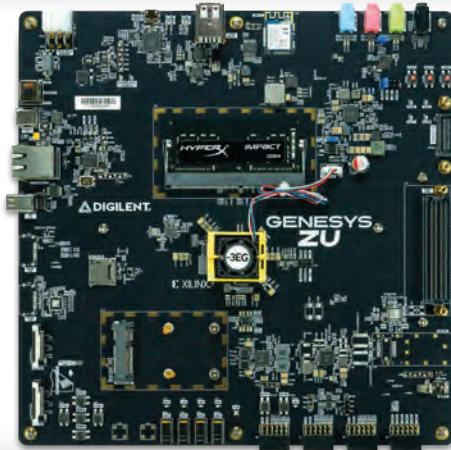




DIGILENT®

A National Instruments Company



2020 Product Catalog

About Us

Dear Engineers,

Despite global challenges and the threat of an industrial recession, 2019 proved to be another great year for Digilent and we're poised to do big things in 2020. Our Discovery family of products continues to be a beacon in the portable instrumentation market with industry-leading value and unbeatable software flexibility. With the addition of the **Analog Discovery Studio**, aimed at cost-constrained educational labs, both students and hobbyists can explore cutting edge electronics anywhere, anytime. Our FPGA development boards like the **Zybo Z7**, **ZedBoard**, and **Basys 3** continue to be stalwarts that provide immense flexibility and increased performance with Xilinx FPGA and SoC technology. And the recent introduction of the **Eclipse** and **Genesys ZU** move us into high-speed measurements and Zynq Ultrascale+ technologies.

As more RF communications, test, software-defined radio (SDR) and other similar applications press the technology further, Digilent has been hard at work to not only keep up the pace but also explore ways to influence the direction of this evolution. These trending applications employ high-speed analog inputs and/or outputs where real-time signal processing is required, driving the need for higher precision and higher speed solutions. With the introduction of the compact and high-speed SYZYGY expansion standard to our newest products, Digilent is well prepared to grow into this emerging space - an area that we are calling "embedded measurement systems". We're aiming to harness our unique knowledge of FPGAs, instrumentation, and software to fill the existing void of products that do all three areas well.



High-performance embedded measurement systems are not well established and recognized by our industry peers, which makes it even more exciting for us. These systems utilize all of the latest emerging technologies, including the Internet of Things (IoT), the Industrial IoT (IIoT), software-defined radio (SDR), products equipped with artificial intelligence (AI) and machine learning (ML) capabilities, and devices targeting virtual reality (VR), augmented reality (AR), and mixed reality (MR). Digilent's plans for 2020 include further research and development into these application areas, exciting new products for test and measurement, and the expansion of our large and growing ecosystem of peripheral modules, including our new high-speed SYZYGY-compatible I/O modules.

Thank you for joining us as we continue to explore new frontiers and seek new and innovative ways to empower engineers - it's going to be an exciting year!

Steve Johnson
President

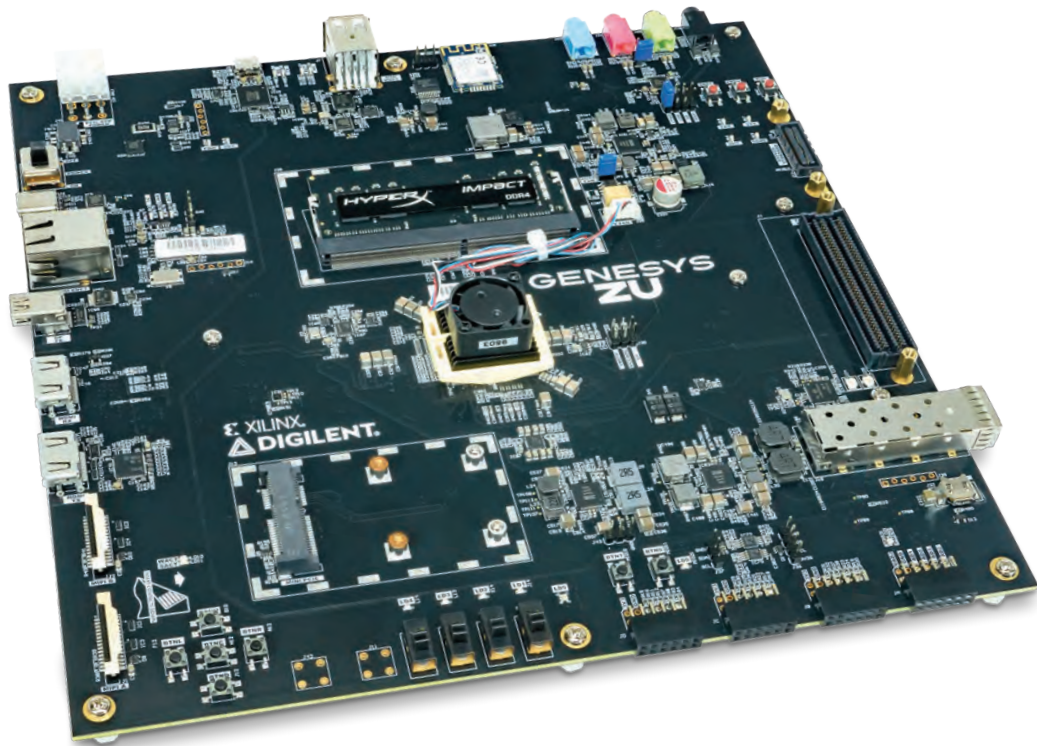


Founded in 2000 by two Washington State University electrical engineering professors, Clint Cole and Gene Apperson, Digilent's original mission was to make electrical engineering and design technologies understandable and accessible to all by supplying educators and students with high-value, industry-relevant educational tools and curriculum. We quickly made a name for ourselves in academic circles, and later moved to providing a diverse offering of cost-optimized professional solutions as well. In 2013, we were purchased by test and measurement powerhouse, National Instruments.

We are set apart by our unique expertise in FPGA-based systems, test instrumentation, and even in software, with our powerful multi-instrument software application, **WaveForms**. We also have a robust and extensive library of documentation, reference guides, tutorials, and other rich content available for free to anyone who needs it. Our customizable and flexible solutions are accessible to advancing engineers and accelerate development and reduce the time to market for the most experienced electronic design and research professionals.



