

FEATURES

- LED Display with Latched Digital Outputs
- Small Size, Lightweight
- Automatic Zero Correction; Max Error: 0.05% +/- 1 Digit
- High Normal Mode Rejection: 40dB @50 or 60Hz
- Optional Ratiometric Operation
- Leading "0" Display Blanking
- 5Vdc Powered

APPLICATIONS

- Medical Scientific/Analytic Instruments
- Data Acquisition Systems
- Industrial Weighing Systems
- Readouts in Engineering Units
- Digital Thermometers

GENERAL DESCRIPTION

The model AD2010 represents an advance in price/performance capabilities of 3½-digit digital panel meters. The AD2010 offers 0.05% ± 1 digit maximum error with bipolar, single-ended input, resolution of 100 μ V, and a common-mode rejection ratio of 60 dB (CMRR) at ± 200 mV (CMV).

The AD2010 features a light-emitting diode (LED) display with a full-scale range of 0 to ± 1999 millivolts, latched digital data outputs and control interface signals, and leading-zero display blanking. Automatic zero-correction circuitry measures and compensates for offset and offset-drift errors, thereby providing virtually zero error. Another useful feature of the AD2010 is its 5 V dc operation. The AD2010 can operate from the user's 5 V dc system supply, thereby eliminating the shielding and decoupling needed for line-powered units when the ac line must be routed near signal leads.

To satisfy most application requirements, the conversion rate of the AD2010 is normally 4 readings per second. However, an external trigger may be applied to vary the sampling rates from a maximum of 24 readings per second down to an indefinite hold time. The AD2010 can also be connected for automatic conversion at its maximum conversion rate. During conversion, the previous reading is held by the latched logic. The numeric readout is available as BCD data. Application of the metering system in a computer or data-logging system is made easy with the availability of the "overrange," "polarity," "overload," and "status" signals. Application of the metering system in a computer or data logging system is made easy with the availability of the "overrange," "polarity," "overload," and "status" signals.

The AD2010/R option for ratiometric operation allows readings to be made of the ratio of two input voltages as well as the absolute value of the input. AD2010/R operation is described in a later section.



A simplified block diagram of the AD2010, illustrating the features described above is shown in Figure 1.

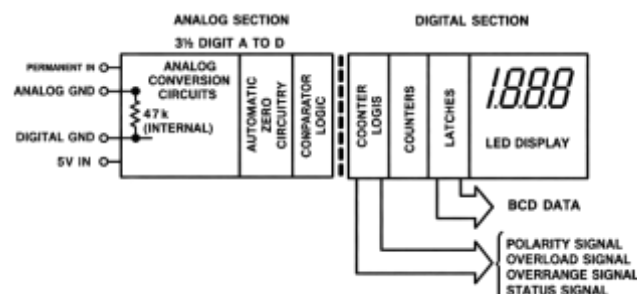


Figure 1. Simplified Block Diagram

IMPROVED NOISE IMMUNITY, ACCURACY AND ZERO STABILITY

Dual-slope integration, as used in the AD2010 and as described in the theory of operation section, offers several design benefits.

- Conversion accuracy, for example, is independent of both the timing capacitor value and the clock frequency, since they affect both the up ramp and down ramp integration in the same ratio.
- Normal mode noise at line frequencies or its harmonics is rejected since the average value of this noise is zero over the integration period.