MODEL 6052
4-Channel Strain/Bridge Transducer Amplifier-Filter-Digitizer

The 6052 input module has four channels of high performance signal-conditioning amplifier-digitizers for strain gages and bridge transducers. Each channel has programmable excitation with remote sensing, voltage calibration, local or remote shunt calibration, programmable gain instrumentation amplifier and four-pole low pass filter. The high level outputs are multiplexed and digitized to 16 bits then output to the 6000 data bus. In addition to the digitized output, each channel provides a continuous, calibrated analog output.

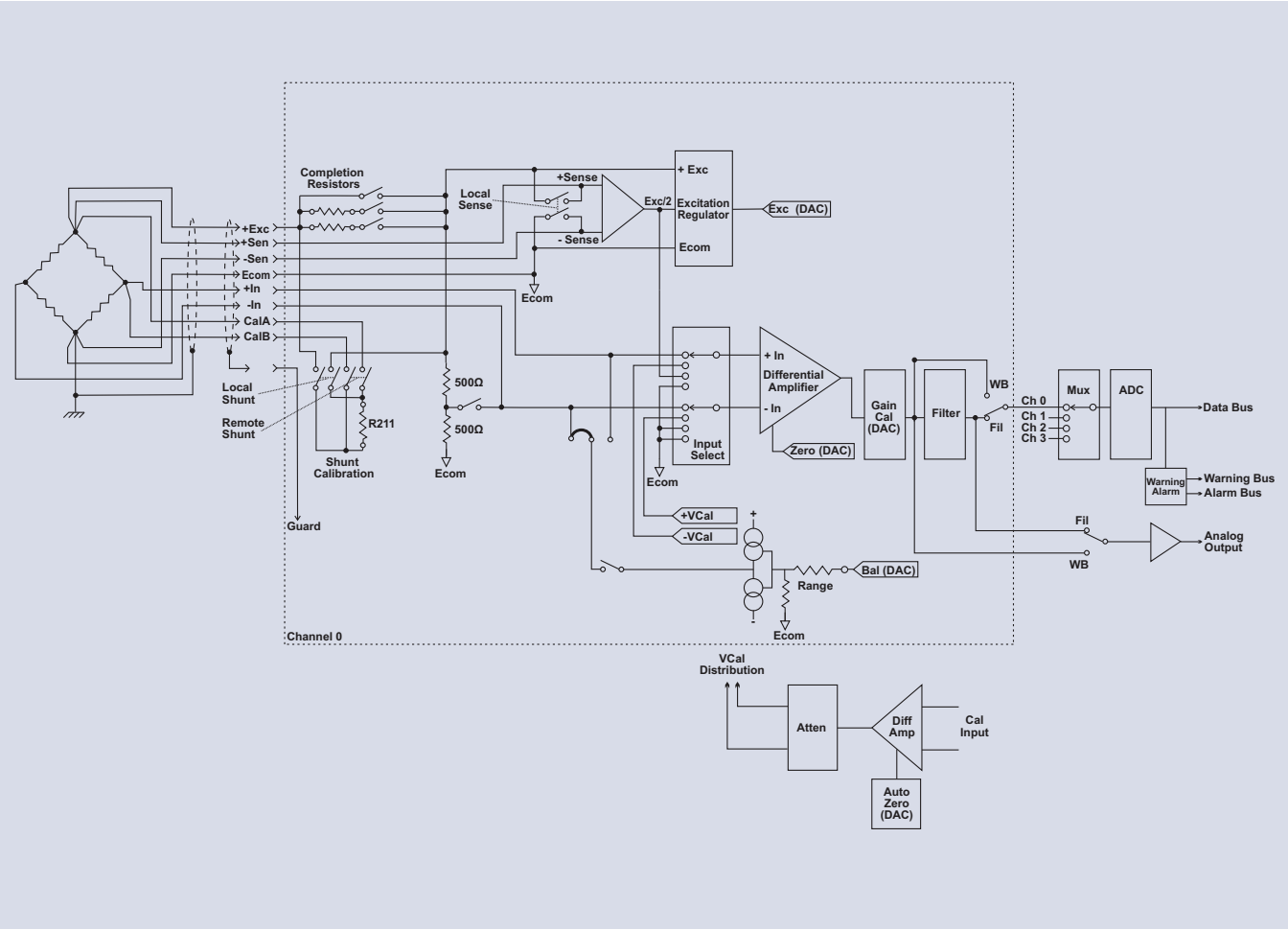
The 6052 is used with quarter, half and full bridge transducers, potentiometers and low-level voltage signals in demanding applications such as load control. The standard filter is a four-pole or six-pole filter with programmable cutoff frequency from 4 Hz to 5 kHz and the 6052C is a four-pole filter with programmable cutoff frequency from 10 Hz to 20 kHz.

Voltage substitution using an external voltage standard is provided for traceable gain calibration. Internal or external shunt calibration is provided for transducer calibration. Transducer balance, zero and gain calibration are automatic. Two programmable alarms with upper and lower limits are checked for each digitized output. The high-level analog outputs provide a means to independently monitor or record each channel.

