2024
Product Catalog

DIGILENT®

Digilent is now part of Emerson.

About Us

Founded in 2000 by two Washington State University electrical engineering professors, Digilent's original mission was to make electrical engineering and design technologies understandable and accessible to educators and students with high-value, industry-relevant educational tools and curriculum. After laying down successful roots in Academia, Digilent — now a subsidiary of test and measurement powerhouse NI — has proven to be an invaluable resource for professional engineers as well. With a diverse offering of multi-instrument PC-based test devices and system boards, Digilent's products empower engineers, researchers, and scientists with the flexibility to design rapidly and test the world around them in either the lab or at home.

Table of Contents

Connect with Digilent on Social

Maximum Utility, Minimum Footprint.

ANALOG DISCOVERY™ PRO ADP2230

The Analog Discovery Pro (ADP2230)™ is a mixed signal oscilloscope (MSO) designed for professional engineers. It features analog inputs, analog output, and digital I/O, all operating at up to 125 MS/s. Users can both receive and generate digital signals to test and analyze data from various devices while simultaneously powering those systems with its robust power supply. The feature-packed design allows the ADP2230 to perform the functions of several test and measurement devices and can replace a stack of traditional instruments.

With the free WaveForms software, users can view and capture complex data, perform spectral and network analysis, and quickly retrieve large amounts of data. WaveForms leverages the ADP2230's deep buffer memory, allowing hundreds of millions of samples to be stored and streamed back to the host computer. WaveForms' friendly user interface has the feel of traditional benchtop oscilloscopes.

Analog Inputs:

- Two BNC input channels with 14-bit resolution and up to ±25 V input range
- 50+ MHz bandwidth, up to 125 MS/s per channel
- On-device buffering of 64 MS per channel by default, up to 128 MS per channel

Analog Output:

- One BNC output channel with 14-bit resolution, ±5 V output range
- 15 MHz bandwidth, up to 125 MS/s per channel

Digital I/O:

- 16 dynamically configurable 3.3 V CMOS digital input/output channels
- Up to 125 MS/s per channel
- On-device buffering up to 128 MS per channel

Power Supplies:

- Two programmable power supplies (0.5 V to 5 V, -0.5 V to -5 V)
- Up to 1 A or 3 W per channel
- Integrated hardware readback of system temperature, voltage rail outputs, & sourced current

Software Support:

- WaveForms, Digilent's free software application for Windows, Mac, and Linux
- WaveForms SDK for custom applications and scripting through C/C++, Python, C#, Visual Basic
- LabVIEW and MATLAB support

Additional Features:

- Adjustable system clock and external clocking
- USB 3.0 support for rapid data streaming
- Advanced triggering and cross triggering between instruments and devices, including Dual Mode support
- Internal hardware loopbacks allow for both the recapture of analog outputs and the output of filtered and unfiltered analog input signals
- Optional standard waveform generator control over the two programmable power supplies

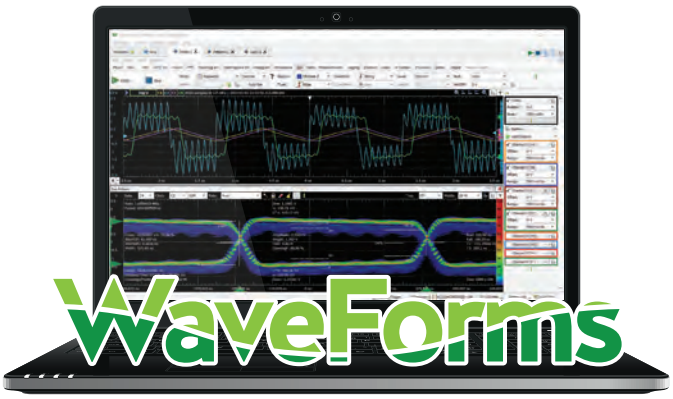
Discover More.

ANALOG DISCOVERY 3

The Analog Discovery 3 is a digital oscilloscope, logic analyzer, waveform generator, pattern generator, and much more. Using the flexible WaveForms software (supported by Windows, Mac, and Linux), the Analog Discovery 3 can be used in the lab, in the field, or even at home - you're no longer tied down to a traditional benchtop and stacks of expensive test instruments.

Mixed-Signal USB Oscilloscope:

- Two differential channels with 14-bit resolution at up to 125 MS/s per channel with a +/-25 V input range, 30+ MHz bandwidth with BNC Adapter
- FFT, Spectrogram, Eye Diagram, XY Plot views, and more



Arbitrary Waveform Generator:

- Two channels with 14-bit resolution at up to 125 MS/s per channel with a +/-5 V output range, 12 MHz bandwidth with BNC Adapter
- Standard waveforms, amplitude and frequency modulated signals, direct playback from analog inputs, custom waveforms, and more

Logic Analyzer and Pattern Generator:

- 16 digital I/O channels at up to 125 MS/s per channel
- SPI, I2C, UART, CAN, JTAG, ROM logic, custom protocols, and more

Programmable Power Supplies

- 0.5 V to 5 V and -0.5 V to -5 V, up to 2.4 W per channel

Additional Features:

- Additional software instruments including Spectrum Analyzer, Network Analyzer, Impedance Analyzer plus many more!
- SDK for hardware control in C, C++, Python, & other languages
- Support for LabVIEW and MATLAB
- Plus more than we can list!

Cloud Software

Engineer and Collaborate From Your Computer

EveryMeasure

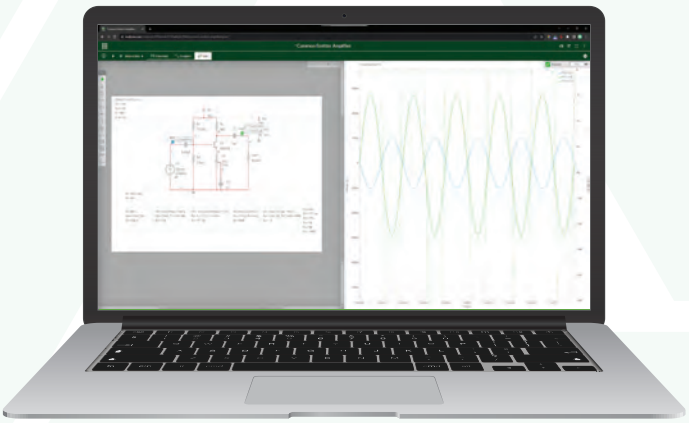
Test and measurement data can be slow, unintuitive, and difficult to collaborate on. Scrolling through sluggish spreadsheets, writing code to downsample data, and manually piecing together screen shots can lead to bottlenecks and miscommunication, impacting productivity for engineers and managers.

T&M data shouldn't slow you down. That's why we developed **EveryMeasure Drive**, a cloud-based solution that makes storing, exploring, and visualizing your data easy.

