



RIGOL

# DHO800 Series

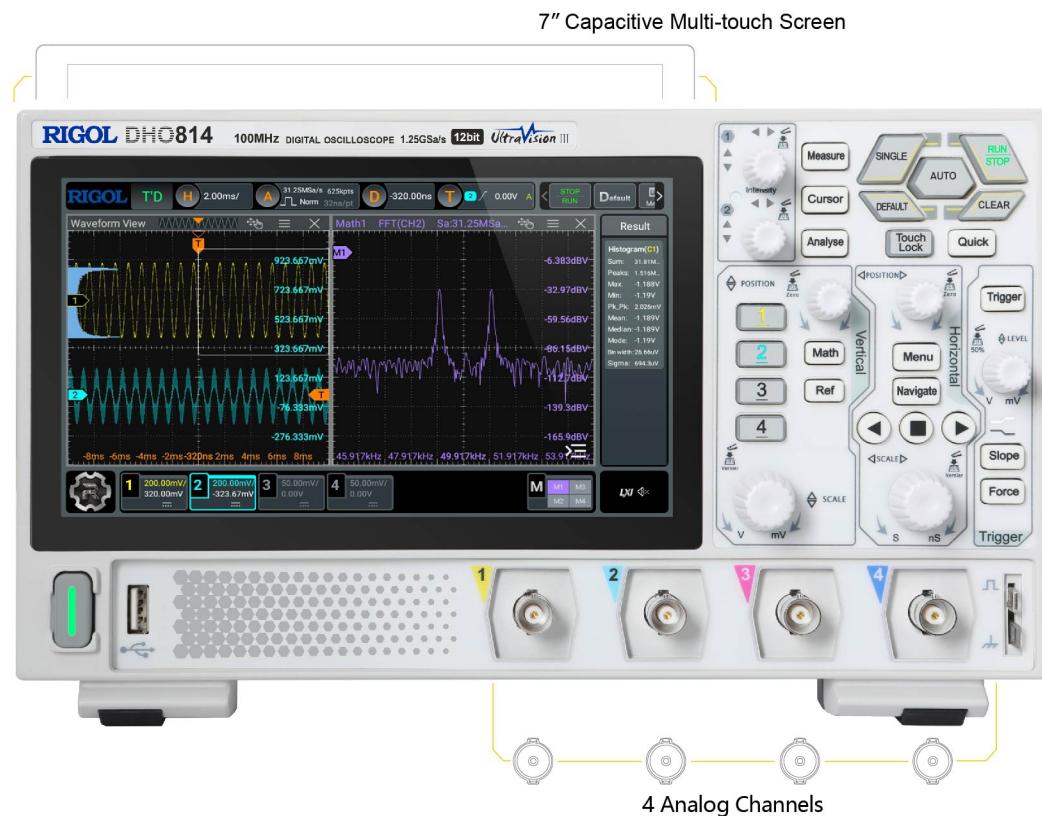
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## Digital Oscilloscope

**Data Sheet**  
DSA36104-1110  
Jul.2024

# DHO800 Series Digital Oscilloscope

## Compact Size, Various Interfaces



265.35 mm (W) × 161.75 mm (H) × 77.38 mm (D)



## Application Scenarios

It is compact and portable, easy to be used on the workbench, in the classroom, on the test site, and in other application scenarios.

Its compact and delicate design makes it easy to carry and operate. You can put it on the workbench, with supporting legs folded or unfolded; put it flat on the workbench; or fix its rear panel to the desktop clamp-on stand to save room.



## Technical Advantage

### 12-bit High Resolution



**12-bit** vertical resolution provides 4096 vertical digitizing levels

16 times the vertical digitizing level of the 8-bit resolution

Easy for users to test and see the small signals

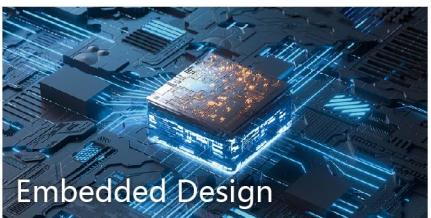
### Type-C Interface



Provides power with the mobile power supply via this interface, making the on-site test more flexible.



## Application



### Embedded Design

The bus error and too much locking may lead to problems in the embedded design. The DHO800 series is equipped with a standard configuration of protocol triggers and decodes, capable of capturing the bus event accurately to check whether the serial communication link between devices runs properly.



### Electronics Maintenance

When troubleshooting a failed component, we need to quickly locate the problem and make some modifications. With the auto measurement, math operation, protocol trigger and decode, the DHO800 series enables you to debug the problems with a high speed and locate the problem accurately.



### Basics R&D

The DHO800 series offers professional user experience at an affordable entry-level price. The brand new DHO800 series supports touch screen operation and the traditional convenient panel operation. It is an ideal high-precision oscilloscope with 12-bit measurement accuracy at an affordable price for your lab.

