

# AD7616 DATA ACQUISITION SYSTEM

*A new solution for smart grid distribution equipment that achieves high accuracy while simplifying development and reducing system cost.*



## Applications

- ▶ Power line monitoring
- ▶ Relay protection for low voltage DTUs and FTUs
- ▶ Multiphase motor control
- ▶ Instrumentation and control systems
- ▶ Data acquisition systems

## Accuracy

The **AD7616** can easily achieve Class 0.2 measurement accuracy because its on-chip ADCs have 90 dB of SNR. Higher SNR performance of 92 dB can be achieved by using the on-chip oversampling mode.

## Simplicity

The AD7616 is a 16-bit, data acquisition system that supports dual simultaneous sampling of 16 channels. This input scheme simplifies system design by removing phase shift associated with voltage and current channels. In addition, it operates from a single 5 V supply, which simplifies the power supply design work.

## Reduced System Cost

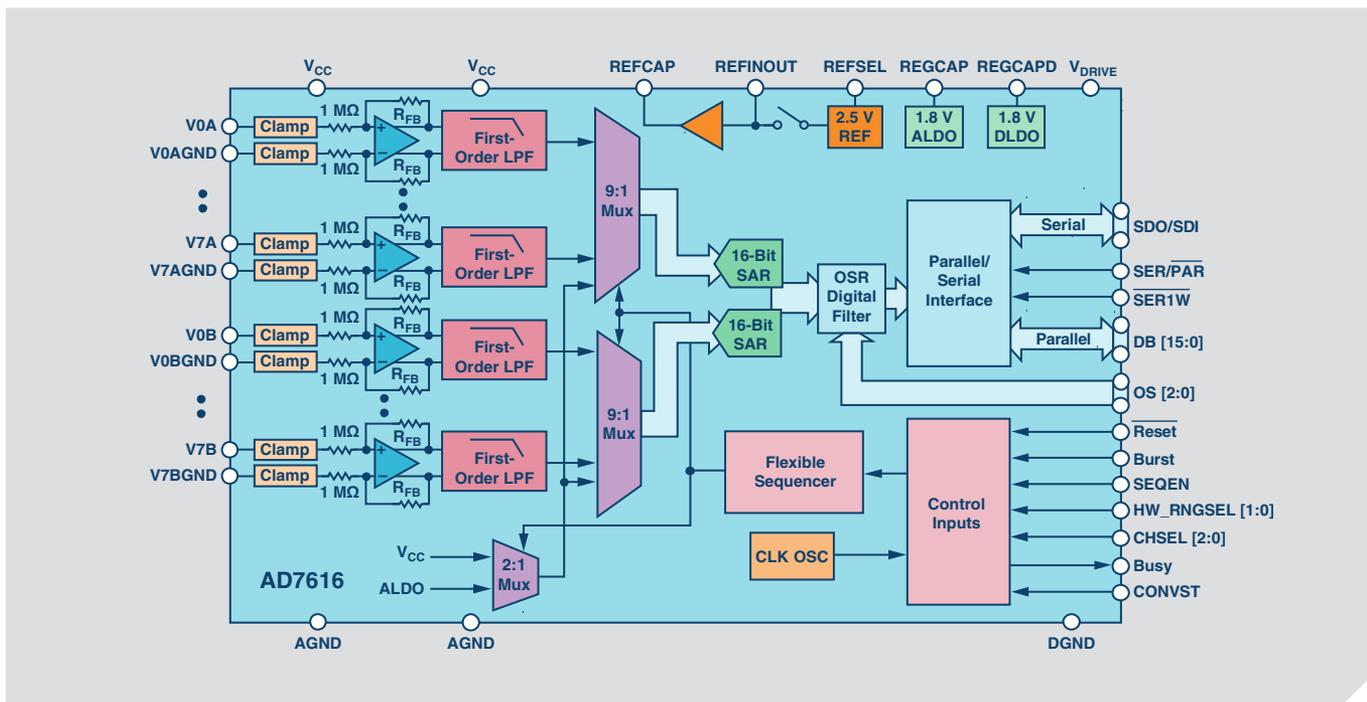
The AD7616 is a 16-channel data acquisition system (DAS) that is highly integrated and can accept a variety of input signal ranges ( $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V). The analog front end features a 1 M $\Omega$ , high impedance, very low drift, input buffer. This eliminates the need for external protection circuits or external signal conditioning ICs, greatly minimizing the system cost and bill of material.

## General Description

The AD7616 is a 16-bit DAS designed for a variety of transmission and distribution applications, including power line monitoring, relay protection for low voltage, distribution terminal units (DTUs), and feeder terminal units (FTUs). It supports dual simultaneous sampling of 16 channels and operates from a single 5 V supply. The AD7616 can accommodate  $\pm 10$  V,  $\pm 5$  V, and  $\pm 2.5$  V true bipolar input signals while sampling at throughput rates up to  $2 \times 1$  MSPS per channel pair with 90 dB SNR. It has 1 M $\Omega$  analog input impedance regardless of sampling frequency. The single-supply operation, on-chip filtering, and high input impedance eliminate the need for driver op amps and external bipolar supplies. Each part contains analog input clamp protection, a dual, 16-bit, charge redistribution successive approximation analog-to-digital converter (ADC), a flexible digital filter, a 2.5 V reference and reference buffer, and high speed serial and parallel interfaces.

## Features

- ▶ 16-channel, dual, simultaneously sampled inputs
- ▶ Independently selectable channel input ranges
- ▶ True bipolar:  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V
- ▶ Single 5 V analog supply and 2.3 V to 5.25 V  $V_{DRIVE}$
- ▶ Fully integrated data acquisition solution
- ▶ Analog input clamp protection
- ▶ Input buffer with 1 M $\Omega$  analog input impedance
- ▶ First-order antialiasing analog filter
- ▶ On-chip accurate reference and reference buffer
- ▶ Dual, 16-bit, SAR ADC
- ▶ Throughput rate:  $2 \times 1$  MSPS
- ▶ Oversampling capability with digital filter
- ▶ Flexible sequencer with burst mode
- ▶ Flexible parallel/serial interface
- ▶ SPI/QSPI™/Microwire™/DSP compatible
- ▶ Optional CRC error checking
- ▶ Hardware/software configuration
- ▶ On-chip self-detect function
- ▶ 80-lead LQFP package



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