

AD50 Differential Amplifier for RS11 & MD33 Engine Monitors

The AD50 is a versatile general-purpose differential amplifier which will interface many common engine sensors to data converter systems such as the RS11 and MD33. Sensors supported include knotmeter (paddle-wheel) transducers, flowmeters, inductive pickups, thermocouples, current shunts, and most other pulsed, analog, or alarm sensors which have low output voltages. The unique feature of differential amplifiers is that they amplify only the difference between their “+/-” inputs and ignore the input DC (common mode) voltage.

The extremely high input impedance of the AD50 will not load down or alter the calibration of most common sensors. Input voltages up to 30 V will not affect the AD50 gain or output. Gain is selectable from 12v/v to 50v/v by proper connection of the Gain (green) wire.

A typical connection for the AD50 to a diesel engine inductive RPM sensor is shown in Figure 1. These sensors produce a pulse as every tooth on the flywheel or gear rotates past the sensor. Pulses may be too weak to be detected until amplified by the AD50.

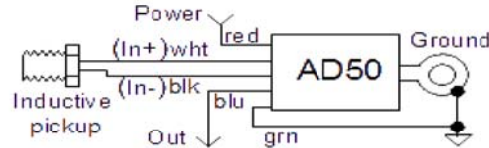


Fig 1 Inductive pickup Amp. Gain=12 v/v

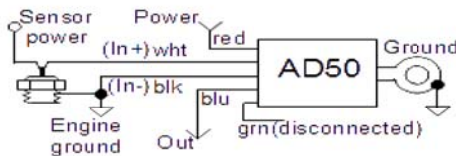


Fig 2 Low-level Sensor Amp. Gain= 20 v/v

Figure 2 shows an amplifier for low level voltage sensor. The sensor is powered externally but produces a low output voltage in need of more amplification. The diagram shows the connection for gain = 20 v/v but gains up to 50 v/v are possible (see “Specifications”).

The AD50 is particularly useful for boosting small differential voltages from sensors such as current shunts and thermocouples, whose outputs can be much less than 100 mV (0.1v). The sensor voltage is amplified by a factor of 50v/v to make it more readily usable by Analog-Digital Converters (ADC’s). The high DC voltage on current shunts does not affect the output of the AD50.

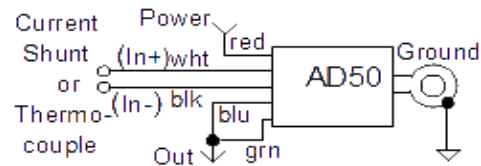


Fig 3 Differential Sensor Amp. Gain= 50 v/v

Connecting the AD50 to an RS11 or MD33 is straightforward. The blue (OUT) wire of the AD50 connects directly to the appropriate analog (A1-A4) input of the engine monitor as shown in Figure 4.

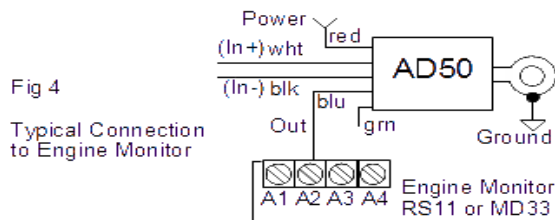
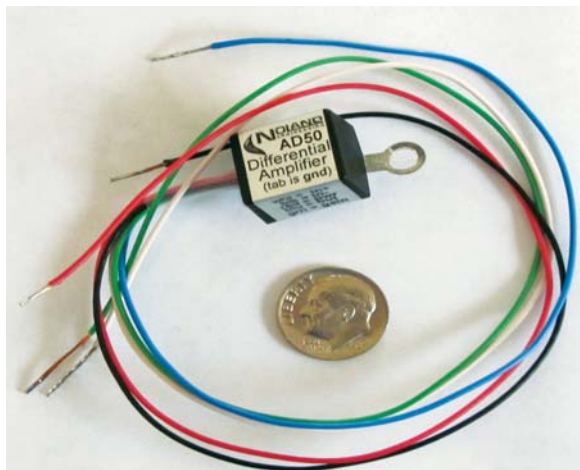


Fig 4
Typical Connection
to Engine Monitor



SPECIFICATIONS

Supply voltage/current	8-30 Vdc / 10 ma.
Max output level	5.5 volts
Input common mode range	-8 to 30 volts
Input impedance	> 100 kOhm
Bandwidth	25 kHz
Voltage gain	12 v/v (Green to 'Ground')
(Green wire connected to...)	20 v/v (Green open)
	50 v/v (Green to 'Out')
Size/weight	0.6" x 1.1" x 0.4" / 1 oz.

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