New For 2020



GENESYS ZU

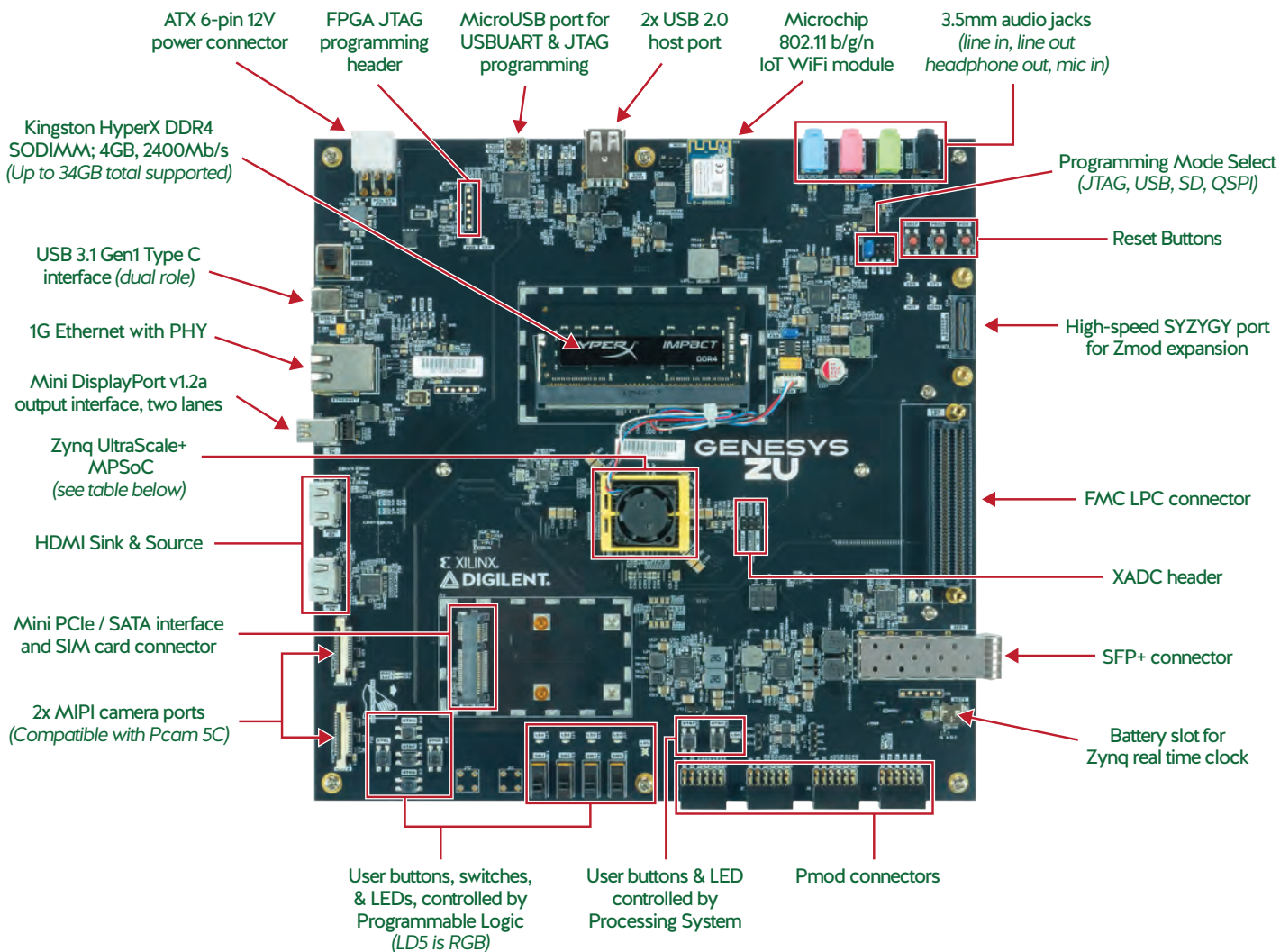
Unleash the power of UltraScale.

This year, Digilent is introducing the **Genesys ZU**, a powerful Zynq UltraScale+ MPSoC development board loaded with peripherals and a wide hardware ecosystem of add-on modules. The Genesys ZU is a standalone board designed with optimized specs, powerful multimedia and network connectivity interfaces, with a robust documentation library to quickly get you started on AI, research, aerospace/defense, cloud computing, and embedded vision applications. There are two versions of the board, the baseline Genesys ZU-3EG and the upgraded Genesys ZU-5EV (available Summer 2020).

What is an UltraScale+ MPSoC?

An MPSoC is a “multi-processor system on chip”, meaning that a single chip contains multiple processors, memory, input/output ports, and storage. Xilinx’s Ultrascale+ MPSoC devices provide 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and packet processing. You can learn more about it at www.xilinx.com.



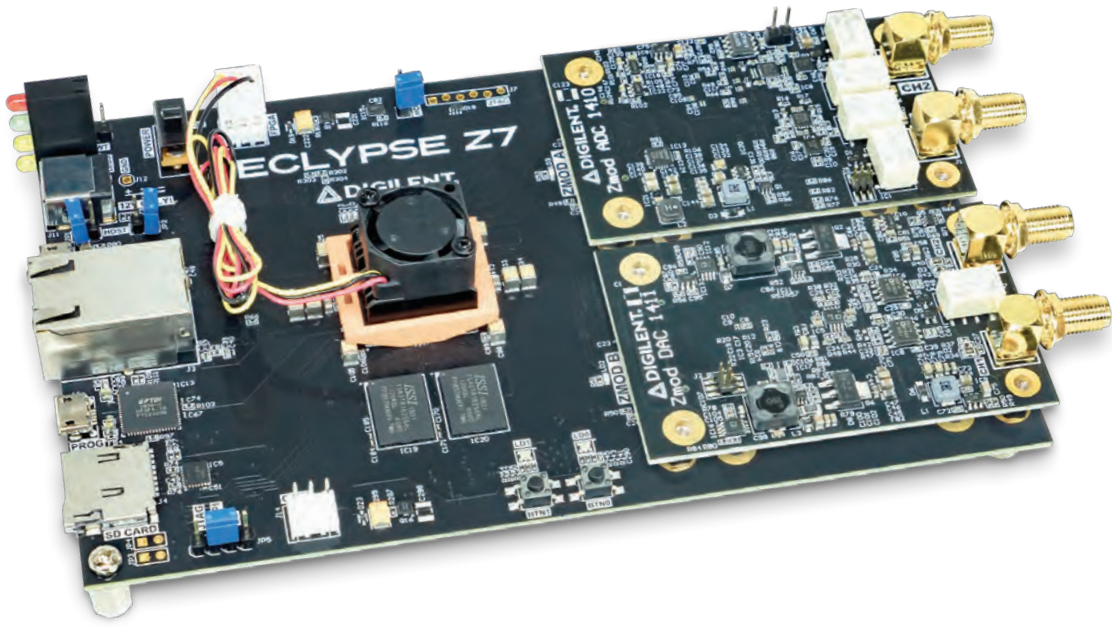


3EG Specs

- 19,250 slices
- **MEMORY:** Upgradeable DDR4, 4GB, 1866 MT/s
- **NETWORK:** 2.4 Gb onboard WiFi, 1 Gb IEEE 1588 Ethernet
- **PORTS:** USB-C USB, MiniPCIe, mSATA dual slot, 2 x USB 2.0 Host
- **MEDIA:** DisplayPort, 2 x Pcam, 2 x Dual-Lane, Audio Codec
- **CONNECTORS:** 4 x Pmod, 1 x SYZYGY, 1 x FMC, 1 x Gigabit

5EV Specs (available Summer 2020)

- 32,000 slices
- **MEMORY:** Upgradeable DDR4, 4GB, 2133 MT/s
- **NETWORK:** 2.4 Gb onboard WiFi, 1 Gb IEEE 1588 Ethernet, SFP+ 10G Ethernet
- **PORTS:** USB-C USB, MiniPCIe, mSATA dual slot, 2 x USB 2.0 Host
- **MEDIA:** DisplayPort, 2 x Pcam, Audio Codec, HDMI Source, HDMI Sink
- **CONNECTORS:** 4 x Pmod, 1 x SYZYGY, 1 x FMC, 1 x Gigabit

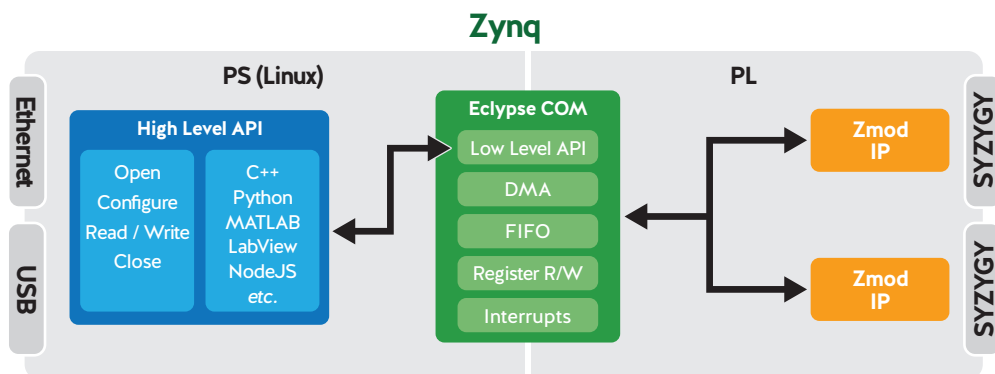


ECLYPSE Z7

A new way to accelerate design flow.

New in 2020, let our Eclipse platform accelerate your design flow and decrease your project's time-to-market. The Eclipse platform consists of our new **Eclipse Z7** development board, the **Zmod ADC 1410**, and **Zmod DAC 1411**, used together to increase your prototyping productivity. Eclipse's software framework provides the FPGA IP

and a common hardware abstraction layer that exposes a straightforward API to the user - think of how a software driver for a printer works. This gives engineers that aren't fluent in hardware languages the ability to efficiently navigate them with software languages, and ultimately harness the incredible power and flexibility of an FPGA!



