Model 161MK Bridgesensor

Features

- Compact, complete and convenient
- Easy access to all trim adjustments
- Simplifies single and half bridge applications
- Eliminates additional wiring with bridge balance trimpot
- Remote sensing minimizes effects of bridge supply lead resistance
- Adjustable filter frequency
- Calibration resistor for push-button calibration

Description

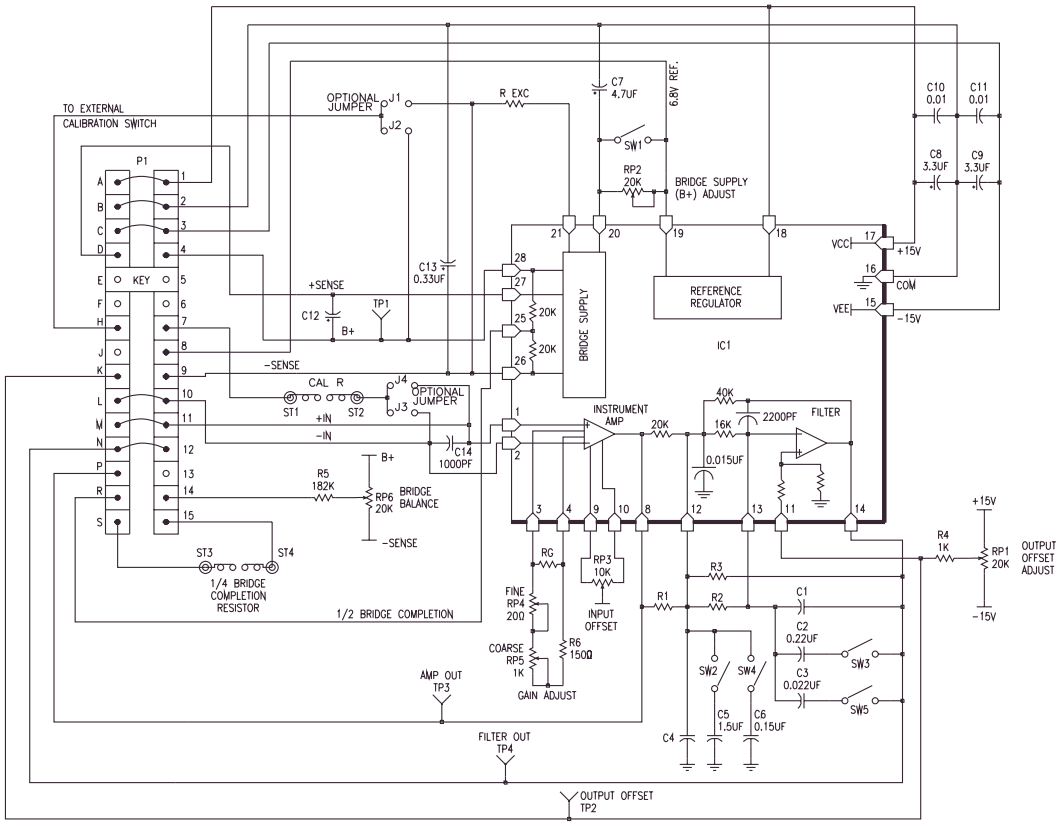
The CALEX 161MK Bridgesensor is a complete signal conditioning system on a card designed expressly for single, half or full bridge transducers.

The 161MK consists of a high performance instrumentation amplifier, user-adjustable active filter, high stability bridge supply and reference regulator in a state-of-the-art hybrid circuit. The hybrid circuit is mounted on a PC board mounting kit containing all of the required external circuitry, trimpots, etc., so that only point-to-point wiring need be made to the inputs, outputs and power to have a complete signal conditioning system up and running.

An on-board trimpot with an adjustment range from +4 to +12VDC simplifies changing the bridge supply voltage.

The mounting kit provides coarse and fine gain adjustment trimpots along with input and output offset adjustments, DIP switches for setting the bridge supply output and active low pass filter cut-off frequency. In addition, the board allows for mounting a quarter bridge completion resistor. Two close tracking 20k ohm half bridge completion resistors are also included in the hybrid circuit.

