

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 4-pole, low-pass Butterworth with plug-in frequency module. The filter frequency may be specified from 4 Hz to 5 kHz. A 10 Hz filter is supplied if not otherwise specified. The PF option is a four-pole filter with programmable cutoff frequency from 4 Hz to 5 kHz in 1 Hz steps.

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 excitation with remote sensing
- Programmable input configuration
- Shunt and voltage calibration
- Automatic zero and balance
- Gains 1 to 5,000 with 0.05% accuracy
- 20 kS/s sample rate with 16-bit resolution
- Continuous ± 10 Volt analog outputs

SPECIFICATIONS

VOLTAGE EXCITATION

Output.....Programmable from 0-12 Volts in 1 Volt $\pm 0.1\%$ steps, with 3.3 mV resolution adjustment.
 Current.....50 mA limited to 70 mA.
 Regulation..... $\pm 0.01\%$ for $\pm 10\%$ line and no-load to full-load using remote sensing.
 Stability..... $\pm 0.01\%$, $\pm 0.005\%/^{\circ}\text{C}$.
 Noise200 μV peak to peak.
 MonitorCalibration mode applies excitation voltage to amplifier input.

INPUT

Configuration2 to 8 wire with guard shield. Bridge configuration is programmable for $\frac{1}{4}$, $\frac{1}{2}$ and full bridge, 120 Ohm and 350 Ohm.
 Balance.....Automatic by program control. Balance accuracy $\pm 0.05\%$ of range, ± 1 mV RTO. Stability $\pm 0.02\%$ for 8 hours, $\pm 0.005\%/^{\circ}\text{C}$. Range set by resistor up to 10 mV/V, 2 mV/V (for 350 Ohms) installed.
 Impedance50 Megohms shunted by 1,000 pF.
 Protection..... ± 50 Volts differential and common mode.

CALIBRATION

ShuntSingle step shunt, either polarity, internal or external connection, 0.502 mV/V (350 Ohm bridge), $\pm 0.1\%$ installed.
 VoltageAlternate input for external calibration source. Programmable attenuator with steps of 1, 0.1 and 0.01, $\pm 0.01\%$ accuracy. Output of the attenuator is provided for calibration.
 ZeroAmplifier input disconnected and shorted.

AMPLIFIER

Gain.....Programmable from 1 to 5,000 in 1, 2, 3, 5 steps with $\pm 0.05\%$ accuracy
 Gain Stability..... $\pm 0.01\%$, $\pm 0.004\%/^{\circ}\text{C}$.
 Linearity $\pm 0.01\%$ for gains $< 1,000$, $\pm 0.02\%$ for gains 1,000 and higher.
 Common Mode80 dB plus gain in dB up to 106 dB, DC to 60Hz for ± 10 Volts.

ZeroAutomatic to ± 1 μV RTI, ± 0.5 mV RTO.
 Zero Stability..... ± 5 μV RTI, ± 1 mV RTO, ± 1 $\mu\text{V}/^{\circ}\text{C}$ RTI, ± 0.2 mV/ $^{\circ}\text{C}$ RTO. Short term: ± 2 μV RTI, ± 0.4 mV RTO.
 Source Current ± 25 nA, ± 0.01 nA/ $^{\circ}\text{C}$
 Noise (10 Hz)0.1 μV rms, RTI.
 Noise (wideband)..2 μV rms, RTI.
 Bandwidth10 kHz (-3dB) or better.
 Slew Rate.....5 V/ μs .
 Recovery.....800 μs to $\pm 0.1\%$ for 10X overload to ± 10 V.
 Analog Output ± 10 Volt full scale, wideband or filtered. Accuracy is $\pm 0.05\%$.

FILTER (STANDARD)

TypeFour-pole, low pass Butterworth.
 Frequency.....Plug-in, 4 Hz to 5 kHz, 10 Hz supplied.
 Noise0.5 mV rms, RTO.

FILTER (OPTION PF)

TypeFour pole, low pass Butterworth.
 Frequency.....4Hz to 5kHz, 1Hz resolution, 3% accuracy.
 Noise0.5 mV rms, RTO

ANALOG-TO-DIGITAL CONVERTER

Resolution16 bits, two's complement output.
 Sample Rate0 to 20 kS/s per channel.
 Linearity ± 2 LSB ($\pm 0.006\%$)
 Continuity.....Monotonic to 15 bits.

GENERAL

Mounting.....Occupies one slot in Series 6000 enclosures.
 ConnectorsInput is 50-pin Type D output is 9-pin Type D.
 Temperature0 $^{\circ}\text{C}$ to +50 $^{\circ}\text{C}$ operating.

ORDERING INFORMATION

6052Four-channel transducer amplifier-digitizer, 16-bits, 20kS/s.
 Opt. PF4-Ch. Programmable filter, 4 Hz to 1 kHz.