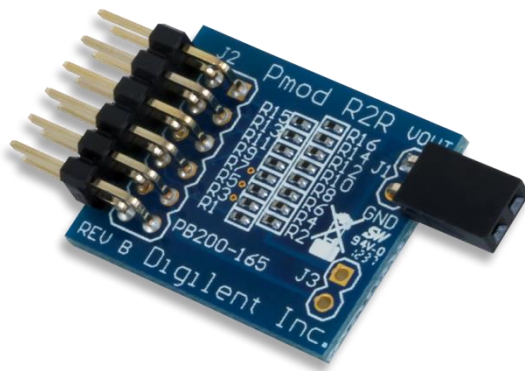# PmodR2R™ Reference Manual

Revised April 12, 2016
This manual applies to the PmodR2R rev. B

Overview

The Digilent PmodR2R is an 8-bit Digital-to-Analog converter. It may not look as sleek and professional as some of the other DACs that are out there, but on a fundamental level that is easy to see, this Pmod does exactly the same thing as its counterparts.

Features include:

- 8-bit digital-to-analog conversion
- Convert data at up to 25MHz
- Easy attachment of oscilloscopes to illustrate the data conversion process
- Small PCB size for flexible designs 1.0" × 0.8" (2.54 cm × 2.0 cm)
- 2×6-pin Pmod port with GPIO interface
- Follows Digilent Interface Specification Type 1

The PmodR2R.

1 Functional Description

The PmodR2R accepts 8 bits in parallel, either at a logic low or high voltage, which then go through a resistor ladder to output a desired voltage. The "R2R" resistor ladder is one of the most popular ways that digital-to-analog converters take a set of digital inputs and create a single analog output, requiring just two resistor values of R and 2*R. Because this Pmod only uses 10K Ω and 20K Ω resistors, very little current is drawn from the input pins.

2 Interfacing with the Pmod

The PmodR2R communicates with the host board via the GPIO protocol. Each of the 8 input pins are expected to send out either a logic high or logic low voltage signal in such a way that represents the desired binary ratio of the full analog output.

Header J1			
Pin Number (top row)	**Description**	**Pin Number (bottom row)**	**Description**
1	Data Bit 0	7	Data Bit 4
2	Data Bit 1	8	Data Bit 5
3	Data Bit 2	9	Data Bit 6
4	Data Bit 3	10	Data Bit 7
5	Ground	11	Ground
6	VCC	12	VCC

Table 1. Pinout description table.

3   Physical Dimensions

The pins on the pin header are spaced 100 mil apart. The PCB is 1 inch long on the sides parallel to the pins on the pin header and 0.8 inches long on the sides perpendicular to the pin header.