# Product Features

## Product Features

- Ultra-low noise floor, purer signal, never miss the small signals
- Up to 12 bits resolution for all the models of this series
- Max. analog bandwidth of 100 MHz, 4 analog channels, external trigger output (std.) available for the dual-channel model
- Max. real-time sample rate of 1.25 GSa/s
- Max. memory depth of 25 Mpts
- Vertical sensitivity range: 500  $\mu$ V/div to 10 V/div
- Max. capture rate of 1,000,000 wfms/s (in UltraAcquire mode)
- Digital phosphor display with real-time 256-level intensity grading
- Waveform search and navigation function allows you to debug the signal anomalies faster
- 7" (1024x600) capacitive multi-touch screen
- Brand new Flex Knob brings user-friendly experience
- USB Device & Host, LAN, and HDMI interfaces (std.) for all the models of this series
- Novel and delicate industrial design, easy to operate
- Unique online upgrade

The DHO800 series is RIGOL's new launched high-performance economical digital oscilloscope. Though compact in design, it has superior performance. It features a capture rate up to 1,000,000 wfms/s (in UltraAcquire Mode), 25 Mpts memory depth, 12 bits resolution, and low noise.

The DHO800 series is a brand new economical digital oscilloscope designed for the vast mainstream digital oscilloscope market to meet their design, debugging, and test demands.

# RIGOL Probes and Accessories Supported

Model	Type	Description
<b>Passive High-impedance Probe</b>		
	Passive High-impedance Probe	<ul style="list-style-type: none"><li>• Attenuation Ratio: 10:1/1:1</li><li>• 1X BW: DC to 35 MHz</li><li>• 10X BW: DC to 150 MHz</li><li>• Compatibility: All models of RIGOL's digital oscilloscopes</li></ul>
PVP2150		
	Passive High-impedance Probe	<ul style="list-style-type: none"><li>• Attenuation Ratio: 10:1/1:1</li><li>• 1X BW: DC to 35 MHz</li><li>• 10X BW: DC to 350 MHz</li><li>• Compatibility: All models of RIGOL's digital oscilloscopes</li></ul>
PVP2350		
	Passive High-impedance Probe	<ul style="list-style-type: none"><li>• Attenuation Ratio: 10:1/1:1</li><li>• 1X BW: DC to 20 MHz</li><li>• 10X BW: DC to 150 MHz</li><li>• Compatibility: All models of RIGOL's digital oscilloscopes</li></ul>
PVP3150		
<b>High-voltage Single-ended Probe</b>		
	High-voltage Probe	<ul style="list-style-type: none"><li>• Attenuation Ratio: 1000:1</li><li>• BW: DC to 40 MHz</li><li>• DC: 0 to 10 kV DC</li><li>• AC: pulse <math>\leq</math>20 kVp-p</li><li>• AC: sine <math>\leq</math> 7 kV<sub>rms</sub></li><li>• Compatibility: All models of RIGOL's digital oscilloscopes</li></ul>
RP1010H		
	High-voltage Probe	<ul style="list-style-type: none"><li>• Attenuation Ratio: 1000:1</li><li>• BW: DC to 150 MHz</li><li>• DC+AC<sub>peak</sub>: 18 kV CAT II</li><li>• AC<sub>rms</sub>: 12 kV CAT II</li><li>• Compatibility: All models of RIGOL's digital oscilloscopes</li></ul>
RP1018H		

Model	Type	Description
	High-voltage Probe RP1300H	<ul style="list-style-type: none"> <li>• Attenuation Ratio: 100:1</li> <li>• BW: DC to 300 MHz</li> <li>• CAT I 2000 V (DC+AC)</li> <li>• CAT II 1500 V (DC+AC)</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
<b>High-voltage Differential Probe</b>		
	High-voltage Differential Probe PHA0150	<ul style="list-style-type: none"> <li>• BW: DC~70 MHz</li> <li>• Max. voltage <math>\leq</math> 1500 Vpp</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
	High-voltage Differential Probe PHA1150	<ul style="list-style-type: none"> <li>• BW: DC~100 MHz</li> <li>• Max. voltage <math>\leq</math> 1500 Vpp</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
	High-voltage Differential Probe PHA2150	<ul style="list-style-type: none"> <li>• 50X BW: DC to 160 MHz</li> <li>• 500X BW: DC to 200 MHz</li> <li>• Max. voltage <math>\leq</math> 1500 Vpp</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
	High-voltage Differential Probe RP1025D	<ul style="list-style-type: none"> <li>• BW: DC to 25 MHz</li> <li>• Max. voltage <math>\leq</math> 1400 Vpp (DC + AC P-P)</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
	High-voltage Differential Probe RP1050D	<ul style="list-style-type: none"> <li>• BW: DC to 50 MHz</li> <li>• Max. voltage <math>\leq</math> 7000 Vpp (DC + AC P-P)</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
	High-voltage Differential Probe RP1100D	<ul style="list-style-type: none"> <li>• BW: DC to 100 MHz</li> <li>• Max. voltage <math>\leq</math> 7000 Vpp (DC + AC P-P)</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>

