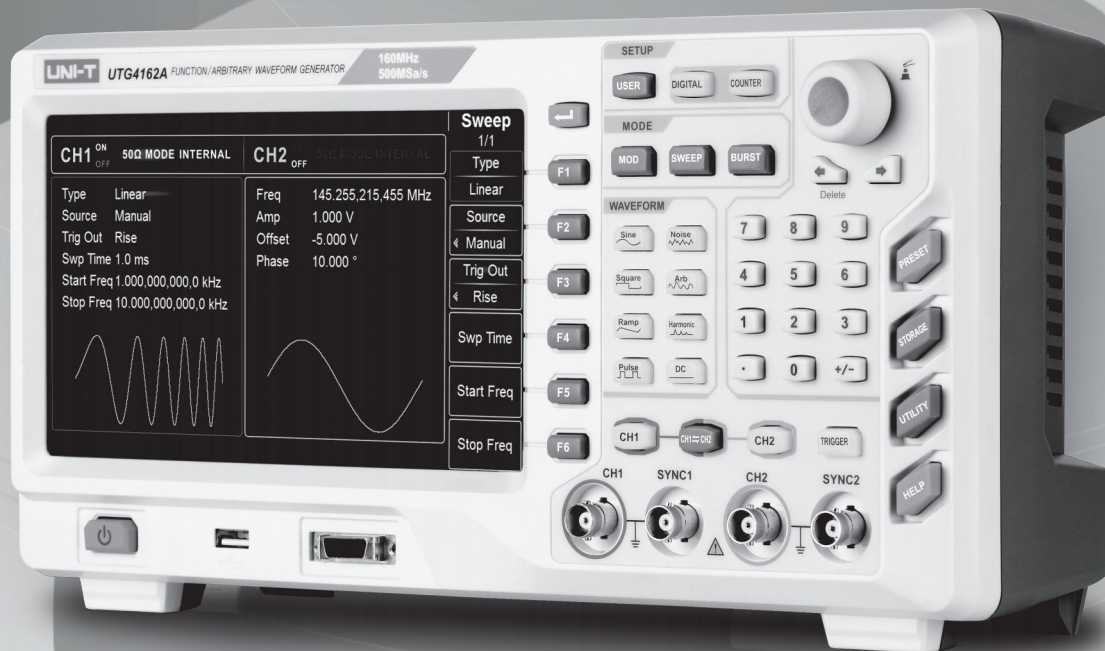


# UNI-T®

## UTG4000A

### Quick Guide



**Function/Arbitrary  
Waveform Generator**

# Introduction

Dear Users:

Hello! Thank you for choosing this brand new UNI-T device. In order to safely and correctly use this instrument, please read this manual thoroughly, especially the Safety Notes part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

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## Document Version

UTG4000A-20160618-EN-V1.2

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- Information in this manual supercedes all previously published versions.

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If the product is proved to be defective within the warranty period, UNI-T reserves the rights to either repair the defective product without charging of parts and labor, or exchange the defected product to a working equivalent product. Replacement parts and products may be brand new, or perform at the same specifications as brand new products. All replacement parts, modules, and products become the property of UNI-T.

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- b) Any repair damage caused by improper use or connection to an incompatible device.
- c) Any damage or malfunction caused by the use of a power source which does not conform to the requirements of this manual.
- d) Any maintenance on altered or integrated products (if such alteration or integration leads to an increase in time or difficulty of product maintenance).

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# Chapter 1 Safety Information

## 1.1 Safety Terms and Symbols

The following terms may appear in this quick guide:

Warning: The conditions and behaviors may endanger life.

Caution: The conditions and behaviors may cause damage to the product and other properties.

The following terms may appear on the product:

Danger: Performing this operation may cause immediate damage to the operator.

Warning: This operation may cause potential damage to the operator.

Caution: This operation may cause damage to the product and devices connected to the product.

The following symbols may appear on the product:

 AC Electricity

 Measurement ground terminal

 Housing ground terminal


 ON/OFF


 High voltage hazard

 Caution: please refer to the manual

 Protective ground terminal

 CE is registered trademark of EU

 C-tick is registered trademark of Spectrum Management Agency of Australia.  
N10149 It indicates conformity with provisions of Australian EMC Framework formulated according to terms of Wireless Communication Act in 1992.

 Containing at least one of six harmful substances that exceed maximum concentration value (MCV) and environment-friendly usage period (EPUP) of 40 years.

## 1.2 General Safety Overview

This instrument is designed and produced in strict accordance with GB4793 Safety Requirements for Electronic Measuring Apparatus and IEC61010-1 safety standard, up to insulation and overvoltage standard CAT II 300V and safety standard for level-II pollution.

Please read the following preventive safety measures:

- In order to prevent electric shock or fire, please use power line and adapter dedicated to this product and approved by the country.
- This product is grounded through protective ground lead in the power line. In order to prevent electric shock, please check whether the power socket to be used for the product is grounded. Please ensure that the protective ground terminal of the product is reliably connected to the ground terminal of power line before connecting any input or output terminal other than power line.
- To avoid personal injury and prevent damage to the product or any product connected to the product. In order to avoid possible danger, the product can only be used in the specified scope. Only personnel that have received professional training can execute maintenance procedures.
- In order to prevent fire or electric shock, please pay attention to all rated values and signs of the product. Please read the user manual to further understand information about rated value.
  - Don't use input voltage above rated value of the instrument.
  - Inspect whether accessories suffer from mechanical damage before use. If so, please replace them.
  - Only accessories provided for the product can be used. Please don't use accessories that are damaged.
  - Don't insert metal objects into input or output terminal of the product.
  - If you suspect the product is damaged, please ask qualified maintenance personnel for inspection.
  - Please don't put the product into operation when crate is opened.
  - Please don't operate in humid environment.
  - Please don't operate in inflammable and explosive environment.
  - Keep the surface of product clean and dry.

## Chapter 2 Quick Start

### 2.1 General Inspection

When you get a new function/arbitrary waveform generator, you are advised to inspect the instrument according to the following steps.

#### 2.1.1 Inspect Whether Damage is Caused by Transportation

If the packaging box or foamed plastic supplementary mat is seriously damaged, please contact with dealer of the product or local office.

If the instrument is damaged during transportation, please keep the package, and notify transportation department and dealer of the product, who will arrange repair or replacement.

#### 2.1.2 Inspect Accessories

UTG4000A accessories include power line (applicable to the destination country/region), a USB data transmission line, two BNC cables (1m), a user CD and a product warranty card.

In case of lack or damage of accessories, please contact with dealer of the product or local office.

#### 2.1.3 Inspect Complete Machine

If appearance of the instrument is damaged, the instrument runs abnormally or fails to pass performance test, please contact with dealer of the product or local office.

