

# Analog Discovery 2 Specifications

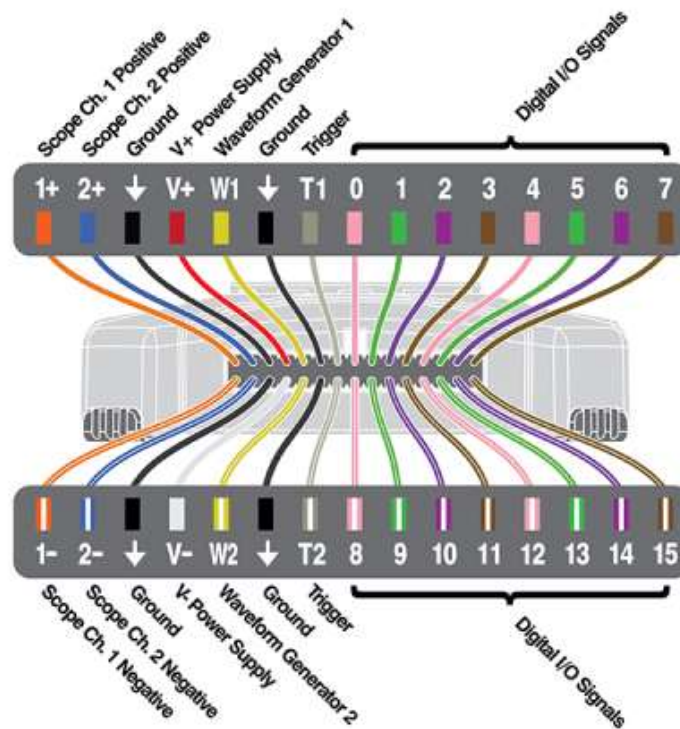
A high performance, all-in-one USB oscilloscope & instrumentation system

([https://reference.digilentinc.com/\\_detail/reference/instrumentation/analog-discovery-2-specs/screenshot-companies.png?id=reference%3Ainstrumentation%3Aanalog-discovery-2%3Aspecifications](https://reference.digilentinc.com/_detail/reference/instrumentation/analog-discovery-2-specs/screenshot-companies.png?id=reference%3Ainstrumentation%3Aanalog-discovery-2%3Aspecifications))



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Turn your PC into a powerful circuit learning platform that can measure, visualize, analyze, record, and control mixed signal circuits! The Analog Discovery 2 is small enough to fit in your pocket and it costs less than a textbook, but it is powerful enough to be the centerpiece of a world-class circuits or electronics teaching lab. 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.



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## Also available for your Discovery 2:



BNC Adapter Board



BNC Oscilloscope Probes



Analog Parts Kit



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### Analog Inputs

- Channels: 2
- Channel type: differential
- Resolution: 14-bit
- Absolute Resolution (scale  $\leq 0.5\text{V/div}$ ):  $0.32\text{mV}$
- Absolute Resolution (scale  $\geq 1\text{V/div}$ ):  $3.58\text{mV}$
- Accuracy (scale  $\leq 0.5\text{V/div}$ ,  $V_{inCM} = 0\text{V}$ ):  $\pm 10\text{mV} \pm 0.5\%$
- Accuracy (scale  $\geq 1\text{V/div}$ ,  $V_{inCM} = 0\text{V}$ ):  $\pm 100\text{mV} \pm 0.5\%$
- CMMR (typical):  $\pm 0.5\%$
- Sample rate (real time):  $100 \text{ MS/s}$
- Input impedance:  $1\text{M}\Omega \parallel 24\text{pF}$
- Scope scales:  $500\mu\text{V}$  to  $5\text{V/div}$
- Analog bandwidth with Discovery BNC adapter:  $30+ \text{ MHz}$  @  $3\text{dB}$ ,  $10 \text{ MHz}$  @  $0.5\text{dB}$ ,  $5 \text{ MHz}$  @  $0.1\text{dB}$
- Analog bandwidth with included flywires:  $9 \text{ MHz}$  @  $3\text{dB}$ ,  $2.9 \text{ MHz}$  @  $0.5\text{dB}$ ,  $0.8 \text{ MHz}$  @  $0.1\text{dB}$
- Input range:  $\pm 25\text{V}$  ( $\pm 50\text{V}$  diff)
- Input protected to:  $\pm 50\text{V}$
- Buffer size/channel: Up to 16k samples
- Triggering: edge, pulse, transition, hysteresis, etc.
- Cross-triggering with Logic Analyzer, Waveform Generator, Pattern Generator, or external trigger
- Sampling modes: average, decimate, min/max
- Mixed signal visualization (analog and digital signals share same view pane)
- Real-time views: FFTs, XY plots, histograms, and other
- Multiple math channels with complex functions
- Cursors with advanced data measurements
- Captured data files can be exported in standard formats
- Scope configurations can be saved, exported, and imported

