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> [Hantek DSO2D15 Digital Oscilloscope User Manual](#)

## Hantek DSO2D15

# Hantek DSO2D15 Digital Oscilloscope User Manual

Model: DSO2D15 | Brand: Hantek

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## 1. INTRODUCTION

This manual provides detailed instructions for the operation, maintenance, and troubleshooting of the Hantek DSO2D15 Digital Oscilloscope. The DSO2D15 is a high-performance, portable 2-channel digital oscilloscope featuring a 150MHz bandwidth, 1GSa/s real-time sampling rate, and an 8Mpts memory depth. It also integrates a 1-channel 25MHz arbitrary waveform generator, making it a versatile tool for various electronic testing and measurement applications.



Figure 1.1: Front view of the Hantek DSO2D15 Digital Oscilloscope, showing the display, control panel, and input ports.

## 2. KEY FEATURES

The Hantek DSO2D15 is equipped with a range of features designed for precision and versatility in signal analysis:

- **High Performance:** 2 channels with 150MHz bandwidth, 1GSa/s real-time sampling rate, and 8Mpts memory depth.
- **Integrated Waveform Generator:** Built-in 1-channel 25MHz arbitrary waveform generator supporting various standard and arbitrary waveforms.
- **Multiple Trigger Modes:** Features 14 trigger modes, including Edge, Pulse, Video, Slope, Timeout, Window, Pattern, Interval, Undervoltage, UART, LIN, CAN, SPI, and IIC for comprehensive signal capture.
- **Extensive Measurement Capabilities:** 32 automatic measurements with statistical analysis (min/max/standard deviation).
- **Advanced Analysis:** Includes PASS/FAIL functionality, Math operations (Addition, Subtraction, Multiplication, Division, FFT), and serial bus decoding (RS232/UART, I2C, SPI, CAN, LIN).
- **Data Storage:** Supports saving settings, waveforms, reference waveforms, CSV data, and images. USB one-click

screenshot function.

- **User-Friendly Display:** 7-inch TFT LCD display with 800x480 pixel resolution.
- **Connectivity:** USB Host and USB Device interfaces for data transfer and remote control.

## KEY PARAMETERS



2 Channel



150 MHz  
Bandwidth



Signal  
Generator



14 Triggering  
Modes



1GSa/S  
Sampling Rate



8 M  
Storage Depth



32 types  
of automatic  
measurement

- 1) Vertical scale: 2 mV/div to 10 V/div;
- 2) Vertical resolution: 8 bits;
- 3) Triggering: Edge, Pulse, Video, Slope, Timeout, Window, Pattern, Interval, Undervoltage, UART, LIN, CAN, SPI, IIC;
- 4) Bus decoding and protocol analysis: RS232/UART, I2C, SPI, CAN, LIN;
- 5) Supports saving settings, waveforms, reference waveforms, CSV, images, and other data formats.
- 6) Digital voltmeter and frequency counter functions;
- 7) Supports 32 automatic measurement and statistical functions, providing real-time statistics on minimum, maximum, standard deviation, and other statistical information;
- 8) Two sets of digital voltmeter functions;
- 9) Supports threshold testing, enabling free measurement within the screen;
- 10) Rich SCPI remote control commands;
- 11) Provides multiple peripheral interface types: USB Host/Device.

Figure 2.1: Visual summary of the Hantek DSO2D15's key parameters and features, including 2 channels, 150 MHz bandwidth, signal generator, 14 triggering modes, 1GSa/s sampling rate, 8M storage depth, and 32 types of automatic measurement.

## 3. SETUP

### 3.1 Unpacking and Inspection

Carefully unpack the oscilloscope and all accessories. Inspect all items for any signs of damage during transit. If any damage is found, contact your dealer immediately.

### 3.2 Power Connection

1. Ensure the power switch on the oscilloscope is in the OFF position.

2. Connect the provided power cable to the power input port on the rear of the oscilloscope.
3. Plug the other end of the power cable into a grounded AC power outlet. The oscilloscope supports 100-240VAC RMS, 45-440Hz.

### 3.3 Probe Connection and Compensation

1. Connect the BNC end of the oscilloscope probe to one of the input channels (CH1 or CH2) on the front panel.
2. Attach the probe tip to the probe compensator output terminal (typically a square wave output) on the front panel.
3. Turn on the oscilloscope.
4. Adjust the probe compensation until a flat-top square wave is displayed on the screen. This ensures accurate measurements.

