

User's Guide

DDS-3X25 USB ARBITRARY FUNCTION GENERATOR



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General safety summary

Please understand the following safety precautions to avoid injuries and damages to the product or any equipment connected. To be away from possible dangers, please be sure to follow the regulations.

- n **Only qualified persons are allowed to do the maintenance.**
- n **Prevent from fire and any personal damage.**
- n **Use Proper Power Cord.** Use the power cord authorized in your country only.
- n **Correctly Plug in and Pull out.** When the probes or the test leads are connecting to the voltage source, please do not plug in or pull out.
- n **Ground the product.** This product is grounded through the grounding conductor of the power cord. To avoid electric shocks, the grounding conductors must be grounded properly before making connections to the input or output terminals of the instrument.
- n **Correctly connect probe.** The probes' ground terminals are at the same voltage level of the product ground. Do not connect the ground terminals to a high voltage.
- n **Check the ratings of all terminals.** To avoid fire or shock hazard, check all ratings and marks on the product. Follow the user's guide for detailed rating information before making connections to the product.
- n **Do not operate the product when the case or panel is removed.**
- n **Avoid Circuit Exposure.** Do not touch exposed connections and components when power is on.
- n **If you think the product is broken, do not operate.** If you think that this product has something wrong, please let qualified service persons to check it.
- n **Keep proper ventilation.**
- n **Do not operate in wet/damp environment.**
- n **Do not operate in flammable and explosive air.**
- n **Please keep the product surface clean and dry.**

Introduction

DDS-3X25 Arbitrary Waveform Generator has one channel of arbitrary waveform output, 12 Bits output, synchronized signal outputs, 1 channels of Counter/Frequency Measurement inputs, 6 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, Trapeze, Exponent, AM and FM. The parameters, such as amplitude, frequency and offset, are also settable. The data format of DDS-3X25 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-3X25 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 widely use in the various kinds of electronics labs and it offers complete interface for second time development to be pointlessly inserted into other auto-measuring systems.

Chapter 1 Getting started

This chapter focuses on the following topics:

- u System Requirements
- u Installing hardware
- u Installing software
- u Understanding of the user interface

System Requirements

I Minimum System Requirements

Operating System

Windows NT/2000/XP/Vista

Memory

128MB

Graphic Card

Microsoft DirectX supported

Screen resolution: 1024x768

Color depth: 16bit

I Recommended System Requirements

Operating System

Windows NT/2000/XP/Vista

Memory

256MB

Graphic Card

Microsoft DirectX supported

Screen resolution: 1024x768

Color depth: 16bit

Installing Hardware

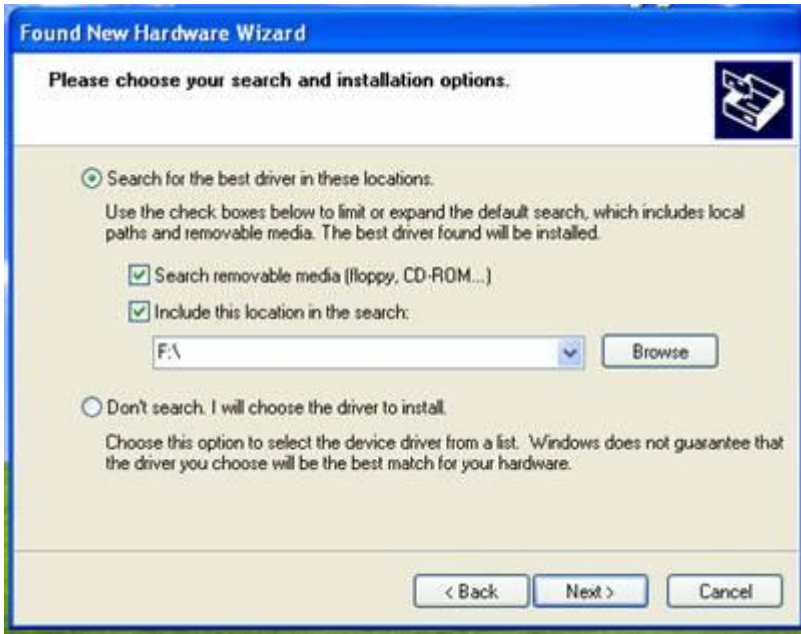
1. Connect the A-Type Plug of USB cable to your PC's USB port.
2. Connect the B-Type Plug of USB cable to DDS-3X25's USB port.
3. New hardware is found.