FEATURES

- Programmable input configuration ¼, ½ & full bridge
- Programmable excitation with remote sensing
- Shunt & voltage calibration
- Automatic zero & balance
- Gains 1 to 5,000 with 0.05% accuracy
- Model 6052: Up to 20kS/s per channel with 16-bit resolution
- Model 6052C: Up to 50kS/s per channel with 16-bit resolution
- Buffered 10 Volt analog output
- Two alarms with programmable upper & lower limits

6052 FUNCTIONAL DIAGRAM



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PACIFIC INSTRUMENTS
A VPG Brand

MODEL 6052
4-Channel Strain/Bridge Transducer Amplifier-Filter-Digitizer

SPECIFICATIONS

INPUT

Configuration .....4 channels, 2 to 8 wire with guard shield. Bridge configuration is programmable for ¼, ½ and full bridge, 120 Ohm and 350 Ohm.

Balance.....Automatic by program control. Balance accuracy ±0.05% of range, ±1 mV RTO. Stability ±0.02% for 8 hours, ±0.005%/°C. Range set by resistor up to 10 mV/V, 2mV/V (for 350 Ohms) installed.

Impedance .....50 Megohms shunted by 1,000 pF.

Protection.....Instrumentation amplifier ±50 Volts differential and Common Mode.
Bridge ±15 Volts Common Mode.

EXCITATION / TRANSDUCER POWER

Voltage .....Programmable from 0-12 Volts in 1 Volt ±0.1% steps, with 3.3 mV resolution adjustment.

Current.....50 mA limited to 70 mA.

Regulation .....±0.01% for ±10% line and no-load to full-load using remote sensing.

Stability.....±0.01%, ±0.005%/°C.

Noise .....200 µV peak to peak.

Monitor .....Calibration mode applies excitation voltage to amplifier input.

AMPLIFIER

Gain.....Programmable from 1 to 5,000 in 1, 2, 3, 5 steps with ±0.05% accuracy

Gain Stability.....±0.01%, ±0.004%/°C.

Linearity .....±0.01% for gains <1,000, ±0.02% for gains 1,000 and higher.

Common Mode .....74 dB plus gain in dB up to 106 dB, DC to 60Hz for ±10 Volts.

Zero .....Automatic to ±1 µV RTI, ±0.5 mV RTO.

Zero Stability.....±5 µV RTI, ±1 mV RTO, ±1 µV/°C RTI, ±0.2 mV/°C RTO. Short term: ±2 µV RTI, ±0.4 mV RTO.

Source Current .....±25 nA, ±0.01 nA/°C

Noise (10 Hz) .....0.1 µV RMS RTI plus 0.5 mV RMS RTO.

Noise (wideband)..2 µV RMS RTI plus 0.5 mV RMS RTO.

Bandwidth (6052).10 kHz (-3dB) or better.

Bandwidth (6052C) 50 kHz (-3dB) for gains 1 to 1,000, 20 kHz (-3dB) for gains above 1,000.

Slew Rate (6052)..5 V/uS.

Recovery.....800 µS to ±0.1% for 10X overload to ±10 V.

Analog Output .....±10 Volt full scale, wideband or filtered. Accuracy is ±0.05%.

FILTER

Type (6052) .....Four or Six pole, low pass Butterworth.

Type (6052C) .....Four pole, low pass Bessel.

Frequency (6052)..Continuously programmable 4Hz to 5kHz, 1.25Hz resolution, 3% accuracy.

Frequency (6052C)Continuously programmable 10Hz to 20kHz.

Noise .....0.5 mV RMS RTO

Other.....Other filter characteristics and cut offs available.

DIGITIZER

Resolution .....16 bits, two's complement output.

Sample Rate (6052) 0 to 20 kS/s per channel.

Sample Rate (6052C) 0 to 50 kS/s per channel.

Linearity .....±2 LSB (±0.006%)

Continuity.....Monotonic to 15 bits.

Alarms .....Two alarms each with programmable upper and lower limits and persistence checked on each ADC sample.

CALIBRATION

Shunt .....Two steps shunt, internal or external connection, 174k Ohm 0.1% and 357k Ohm 0.1% .

Voltage Subst. .....Alternate input for external calibration source. Programmable attenuator with steps of 1, 0.1 and 0.01, ±0.02% accuracy. Output of the attenuator is provided for calibration.

Zero .....Amplifier input disconnected and shorted.

MECHANICAL

Mounting.....Occupies one slot in Series 6000 enclosures.

Connectors .....Input is 50-pin Type D output is 9-pin Type D.

Temperature .....0°C to +50°C operating.

ORDERING INFORMATION

6052-PF4/5K-BU4.....4-Ch Strain-Bridge, PF 4Hz-5kHz 4-Pole Butterworth

6052-PF4/5K-BU6.....4-Ch Strain-Bridge, PF 4Hz-5kHz 6-Pole Butterworth

6052B-PF4/5K-BU4.....4-Ch Strain-Bridge, PF 4Hz-5kHz 4-Pole Butterworth, 2-Step Shunt

6052B-PF4/5K-BU6.....4-Ch Strain-Bridge, PF 4Hz-5kHz 6-Pole Butterworth, 2-Step Shunt

6052C-PF10/20K-BE4....4-Ch Strain-Bridge, PF 10Hz-20kHz 4-Pole Bessel, 2-Step Shunt, 50ks/s

6052C-PF10/20K-BU4....4-Ch Strain-Bridge, PF 10Hz-20kHz 4-Pole Butterworth, 2-Step Shunt, 50ks/s

6052D-PF4/5K-BU4.....4-Ch Strain-Bridge, PF 4Hz-5kHz 4-Pole Butterworth, 2-Step Shunt, Dual Analog Outputs

6052D-PF4/5K-BU6.....4-Ch Strain-Bridge, PF 4Hz-5kHz 6-Pole Butterworth, 2-Step Shunt, Dual Analog Outputs

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