### 2.2.1 Introduction of Panels and Keys

#### 2.2.2 Front Panel

Function/arbitrary waveform generator of UTG4000A series provides users with simple and intuitive front panel that is easy to operate, which is shown in figure 2-1 below:



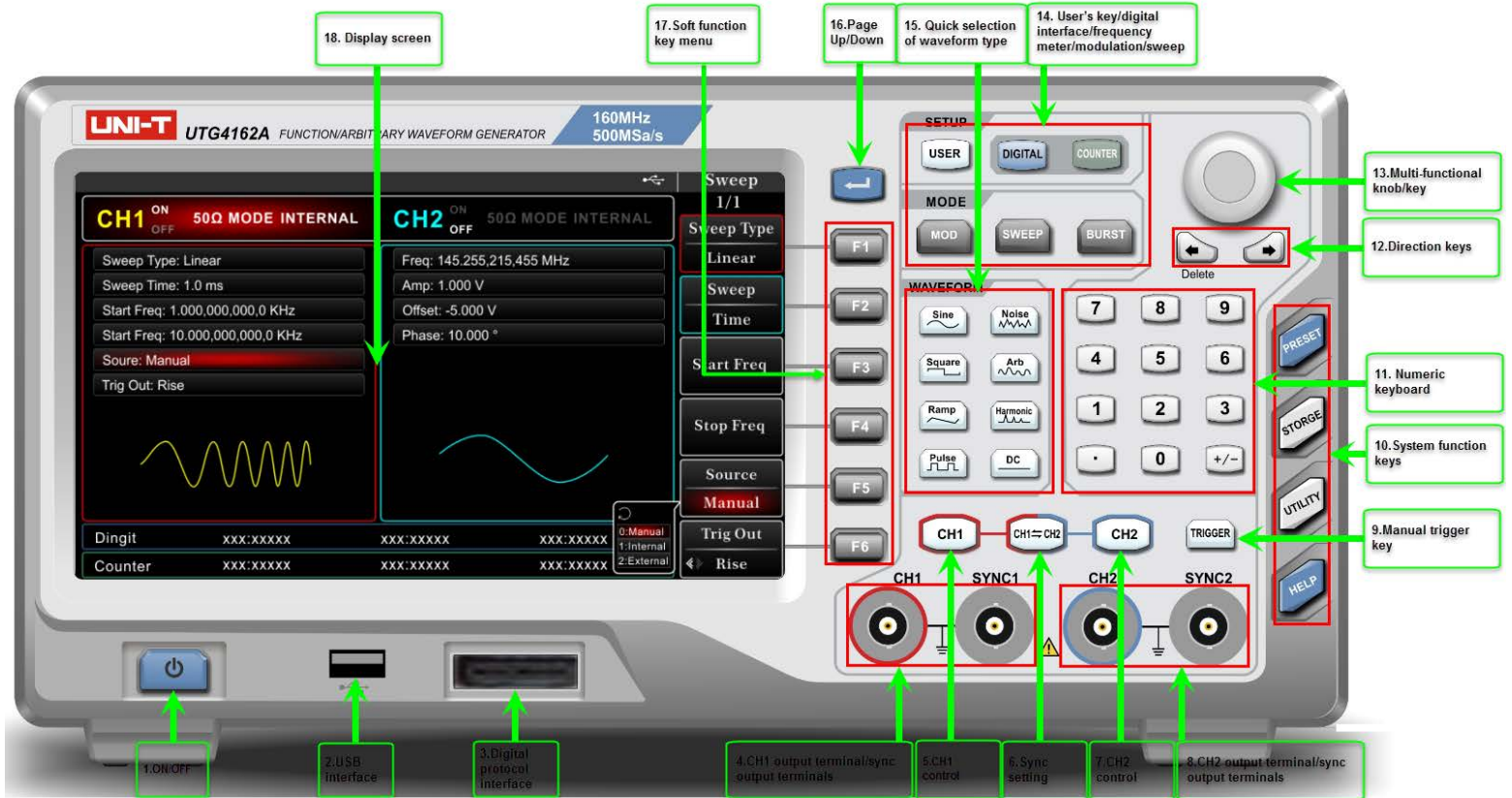


Figure 2-1 Structure of front panel

## 2.2.3 Function Interface

Function interface is shown in Figure 2-2:

