optional. Either the standard or optional filters may be obtained with Butterworth or other response characteristic.



CONSTANT VOLTAGE

VoltageProgrammable from 0.1 to 10.24 Volts with 2.5mV resolution. Calibrated 1-Volt steps $\pm 0.1\%$.

Current50 mA limited to 70 mA maximum.

RegulationEach channel individually regulated. $\pm 0.01\%$ over input voltage range and no-load to full load.

Stability $\pm 0.01\%$ for 30 days. Temperature coefficient less than $\pm 0.005\%/^{\circ}\text{C}$.

Noise200 μV peak-to-peak, DC to 10 kHz

MonitorExcitation voltage or current is read by a program instruction. Accuracy is $\pm 0.2\%$.

CONSTANT CURRENT

Output RangeProgrammable 0.1mA to 51.2 mA with 12.5 μA resolution. Calibrated 5 mA steps $\pm 0.1\%$.

Compliance0.1 to 10 Volts.

Regulation $\pm 0.01\%$ or $\pm 0.1 \mu\text{A}$ for 10% line change.

Noise2 μA or 5 μV peak-to-peak DC to 10 kHz.

Stability $\pm 0.01\%$ or $\pm 2 \mu\text{A}$ for 30 days. Temperature coefficient is less than $\pm 0.005\%$ or $\pm 1 \mu\text{A}/^{\circ}\text{C}$.

MonitorExcitation voltage or current is read by a program instruction. Accuracy is $\pm 0.2\%$.

INPUT - BRIDGE

Configuration2 to 8 wire inputs, input (2), excitation (2), excitation sense (2) and shunt calibration (2) with shield. Programmable bridge completion for half bridges and 120 Ohm and 350 Ohm quarter bridges. Other gage resistances by request.

Bridge BalanceAutomatic by program control. Balance accuracy $\pm 0.05\%$ of range, $\pm 1 \text{ mV RTO}$. Stability $\pm 0.02\%$ for 8 hours, $\pm 0.005\%/^{\circ}\text{C}$. Range set by resistor up to 25 mV/V, 2.5 mV/V (350 Ohms) installed.

Input Impedance50 Megohms, shunted by 500 pF.

Input Protection ± 50 Volts differential, ± 30 Volts common mode without damage.

INPUT - AUXILIARY

ConfigurationAC-coupled, 2-wire with shield. High-pass $< 1\text{Hz}$.

ICP TransducerCurrent source 1 to 20 mA, 6 mA supplied. Requires 28 Volt DC power option in the enclosure.

Input Impedance100K Ohms.

Input Protection ± 50 Volts without damage.

CALIBRATION

Shunt (Standard) ..Two steps, single shunt. Calibration resistors mount in bifurcated terminals. Program selection of internal or external shunt connection.

Shunt (Optional) ...Four-step, single, external shunt. Calibration resistors mounted on a plug-in card. May be wired for local shunt at the input connector.

Shunt ResistorsInstalled shunt resistors provide 0.502 and 0.250, $\pm 1\%$ mV/V for 350 Ohm bridge. Customer specified, 0.01% shunt resistors are available.

VoltageAlternate input for external calibration source. Programmable 1, 0.1 and 0.01, attenuation with $\pm 0.02\%$ accuracy. Attenuator output may be connected to bus for external monitoring.

Zero CalibrationAmplifier input disconnected and shorted for zero calibration.

AMPLIFIER

Range $\pm 2 \text{ mV}$ to $\pm 10 \text{ Volts}$.

GainProgrammable from 1 to 5,000 with 0.05% resolution.

Gain StepsSixteen calibrated gain steps are provided: 1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 500, 1000, 2000, 3000 and 5000 with $\pm 0.1\%$ accuracy.

Gain Stability $\pm 0.02\%$ for 30 days, $\pm 0.005\%/^{\circ}\text{C}$.

Linearity $\pm 0.01\%$ for gains $< 1,000$, $\pm 0.02\%$ for gains 1,000 and above.

Common Mode60 dB plus gain in dB to 120 dB for balanced input and 110 dB for a 350 Ohm source unbalanced, DC to 60Hz.

CM Voltage $\pm 10 \text{ Volts}$.

ZeroAutomatic zero to $\pm 2 \mu\text{V RTI}$ or $\pm 1.0 \text{ mV RTO}$ whichever is greater.

Zero Stability $\pm 5 \mu\text{V RTI}$, $\pm 1 \text{ mV RTO}$ at constant temperature, $\pm 1 \mu\text{V RTI}/^{\circ}\text{C}$, $\pm 0.2 \text{ mV RTO}/^{\circ}\text{C}$. Short term: $\pm 2 \mu\text{V RTI}$, $\pm 0.4 \text{ mV RTO}$ for 8 hours.

Source Current $\pm 5 \text{ nA}$, $\pm 0.05 \text{ nA}/^{\circ}\text{C}$.

Noise (10 kHz)2.0 $\mu\text{V RTI}$ plus 0.3 mV RTO, RMS.

Bandwidth50 kHz(-3dB) for gains to 1,000, 20 kHz for gains above 1,000.

Bandwidth (HF)100 kHz(-3dB) for gains to 1,000, 50 kHz for gains above 1,000.

Slew Rate5 V/uS.

OverloadRecovery time is 120 μs to within $\pm 0.1\%$ for a 10 times overload to $\pm 10 \text{ Volts}$.

Analog OutputTwo outputs, one calibrated and one monitor. $\pm 10 \text{ Volt full scale}$ either filtered or wideband

FILTER (STANDARD)

TypeEight pole, low-pass Bessel (48 dB/octave).

Frequency4 programmable filter bandwidths, 150 Hz, 625 Hz, 2.5 kHz, 10 kHz and wideband.

Frequency (HF)4 programmable filter bandwidths, 300 Hz, 1.25 kHz, 5 kHz, 20 kHz and wideband.

FILTER (OPTION 6030-PF)

TypeFour-pole, low-pass Bessel (24 dB/octave).

Frequency4 Hz to 20 kHz. 4 Hz to 1 kHz, 1 Hz resolution, $\pm 2\%$ accuracy. 1 kHz to 20 kHz, 5 Hz resolution, $\pm 5\%$ accuracy.

ANALOG-TO-DIGITAL CONVERTER

Sample $\pm 50 \text{ nS}$ channel-to-channel time correlation.

Resolution16 bits, two's complement output.

Rate (6030)Programmable up to 100 kS/s per channel.

Rate (6030HF)Programmable up to 200 kS/s per channel.

Linearity $\pm 1\frac{1}{2} \text{ LSB}$ ($\pm 0.004\%$)

ContinuityMonotonic to 15 bits.

GENERAL

MountingOccupies one slot in Series 6000 enclosures.

ConnectorsInput connectors are 15-pin Type D. Outputs are a 9-pin Type D and 3.5mm audio jacks. Type D mates supplied.

Temperature 0°C to $+50^{\circ}\text{C}$ operating.

ORDERING INFORMATION

6030Two-Channel Transducer Amplifier-Digitizer, 16-bit, 100 KS/s.

6030Two-Channel Transducer Amplifier-Digitizer, 16-bit, 200 KS/s.

6030-PFProgrammable Filter Option, 4 Hz to 10 kHz.

6030-S4Four-Step Shunt Calibration with Plug-In Resistor Card (resistors not installed).