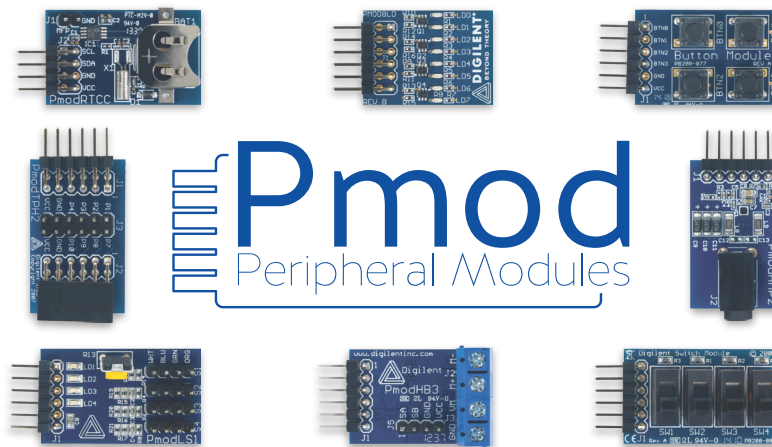


Pmod™ Peripheral Modules

Flexible add-on boards for all your designs.

What are they, and why use them?

Pmods are small I/O interface boards that offer an ideal way to extend the capabilities of programmable logic and microcontroller boards. They allow sensitive signal conditioning circuits and high-power drive circuits to be placed where they are most effective – near sensors and actuators. Pmods enable more effective design partitions by routing analog signals and power supplies only where they are needed and away from digital controller boards.



How do they work?

Pmods communicate with system boards using 6, 8 or 12-pin connectors that are designed to plug directly into Pmod host ports. Take advantage of standard communication protocols including SPI, I²C, UART and GPIO.



How do I use them?

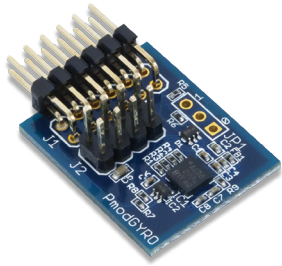
Through the Pmod Standard users know what to expect from their Pmod. The Pmod Standard lays out guidelines for form factor, communication protocols and interface specification, as well as access to a target audience through reference manuals, code examples, user guides, and technical support.



You can learn more about the Pmod Standard by visiting the Pmod resource center at:
reference.digilentinc.com

Featured Pmods

With Digilent's diverse line of over 60 peripheral modules, you can augment the capabilities of your system board by adding sensors, data conversion, communication, actuators, user input and more. Here are some of our customers' favorites.



PmodGYRO

3-axis MEMS digital gyroscope

Highly customizable, the PmodGYRO provides angular momentum data with user selectable resolution (250/500/2000dps), two customizable interrupt pins and user configurable signal filtering. The PmodGYRO is one of many sensors available for enabling interaction with the physical world.

Other features include:

- 6"-255" detection range
- Continuous measurement (free run) operation
- Small PCB size for flexible designs (0.9" x 0.8")
- 6-pin Pmod connector with UART interface
- Library and example code available for getting started



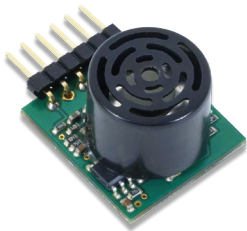
PmodGPS

Ultra sensitive GPS module (-165dBm)

Add 3m 2D accuracy to any embedded system with this ultra-sensitive (-165dBm) GPS module. Applications include personal positioning, marine and automotive navigation.

Other features include:

- Up to 10Hz update rate
- Low power consumption
- Small PCB size for flexible designs (2.0" x 0.8")
- 6-pin Pmod connector with UART interface
- Library and example code available for getting started



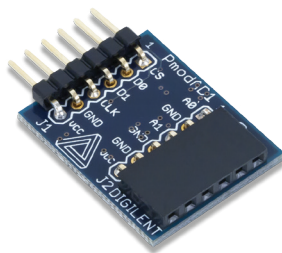
PmodMAXSONAR

Ultrasonic range finder

Back by popular demand, the PmodMAXSONAR enables users to measure how far away an object is to an accuracy of 1" at distances up to 20 feet! With this versatile Pmod, data can be sent as a 5-byte UART serial output, analog output or pulse width output.