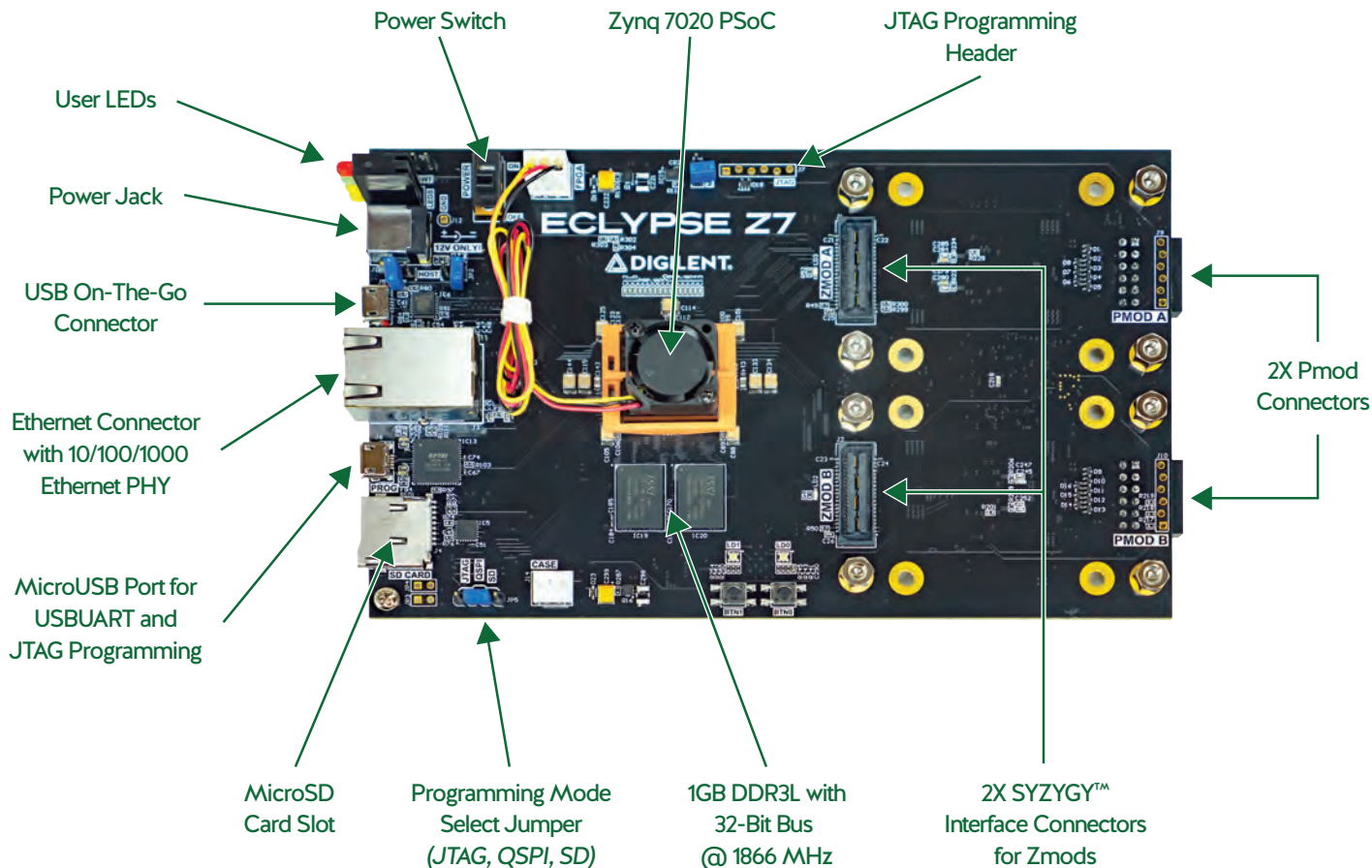
Don't touch hardware until desired.



What is Embedded Measurement?

EMSS like the Eclipse Z7 are hardware-software systems dedicated to the acquisition, processing, and measurement of signals associated with the world around us.

They're applied to a diverse array of applications such as industrial and scientific monitoring and control and are increasingly part of networked systems at "the edge", incorporating artificial intelligence and machine learning technology.

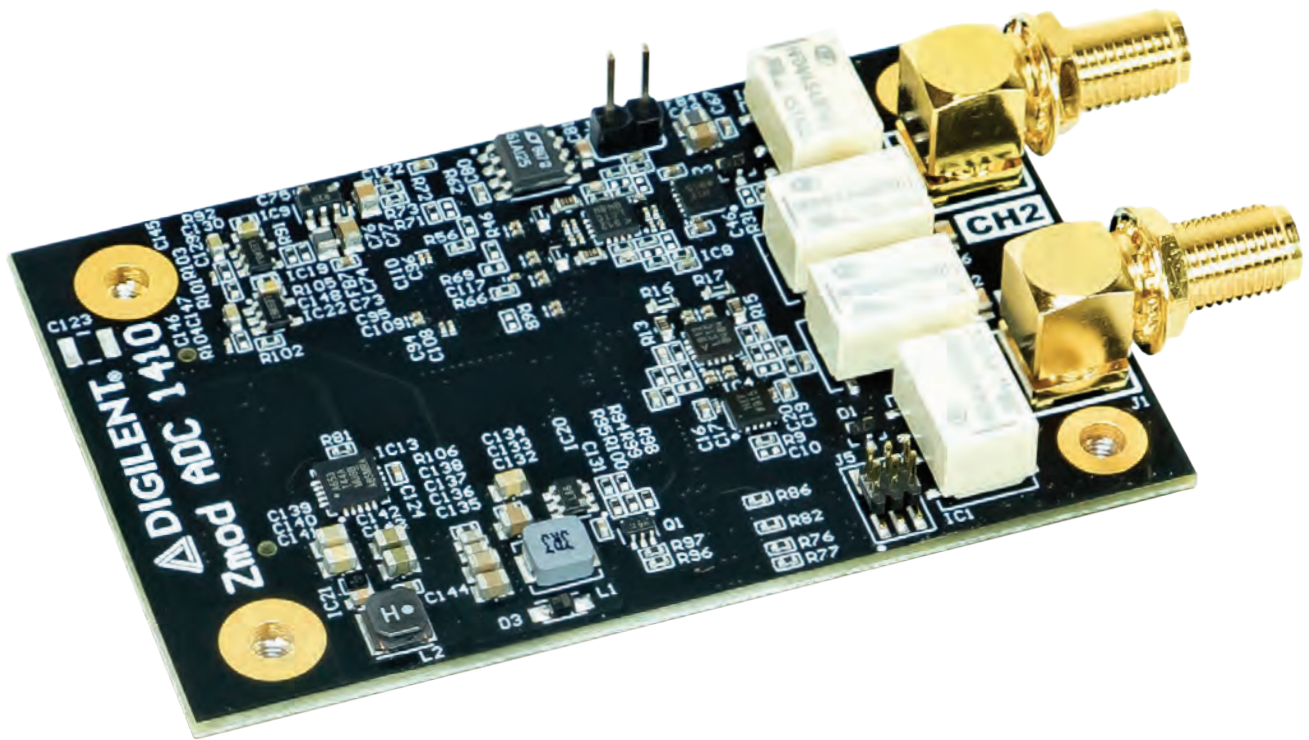


Eclipse Z7 Specs:

- Zynq 7020 SoC
- 1GB DDR3L with 32-bit bus @ 1866 MHz
- 2x SYZYGY standard interface connectors for Zmod expansion
- Micro USB, MicroSD, Ethernet, and Pmod connectors
- JTAG capability

Applications:

Medical, software defined radio (SDR), edge computing, real-time image processing, and a number of other user-defined data acquisition or signal processing systems



