MODEL 6131

2-Channel Transducer Amplifier-Filter-Analog Output

Model 6131 may not be regularly available. Please see Model 6030, 6060 or 6068 for similar applications.

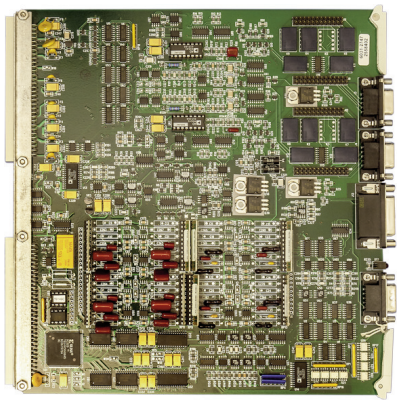
The 6131 is a two-channel, fully programmable signal conditioning amplifier and filter. It features a plug-on signal conditioning completion card that is available for strain gage, bridge, RTD, potentiometer, voltage-mode charge, voltage and current transducers. Each channel has a programmable gain differential instrumentation amplifier, four 8-pole low-pass filters, a 16-bit digitized output and a ±10 Volt analog output that can be selected for wideband or filtered response.

The signal conditioning in the 6131 is built around a completion card that configures it for various types of transducers. Programmable excitation provides either 0 to 10.24 Volts constant voltage with remote sensing or 0 to 50 mA constant current excitation for strain gages, bridges, RTDs, potentiometers and other transducers requiring a highly stable source of DC power. A DC supply provides up to 25 Volts of regulated DC power and doubles as the power source for current loops and integrated electronic piezoelectric (IEPE) transducers.

The bridge input is eight-wire shielded; input (2), excitation (2), sense (2) and shunt calibration (2). Automatic bridge balancing ahead of the instrumentation amplifier accommodates large imbalances without limiting gain or dynamic range. The high impedance current source used for balancing will not cause linearity errors due to bridge loading effects.

The 6131 employs an amplifier-per-channel architecture which provides high bandwidth and offers the highest accuracy, completely eliminating crosstalk between channels. Using Pacific's PI660 software zero and gain calibration and correction are automatic.

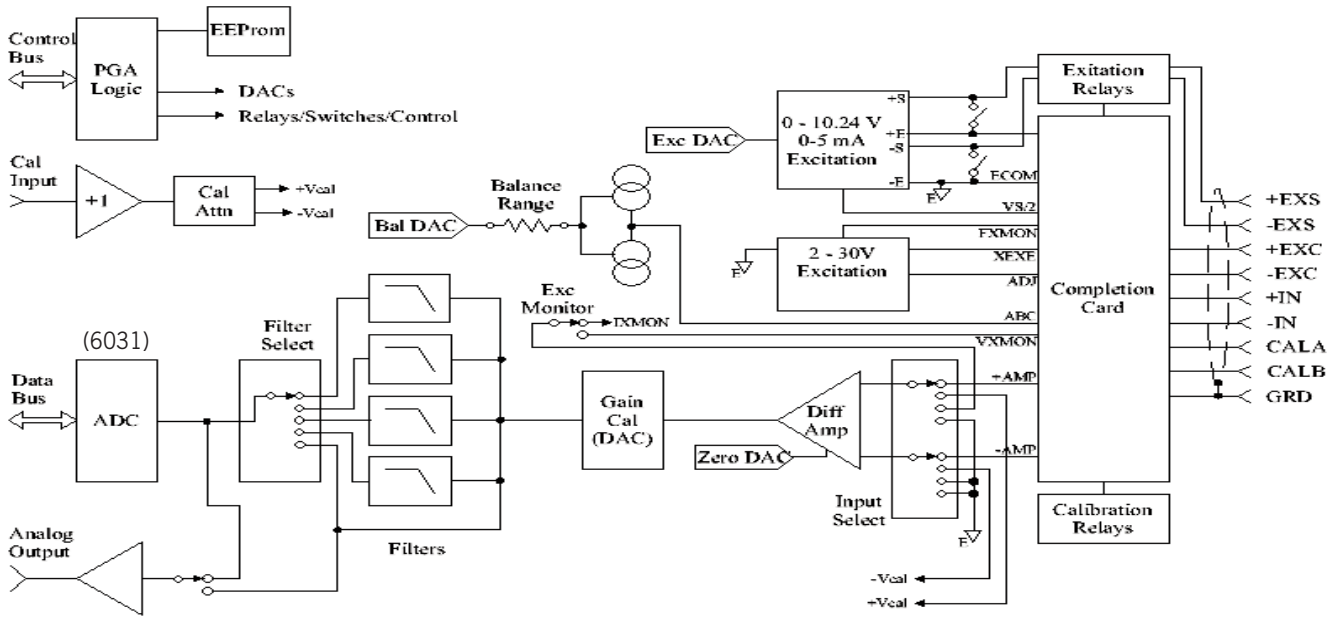
The differential instrumentation amplifier has continuous programmable gains from 1 to 5,000 with automatic zero and high common mode rejection. The standard filter is an eight-pole Bessel with four programmable bandwidths and wideband. An optional four-pole Bessel filter has continuously programmable bandwidth with resolution of 1 Hz from 4 Hz to 1 kHz and 5 Hz from 1 kHz to 20 kHz.



