

## Digital Discovery



The Digilent Digital Discovery™ is a combined logic analyzer and pattern generator instrument that was created to be the ultimate embedded development companion. The Digital Discovery was designed to optimize channels, speed, and portability. The small form factor facilitates easy storage and provides a whole suite of advanced features to allow you to debug, visualize, and simulate digital signals for most embedded projects. The digital inputs and outputs can be connected to a circuit using simple wire probes or breadboard wires; alternatively, the Digital Discovery High Speed Adapter and impedance-matched probes can be used to connect and utilize the inputs and outputs for more advanced projects. The Digital Discovery is driven by the free WaveForms software and can be configured to be any of the below instruments:

- 24-channel digital logic analyzer (1.2...3.3V CMOS, up to 800MS/s(with the High Speed Adapter))
- 16-channel pattern generator (1.2...3.3V CMOS, 100MS/s)
- 16-channel virtual digital I/O including buttons, switches, and LEDs – perfect for logic training applications
- Two input/output digital trigger signals for linking multiple instruments (1.2...3.3V CMOS)
- A programmable power supply of 1.2...3.3V/100mA. The same voltage supplies the Logic Analyzer input buffers and the Pattern Generator input/output buffers, for keeping the logic level compatibility with the circuit under test.
- Digital Bus Analyzers (SPI, I<sup>2</sup>C, UART, I2S, CAN, Parallel)

The Digital Discovery was designed for anyone embarking on embedded development. Its features and specifications were deliberately chosen to maintain a small and portable form factor, withstand use in a variety of environments, and keep costs down, while balancing the requirements of operating on USB Power.

# Digital Discovery

## Digital Logic Analyzer

**Channels** 24

**Sample Rate** 800 MS/s (with the High Speed Adapter)

**Bandwidth** 100 MHz+

**Voltage Range** 1.2V to 3.3V (5V compatible)

**Buffer** 2Gbit DDR3 acquisition

**Bus Analyzers** SPI, I<sup>2</sup>C, UART, CAN, I2S, Parallel and Custom

## Digital Pattern Generator

**Channels** 16

**Sample Rate** 100 MS/s

**Bandwidth** 50MHz

**Voltage Range** 1.2V to 3.3V (5V compatible)

**Bus output** Counters and Custom

## Multi-purpose Digital I/O

**Channels** 16

**Sample Rate** 100 MS/s (50 MHz max output frequency)

**Voltage Range** 1.2V to 3.3V (5V compatible)

**Buffer** Algorithmic pattern generator (no buffers used)

## Protocol Analyzer

**Channels** 16-32

**Voltage Range** 1.2V to 3.3V (5V compatible)

**Bus Analyzers** UART send and receive, SPI read and write, I2C read and write

## Other Features

**Power** USB bus powered

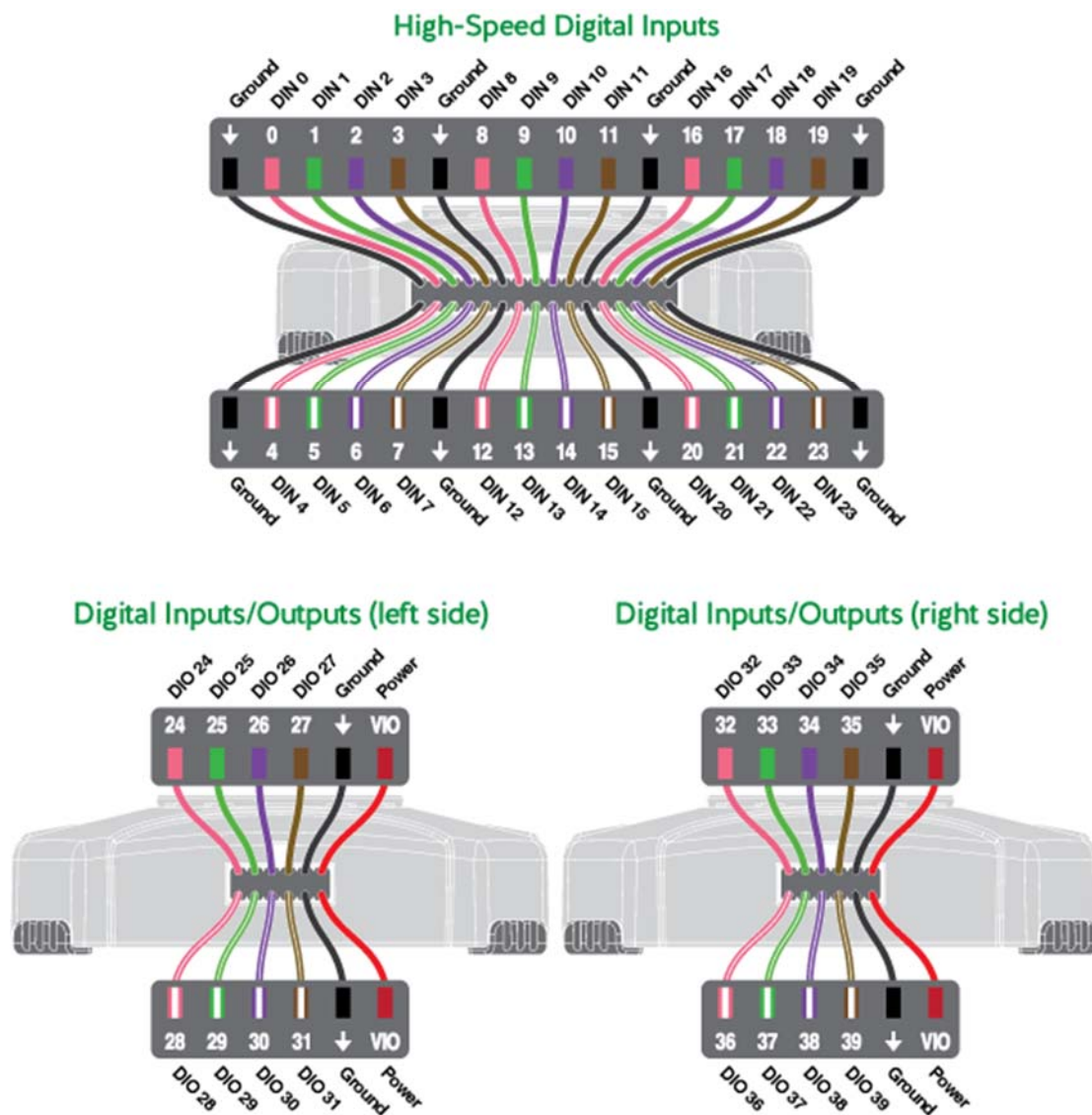
**User Power supplies** 1.2V to 3.3V, available in the two Pmod-style connectors (100mA max)