161MK Block Diagram



NOTE: Board size is the same as Model 160MK except the length is 4.5 inches.

Specifications

Conditions (Unless Noted): Ta = 25°C, Vs. = ±15 VDC, G = 500 V/V

Parameter		Minimum	Typical	Maximum	Units
Amplifier					
Gain Range:	Adjustable w/External Set Resistor	100 2		500 5000	V/V
Gain Equation			Rg = 80,000/(G-2)		
Gain Equation Accuracy 2 < G < 1000 V/V			3		%
Gain Change w/ Temperature:	w/Trimpots Amplifier alone		75 15	150	ppm/°C
Nonlinearity, ±10V Output Swing			0.002	0.005	%
Offset Voltage, Input and Output			Adjustable to Zero		
Warm-up Drift			1		µV
Vs. Temperature	G = 2 V/V G = 1000 V/V At other Gains, Max		30 1 ±4 ±(100/G)	75 4	µV/°C
Vs. Power Supply Pin K tied to Pin B			1		µV/V
Output Offset Adjust Range		±10			V
Input Bias Current Vs. Temperature			10 25	50	nA pA/°C
Input Offset Current Vs. Temperature			5 10	20	nA pA/°C
Input Impedance			4G ohms || 15 pF		
Common Mode Input Voltage:	Range, Linear Response Maximum		±9.5 ±15		VDC
CMR:	1 kHz bw, DC - 60 Hz 10 Hz bw, DC - 60 Hz	110 110	140 140		dB
Input Noise Voltage:	0.1 Hz - 10 Hz 10 Hz - 100 Hz		0.3 1		µV P-P
Current:	0.1 Hz - 10 Hz 10 Hz - 100 Hz		60 100		pA P-P
Rated Output:	Voltage, 2k ohm Load Current Load Capacitance Short Circuit	±10 ±5	 Indefinite	 1000	VDC mA pF
Dynamic Response:	Small Signal Bandwidth Amp Out Gain Bandwidth		Adjustable 25		kHz MHz
Low Pass Filter:	Number of Poles DC Gain (Pin P to N) Roll Off		2 -2 40		 V/V dB/Dec
Bridge Excitation Supply					
Output Adjustment Range:	w/Trimpot w/Ext Resistor	4 4		10 12	VDC
Output Current		0		100	mA
Load Regulation I_L = 0 - 100 mA			0.1	0.2	%
Line Regulation Vin = 14.5 - 18 VDC			0.05	0.5	%/V
Stability:	Short Term Long Term Vs. Temperature Warm-up Drift		0.05 0.2 40 0.1	 80	%/24 Hrs %/kHrs ppm/°C %
Short Circuit Protection			8 Hours Minimum		
Output Noise, 10 Hz - 1 kHz			200		µV P-P
Internal Reference Voltage		6.46	6.80	7.14	VDC
Half Bridge Completion					
Nominal Resistance Value			20		kohms
Initial Accuracy				1	%
Temperature Tracking				5	ppm/°C
Balance Adjustment Range		5			%
Power Requirements					
Voltage: Current (add your bridge excitation current)	Rated Performance Operating	 ±12	±15 ±12	 ±18	VDC mA
Environmental					
Ambient:	Operating Storage	-25 -40		70 100	°C

161MK Applications Example

Figures 1 through 4 illustrate full, half and single bridge applications. The 161MK and 160MK use the same amplifier and bridge supply. See the Model 160MK on pages A40 through A48 for additional technical information. Please contact our applications engineering department if further assistance is required.