ZMOD ADC 1410

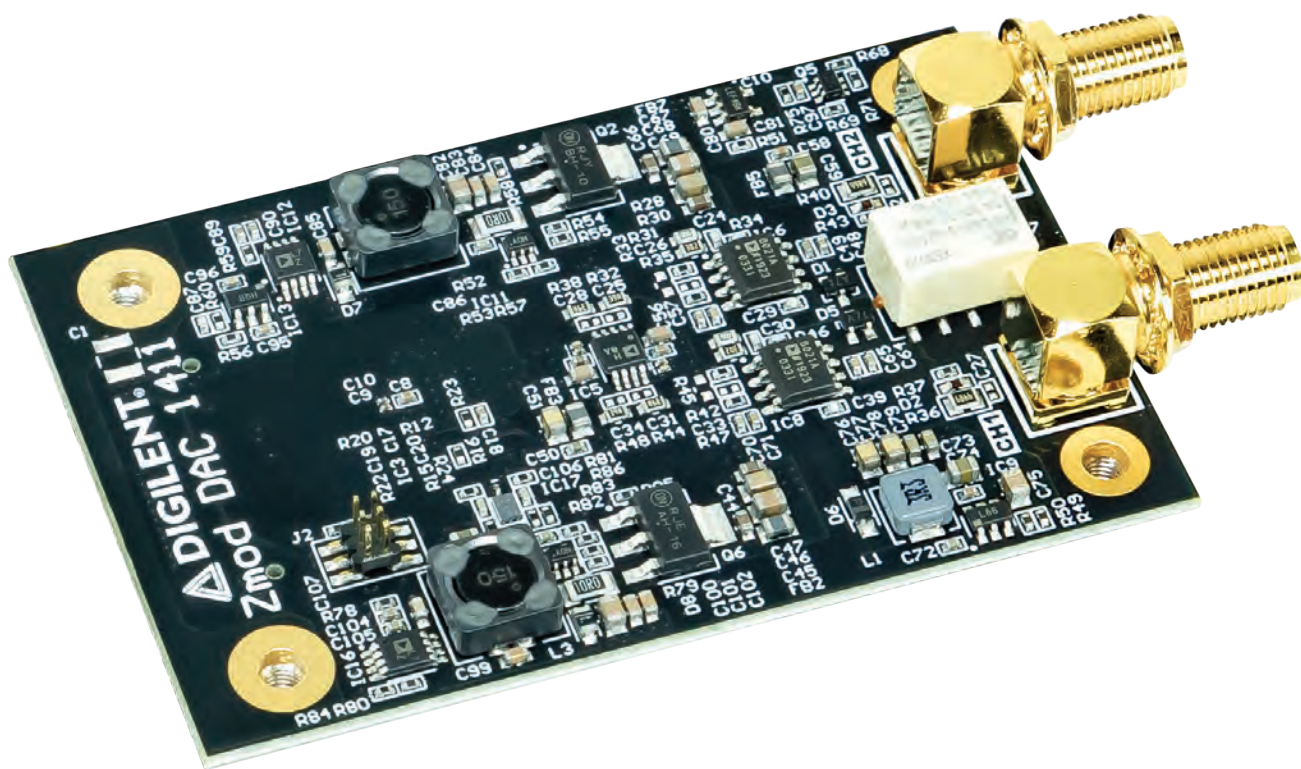
SYZYGY-compatible Dual-channel 14-bit ADC

The **Zmod ADC** is one of Digilent's first SYZYGY-compliant expansion modules. The SYZYGY standard offers a much higher speed and bandwidth digital interface than Pmods, but at a much smaller and lower-cost form-factor than FMC, enabling the user to configure an FPGA development board with the right I/O for their application.

Driven by the SYZYGY carrier, the **Zmod ADC** can simultaneously acquire two $\pm 25V$ signals with 14 bits of resolution at a sample rate up to 100MS/s. Analog inputs can be connected to a circuit using SMA cables.

Zmod ADC 1410 Specs:

- Channels: 2, single-ended
- Resolution: 14-bit
- Input range: $\pm 1V$ (High Gain) or $\pm 25V$ (Low Gain)
- Sample rate (real time): 100MS/s
- Analog bandwidth: 70 MHz+ @ 3dB, 30 MHz @ 0.5dB, 20 MHz @ 0.1dB



ZMOD DAC 1411

SYZYGY-compatible Dual-channel 14-bit DAC

The **Zmod DAC** is one of Digilent's first SYZYGY-compliant expansion modules. The SYZYGY standard offers a much higher speed/bandwidth digital interface than Pmods, but at a much smaller and lower-cost form-factor than FMC, enabling the user to configure an FPGA development board with the right I/O for their application.

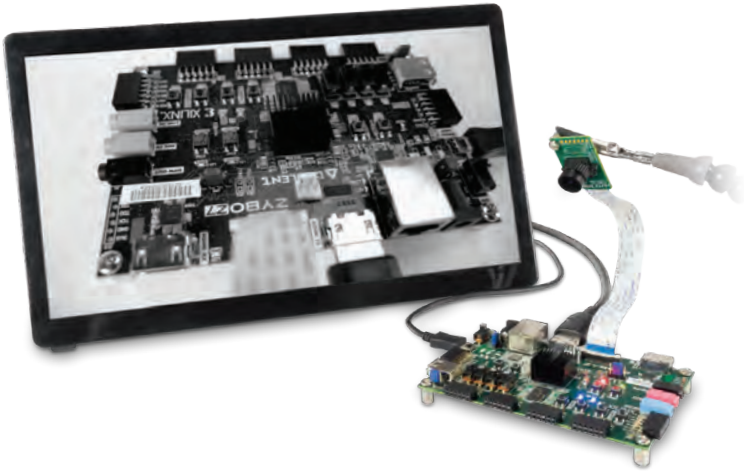
Driven by the SYZYGY carrier, the **Zmod DAC** can simultaneously generate two $\pm 5V$ signals with 14 bits of resolution at a sample rate up to 100MS/s. The analog outputs can be connected to a circuit using SMA cables.

Zmod ADC 1411 Specs:

- Channels: 2, single-ended
- Resolution: 14-bit
- Absolute Resolution (amplitude $\leq 1.25V$): 167 μV
- Absolute Resolution (amplitude $> 1.25V$): 665 μV
- Sample rate (real time): 100MS/s.
- Analog bandwidth: 40 MHz @ 3dB, 20 MHz @ 0.5dB, 14 MHz @ 0.1dB

FPGA

Plenty of attention goes into making sure that the Digilent FPGA board you're buying is optimized for both performance and cost. Our proud partnership with Xilinx means that each of our kits features one of their industry-leading devices. Our FPGA boards range from the accessible **Cora Z7** to more powerful system-on-a-chip offerings like the Zedboard Development Board.



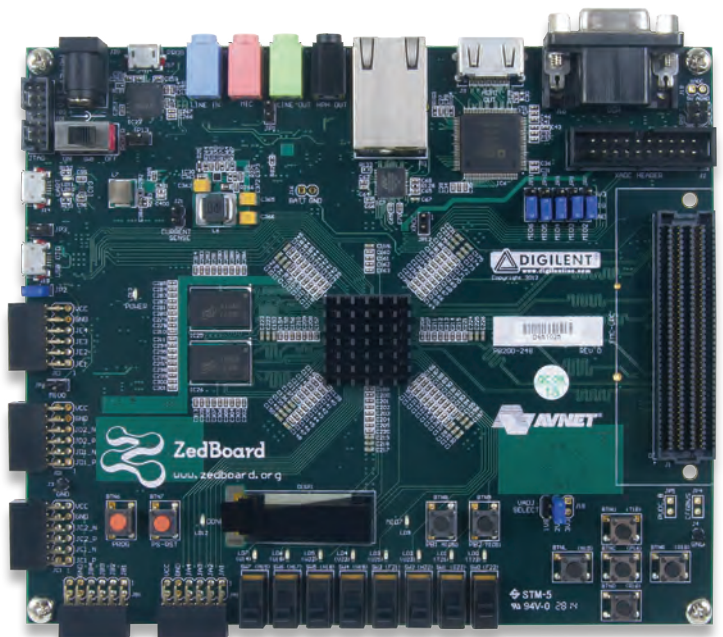
Why FPGAs?