Model	Type	Description
<b>Current Probe</b>		
	Current Probe	<ul style="list-style-type: none"> <li>• BW: DC to 300 kHz</li> <li>• Maximum Input</li> </ul> <p>AC: <math>\pm 100</math> A AC P-P: 200 A AC RMS: 70 A</p> <ul style="list-style-type: none"> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
RP1001C		
	Current Probe	<ul style="list-style-type: none"> <li>• BW: DC to 1 MHz</li> <li>• Maximum Input</li> </ul> <p>AC: <math>\pm 70</math> A AC P-P: 140 A AC RMS: 50 A</p> <ul style="list-style-type: none"> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> </ul>
RP1002C		
	Current Probe	<ul style="list-style-type: none"> <li>• BW: DC to 50 MHz</li> <li>• Maximum Input</li> </ul> <p>AC P-P: 50 A (non-continuous) AC RMS: 30 A</p> <ul style="list-style-type: none"> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> <li>• Required to order RP1000P power supply.</li> </ul>
RP1003C		
	Current Probe	<ul style="list-style-type: none"> <li>• BW: DC to 100 MHz</li> <li>• Maximum Input</li> </ul> <p>AC P-P: 50 A (non-continuous) AC RMS: 30 A</p> <ul style="list-style-type: none"> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> <li>• Required to order RP1000P power supply.</li> </ul>
RP1004C		
	Current Probe	<ul style="list-style-type: none"> <li>• BW: DC to 10 MHz</li> <li>• Maximum Input</li> </ul> <p>AC P-P: 300 A (non-continuous), 500 A (@pulse width <math>\leq</math> 30 us) AC RMS: 150 A</p> <ul style="list-style-type: none"> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> <li>• Required to order RP1000P power supply.</li> </ul>
RP1005C		

Model	Type	Description
RP1006C	Current Probe	<ul style="list-style-type: none"> <li>• BW: DC to 2 MHz</li> <li>• Maximum Input</li> <li>AC P-P: 700 A peaks, non-continuous</li> <li>AC RMS: 500 A</li> <li>• Compatibility: All models of RIGOL's digital oscilloscopes</li> <li>• Required to order RP1000P power supply.</li> </ul>
RP1000P	4CH Power Supply	Power supply for RP1003C, RP1004C, RP1005C, and RP1006C; supporting 4 channels.

# Specifications

All the specifications are guaranteed except the parameters marked with "Typical" and the oscilloscope needs to operate for more than 30 minutes under the specified operation temperature. The specifications are measured when the oscilloscope is properly grounded.

## Overview of the DHO800 Series Technical Specifications

Overview of the DHO800 Series Technical Specifications				
Model	DHO802	DHO804	DHO812	DHO814
Analog Bandwidth (-3 dB)		70 MHz		100 MHz
Rise Time (10% to 90%, typical)		≤5 ns		≤3.5 ns
No. of Analog Channels	2 + EXT	4	2 + EXT	4
Sampling Mode	Real-time Sampling			
Max. Sample Rate of Analog Channel	Two-channel model: 1.25 GSa/s (single-channel <sup>[1]</sup> ), 625 MSa/s (full-channel <sup>[3]</sup> ) four-channel model: 1.25 GSa/s (single-channel <sup>[1]</sup> ), 625 MSa/s (dual-channel <sup>[2]</sup> ), 312.5 MSa/s (full-channel <sup>[3]</sup> )			
Max. Memory Depth	Two-channel model: 25 Mpts (single-channel <sup>[1]</sup> ), 10 Mpts (full-channel <sup>[3]</sup> ) four-channel model: 25 Mpts (single-channel <sup>[1]</sup> ), 10 Mpts (dual-channel <sup>[2]</sup> ), 5 Mpts (full-channel <sup>[3]</sup> )			
Max. Waveform Capture Rate	30,000 wfms/s (Vector Mode) 1,000,000 wfms/s (UltraAcquire Mode)			
Vertical Resolution	12 bits			
Hardware Real-time Waveform Recording and Playing	Max. 500,000 frames			
Peak Detection	Capture 1.6 ns glitches			
LCD Size and Type	7" capacitive multi-touch screen			

## Overview of the DHO800 Series Technical Specifications

Display Resolution	1024x600
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## Vertical System Analog Channel