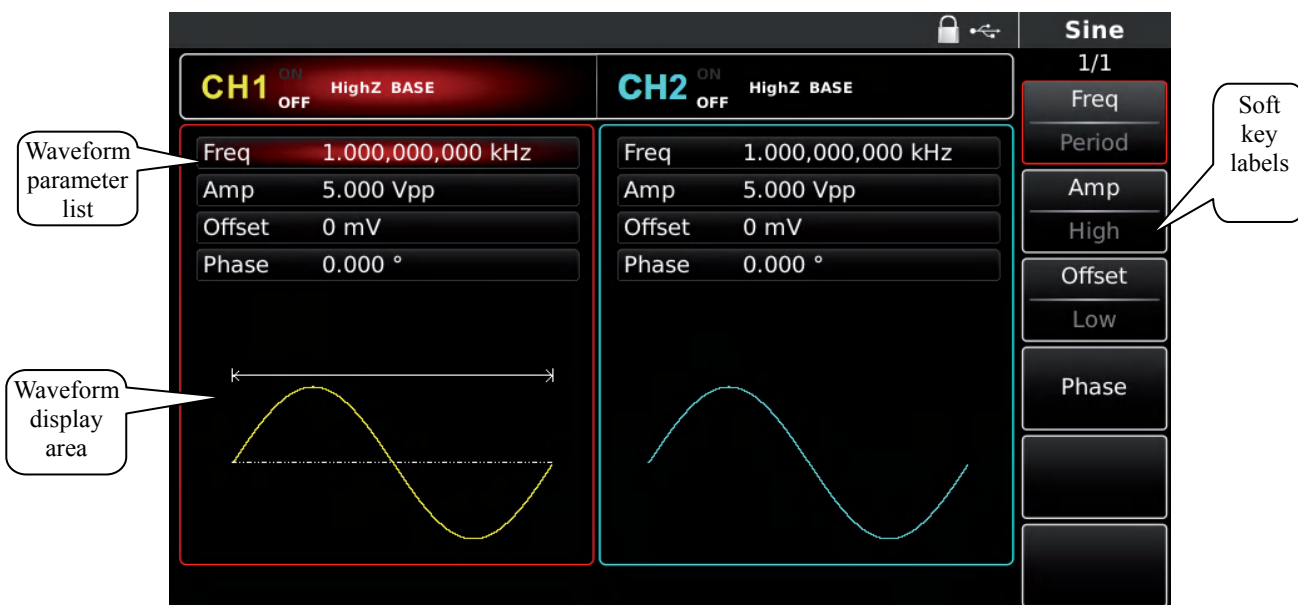


Figure 2- 2 Function interface

## 2.2.4 Back Panel

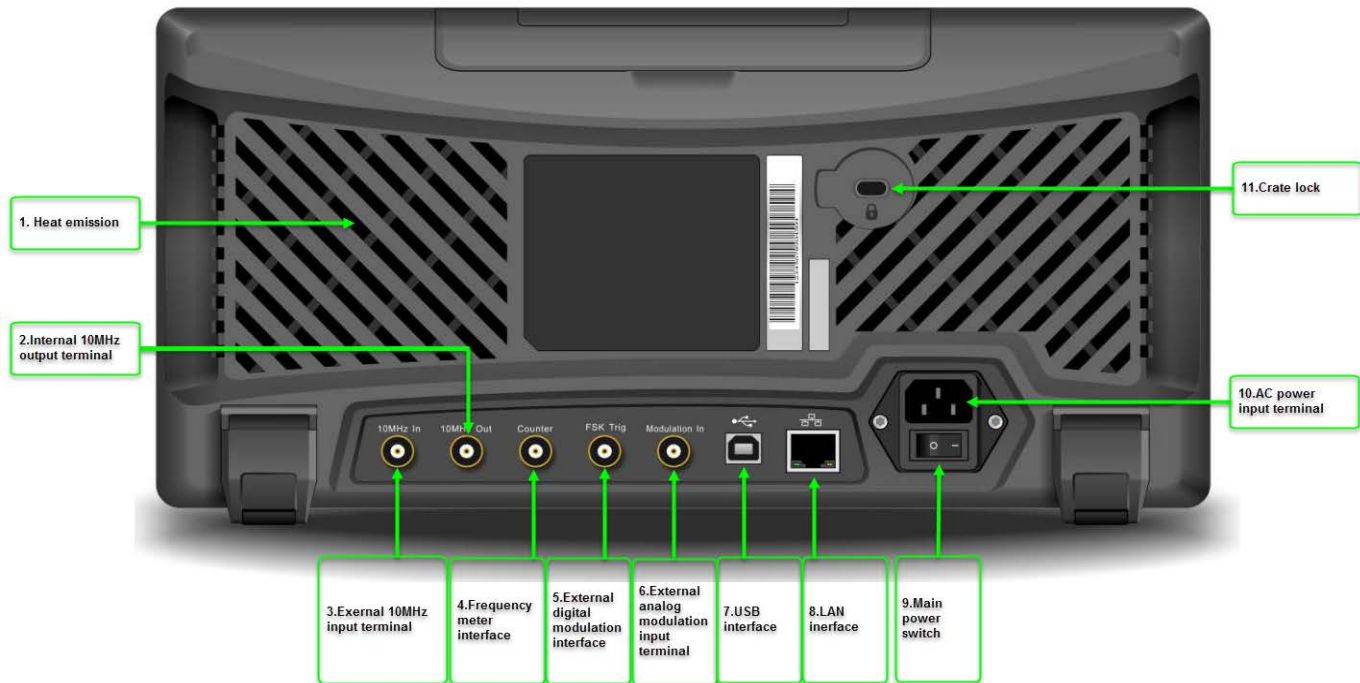


Figure 2-3 Structure of back panel

### 2.3.1 Output Basic Waveform

### 2.3.2 Set Output Frequency

The default configuration of waveform is a sine wave with frequency of 1kHz and peak-to-peak amplitude of 100mV (terminating at 50Ω) when powering on. One example for changing frequency into 2.5MHz are as follows:

1. Press function key **F1**, when outline border in the display area is the color of corresponding channel, and “Freq” character is white, “Period” tag is gray. If the current frequency value is valid, the same frequency is used. Please press function key **F1** again to change to the set waveform period, when “Freq” character turns gray, “Period” character is highlighted, and frequency and period can be switched.

