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Hantek DDS-3005 USB Arbitrary Waveform Generator

Hantek DDS-3005 USB Arbitrary Waveform Generator User Guide

Contents

Hantek®

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Product Information

- **Specifications**
    - **Waveform Output Channel:** 1
    - **Frequency Range:** 0.1Hz(DC)~5MHz
    - **Resolution:** 0.01Hz
    - **DAC Clock:** 0~50MHz Continuously adjustable, in the step of 0.2Hz
    - **Channels:** 1CH waveform output
    - **Memory Depth:** 256KSa
    - **Vertical Resolution:** 14 Bits
    - **Stability:** 50K
    - **Frequency Counter Channel 2 Range:** 25MHz~2.7GHz
    - **Input Power Coupling Mode:** AC
    - **Accuracy:** Input Impedance 50Ω
    - **Standard Frequency:** 25MHz
    - **Frequency Stability:** 20 ppm max.
    - **Aging Rate:**
    - **Digital Input and Output Bits:** 8 Bits+ Synchronized Signal 1 Bit + External Signal 1 Bit
    - **Level:** 3/5V TTL/CMOS
    - **Working Environment Working Temperature:** 0~70°C
    - **Working Humidity:** 0~65%
    - **Weight:** 0.7Kg

Product Usage Instructions

- **Introduction**
    - The DDS-3005 USB signal generator operates by transferring waveform data from a PC to its memory via the USB bus.
- **Working Principle**
    - The ID counter cycles and sends period waveform data to the DAC circuits, which are then processed by the DDS circuit to produce corresponding DAC refreshing clock signals.
- **Hardware Specification**
    - The device offers a waveform output channel, frequency range of 0.1Hz(DC)~5MHz, resolution of 0.01Hz, and various other specifications detailed above.
- **Installation**
    - **System Requirements**
        - The minimum system requirements include Windows OS (11/10/98/2000/XP), 128Mbyte memory, and specific graphic card specifications for optimal performance.
    - **Shape and Terminal Illustration**
        - The device's shape and terminal illustrations are provided for easy setup and connection.
- **Software Operations**
    - **Installing the Hardware**
        - To install the hardware, connect the USB instrument to the PC via the USB cable. The PC should detect the new USB device and prompt for driver installation in the nominated directory.

FAQs

- **Q: What is the frequency range of the DDS-3005 USB signal generator?**
- **A:** The frequency range of the signal generator is from 0.1Hz(DC) to 5MHz.
- **Q: What are the system requirements for operating the DDS-3005 USB signal generator?**
- **A:** The minimum system requirements include Windows OS (11/10/98/2000/XP), 128Mbyte memory, and specific graphic card specifications for optimal performance.

Introduction

- DDS-3005 USB Arbitrary Waveform Generator has one channel of arbitrary waveform output, 8 Bits output, synchronized signal outputs, two channels of Counter/Frequency Measurement inputs, 8 Bits input and external trigger input.
- Users can edit the waveform arbitrarily with the mouse or choose the regular waveforms such as Sine, Square, Triangle, Saw-tooth, TTL, White Noise, Gauss Noise, Trapezia, Exponent, AM and FM.
- The parameters, such as amplitude, frequency and offset, are also settable.
- The data format of DDS-3005 USB is completely compatible with that of Tektronix; it can directly read the waveform data files produced by the Tektronix oscilloscope or Tektronix waveform editor software and redisplay the waveform. DDS-3005 USB adopts the DDS technology so that it has the advantages of high-frequency accuracy, high waveform resolution, high reliability, and wide software support.
- It can be widely used in various kinds of electronics labs and it offers a complete interface for second-time development to be jointlessly inserted into other auto-measuring systems.

Working Principle

- The PC transfer the waveform data to the memorizer of the signal generator via the USB bus, the ID counter cycles and send the period waveform data to the DAC circuits, the DDS (Direct Digital Synthesized) circuit produces the corresponding DAC refreshing clock.
- The waveform of DAC is outputted through the Cache magnifier, Low Pass Filter, and the Magnifier. The frequency counter can test the external frequency.