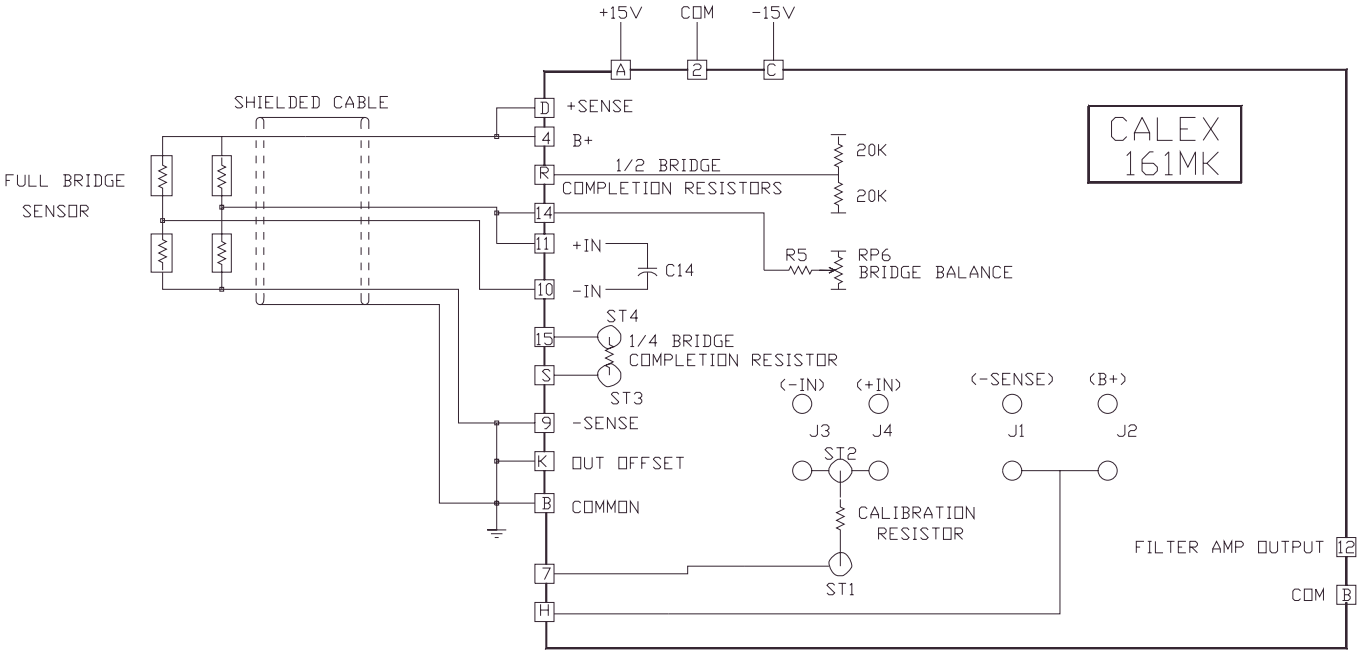


FIGURE 1. Full Bridge Application