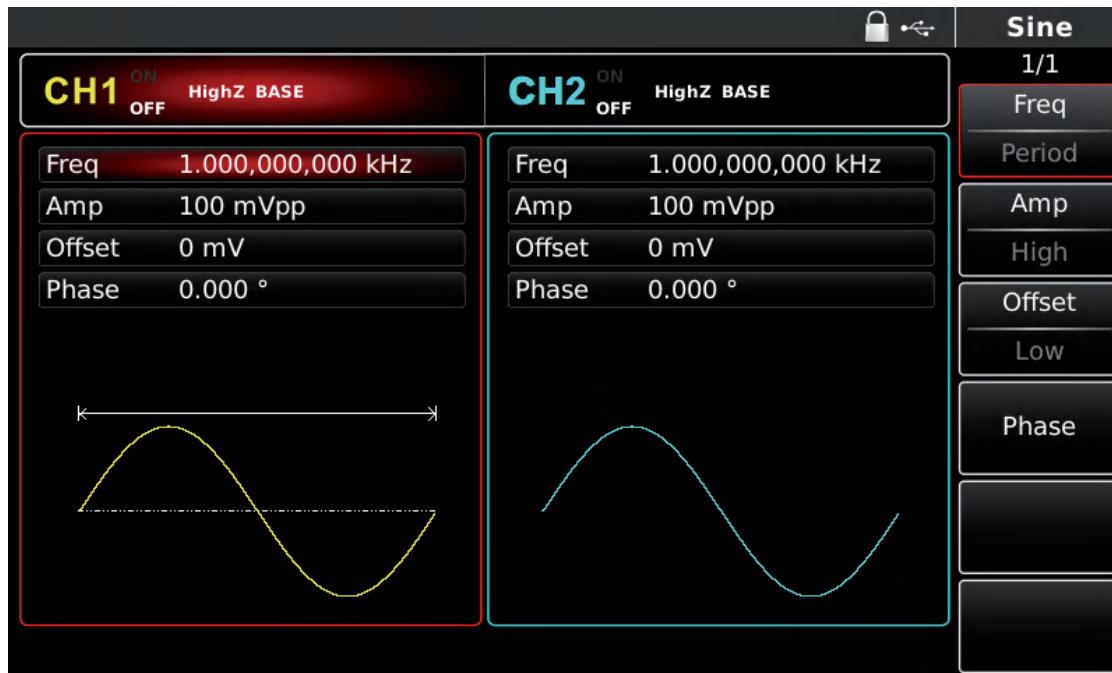


Figure 2- 4 Setting of selected frequency

2. Input the required number 2.5 with numeric keyboard. The left direction key can be used as backspace during input.

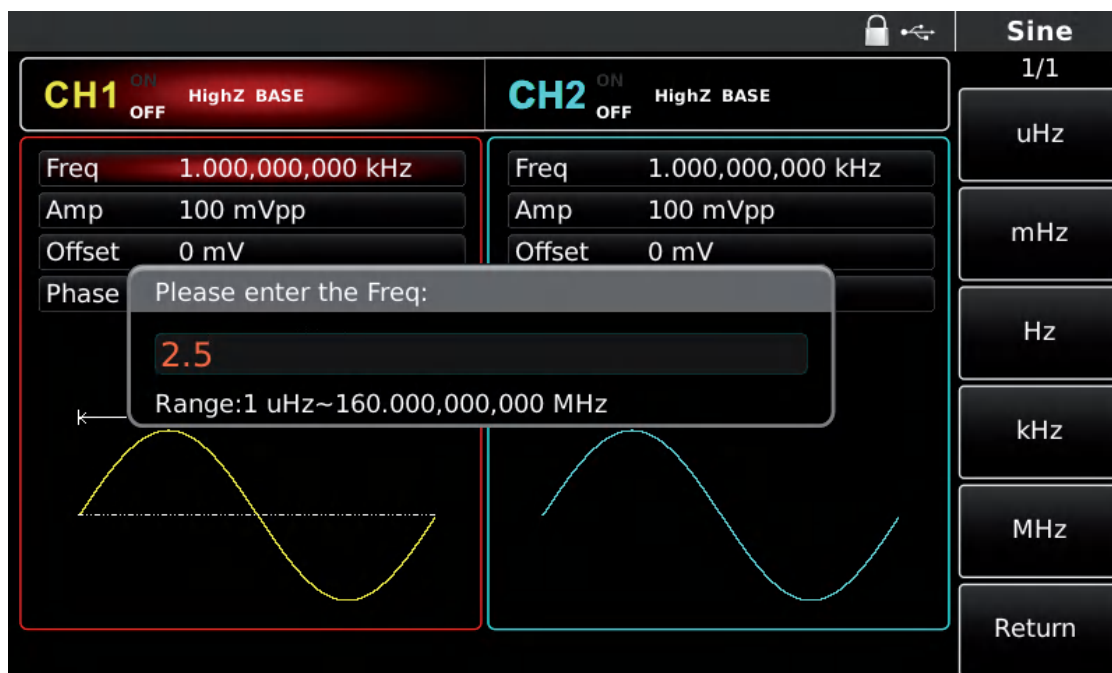


Figure 2- 5 Set frequency

### 3. Select required unit

Press soft key of corresponding unit. The waveform generator outputs waveform with the displayed frequency when you select unit (if output has been used). In this example, press soft key corresponding to MHz.

#### 4. Use multi-functional knob and direction key for parameter setting

In default state, rotate multi-functional knob to switch between multiple soft keys of function menu. When setting some parameter, press the multi-functional knob to select a bit of the parameter after selecting the corresponding parameter, when the parameter bit is highlighted in blue. Rotate the multi-functional knob to adjust the number. Press left or right direction key to select different bits. Press the multi-functional knob again after setting to exit from parameter editing.

### 2.3.3 Set Output Amplitude

The default configuration of waveform is a sine wave with peak-to-peak amplitude of 100mV (terminating at 50Ω) when powering on. The specific steps for changing amplitude into 300mVpp are as follows:

1. Press function key **F2**, when outline border of corresponding part in the display area is the color of corresponding channel, and character “Amp” is white, tag “High” is gray. If the current amplitude value is valid when changing amplitude, the same amplitude is used. Press function key **F2** again to quickly switch between units Vpp, Vrms, and dBm.

2. Input requires amplitude value 300 with numeric keyboard.

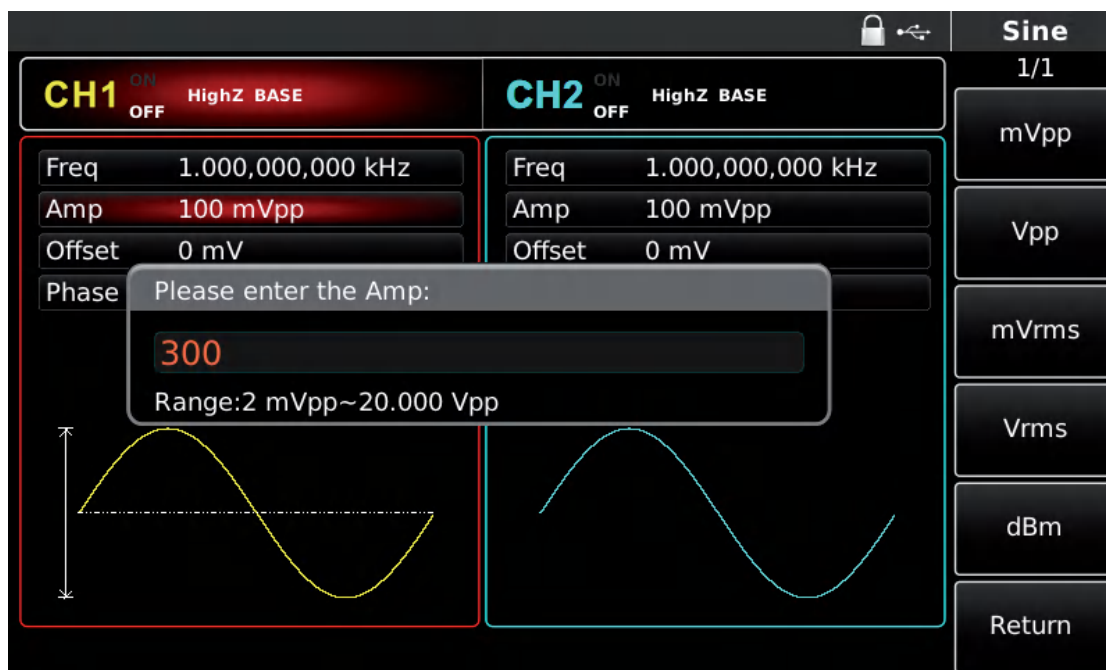


Figure 2- 6 Set amplitude

3. Select required unit

Press soft key of corresponding unit. The waveform generator outputs waveform with the displayed amplitude when you select unit (if output has been used). Press mVpp in this example.

Note: this parameter can also be set with multi-functional knob and direction keys.

### 2.3.4 Set DC Offset Voltage

The default configuration of waveform is a sine wave with DC offset voltage of 0V (terminating at 50Ω) when powering on. The specific steps for changing DC offset voltage into -150mV are as follows:

1. Press function key **F3**, when outline border of corresponding part in the display area is the color of corresponding channel. If the current DC offset value is valid when changing DC offset, the same DC offset value is used. Press function key **F3** again and you will find that the waveform of parameter described with amplitude and DC offset has been described with high level (maximum value) and low level (minimum value). Such method for setting signal limit is very convenient for digital application.

