

# **OPERATING MANUAL**

## **UDB100xS Series Direct Digital Synthesis (DDS) Signal Generator**

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Hangzhou Junce Instrument Co., Ltd.

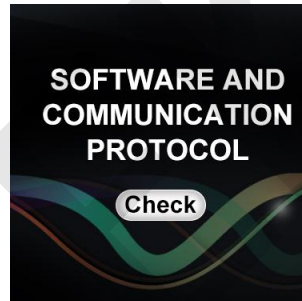
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# 1. Contact

Web: [www.junteks.com](http://www.junteks.com)

Software and communication protocol download links:



# 2. Inspecting Package Contents

When you get a new UDB100xS series DDS Signal Generator, please inspect the instrument as follows:

## 2.1 Check if there is damage due to transportation

If the package is damaged, please retain them until the instrument and accessories are tested.

## 2.2 Check package contents

Contents of the case are as bellows, if the content does not match with the packing list or the instrument is damaged, please contact us.

	UDB100xS series DDS Signal Generator	1pc
Accessories:	DC 5V adapter	1pc
	User manual(pdf)	1pc
Optional:	The dedicate data line connect signal source or power to the computer	1pc

## 2.3 Check the machine

If the machine was damaged; did not work properly or failed to pass performance tests, please contact your dealer or our company.

## 3. Summary

### 3.1 Brief introduction

UDB100xS series is based on direct digital synthesis (DDS) technology, using FPGA design. It is easy to use and has high signal stability. The meter has both TTL output and external frequency measurement functions, able to adjust the amplitude and DC bias of the output signal. UDB100xS series has sweep function, it can be arbitrarily set to scan the frequency range and scan time. Suitable for laboratory, engineering technicians and enthusiasts.

### 3.2 Main function

- 1.Signal aspects: The meter is able to generate sine, square, triangle and sawtooth;
- 2.Measurement: The meter has the frequency measurement and counting functions;
- 3.Scan aspects: It has scanning capability and can achieve frequency sweep with an arbitrary start and end point.
- 4.Storage and Recall function: With 10sets (M0~M9) parameter storage locations, data of M0 can be loaded as power on.

### 3.3 Technical data

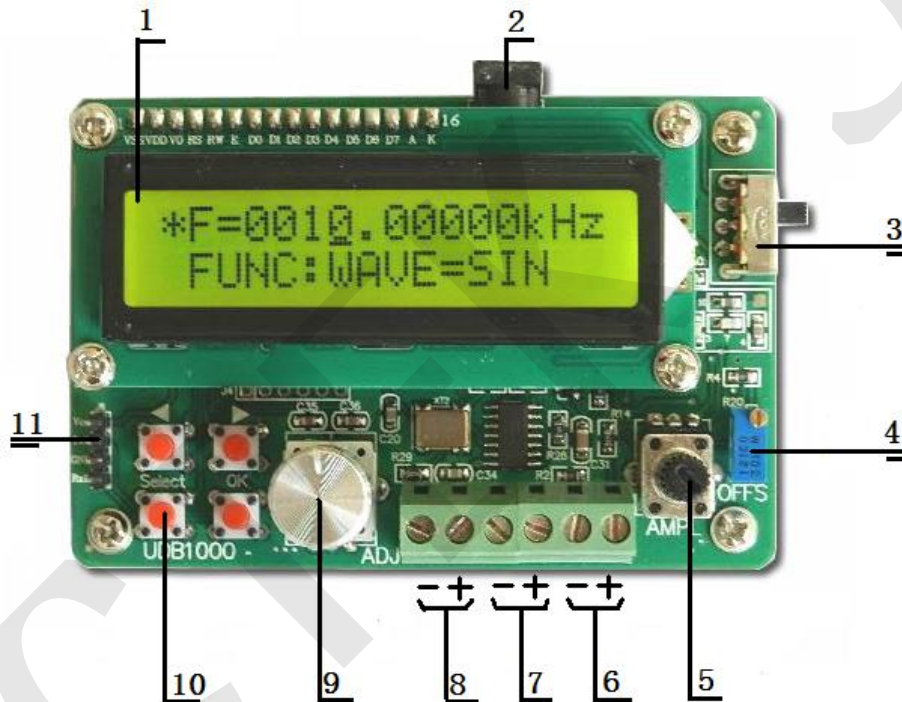
	Item	Parameter
Output	Waveform	sine, square, triangle and sawtooth
	Output amplitude	$\geq 9V_{p-p}$ (No load)
	Output Impedance	$50\Omega \pm 10\%$
	DC bias	$\pm 2.5V$
	Frequency Range	0.01Hz~2MHz(UDB1002S) 0.01Hz~5MHz(UDB1005S) 0.01Hz~8MHz(UDB1008S)
	Frequency resolution	0.01Hz
	Frequency stability	$\pm 1 \times 10^{-6}$
	Frequency error	$\pm 5 \times 10^{-6}$
	Distortion of sine Wave	$\leq 0.8\%$ (Reference frequency:1kHz)

