

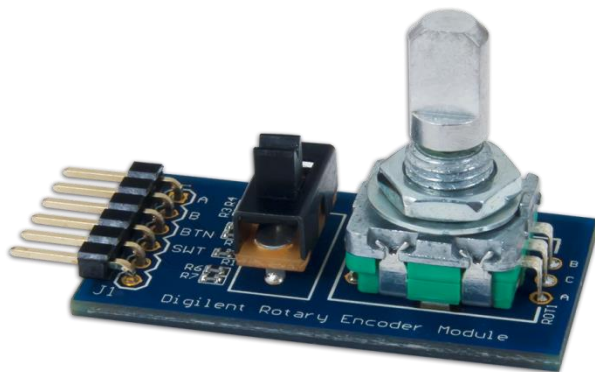
PmodENC™ Reference Manual

Revised April 12, 2016

This manual applies to the PmodENC rev. A

Overview

The Digilent PmodENC features a rotary shaft encoder with an integral push-button to provide multiple types of outputs. The module also includes a sliding switch that is commonly used as an on/off output. An encoder is commonly used in freely rotating volume knobs to detect how many “clicks” a knob has been rotated.



The PmodENC.

Features include:

- Rotary push-button shaft encoder
- Add multiple types of user input to host board or project
- Additional static slide switch
- Small PCB size for flexible designs 1.5 in × 0.8 in (3.8 cm × 2.0 cm)
- 6-pin Pmod port with GPIO interface
- Follows Digilent Pmod Interface Specification Type 1
- Library and example code available in [resource center](#)

1 Functional Description

The PmodENC utilizes a rotary shaft encoder as a way for users to quickly switch between multiple options such as choices shown on a screen or predefined motors speeds. An integral push-button on the shaft as well as a slide switch allow for a highly configurable Pmod.

2 Interfacing with the Pmod

The PmodENC communicates with the host board via the GPIO protocol. It provides four inputs to the system board; the two buttons internal to the encoder that are in quadrature with each other as well as the integral push button on the shaft and the slide switch. A system board will read the integral push button and the slide switch at a logic low voltage in their native (or off in the case of the switch) states.

The two internal buttons are both natively pulled to a logic high level through a pull-up resistor. As the two buttons are located 90 degrees from each other (i.e. in quadrature), while the shaft is rotating one button will be pulled to a low logic level voltage before the other button.

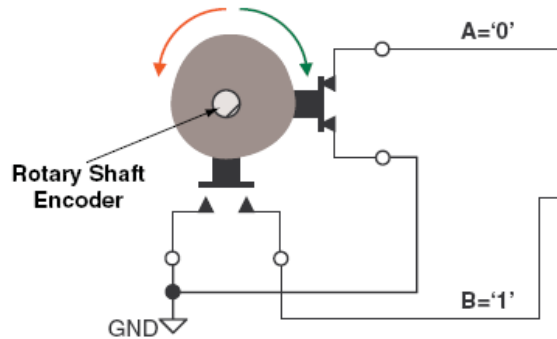


Figure 1. Rotary shaft encoder circuitry.

Users can program their system boards to determine which button was pulled low last (within a small time frame to ensure additional “clicks” are not also captured) in order to figure out which direction the shaft is being rotated.

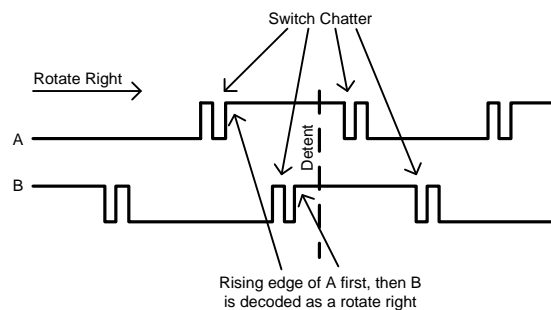


Figure 2. Timing of outputs A and B.

2.1 Pinout Description Table

Pin	Signal	Description
1	A	Output of button A in the encoder shaft
2	B	Output of button B in the encoder shaft
3	BTN	Output of the integral push button in the encoder shaft
4	SWT	Output of the on board switch
5	GND	Power Supply Ground
6	VCC	Positive Power Supply (3.3/5V)

It is recommended that Pmod is operated at 3.3V or 5V, although because there are no integrated circuits on the Pmod, any voltage that your system board can handle as a digital input will work fine.