Digilent PmodAD5™ Analog to Digital Voltage Converter

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Note: This document applies to REV A of the board

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Overview

The PmodAD5 is a high resolution analog-to-digital converter built around the Analog Devices AD7193 Sigma-Delta ADC.

Features include:

- SPI communication interface
- 24-bit resolution
- fast settling filter
- conversion synchronization
- five filter options
- four differential analog inputs or eight pseudo-differential inputs
- two SMA connector inputs

Functional Description

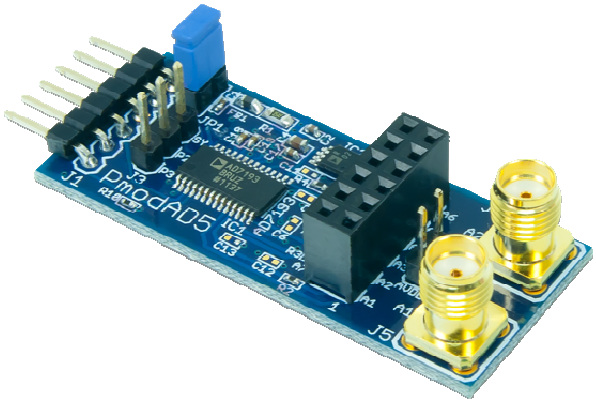
The PmodAD5 has ten analog inputs that correspond to eight data lines. The two SMA female connectors route to inputs one and two, while eight standard female header pins route to inputs one through eight.

Customers can set the PmodAD5 into single or continuous conversion mode. The PmodAD5 powers up by default in continuous conversion mode. You can set the mode to start a conversion by either writing to the appropriate registers or on the rising edge of SYNC.

Note: Please see the AD7193 data sheet, available from www.analog.com, for more detailed information on controlling the A/D Converter.

Serial Interface

The PmodAD5 has a 4-wire SPI communication interface. (See Table 1 for signal descriptions.)



Analog Inputs

The analog inputs (AIN) on the PmodAD5 are configurable as four differential inputs or as eight pseudo-differential inputs. AINCOM serves as a common reference for AIN channels 1 through 8 under the eight pseudo-differential input configuration setting.

When operating the PmodAD5 analog inputs as four differential inputs, the adjacent inputs correspond to positive and negative differential signals. For example, AIN1/ AIN2 represent one positive/negative differential pair and AIN3/AIN4 represent the second positive/negative differential pair.

Connectors J5 and J6 are SMA female analog inputs that correspond to AIN1 and AIN2 respectively.

Reference Supply and GPO

The PmodAD5 has a maximum of four general purpose output (GPO) signals. Operators can access these signals from headers J2 or J3. Please see Table 1 for signal descriptions.

GPO pins 1 and 0 also correspond to REFIN2+ and REFIN2-. These pins can be configured to supply the conversion/calibration reference voltage for the PmodAD5.

The PmodAD5 uses the 2.5VDC reference present on REFIN1+ and REFIN2- by default.

Note: Please see the PmodAD5 schematic, available from www.digilentinc.com, for more detailed information on GPO and Reference Supply routing.

Synchronization

Setting the SYNC pin to a logic low puts the PmodAD5 in a standby state. Once you set the pin to logic high, the PmodAD5 will begin gathering samples. The conversion mode (either single or continuous) must be set previously.

Bridge Power Down Switch

Operators can use the bridge power down switch to control external circuitry driving the analog inputs. Closing this "switch" internally ties the BPDSW signal to ground.

Analog Supply Voltage

Customers can connect an analog supply voltage at header J4, if JP1 remains open. You must keep this external voltage between 3.0V and 5.25V to avoid damaging your device.

Connector Pin #	Pin Name	Description
J1-01	CS	SPI Chip Select. Connect to host ~SS
J1-02	DIN	SPI Data In. Connect to host SDO
J1-03	DOUT/RDY	SPI Data Out. Connect to host SDI
J1-04	SCLK	SPI Clock. Connect to host SCK
J1-05	GND	Ground
J1-06	DVDD	Digital Vdd
J2-01	AIN1	Analog Input 1
J2-02	AIN2	Analog Input 1
J2-03	AIN3	Analog Input 1
J2-04	AIN4	Analog Input 1
J2-05	AIN5	Analog Input 1
J2-06	AIN6	Analog Input 1
J2-07	AIN7	Analog Input 1
J2-08	AIN8	Analog Input 1
J2-09	AINCOM	Analog Input Common, used for pseudo differential signaling with AIN8:1
J2-10	REFIN2+/P1	Positive Reference Input/GPO1.
J2-11	REFIN2-/P0	Negative Reference Input/GP0.
J2-12	BPDSW	Bridge Power Down Switch.
J3-01	SYNC	Synchronization control
J3-02	P2	GPO2
J3-03	P3	GPO3
J4-01	AVDD	Analog Vdd
J4-02	GND	Ground
J5	AIN1	SMA input 1
J6	AIN2	SMA input 2

Table 1. ***Connector Pinout Tables***