
DDS-3005 USB Arbitrary Waveform Generator and Frequency Counter

Operation Manual V1.9

Introduction

1.1 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. User can edit the waveform arbitrarily by the mouse or choose the regular waveforms such as Sine, Square, Tri-angle, 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 the various kinds of electronics labs and it offers complete interface for second time development to be jointly inserted into other auto-measuring systems.

1.2 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.

1.3 Technical Indexes

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 V _{peak} =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	400mV _{pp} ~25V _{pp}
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 and Set up

2.1 Minimum System requirements :

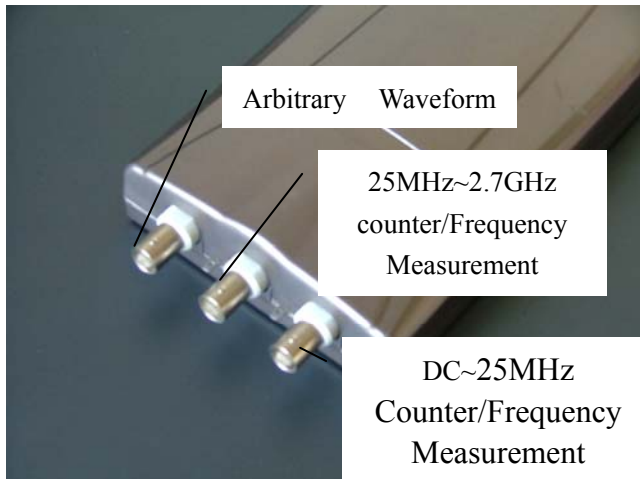
PentiumⅢ400M CPU or compatible PC, 64 RAM, 1024x768 VGA,

Windows98/Windows2000/WindowsXP/Windows Vista , USB1.2 or USB 2.0 port.

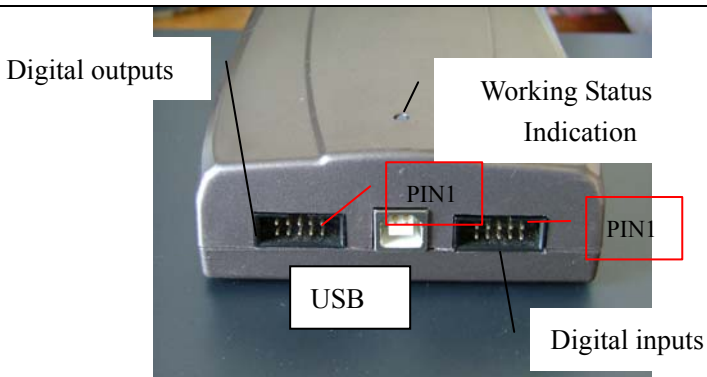
2.2 DDS-3005 USB Shape and Terminal Illustration



DDS-3005 USB Shape



Front Panel



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

DDS-3005 USBV1.08 Software Operations

3.1 Driver Installation

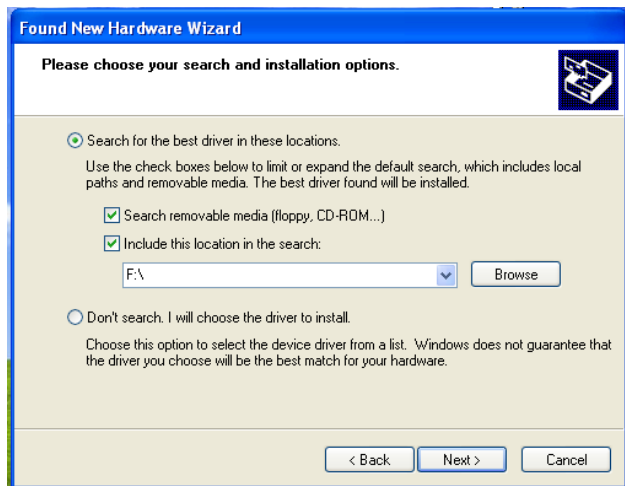
Connect the USB instrument to the USB port through the USB cable, the PC prompts that new USB device is found.