Other features include:

- 6"-255" detection range
- Continuous measurement (free run) operation
- Small PCB size for flexible designs (0.9" x 0.8")
- 6-pin Pmod connector with UART interface
- Library and example code available for getting started



PmodAD1

Two channel 12-bit analog-to-digital converter

Representing Digilent's selection of data conversion modules, the PmodAD1 is a simple yet effective device. At a resolution of up to one million samples per second (MSa) the AD1 excels in even the most demanding audio applications.

Other features include:

- Simultaneous 12-bit data conversion on two channels
- Two 2-pole Sallen-Key anti-alias filters
- Small PCB size for flexible designs (0.95" x 0.8")
- 6-pin Pmod connector with GPIO interface
- Library and example code available for getting started



PmodHB5

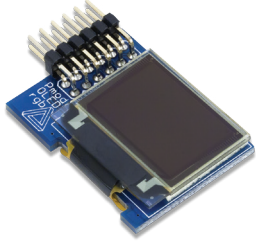
2A H-bridge circuit

Our most popular motor driver, the PmodHB5 was designed with a 6-pin JST connector for direct connection to Digilent motor-gearboxes. Drive a DC motor with operating voltage up to 12V with this 2A H-bridge circuit.

Other features include:

- Two screw terminals for external motor power supply
- Small PCB size for flexible designs (1.2" x 0.8")
- 6-pin Pmod connector with GPIO interface
- Libraries and example code available for getting started

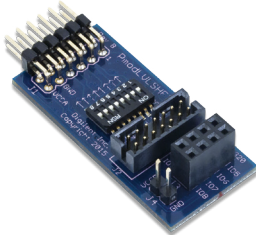
New Pmods



PmodOLEDrgb

96 x 64 pixel RGB OLED screen

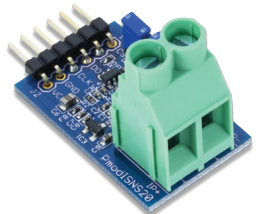
Just released! Create detailed images with our newest Pmod display option. The PmodOLEDrgb features a 0.8" x 0.5" graphical display with 16-bit color resolution, a 12-pin Pmod connector with SPI interface and two low-power shutdown modes perfect for battery operated applications.



PmodLVLSHFT

Digital logic level shifter

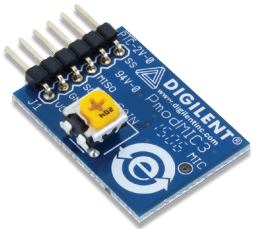
The PmodLVLSHFT is a digital logic level shifter ideal for users who want to supply logic signals following a 3.3V CMOS standard but have an alternate logic level output that is used for other applications such as JTAG programming. Features include 2x7 JTAG header, 8 miniature switches to dictate logic level conversion, 1.8V-5.5V range and 12-pin Pmod connector with GPIO interface.



PmodISNS20

High accuracy current sensor

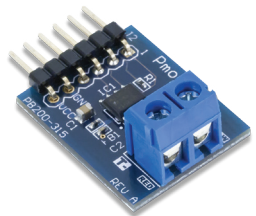
Measure current from a $\pm 20A$ DC or AC input accurate to within $\pm 2\%$. The PmodISNS20 is perfect for a range of applications including over-current protection, power metering and closed loop current control. Other features include 12-bit ADC, 120Hz/20kHz/80kHz jumper selections and 6-pin Pmod connector with SPI interface.



PmodMIC3

Small MEMS microphone module

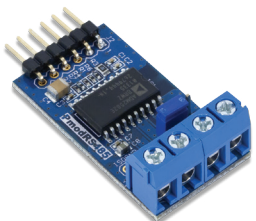
Capture audio input with this small MEMS microphone module featuring a 12-bit A/D converter and on-board potentiometer for adjustable gain. Other features include up to 1 MSPS of data and 6-pin Pmod connector with SPI interface.