4. New hardware search wizard starts.



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



5. New hardware wizard installs software



6. Finish new hardware search wizard.

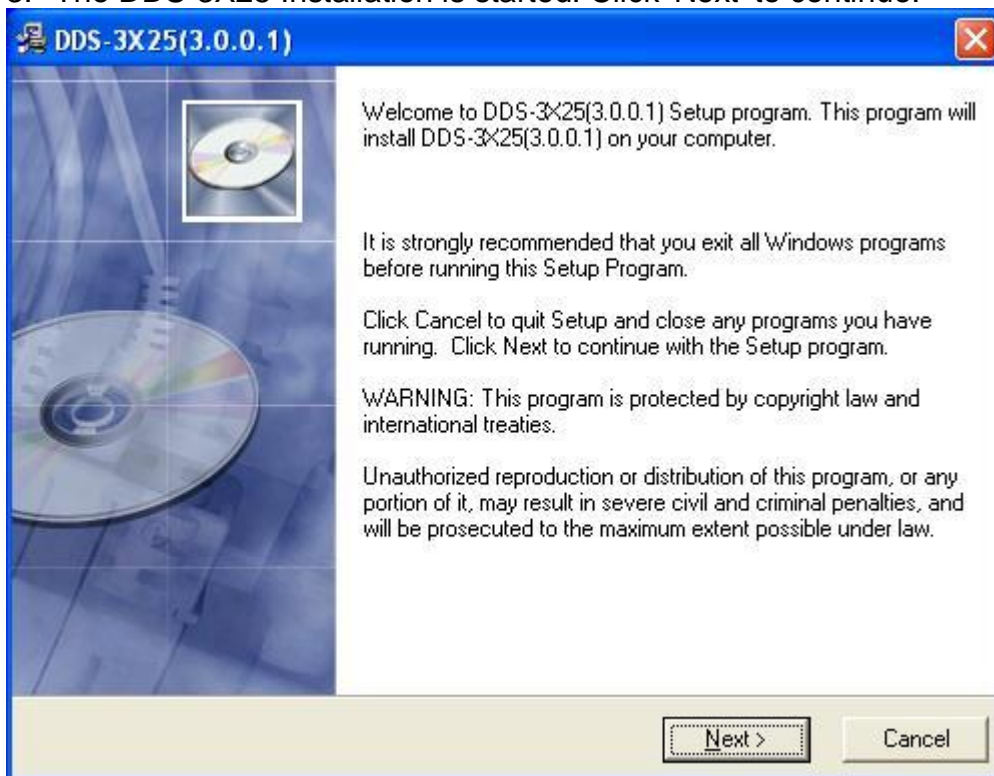


Installing Software

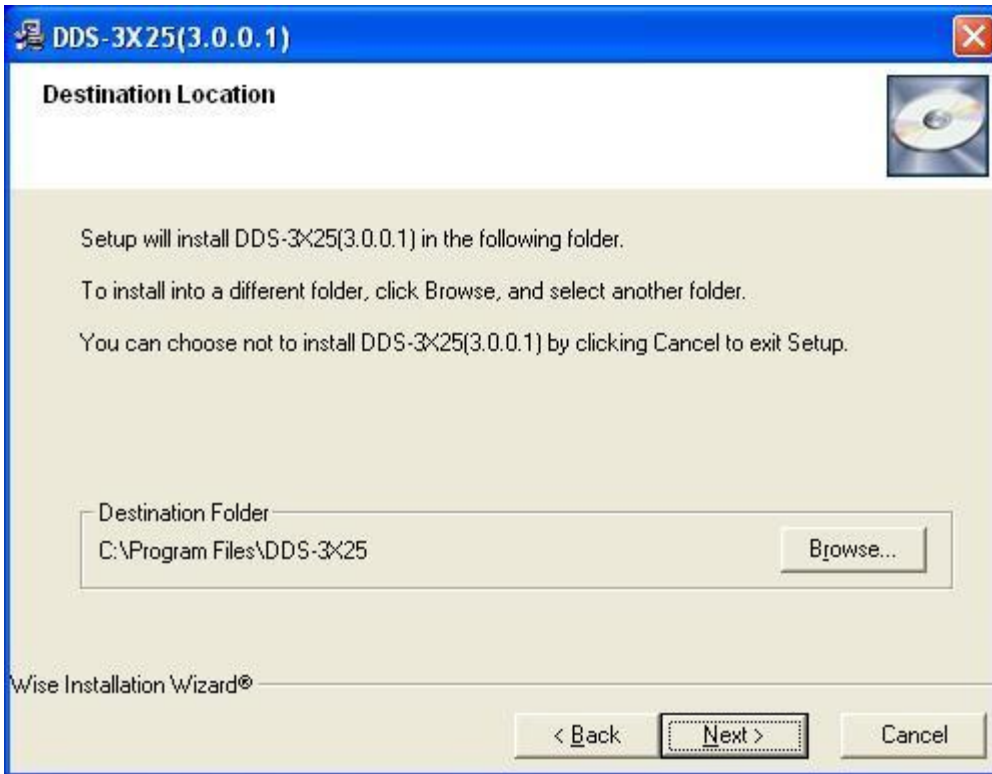
1. While in Windows, insert the installation CD into the CD-ROM drive.
2. The installation should start up automatically. Otherwise in Windows Explorer, switch to the CD-ROM drive and run "Setup.exe".



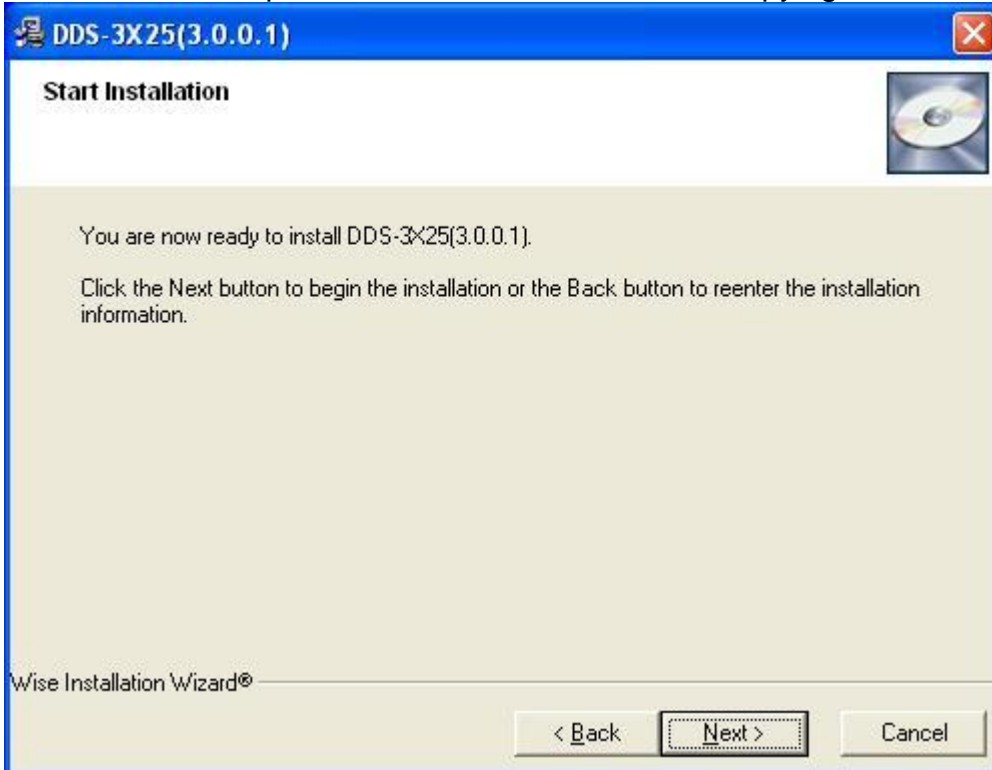
3. The DDS-3X25 Installation is started. Click 'Next' to continue.



