Digilent PmodDPOT™ Digital Potentiometer Reference Manual

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Overview

The PmodDPOT allows a Pmod™ compatible host board to control a digital potentiometer. Digilent engineers designed this Pmod around the Analog Devices AD5160 Digital Potentiometer.

Functional Description

For a detailed description of the Analog Devices AD5160 please refer to the device data sheet available at analog.com.

Users can access the PmodDPOT's programmed resistance through two methods. The primary means of access is via a three point screw terminal available on every PmodDPOT. Users may, at their discretion, load a 3-pin MTE cable header as an alternate method of access.

The three terminal contacts are W (the wiper), A, and B. The wiper contact resistance is 60 Ω.

Current flow between the wiper terminal and either terminal A or B must be limited to a pulsed ±20mA or a continuous 4.7mA. Do not apply voltage to any of the terminal contacts (A, W, or B) that exceeds the voltage rail powering the Pmod. Given these current flow limitations users must never apply a voltage to the terminal contacts if a host board is not powering the Pmod.

SPI Interface

The PmodDPOT communicates through a 3-wire Serial Peripheral Interface (SPI) to configure the Analog Devices AD5160. *Note: The Analog Devices AD5160 is write-only*.

Table one describes the Pmod board header pin functions. These are the control signals as named on the AD5160.
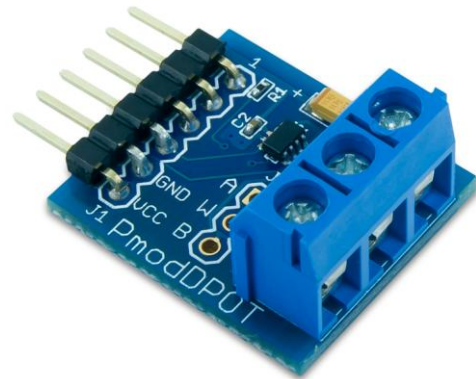
Features include:

- 3-wire SPI™ communication interface
- 10 kOhm nominal resistance with minimal achievable resistance ≈ 60 Ω
- 256 possible resistance settings

To establish a communication interface connect the CS pin to the SS signal and the SDI to the SDO signal on the host board.

Users can configure the AD5160 by sending an 8-bit word to the device via SPI. Users can access maximum resistance between terminal A and W by sending *0xFF*. Users may access the maximum resistance between terminal B and W by sending *0x00*.

Table 1
Interface Connector Signal Description

Connector J1 – SPI Communications		
Pin	**Signal**	**Description**
1	CS	Chip Select
2	SDI	Serial Data In
3	N/A	Not Connected
4	SCLK	Serial Clock
5	GND	Power Supply Ground
6	VCC	Power Supply (3.3V/5V)