PmodTC1

Accurate K-type thermocouple with digital output

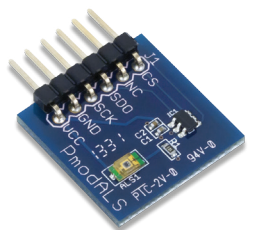
With the provided K-type thermocouple wire, users can measure a wide range of temperatures from $-73^{\circ}C$ to $482^{\circ}C$, although the board itself is capable of an even wider range of $-270^{\circ}C$ up to $1372^{\circ}C$. Features include $\pm 2^{\circ}C$ accuracy from $-200^{\circ}C$ to $700^{\circ}C$, $0.25^{\circ}C$ resolution, cold-junction temperature compensation and 6-pin Pmod connector with SPI interface.



PmodRS485

High-speed RS-485 communication module

Achieve signal and power isolation across long distances and in environments with high electrical noise. The PmodRS485 features isolated RS-485/RS-422 interfaces, 16Mbps maximum data rate, ability to connect up to 256 nodes on one bus, differential half or full-duplex communication, thermal shutdown and $\pm 15kV$ ESD protection as well as a 6-pin Pmod connector with UART interface.



PmodALS

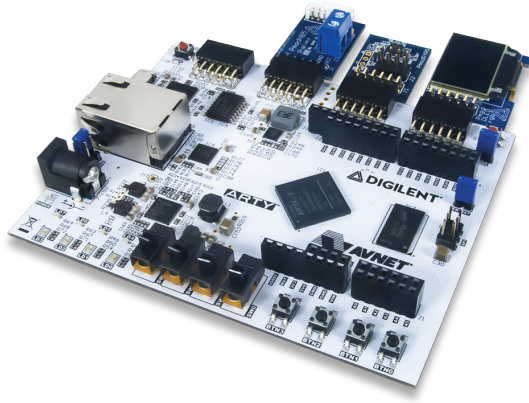
Simple ambient light sensor

Perform light-to-digital conversion with this simple ambient light sensor. Features include 8-bit resolution and 6-pin Pmod connector with SPI interface.

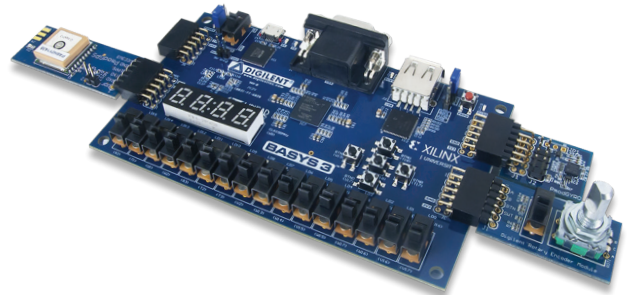
The Pmod Ecosystem

The Pmod Ecosystem: Bridging your FPGA or microcontroller board to the physical world through hardware design and software support. It's our goal to get users up and running with useful data in just a matter of minutes. Need some help? You'll find libraries and example designs on the Digilent wiki.

Pmod connectors are designed to plug directly into Pmod host ports on all Digilent FPGA boards.