## 4. OPERATING INSTRUCTIONS

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### 4.1 Control Panel Overview

The front panel of the DSO2D15 is intuitively designed for ease of use. It consists of the display, function buttons (F0-F6), menu buttons, vertical controls (VOLTS/DIV, POSITION), horizontal controls (SEC/DIV, POSITION), trigger controls, and input channels.

# CONTROL BUTTONS

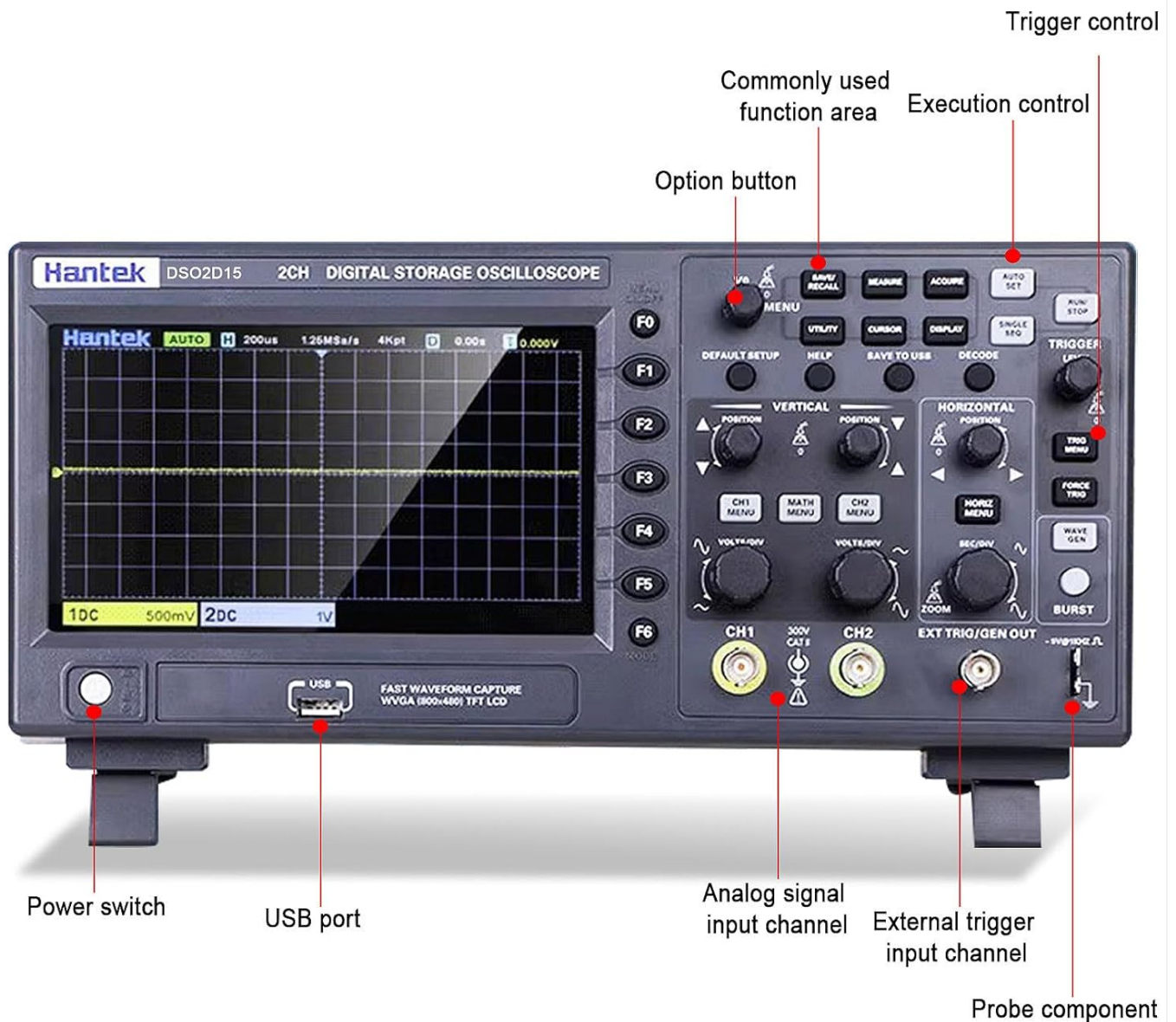


Figure 4.1: Labeled diagram of the Hantek DSO2D15 control panel, highlighting the power switch, USB port, analog signal input channels (CH1, CH2), external trigger input channel, and probe compensator output.