- Upload and convert your T&M data into Streams; a time-series database file that is optimized for lightning-fast querying, exploration, and visualization.
- Use the Stream Viewer to create visualizations, locate important ranges of data, and downsample data on the fly, from anywhere, without having to write any code.
- Communicate insights and highlight points of interest with other users in a familiar project and file system.

MultisimLive

Multisim Live, an innovative browser-based circuit simulation software, is now offered by Digilent as part of its suite of electronic design tools and instrumentation. With the addition of Multisim Live, Digilent now provides a comprehensive platform for circuit simulation, prototyping and testing.



- **Easy In-Browser Circuit Design:** Design circuits easily in your web browser with Multisim Live. Drag-and-drop components, from basic resistors to advanced ICs, for analog and digital circuits. Access a vast library of real and virtual components without any installation required. Start designing anytime, anywhere, on any computer.
- **Accurate SPICE Simulation for Deep Analysis:** Multisim Live utilizes advanced SPICE simulation for accurate modeling of circuits. Simulate designs to visualize currents, voltages, and logic states interactively. This empowers a test-before-you-build approach with powerful plotting tools for detailed signal analysis.
- **Community Collaboration and Knowledge Sharing:** Explore public circuits published by other users to discover new techniques and copy any design to experiment with modifications.

13-In-1: The Analog Discovery Product Family

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.

There isn't a more flexible scope solution or cost-effective value in the industry. With up to 13 functions and a range of specifications between them, our WaveForms-powered products like the Analog Discovery 3, Analog Discovery Pro ADP3450, and the Analog Discovery Studio are perfectly perfectly capable of acting as an entire stack of lab instruments.

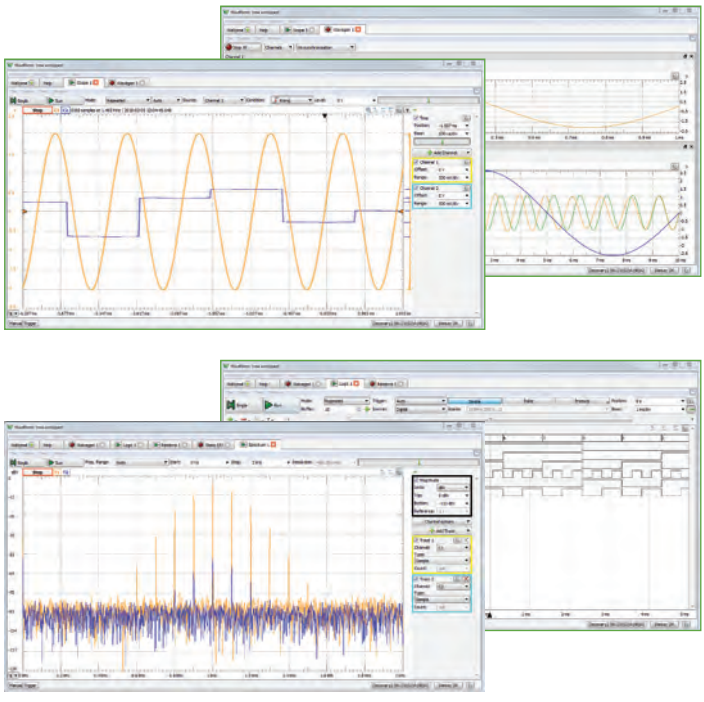
- **Oscilloscope**
- **Arbitrary Waveform Generator**
- **Power Supplies**
- **Voltmeter**
- **Data Logger**
- **Logic Analyzer**
- **Digital Pattern Generator**
- **Virtual I/O**
- **Spectrum Analyzer**
- **Network Analyzer**
- **Impedance Analyzer**
- **Protocol Analyzer**
- **Script Editor**

WaveForms

Supported by Windows, macOS, and Linux

All of our Test and Measurement devices come with the multi-instrument software application, WaveForms. It seamlessly connects our Analog Discovery products and the Digital Discovery with full Windows, macOS, 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 PRO

3000 SERIES

Portable High Resolution Mixed Signal USB Oscilloscopes

FRONT

BACK

What is the Analog Discovery Pro 3000 Series?

Devices in the Analog Discovery Pro 3000 series provide the utility of professional benchtop equipment with the flexibility of a portable instrument. With myriad choices available for test and measurement devices, adding to your benchtop can be a daunting task, especially sorting through which features on your new instrument are included versus what you'll need to pay extra for. With the ADP3450, every listed feature is an included feature, making it an investment that will last — *at a price without surprises.*

Introducing Linux Mode

Linux Mode provides an on-device terminal-based operating system that, when combined with WaveForms SDK, is a flexible starting point for all kinds of custom tests and applications. Running embedded on the device itself or via WaveForms, engineers and measurement enthusiasts alike can take advantage of data streaming via Ethernet, and the on-device storage to capture buffers of millions of samples.

Powered By WaveForms

Key Features

Analog Inputs

- Two (ADP3250) or Four (ADP3450) BNC input channels with 14-bit resolution and up to ±25 V input range
- 55+ MHz bandwidth, 125 MS/s, 0.5 GS/s with oversampling
- On-device shared buffering of 128 MS among analog inputs

Digital Channels

- 16 dynamically configurable digital input/output with LVCMOS 1.2 V to 3.3 V
- On-device buffering up to 64 MS per channel

Analog Outputs

- Two BNC output channels with 14-bit resolution and ±5 V output range
- 15 MHz bandwidth @ -3 dB, 125 MS/s

Additional Features

- Embedded Linux Mode
- Flexible USB or Ethernet connectivity

ANALOG DISCOVERY™ PRO ADP5250

All-In-One 1 GS/s 100 MHz Mixed Signal Oscilloscope, Function Generator, Power Supply, and DMM

FRONT

BACK

What is the ADP5250?

The ADP5250 brings higher sample rate and bandwidth and a more rugged design to the Analog Discovery Pro family, keeping our free highly rated WaveForms application software at the controls.

The Ultimate All-In-One Test System

Analog Discovery Pro devices feature a variety of advanced triggering options. Instruments within WaveForms can be cross-triggered, for example, by activating an oscilloscope capture based on a received and decoded digital protocol. In addition, external signals can trigger events using the dedicated external trigger input/output. Our free WaveForms software provides these features configurable in the instruments themselves, or for more control or automation in one of the available scripting interfaces.