FEATURES

- Plug-in channel configuration & calibration card
- Voltage & current excitation including remote sense
- Gains 1 to 5,000 with 0.05% resolution
- 50 kHz or 100 kHz bandwidth
- Automatic zero & balance
- Programmable low pass filters
- Voltage substitution gain calibration
- Digitized & analog outputs
- Dual buffered 10 Volt analog outputs

The 6131 with the 6131-CC6 completion card provides two-step, bipolar, resistive shunt calibration that may be applied to internal or external bridge arms. Other completion cards have resistance substitution and series resistance calibration. Voltage substitution is usable with all completion cards and employs an external, traceable standard for gain calibration. Automatic zero and gain calibration are implemented in software.



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

PACIFIC INSTRUMENTS

MODEL 6131

2-Channel Transducer Amplifier-Filter-Analog Output

SPECIFICATIONS

INPUT

BRIDGE INPUT

Connection .....2 to 8 wires with shield.
Configuration .....Plug-in completion card configures the channel for specific transducer and calibration types. Completion card type is read by software.
Bridge Balance .....Automatic using program control. Balance accuracy ±0.04% of range, ±1 mV RTO.
Stability .....±0.02% for 24 hours, ±0.005%/°C. Bridge balance may be turned off without changing the balance setting.
Impedance .....50 Megohms, shunted by 500 pF.
Protection .....±50 Volts differential, ±30 Volts common mode without damage.

RTD INPUT

RTD .....Two substitution resistors ±0.1%, 10 ppm/°C.
Current .....Current loop calibration resistor, ±0.1%, 10 ppm/°C

EXCITATION / TRANSDUCER POWER

Auxiliary .....Resistor settable +5 to +25 Volts is available on certain completion cards. Regulation is ±1%.
Monitor (digital) .....Excitation voltage, 0.5V/V ±0.05% (0.1V/V ±2% for Auxiliary) or current, 0.1 V/mA ±0.1%.
Monitor (analog) .....Test points for excitation and sense
Excitation Off .....Removes excitation from the transducer without changing the setting.
IEPE (6131-CC1) ....Nominal 6 mA, 24 Volt compliance. User settable from 1 to 20 mA.

CONSTANT VOLTAGE

Voltage .....Programmable from 0 to 10.24 Volts with 2.5mV resolution.
Current .....50 mA limited to 70 mA maximum. No damage for continuous short.
Rmt Sensing.....Full excitation at the transducer with up to 1 Volt line loss.
Regulation .....Each channel individually regulated, ±0.01% for ±10% line voltage change and no-load to full load.
Stability .....±0.01% for 30 days. Temperature coefficient less than ±0.005%/°C.
Noise .....100 µV RMS, DC to 100 kHz.

CONSTANT CURRENT

Output Range .....Programmable 0.1mA to 50 mA with 12 µA resolution.
Compliance .....0.1 to 10 Volts.
Regulation .....±0.01% or ±0.1 µA for ±10% line voltage change.
Noise .....2 µA or 100 µV RMS, DC to 20 kHz.
Stability .....±0.01% or ±2 µA for 30 days. Temperature coefficient is less than ±0.005% or ±1 µA/°C.