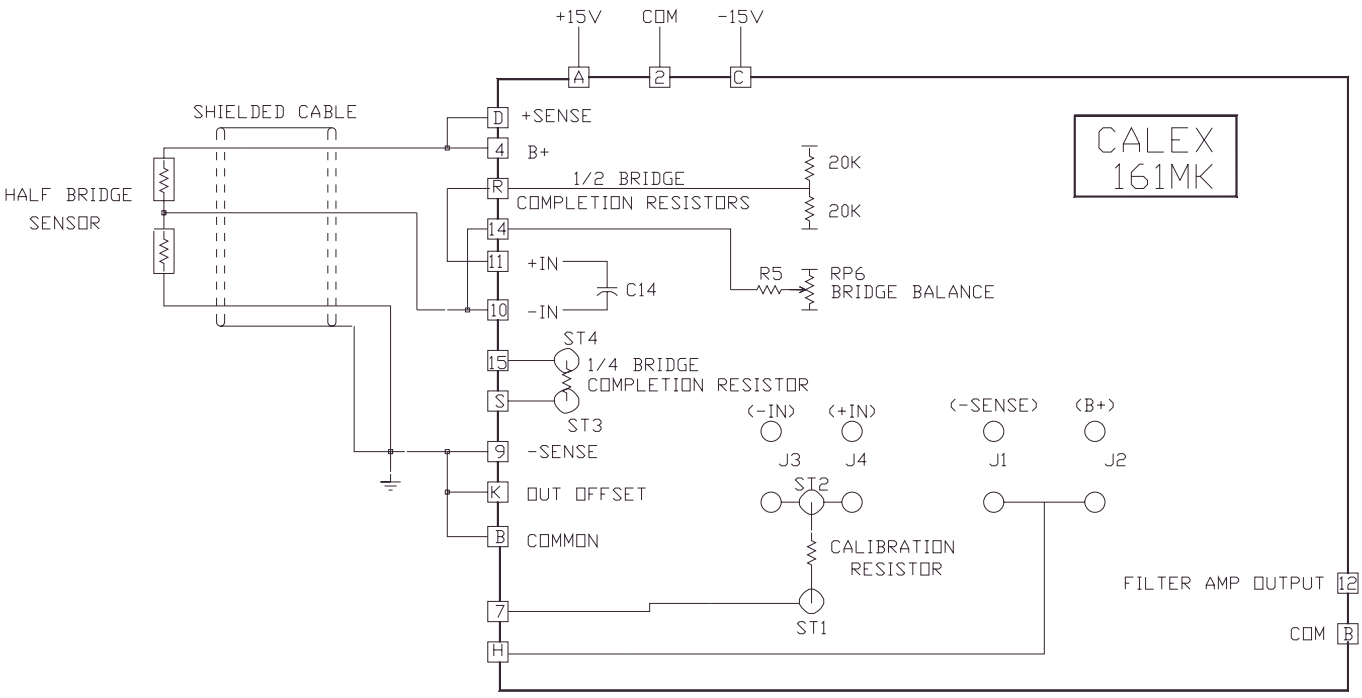
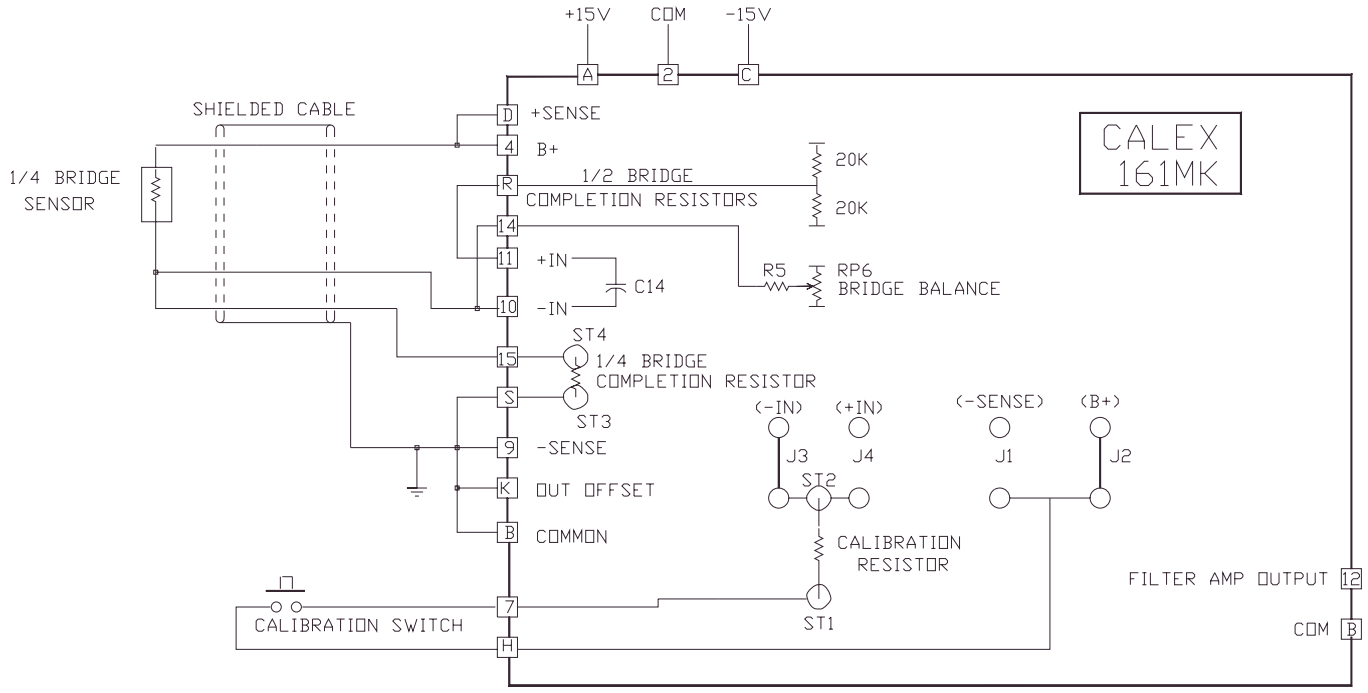


