SPECIFICATIONS:

POWER SUPPLY REQUIREMENTS:

+/- 10 VDC minimum with suffix AAA = 100

+/- 15 VDC minimum with suffix AAA = 150

The maximum power supply voltage is + 30 volts DC. The positive and negative power supplies must deliver a minimum of 15 ma.

INPUT VOLTAGE SIGNAL RANGE:

+/- 3 volts dc with suffix BBB = 030

+/- 5 volts dc with suffix BBB = 050 | +/- 10 volts dc with suffix BBB = 100

+/- 12 volts dc with suffix BBB = 120 | +/- 24 volts dc with suffix BBB = 240

+/- 48 volts dc with suffix BBB = 480 | +/- 100 volts dc with suffix BBB = 101

All of the inputs will withstand up to plus or minus 100 volts dc or 200% of the rated range without damage. The higher of the two ratings shall apply.

INPUT CURRENT SIGNAL RANGE:

4 to 20 ma. with suffix BBB = 420

The current input signal line will withstand up to 50 ma. without damage.

INPUT SIGNAL IMPEDANCE:

100K ohms at terminals 5 and 6 with all voltage input models.

75 ohms at terminals 5 and 6 with the 4 to 20 ma. current input.

Input signals applied to terminal number 7 requires that external impedance be added in series.

OUTPUT VOLTAGE SIGNAL RANGE:

+/- 3 volts dc. with suffix CCC = 030

+/- 5 volts dc with suffix CCC = 050 | +/- 10 volts dc with suffix CCC = 100

The voltage signal on terminal number 9 is the same polarity as the input. The voltage signal on terminal number 10 is the opposite polarity of the input.

RATED OUTPUT CURRENT:
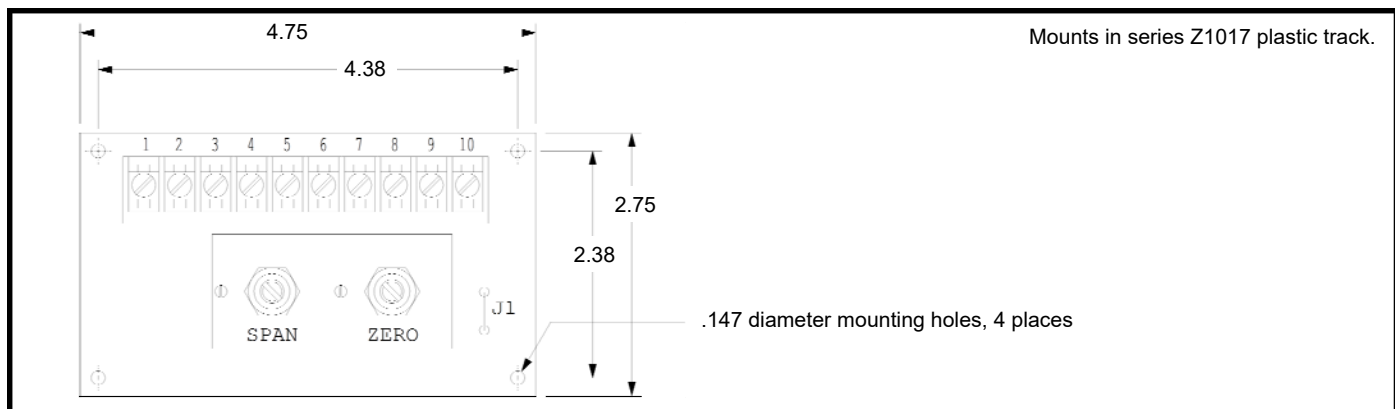
+/- 5 ma., maximum at terminal numbers 9 and 10.

OUTPUT VOLTAGE STABILITY AND DRIFT:

Better than 1% at unity gain.

ZERO ADJUSTMENT RANGE:

Plus and minus 30% of the rated input range as defined with suffix BBB

SPAN ADJUSTMENT RANGE:

The module will deliver the rated output voltage as defined with suffix CCC for input signal from 50% to 100% of the rated input range as defined with suffix BBB.

OPERATING TEMPERATURE RANGE:

- 20 degrees C to + 55 degrees C.

Extended temperature range operation is available, contact Datatran's Sales Department for availability and price.

OUTLINE DIMENSIONS:

Mounts in series Z1017 plastic track.