## 4.2 Oscilloscope Functions

### 4.2.1 Dual Channel Operation

The DSO2D15 features two independent input channels (CH1 and CH2), each with its own vertical scale (VOLTS/DIV) and position control. This allows for simultaneous observation and comparison of two different signals.

# DUAL CHANNEL

Each channel has an independent knob



Figure 4.2: Display illustrating the dual-channel capability of the Hantek DSO2D15, with independent knob control for each channel.

## 4.2.2 Triggering System

The trigger system stabilizes repetitive waveforms and captures single-shot events. The DSO2D15 offers a wide range of trigger types:

- **Standard Triggers:** Edge, Pulse, Video, Slope, Timeout, Window, Pattern, Interval, Undervoltage.
- **Serial Protocol Triggers:** UART, LIN, CAN, SPI, IIC.

Use the "TRIGGER" section controls to select trigger type, level, and mode (Auto, Normal, Single).

# MULTIPLE TRIGGER FUNCTIONS

Edge, pulse, video, slope, timeout, window, pattern, interval, undershoot, UART, LIN, CAN, SPI, IIC

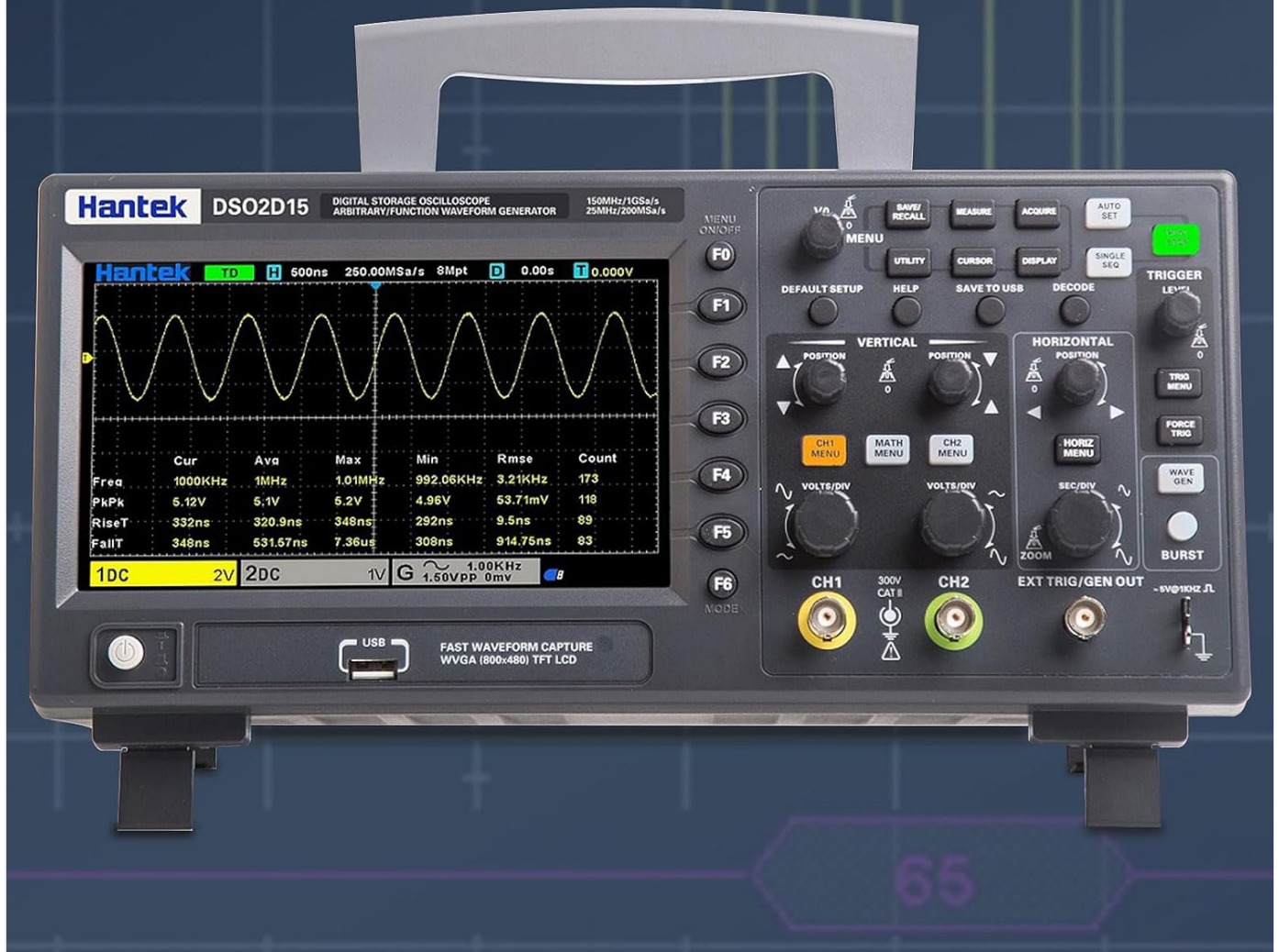


Figure 4.3: Screenshot of the Hantek DSO2D15 display demonstrating various trigger functions, including Edge, Pulse, Video, Slope, Timeout, Window, Pattern, Interval, Undershoot, UART, LIN, CAN, SPI, and IIC.

## 4.2.3 Measurement and Statistical Functions

The oscilloscope provides 32 automatic measurement parameters, including Frequency, Period, Average, Peak-to-Peak, RMS, Min, Max, Rise Time, Fall Time, and various duty cycles. Statistical analysis provides real-time calculations of minimum, maximum, and standard deviation for measurements.

# MEASUREMENT AND STATISTICAL FUNCTIONS

32 automatic measurement and statistical functions, real-time statistics of maximum, minimum, standard deviation, and other statistical information



Figure 4.4: The Hantek DSO2D15 screen showing the results of 32 automatic measurement and statistical functions, providing real-time statistics such as maximum, minimum, and standard deviation.

## 4.2.4 Saving and Recalling Data

The DSO2D15 allows users to save various data types, including instrument settings, captured waveforms, reference waveforms, CSV data, and screenshots (images). Use the "SAVE/RECALL" and "SAVE TO USB" buttons for these operations.