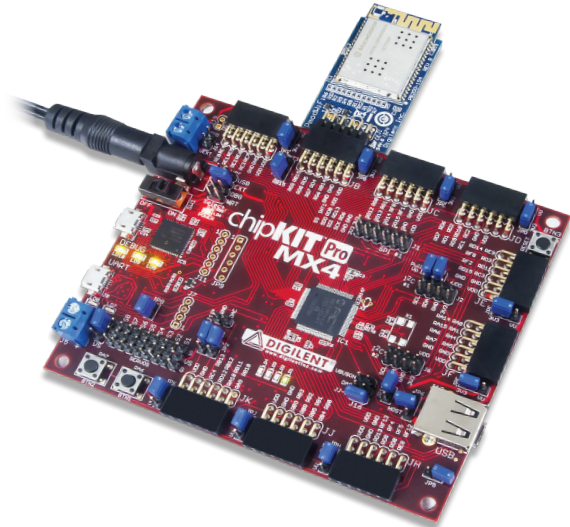


Arty board with four 2x6-pin Pmod host ports

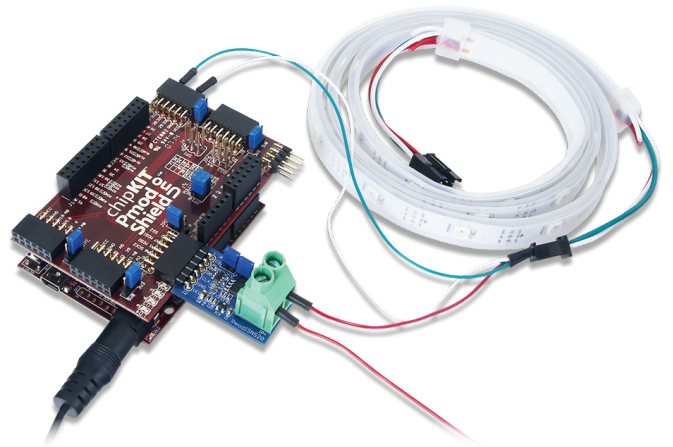


Basys 3 board with four 2x6-pin Pmod host ports

You can find Pmod host ports on our microcontroller boards as well.



chipKIT Pro MX4 board with nine 2x6-pin Pmod host ports



The chipKIT Pmod Shield Uno adds five 2x6-pin Pmod host ports to the chipKIT Uno32

We also carry a growing line of Pmod accessories and related products.



PCB ruler, Pmod clip, UART crossover cable, 6 & 12-pin Pmod extension cables, 6-pin MTE cable, SMA-to-alligator cable, DC motor/gearbox

Pmods by Function

Our ample assortment of Pmods are grouped into six different categories based on their functionality; input, output, communication, connector, power, and miscellaneous. These categories contain audio amplifiers, GPS receivers, seven-segment displays, accelerometers, analog-to-digital converters, and much more!

PmodACL



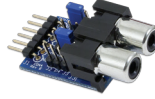
PmodOLEDRgb



PmodWiFi



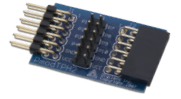
PmodCON4



PmodISNS20



PmodTPH2



Input

These Pmods primarily collect information about the outside world, either inherently like the **PmodACL** or those that require a physical input such as the **PmodKYPD**, and submit the information to the host board by using their assigned communication protocol.

Output

These Pmods primarily output information that was given to them by the host board. Examples of this style of Pmod include visual Pmods such as the **PmodCLS**, the **PmodHB5** to drive motors, and the **PmodDA4** to get a desired analog output.

Communication

These Pmods are capable of sending and receiving data to communicate with a host board. By enabling access to an outside source or system, communication Pmods augment the capabilities of any project; internet access with the **PmodWiFi**, additional flash memory through the **PmodSF2**, even an external serial port with the **PmodRS232**!

Connector

Connector Pmods are designed to offer a solution for mechanical connectivity, allowing the user to choose a Pmod based on its specific application, such as the **PmodCON4**, and properly connect between an external source and the host system.

Power

These Pmods provide a hassle-free approach to routing external power to an outside component while protecting the host board from damage.

Miscellaneous

The Pmods within this category have unique characteristics and extra peripheral functions that set them apart from the standard classification.