4.75
4.38
2.75
2.38
.147 diameter mounting holes, 4 places
SPAN   ZERO   J1

GENERAL DESCRIPTION:

This bipolar signal scaling module is designed to be used as a general purpose linear, bipolar gain block or signal level converter. The module can be used for current to voltage or voltage to voltage level conversion. The three input terminals allow multiple input signals be summed and scaled into a common output. The module provides both a non-inverted and inverted voltage output signal.
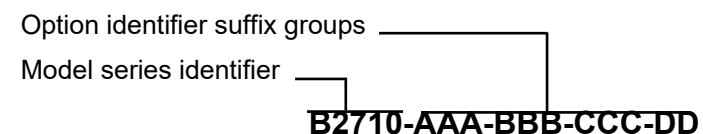
This industrial grade module includes a stable DC coupled amplifier and will maintain the output signal within 1% of it's setting as the input power supply voltage and ambient temperature are varied over the specified range.

Each signal scaling module includes controls to set the zero and span. The zero adjustment can be used to remove the offset from input signals that do not go to zero. The span is used to scale and set the output voltage value for a specific input signal. Three signal input connections are provided, one input is left uncommitted and may be configured by the user to accept a non-standard input signal level. The module requires a bipolar 10 to 30 volt DC power supply for operation.

The circuit board is solder masked. All external power and valve coil connections are made to a barrier type terminal block with #6-32 captive wire clamping plates. All external connections are clearly marked on the board.

PART NUMBERING SYSTEM:

Option identifier suffix groups

Model series identifier

B2710-AAA-BBB-CCC-DD

PART NUMBER SUFFIX GROUP EXPLANATION	
SUFFIX	**DESCRIPTION**
AAA	Minimum power supply voltage
BBB	Maximum input signal voltage
CCC	Maximum output current to valve coil
DD	Factory installed option identifier

Parts shipped from the factory will have the correct alphanumeric option identifier in place of the suffix letters indicated in the table above.

ORDERING INFORMATION:

Refer to the B2710 model series selection sheet for a complete listing of the currently available models.

DATA SHEET FOR DATATRAN B2710 BIPOLAR SIGNAL SCALING MODULE

FOR TECHNICAL ASSISTANCE CONTACT
CONIC SYSTEMS INC.
11 REBEL LANE, PORT JERVIS, NY 12771
TEL: (845) 856-4313   FAX (845) 858-2824
www.conicsystems.com

APPLICATION INFORMATION:

NON STANDARD INPUT VOLTAGE SIGNALS: The signal scaling module is capable of operating with voltage input signals that differ from those defined by suffix BBB. These non standard input signals should be applied to terminal number 7. All signals applied to terminal number 7 require that external impedance be added externally, in series with the signal. The value of the external series resistor and it's power dissipation can be calculated from the formulas given below.

$$R(\text{External value, ohms}) = \frac{\text{Input signal voltage} * 500000}{\text{Rated input voltage (suffix BBB)}}$$

$$R(\text{External power, watts}) = \frac{\text{Input signal voltage}^2}{R(\text{External value})}$$

The external resistor can be mounted on the board in place of jumper "J1" provided that the total power dissipation does not exceed .25 watt. For optimum performance, the selected resistor should have a temperature coefficient that does not exceed 25 parts per million.

Non standard voltage or current input signals can also be handled by modification of the components located on the circuit board. This approach is recommended for volume applications. In this case Datatran Labs will assign a special part number to the module. This part number can be used for additional orders.

OPERATION WITH LOW LEVEL INPUT VOLTAGE SIGNALS: The signal scaling module can be modified at the factory to amplify signals of less than 100 mv. to 3, 5 or 10 volt outputs. The user should make note of the fact that very high amplifier gain setting may increase the output signal drift at extreme temperatures. High amplifier gain settings also increase the effects of electrical noise on the signal processing. Extreme cases may cause oscillation of the output signal.

User's are invited to contact Datatran's engineering department with specific requests for modifications that allow the amplifier to be used with non standard input signals.

OPERATION WITH 4 TO 20 MA. CURRENT SIGNALS: Current signals are converted to voltage inputs by passing them through a 75 ohm resistor to the system common (0 volts). The voltage offset generated by the minimum 4 ma. signal should be removed with the "ZERO" control. Once this is accomplished, the input signal should be increased to 20 ma. and the "SPAN" control adjusted to obtain the rated output voltage.