# SAVE SETTINGS

Save settings, waveforms, reference waveforms, CSV images, and other data formats



Figure 4.5: Close-up of the Hantek DSO2D15 control panel, highlighting the "SAVE/RECALL" and "SAVE TO USB" buttons for saving settings, waveforms, reference waveforms, CSV images, and other data formats.

## 4.3 Waveform Generator Function

The built-in 1-channel 25MHz arbitrary waveform generator can produce various standard waveforms (Sine, Square, Pulse, Triangle, Sample Wave, Exponential Wave, Noise) and user-defined arbitrary waveforms (Arb1-Arb4). This function is useful for testing circuits and systems.

- **Sine Wave:** Frequency Range 0.1Hz~25MHz
- **Square/Pulse Wave:** Frequency Range 0.1Hz~10MHz
- **Triangle Wave:** Frequency Range 0.1Hz~1MHz
- **Arbitrary Wave:** Frequency Range 0.1Hz~10MHz

Access the waveform generator settings via the dedicated "WAVE GEN" button or menu option.

## 5. SPECIFICATIONS

## 5.1 General Parameters

Parameter	Value (DSO2D15)
Model	DSO2D15
Bandwidth	150MHz
Oscilloscope Channel Count	2CH
Built-in Signal Source	1CH
Sampling Rate (Single Channel)	1GSa/s
Sampling Rate (Dual Channel)	500MSa/s
Maximum Record Length (Single Channel)	8M
Maximum Record Length (Dual Channel)	4M
Display Type	7" TFT LCD
Display Resolution	800 (H) x 480 (V) pixels
Input Impedance	1 M $\Omega$ $\pm$ 2%, 13 pF $\pm$ 3 pF
Maximum Input Voltage	300 V RMS (10X)
Power Supply Voltage	100-240VAC RMS ( $\pm$ 10%), 45-440Hz
Power Consumption	Less than 30W
Operating Temperature	0~50 °C (32~122 °F)
Product Dimensions	12.6 x 4.3 x 5.9 inches
Weight	4.2 Pounds

## 5.2 Vertical System

- **Rise time at BNC (typical):** 2.4 ns
- **Vertical resolution:** 8-bit resolution, simultaneous sampling on each channel
- **Vertical sensitivity:** 2 mV/div to 10 V/div
- **Offset range:**  $\leq$ 200 mV/div,  $\pm$ 1 V;  $>$ 200 mV/div,  $\pm$ 50 V
- **Mathematical operations:** Addition, subtraction, multiplication, division, FFT
- **FFT window:** Rectangular, Hanning, Hamming, Blackman, Bartlett, Flat-top window
- **Bandwidth limit:** 20 MHz
- **Low-frequency response (-3 dB):**  $\leq$ 10 Hz at BNC
- *Note: When using the X1 probe, the bandwidth is reduced to 6MHz.*