Powered By WaveForms

Key Features

Analog Inputs

- Two BNC input channels with 8-bit resolution and 40 V peak to peak input range
- 100 MHz bandwidth, up to 1 GS/s per channel

Analog Output

- One BNC output channel with 14-bit resolution and up to ±12 V output range
- 20 MHz bandwidth @ -3 dB, 125 MS/s

Digital Channels

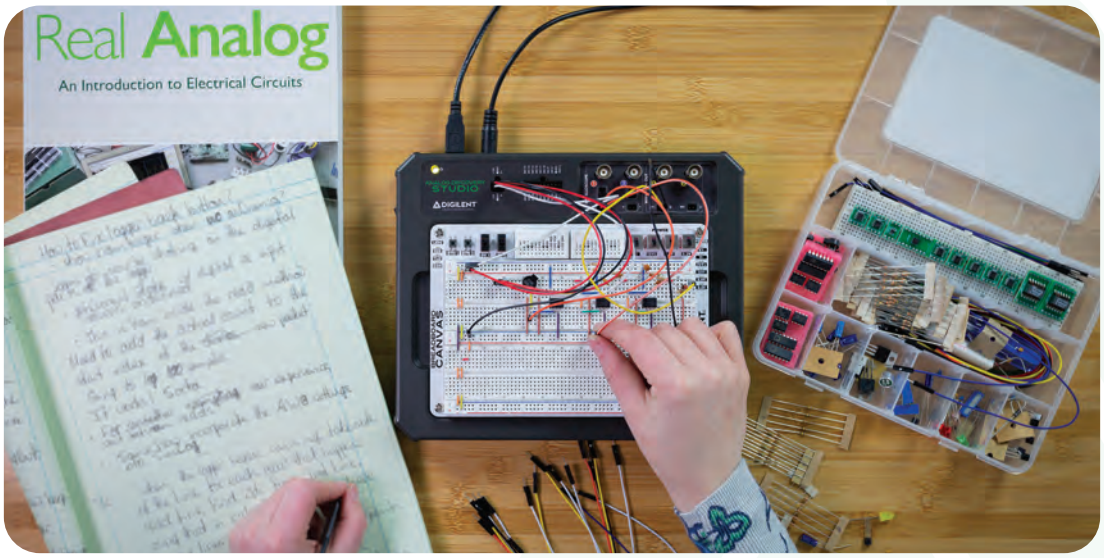
- 34 digital inputs, 1 GS/s, 0 V to 5 V input range
- 8 digital I/O channels, 0 V to 5 V input range, 3.3 V output

Additional Features

- Variable 6 V, -25 V, and 25 V power supplies
- Dedicated CAT II Digital Multimeter

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, the Analog Discovery Studio is a great choice as a supplement to traditional laboratories.

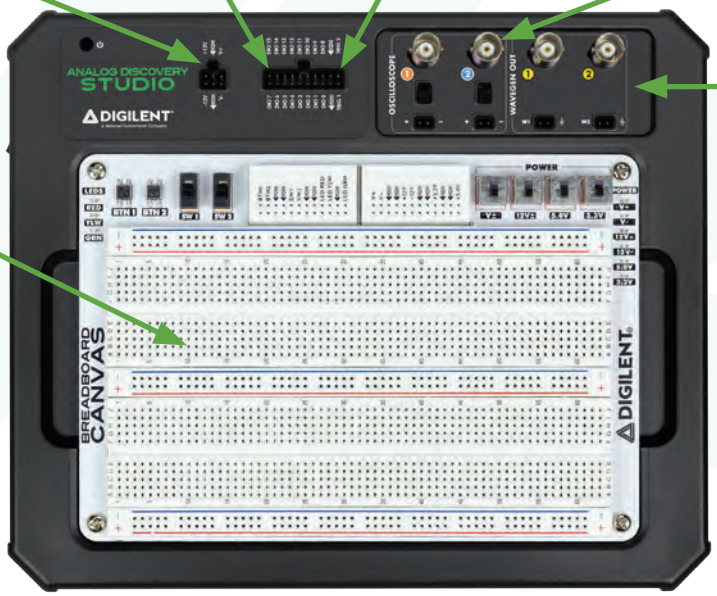
Power Supplies
- Fixed: +12 V, -12 V
- Variable: +0.5 to +5 V, -0.5 to -5 V

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

Included Breadboard Canvas
- Removable and replaceable breadboard interface
- Built in switches, buttons, and LEDs
- Switches for every power supply
- Secure magnetic connection
- Additional fixed supplies: 5.0 V & 3.3 V

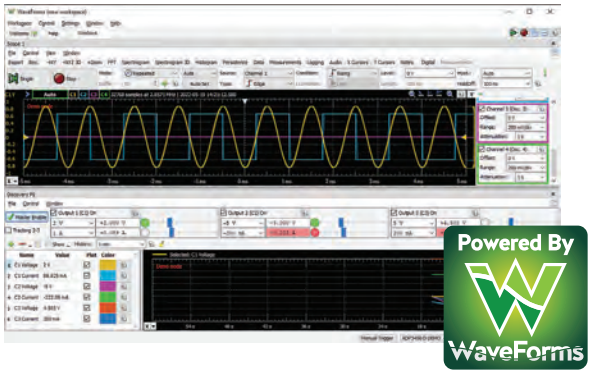


Waveform Generator
- Two Channels
- BNC or MTE connection

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

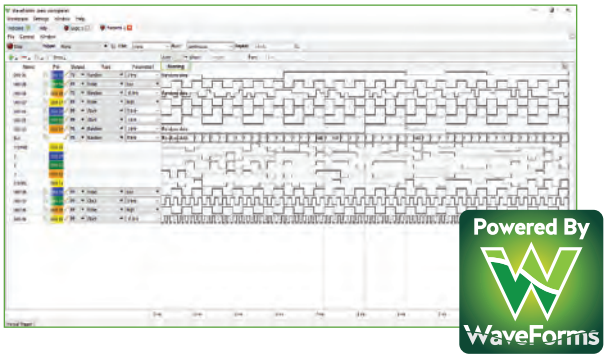
Powered By WaveForms

DISCOVERY POWER SUPPLY DPS3340



The Discovery Power Supply is a flexible, programmable, three-channel power supply that can deliver up to ±15 V at 0.5 A and up to 3 A on the +5 V supply. Connection to WaveForms provides the ability to vary the voltage and current manually or automatically by scripts in the application or custom applications built in the WaveForms SDK.

DIGITAL DISCOVERY



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

Data Acquisition

What is Data Acquisition?

Data acquisition, or DAQ as it is often referred, is the process of digitizing data from the world around us so it can be displayed, analyzed, and stored in a computer. A simple example is the process of measuring the temperature in a room as a digital value using a sensor such as a thermocouple. Modern data acquisition systems can include the addition of data analysis and reporting software, network connectivity, and remote control and monitoring options.

USB, Ethernet, Temperature, and Remote DAQ

USB-200 Series: These low-cost, multifunction devices are designed for general purpose DAQ applications and feature analog input, analog output, DIO, and one counter input.

MCC multifunction data acquisition devices are available with analog input and output, digital I/O, and counter/timers to suite your various application requirements. Devices are available with up to 64 analog inputs, sample rates up to 2 MS/s, and resolution from 12-24 bits. Signal conditioning for measuring sensors like pressure, strain, and accelerometers is also available.

Ethernet DAQ

Ethernet-based data acquisition devices are ideal for remote measurement and control applications. These devices feature up to eight analog inputs, analog output, and digital I/O.