### Vertical System Analog Channel

Input Coupling	DC, AC, or GND
Input Impedance	$1 \text{ M}\Omega \pm 1\%$
Input Capacitance	$15 \text{ pF} \pm 3 \text{ pF}$
Probe Attenuation Coefficient	0.001X, 0.002X, 0.005X, 0.01X, 0.02X, 0.05X, 0.1X, 0.2X, 0.5X, 1X, 2X, 5X, 10X, 15X, 20X, 50X, 100X, 150X, 200X, 500X, 1000X, 1500X, 2000X, 5000X, 10000X, 15000X, 20000X, and 50000X
Maximum Input Voltage	CAT I 300 V <sub>rms</sub> , 400 V <sub>pk</sub> (DC + V <sub>peak</sub> )
Remarks	Whether the probe is used or not, the transient overvoltage is not allowed to occur. Please use the instrument dedicated for the specified measurement category (not applicable to CAT II, III, and IV)
Vertical Resolution	12 bits
Vertical Sensitivity Range <sup>[4]</sup>	500 $\mu\text{V}/\text{div}$ to 10 V/div
Offset Range	$\pm 0.5 \text{ V}$ ( $< 500 \mu\text{V}/\text{div}$ ) $\pm 1 \text{ V}$ ( $\geq 500 \mu\text{V}/\text{div}$ , $\leq 65 \text{ mV}/\text{div}$ ) $\pm 8 \text{ V}$ ( $> 65 \text{ mV}/\text{div}$ , $\leq 270 \text{ mV}/\text{div}$ ) $\pm 20 \text{ V}$ ( $> 270 \text{ mV}/\text{div}$ , $\leq 2.75 \text{ V}/\text{div}$ ) $\pm 100 \text{ V}$ ( $> 2.75 \text{ V}/\text{div}$ , $\leq 10 \text{ V}/\text{div}$ )
Dynamic Range	$\pm 4 \text{ div}$ (12 bits)
Bandwidth Limit (Typical)	20 MHz, FULL; selectable for each channel
DC Gain Accuracy <sup>[4]</sup>	$\pm 1\%$ ( $> 5\text{mV}/\text{div}$ , FullScale) $\pm 2\%$ ( $\leq 5\text{mV}/\text{div}$ , FullScale, Typ.)
DC Offset Accuracy	$\leq 200 \text{ mV}/\text{div}$ ( $\pm 0.1 \text{ div} \pm 2 \text{ mV} \pm 1.5\%$ of offset value) $> 200 \text{ mV}/\text{div}$ ( $\pm 0.1 \text{ div} \pm 2 \text{ mV} \pm 1.0\%$ of offset value)

## Vertical System Analog Channel

Channel-to-Channel Isolation  $\geq 100:1$

ESD Tolerance  $\pm 8$  kV (on input BNCs)

## Horizontal System--Analog Channel

### Horizontal System--Analog Channel

Range of Time Base 5 ns/div to 500 s/div

Range of Time Base Fine

Time Base Resolution 100 ps

Time Base Accuracy  $\pm 25$  ppm  $\pm 5$  ppm/year

Time Base Delay Range Pre-trigger -5 div

Time Base Delay Range Post-trigger 1 s or 100 div, whichever is greater

Delta Time Accuracy  $\pm (\text{Time Base Accuracy} \times \text{Readout}) \pm (0.001 \times \text{Screen Width})$   
 $\pm 20$  ps

Channel-to-Channel Skew Correction  $\pm 100$  ns, Accuracy  $\pm 1$  ps

Analog Channel-to-Channel Delay (Typical)<sup>[5]</sup>  $\leq 2$  ns

Horizontal Mode YT Default

Horizontal Mode XY Channel 1/2/3/4

Horizontal Mode SCAN Time base  $\geq 200$  ms/div

Horizontal Mode ROLL Time base  $\geq 50$  ms/div, available to enter or exit the ROLL mode by adjusting the horizontal timebase knob

## Acquisition System

### Acquisition System

	Two-channel model:  Max. Sample Rate of Analog Channel	1.25 GSa/s (single-channel <sup>[1]</sup> ), 625 MSa/s (full-channel <sup>[3]</sup> )  four-channel model: 1.25 GSa/s (single-channel <sup>[1]</sup> ), 625 MSa/s (dual-channel <sup>[2]</sup> ), 312.5 MSa/s (full-channel <sup>[3]</sup> )
	Two-channel model:  Max. Memory Depth of Analog Channel	25 Mpts (dual-channel <sup>[2]</sup> ), 10 Mpts (full-channel <sup>[3]</sup> )  four-channel model: 25 Mpts (single-channel <sup>[1]</sup> ), 10 Mpts (dual-channel <sup>[2]</sup> ), 5 Mpts (full-channel <sup>[3]</sup> )
	Normal	Default
Acquisition Mode	Peak Detection	Capture 1.6 ns glitches
	Average Type	2, 4, 8, 16...65536 are available for you to choose
	UltraAcquire	Waveform capture rate up to 1,000,000 wfms/s

## Trigger System

### Trigger System

Trigger Source	Analogue channel (CH1 to CH4), EXT TRIG <sup>[6]</sup>
Trigger Mode	Auto, Normal, Single
	DC DC coupling trigger
	AC AC coupling trigger
Trigger Coupling	High Frequency Rejection Cut-off frequency to 120 kHz (internal trigger only)
	Low Frequency Rejection Cut-off frequency to 120 kHz (internal trigger only)
Noise Rejection	Increases delay for the trigger circuit (internal trigger only), On/Off
Holdoff Range	8 ns to 10 s

## Trigger System

Trigger Bandwidth	Internal trigger: analog bandwidth of the oscilloscope
Trigger Sensitivity	Internal trigger: 0.5 div, $\geq 50$ mV/div; 0.7 div (with noise rejection enabled) External trigger <sup>[6]</sup> : 500 mVpp (DC to 100 MHz)
Trigger Level Range	Internal trigger: $\pm 4.5$ div from the center of the screen External trigger <sup>[6]</sup> : $\pm 5$ V