FIGURE 2. Half Bridge 3 Wire Application



C14, A 0.47µF Ceramic or Mylar, may be added to reduce line frequency noise pick up. It limits frequency response to 30 CPS.

FIGURE 3. 1/4 Bridge 3 Wire Compensation

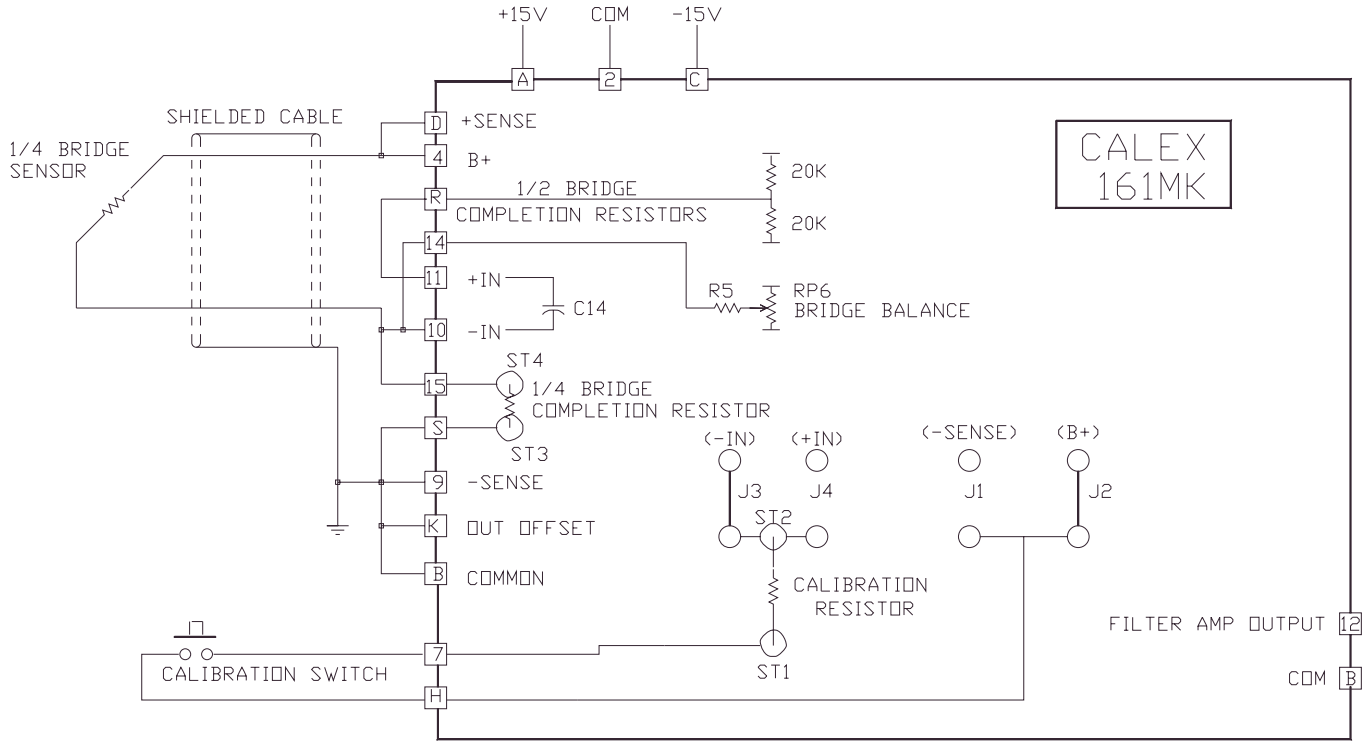


FIGURE 4. Typical 1/4 Bridge Application