MODEL 5821
Transducer Channel Module

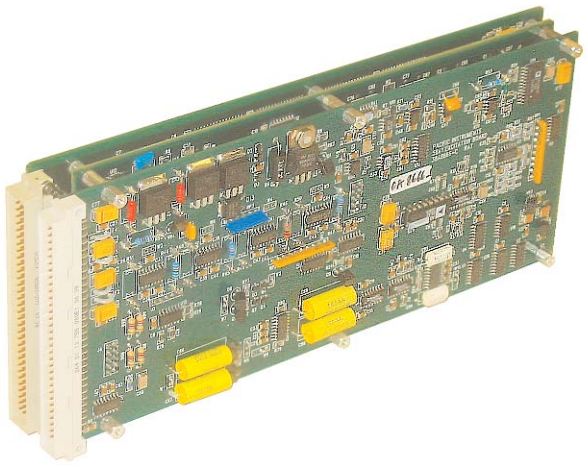
The 5821 is a channel module for the 5800 series transient recorders that is used to acquire and record high-frequency transducer signals. It conditions, amplifies, filters, digitizes and stores data from strain gage, bridge, thermocouple, potentiometer and piezoelectric (IEPE) or other similar voltage output transducers. Synchronized sampling of channels in multiple systems provides excellent time correlation between channels and to external events.

Each channel has two inputs. One has excitation and amplification for low-level voltage output transducers such as strain gages. The other is AC coupled with current excitation for transducers with built-in electronics. Signal conditioning includes programmable voltage excitation and completion for ¼, ½ and full bridge transducers, automatic balance, four-step shunt calibration, programmable gain and a four frequency, eight-pole filter. Voltage substitution calibration with internal precision reference is optional.

The conditioned transducer output is digitized and recorded in non-volatile, solid-state memory. It records calibration, pre-trigger and post-trigger data. In a typical test scenario recording of pre-trigger data is initiated by a remote TTL input or automatic sequencer. Pre-trigger data is recorded until a remote TTL input or on-board discriminator triggers the recording of post -trigger data. After the desired number of post-trigger samples recording stops and the data record is write protected. The record then contains the most recent pre-trigger and all post-trigger data.

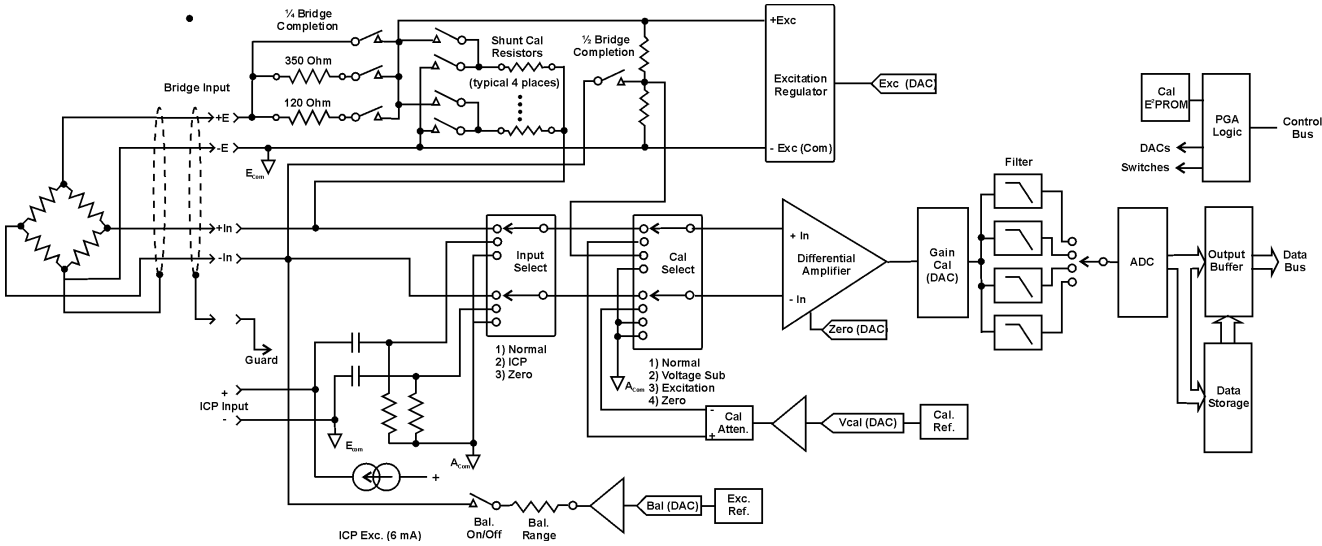
The quantities and sample rates of pre and post-trigger data storage are user selected, enabling the channel's data storage to be configured according to the characteristics of the data being acquired. Sample rate is changed during acquisition without interrupting data flow to capture high-speed events, yet have sufficient storage space to record long-term effects. The 5821 can be configured for multiple records, each using the same pre and post-trigger sampling profile. Data is debriefed and transferred to permanent storage by the Ethernet interface in the enclosure in which the channel module is installed.

Battery life is extended by sequencing power. Power up only those circuit elements necessary for current operations. The solid-state data storage memory has 40 hours of independent back up power.