- **PARALLEL:** FPGAs can be programmed as parallel processing devices, whereas CPUs execute operations in a sequential manner.
- **ACCURACY:** FPGAs can perform consistent time critical processing.
- **FLEXIBILITY:** FPGAs can be configured for a specific application, and then changed again after installation.
- **POWER:** FPGAs have high performance per watt.
- **EFFICIENT:** No overhead of an Operating System, such as you would have with a CPU.
- **CUSTOMIZABLE:** The programmer decides what is accomplished with each clock cycle.



Take advantage of the Zynq-7000 AP SoCs tightly coupled ARM® processing system and 7-series programmable logic to create unique and powerful designs with the **ZedBoard**.

- Target applications include video processing, motor control, software acceleration
- Xilinx Zynq-7000 AP SoC XC7Z020-CLG484 with 13,300 slices
- Dual-core ARM Cortex™-A9
- 512 MB DDR3
- On-board USB-JTAG Programming
- 10/100/1000 Ethernet, USB OTG 2.0 and USB-UART, and PS & PL I/O expansion (FMC, Pmod, XADC)

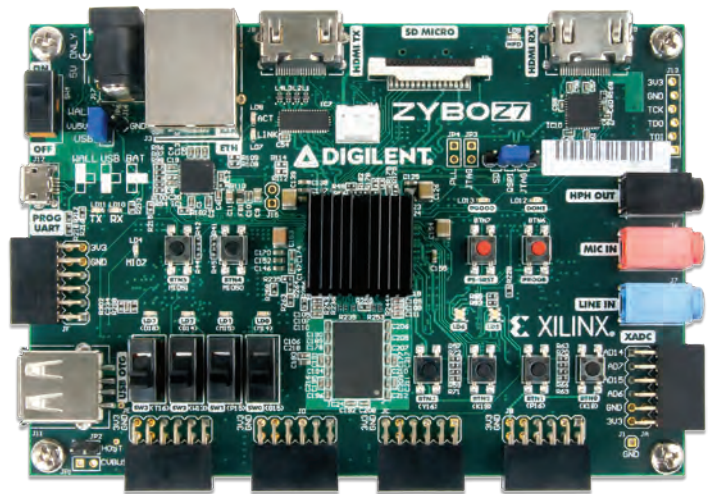


ZYBO Z7

ZYNQ™-7020 Development Board

The **Zybo Z7-20** is a feature-rich, ready-to-use embedded software and digital circuit development board built around the Xilinx Zynq-7000. It comes in two APSoC variants: Zybo Z7-10 features Xilinx XC7Z010-1CLG400C. Zybo Z7-20 features the larger Xilinx XC7Z020-1CLG400C.

- 4,400 slices (Z7-10) / 13,300 slices (Z7-20)
- 667 MHz dual-core Cortex-A9 processor
- DDR3L memory controller with 8 DMA channels and 4 High Performance AXI3 Slave ports
- High-bandwidth peripheral controllers: 1G Ethernet, USB 2.0, SDIO
- Low-bandwidth peripheral controllers: SPI, UART, CAN, I2C

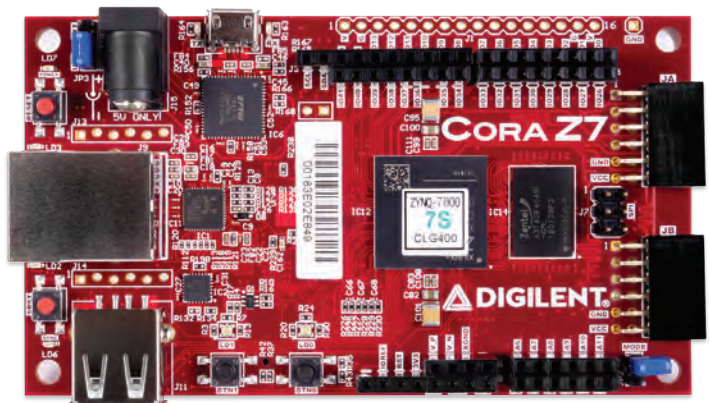


CORA Z7

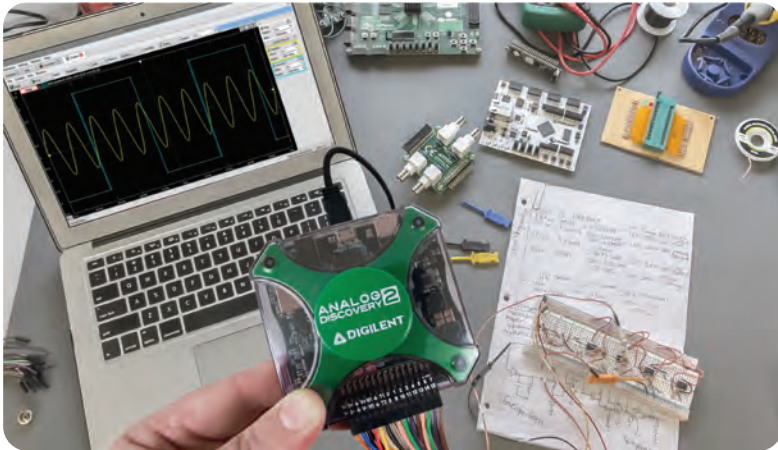
Low-Cost ZYNQ™ Development Board

The **Cora Z7** is a ready-to-use, low-cost, and easily embeddable development platform designed around the powerful Zynq-7000 APSoC from Xilinx. The small form factor and mounting holes make the Cora Z7 ready to be used as one component of a larger solution. The on-board SD Card slot, Ethernet, and Power solution allow the Cora Z7 to operate independently of a host computer.

- 4,400 slices
- 667 MHz Cortex-A9 processor with tightly integrated Xilinx FPGA (option between Dual Core and Single Core options)
- 512 MB DDR3 memory
- Arduino shield and Pmod connectors for add-on hardware devices
- USB and Ethernet connectivity
- Large array of general purpose input/output ports for any number of different custom solutions



Test & Measurement



With lab spaces decreasing and engineering teams becoming more distributed, companies are choosing all-in-one instruments as a supplement to traditional laboratories, creating a need for a portable test and measurement bench that can support all types of designs. Engineers all over the world use Digilent Test and Measurement devices to decrease their design cycle time and increase their impact by always having an oscilloscope, logic analyzer, waveform generator and more within reach. Our line of Test and Measurement products enables engineers to continue their designs in the library, home office, or even a coffee shop without having to reserve a lab that has all the necessary equipment.

13-in-1: The Analog Discovery 2 and Analog Discovery Studio

There isn't a more flexible scope solution or cost-effective value in the industry. With 13 functions, the Analog Discovery 2 and Analog Discovery Studio are perfectly capable of acting as an entire stack of lab instruments.

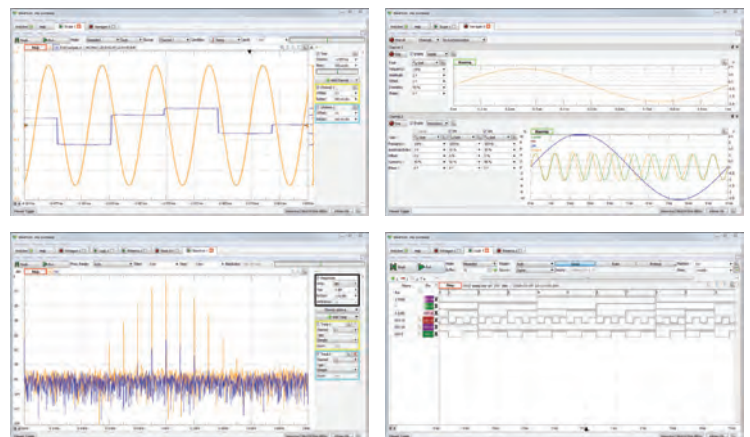
- Oscilloscope
- Arbitrary Waveform Generator
- Power Supplies
- Voltmeter
- Data Logger
- Logic Analyzer
- Digital Pattern Generator
- Virtual I/O
- Spectrum Analyzer
- Network Analyzer
- Impedance Analyzer
- Protocol Analyzer
- Script Editor

WaveForms

Supported by Windows, MacOS, and Linux

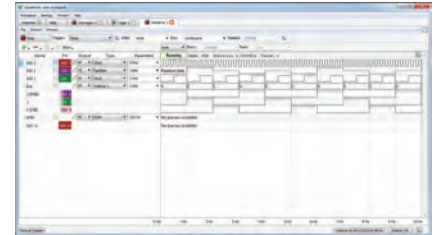
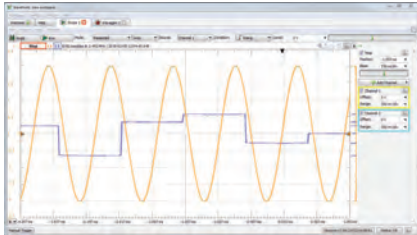


All of our Test and Measurement devices come with the FREE multi-instrument software application, **WaveForms**. It seamlessly connects to our **Analog Discovery 2**, **Digital Discovery**, and **Analog Discovery Studio** with full Windows, Mac OS X, and Linux support. Designed with a clean, easy to use graphical interface for each instrument, WaveForms makes it easy to acquire, visualize, store, analyze, produce and reuse analog and digital signals. And as an added perk, it's FREE for all to download and use.