2. Input required DC offset value -150mV with numeric keyboard.

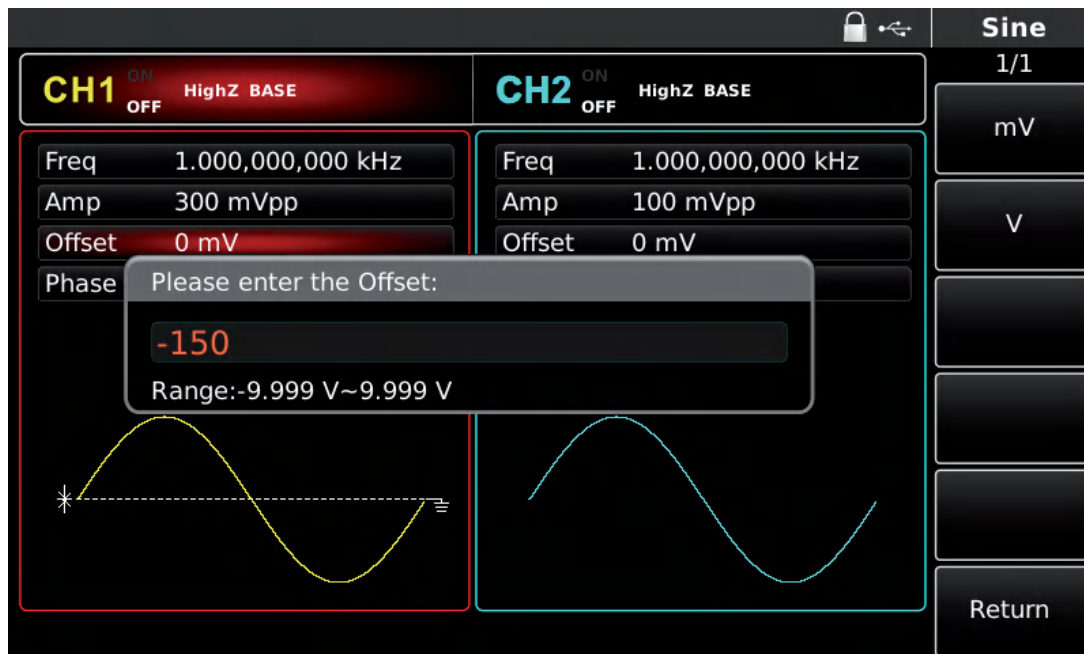


Figure 2- 7 Set offset voltage

3. Select required unit

Press soft key of corresponding unit. The waveform generator outputs waveform with the displayed DC offset when you select unit (if output has been used). Press mV in this example.

Note: this parameter can also be set with multi-functional knob and direction key.

### 2.3.5 Set Pulse Wave

The duty ratio of pulse wave represents time quantum from the 50% threshold value of rising edge of the pulse to 50% threshold value of the next falling edge in each cycle (suppose waveform is not reversed). You can conduct parameter configuration for UTG4000A function/arbitrary waveform generator to output pulse waveform with variable pulse width and edge time. The default duty ratio of pulse wave is 50% when powering on. Rising/falling edge time of UTG4162A is 5ns (UTG4122A is 6ns/ UTG4082A is 7ns). The specific steps for setting pulse wave with period of 2ms, amplitude of 1.5Vpp, DC offset of 0V, duty ratio (restricted by minimum pulse width specification 10ns) of 25%, rising edge time of 200µs and falling edge time of 200µs are as follows:

Press **Pulse**, **Freq**, **Amp**, **Duty**, **Rise** and **Fall** (if tag is not highlighted, press corresponding soft function key to select), and press soft key **Freq** twice to switch between frequency and period. Input the required value, and then select the unit. When inputting value of duty ratio, input 25 and press **%** to finish input. To set falling edge time, please press **soft** key Page Up/Down or rotate multi-functional knob rightward when sub-tag is selected to display the next screen of sub-tags (the edge of sub-tag “selected” is the color of channel, the sub-tag is “edited” when highlighted, such as white letters on a blue background in the figure below), press soft key **Fall** to input the required value and select the unit.

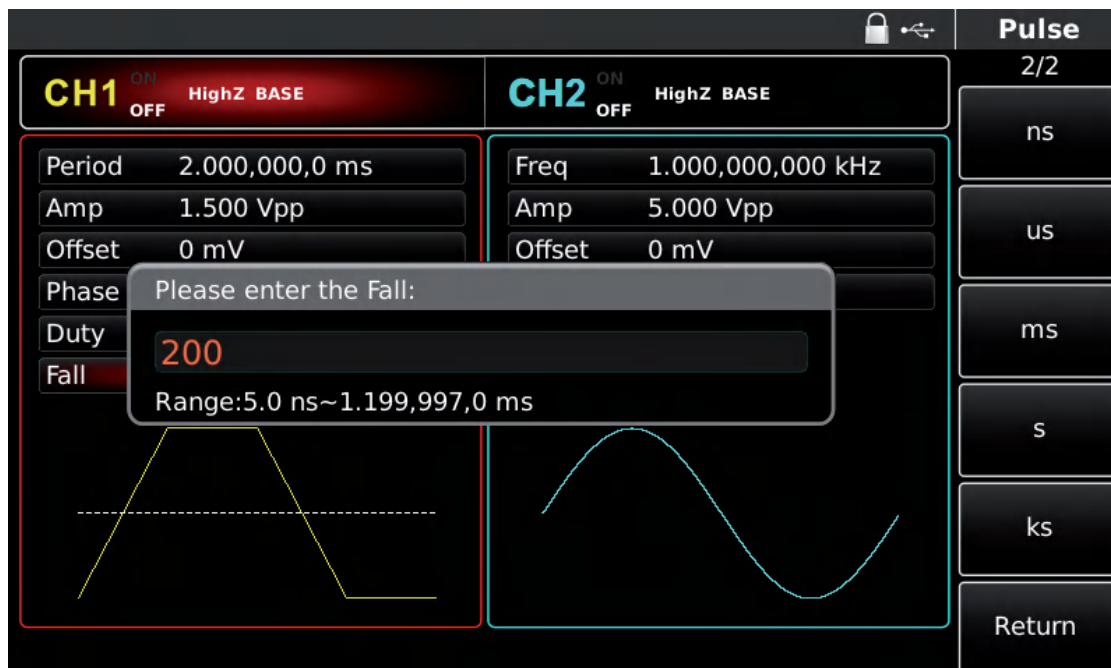


Figure 2- 8 Set falling edge time

Note: this parameter can also be set with multi-functional knob and direction key.