Hardware Specification

Waveform Output Channel	
Frequency Range	0.1Hz(DC)~5MHz
Resolution	0.01Hz
DAC Clock	0~50MHz Continuously adjustable, in step of 0.2Hz
Channels	1CH waveform output
Memory Depth	256KSa
Vertical Resolution	14 Bits
Stability	<30ppm
Amplitude	±10V Max.
Output Impedance	50 Ω
Output Current	50mA Vpeak=100mA
Low Pass Filter	5MHz, 1MHz, 100KHz, 10KHz, 1KHz Programmable Control
Harmonic Wave distortion	-65dBc(1KHz), -53dBc(10KHz)
Frequency Counter Channel 1	
Range	DC~25MHz
Input Amplitude	400mVpp~25Vpp
Coupling Mode	AC, DC Programmable
Accuracy	±Time Base Error ±1 Count
Input Impedance	> 50KΩ
Frequency Counter Channel 2	
Range	25MHz~2.7GHz

Input Power	±20dbm
Coupling Mode	AC
Accuracy	±Time Base Error ±1 Count
Input Impedance	50 Ω
Standard Frequency	25MHz
Frequency Stability	20 ppm max.
Aging Rate	±1 ppm/year
Digital Input and Output	
Bits	8 Bits+ Synchronized Signal 1 Bit + External Signal 1-Bit
Level	3/5V TTL/CMOS
Working Environment	
Working Temperature	0~70 Centigrade
Working Humidity	0~65%
Weight	0.7Kg

Installation

System requirements

- **Minimum System Requirements Operating System**
    - Windows
    - 11/10/ 9 8/ 2000/XP
    - Memory
    - 128Mbyte
    - Graphic Card
- **Microsoft DirectX supported**
    - **Screen resolution:** 1024×768
    - **Colour depth:** 16bit

- **Recommended System Requirements Operating System**
  - Windows
  - 11/10/ 9 8 2000/XP
  - Memory
  - 256Mbyte
- **Graphic Card**
  - Microsoft DirectX supported
  - **Screen resolution:** 1024×768
  - **Colour depth:** 16bit

Shape and Terminal Illustration

DDS-3005 USB Shape

Arbitrary   Waveform

25MHz~2.7GHz counter/Frequency Measurement

DC~25MHz Counter/Frequency Measurement

Digital outputs

Working Status Indication

PIN1

PIN1

USB

Digital inputs
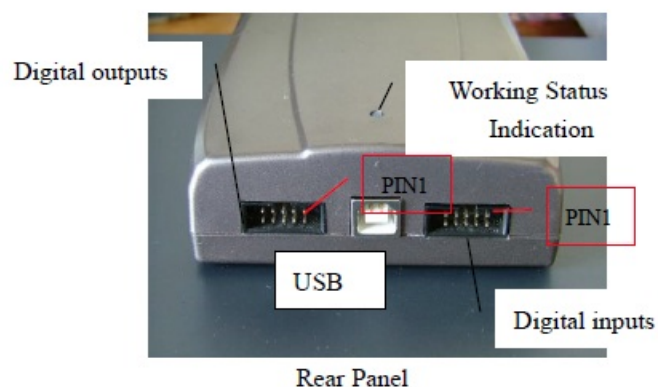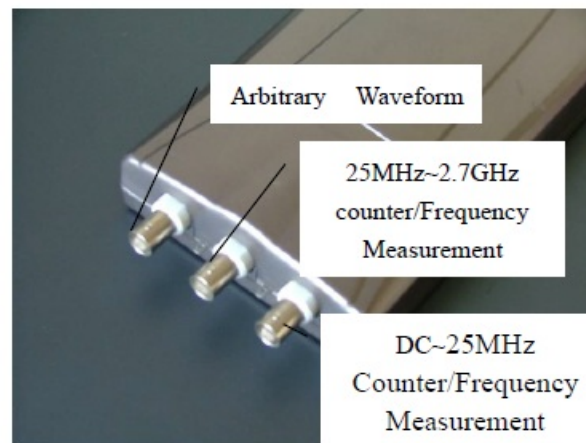
Rear Panel

PIN1	Bit7
PIN2	Bit6
PIN3	Bit5
PIN4	Bit4
PIN5	Bit3
PIN6	Bit2
PIN7	Bit1
PIN8	Bit0
PIN9	Synchronized Signal Output
PIN10	Digital Ground

Digital Output Port Definition

PIN1	Bit7
PIN2	Bit6
PIN3	Bit5

PIN4	Bit4
PIN5	Bit3
PIN6	Bit2
PIN7	Bit1
PIN8	Bit0
PIN9	External Trigger Input
PIN10	Digital Ground

Digital Input Port Definition

Software Operations

- **Installing the Hardware**
  - Connect the USB instrument to the USB port through the USB cable, the PC prompts that new USB device is found.