## Trigger Type

### Trigger Type

Trigger Type	Edge trigger, Pulse trigger, Slope trigger, Video trigger, Pattern trigger, Duration trigger, Timeout trigger, Runt trigger, Window trigger, Delay trigger, Setup/Hold trigger, Nth Edge trigger, RS232/UART, I2C, SPI, CAN
Edge	Triggers on the threshold of the specified edge of the input signal. The edge types can be Rising, Falling, or Either. Source channel: CH1 to CH4, and EXT <sup>[6]</sup>
Pulse	Triggers on the positive or negative pulse with a specified width. The pulse width is greater or smaller than a certain value or within a certain time range. Source channel: CH1 to CH4
Slope	Triggers on the positive or negative slope of the specified time. The slew time is greater or smaller than a certain value or within a certain time range. Source channel: CH1 to CH4
Video	Triggers on all lines, specified line, odd field, or even field that conforms to the video standards. The supported video standards include NTSC, PAL/SECAM, 480p/60Hz, 576p/50Hz, 720p/60Hz, 720p/50Hz, 720p/30Hz, 720p/25Hz, 720p/24Hz, 1080p/60Hz, 1080p/50Hz, 1080p/30Hz, 1080p/25Hz, 1080p/24Hz, 1080i/60Hz, and 1080i/50Hz. Source channel: CH1 to CH4
Pattern	Identifies a trigger condition by searching for a specified pattern. The pattern is a combination of multiple selected channel sources. The logic pattern of each channel is H, L, X, Rising, or Falling. Source channel: CH1 to CH4
Duration	Triggers when the specified pattern meets the specified duration condition. The pattern is a combination of multiple selected channel sources. The logic pattern of each channel is H, L, and X. The duration is greater or smaller than a certain value, or within a certain time range, or outside a certain time range. Source channel: CH1 to CH4

## Trigger Type

Timeout	Triggers when duration of a certain event exceeds the specified time. The event can be specified as Rising, Falling, or Either. Source channel: CH1 to CH4
Runt	Triggers when the pulses pass through one threshold but fail to pass through another threshold. Source channel: CH1 to CH4
Window	Triggers in a specified window state when the rising edge of the signal crosses the upper threshold or the falling edge crosses the lower threshold. The window state can be Enter, Exit, or Time. Source channel: CH1 to CH4
Delay	Triggers when the time difference between the specified edges of Source A and Source B meets the preset time. The duration is greater or smaller than a certain value, or within a certain time range, or outside a certain time range. Source channel: CH1 to CH4
Setup/Hold	When the setup time or hold time between the input clock signal and the data signal is smaller than the specified time. Source channel: CH1 to CH4
Nth Edge	Triggers on the Nth edge that appears after the specified idle time. The edge can be specified as Rising or Falling. Source channel: CH1 to CH4
RS232/UART	Triggers on the Start, Error, Check Error, or Data frame of the RS232/UART bus (up to 20 Mb/s). Source channel: CH1 to CH4
I2C	Triggers on the Start, Stop, Restart, MissedACK, Address (7 bits, 8 bits, or 10 bits), Data, or Address Data of the I2C bus. Source channel: CH1 to CH4
SPI	Triggers on the specified pattern of the specified data width (4 to 32) of SPI bus. CS <sup>[7]</sup> and Timeout are supported. Source channel: CH1 to CH4
CAN	Triggers on the start of a frame, end of a frame, Remote ID, Overload, Frame ID, Frame Data, Data&ID, Frame Error, Answer Error, Check Error, Format Error, Bit Fill, and Random of the CAN signal (up to 5Mb/s). The supported CAN bus signal types include CAN_H, CAN_L, TX/RX, and DIFF. Source channel: CH1 to CH4, D0 to D15

## Search&Navigation

### Search&Navigation

Type	Edge, Pulse
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## Search&Navigation

Source	Analog channel
Copy	Copies the search settings from or to the trigger settings mutually, including threshold setting and search condition settings
Result Display	Displays in event table form; can be exported to the external or internal memory
	Time navigation: navigates to the acquired waveforms in time order.
Navigation	Event navigation: uses the navigation keys to scroll through the event search results and navigates to the specified event.
	Frame navigation: navigates to the specified frame segment in UltraAcquire mode.

## Waveform Measurement

### Waveform Measurement

	Number of Cursors	2 pairs of XY cursors
		Voltage deviation between cursors ( $\Delta Y$ )
	Manual Mode	Time deviation between cursors ( $\Delta X$ ) Reciprocal of $\Delta X$ (Hz) ( $1/\Delta X$ )
Cursor	Track Mode	Fixes Y-axis to track X-axis waveform point's voltage and time values Fixes X-axis to track Y-axis waveform point's voltage and time values
	Auto Measurement	Allows to display cursors during auto measurement
	XY Mode	Measures the voltage parameters of the corresponding channel waveforms in XY time base mode. X = Channel 1, Y = Channel 2

