

The 6038 input module has eight channels of programmable transducer signal conditioning amplifiers, filters and digitizer. Each channel has programmable voltage excitation, bridge completion and balance, programmable gain instrumentation amplifier and four-pole low pass filter. Channel outputs are multiplexed and digitized to 16 bits then provided to the 6000 data bus.

The 6038 is used with 1/4, 1/2 and full bridge transducers, potentiometers and low-level voltage signals. It is particularly suited to strain gages and bridge transducers. A shielded eight-wire input provides excitation, calibration and signal connections to the transducer. Excitation is programmable from 0 to 12 Volts for each channel. Remote sensing regulates excitation at the transducer eliminating line losses. The effect of loading or a short on any other channel is less than 0.01%. A calibration mode is provided to measure the excitation voltage applied to the transducer.

Gain calibration may be done by voltage substitution using an external traceable voltage standard. A calibration attenuator enables the voltage standard to be used on its highest accuracy ranges and has a post-attenuator output for accuracy verification. Internal and external shunt is provided for transducer calibration. Calibration and gain and zero correction can be automated using Pacific's PI660 software. Two alarms with programmable upper and lower limits are provided.

## SPECIFICATIONS

### INPUT

Configuration .....8 channels, 2 to 8 wire with guard shield. Bridge configuration is programmable for 1/4, 1/2 and full bridge. Completion resistor is  $\pm 0.1\%$ , desired value must be specified.

Balance .....Automatic by program control. Balance accuracy  $\pm 0.05\%$  of range,  $\pm 1$  mV RTO. Stability  $\pm 0.02\%$  for 8 hours,  $\pm 0.005\%/^{\circ}\text{C}$ . Range set by resistor up to 10 mV/V,  $\pm 5$  mV/V (350 Ohms) installed.

Impedance .....50 Megohms shunted by 1000 pF.

Protection ..... $\pm 50$  Volts differential,  $\pm 50$  Volts common mode.

### EXCITATION / TRANSDUCER POWER

Voltage .....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. Operation reverts to local sense if sense leads are not connected.

Stability ..... $\pm 0.01\%$ ,  $\pm 0.005\%/^{\circ}\text{C}$ .

Noise .....200  $\mu\text{V}$  peak to peak.

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

### AMPLIFIER

Gain .....Programmable from 1 to 5,000 in 1, 2, 3, 5 10 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 Mode .....60 dB plus gain in dB up to 106 dB, DC to 60Hz for  $\pm 10$  Volts.

Zero .....Automatic to  $\pm 1$   $\mu\text{V}$  RTI,  $\pm 0.5$  mV RTO.

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

Source Current ..... $\pm 2$  nA,  $\pm 0.01$  nA/ $^{\circ}\text{C}$

Noise (1 kHz) .....0.5  $\mu\text{V}$  rms, RTI.

Bandwidth .....1 kHz (-3dB).

Recovery .....800  $\mu\text{s}$  to  $\pm 0.1\%$  for 10X overload to  $\pm 10$  V.



## FEATURES

- Programmable input configuration, 1/4, 1/2 & full bridge
- Programmable excitation with remote sensing
- Shunt & voltage calibration
- Automatic zero & balance
- Gains 1 to 5,000 with 0.05% accuracy
- Four-pole, low-pass filter
- Up to 10kS/s per channel with 16-bit resolution
- Two alarms with programmable upper & lower limits

### FILTER

Type .....Four pole, low pass Butterworth.

Frequency .....Plug-in, 1 Hz to 1 kHz, 10 Hz supplied.

Noise .....0.5 mV rms, RTO.

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

### DIGITIZER

Sample .....Simultaneous, within  $\pm 50$  nS using sample & hold amplifier. Droop is less than  $\pm 0.005\%$ .

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

Sample Rate .....Up to 10 kS/s per channel.

Linearity ..... $\pm 2$  LSB ( $\pm 0.006\%$ )

Continuity .....Monotonic to 15 bits.

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

### CALIBRATION

Shunt .....Single step shunt of internal completion resistor or external strain gage or bridge arm using dedicated input connector pins. Installed shunt resistor provides 0.502 mV/V (350 Ohm) or 0.172 mV/V (120 Ohm)  $\pm 0.5\%$ .

Voltage Subst. ....Alternate input for external calibration source. Programmable attenuator with steps of 1, 0.1 and 0.01,  $\pm 0.02\%$  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 .....Inputs are on two 50-pin, Type D. connectors. Mating connectors supplied.

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

### ORDERING INFORMATION

6038 .....8-Ch Strain-Bridge, 8-Wire Input.