- The PC will automatically find the new USB device and choose the nominated directory to install the driver.

- Choose the correct directory of the driver through the browser or search in the CD driver.
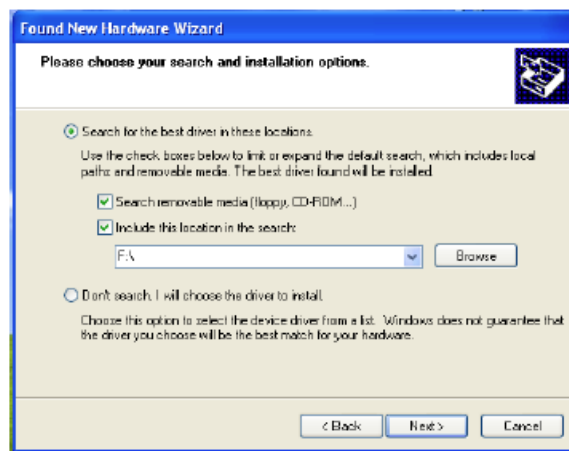
- Click Continue to finish the installation.

- The system will notify you that the new USB device can work normally now.
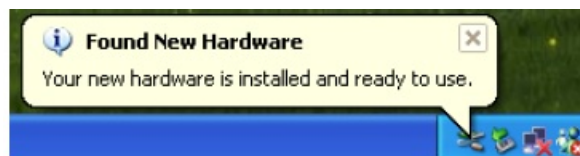
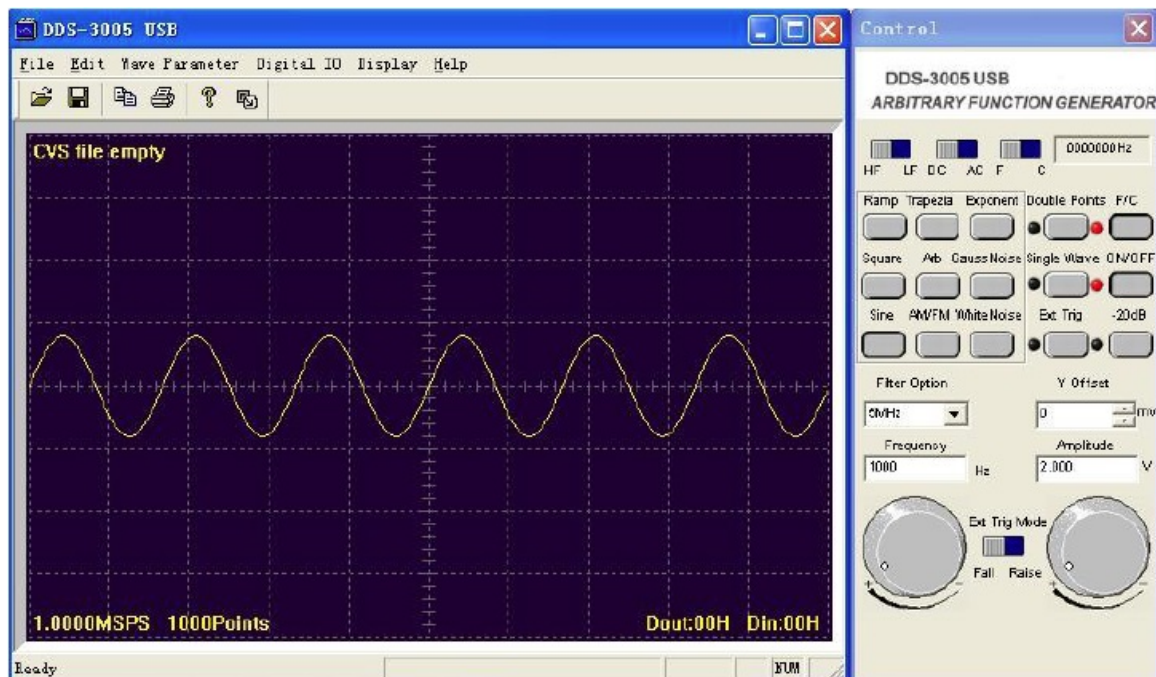- After the successful installation, in the Device Manager, you can see the DDS 3005 USB device.
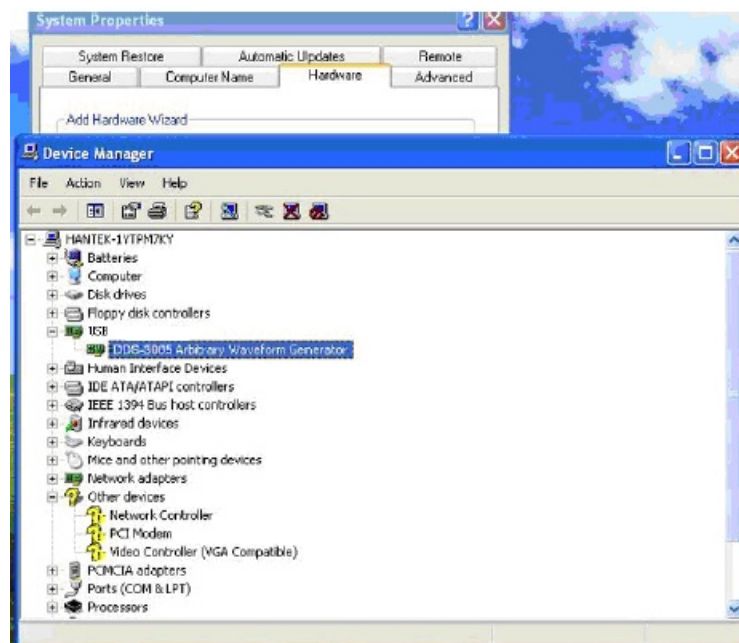
Installing the Software