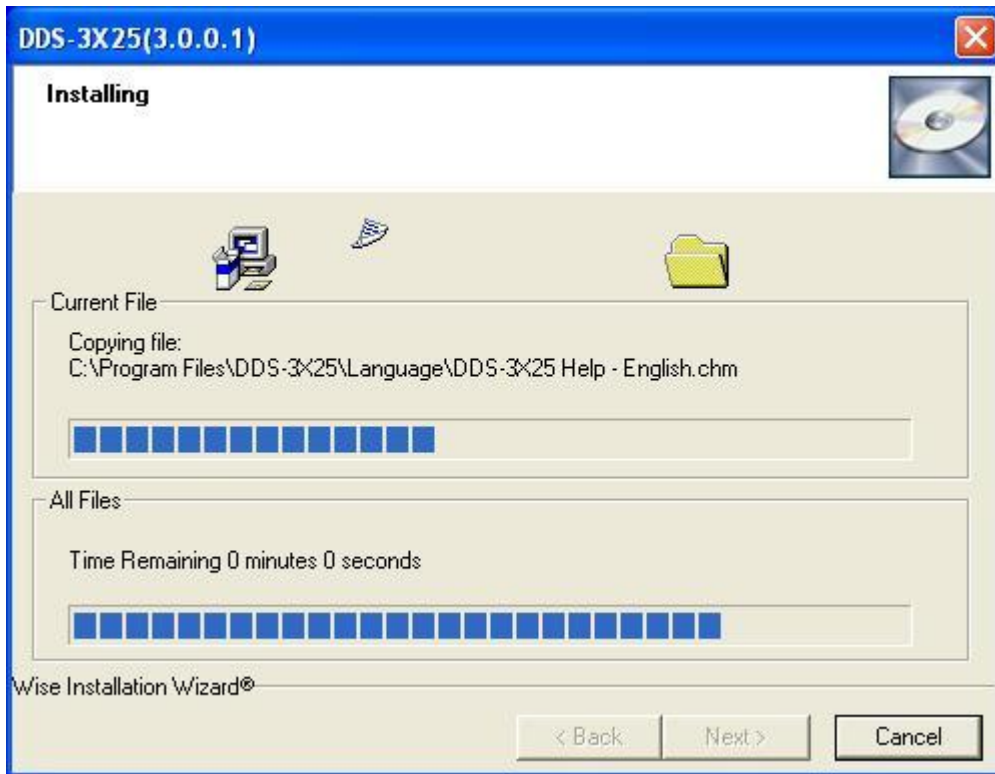
4. Choose a destination directory. Click 'Next' to continue.



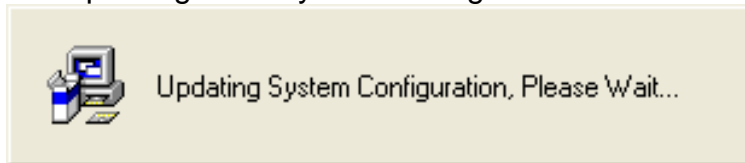
5. Check the setup information. Click Next to start copying of files.



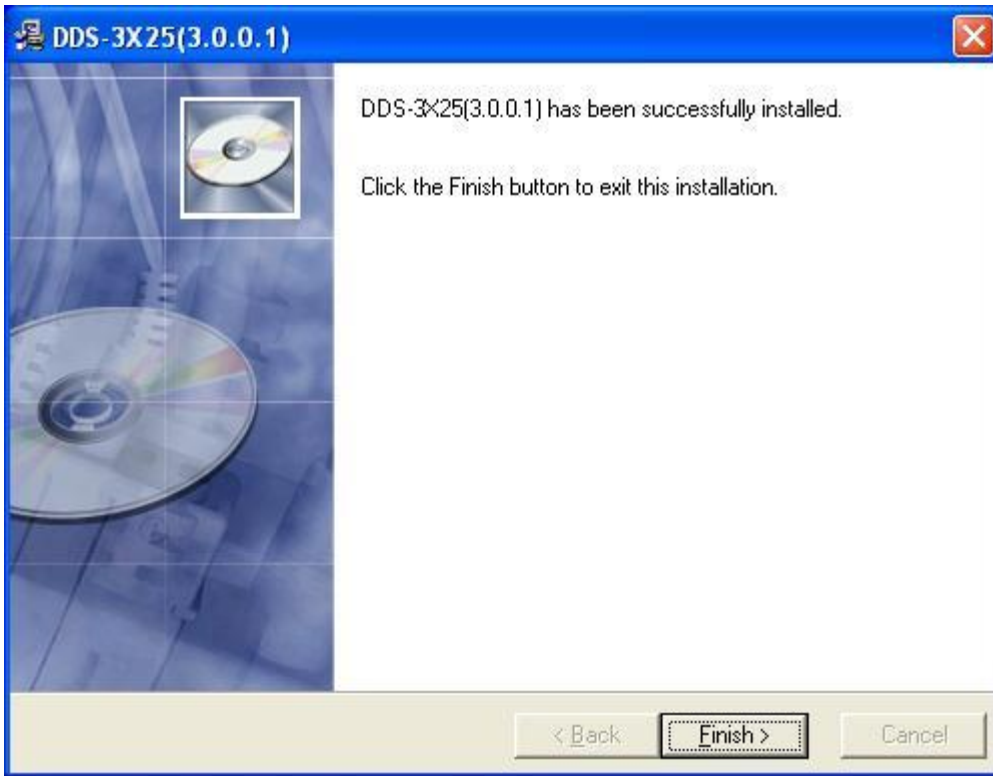
6. This Status dialog is displayed during copying of files.