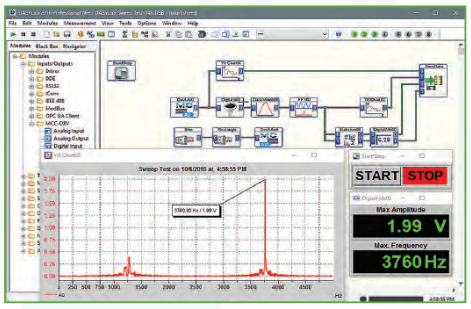
E-1608 Series: These Ethernet devices have built-in 10/100 BASE-T auto-negotiation, high-speed communication port for data transfers over a network.

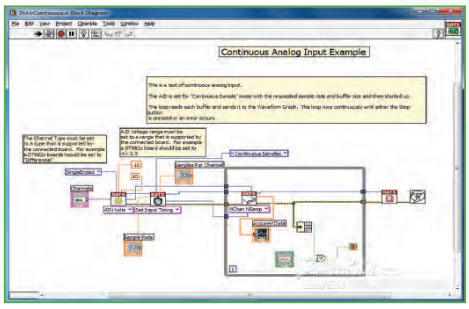
Temperature Measurement

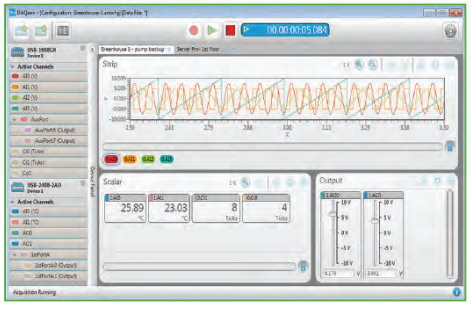
Temperature is one of the most common measurement types in DAQ applications. **These devices** are offered in USB, Ethernet, or stand alone configurations, with the ability to measure 8-64 thermocouples, RTD's, or thermistors. Built-in cold-junction compensation and up to 24-bit resolution provide superior measurement capability.

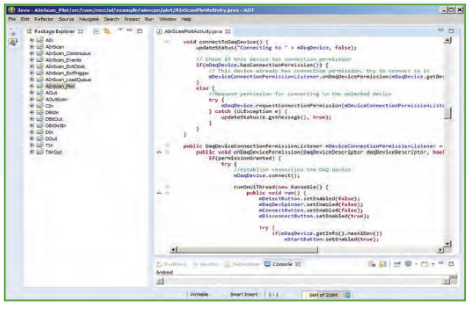
Data Acquisition Software

Out-of-the-box software provides the ability to log and view data and generate signals. Drivers are also included for the most popular applications and programming languages, including **DASYLab®**, Visual C++®, Visual C#®, Visual Basic®.NET, NI LabVIEW™, MATLAB®, Linux®, and Python™.





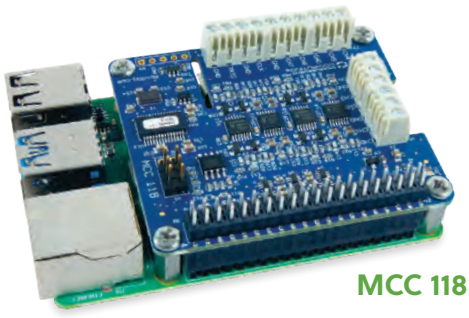




MCC DAQ HAT Series for Raspberry Pi®

Precision Voltage, Thermocouple, and IEPE Measurements, Plus Analog and Digital I/O

	Analog Inputs	Sample Rate	Resolution
MCC 118	8 SE Voltage	100 kS/s	12-bit
MCC 128	8 SE/4 DIFF Voltage	100 kS/s	16-bit
MCC 134	**Analog Inputs**	**Update Interval**	**Resolution**
	4 Thermocouple	1 Sec	24-bit
MCC 152	**Analog Outputs**	**Digital I/O**	**Resolution**
	2 Voltage	8	12-bit
MCC 172	**Analog Inputs**	**Sample Rate**	**Resolution**
	2 IEPE	51.2 kS/s/ch	24-bit



MCC 118

Raspberry Pi is the most popular single-board computer in use today. Many traditional DAQ users are designing systems around it because of its flexibility and low cost. This growing base of Raspberry Pi users, along with open-source software becoming more industry accepted, is driving growth and making single-board computer use more prevalent in professional DAQ applications.

WebDAQ Series

Internet Enabled Data Loggers for the Internet of Things

WebDAQ Series internet data logger devices offer a complete and easy-to-use remote data acquisition solution. With an embedded web server, users can configure and run simple to complex data logging operations, log data, set alarm conditions, and view the data in real-time from anywhere on an internet-enabled device.

	Analog Inputs	Sample Rate	Resolution
WebDAQ 316	16 Thermocouple	75 S/s/ch Max	24-bit
WebDAQ 504	4 IEPE	51 kS/s/ch Max	24-bit
WebDAQ 904	4 Universal	100 S/s/ch Max	24-bit

WebDAQ 504

There are three devices in the WebDAQ Series. Devices are available to log multiple signal types including voltage (up to ±60 V), thermocouples, IEPE-based sensors like accelerometers, current, RTDs, resistance, and bridge-based sensors.

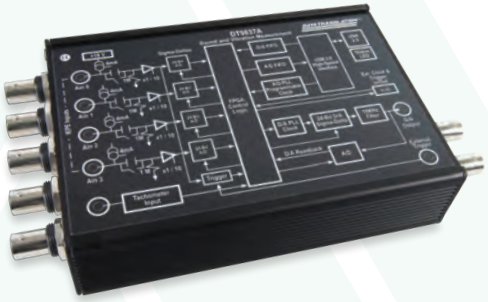
USB DAQ

Multifunction devices with analog input and output, digital I/O, and counter/timers

Whether you are measuring voltage, current, temperature, or digital signals, these products include accompanying software and drivers for a quick and customizable solution for your unique application. Most devices are available in an enclosed or board-only version for embedded and OEM applications.

USB-1608GX-2AO

USB-205



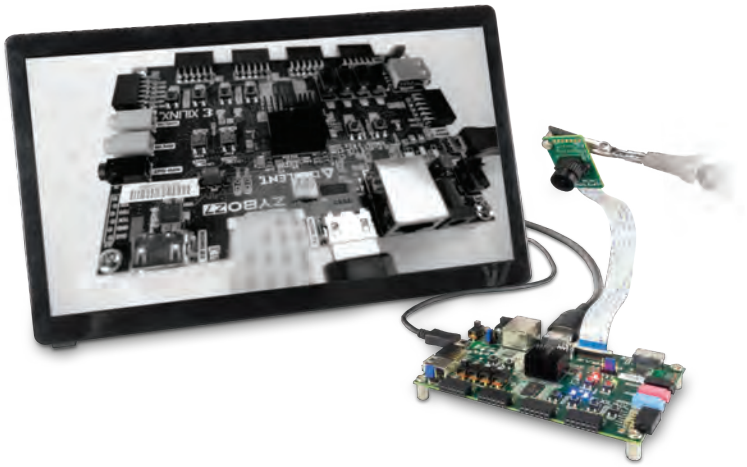
DT9837A

TC-32

	Analog Inputs	Sample Rate	Resolution	Analog Outputs	DIO
USB-205	8 SE	500 kS/s	12-bit	2	8 DIO/1 CTR
USB-234	8 SE/4 DIFF	100 kS/s	16-bit	2	8 DIO/1 CTR
USB-1608GX-2AO	16SE/8 DIFF	500 kS/s	16-bit	2	8 DIO/2 CTR
USB-1808X	8 SE/8 DIFF	200 kS/s/ch	18-bit	2	4 DIO/2 CTR
USB-2637	64 SE	1 MS/s	16-bit	4	24 DIO/4 CTR
USB-Temp	8 Temperature	2 S/s/ch	24-bit		8 DIO
TC-32	Up to 64 Thermocouple	3 S/s/ch	24-bit		Up to 40 DIO
DT9837A	4 IEPE	52.7 kS/s/ch	24-bit	1	1 Tach input