- The setup software of DDS-3005 USB is in the CD, run the Setup.exe to install the software.
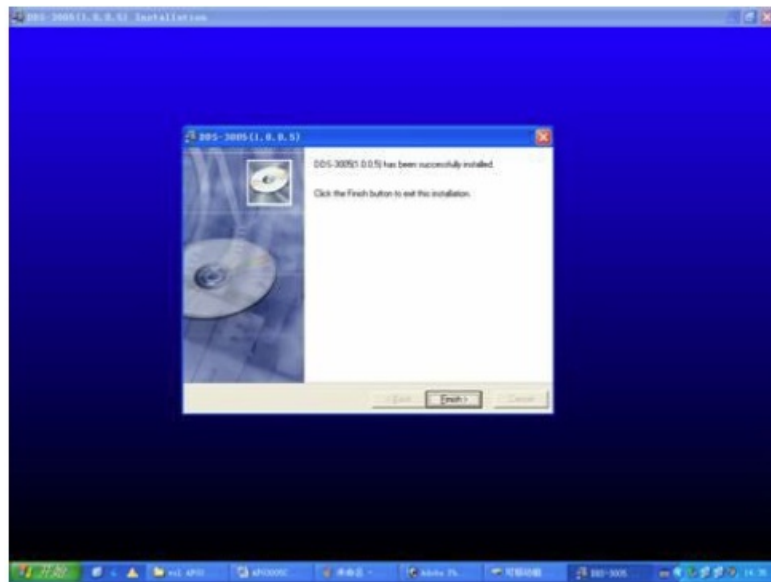
Run the DDS-3005 USB

Click Start"- Program DDS-3005 USB DDS-3005 USB to go into the main window, shown below:

Choose the Wave Forms

- Press down any button of the certain waveform to switch to the output of such kind of waveform.
- When switching to an arbitrary waveform from another kind of waveform, the edition work can be done on the original waveform.