The input signal current source must be capable of sourcing 4 to 20 ma. into 75 ohms (.3 to 1.5 volts) connected to the system common (0 volts). The signal scaling module does not provide signal isolation. the current source and the signal scaling module must share the same system common (0 volts) point. This point must be connected to terminal number 2 or 4.

OPERATION WITH MULTIPLE INPUT SIGNALS: Input signals applied to terminal numbers 5, 6 and 7 are summed internally with each other and the "ZERO" control setting prior to multiplication by the "SPAN" setting. The summing operation preserves the sign of the input signals. The input signals are added internally, using both the magnitude and sign of the signals prior to the gain function. For example, with the gain set equal to 1, two input signals of equal magnitude but opposite in sign will produce an output of zero. Two input signals of equal magnitude and sign will produce an output equal to twice the value of a single input signal.

FREQUENCY RESPONSE: The voltage output signals will follow the change in the input signals within 1% as the input signal frequency varies from DC to a maximum of 10 Khz.

EXTERNAL WIRING: External voltage input signals should be twisted and shielded cable. All shields should be terminated at terminal 2 on the amplifier only. Do not expose or connect the shield at any point in its run from the signal source to the signal scaling module.

External 4 to 20 ma. current input signals generally do not require shielded cable, however a reasonable effort should be made to route these connections away from equipment generating electrical noise.

The output connections from the module should be shielded and twisted if the wire run exceeds five feet or should a large amount of electrical noise be present in the application. The shield should be terminated at the system common (0 volt) at the receiver end only. Do not expose or connect the shield at any point in it's run from the signal scaling module to the receiver.

It is not necessary to shield the power supply connections to the module. However, these wires should not be routed next to non-signal wires. For optimum performance or when in doubt, the power supply wiring should also be made with shielded cable.

For optimum performance, all connections to the signal scaling module should be twisted and shielded. These connections should be run in signal level conduit only.

FUNCTIONAL DIAGRAM:
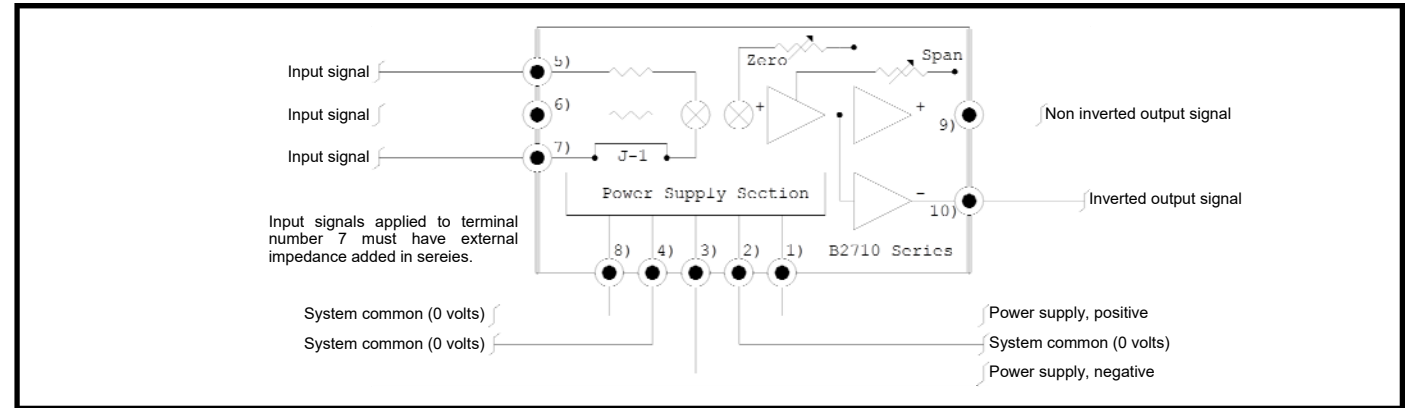
APPLICATION EXAMPLES:

Industrial, closed loop pressure control system with both the setpoint and the process pressure feedback signals generated from external transducers with 4 to 20 ma. output signals.

The application shown below uses the model series D2408 Linear servo amplifier to drive the valve. This amplifier uses the internal ramp controls to limit the rate at which the pressure command signal can be changed. If the ramping function is not required, the model series D2408 may be replaced with the model series C2405 Linear servo amplifier.

Connections to the C2405 remain the same as those shown.