## 2.4 Frequency Measurement

This function/arbitrary waveform generator can measure frequency and duty ratio of compatible TTL level signal. The range of frequency measurement is 100mHz~200MHz. When frequency meter is used, signal of compatible TTL level is input through external frequency meter interface (Counter connector). Then press COUNTER to read “frequency”, “period”, “duty ratio”, “positive pulse width” and “negative pulse width” in parameter list. When no signal is input, the parameter list of frequency meter displays the value measured last time. The frequency meter only refreshes display after signal of compatible TTL level is entered into frequency meter interface (Counter connector).

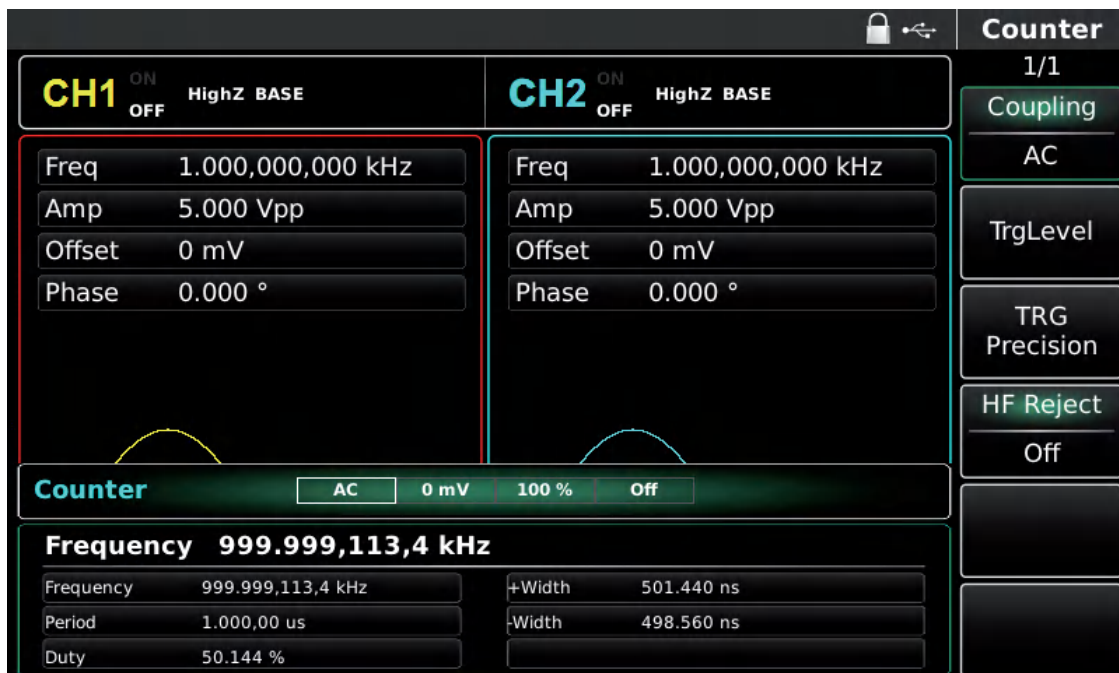


Figure 2-9 Frequency measurement

## Chapter 3 Advanced Applications

### 3.1 Output Modulation Waveform

Select different modulation waveform by pressing the buttons in MODE area of control panel. The followings introduce the relative parameter setting of modulation waveform. Other parameter setting of modulation types are similar with the following.

In amplitude modulation, the modulated waveform generally is composed of carrier wave and modulation wave. The amplitude of carrier wave will vary with that of modulation wave. The modulation mode of the two channels is mutually independent. You can configure same or different modulation mode for channel 1 and 2.

#### Select AM

Press **MOD**, **Type** and **AM** to use AM function (if **Type** is not highlighted, press soft key **Type** to select). After AM function is used, UTG4000A function/arbitrary waveform generator will output modulated waveform with the current modulation waveform and carrier wave.

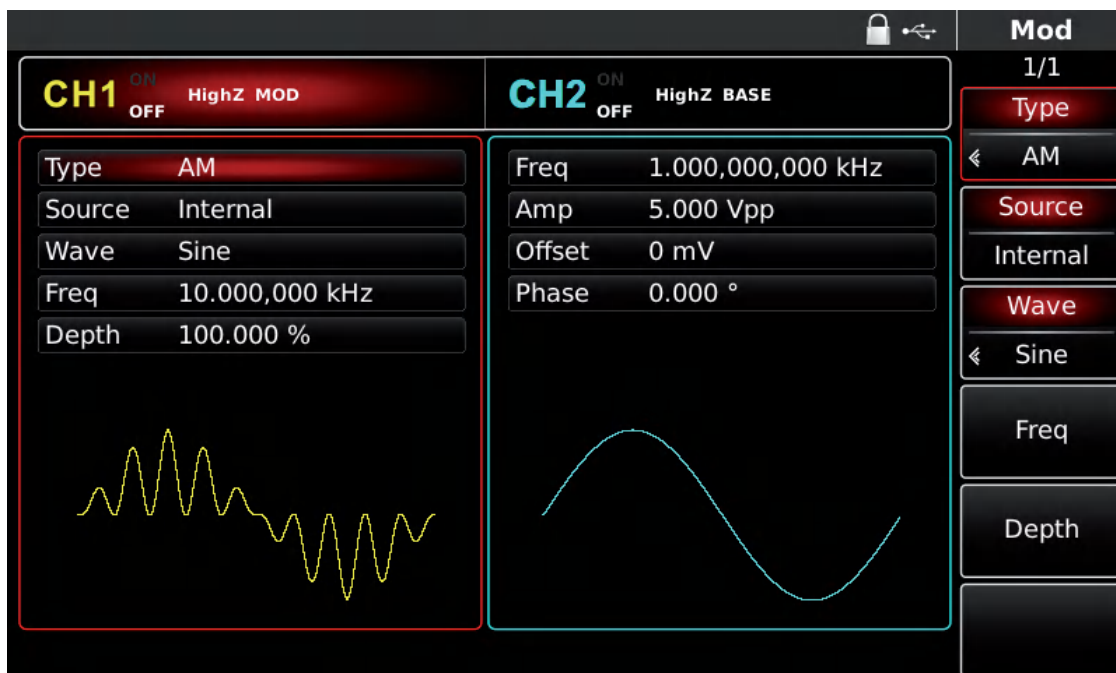


Figure 3-1 Select AM function

#### Select carrier waveform

AM carrier waveform can be sine wave, square wave, oblique wave or arbitrary wave (except DC), and is sine wave by default. After AM is selected, press the key of basic waveform setting to quickly set corresponding carrier waveform.