## 5.3 Horizontal System

- **Waveform interpolation:** (sin x)/x
- **Horizontal scale range:** 2ns/div to 100s/div, 1, 2, 5 steps
- **Time base mode:** Y-T, X-Y, Roll

- **Incremental time measurement accuracy:** Single, "Sample" mode
- **Sampling rate and delay time accuracy:**  $\pm 50$  ppm (for any time interval greater than 1 ms)

## 5.4 Trigger System

- **Trigger Types:** Edge, Pulse, Video, Slope, Timeout, Window, Pattern, Interval, Undervoltage, UART, LIN, CAN, SPI, IIC
- **Trigger Level Range:**  $\pm 5$  divisions from the screen center
- **Trigger Mode:** Auto, Normal, Single
- **Release range:** 16ns~10s

## 5.5 Waveform Generator (AWG)

- **Channel count:** 1 channel
- **Sampling rate:** 200MSa/s
- **Vertical resolution:** 12 bits
- **Maximum Frequency:** 25 MHz
- **Standard Waveforms:** Sine, Square, Pulse, Triangle, Sample Wave, Exponential Wave, Noise
- **Arbitrary Waveforms:** Arb1, Arb2, Arb3, Arb4
- **Amplitude:** Output Range 10 mV to 7 Vp-p (high impedance), 5 mV to 3.5 Vp-p (50  $\Omega$ )
- **DC Offset Range:**  $\pm 3.5$  V (high impedance);  $\pm 1.75$  V (50  $\Omega$ )
- **Output Impedance:** 50  $\Omega$

# MODEL COMPARISON

Model	Channels	Bandwidth	Sampling Rate	Storage Depth	Signal Source (AFG)	Screen Size
DSO2C10	2 CH	100 MHz	1GSa/S	8M	-	7-inch LCD display
DSO2C15	2 CH	150 MHz	1GSa/S	8M	-	7-inch LCD display
DSO2D10	2 CH + 1CH	100 MHz	1GSa/S	8M	Yes	7-inch LCD display
DSO2D15	2 CH + 1CH	150 MHz	1GSa/S	8M	Yes	7-inch LCD display
DSO2C20	2 CH	200 MHz	2GSa/S	80K	-	7-inch LCD display
DSO2C35	2 CH	350 MHz	2GSa/S	80K	-	7-inch LCD display
DSO2C50	2 CH	500 MHz	2GSa/S	80K	-	7-inch LCD display
DSO2D20	2 CH + 1CH	200 MHz	2GSa/S	80K	Yes	7-inch LCD display
DSO2D35	2 CH + 1CH	350 MHz	2GSa/S	80K	Yes	7-inch LCD display
DSO2D50	2 CH + 1CH	500 MHz	2GSa/S	80K	Yes	7-inch LCD display

Figure 5.1: A comparison table showing specifications across different Hantek oscilloscope models, including DSO2D15, highlighting channels, bandwidth, sampling rate, storage depth, signal source, and screen size.

## 6. MAINTENANCE

### 6.1 Cleaning

To clean the exterior of the oscilloscope, use a soft cloth dampened with mild detergent and water. Do not use abrasive cleaners or solvents that could damage the plastic casing or display. Ensure the device is powered off and unplugged before cleaning.

### 6.2 Storage

When not in use for extended periods, store the oscilloscope in a dry, dust-free environment, away from direct sunlight and extreme temperatures. The recommended storage temperature is -40~+71 °C (-40~159.8 °F).

### 6.3 Calibration

For optimal performance, periodic calibration by qualified personnel is recommended. Refer to the Hantek official website or contact support for calibration services.

## 7. TROUBLESHOOTING

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This section provides solutions to common issues you might encounter. For problems not listed here, please contact Hantek customer support.

Problem	Possible Cause	Solution
No power	Power cable not connected; Power outlet faulty; Fuse blown.	Check power cable connection; Test power outlet; Replace fuse (T, 3.15A, 250V, 5x20mm) if necessary.
No waveform displayed	Probe not connected or faulty; Input coupling incorrect; Vertical scale too high/low; Trigger not set correctly.	Ensure probe is securely connected and functional; Set input coupling to DC or AC; Adjust VOLTS/DIV; Adjust trigger level or mode (try Auto).