7. Updating Your System Configuration.



8. The installation is complete.



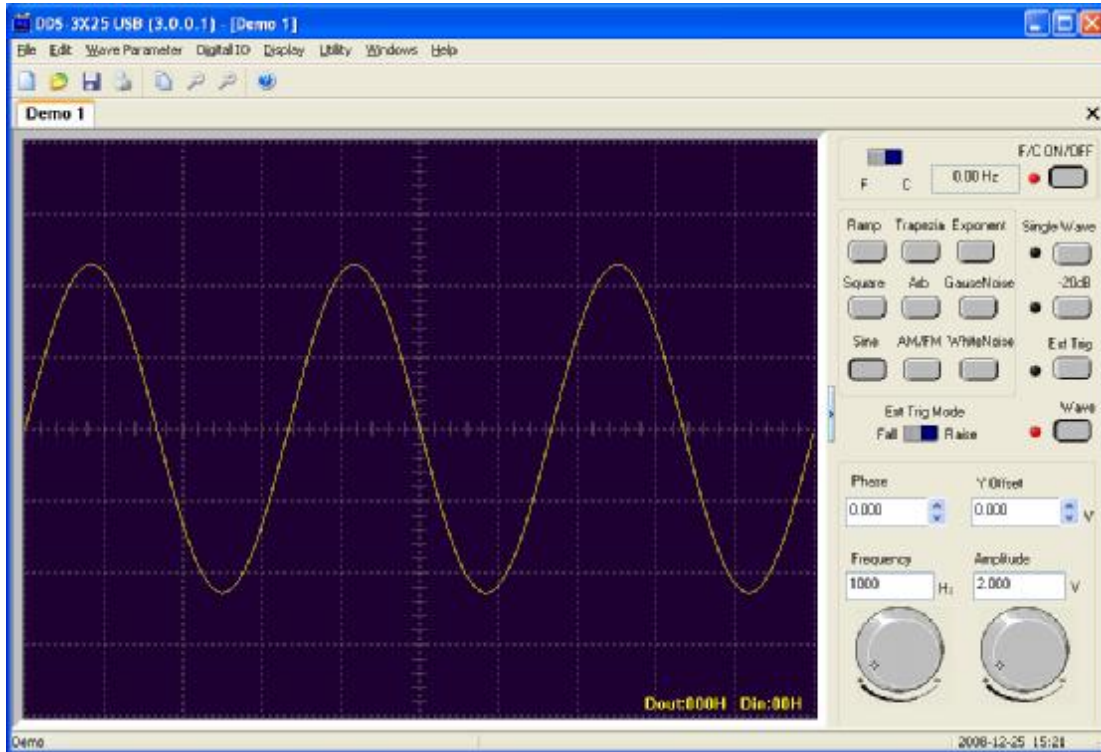
Chapter 2 Operating Basics

This chapter focuses on the following topics:

- u The User's Interface
- u The Menu System
- u The Waveform Control System

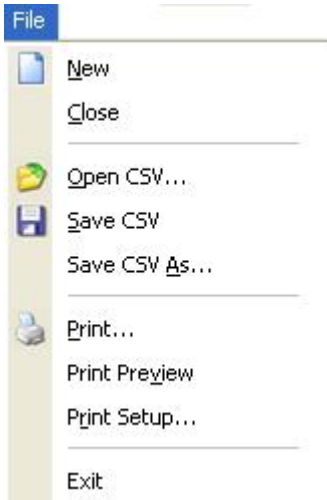
The User's Interface

DDS-3X25 provides users a simple and full-featured interface so that users do not have to spend a lot of time to learn.



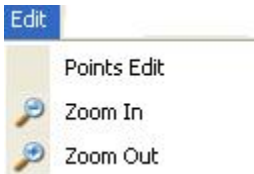
The Menu System

1. File



- I **New:** Create a new device
- I **Close:** Close current device
- I **Open CSV...:** Open a “CSV” file
- I **Save CSV...:** Save a “CSV” file
- I **Save CSV As...:** Save a “CSV” file as other name
- I **Print...:** Print the current waveform
- I **Print Preview:** Preview the current waveform
- I **Print Setup:** Configure the print setup
- I **Exit:** Exit DDS-3X25 USB

2. Edit



- I **Points Edit:** Draw the waveform after click the command of Arb.
- I **Zoom In:** Zoom in the waveform.
- I **Zoom Out:** Zoom out the waveform.

3. Wave Parameter

Wave Parameter

- Square
- Ramp
- Trapezia
- Exponent
- AM/FM

- I **Square:** Show square waveform.
- I **Ramp:** Show ramp waveform.
- I **Trapezia:** Show trapezia waveform.
- I **Exponent:** Show exponent waveform.
- I **AM/FM:** Show AM/FM waveform.

4. Digital IO

Digital IO

- Pattern Generator
- Programmable Output
- Output Set

- I **Pattern Generator:** Set the Digital out pin as pattern generator.
- I **Programmable Output:** Set the Digital out pin as programmable output.
- I **Output Set:** Show Digital out setup dialog.

5. Display

Display

- Background Color
- XY Line Color
- Curve Color
- Cursor Color
- Wave Number
- Show/Hide Control

- **Background Color:** Set background color.
- **XY Line Color:** Set XY color.
- **Curve Color:** Set curve color.
- **Cursor Color:** Set cursor color.
- **Wave Number:** Set the number of periods displayed.
- **Show/Hide Control:** Show or hide the control panel.

6. Utility

Utility

Sweep

Open Output Power On

Close Output Power On

Language ▶

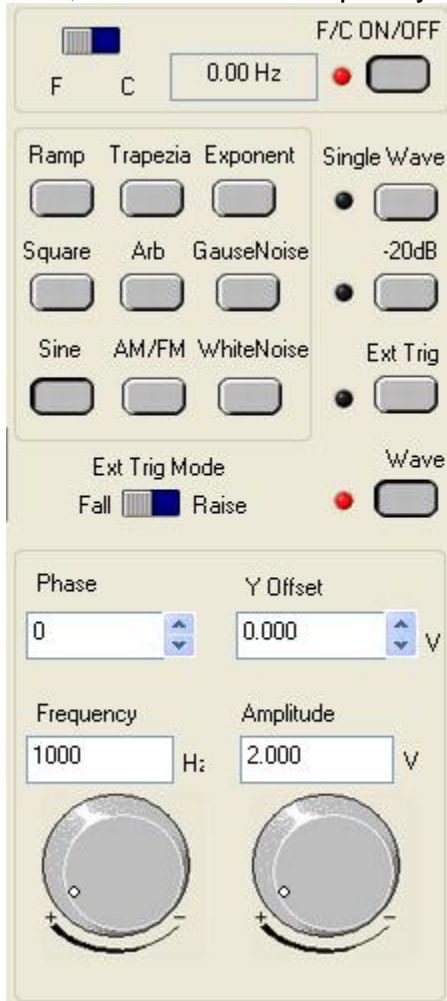
- **Sweep:**
Show the sweep dialog.
- **Open Output Power On:** Save the current waveform to DDS-3X25, and generate the waveform when the DDS-3X25 powers on.
- **Close Output Power On:** Stop generates the waveform when the DDS-3X25 powers on.