FPGA Boards

Plenty of attention goes into making sure that the **Digilent FPGA boards** you're buying are optimized for both performance and cost. Our proud partnership with AMD means that each of our kits features one of their industry-leading devices. Our FPGA boards range from the accessible Cmod S7 to more powerful system-on-a-chip offerings like the Genesys ZU 5EV, featuring UltraScale+ technology.



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.

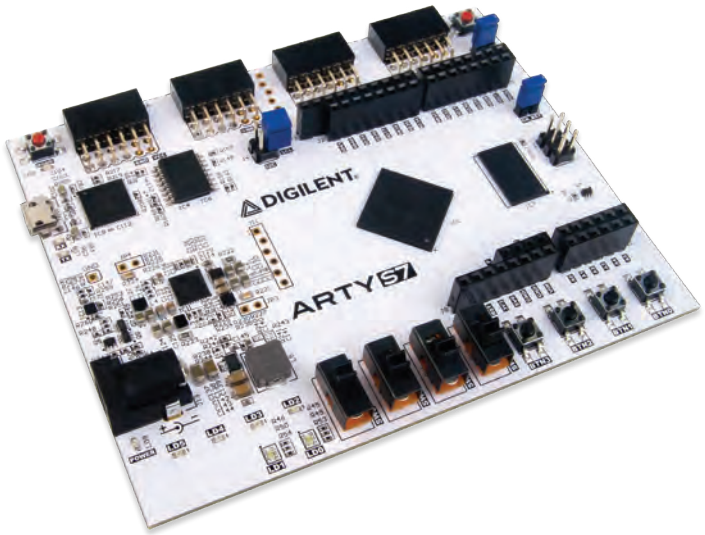
ARTY S7

Spartan-7 FPGA Development Board

The Arty family of Digilent FPGA/SoC boards was designed with versatility and flexibility in mind. With universally popular Arduino™ headers and multiple Pmod™ ports, an Arty will be the most adaptable FPGA/SoC board in your toolbox.

The Arty S7 is an affordable, ready to use development platform designed around the Xilinx Spartan®-7 FPGA family. With the Spartan-7 devices, the Arty S7 board offers best-in-class performance-per-watt, along with small form-factor packaging to meet the most stringent requirements. With the MicroBlaze Soft Processor Core from Xilinx, you can create embedded applications with a variety of peripherals, memory, and interfaces.

The Arty S7 is supported by AMD's Vivado Design Suite, including the free Vivado ML Edition. You can also leverage the Vitis Core Development Kit or Xilinx Software Development Kit to start developing for the MicroBlaze processor with no prior FPGA experience.



Key Features

- **Internal clock speeds exceeding 450 MHz**
- **On-chip analog-to-digital converter (XADC)**
- **Programmable over JTAG and Quad-SPI Flash**
- **256 MB DDR3L with a 16-bit bus @ 650 MHz**
- **128 Mbits Quad-SPI Flash**
- **100 MHz External Clock**

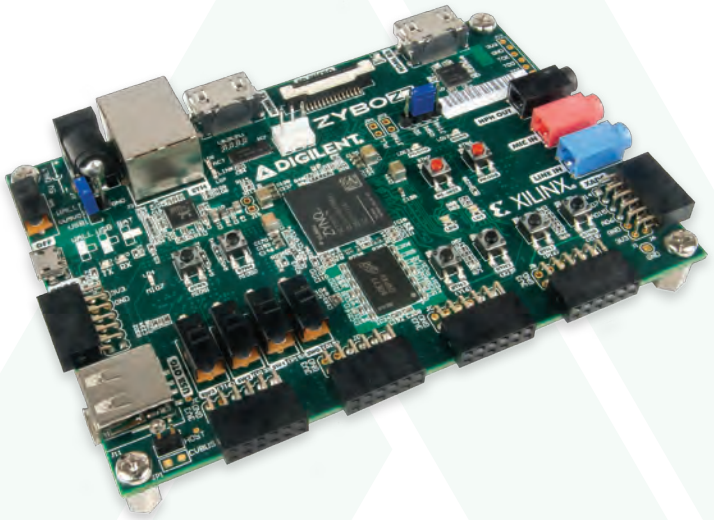
ZYBO Z7

Zynq-7000 ARM/FPGA SoC Development Board

The Zybo Z7 is a ready-to-use embedded software and digital circuit development board built around the Xilinx Zynq™-7000 family. The Zynq-7000 tightly integrates a dual-core ARM Cortex-A9 processor with Xilinx 7-series Field Programmable Gate Array (FPGA) logic.

A rich set of multimedia and connectivity peripherals make the Zybo Z7 a formidable single-board computer. A MIPI CSI-2 compatible Pcam connector, HDMI input, HDMI output, and high DDR3L bandwidth establish the Zybo Z7 as an affordable, yet capable, solution for high-end embedded vision applications. Attaching additional hardware is made easy by the Zybo Z7's Pmod connectors, allowing access to Digilent's catalog of over 60 Pmod peripheral boards, including motor controllers, sensors, displays, and more.

The Zybo Z7 is supported by Xilinx's Vivado Design Suite, including the free Vivado ML Edition. You can also interact with the processing system (PS) with Xilinx's Vitis Unified Software Platform and PetaLinux Tools.