ANALOG DISCOVERY 2

The All-in-One USB oscilloscope and test and measurement system.



The **Analog Discovery 2** turns your PC into a powerful electronics test bench that can measure, visualize, analyze, record and control mixed signal circuits! The **Analog Discovery 2** is small enough to fit in a pocket but contains the test and measurement devices needed as the centerpiece of a world-class prototyping and design lab.

The **Analog Discovery 2** is an Oscilloscope, Logic Analyzer, Waveform Generator, Pattern Generator, Power Supply, Network Analyzer, Spectrum Analyzer, Protocol Analyzer, and more! Powered by a Hi-Speed USB port and the free **WaveForms** software, the Analog Discovery 2 lets you build and test analog and digital circuits anywhere you want to work, even outside of the lab.

An Ecosystem of Adapters

The **Analog Discovery 2** has been used by thousands of engineers in countries all around the world. Since its launch, we've developed an ecosystem of adapter boards and accessories inspired (and sometimes designed) by customers. With these accessories, additional functionality can be added including BNC probes, impedance analysis, and even a breadboard.



Impedance Analyzer



Breadboard Adapter



Breadboard Breakout



BNC Adapter Board



BNC Oscilloscope Probes



BNC to Alligator Probes

Test & Measurement

ANALOG DISCOVERY STUDIO[™] The Portable Circuits Laboratory for Everyone.



The **Analog Discovery Studio** is a fully-functional portable test and measurement device that can turn any cross-functional space into a pop-up electronics laboratory. Equipped with 13 instruments including an Oscilloscope, Logic Analyzer, Spectrum Analyzer, Waveform Generator, and more; the **Analog Discovery Studio** provides an entire stack of benchtop instruments with a convenient breadboardable interface, perfect for enabling circuit design anywhere!

When lab spaces are not always available or convenient, the **Analog Discovery Studio** is a great choice as a supplement to traditional laboratories.

Power Supplies:

- Fixed: +12 V, -12V
- Variable: +1 to +5V, -1 to -5V

Logic Analyzer and Pattern Generator:

- 16 Inputs and Outputs

Triggers:

- Cross-instrument triggering
- Two external triggers

Oscilloscope:

- Two Channels
- BNC (single-ended) or MTE (differential) connection

Waveform Generator:

- Two Channels
- BNC or MTE connection

Included Breadboard Canvas:

- Removable and replaceable breadboard interface
- Built in switches, buttons, and LEDs
- Switches for every power supply
- Secure magnetic connection
- Additional fixed supply: 3.3V

Additional Instruments:

- Network Analyzer
- Spectrum Analyzer
- Voltmeter
- Impedance Analyzer
- Data Logger
- Protocol Analyzer
- Digital Inputs or Outputs

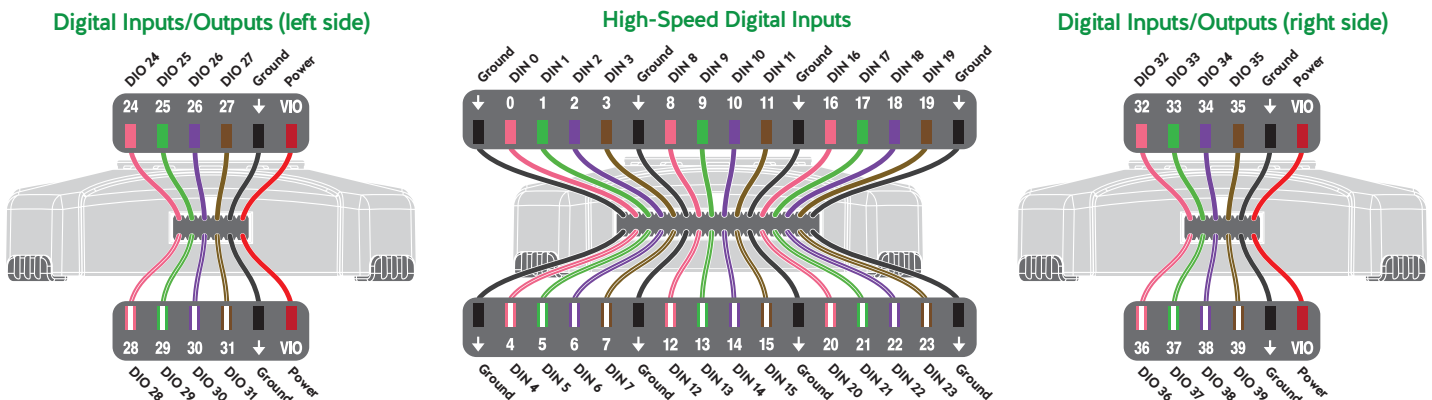
Analog ICs provided by **ANALOG DEVICES**

DIGITAL DISCOVERY

A USB Embedded Development Tool for High-speed and Multi-channel Applications.



The **Digital Discovery** is a combined Logic Analyzer, Protocol Analyzer, and Pattern Generator instrument that was created to be the ultimate embedded development companion. Designed with flexibility in mind, the **Digital Discovery** has selectable voltage levels, output drive, channel number, and sample rate. One portable device provides access to advanced features to debug, visualize, and simulate digital signals for a wide range of embedded projects. Its digital inputs and outputs can be connected to a circuit using the included MTE cables or breadboard wires.



For designs that require speeds up to 800 MS/s, the High-Speed Adapter and impedance-matched probes can be used to connect the inputs and outputs for more advanced projects. The **Digital Discovery** is driven by the free **WaveForms** software and can be configured to any combination of power supplies, logic analyzer, pattern generator, static inputs and outputs, and protocol analyzer.

Modular Connectors

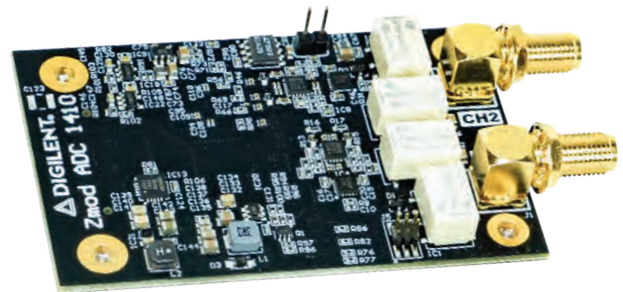


The **Zmod DAC** and **Zmod ADC** are intended to be included in user-defined data acquisition or signal processing systems. They use Opal Kelly's new SYZYGY standard, which fits – in cost, size, and performance – somewhere between our existing Pmod and FPGA Mezzanine Card (FMC) standards. Although not much larger than **Pmods**, SYZYGY-compatible modules are capable of high-bandwidth connections to an FPGA (such as the new Eclipse Z7), enabling very compact and cost-effective high performance I/O. We recommend them for compact, configurable, and rugged systems, though the high bandwidth and sampling rate (100 MS/s), the flexible input/output range, the high resolution, and the flexibility provided by the FPGA interface make the new Zmods an ideal solution for a wide variety of applications.

