



This version (09 Nov 2020 07:14) was **approved** by jessedanielsantos.

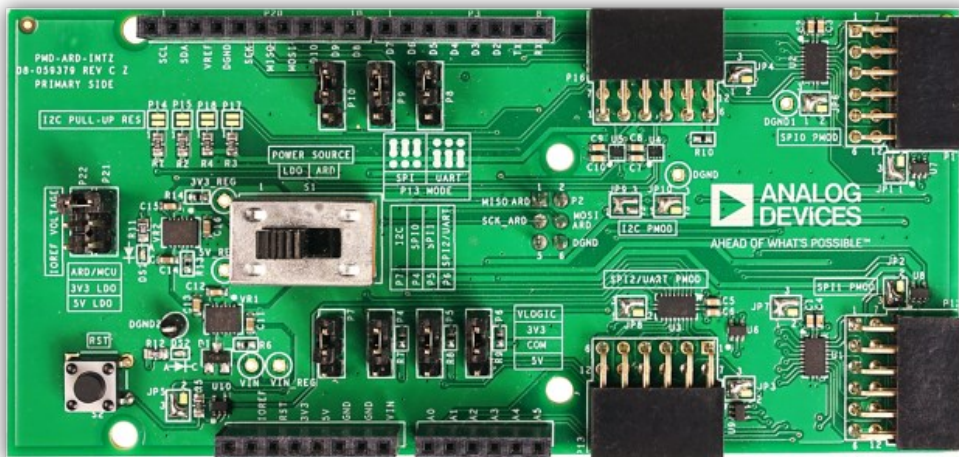
# PMD-ARD-INTZ Hardware User Guide

## Overview

Arduino interface is found on many development platforms and is used on many prototype designs. The Pmod standard is a 6,8, or 12-pin standard that carries GPIO and/or serial communication protocols. PMD-ARD-INTZ enables four Pmod modules to interface with **EVAL-ADICUP3029** / **EVAL-ADICUP360** development boards or any equivalent Arduino MCU boards. Out of the four Pmod ports, two is configured as SPI Pmod, one is I<sup>2</sup>C Pmod, the other one can be configured as either SPI or UART Pmod.

### Table of Contents

- ◆ [PMD-ARD-INTZ Hardware User Guide](#)
- ◆ [Overview](#)
- ◆ [General Setup](#)
  - ◆ [Power Source Settings](#)
  - ◆ [Logic Voltage Settings](#)
  - ◆ [Reset Logic Active State](#)
- ◆ [Pmod Interface Types](#)
  - ◆ [SPI Ports](#)
  - ◆ [I<sup>2</sup>C Port](#)
  - ◆ [UART Port](#)
- ◆ [Schematic, PCB Layout, Bill of Materials](#)



## General Setup

### Power Source Settings

The circuit is powered either by the voltages coming from the Arduino headers or the input DC voltage supplied from the barrel jack of the MCU baseboard. Switch S1 is used to choose where the system voltages (3.3V and 5V) is sourced from.

Positioning S1 to ARD will cause the board to use voltage supplied from the MCU baseboard headers. Positioning S2 to LDO uses the DC voltage supplied from the barrel jack of the MCU baseboard, then regulated by LT1763-3.3 and LT1763-5 to provide the 3.3V and 5V system voltage respectively.

A green LED (labeled DS1) should be lit to indicate that the board is powered up.

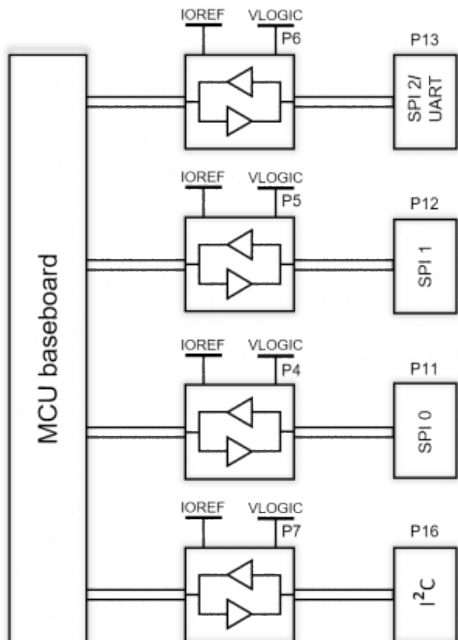


Recommended external supply voltage is 7 to 13 volts.



## Logic Voltage Settings

Each Pmod port has bidirectional voltage level translators. This enables compatibility with Pmod modules and MCU baseboards that has different logic voltage levels.



The logic voltage level of each Pmod port can be set to either 3.3V or 5V using the shunt connectors P4,P5,P6, and P7.