**Cross-triggering** Between Logic Analyzer, Pattern Generator or external trigger

**Data file** Import/export using standard formats

**Includes** USB cable, fly-wire accessories, high-speed adapter

## Pinout



## Digital Discovery Specifications

A USB embedded development tool for high speed and multi-channel applications

The Digilent Digital Discovery™ is a combined logic analyzer and pattern generator instrument that was created to be the ultimate embedded development companion. Digital Discovery was designed to optimize channel number, speed, and portability. A small form factor facilitates easy storage and provides a whole suite of advanced features to allow you to debug, visualize, and simulate digital signals for most embedded projects. Its digital inputs and outputs can be connected to a circuit using simple wire probes or breadboard wires; alternatively, the Digital Discovery High Speed Adapter and impedance-matched probes\* can be used to connect and utilize 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.

\*Note: The High Speed Adapter and High Speed Logic Probes are an optional add-on at checkout. You can also buy them separately as an accessory. (Pinout)

- Logic Analyzer
  - 24 high-speed input channels (DIN0...23), accessible through one 2×16 connector, used with the Logic Analyzer in Waveforms (560kΩ||10pF)
  - 16 digital I/Os (DIO24...39) arranged in two Pmod-style (2×6) connectors, used with the Logic Analyzer in Waveforms
  - 800MS/s input sample rate when using maximum 8 inputs (and the High Speed Adapter), 400 MS/s with maximum 16 inputs (with the High Speed Adapter), 200MS/s and lower with maximum 32 inputs
  - User programmable input and output LVCMOS voltage levels from 1.2V to 3.3V (5V compatible )
  - 100MHz signal input bandwidth
  - 2Gbit DDR3 acquisition buffer for Logic Analyzer
  - Multiple trigger options including pin change, bus pattern, etc
  - Digital Bus Analyzers (SPI, I<sup>2</sup>C, UART, Parallel)
- Pattern Generator
  - 16 Channels
  - 100MS/s Sample Rate
  - 50 MHz Bandwidth
  - 1.2V to 3.3V outputs, 5V compatible
  - Counter and Custom Bus Outputs
- Protocol Analyzer
  - 24 High Speed Inputs
  - 1.2 to 3.3V inputs and outputs, 5V compatible
  - UART send and receive, SPI read and write, I2C read and write capable
- Digital I/O
  - 16 digital I/Os arranged in two Pmod-style (2×6) connectors.
  - Each of the 16 pins can be configured for input (Logic analyzer) or set as output.
  - Algorithmic pattern generator (no buffers used)

- Custom pattern buffer/ch.: 32K samples
- ROM Logic for implementing user defined Boolean functions and State Machines
- Bus Protocol Controllers (SPI, UART, I<sup>2</sup>C)
- 100MS/s max output sample rate (50MHz maximum output frequency).
- Automatic or manual strength and slew settings for outputs.
- User programmable logic I/O levels from 1.2V to 3.3V (5V compatible)
- All 16 Digital I/Os can be configured as virtual buttons, LEDs, switches, slider, progress bar, and seven segment display
- Other Features
  - USB bus powered
  - User power supplies, 1.2V to 3.3V, available in the two Pmod-style connectors (100mA max)
  - Twisted wire high-speed cable option for input channels to insure signal integrity
  - Free Waveforms 2015 software runs on Windows, Mac OS, and Linux
  - Cross-triggering between Logic Analyzer, Pattern Generator or external trigger
  - Data file import/export using standard formats
  - 80X80X25mm, 80g (without accessories)
  - includes: USB cable, fly-wire accessories