

The 6032 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 analog output

The 6032 is used with quarter, half and full bridge transducers, potentiometers and low-level voltage signals in demanding applications such as load control. The EM option adds continuous excitation monitoring with out-of-limit alarms. The PF option adds a four-pole, 4 to 5,000 Hz programmable filter with 1 Hz resolution.

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.

### 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.

Bridge 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) installed.

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

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

#### EXCITATION / TRANSDUCER POWER

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, regulated per channel.

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 amplifier input.

#### EXCITATION MONITOR (OPTION EM)

Output.....Supplemental measured excitation channels using 16-bit ADC with four-level alarm, at  $\pm 0.1\%$

#### 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 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.

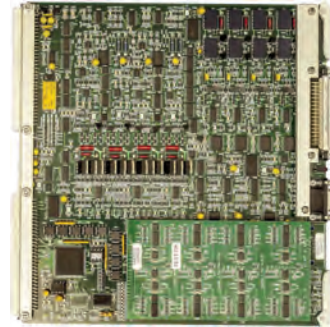
Source Current ..... $\pm 2$  nA,  $\pm 0.01$  nA/ $^{\circ}\text{C}$

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

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

Bandwidth.....5 kHz (-3dB) for gains  $\leq 500$ , 1 kHz for gains  $> 500$ .

Slew Rate.....0.5 V/ $\mu\text{s}$ .



### FEATURES

- Quarter, half & full bridge conditioning
- Programmable excitation with remote sensing
- Shunt & voltage calibration
- Automatic zero & balance
- Gains 1 to 5,000 with 0.05% accuracy
- Fixed or programmable filter
- Up to 20 kS/s per channel with 16-bit resolution
- Two alarms with programmable upper & lower limits

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

Analog Monitor ..... $\pm 10$  Volt full scale, wideband. Accuracy is  $\pm 2\%$ .

#### FILTER

##### STANDARD FILTER

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

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

Noise .....1 mV peak, RTO.

##### OPTIONAL PROGRAMMABLE FILTER

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

Frequency.....Continuously programmable 4Hz to 5kHz, 1Hz resolution,  $\pm 2\%$  accuracy.

Noise .....1 mV peak, RTO

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

#### DIGITIZER

Sample.....Simultaneous sample and hold with  $\pm 50$  nS channel-to-channel. Droop is less than  $\pm 0.005\%$ .

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

Sample Rate .....Up to 20 kS/s per channel.

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

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

Shunt .....Single step shunt, internal or external connection, 0.502 mV/V (350 Ohm bridge),  $\pm 1\%$  installed.

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

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

#### ORDERING INFORMATION

6032 .....4-Ch Strain-Bridge, Single Freq Filter.

6032-PF .....4-Ch. 6032 PF 4 Hz to 1 kHz.

6032-EM .....4-Ch 6032 Excitation measurement.