

SKU	MPN	Description
3760600	471-040	MSO / MDO Oscilloscope, Analog Discovery Pro 3000 Series, 4 Analogue, 16 Digital, 55 MHz, 100 MSPS



What is the Analog Discovery Pro 3000 Series?

What you see is what you need. No misleading specs. No hidden costs.

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.

High Resolution Meets Mixed Signals

The ADP3450 is the first in the line of Analog Discovery Pro devices and take the analog and digital instruments from the internationally popular Analog Discovery and turn up key functionalities to meet the growing need for professional-level home electronics test benches. At the heart of each device is a four or two channel high-resolution oscilloscope, offering 14-bit resolution at up to 0.5 GS/s. Additionally, to meet the needs of an increasingly digital world, 16 dedicated digital channels make the Analog Discovery Pro a true mixed signal oscilloscope. With the included digital power supply, digital outputs, two channel arbitrary waveform generator, and two dedicated external triggers the Analog

Discovery Pro comes with 12 instruments ready to analyze mixed signal systems through our free software, WaveForms.

Introducing Linux Mode

Whether at home or in the lab, engineers are routinely asked to design and validate increasingly complex systems and decrease design cycle time. Using flexible test equipment that can research, validate, and test is one of the ways engineers can expedite this process. In addition to the 12 built-in instruments enabled by WaveForms, the Analog Discovery Pro introduces 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.

Advanced Trigger Modes

Whether in Linux Mode using WaveForms SDK, or in Standard Mode connected via WaveForms, the Analog Discovery Pro features a variety of advanced triggering options. Instruments within WaveForms can be cross-triggered for example, activating an oscilloscope capture based on a received and decoded digital protocol. And external signals can trigger events using the two dedicated external trigger inputs on the back of the device. WaveForms provides these features configurable in the instruments themselves, or for more control or automation in one of the available scripting interfaces.

Analog Inputs:

- Used in the Oscilloscope, Network Analyzer, Spectrum Analyzer, Voltmeter, Impedance Analyzer, and Data Logger
- ADP3450: Four analog input channels accessible via front panel BNC connectors
- Channel type: single ended
- Analog bandwidth: 55+ MHz @ 3 dB
- Noise limiting hardware bandwidth filter: 20 MHz
 - Can be enabled or disabled
- 14-bit resolution (16-bit resolution with oversampling)
- Input range ± 25 V (± 50 V diff)
- Input protected to ± 50 V
- Max sampling rate:
 - 0.5 GS/s (with oversampling enabled)
 - 100 MS/s default
- AC or DC coupling
- Input buffer Size
 - 128 MS total in record mode
 - 32 k + samples per channel in repeated/shift/screen modes
- Channel type: single-ended

Analog Outputs:

- Used in the Waveform Generator, Impedance Analyzer, and Network Analyzer
- Two arbitrary waveform generator channels, accessible via front panel BNC connectors
- 14-bit Resolution
- AC amplitude (max): ± 5 V
- Analog bandwidth: 15 MHz @ 3 dB
- Maximum Sampling Rate: 125 MS/s

Digital Inputs and Outputs:

- Used in the Logic Analyzer, Pattern Generator, Protocol Analyzer, and Digital I/O
- Channels: 16
- Input logic standard: LVCMOS (adjustable 1.2 V to 3.3 V, 5 V tolerant)
- Output logic standard: LVCMOS (adjustable 1.2 V to 3.3 V, 8 mA)
- Max sampling rate: 125 MS/s
- Logic analyzer buffer memory:
 - 64 MS total in Record Mode
 - 32 k+ per channel in Repeated/Shift/Screen modes

Digital Power Supply:

- One Power supply with two access points
- Voltage Range: 1.2 V to 3.3 V
- Output Current: 300 mA

Advanced Triggering:

- Trigger sources: oscilloscope analog channels, function generator start, digital I/O lines, external triggers, manual trigger button
- Trigger Modes
 - None, auto, manual (forced trigger), single
- Analog Trigger
 - Edge, pulse, transition, condition, level, hysteresis, hold-off
- Digital Trigger
 - Edge, level, pattern, glitch, protocol

**Connectivity:**

- Device to computer: USB or Ethernet connection (in Linux or Standard Modes)
- 4 High-speed USB 2.0 ports for peripheral connection (enabled in Linux mode)
 - Enabled for set and tested WiFi dongles (in Linux Mode)

Other:

- Auxiliary Powered
- Dimensions: 23.40 cm x 19.40 cm x 3.81 cm (9.2 in x 7.6 in x 1.5 in)
- Weight: 450 g

Product Compliance:

- HTC: 8471809000
- ECCN: 3A992.a

What's Included**ADP3450 (Add BNC Probes):**

- 1 ADP3450
- 1 USB A to B cable
- 1 19V 3.4A power supply brick
- 1 US IEC cable
- 1 EU IEC cable
- 1 2x12 MTE cable
- 4 BNC to mini-grabber cables
- 4 P2150 oscilloscope probes

Software:

What is WaveForms?

WaveForms is the free software application for the ADP3450 and enables use of the available analog and digital instruments. The software has been refined by customer feedback for over 10 years and features a computer and laptop friendly user interface that has the feel of traditional benchtop software. The device communicates with WaveForms via a USB or Ethernet connection to your computer, allowing users to capture, record, analyze, and generate mixed signal and mixed domain

waveforms. WaveForms can be downloaded and installed in under 60 seconds and can be tested without hardware using its demo mode feature. In addition to the use of instruments in the application, the WaveForms application has a script editor tool, which allows custom scripting of the instrument in

JavaScript. WaveForms is designed to be run on a laptop or desktop computer and is Mac, Windows, and Linux compatible.

For even more customization potential, the WaveForms Software Development Kit (SDK) can be used to create custom applications and scripts in Python, C and additional languages. The ADP3450 also compatible with LabVIEW



The following instruments are available in the WaveForms application for the ADP3450

- Oscilloscope
- Waveform Generator
- Power Supplies
- Voltmeter
- Data Logger
- Logic Analyzer
- Pattern Generator
- Static I/O
- Spectrum Analyzer
- Network Analyzer
- Impedance Analyzer
- Protocol Analyzer



What are the modes of operation?

For the ADP3450 WaveForms also provides a convenient method for changing between the available modes: Standard Mode and Linux mode.

Standard Mode allows the ADP3450 to be operated as a USB/Ethernet connected instrument, providing all the functionality of the 12 instruments in WaveForms.

The ADP3450 also has Linux Mode, which boots a terminal based Linux distribution onto the device itself. When running as an embedded device, the ADP3450 adds additional flexibility and connectivity to WaveForms SDK. When scripts are run on the device data can be stored locally or streamed via a wired or wireless connection. The ADP3450 also have four USB ports that are enabled in Linux mode allowing for the connection of peripherals, such as a WiFi dongle.

For examples and tutorials on WaveForms, Standard Mode, or Linux Mode, visit the Resource Center from the *Support Materials* tab.

Quickly find what you need to get started and reduce mean time to measure.

<https://reference.digilentinc.com/reference/instrumentation/analog-discovery-pro-3x50/start>