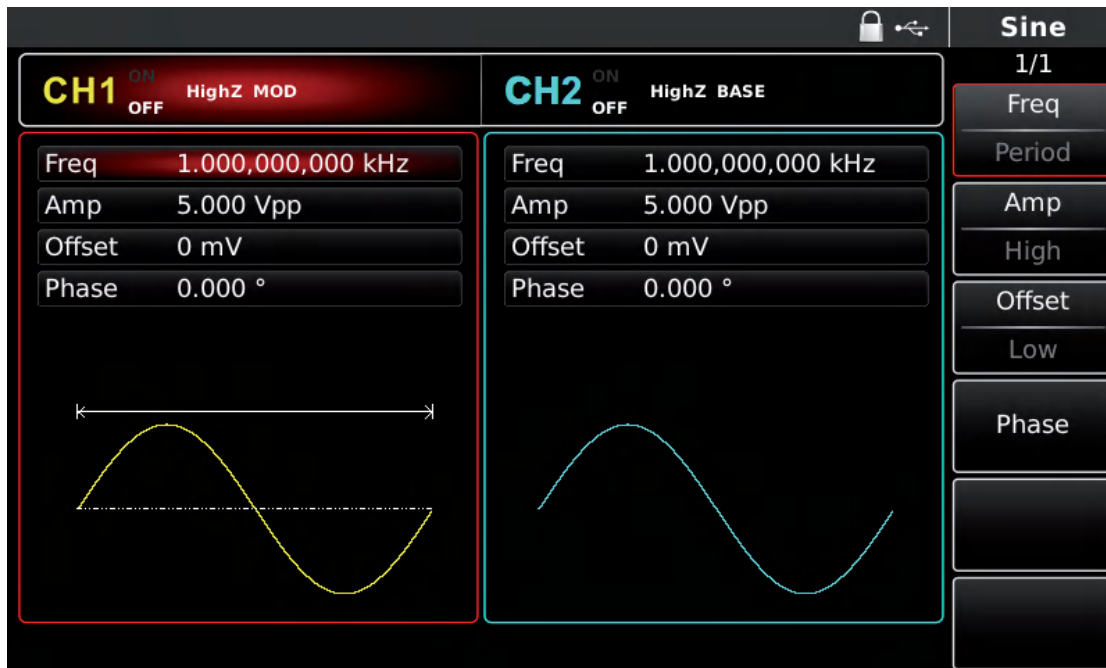


Figure 3-2 Select carrier waveform

### Set carrier frequency

Carrier frequency range varies with carrier waveform. The default frequency of all carrier waves is 1kHz. See the table below for frequency range of carrier wave:

Table 3- 1

Carrier waveform	Frequency		
	UTG4082A	UTG4122A	UTG4162A
Sine wave	1μHz~ 80MHz	1μHz ~ 120MHz	1μHz ~ 160MHz
Square wave	1μHz ~ 30MHz	1μHz ~ 40MHz	1μHz ~ 50MHz
Oblique wave	1μHz ~ 30MHz	1μHz ~ 40MHz	1μHz ~ 50MHz
Arbitrary wave	1μHz ~ 30MHz	1μHz ~ 30MHz	1μHz ~ 30MHz

To set carrier frequency, please use multi-functional knob and direction key or press corresponding keys, input the required value and select the unit.

### Select modulation source

UTG4000A function/arbitrary waveform generator can selected as internal or external modulation source. After you use AM function, you can see that modulation source is internal by default. You can change it with multi-functional knob on AM interface or by pressing function menu Source.

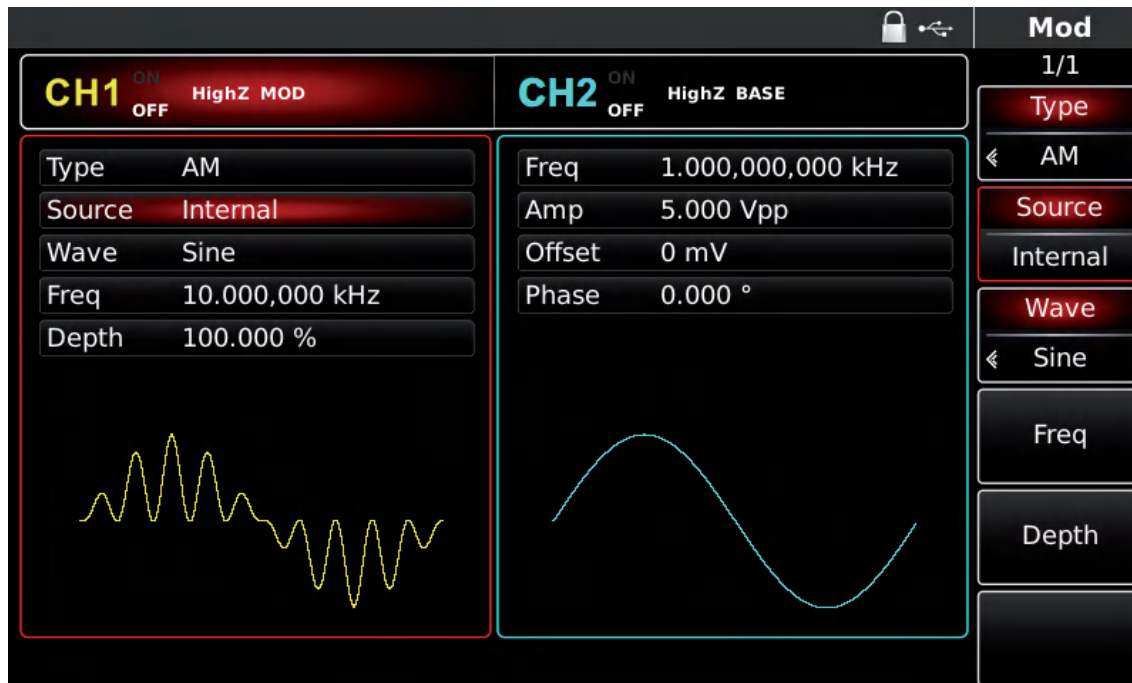


Figure 3- 3 Select modulation source

### 1) Internal source

In case of internal modulation source, modulation wave can be sine wave, square wave, oblique wave, or arbitrary wave, and is sine wave by default. After you use AM function, you can see that modulation wave is sine wave by default. You can change it with multi-functional knob on AM interface or by pressing Wave.

- Square wave: duty ratio is 50%
- Sawtooth wave: degree of symmetry is 0.10%
- Arbitrary wave: when selecting arbitrary wave as modulation waveform,

function/arbitrary waveform generator limits length of arbitrary wave to 32Mpts by automatic test count.

### 2) External source

In case of external modulation source, modulation wave and frequency will be hidden in the parameter list, when an external waveform will be used to modulate carrier waveform. AM depth is controlled by built-in modulation depth and  $\pm 5V$  signal level on external analog modulation input terminal (Modulation In connector) of back panel. For example, if modulation depth in parameter list is set to be 100%, AM output amplitude is the maximum when external modulation signal is +5V and the minimum when external modulation signal is -5V.