The Waveform Control System

Click Menu “Display”->”Show/Hide control”, you can show or hide the waveform control panel.

You can change the waveform parameter such as frequency, amplitude, Y Offset, or phase.

Also, it includes the frequency/counter measurement system.



Chapter 3 Understanding Functions

This chapter focuses on the following topics:

- u Waveform parameter
- u Waveform output control
- u Edition of Arbitrary Waveform
- u Counter/Frequency Measurement
- u Waveform data files

Waveform parameter

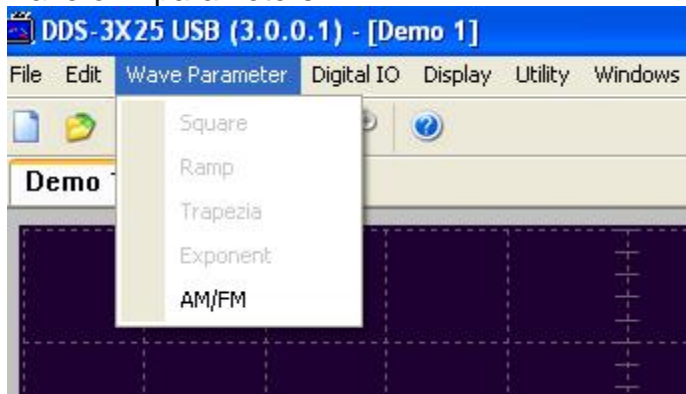
1. Choose waveform

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.

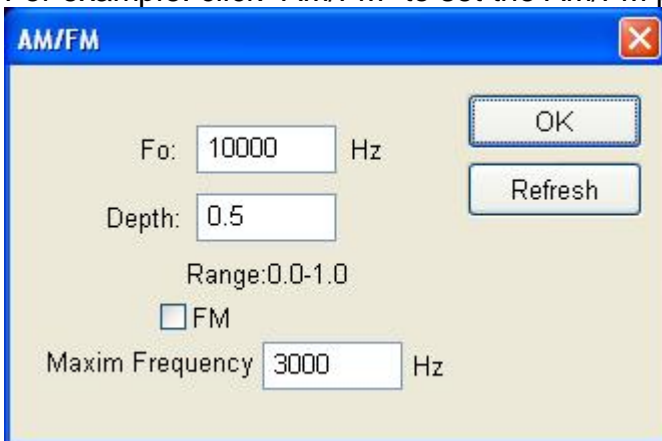


2. Set waveform parameters

Click Menu “Wave Parameter”, there are the choices for setting of various waveform parameters.

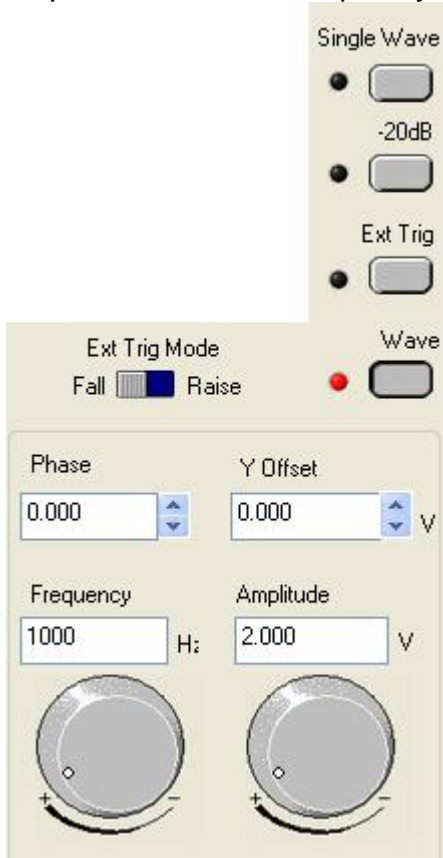


For example: click “AM/FM” to set the AM/FM parameters in the dialog.