## Waveform Measurement

Auto Measurement	Number of Measurements	41 auto measurements; and up to 10 measurements can be displayed at a time.
	Measurement Source	CH1 to CH4, Math1 to Math4
	Measurement Range (Region)	Main, Zoom
	All Measurement	Displays 33 measurement items (vertical and horizontal) for the current measurement channel; the measurement results are updated continuously.
	Vertical	Vmax, Vmin, Vpp, Vtop, Vbase, Vamp, Vupper, Vmid, Vlower, Vavg, VRMS, Per. VRMS, Overshoot, Preshoot, Area, and Period Area.
	Horizontal	Period, Frequency, Rise Time, Fall Time, +Width, -Width, +Duty, -Duty, Positive Pulse Count, Negative Pulse Count, Rising Edge Count, Falling Edge Count, T <sub>vmax</sub> , T <sub>vmin</sub> , +Slew Rate, and -Slew Rate
	Others	Delay(A <sub>↑</sub> -B <sub>↑</sub> ), Delay(A <sub>↑</sub> -B <sub>↓</sub> ), Delay(A <sub>↓</sub> -B <sub>↑</sub> ), Delay(A <sub>↓</sub> -B <sub>↓</sub> ), Phase(A <sub>↑</sub> -B <sub>↑</sub> ), Phase(A <sub>↑</sub> -B <sub>↓</sub> ), Phase(A <sub>↓</sub> -B <sub>↑</sub> ), and Phase(A <sub>↓</sub> -B <sub>↓</sub> )

## Waveform Calculation

### Waveform Calculation

No. of Math Functions	4 math functions available to be displayed at a time
Operation	A+B, A-B, A×B, A/B, FFT, A&&B, A  B, A <sup>^</sup> B, !A, Intg, Diff, Sqrt, Lg, Ln, Exp, Abs, AX+B, LowPass, HighPass, BandPass, and BandStop
Color Grade	Supports FFT
Record Length	Max. 1 Mpts (The max. number of the points to be analyzed for the FFT operation is 1 Mpts.)
FFT	Window Type Rectangular, Blackman-Harris, Hanning (default), Hamming, Flattop, and Triangle.
	Peak Search A maximum of 15 peaks, determined by the user-defined threshold and offset threshold

# Waveform Analysis

## Waveform Analysis

		Stores the signal under test in segments according to the trigger events, that is, saves all the sampled waveform data as a segment to the RAM for each trigger event. The maximum number of the sampled segments reaches 500,000.
Waveform Recording	Source	All enabled analog channels
	Analysis	Support playing frame by frame or continuous playing; capable of calculating, measuring, and decoding the played waveforms
PassFail		Compares the signal under test with the user-defined mask to provide the test results: the number of successful tests, failed tests, and the total number of tests. The pass/fail event can enable immediate stop, beeper, and the screenshot.
	Source	Any analog channel
		The waveform histogram provides a group of data, showing the number of times a waveform hits within the defined region range on the screen. The waveform histogram not only shows the distribution of hits, but also the ordinary measurement statistics.
Histogram	Source	Any analog channel, auto measurement item
	Type	Horizontal, vertical, and measure
	Measure	Statistics: Sum, Peaks, Max, Min, Pk_Pk Histogram: Mean, Median, Mode, Bin width, Sigma, and XScale
	Sampling Mode	Supports all modes, except the Zoom, XY, and ROLL modes
Color Grade		Provides a dimensional view for waveform intensity, color grade >16, 256-level color scale display
	Source	Any analog channel
	Color Theme	Temperature and intensity
	Sampling Mode	Supports all modes

## Serial Decoding

### Serial Decoding

Number of Decodings	4 protocol types can be decoded and enabled at the same time
Decoding Type	Standard: Parallel, RS232/UART, I2C, SPI, CAN
Parallel	Up to 4 bits of Parallel decoding, supporting any analog channel. Support user-defined clock and auto clock settings. Source channel: CH1 to CH4
RS232/UART	Decodes the RS232/UART (up to 20 Mb/s) bus's TX/RX data (5-9 bits), parity (Odd, Even, or None), and stop bits (1-2 bits) Source channel: CH1 to CH4
I2C	Decodes the address (with or without the R/W bit) of the I2C bus, data, and ACK. Source channel: CH1 to CH4
SPI	Decodes the MISO/MOSI data (4-32 bits) of the SPI bus. The available mode includes "Timeout" and "CS" <sup>[7]</sup> . Source channel: CH1 to CH4
CAN	Decodes the remote frame (ID, byte number, CRC), overload frame, and data frame (standard/extended ID, control domain, data domain, CRC, and ACK) of the CAN bus (up to 5 Mb/s). The supported CAN bus signal types include CAN_H, CAN_L, TX/RX, and DIFF. Source channel: CH1 to CH4

## Auto

### Auto

AutoScale	Min voltage > 10 mVpp, duty cycle > 1%, frequency > 35 Hz
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## Digital Voltmeter

### Digital Voltmeter

Source	Any analog channel
Function	DC, AC+DC <sub>rms</sub> , AC <sub>rms</sub>
Resolution	ACV/DCV: 3 digits
Limits Beeper	Sounds an alarm when the voltage value is within or outside of the limit range

# High-precision Frequency Counter

## High-precision Frequency Counter

Source	Any analog channel and EXT <sup>[6]</sup>	
Measure	Frequency, period, totalizer	
Counter	Resolution	3-6 digits, user-defined
	Max. Frequency	Max. analog bandwidth
Totalizer	48-bit totalizer	
	Counts the number of the rising edges	
Time Reference	Internal reference	

## Command Set

### Command Set

Common Commands Support	IEEE488.2 Standard
Error Message Definition	Error messages
Support Status Report Mechanism	Status Reporting
Support Syn Mechanism	Synchronization