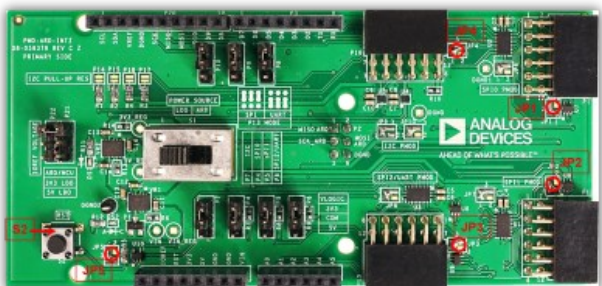


Meanwhile, the logic voltage source of the MCU baseboard can be chosen from the IOREF from the MCU baseboard header and the 3.3V and 5V system voltages using the shunt connector between P22 and P21 (encircled blue in Fig D). Preferably, this should be set to IOREF to ensure a proper voltage setting.



## Reset Logic Active State

The reset button (S2) on PMD-ARD-INTZ resets the MCU baseboard and all of the Pmod ports simultaneously. By default, the reset pins are **Active Low** and can be changed to an **Active High** using solder jumpers JP1, JP2, JP3, JP4 for the Pmod ports and JP5 for the MCU.



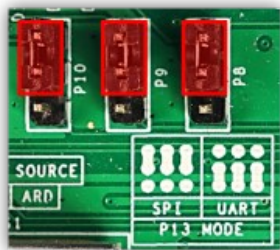
# Pmod Interface Types

The Pmod connectors on the PMD-ARD-INTZ follow the latest [Digilent Pmod Interface Specifications-1.2.0](#). Pin assignments are adapted from Arduino UNO pin assignments. Different MCU baseboards have different pinouts. If a different MCU baseboard is used, use the Arduino UNO pinout as a reference to determine the proper pin number for your MCU baseboard.

## SPI Ports

Pmod ports (P11, P12, and P13) follow the expanded SPI interface. P11 and P12 are dedicated SPI ports while P13 can be configured to either expanded SPI or expanded UART. To configure P13 as expanded SPI, set the shunt connectors P8, P9, and P10 similar to the encircled in Figure A.

Pin No.	P11: SPI 0	P12: SPI 1	P13: SPI 2
1	D10 (CS)	D9 (CS)	D8 (CS)
2	D11 (MOSI)	D11 (MOSI)	D11 (MOSI)
3	D12 (MISO)	D12 (MISO)	D12 (MISO)
4	D13 (SCK)	D13 (SCK)	D13 (SCK)
5	GND	GND	GND
6	VCC	VCC	VCC
7	D6 (GPIO/INT)	D5 (GPIO/INT)	D4 (GPIO/INT)
8	RST	RST	RST
9	A5 (GPIO/CS2)	A3 (GPIO/CS2)	A1 (GPIO/CS2)
10	A4 (GPIO/CS3)	A2 (GPIO/CS3)	A0 (GPIO/CS3)
11	GND	GND	GND
12	VCC	VCC	VCC

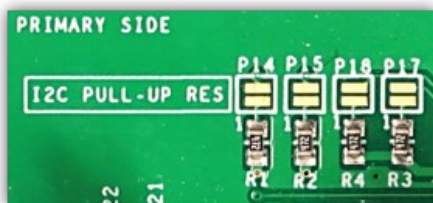


## I<sup>2</sup>C Port

Pmod port (P16) is designed to interface to both old and new I<sup>2</sup>C modules. The older versions of I<sup>2</sup>C pmod (2x4 connector) should be attached to pins 3-4 and 9-10 of P16 and new versions of I<sup>2</sup>C pmod (1x6 connector) should be attached to pins 1-6 or pins 7-12 of P16 as shown in the table below.

Pin No.	P16: New I <sup>2</sup> C	P16: Old I <sup>2</sup> C
1	D3 (INT)	-
2	RST	-
3	D19 (SCL)	D19 (SCL)
4	D18 (SDA)	D18 (SDA)
5	GND	GND
6	VCC	VCC
7	D3 (INT)	-
8	RST	-
9	D19 (SCL)	D19 (SCL)
10	D18 (SDA)	D18 (SDA)
11	GND	GND
12	VCC	VCC

Pull-up resistors (4.7 kΩ) for SCL and SDA lines are also provided. Apply a short on solder jumpers P14, P15, P17, and P18 to use the pull-up resistors.



## UART Port

Pmod port (P13) can be reconfigured between an expanded SPI and expanded UART. To configure P13 as expanded UART, set the shunt connectors P8, P9, and P10.

Pin No.	P13: UART
1	D8 (CTS)




Pin No.	P13: UART
3	D0 (TX)
4	D2
5	GND
6	VCC
7	D4 (GPIO/INT)
8	RST
9	A1 (GPIO)
10	A0 (GPIO)
11	GND
12	VCC



## Schematic, PCB Layout, Bill of Materials

### PMD-ARD-INTZ Design & Integration Files



-  [Schematics](#)
-  [Bill of Materials](#)
-  [Allegro Project](#)

[resources/eval/user-guides/pmd-ard-intz.txt](#) · Last modified: 04 Sep 2020 08:50 by jessedanielsantos