AMPLIFIER

Input Range .....±2 mV to ±10 Volts.
Gain .....Programmable 1 to 5000, in 1, 2, 3, 5 steps, with ±0.05% accuracy.
Gain Stability .....±0.02% for 30 days, ±0.005%/°C.
Linearity .....±0.01% for gains to 1,000, ±0.02% for gains above 1,000.
Common Mode .....60 dB plus gain in dB to 120 dB for balanced input and 100 dB for a 1,000 Ohm source unbalance, DC to 60Hz.
CM Voltage .....±10 Volts.
Zero .....Automatic zero to ±2 µV RTI or ±1.0 mV RTO whichever is greater.
Zero Stability .....±5µV RTI, ±1mV RTO at constant temperature, ±1µV RTI/°C, ±0.2mV RTO/°C. Short term: ±2µV RTI, ±0.4mV RTO for 8 hours.
Source Current .....±5 nA, ±0.05 nA/°C.
Noise (10 kHz).....2.0 µV RTI plus 0.3 mV RTO, RMS.
Bandwidth .....50 kHz (6131), 100 kHz (6131HF) (-3dB) for gains to 1,000.
Slew Rate.....5 V/uS.
Overload .....Recovery time is 120 µS to within ±0.1% for a 10 times overload to ±10 Volts.
Analog Output.....Two outputs, one calibrated and one monitor. ±10 Volt full scale either filtered or wideband.

FILTER

STANDARD FILTER

Type .....Eight pole, low-pass Bessel (48 dB/octave).
Frequency.....4 programmable filter bandwidths, 10 Hz, 500 Hz, 5 kHz, 10 kHz and wideband. Other filter frequencies are available on request.

OPTIONAL PROGRAMMABLE FILTER

Type.....Four-pole, low-pass Bessel (24 dB/octave)
Frequency (PF) .....4 Hz to 1 kHz, 1 Hz resolution, 1 kHz to 10 kHz, 5 Hz resolution, ±2% accuracy.
Frequency (PHF).....10 Hz to 1 kHz, 1 Hz resolution, 1 kHz to 20 kHz, 5 Hz resolution, ±2% accuracy.

DIGITIZER (6031)

See Model 6031 for the following Digitizing Capabilities:

Sample.....±50 nS channel-to-channel time correlation.
Resolution .....16 bits, two's complement output.
Rate.....Programmable up to 100 kS/s (6131), 200 kS/s (6131HF).
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

Voltage Subst.....Alternate input for external calibration source. Programmable 1, 0.1 and 0.01, attenuation with ±0.02% accuracy. Attenuator output may be connected to bus for calibration.
Bridge (Series) .....Series calibration resistors, ±0.1%, 10 ppm/°C.
Bridge (Shunt) .....Two steps of bipolar shunt ±0.1%, 10 ppm/°C.
Zero .....Amplifier input disconnected and shorted for zero calibration.

MECHANICAL

Mounting .....Occupies one slot in Series 6100 enclosures.
Temperature .....0°C to +50°C operating.
Connectors .....Input connectors are 9-pin Type D. Outputs are a 9-pin Type D. All mates supplied.

ACCESSORIES

TEST FIXTURE (6087-6131)

6087-6131 .....Input/Output Monitor. Fixture with test jacks for transducer inputs, amplifier inputs, excitation, sense, shunt calibration and outputs.

ORDERING INFORMATION

CHANNEL MODULES

6131 .....2-ch transducer amplifier, 50 kHz bandwidth, 100 kHz sample rate.
6131HF .....2-ch transducer amplifier, 100 kHz bandwidth, 200 kHz sample rate.
6131-PF.....Programmable filter option, 4 Hz to 10 kHz..
6131-PHF .....Programmable filter option, 10 Hz to 20 kHz.

PLUG-ON COMPLETION CARDS

Specifications are available for individual completion cards.
6031-CC1 .....Low impedance piezoelectric (IEPE) completion card, AC coupled, 2-20 mA.
6031-CC2 .....Bridge completion card with series calibration.
6031-CC3 .....Voltage completion card with Auxiliary (5-25 Volt) excitation output.
6031-CC4 .....Current (4-20 mA) completion card.
6031-CC5 .....RTD, potentiometer completion card.
6031-CC6 .....Bridge or strain gage completion card with shunt calibration
6031-CC7 .....Strain gage completion card with series calibration.

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