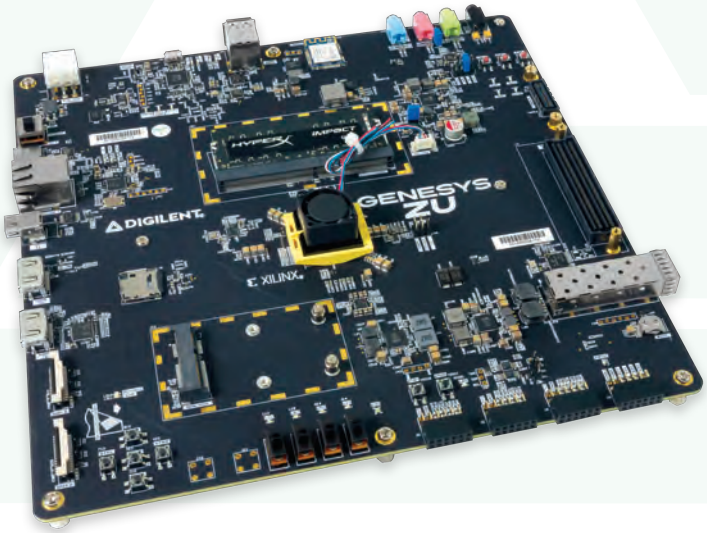


GENESYS ZU

Zynq Ultrascale+ MPSoC Development Board

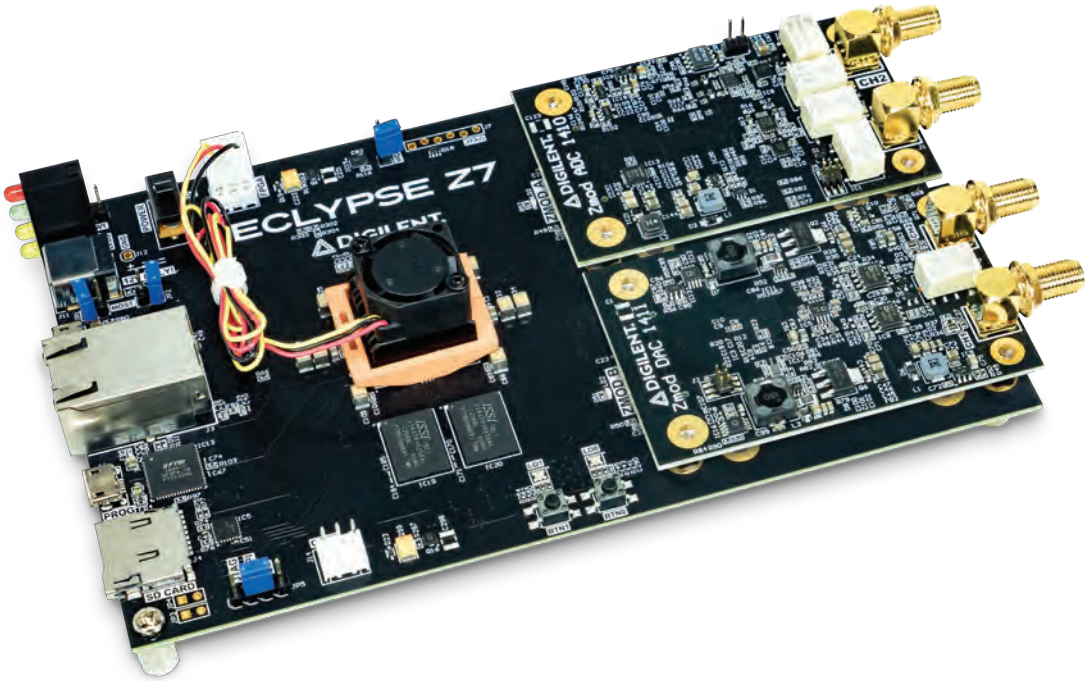
The Genesys ZU is a standalone Zynq UltraScale+ EG/EV MPSoC development board, designed to provide an ideal entry point by combining cost-effectiveness with powerful multimedia and network connectivity interfaces. There are two variants of the Genesys ZU: 3EG and 5EV. These two variants are differentiated by the MPSoC chip version and some peripherals. As compared to the 3EG, with the 5EV you get faster DDR4, more FPGA fabric, a video codec, and GTH transceivers allowing HDMI Source, Sink and 10G SFP+. Both variants support multiple multimedia and network interfaces with an excellent mix of on-board peripherals, upgrade-friendly DDR4, Mini PCIe and microSD slots, along with multi-camera and high-speed expansion connectors which are designed to support a wide range of use-cases.

The Genesys ZU is primarily targeted towards Linux-based applications that facilitate access to Wi-Fi, cellular radio (WWAN), SSD, USB SuperSpeed and 4K video. Two different specialized ports, including Pmod and high-speed SYZYGY-compliant expansion module ports for our new Zmods, enable flexible expansion and easy access to a wide ecosystem of add-on modules, perfect for silicon evaluation and rapid prototyping.



ECLYPSE Z7

A New Way to Accelerate Design Flow



The Eclypse Z7 is specifically designed to enable the rapid prototyping and development of embedded measurement systems. Featuring high-speed SYZYGY® ports for modular expansion and a Xilinx Zynq®-7020 SoC, the Eclypse Z7 is fast and flexible, reducing the time it takes for engineers and researchers to develop innovative and powerful new high-speed instrumentation, control, and measurement systems for edge-computing, medical, and communications applications.

Powerful Hardware

The Eclypse Z7 is specifically designed to enable the rapid prototyping and development of Embedded Measurement Systems including applications like software-defined radio, ultrasound, other medical devices, and much more. Pick and choose the hardware specs based on the performance requirements of your specific application, or design your own powerful hardware that best suits your specific needs with SYZYGY-compatible Zmod connector boards.

Flexible Software

To create and modify designs for your Eclypse Z7, you can use Xilinx's Vivado Design Suite, PetaLinux, and SDK tools to customize, build, and deploy solutions on the Eclypse's Zynq-7000. For those who want to get started without FPGA experience, Digilent provides several example designs using the Eclypse with C/C++®, including both baremetal and Linux® software applications.

ZYNQ ZMOD SYZYGY

Modular Connectors

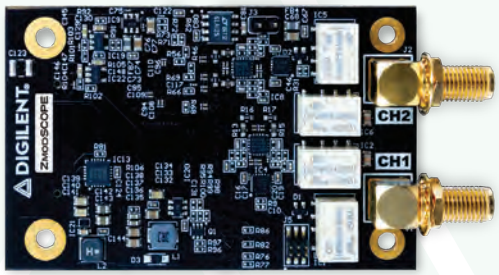
ZMOD

Digilent's Zmods are intended to be included in user-defined data acquisition or signal processing systems. They use Opal Kelly's 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 Eclypse 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 (up to 125 MS/s), the flexible input/output range, the high resolution, and the flexibility provided by the FPGA interface make the Zmods an ideal solution for a wide variety of applications.