ZMOD ADC 1410

SYZYGY-compatible Dual-channel 14-bit ADC

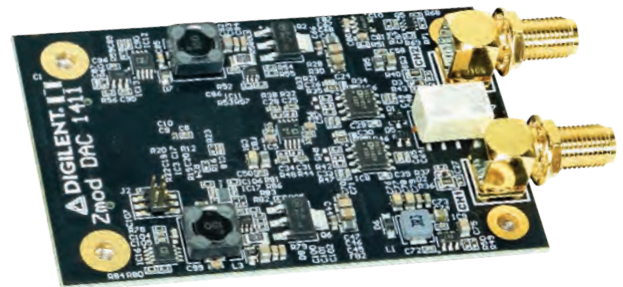
- Channels: 2, single-ended
- Resolution: 14-bit
- Input range: $\pm 1V$ (High Gain) or $\pm 25V$ (Low Gain)
- Sample rate (real time): 100MS/s
- Analog bandwidth: 70 MHz+ @ 3dB, 30 MHz @ 0.5dB, 20 MHz @ 0.1dB



ZMOD DAC 1411

SYZYGY-compatible Dual-channel 14-bit DAC

- Channels: 2, single-ended
- Resolution: 14-bit
- Absolute Resolution (amplitude $\leq 1.25V$): $167\mu V$
- Absolute Resolution (amplitude $> 1.25V$): $665\mu V$
- Sample rate (real time): 100MS/s.
- Analog bandwidth: 40 MHz @ 3dB, 20 MHz @ 0.5dB, 14 MHz @ 0.1dB



1 Zmod ADC + 1 Zmod DAC = Closed analog loops with digital control, digital filters with analog input and output, hardware-in-the-loop, digital signal processing, high frequency modulators/demodulators, real time image processing, and software-defined radio.

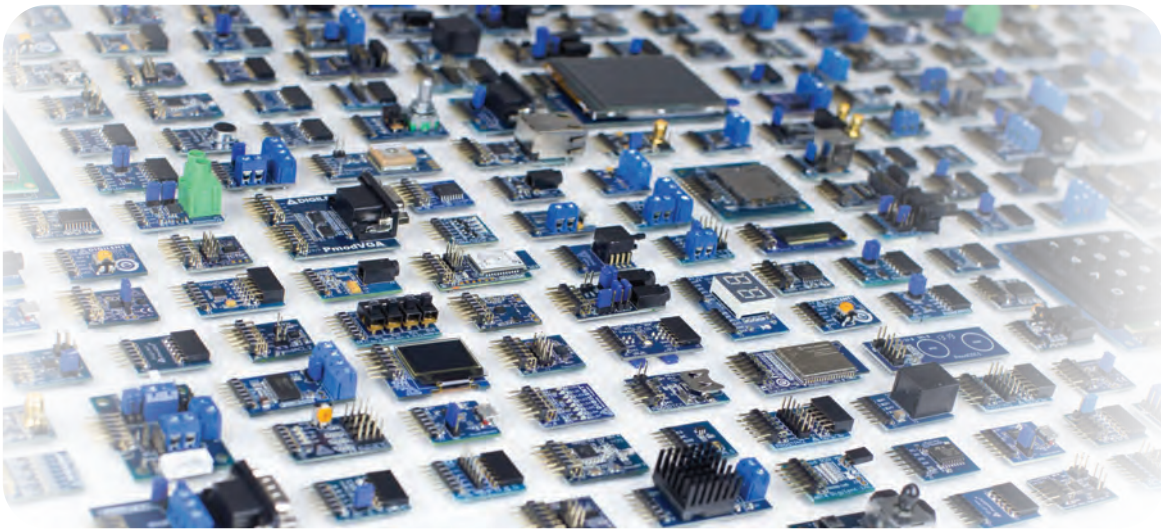
2 Zmod ADCs = Simultaneous digitization of two or four analog signals.

2 Zmod DACs = high sample rate analog signals.

Pmod

The industry's most flexible add-on board standard.

Open, flexible and thoughtfully designed, Pmod is an established add-on board standard offering an ideal way to bridge programmable logic and microcontroller boards to the physical world. With our line of over 80 modules and counting, users can easily augment the capabilities of system boards by adding sensors, actuators, communication, user input and much more, all while staying within the **Pmod Ecosystem**. From rapid prototyping to learning the basics, it is our goal to get users up and running with useful data in just a matter of minutes.



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 interfaces including SPI, I²C, UART, GPIO, H-bridge and I²S.

SPI

I²C

UART

GPIO

H-Bridge

I²S

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/pmod

Pmod

Input

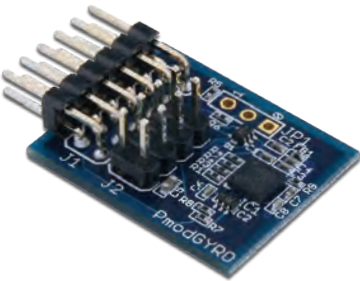
These Pmods primarily collect information about the outside world, either inherently or through a physical input, and submit the information to the host board by using their assigned communication protocol.



Pmod GPS

Accurate satellite positioning for any embedded system.

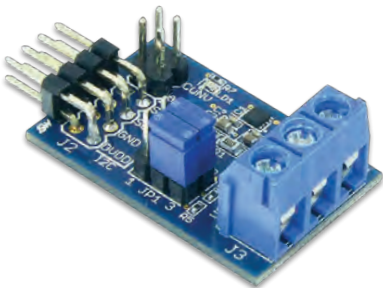
The Pmod GPS can provide satellite-positioning accuracy to any embedded system. By communicating through UART with the GlobalTop FGPM6H GPS module, users may benefit from the 3-meter accuracy for any long term traveling.



Pmod GYRO

Three-axis MEMS digital gyroscope + temperature sensor.

The Pmod GYRO is a 3-axis gyroscope powered by the ST Microelectronics L3G4200D. By communicating with the chip through SPI or I2C, users may configure the module to report angular momentum at a resolution of up to 2000 dps at an output rate up to 800Hz.



Pmod Pmon1

System power monitor using a standard I2C interface.

The Pmod PMON1 is a power monitoring system that uses the Analog Devices AD5112 and ADM119. By using I2C, users can set a reference voltage on the AD5112 to indicate what qualifies as an overcurrent condition for the ADM119.



Pmod KYPD

16-button hexadecimal keypad with a simple interface.

The Pmod KYPD is a 16-button keypad arranged in a hexadecimal format (0-F). By digitally driving a column line to a logic low level and digitally reading each of the rows, users can determine which button is currently pressed.

Pmod

Output

Output Pmods primarily output information that was given to them by the host board. This includes visual displays, motor drivers and analog output.



Pmod OLEDrgb

96x64 pixel graphical OLED with 16-bit color.

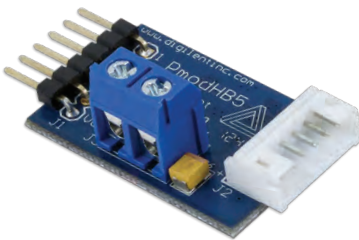
The Pmod OLEDrgb features a 96 x 64 pixel RGB OLED display that is capable of 16-bit color resolution. As a graphical display, users may show off graphs, full-color pictures, text, and anything else they want to see by communicating with it through a standard SPI interface.



Pmod VGA

Standard VGA port for connecting commonly found displays.

The Pmod VGA provides a VGA port to any board with Pmod connectivity. The VGA port can be used to drive standard displays such as televisions and monitors.



Pmod HB5

2A H-bridge module with external feedback support.

The Pmod HB5 offers a 2 A H-bridge circuit to drive small to medium-sized DC motors. Two sensor feedback pins are incorporated into the motor connection header and are specifically designed to work with motors that incorporate quadrature encoder feedback.



Pmod MTDS

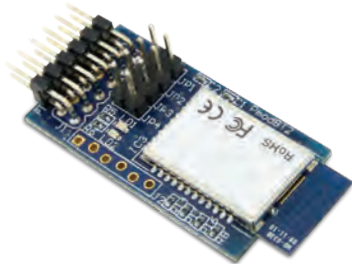
Two finger capacitive touch panel.

A gorgeous 2.8" touchscreen display with a powerful on-board microcontroller that performs graphics processing tasks and allows you to design sleek, stylish user interfaces very quickly and with very little code.