### Arbitrary Waveform Generator

- Channels: 2
- Channel type: single ended
- Resolution: 14-bit
- Absolute Resolution (amplitude  $\leq 1V$ ):  $166\mu V$
- Absolute Resolution (amplitude  $> 1V$ ):  $665\mu V$
- Accuracy - typical ( $|V_{out}| \leq 1V$ ):  $\pm 10mV \pm 0.5\%$
- Accuracy - typical ( $|V_{out}| > 1V$ ):  $\pm 25mV \pm 0.5\%$
- Sample rate (real time):  $100 \text{ MS/s}$
- AC amplitude (max):  $\pm 5 V$
- DC Offset (max):  $\pm 5 V$
- Analog bandwidth with Discovery BNC adapter:  $12 \text{ MHz}$  @ 3dB,  $4 \text{ MHz}$  @ 0.5dB,  $1 \text{ MHz}$  @ 0.1dB
- Analog bandwidth with included flywires:  $9 \text{ MHz}$  @ 3dB,  $2.9 \text{ MHz}$  @ 0.5dB,  $0.8 \text{ MHz}$  @ 0.1dB
- Slew rate (10V step):  $400V/\mu s$
- Buffer size/channel: up to 16k samples
- Standard waveforms: sine, triangle, sawtooth, etc.
- Advanced waveforms: Sweeps, AM, FM.
- User-defined arbitrary waveforms: defined within WaveForms software user interface or using standard tools (e.g. Excel)

## Logic Analyzer

- Channels: 16 (shared)
- Sample rate (real time):  $100 \text{ MS/s}$
- Buffer size/channel: up to 16K samples
- Input logic: LVCMOS (1.8V/3.3V, 5V tolerant)
- Multiple trigger options including pin change, bus pattern, etc.
- Cross-triggering between Analog input channels, Logic Analyzer, Pattern Generator, or external trigger
- Interpreter for SPI, I2C, UART, Parallel bus
- Data file import/export using standard formats

## Digital Pattern Generator

- Channels: 16 (shared)
- Sample rate (real time):  $100 \text{ MS/s}$
- Algorithmic pattern generator (no buffers used)
- Custom pattern buffer/channel: up to 16K samples
- Output logic standard: LVCMOS (3.3V, 12mA)
- Data file import/export using standard formats
- Customized visualization for signals and buses

## Digital I/O

- Channels: 16 (shared)
- Input logic: LVCMOS (1.8V/3.3V, 5V tolerant)
- Output logic standard: LVCMOS (3.3V, 12mA)
- Virtual I/O devices (buttons, switches & displays)
- Customized visualization options available

## Power Supplies

- Voltage range: 0.5V...5V and -0.5V...-5V
- Pmax (USB powered): 500mW total
- Imax (USB powered): 700mA for each supply
- Pmax (AUX powered): 2.1W for each supply
- Imax (AUX powered): 700mA for each supply
- Accuracy (no load):  $\pm 10mV$
- Output impedance:  $50m\Omega$  (typical)

## Network Analyzer

- Shared instruments: Scope, AWG
- Frequency sweep range: 1Hz to 10MHz
- Frequency steps: 5 ... 1000
- Settable input amplitude and offset
- Analog input records response at each frequency
- Available diagrams: Bode, Nichols, or Nyquist

## Voltmeters

- Channels (shared with scope): 2
- Channel type: differential
- Measurements: DC, AC, True RMS
- Resolution: 14-bit
- Accuracy (scale  $\leq 0.5V/div$ ):  $\pm 5mV$
- Accuracy (scale  $\geq 1V/div$ ):  $\pm 50mV$
- Input impedance:  $1M\Omega || 24pF$
- Input range:  $\pm 25V$  ( $\pm 50V$  div)
- Input protected to:  $\pm 50V$

## Spectrum Analyzer

- Channels (shared with scope): 2
- Power spectrum algorithms: FFT, CZT
- Frequency range modes: center/span, start/stop
- Frequency scales: linear, logarithmic
- Vertical axis options: voltage-peak, voltage-RMS, dBV, and dBu
- Windowing: options: rectangular, triangular, hamming, Cosine, and many others
- Cursors and automatic measurements: noise floor, SFDR, SNR, THD and many others
- Data file import/export using standard formats

## Other Features

- USB power option; all needed cables included.
- External supply option: 5V, 2.5A (not included)
- High-speed USB2 interface for fast data transfer
- Waveform Generator output played on stereo audio jack
- Trigger in/trigger out allows multiple instruments to be linked
- Cross triggering between instruments
- Help screens, including contextual help
- Instruments & workspaces can be individually configured; configurations can be exported
- Device drivers available for NI LabVIEW

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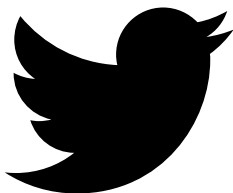
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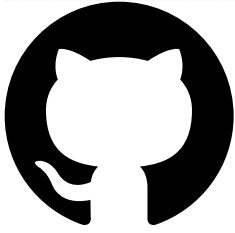
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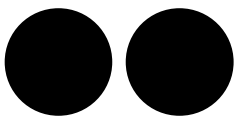
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