ZMOD SCOPE

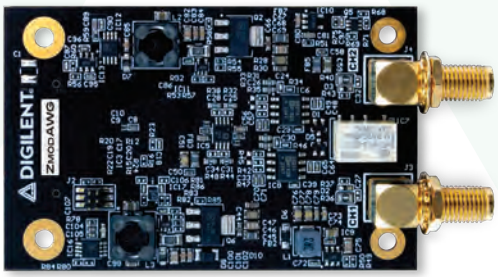
2-channel Oscilloscope Module (available in 10-, 12-, or 14-bit)



- 2 Channels, single-ended, 14-bit resolution
- Input range: ±1 V (High Gain) or ±25 V (Low Gain)
- Absolute Resolution: 3.2 mV (High Gain) or 0.13 mV (Low Gain)
- Sample rate (real time): Ranging from 40 MS/s to 125 MS/s, depending on model
- Input impedance: 1 MΩ || 18 pF
- Analog bandwidth, -40 Models: 20 MHz @ -3 dB, 8 MHz @ -0.5 dB, 4 MHz @ -0.1 dB
- Analog bandwidth, -105 and -125 Models: 70 MHz @ -3 dB, 30 MHz @ -0.5 dB, 20 MHz @ -0.1 dB
- Input protected to: ±50 V

ZMOD AWG

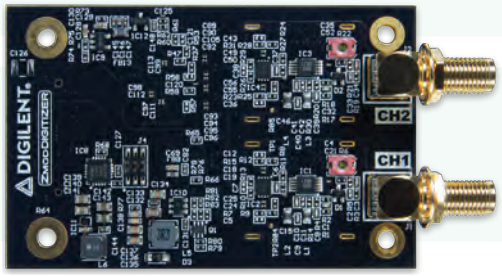
2-channel 14-bit Arbitrary Waveform Generator Module



- 2 Channels, single-ended, 14-bit resolution
- Absolute Resolution (amplitude ≤1.25 V): 167 µV
- Absolute Resolution (amplitude >1.25 V): 665 µV
- Sample rate (real time): 100 MS/s
- Output impedance: 50 Ω
- Analog bandwidth: 40 MHz+ @ -3 dB, 20 MHz @ -0.5 dB, 14 MHZ @ -0.1 dB
- Slew rate (2 V step): 180 V/µs

ZMOD DIGITIZER

2-channel 14-bit Analog-to-Digital Converter Module



- 2 Channels, single-ended, 14-bit resolution
- Input range: ±1 V
- Absolute Resolution: 0.13 mV
- Sample rate: 125 MS/s max
- Input impedance: 1 MΩ || 5 pF
- Analog bandwidth: 60+ MHz @ -3 dB, 20 MHz @ -0.5 dB, 8 MHz @ -0.1 dB
- Precision clock generator supporting 122.8 MHz
- Input protected to: ±50 V

Ettus USRP Products

Software-Defined Radio Solutions

By supporting a wide variety of development environments on an expansive portfolio of high-performance RF hardware, the USRP platform is the SDR platform of choice for thousands of engineers, hobbyists, and students worldwide for exploration, prototyping and developing next-generation wireless technologies across a wide variety of applications. This software-defined radio portfolio combines ease of use and a robust open-source software community.

Ettus USRP B205mini-i

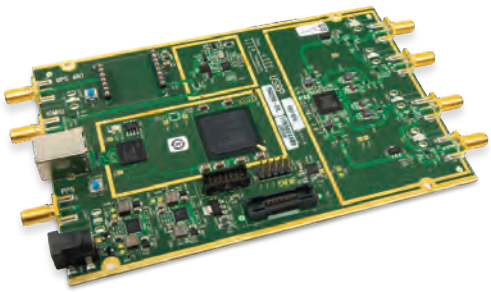
The USRP B205mini-i is a flexible and compact platform that is ideal for both hobbyist and OEM applications. It is designed by Ettus Research™ and provides a wide frequency range (70 MHz to 6 GHz) and a user-programmable, industrial-grade Xilinx Spartan-6 XC6SLX150 FPGA. The similar Ettus USRP B200mini is limited to a narrower operating temperature range and utilizes a smaller FPGA.

Ettus USRP B200

The USRP B200 provides a fully integrated, single board, Universal Software Radio Peripheral platform with continuous frequency coverage from 70 MHz to 6 GHz. Designed for low-cost experimentation, it combines a fully integrated direct conversion transceiver providing up to 56 MHz of real-time bandwidth, an open and reprogrammable Spartan 6 FPGA, and fast and convenient bus-powered SuperSpeed USB 3.0 connectivity. Full support for the UHD (USRP Hardware Driver) software allows you to immediately begin developing with GNU Radio, prototype your own GSM base station with OpenBTS, and seamlessly transition code from the B200 to higher performance, industry ready USRP platforms.

Ettus USRP B210

The USRP B210 provides a fully integrated, single-board, Universal Software Radio Peripheral (USRP™) platform with continuous frequency coverage from 70 MHz – 6 GHz. Designed for low-cost experimentation, it combines the AD9361 RFIC direct-conversion transceiver providing up to 56 MHz of real-time bandwidth, an open and reprogrammable Spartan-6 FPGA, and fast SuperSpeed USB 3.0 connectivity. Full support for the USRP Hardware Driver™ (UHD) software allows you to immediately begin developing with GNU Radio, prototype your own GSM base station with OpenBTS, and seamless transition code from the USRP B210 to higher performance, industry-ready USRP platforms.



Coming in 2024: ZMODSDR

Engineering Tools Every Student Can Own

Academic Program Details

At Digilent, our mission has always been, and still is, to make engineering technologies understandable and accessible to all. We provide professors, lab managers and students with low-cost, fundamental tools and coursework to turn this mission into reality.

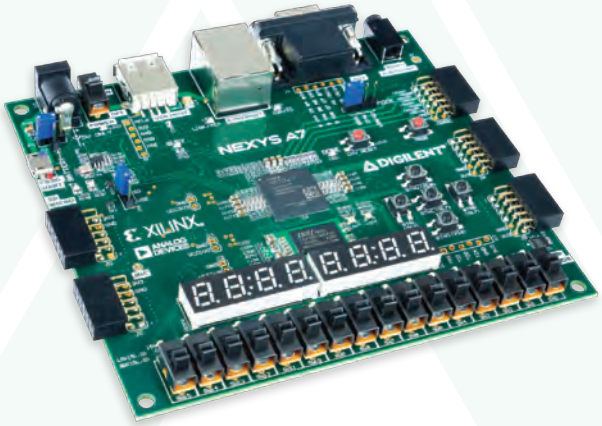
Products like the portable Analog Discovery 3 mixed-signal oscilloscope, or the entry-level Basys 3 FPGA development board put the hardware in the student's hands for maximum engagement and growth in a traditional classroom setting or remote.

Expanded Discounts

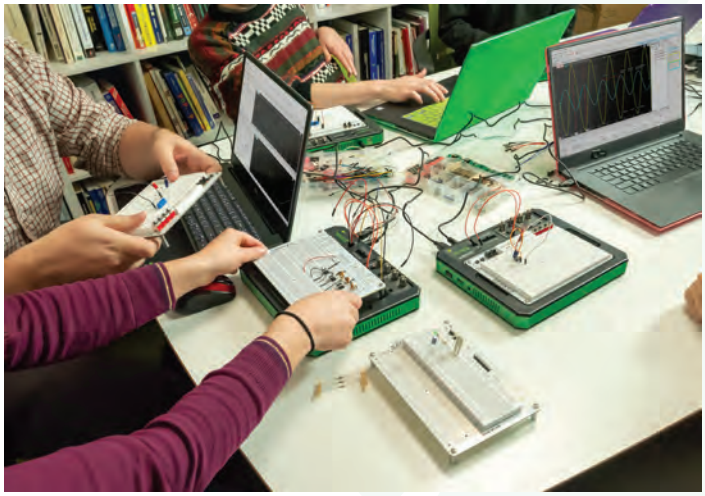
Verified academic accounts will receive 15% off all products that weren't already discounted (web purchases only). Visit our site to begin the verification process.