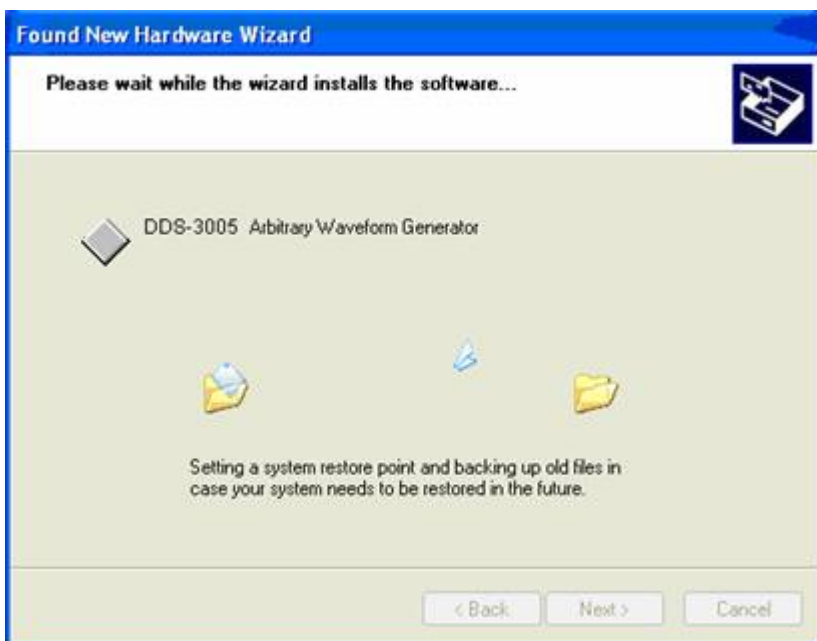
The PC will automatically find the new USB device and choose the nominated directory to install the driver.



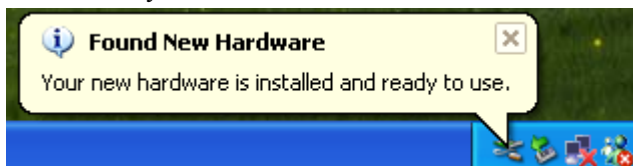
Choose the correct directory of the driver through the browser or search in the CD driver.



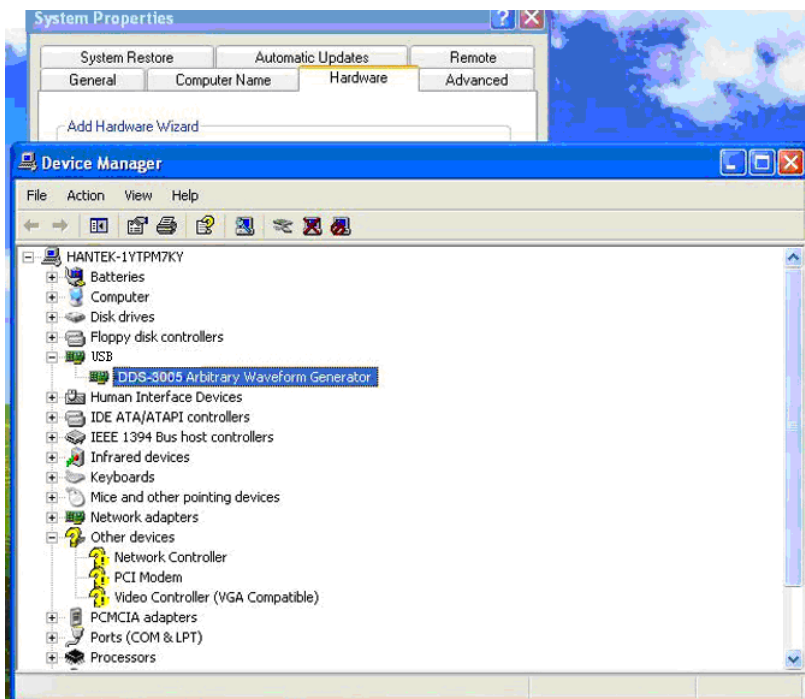
Click “Continue” to finish the installation.



The system will notify that the new USB device can work normally now.