FEATURES

- Dual inputs, strain gage or transducer and low-impedance charge
- Programmable bridge configuration, no jumper or wiring changes
- Continuously programmable voltage excitation
- Automatic zero and balance
- Four-step shunt calibration
- 100 kHz bandwidth
- Four eight-pole low-pass filters
- 10 to 1M Samples per second with 16-bit resolution
- Up to 4M non-volatile data storage



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PACIFIC INSTRUMENTS

MODEL 5821
Recorder Channel Module

SPECIFICATIONS

EXCITATION (CONSTANT VOLTAGE)

Range .....0 to 12 Volts in 1-Volt ±0.1% steps.
Output Current..50 mA, limited to 70 mA maximum.
Regulation .....±0.2% over the input voltage range and no load to full load.
Stability.....±0.1% for 8 hours, ±0.01%/°C.
Monitor .....Excitation voltage and current is digitized, output and recorded as calibration data. Accuracy is ±0.1%.

BRIDGE INPUT

Configuration ....Four-wire with shield.
Completion .....Programmable completion is installed for 350 Ohm and 120 Ohm ¼ and all ½ bridge circuits. The ¼ bridge completion resistors are in resolderable sockets and may be replaced to accommodate other values.

AUXILIARY INPUT

Power .....6 mA, ±10% (range is 1 to 20 mA).
Input .....AC coupled input (<2 Hz) to accept charge transducer with integral or line preamplifier.
Impedance.....100K Ohms.
Connector .....BNC. Screw terminals on 5871ST.

BRIDGE BALANCE

Type .....Automatic, may be turned off without affecting the setting.
Range .....±2 mV/V for 350 Ohm bridge. Range is setable by resistor from <0.1 mV/V to >10 mV/V.
Resolution .....0.025% of range.
Accuracy .....±0.1% of range, ±1 mV
Stability.....±0.1% for 8 hours, ±0.01%/°C
Time .....5 seconds maximum to balance.

VOLTAGE CALIBRATION (Option)

Range .....Three ranges, ±10 Volts, ±1 Volt and ±100 mV.
Resolution .....0.025% of range.
Accuracy .....±0.25%.

SHUNT CALIBRATION

Type .....Four-step shunt calibration.
Value .....Resistor values are 150K, 75K, 15K, and 7.5K ohms give 0.583, 1.16, 5.77, and 11.4 mV/V for a 350 Ohm bridge, ±1%. Alternate values may be customer specified.

AMPLIFIER

Impedance.....25 Megohms shunted by 500 pF.
Protection .....±50 Volts differential or common mode.
Input Range.....±10 mV to ±10 Volts full scale.
Gain .....Programmable steps 1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 500 and 1,000.
Accuracy .....±0.1%.
Stability.....±0.02% for 8 hours, ±0.005%/°C.
Linearity .....±0.02%.
Bandwidth .....100 kHz (-3dB). Slew rate is 5 V/µS.
Common Mode..60 dB plus gain in dB to 110 dB minimum for 350 Ohm source unbalance, DC to 60 Hz.
CM Voltage .....±10 Volts.
Zero Stability ....±5 µV RTI, ±1 mV RTO at constant temperature. ±1 µV/°C RTI, ±0.2 mV/°C RTO.
Noise.....10 µV RTI plus 1 mV RTO RMS.

ANALOG FILTER

Type .....Eight-pole, Bessel, low-pass (48dB/octave terminal slope).
Frequency .....5 kHz, 10 kHz, 20 kHz, 50 kHz (-3 dB) and wideband.
Output (Option) Filtered or wideband buffered output, ±10 Volts. Requires Option "-AO" for Transient Redcorder mainframe.

DIGITAL

Sampling .....One pre-trigger and two post-trigger sample rates per record.
Rates.....1M, 500K, 200K, 100K, 50K, 20K, 10K, 5K, 2K, 1K, 500, 200, 100, 50, 20 and 10 S/s.
Resolution 16-bits
Correlation .....±1 nS sample to sample, ±50 nS channel to channel.

MEMORY

Type .....CMOS, with power back up for 40 hours.
Size.....1M words (2M and 4M optional).
Records .....Programmable pre and post-trigger data in 4096 word blocks. Multiple records without debriefing.
Write Protect ....Enabled on power up and after recording data. Must be cleared before recorded data can be overwritten.

TRIGGER

Discriminator ....Programmable full scale with 0.4% resolution. First channel triggers all channels in recorder group.
Delay .....0 to 60 seconds with 1 microsecond resolution.

GENERAL

Size.....Plug-in module for any Series 5800 enclosure.
Temperature.....0 to +55°C operating, -40 to 71°C non-operating.
Humidity .....95%., non-condensing.
Altitude .....15,000 ft operating, 40,000 ft non-operating.
Vibration .....0.27grms from 5 to 55 Hz, 10 minutes per axis.
Shock .....30g, half sine, 11 mS.

ORDERING INFORMATION

RECORDER CHANNEL MODULES

5821.....Channel Module, 1 MS/s, 16-bit, 1M data storage.

OPTIONS

AO.....Analog output, ±10 Volts.
CV.....Voltage substitution calibration.
-2M.....Increase storage to 2M samples.
-4M.....Increase storage to 4M samples.

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