## Display

### Display

LCD	7-inch capacitive multi-touch screen, gesture enabled operation
Resolution	1024×600 (Screen Region) 16:9
Graticule	10 horizontal divisions x 8 vertical divisions
Persistence	Off, Infinite, variable persistence (100 ms to 10 s)
Brightness	256 intensity levels (LCD, HDMI)

## Processor System

### Processor System

Processor	Cortex-A72 up to 1.8 GHz, 6-core processor
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## Processor System

System Memory 4 GB RAM

Operating System Android

Internal Non-volatile Memory 8 GB

## I/O

### I/O

USB2.0 Host 1 on the front panel

USB2.0 Device 1 on the rear panel

LAN 1 on the rear panel, 10/100 Base-T, supporting LXI-C

Web Remote Control Supports Web Control interface (input the IP address of the oscilloscope into the Web browser to display the operation interface of the oscilloscope)

EXT Interface<sup>[6]</sup> Trigger Input 1 on the front panel, BNC connector

1 on the rear panel, BNC connector

Output Interface  $V_o (H) \geq 2.5 \text{ V}$  open circuit,  $\geq 1.0 \text{ V}$   $50 \Omega$  to GND

$V_o (L) \leq 0.7 \text{ V}$  to load  $\leq 4 \text{ mA}$ ,  $\leq 0.25 \text{ V}$   $50 \Omega$  to GND

AUX OUT Trigger Output Outputs a pulse signal when the oscilloscope is triggered

Pass/Fail Output a pulse signal when a pass/fail event occurs.

Supports user-defined pulse polarity and pulse time (100 ns to 10 ms)

HDMI Video Output 1 on the rear panel, HDMI 1.4, A plug. It is used to connect to an external monitor or projector

Probe Compensation Output 1 kHz,  $3 \text{ V}_{\text{pp}}$  square waveform

## Power Supply

### Power Supply

Power Supply Interface Type-C

Power Voltage DC 12 V, 4 A

## Power Supply

Power	Max. 48 W (when connected to various interfaces, USB storage device, active probes)
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## Environment

### Environment

Temperature Range	Operating	0°C to 50°C
	Non-operating	-30°C to +60°C
Humidity Range	Operating	below +30°C: ≤90% RH (without condensation)
		+30°C to +40°C, ≤75% RH (without condensation)
	Non-operating	+40°C to +50°C, ≤45% RH (without condensation)
Altitude	Operating	below 3,000 m
	Non-operating	Below 15,000 m

## Warranty and Calibration Interval

### Warranty and Calibration Interval

Warranty	Three years for the mainframe, excluding the probes and accessories.
Recommended Calibration Interval	18 months

# Regulations

## Regulations

Compliant with EMC DIRECTIVE 2014/30/EU, compliant with or higher than the standards specified in IEC 61326-1:2013/EN 61326-1:2013 Group 1 Class A

### CISPR 11/EN 55011

IEC 61000-4-2:2008/EN 61000-4-2  $\pm 4.0$  kV (contact discharge),  $\pm 8.0$  kV (air discharge)

IEC 61000-4-3:2002/EN 61000-4-3 3 V/m (80 MHz to 1 GHz); 3 V/m (1.4 GHz to 2 GHz); 1 V/m (2.0 GHz to 2.7 GHz)

#### Electromagnetic Compatibility

IEC 61000-4-4:2004/EN 61000-4-4 1 kV power line

IEC 61000-4-5:2001/EN 61000-4-5 0.5 kV (phase-to-neutral voltage); 1 kV (phase-to-earth voltage); 1 kV (neutral-to-earth voltage)

IEC 61000-4-6:2003/EN 61000-4-6 3 V, 0.15-80 MHz

IEC 61000-4-11:2004/EN 61000-4-11 Voltage dip: 0% UT during half cycle; 0% UT during 1 cycle ; 70% UT during 25 cycles  
short interruption: 0% UT during 250 cycles

EN 61010-1:2019

EN 61010-031:2015

IEC 61010-1:2016

IEC 61010-2-030:2017

#### Safety

UL 61010-1:2012 R7

UL 61010-2-31:2017 R2

CAN/CSA-22.2 No. 61010-1-12:2017

CAN/CSA-22.2 No. 61010-2-30:2018

CAN/CSA-22.2 No. 61010-031-07:201

#### Vibration

Meets GB/T 6587; class 2 random

Meets MIL-PRF-28800F and IEC60068-2-6; class 3 random

## Regulations

	Meets GB/T 6587-2012; class 2 random
Shock	Meets MIL-PRF-28800F and IEC 60068-2-27; class 3 random
	In non-operating conditions: 30 g, half-sine wave, 11 ms duration, 3 shocks along the main axis, total of 18 shocks

## Mechanical Characteristics

### Mechanical Characteristics

Dimensions 265.35 mm (W) x 161.75 mm (H) x 77.38 mm (D)

Weight<sup>[8]</sup> Package excluded: 1.78 kg

Package included: 2.78 kg

## Non-volatile Memory

### Non-volatile Memory

Setup/Image setup (\*.stp), image (\*.png, \*.bmp, \*.jpg)

Data/File Storage CSV waveform data (\*.csv), binary waveform data (\*.bin), list data (\*.csv), and reference waveform data (\*.ref, \*.csv, \*.bin)

Internal Capacity 8 GB

Reference Waveform Displays 10 internal waveforms

Setting Storage is limited by the capacity

USB Capacity Supports the USB storage device that conforms to the industry standard

### Note:

[1]: Single-channel mode: If any one of the channels is enabled, it is called single-channel mode.

