

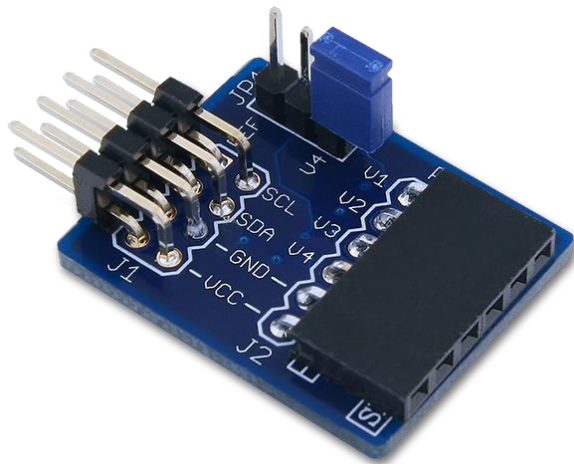
## PmodAD2™ Reference Manual

Revised May 24, 2016

This manual applies to the PmodAD2 rev. A

### Overview

The PmodAD2 is an analog-to-digital converter powered by the [Analog Devices AD7991](#). Users may communicate with the board through I<sup>2</sup>C to configure up to 4 conversion channels at 12 bits of resolution.



*The PmodAD2.*

Features include:

- Up to four 12-bit analog to digital converter channels
- On-board 2.048 V voltage reference
- Jumper selectable reference input
- Small PCB size for flexible designs (1.0 in × 0.8 in)(2.5 cm × 2.0 cm)
- Follows [Diligent Interface Specification](#)
- Library and example code available in [resource center](#)

## 1 Functional Description

The PmodAD2 utilizes Analog Devices<sup>®</sup> AD7991 to provide up to four channels of 12-bit analog-to-digital conversion.

## 2 Interfacing with the Pmod

The PmodAD2 communicates with the host board via the I<sup>2</sup>C protocol. System boards are able to call the Pmod by sending out the device address of 0b0101000 followed by the appropriate read or write bit. If a write bit is chosen, users may then configure the on-board chip to only use certain channels or may immediately start reading the 12 bits of data from the 16-bit data register if the read bit is sent.

Unlike other devices that use I<sup>2</sup>C, no addresses are associated with these two registers; only the read/write bit at the end of the slave address distinguishes between the two registers. By default, all four channels have analog-to-

digital conversions performed on them sequentially with the supply voltage VCC acting as the voltage reference for the ADC.

After each conversion is performed, the device places itself into power-down mode. Upon a read command, the device will wake itself up and prepare for a conversion, which takes approximately 0.6  $\mu$ s. The actual conversion process takes approximately 1.0  $\mu$ s.

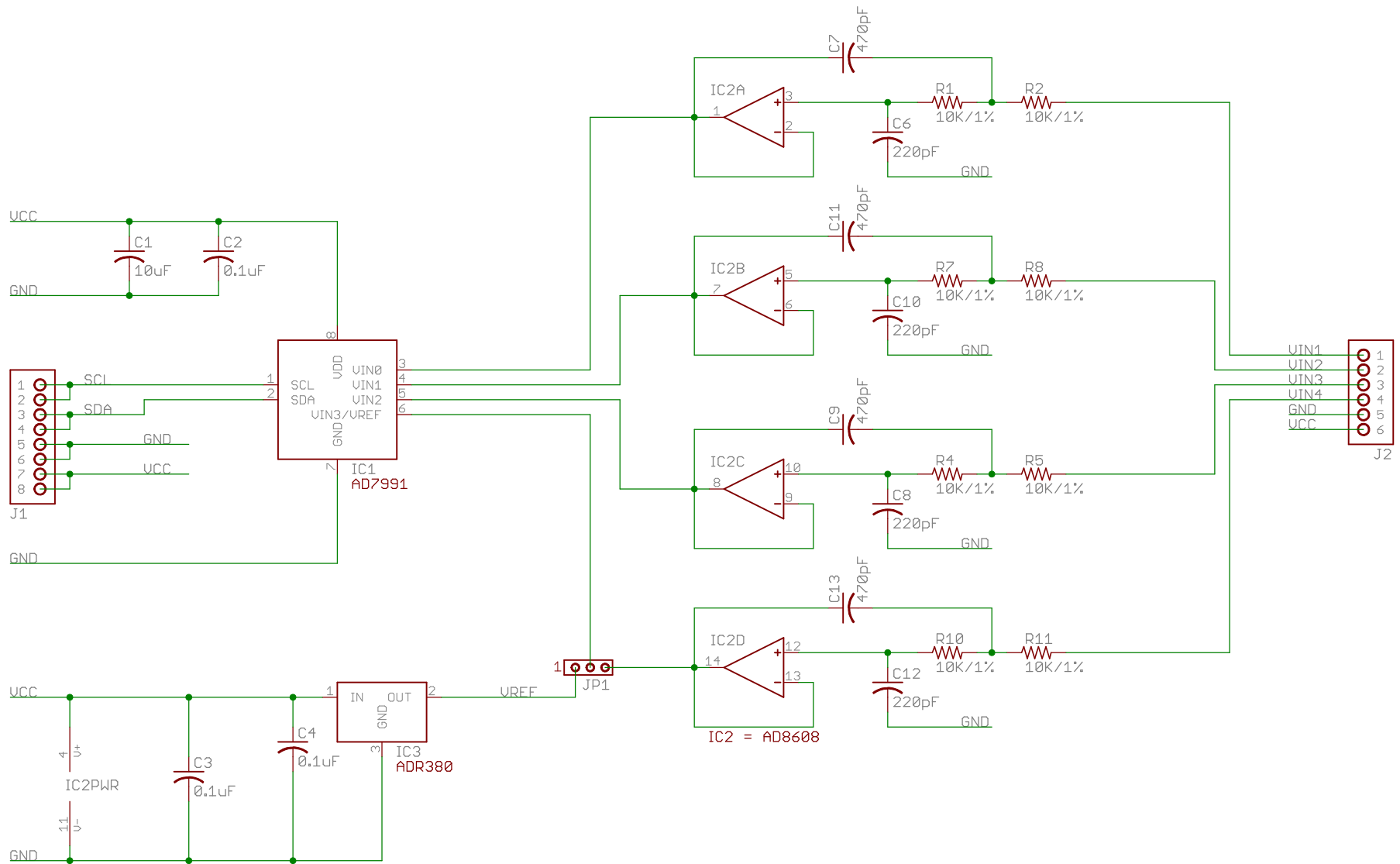
Pin	Signal	Description
1 & 5	SCL	Serial Clock
2 & 6	SDA	Serial Data
3 & 7	GND	Power Supply Ground
4 & 8	VCC	Power Supply (3.3V/5V)

Table 1. Pinout description table.

Any external power applied to the PmodAD2 must be within 2.7V and 5.5V; however, it is recommended that the Pmod is operated at 3.3V.

### 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.



For more information on the parts used in this design, please refer to:  
[www.analog.com/AD7991](http://www.analog.com/AD7991) - 4-Channel, 12-Bit ADC with I2C Compatible Interface  
[www.analog.com/AD8608](http://www.analog.com/AD8608) - Precision, Low Noise, CMOS, Rail-to-Rail, Input/Output Operational Amplifier  
[www.analog.com/ADR380](http://www.analog.com/ADR380) - 2.048V Bandgap Voltage Reference

### Digilent PmodAD2

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