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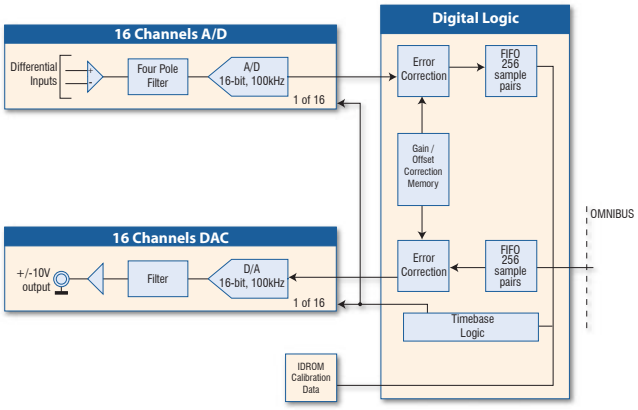
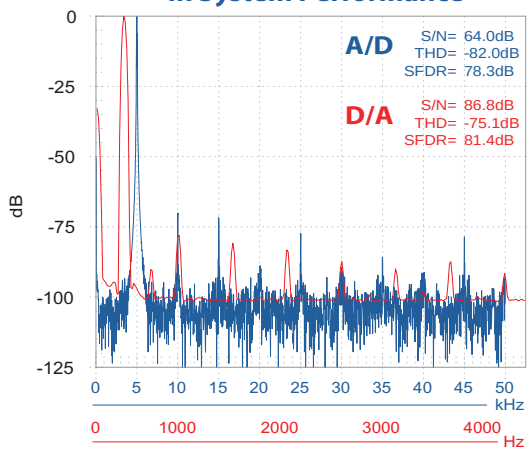
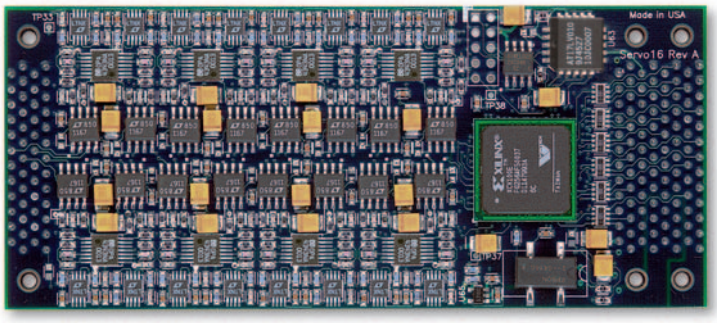
|---|---|
| **Interface** | Compatible with all OMNIBUS host products<br>Consumes one interrupt to host |
| **Power Requirements** | +5V @ 30mA; +15V @ 120mA; -15V @ 120mA;<br>+5V @ 250mA |
| **Physicals** | OMNIBUS mezzanine card; 2.000" X 4.600" |
| **A/D Converters** | 16 Burr Brown ADS8321 successive approximation converters |
| **Resolution** | 16-bit |
| **Update Rate** | 1-100 kHz |
| **Analog Input Range** | +/-10V differential (custom input ranges may be special ordered) |
| **S/N** | 85 dB |
| **THD** | -73 dB |
| **SFDR** | -78 dB |
| **Gain and Offset Error** | Factory calibrated error correction coefficients programmable into FPGA |
| **Differential Linearity Error** | +2.5/-.5 LSB |
| **Input impedance** | 10 MΩ\|\|5 pF |
| **Input Type** | Differential |
| **Filter Characteristics** | 4-pole elliptic Filter<br>3 dB set at 30 kHz. |
| **Conversion Trigger** | Host timers/DDS |
| **Sources** | Memory-mapped 32 bit result returned for each pair. |
| **Interface to host** | Input FIFOs hold to 512 samples. |
| **D/A converters** | 16 Analog Devices AD5544 converters |
| **Resolution** | 16-bit |
| **Output Range** | +/-10V (custom ranges may be special ordered) |
| **Settling Time** | 2 $\mu$sec |
| **THD** | -75 dB |
| **Gain and Offset Error** | Factory calibrated error correction coefficients programmable into FPGA |
| **Smoothing Filter** | Single Pole -3dB set at 50kHz |
| **Differential Nonlinearity Error** | +/- 1.5 LSB |
| **DAC Glitch Energy** | 45 nV-sec typ at MSB transition |
| **Trigger Resources** | Host timers. |
| **Interface to host** | Memory-mapped 32 bit number output for each pair.<br>Output FIFOs hold up to 512 samples. |




## In System Performance




## Servo16 - Analog Measurement and Control

The Servo16 module is perfectly designed for analog measurement and control applications requiring high accuracy and channel density. This module employs sixteen, simultaneous sampling, 100 kHz, 16 bit A/Ds and sixteen, simultaneous update, 100 kHz, 16 bit D/As for an unprecedented analog I/O density. Applications include vibration measurement/control, SONAR and industrial process control to name just a few. The simultaneous sampling is ideal for state-space or MIMO control systems.

Each analog input utilizes Burr Brown ADS8321 A/D converter, a 4-pole analog anti-alias filter, a differential +/-10 Volt input for noise rejection and is DC accurate. An auto-calibration routine stores offset and gain error terms in an FPGA for each channel, allowing accurate measurement.

The sixteen output channels are cleared to 0 Volts at power up or upon reset and have a ±10 Volt output range. The module is also equipped with the ability to simultaneously update all the channels with a single command. The output channels utilize the Analog Devices AD5544 D/A converter and offer software programmable gain and offset error correction capability in the FPGA.

A decimation mode built-in the logic allows the user to discard A/D readings and deliver data at the desired rate but with minimum latency. The DAC has a delayed trigger mode specific for servo applications. This mode allows the DAC to be updated at a fixed time after A/D conversion occurs. The designer can tune this delay so that the servo calculations are done during this delay, and the DAC is therefore updated as soon as possible. This minimizes data latency and CPU interrupts. Overrun and under-run FIFO register assist the developer in optimizing settings and monitoring system at run time.

Software examples demonstrating module operation and communication are included in the Zuma/Armada Toolsets. A full calibration report ships with every module.

## Ordering Information

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| Servo16 | 80020-23 |