[2]: Dual-channel mode: For four-channel models, if any two of the channels are enabled, it is called dual-channel mode.

[3]: Full-channel mode: For two-channel models, if all of the two channels are enabled, it is called full-channel mode; for four-channel models, if any three channels or all of the four channels are enabled, it is called full-channel mode.

[4]: 500  $\mu$ V/div is a magnification of 1 mV/div setting. For vertical accuracy calculations, use full scale of 8 mV.

[5]: For any channel, under the same input impedance with DC-coupled, the Volts/div setting is the same for 100 mV/div and 200 mV/div.

[6]: Only available for the two-channel models.

[7]: Only available for the four-channel models.

[8]: Standard configuration.

# Order Information and Warranty Period

## Order Information

Order Information	Order No.
<b>Model</b>	
100 MHz, 1.25 GSa/s, 25 Mpts, 4CH	DHO814
100 MHz, 1.25 GSa/s, 25 Mpts, 2CH	DHO812
70 MHz, 1.25 GSa/s, 25 Mpts, 4CH	DHO804
70 MHz, 1.25 GSa/s, 25 Mpts, 2CH	DHO802
<b>Standard Accessories</b>	
Power Adaptor Conforming to the Standard of the Destination Country	— —
Banana-Plug Ground Connecting Cable	— —
DHO814/DHO804: Passive Probe x4 (150 MHz)	PVP3150
DHO812/DHO802: Passive Probe x2 (150 MHz)	

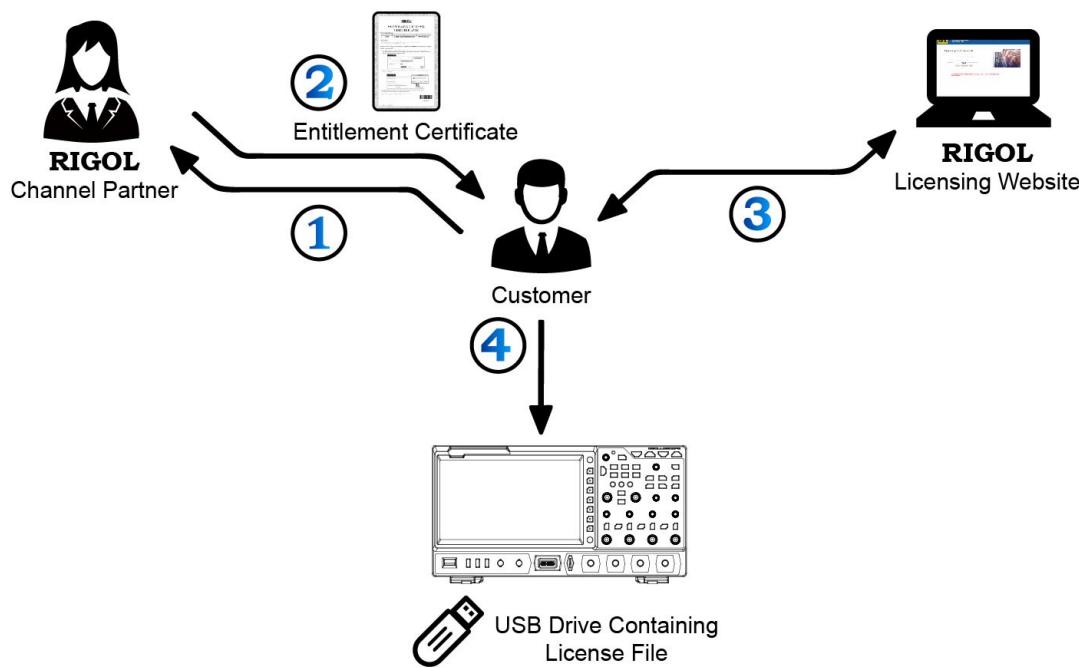
### NOTE:

For all the mainframes, accessories and options, please contact the local office of RIGOL.

## Warranty Period

Three years for the mainframe, excluding the probes and accessories.

# Option Ordering and Installation Process



1. According to the usage requirements, please purchase the specified function options from **RIGOL Sales Personnel**, and provide the serial number of the instrument that needs to install the option.
2. After receiving the option order, the **RIGOL** factory will mail the paper software product entitlement certificate to the address provided in the order.
3. Log in to **RIGOL** official website for registration. Use the software key and instruments serial number provided in the entitlement certificate to obtain the option license code and the option license file.
4. Download the option license file to the root directory of the USB storage device, and connect the USB storage device to the instrument properly. After the USB storage device is successfully recognized, the **Option install** menu is activated. Press this menu key to start installing the option.

# Boost Smart World and Technology Innovation



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## Provide Testing and Measuring Products and Solutions for Industry Customers

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