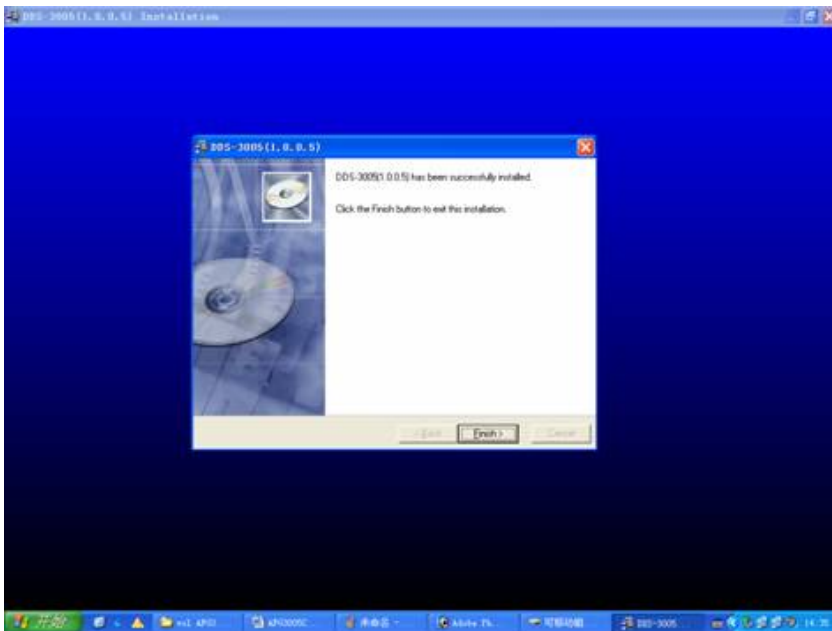


After the successfully installation, in the Device Manager, you can see the DDS-3005 USB device.



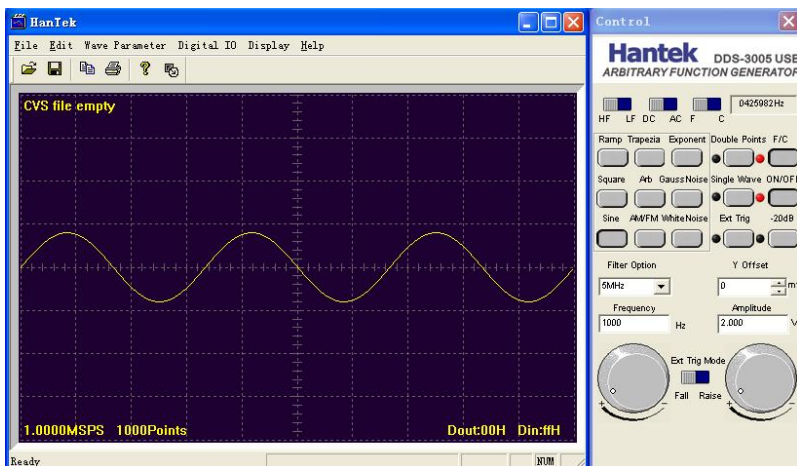
3.2 Run the DDS-3005 USB software

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



3.3 Run the DDS-3005 USB

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



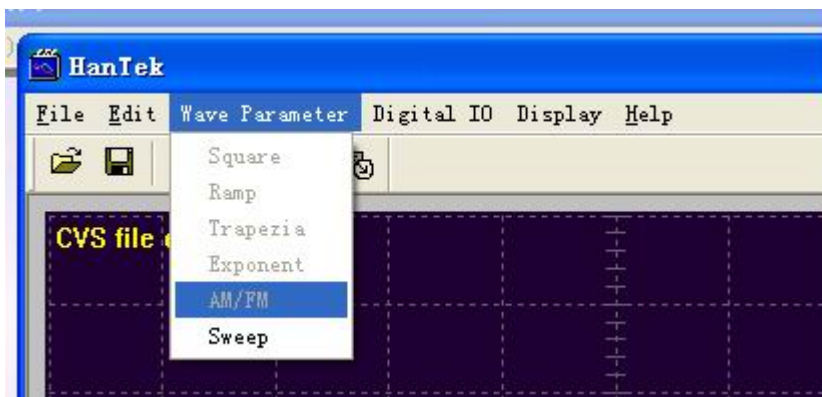
3.4 Choose the Wave Forms

Press down any button of certain waveform to switch to the output of such kind of waveform. When switch to arbitrary waveform from other kind of waveform, the edition work can be done on the original wave form.