Complete Pmod List

ACL	3-axis digital accelerometer module.	8LD	Eight high-brightness LEDs in a compact package.	RS232	A serial interface module for UART communication.
ACL2	Ultra-low power 3-axis MEMS accelerometer.	AMP2	High efficiency, 2.5 watt class-D mono audio amplifier.	RS485	For all your isolated communication needs.
AD1	Two channel, 12-bit analog-to-digital converter module.	AMP3	Digital input, 2 watt class-D stereo audio amplifier.	SD	Read from & write to SD memory cards of any capacity.
AD2	Four channel, 12-bit analog-to-digital converter module.	CLP	16 x 2 character LCD with a simple parallel interface.	SF	16Mbit Serial Flash for accessible non-volatile storage.
AD5	24-bit analog-to-digital conversion on 4 or 8 inputs.	CLS	16 x 2 character LCD supporting SPI, I ² C, & UART protocols.	SF2	16MB PCM memory for accessible non-volatile storage.
ALS	An easy-to-use ambient light sensor.	DA1	Four channels of 8-bit digital-to-analog conversion.	USBUART	USB to serial UART interface, the perfect replacement for RS232.
BTN	Four momentary push buttons for easy user I/O.	DA2	Two channels of 12-bit digital-to-analog conversion.	WiFi	WiFi communication for Microchip®-powered host boards.
CDC1	Learn capacitance-to-digital conversion with two "button" pads.	DA3	Single channel, 16-bit digital-to-analog conversion.	BB	Convenient breadboard prototyping for your Pmod projects.
CMPS	Accurate 3-axis digital compass with an I ² C interface.	DA4	Eight channels of 12-bit digital-to-analog conversion.	CON1	Route your project's data signals to screw terminals.
ENC	Rotary encoder with integral pushbutton for easy user I/O.	DHB1	Dual H-bridge module that drives 2 DC motors or 1 stepper motor.	CON3	Drive up to four R/C servo motors from your system board.
GPS	Accurate satellite positioning for any embedded system.	DPOT	A 256 position SPI-compatible digital potentiometer.	CON4	Two RCA jacks plus convenient signal routing.
GYRO	Three-axis digital gyroscope + temperature sensor.	HB3	2A H-bridge module with external feedback support.	DIP	Use your Pmods in DIP sockets and solderless breadboards.
IA	Measure your circuits' impedance over an I ² C interface.	HB5	2A H-bridge module with external feedback support.	IOXP	I/O expander with 19 configurable I/Os & an I ² C interface.
JSTK	2-axis joystick with three pushbuttons and two LEDs.	I²S	Take digital audio in any major format and output to a headphone jack.	I²LSHFT	Fully-configurable digital logic level shifter.
KYPD	16-button hexadecimal keypad with a simple interface.	LED	Four high-bright LEDs in a compact package.	PS2	Add a standard PS/2 mouse/keyboard port to your project.
LS1	Four-input infrared light sensor, perfect for line-followers.	OLED	Compact, easy-to-read OLED graphic display.	RJ45	Extend your 6-pin Pmod connections greater distances via an RJ-45 cable.
MAX-SONAR	Ultrasonic range detector with one-inch resolution.	OLEDrgb	96 x 64 pixel graphical OLED with 16-bit color.	ISNS20	Quick, accurate current sensing with a digital SPI interface.
MIC3	A handy MEMS microphone with adjustable gain.	R2R	Resistor ladder based 8-bit digital-to-analog converter.	OC1	Four open-collector BJT's to drive high current applications.
RTCC	A real-time clock / calendar with battery backup.	SSD	Two digit, high-bright seven segment display for clear output.	OD1	Four open-drain MOSFETs to drive high current applications.
SWT	Four slide switches for basic I/O.	STEP	Stepper motor driver for any 4 or 6-pin stepper motor.	PMON1	System power monitor using a standard I ² C interface.
TC1	Accurate thermocouple module with 14-bit resolution.	BT2	Full-featured Bluetooth radio with a simple UART interface.	TPH	An easy way to test signals between a Pmod and its host.
TMP2	Temperature sensor / thermostat control module.	NIC100	A complete Ethernet interface for your Digilent board.	TPH2	An easy way to test signals between a Pmod and its host.
TMP3	Temperature sensor accurate to within ±1°C.	RF2	Add IEEE 802.15.4 RF communication to your project.		

Key: **Input** **Output** **Communication** **Connector** **Power** **Miscellaneous**



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