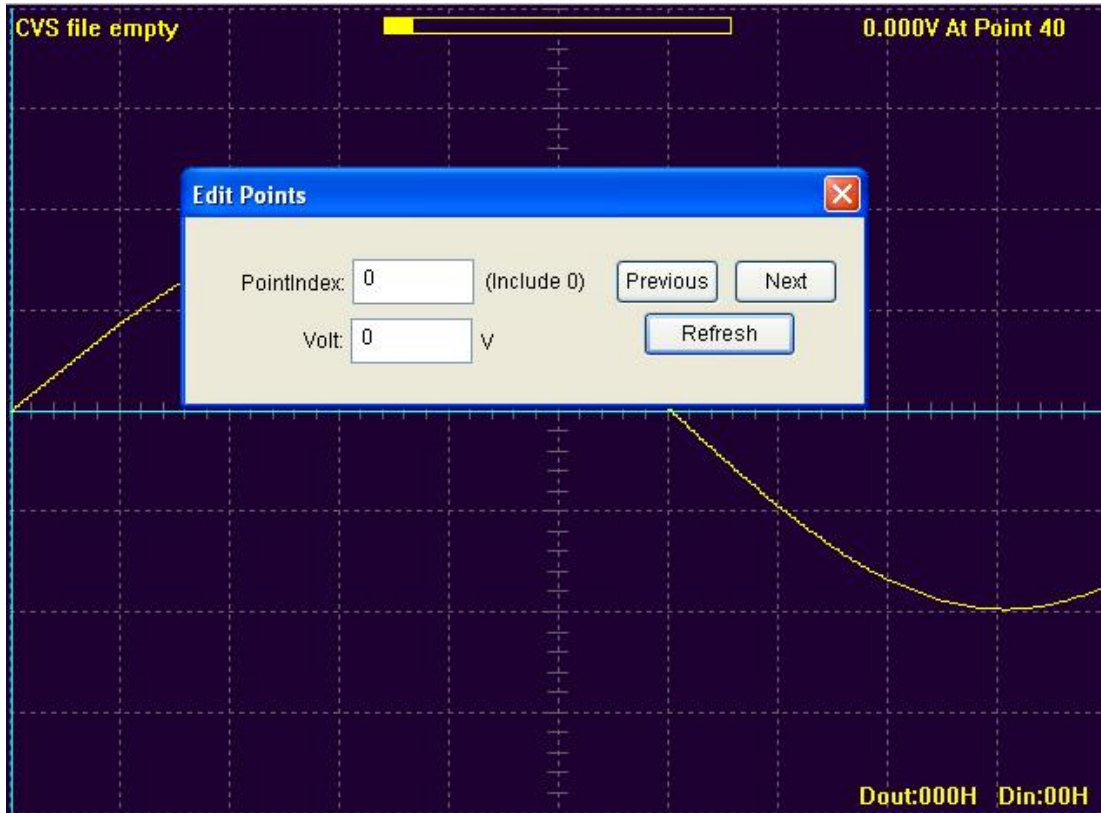
Waveform Output Control

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



Edition of Arbitrary Waveform

Choose “Arb” waveform, and click the menu “Edit” -> “Edit Points” to open edit points dialog.

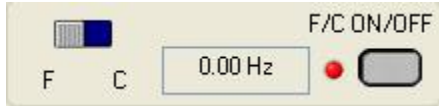


Waveform Data Files

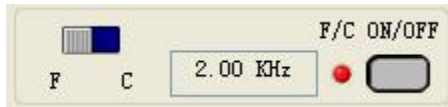
The data format of DDS-3X25 is “.CSV”. Its format is compatible with the CSV file produced by the Tektronix ARBExpress software. User can edit or set up the required CSV waveform and also use Excel to open and edit the CSV wave files.

Frequency/Counter Measurement

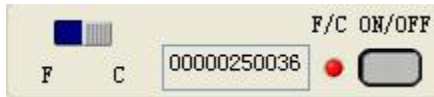
Click the “F/C ON/OFF” to turn on or off the frequency/counter measurement.



Connect to the Frequency/Counter Measurement pin, and turn on the “F/C ON/OFF”, you can see the frequency in the edit box.



Turn the left right button to “C” end; you can see the counter in the edit box.



Chapter 4 Application Examples

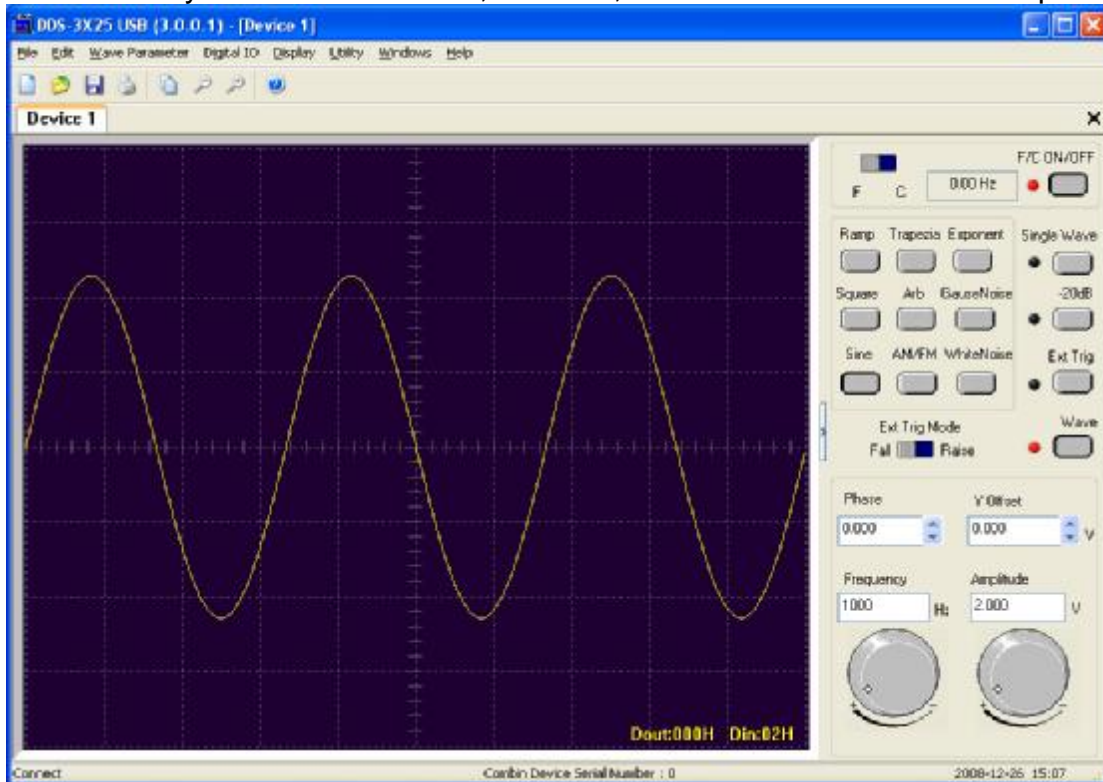
This chapter focuses on the following topics:

- u Generate the simple waveform
- u Generate Arbitrary Waveform
- u Combine Devices

Generate the Simple Waveform

To generate a simple waveform, please do these steps as follows:

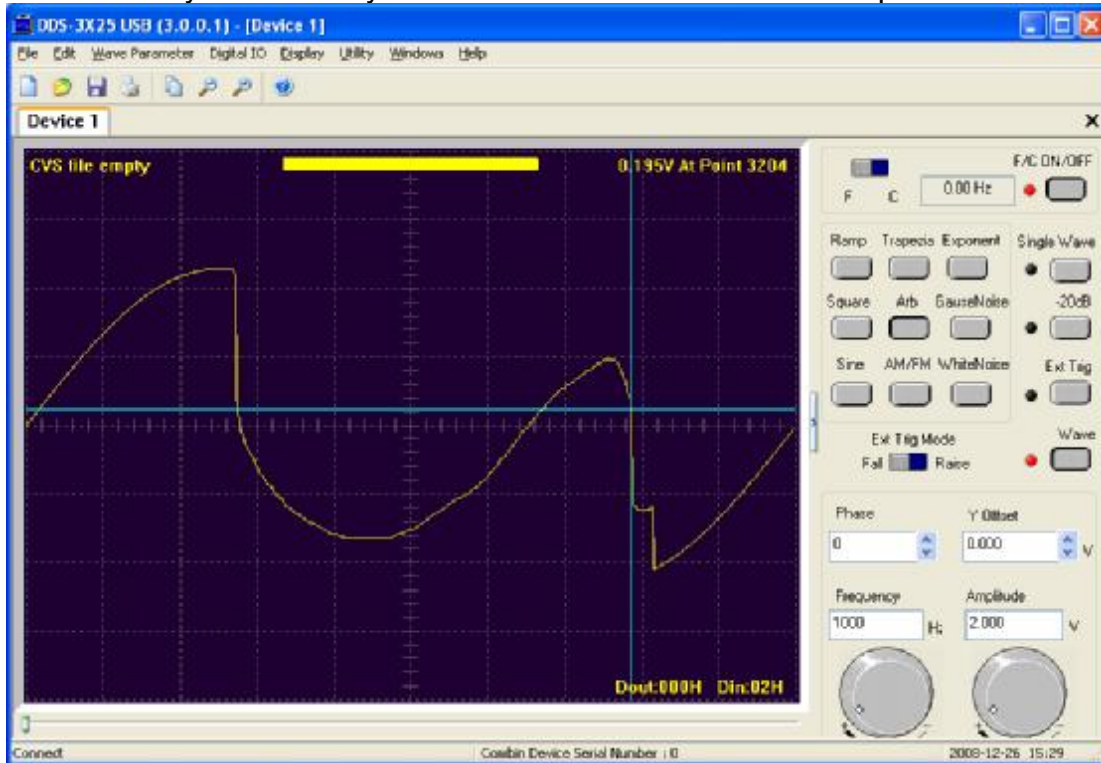
1. Connect wave output pin to Oscilloscope.
2. Connect the USB probe to PC.
3. Select “Start”->”All programs”->”DDS-3X25 USB”->”DDS-3X25 USB” to open the interface.
4. Then you can see a 1 KHz, 2 V max, sine waveform on Oscilloscope.



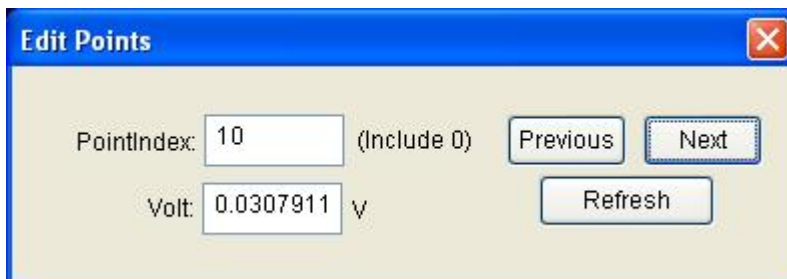
Generate Arbitrary Waveform

To generate a arbitrary waveform, please do these steps as follows:

1. Open the software.
2. Choose the “Arb” waveform in the right control panel.
3. Move your mouse to the waveform screen.
4. Press the mouse left button and move, draw your own waveform.
5. Then you can see your own waveform in the oscilloscope.



6. Click “Edit”->”Edit Points”, you can change the voltage of each point.
7. Click “Edit”->”Zoom In” or “Zoom Out”, you can zoom in or out the waveform screen.



Combine Devices

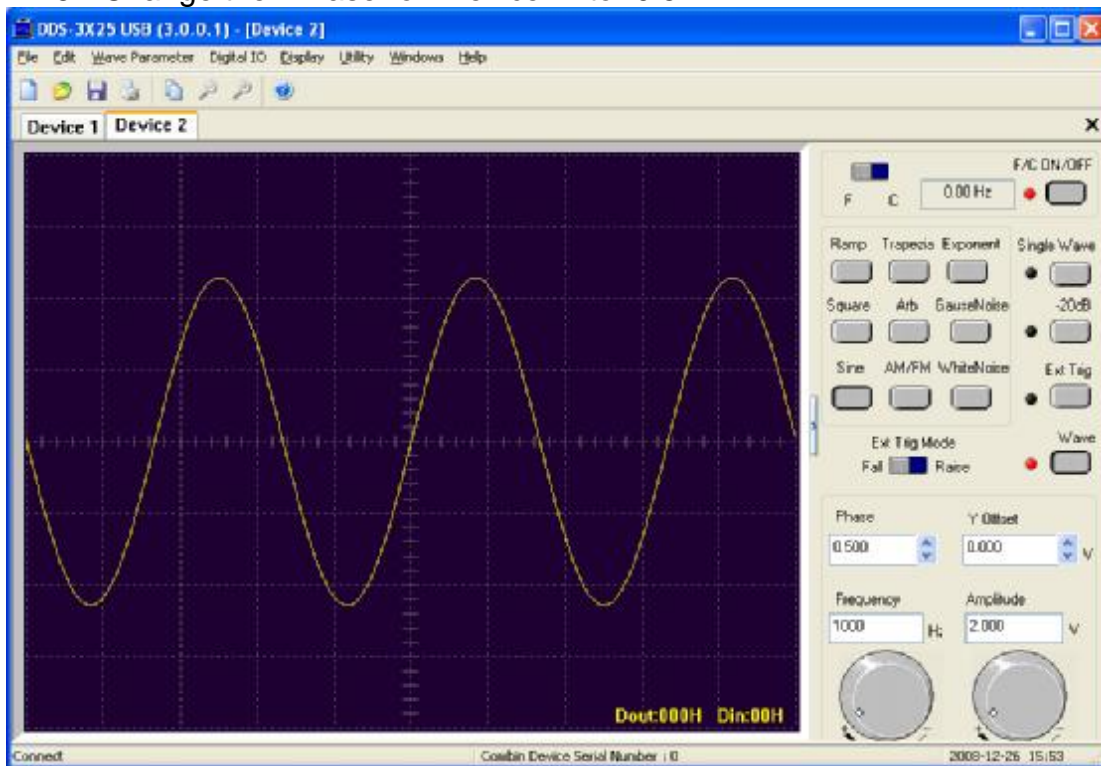
To generate the combine device waveforms, please do these steps as follows:

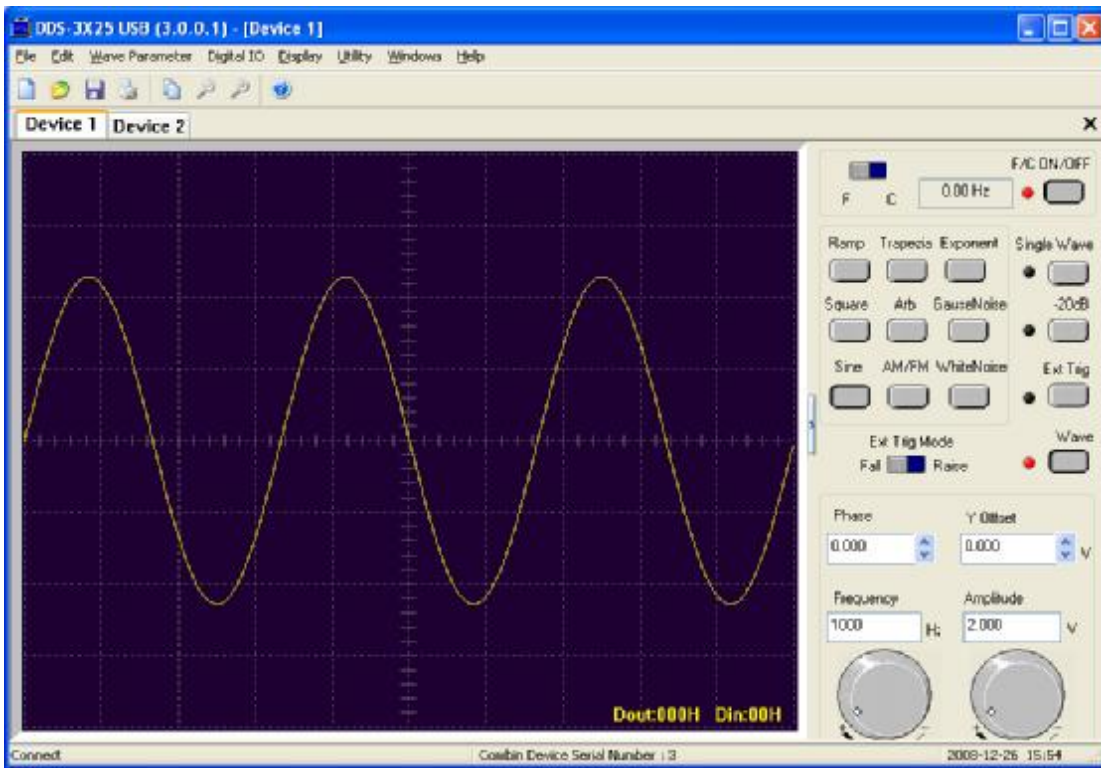
For example, we have two devices.

1. Connect them USB by the cable. (Caution: You must connect one device to the main interface of cable!).

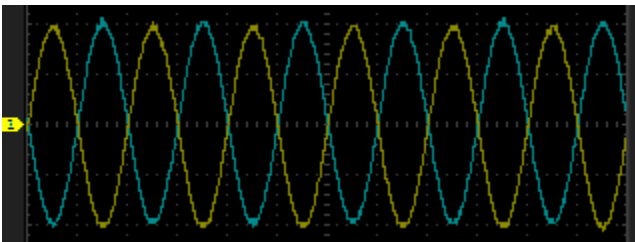


2. Connect them to Oscilloscope.
3. Connect them to PC.
4. Open the two devices by software.
5. You can see the device serial number in the status.
6. Change the "Phase" of "Device 2" to "0.5".





7. Then you can see the waveform as following on oscilloscope.



Appendix

- u Hardware specification
- u Cleaning and Maintenance

Hardware Specification

Waveform Output Channel	
Frequency Range	1Hz(DC)~25MHz
Frequency Resolution	1‰
DAC Clock	2K~200MHz adjustable
Channels	1CH waveform output
Memory Depth	4KSa
Vertical Resolution	12 Bits
Stability	<30ppm
Amplitude	±3.5V Max.
Output Impedance	50 Ω
Output Current	50mA I _{peak} =50mA
System BW	10M
Harmonic Wave distortion	50dBc(1KHz)
Frequency Counter Channel	
Range	DC~25MHz
Input Amplitude	400mVpp~18Vpp
Coupling Mode	DC
Accuracy	±Time Base Error ±1 Count
Input Impedance	> 100KΩ
Digital Input and Output	
12 Bits Output 6 Bit Input	12 Bits Digital Generator and GO 6Bit GI
Level	LVC MOS
Working Environment	
Working Temperature	0~70 Centigrade
Working Humidity	0~95%
Weight	0.5Kg

Cleaning and maintenance

Cleaning

In order to maintain the cleanliness of equipment, you need to check whether the channels are dusty or not. Please clean the out surface of the equipment follow these matters.

1. Use velvet cloth contact the surface of the equipment.
2. Please do not use any corrosive or chemistry.

Caution: Please make sure the equipment is dry enough before going to work. Avoid mangling the equipment or hurting body because of water!

Maintenance

Don't put the equipment under the sun for a long time. Put it in wind to the best of one's abilities

Caution: In order to not mangle the equipment, you should not put it in fog, water or impregnate.