

The 6033 input module has eight channels of transducer signal conditioning and digitizer. Each channel has regulated voltage excitation, programmable gain instrumentation amplifier, four-pole low pass filter and sample and hold amplifier. 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 has a wideband analog output.

The 6033 is used with  $\frac{1}{4}$ ,  $\frac{1}{2}$  and full bridge transducers, potentiometers and low-level voltage signals. It is particularly suited to strain gages where remote sensing is not a requirement. A shielded four-wire input provides signal and excitation connections to the transducer. Excitation is programmable from 0 to 12 Volts for all channels on the module. An individual regulator for each channel prevents loading or a short on one channel from affecting other channels. A calibration mode is provided that measures excitation voltage or current.

Voltage substitution is provided for gain calibration using an external voltage standard. A calibration attenuator enables the voltage standard to be used on its highest accuracy ranges and has a post-attenuator output for verification and calibration. Resistive shunt is provided for transducer calibration. Two alarm with programmable upper and lower limits are provided and checked each time the output is digitized. Analog outputs provide a means to independently monitor or record each channel.



### FEATURES

- Voltage excitation, 0 to 12 Volts
- Quarter, half and full-bridge conditioning
- Shunt and voltage calibration
- Automatic zero and balance
- Gains 1 to 5,000 with 0.05% accuracy
- Four-pole low-pass filter
- Up to 10 kS/s ADC rate with 16-bit resolution
- Two alarms with programmable upper and lower limits

### SPECIFICATIONS

#### EXCITATION

Voltage .....Programmable for 8 channels from 0 to 12 Volts with 3.3 mV resolution. Calibrated 1 Volt  $\pm 0.1\%$  steps.

Current.....50 mA, limited to 70 mA. Short on one channel will not affect other channels.

Regulation ..... $\pm 0.2\%$  line and no-load to full-load measured at the input connector.

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

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

Monitor .....Voltage or current selected by jumper plug.

#### INPUT

Configuration .....2 to 4 wires plus shield for bridge and voltage. Input configured by plug-in jumpers.

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, 2 mV/V (350 Ohms) is installed.

Protection..... $\pm 50$  Volts differential,  $\pm 30$  Volts common mode.

#### CALIBRATION

Shunt.....Programmable single shunt, 0.502 mV/V (350 Ohm bridge),  $\pm 1\%$  installed.

Voltage .....Alternate amplifier input for external voltage standard. Programmable attenuator steps of 1, 0.1 and 0.01 with  $\pm 0.02\%$  accuracy. Output of the attenuator provided on rear panel connector for calibration.

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

#### AMPLIFIER

Input.....50 Megohms, shunted by 1,000 pf.

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 (10 Hz) .....0.5  $\mu\text{V}$  peak, RTI.

Noise (1kHz) .....1.5  $\mu\text{V}$  peak, RTI.

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

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

Analog Output ..... $\pm 3$  Volts full scale, unfiltered.

#### FILTER

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

Frequency.....Plug-in, 4 Hz to 1 kHz, 10 Hz supplied.

Noise .....2 mV peak RTO.

#### SAMPLE & HOLD, ADC

Sample.....Simultaneous, within  $\pm 50$  nS channel-to-channel. Droop is less than  $\pm 0.005\%$ .

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

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

Linearity.....2 LSB (0.006%).

Continuity.....Monotonic to 15 bits.

#### GENERAL

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

Connectors .....Input connectors are 50-pin Type D, output connectors are 9-pin Type D. Mates are supplied

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

#### ORDERING INFORMATION

6033 .....Eight-Channel Transducer Amplifier-Digitizer, 16-Bits, 10 kS/s.

6081 .....Screw Terminal Adapter.

6082 .....RJ45 Plug Adapter with Bridge Completion for 120 and 350 Ohm Gages.