Waveform Parameter Setup

- Select the Parameters in the Menu, there are the choices for setting of various waveform parameters parameters.
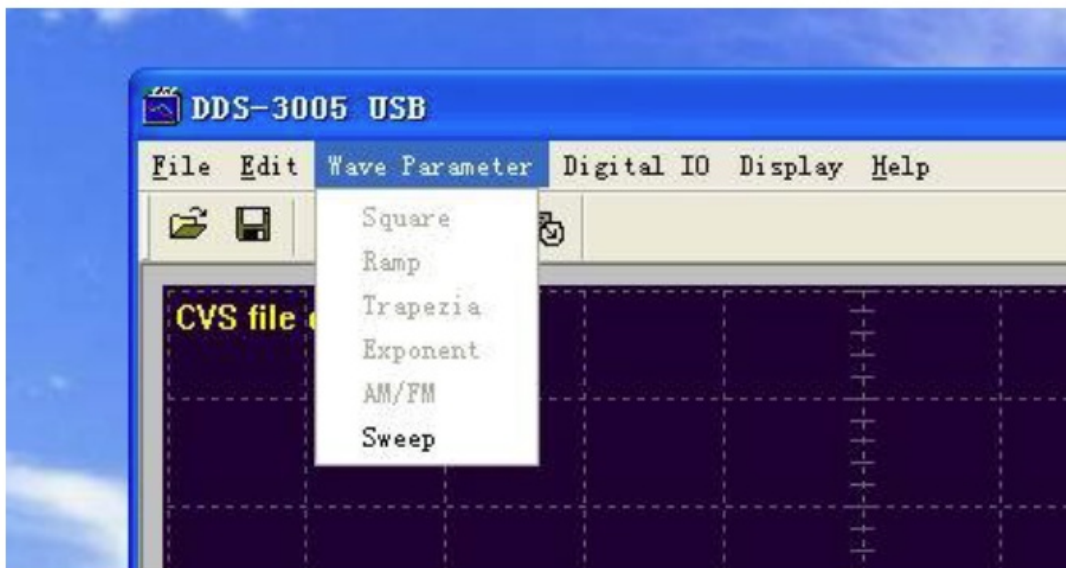
- Example modulation Signal "":
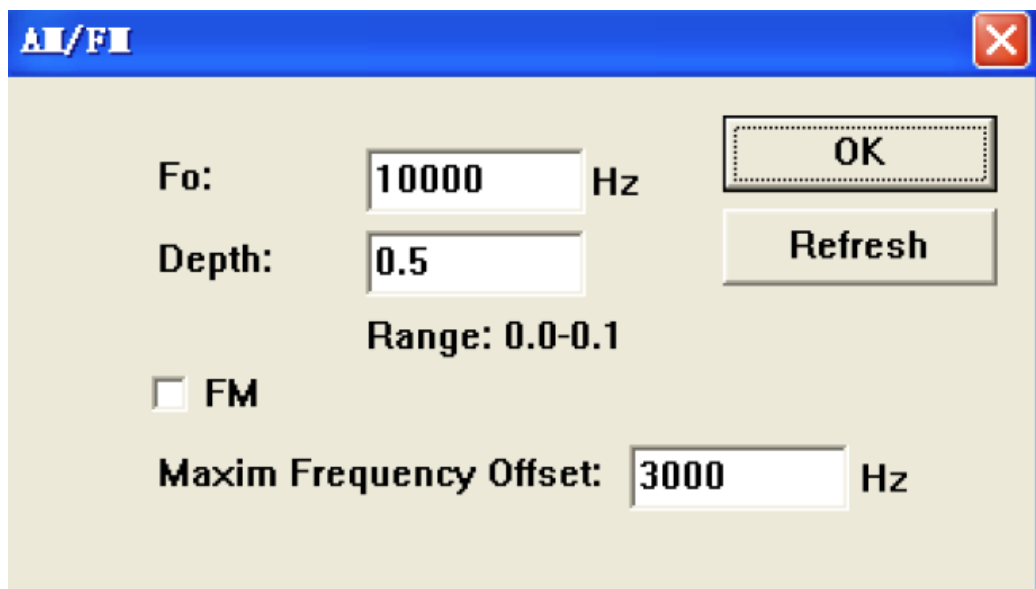
- Set the parameters in the dialogue box.
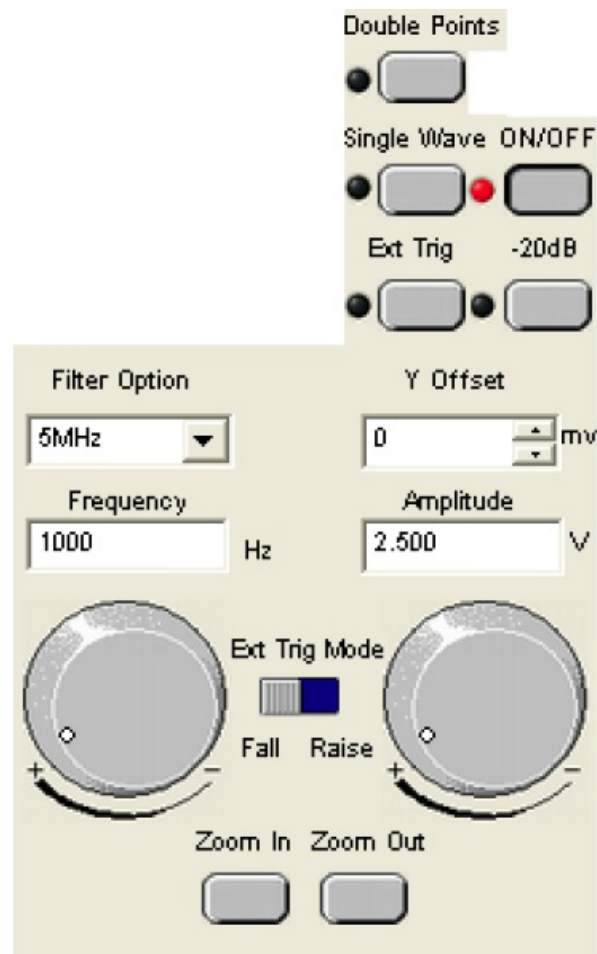
Counter/ Frequency Measurement
To measure by the buttons shown below:
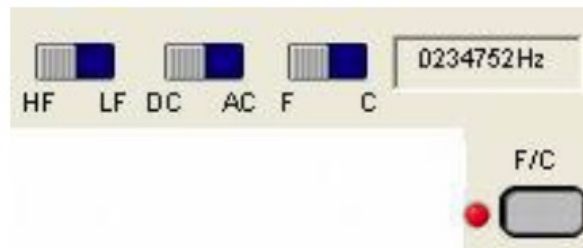
Including High Frequency/Low-Frequency Coupling Mode Frequency Measure/ Counter and the function's On/Off".