Pmod

Communication

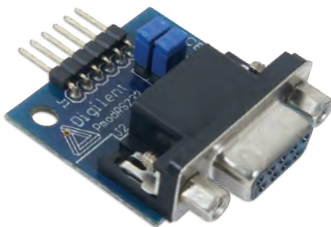
Communication Pmods can send and receive data to communicate with a host board. By enabling access to an outside source or system, they augment the capabilities of any project.



Pmod BT2

Full-featured Bluetooth radio with a simple UART interface.

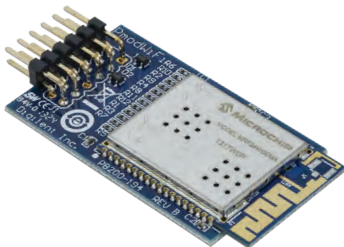
The Pmod BT2 is a powerful peripheral module employing the Roving Networks® RN-42 to create a fully integrated Bluetooth interface. Users can communicate with the chip via UART and can also use the secondary SPI header on the board for updating the RN-42 firmware if needed.



Pmod RS232

A serial interface module for UART communication.

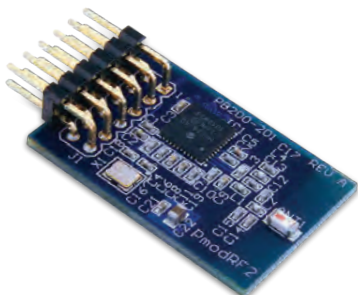
The Pmod RS232 converts between digital logic voltage levels to RS232 voltage levels using the Maxim Integrated MAX3232 transceiver. The RS232 module is configured as a data communications equipment (DCE) device.



Pmod WiFi

WiFi communication for Microchip®-powered host boards.

The Pmod WiFi provides Wi-Fi access through the Microchip® MRF24WG0MA WiFi™ radio transceiver module. Users can communicate with the IEEE 802.11g compliant chip through SPI and achieve data rates up to 54 Mbps.

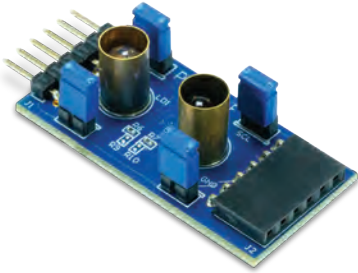


Pmod RF2

Add IEEE 802.15.4 RF communication to your project.

The Pmod RF2 adds RF communication through the Microchip® MRF24J40 IEEE 802.15.4™ 2.4GHz RF transceiver module. By communicating with the device through SPI, users can transmit data at speeds up to 625 kbps.

These Pmods use embedded sensors to either relay information to a host board or to output useful information.



Pmod ToF

Time of Flight optical distance sensor.

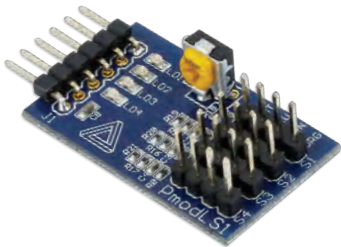
The Pmod ToF (Time of Flight) is a sensor that enables optical distance sensing at low power. The on-chip digital signal processor calculates the time it takes for light emitted by the ToF to fly to the target and back, which is proportional to the distance to the target.



Pmod HYGRO

Digital humidity sensor with an integrated temperature sensor.

The Pmod HYGRO is a relative humidity sensor with integrated temperature sensor for highly accurate measurements at low power. With the TI HDC1080, you can determine the relative humidity of the environment with up to 14 bits of resolution.



Pmod LS1

Four-input infrared light sensor, perfect for line-followers.

The Pmod LS1 allows users to receive signals from multiple optical sensors, such as the popular combination of an IR LED with an IR sensor used in line-following robots.



Pmod MAXSONAR

Ultrasonic range detector with one-inch resolution.

The Pmod MAXSONAR is a single-transducer ultrasonic range finder that uses the MaxBotix® LV-MaxSonar®-EZ1™. Users can measure how far away an object is with an accuracy within 1 inch to over 20 feet away.



Pmod COLOR

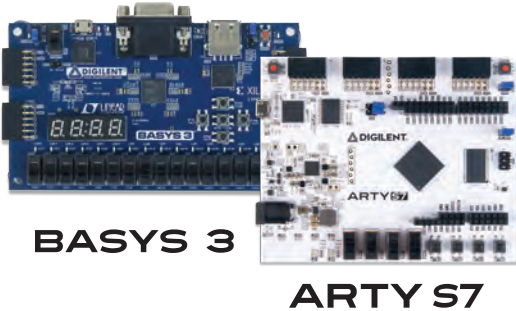
Highly sensitive red, green, blue and clear light sensor.

The Pmod COLOR is a color sensor module with the ability to sense red, green, blue and clear light.

Introductory Products

Digilent's offerings span all ability levels, from aspiring engineers to seasoned design veterans. We are proud of working hard to lower the barrier to entry to designing and prototyping. In addition to our cost optimized products, we have a robust library of documentation, reference manuals, and data sheets available for free to get you up and running as quickly as possible. The products below are celebrated as being wonderful entry points for their respective industries.

Intro to FPGA:



Both of these boards are designed with Xilinx chips and work with Vivado Design Suite. The **Basys 3** is equipped with a multitude of set I/O switches while the **Artly S7** offers a wide variety of I/O and expansion options. Each would be a perfect start for a beginner with FPGAs or a hobbyist.

Intro to Video:



Embedded vision and multimedia applications have become more ubiquitous in the past decade across a wide range of industries. The **Nexys Video** comes with the ports and specs to give any audio/video enthusiast a leg up in multimedia design.

Intro to Scopes:



The **Analog Discovery 2** is perfect for both beginners and for engineering professionals. With a compact form factor, multiple instruments, and a user-friendly software interface (WaveForms), the **Analog Discovery 2** will add a flexible test and measurement toolbox to your workbench.

JTAG

Our family of **JTAG cables** and modules provide engineers designing their own boards with a drop-in solution for programming and debugging the onboard Xilinx silicon from Xilinx's tool suite. Our **JTAG Cables** are designed to plug into a pin connector on the board, while our **JTAG SMT** modules provide a secure surface mount solution that can be soldered directly onto the board. All of our programmers are self-contained programming modules for Xilinx FPGAs, SoCs, MPSoCs, RFSOCs, and CPLDs, and can be accessed directly from most Xilinx Tools.



JTAG-SMT3-NC



JTAG-SMT2-NC



JTAG-SMT2



JTAG-SMT1



JTAG-HS3



JTAG-HS2



JTAG-USB

Max Speed	30 Mhz	30 Mhz	30 Mhz	30 Mhz	30 Mhz	30 Mhz	1.6 Mhz
Voltage Range	1.8 - 5 V	1.8 - 5 V	1.8 - 5 V	1.8 - 5 V	1.8 - 5 V	1.5 - 5 V	1.8 - 5 V
Xilinx Native Support	ISE 14.1+ Vivado 2013.1+	ISE 14.1+ Vivado 2013.1+	ISE 14.1+ Vivado 2013.1+	ISE 13.2+ Vivado 2012.1+	ISE 14.1+ Vivado 2013.3+	ISE 13.2+ Vivado 2012.1+	ISE 13.2+ Vivado 2014.2+
Xilinx Plug-in Support	ISE 13.1+	ISE 13.1+	ISE 13.1+	ISE 13.1+	ISE 12.1+	ISE 12.1+	ISE 12.1+
Digilent Adept Support	✓	✓	✓	✓	✓	✓	✓
PC Interface	USB	USB	USB	USB	USB	USB	USB
Onboard USB Connector	✗	✗	✓	✓	✓	✓	✓
Target Board Connector Interface	18-Pad SMT	13-Pad SMT	11-Pad SMT	8-Pad SMT	14-Pin	6-Pin, 14-Pin	6-Pin
4-Wire JTAG	✓	✓	✓	✓	✓	✓	✓
2-Wire JTAG	✗	✓	✓	✗	✗	✓	✗
ZYNQ-7000 PS_SRST Support	✓	✓	✓	✗	✓	✗	✗
SPI Support	✗	✓	✓	✗	✗	✓	✓
Independent UART Channel	✓	✗	✗	✗	✗	✗	✗