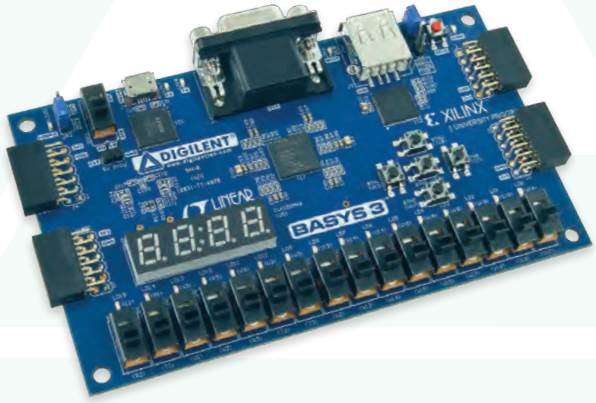
Once we verify your academic information, a confirmation email will be sent out and academic pricing will be applied automatically when you are logged into your Digilent account.

Analog Discovery 3: 125 MS/s USB Oscilloscope, logic analyzer and variable power supply



Nexys A7: An incredibly accessible, yet powerful, FPGA development board





Basys 3 Artix-7 FPGA Trainer Board: Recommended for introductory users

digilent.com/academic

Product Comparison

Test Devices

Product	Analog Input	Analog Output	Digital Input	Digital Output	Analyzer and Full Protocol Support	Power Supplies	OS Support
Analog Discovery 3	2 Channel,14-bit, 125 MS/s, ±25 V, 30 MHz+ bandwidth with BNC Adapter	2 Channel, 14-bit, 125 MS/s, ±5 V	16 Channel, 125 MS/s, 3.3 V CMOS, 5 V tolerant	16 Channel, 125 MS/s, 3.3 V CMOS	Spectrum, Network, Impedance, SPI, I2C, UART, etc.	-0.5 to -5 V, 0.5 to 5 V, 600 mW over USB, 2.4 W via ext power	Windows, Mac, Linux
Digital Discovery	N/A	N/A	32 Channel, 800 MS/s, 1.2 V to 3.3 V CMOS, 5 V tolerant	16 Channel, 100 MS/s, 1.2 V to 3.3 V CMOS	SPI, I2C, UART, CAN, AVR Programming, etc.	1.2 to 3.3 V, 200 mA current total	Windows, Mac, Linux
Analog Discovery Studio	2 Channel,14-bit, 100 MS/s, ±25 V, 30 MHz+ bandwidth with BNC Adapter	2 Channel, 14-bit, 100 MS/s, ±5 V	16 Channel, 100 MS/s, 3.3 V CMOS, 5 V tolerant	16 Channel, 100 MS/s, 3.3 V CMOS	Spectrum, Network, Impedance, SPI, I2C, UART, etc.	-0.5 to -5 V, 0.5 to 5 V, each at 2.1 W, ±12 V at 0.2 A, 5 V and 3.3 V at 1 A	Windows, Mac, Linux
Analog Discovery Pro ADP2230	2 Channel, 14-bit, 125 MS/s, ±25 V, 50 MHz+ bandwidth	1 Channel, 14-bit, 125 MS/s, ±5 V	16 Channel, 125 MS/s, 3.3 V CMOS, 5 V tolerant	16 Channel, 125 MS/s, 3.3 V CMOS	Spectrum, Network, Impedance, SPI, I2C, UART, etc.	-0.5 V to -5 V, 0.5 V to 5 V, each at 3 W	Windows, Mac, Linux
Analog Discovery Pro ADP3450/ADP3250	4 channel / 2 channel, 14-bit, 125 MS/s, ±25 V, 55 MHz+ bandwidth	2 Channel, 14-bit, 125 MS/s, ±5 V	16 Channel, 125 MS/s, 1.2 V to 3.3 V CMOS, 5 V tolerant	16 Channel, 125 MS/s, 1.2 V to 3.3 V CMOS	Spectrum, Network, Impedance, SPI, I2C, UART, etc.	1.2 to 3.3 V, 300 mA current total	Windows, Mac, Linux
Analog Discovery Pro ADP5250	2 channel, 8-bit, 1 GS/s, 40 V peak to peak, 100 MHz bandwidth	1 Channel, 14-bit, 125 MS/s, ±12 V	32 Channel, 1 GS/s, 0 V to 5 V input	N/A	Spectrum, Network, Impedance	0 to 6 V up to 1 A, 0 to 25 V up to 500 mA, 0 to -25 V up to 500 mA	Windows

System Boards

Product	FPGA Chip	Expansion Connectors	Connectivity	Audio	Video	External Memory
Arty S7	Spartan-7 (XC7S50/XC7S25)	4x Pmod	USB-UART	none	none	256 MB DDR3L
Arty A7	Artix-7 (XC7A100T)	4x Pmod	USB-UART, 10/100 Ethernet	none	none	256 MB DDR3L
Arty Z7	Zynq-7000 (XC7Z020/XC7Z010)	2x Pmod	USB-UART, Gigabit Ethernet, USB 2.0 Host PHY	Mono output	HDMI source and sink	512 MB DDR3
Basys 3	Artix-7 (XC7A35T)	3x Pmod	USB-UART	none	VGA output	none
Eclypse Z7	Zynq-7000 (XC7Z020)	2x Zmod, 2x Pmod	USB-UART, Gigabit Ethernet, USB 2.0 Host/Device/OTG PHY	none	none	1 GB DDR3L
Genesys ZU	Zynq UltraScale+ (XCZU5EV/XCZU3EG)	1x Zmod, 4x Pmod, FMC LPC, FMC Gigabit (5EV-only), dual-slot Mini-PCIe / mSATA	USB-UART, 2.4 GHz Wi-Fi, Gigabit Ethernet, SFP+ 10G Ethernet (5EV-only), USB 2.0 Host PHY	Line-in, line-out, headphone-out, and microphone-in jacks	HDMI source and sink (5EV-only), 2x Pcam connectors, DisplayPort source	4 GB DDR4
Nexys A7-100T	Artix-7 (XC7A100T)	5x Pmod	USB-UART, 10/100 Ethernet	Mono output, microphone	VGA output	128 MB DDR2
Zybo Z7	Zynq-7000 (XC7Z020/XC7Z010)	6x Pmod (Z7-20) / 5x Pmod (Z7-10)	USB-UART, Gigabit Ethernet, USB 2.0 Host/Device/OTG PHY	Line-in, headphone-out, and microphone-in jacks	HDMI source and sink, 1x Pcam connector	1 GB DDR3L