Waveform Output Control

- The following buttons control the output dot numbers, trigger mode, output amplitude, and limit frequency of the wave filter.

Edition of Arbitrary Waveform

- Choose the Arbitrary Dot Edit in the Edit Menu, or double-click the display window to edit each dot, or use the mouse the draw the waveform.
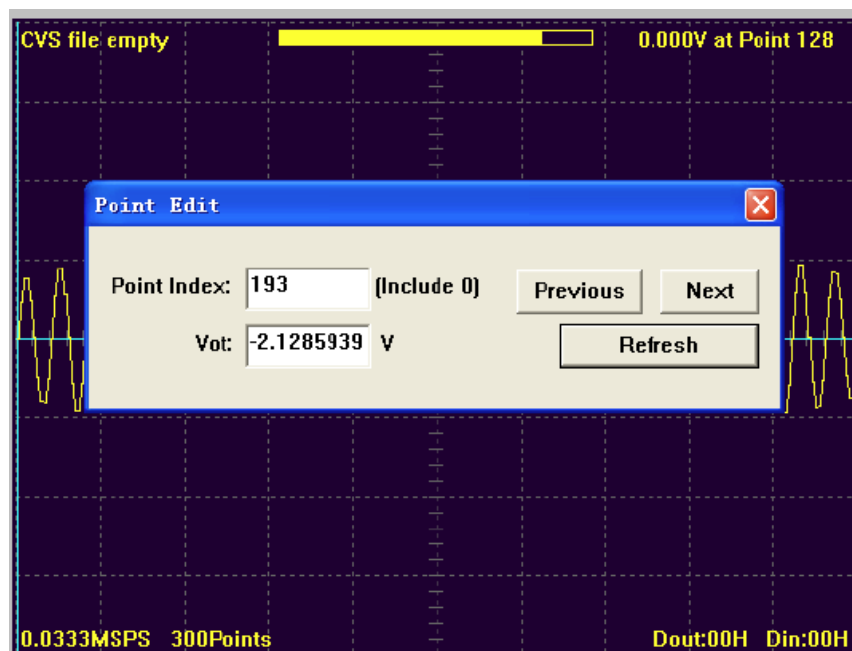
Waveform Data Files

- The data format of DDS-3005 USB is """.CSV""". Its format is compatible with the CSV file produced by the Tektronix ARBExpress software. Users can edit or set up the required CSV waveform and also use Excel to open and edit the CSV wave files.
- **Warning:** Any usage beyond the limit of the input & output signal ports as well as strong electrical field and static may cause the abnormal working or even damage to the instrument.

Documents / Resources

Hantek DDS-3005 USB Arbitrary Waveform Generator [pdf] User Guide
DDS-3005 USB Arbitrary Waveform Generator, DDS-3005, USB Arbitrary Waveform Generator, Arbitrary Waveform Generator, Waveform Generator, Generator

References

- **User Manual**