	Linearity of triangle wave	≥98% (0.01Hz~10kHz)
	Rise or fall time of square wave	≤100ns
	Duty cycle range of square wave	1%~99%
<b>TTL</b>	Frequency Range	0.01Hz~2MHz(UDB1002S) 0.01Hz~5MHz(UDB1005S) 0.01Hz~8MHz(UDB1008S)
	Amplitude	>3Vp-p
	Fanout factor	>20 TTL Load
<b>Measurement</b>	Counting range	0-4294967295
	Frequency range	1Hz~60MHz
	Input amplitude	0.5Vp-p~20Vp-p
<b>Sweep</b>	Range	$f_{M1} \sim f_{M2}$
	Amplitude	0.5Vp-p~20Vp-p
<b>Save</b>	Quantity	10
	Location	M0~M9
<b>Power supply</b>	DC	5V
<b>Dimensions</b>	W*H*D	130×102×85mm
<b>Weight</b>	Host	260g

3-1 Technical data

## 4. Instrument Introduction

### 4.1 Structure Description



Item	Introduction	Item	Introduction
1	1602LCD	7	Ext.In Input terminal
2	DC5V Power supply interface	8	TTL Output
3	Power switch	9	Knob
4	Bias adjustment potentiometer	10	Button
5	Amplitude adjustment potentiometer	11	Communication Interface
6	Output terminal		

4-1 The introduction of UDB100xS

## 4.2 Button Description

Item	Introduction
◀	Move the cursor left or select adjustment items
▶	Move the cursor right or select adjustment items
SELECT	The select button, it can switch between the up and down lines, which "*" indicates that the contents of this line can be modified.
OK	The "OK" button can switch the range of frequency

	when the "*"is in the first line ,and when the "*"is in the first line, the "OK" button can switch the waveform.
ADJ	Adjust the frequency
OFFS	Adjust the bias
AMP	Adjust the range

4-2 The introduction of button

## 5. Operation

### 5.1 Power On

5.1.1 Plug 5V adapter, UDB100xS series can be powered by a USB interface and 5V power adapter.

5.1.2 Switch on.

### 5.2 Operation

#### 5.2.1 Set Waveform

UDB100xS series can issue three types of waves, they are sine , square and triangular. If you want to switch the waveform, you can press the "Select" button, the "\*" will switch to the second line, and then press the "OK" button to switch waveforms. "SIN": sine wave, "TRI": triangle wave, "SQR": square wave.

When the output is sine wave, the screen will display:

**F=0010.00000kHz**  
**\*FUNC:WAVE=SIN**

When the output is square wave, the screen will display:

**F=0010.00000kHz**  
**\*FUNC:WAVE=TRI**

When the output is triangular wave, the screen will display:

**F=0010.00000kHz**  
**\*FUNC:WAVE=SQR**

#### 5.2.2 Set Frequency

When setting the frequency, a cursor appears and then pressing ◀ and ▶ which can move the cursor. Rotate the knob to adjust, as shown below.

**\*F=0010.00000kHz**  
**FUNC:WAVE=SIN**

At this time, the step frequency is 0.01kHz.

When the "\*" is in the first line, press the "OK" button to switch the unit of frequency(Hz, kHz and MHz), as shown below.

**\*F=0010000.00 Hz**  
**FUNC:WAVE=SIN**

Frequency unit becomes: Hz.

**\*F=0.01000000MHz**  
**FUNC:WAVE=SIN**

Frequency unit becomes: MHz.

### 5.2.3 Set the duty cycle

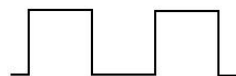
Press the "Select" button, the "\*" will transfer to the second line and then press the ▶ button, there will be:

**F=0010.00000kHz**  
**\*FUNC:DUTY=50%**

That has entered the set duty cycle interface. At this time rotary the encoder can adjust the duty cycle. It should be noted that this setting is only valid for triangle and square wave except sine wave.