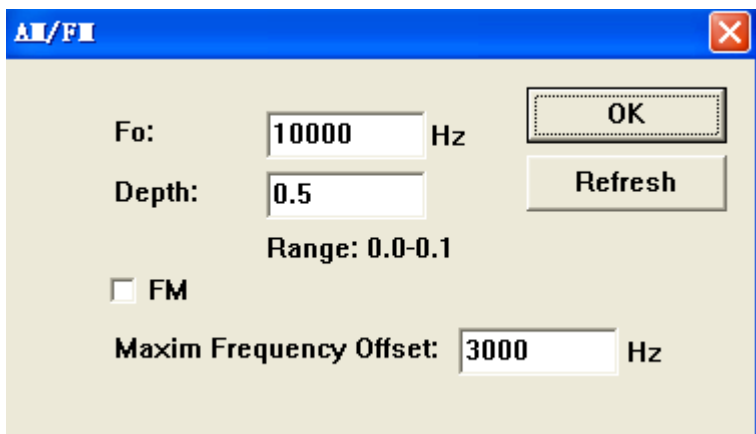


3.5 Waveform Parameter Setup

Select the “Parameters” in the Menu, there are the choices for setting of various waveform parameters.



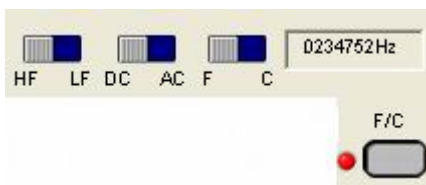
Example “modulation Signal”:



Set the parameters in the dialog box.

3.6 Counter/ Frequency Measurement

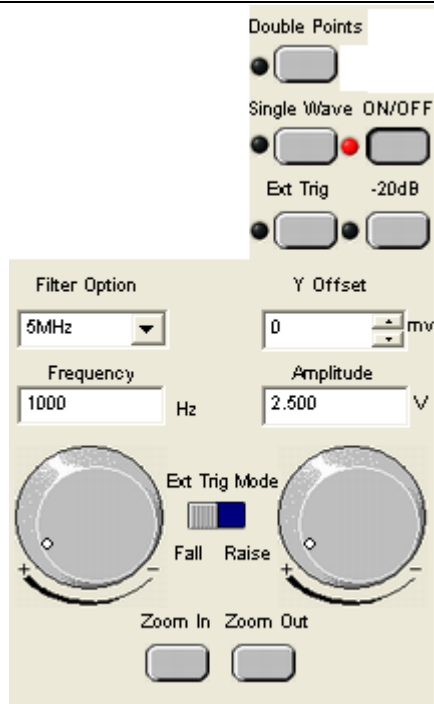
To measure by the buttons shown as below:



Including “High Frequency/ Low Frequency” , “Coupling Mode” “Frequency Measure/ Counter” and the function’s “On/Off”.

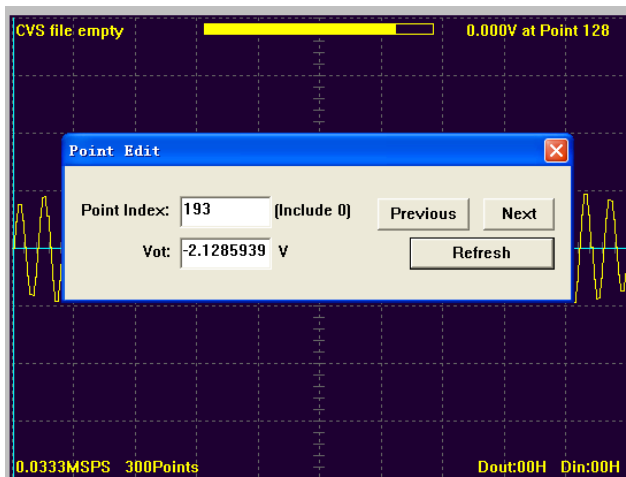
3.7 Waveform Output Control

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



3.8 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 to draw the waveform.



3.9 Waveform Data Files

The data format of DDS-3005 USB V1.09 is “.CSV”. Its format is compatible with the CSV file produced by the Tektronix ARBExpress software. User can edit or set up the required CSV waveform and also use Excel to open and edit the CSV wave files.

Warn: 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.