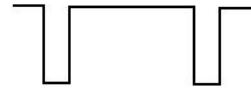
The duty cycle of square wave can be adjusted between 1%~99%, as shown below:

**F=0010.00000kHz**  
**\*FUNC:DUTY=50%**



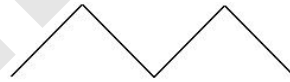


**F=0010.00000kHz**  
**\*FUNC:DUTY=80%**

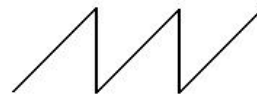


There are three cases of the duty cycle of the triangular wave, when the duty cycle is 50%, it is a standard triangular wave, when the duty cycle is greater than 50%, it is a rising saw tooth, when the duty cycle is less than 50%, it is a falling saw tooth. As shown below.

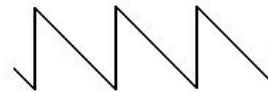
**F=0010.00000kHz**  
**\*FUNC:DUTY=50%**




**F=0010.00000kHz**  
**\*FUNC:DUTY=51%**



**F=0010.00000kHz**  
**\*FUNC:DUTY=49%**




#### 5.2.4 Counter

Press the "Select" button, the "\*" will transfers to the second line and then press the  button and transfers to the counting function(FUNC:COUNT). The pulse can be entered from the Ext.In input terminal and the screen will display the count value. You can press the "OK"button to clear the count value and re-count.


**CNTR=1246**  
**\*FUNC:COUNTER**

#### 5.2.5 Function of external frequency measurement

Press the "Select" button, the "\*" will transfers to the second line and then press the  button and transfers to the function of external frequency measurement (FUNC:EXT.FREQ. It can measure the frequency of signal from the Ext.In input terminal.

**ExtF=9.998kHz**  
**\*FUNC:EXT.FREQ**


#### 5.2.6 Save

Press the "Select" button, the "\*" will transfers to the second line and then press the  button and transfers to the function of save(FUNC:SAVE). The save function can store the current frequency value、 waveform and duty cycle in the internal memory. There are ten storage locations inside the machine for saving user's settings, they are M0 to M9, by adjusting the encoder you can select which location to save. After selecting the storage location, press the "OK" button to save. The "OK" appears in the lower right conner of the screen means that the storage was successful.


**F=0012.32000kHz**  
**\*FUNC:SAVE=0**  
**F=0012.32000kHz**  
**\*FUNC:SAVE=0 OK**

If you store the current settings to position M0, the machine can load parameter of M0 automatically at boot time. In addition, M1 and M2 has a special significance, M1 represents the starting frequency, M2 representatives the stop frequency. If you need to use the sweep function, you need to set the value of M1 and M2 in advance, and ensure  $f_{M2} > f_{M1}$  .

#### 5.2.7 Load

Press the "Select" button, the "\*" will transfers to the second line and then press the  button and transfers to the function of load(FUNC:LOAD). The specific operations is similar to "Save"function, we will not repeat.

#### 5.2.8 Sweep

Press the "Select" button, the "\*" will transfers to the second line and then press the  button and transfers to the function of sweep(FUNC:SWEEP). The default setting of "Sweep "is stop. If you need to start scanning, press the "OK" button, and the frequency of output signal will change from  $f_{M1}$  to  $f_{M2}$  continuously.

#### 5.2.9 TTL

The TTL output port of the meter can export TTL waveform with the same frequency synchronously.

#### 5.2.10 PC control

PC can control UDB1002S, UDB1005S and UDB1008S.

## 6. Cautions

6.1 Make sure the input power adapter correctly, the machine uses DC5V power adapter;

6.2 Operating temperature is from -10 to 50 degrees Celsius, and storage temperature is from -20 to 70 degrees Celsius; make sure the instrument kept dry.

6.3 Do not attempt to disassemble the instrument, destroying the package will void the warranty, this instrument has no user-serviceable parts inside, if it need to be repaired, you can repair it by specifying outlets, or return to the factory for repair.

6.4 Do not move the instrument violently as it is working to avoid irreparable damage to the internal circuitry.

## 7. Warranty and service

Thank you for purchasing our products. To maximize the use of the new product features, we recommend that you take the following steps:

- 1 Read safe and efficient use instruction.
- 2 Read the warranty terms and conditions.

We warrants to the original purchaser that its product and the component parts thereof will be free from defects in workmanship and materials for a period of one year from the data of purchase.

We will repair or replace, at its' option, defective product or component parts. Returned product must be accompanied by proof of the purchase date.

Exclusions: This warranty does not apply in the event of misuse or abuse of product or as a result of unauthorized alternations or reapers. It is void if the serial number is alternated, defaced or removed.