### Set modulation wave frequency

The frequency of modulation wave can be set in case of internal modulation source. After you use AM function, you can see that frequency of modulation wave is 100Hz by default. You can change it with multi-functional knob and direction key on AM interface or by pressing Freq. Modulation frequency range is 2mHz~200kHz. In case of external modulation source, modulation wave and frequency will be hidden in parameter list, when an external waveform will be used to modulate carrier waveform. The frequency range of modulation signal of external input is 2mHz~20kHz.

### Set modulation depth

Modulation depth is degree of amplitude change, expressed in percentage. The range of AM depth is 0%~120%, 100% by default. When modulation depth is 0%, a constant amplitude is outputted (half of carrier amplitude). When modulation depth is 100%, the output amplitude varies with the modulation waveform. When modulation depth is more than 100%, the instrument will not output a peak-to-peak voltage (terminating at 50Ω) more than ±5V. You can change it with multi-functional knob and direction key on AM interface or by pressing Depth. In case of external modulation source, the output amplitude of instrument is also controlled by ±5V signal level on external analog modulation input terminal (Modulation In connector) of back panel. For example, if modulation depth in parameter list is set to be 100%, AM output amplitude is the maximum when external modulation signal is +5V and the minimum when external modulation signal is -5V.

### Comprehensive example

First make the instrument run in amplitude modulation (AM) mode, and then set an internal sine wave of 200Hz as modulation signal and a square wave with frequency of 10kHz, amplitude of 200mVpp and duty ratio of 45% as carrier signal. Finally set modulation depth to be 80%. The specific steps are as follows:

#### 1) Use AM function

Press MOD to use the function, and select AM function (press soft key Type to select if Type is not highlighted).

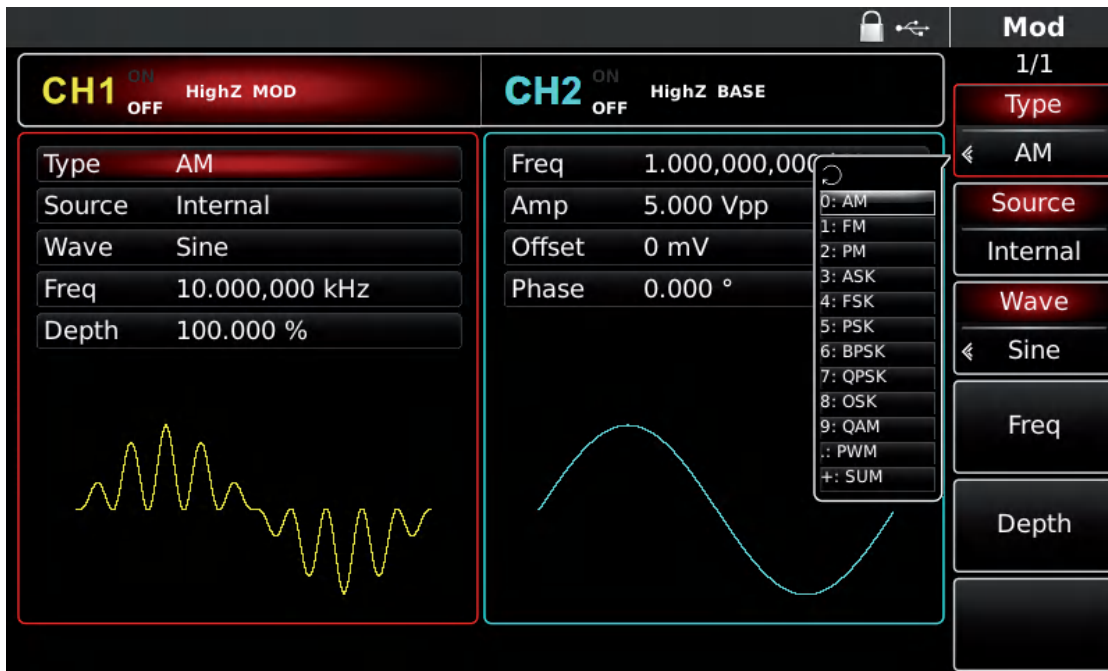


Figure 3-4 Select AM function

## 2) Set modulation signal parameters

Set with multi-functional knob and direction key after using AM function. You can also press soft keys of function on the above interface for using AM function.

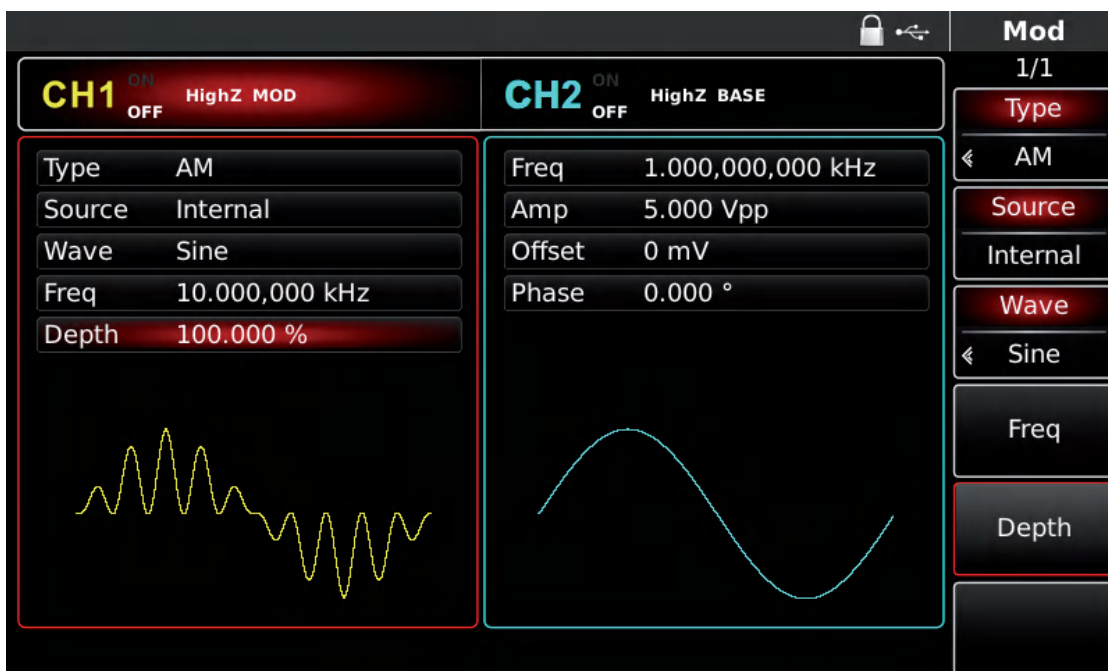


Figure 3-5 Set modulation parameters

To set parameters, press corresponding soft key, input the required value and select the unit.

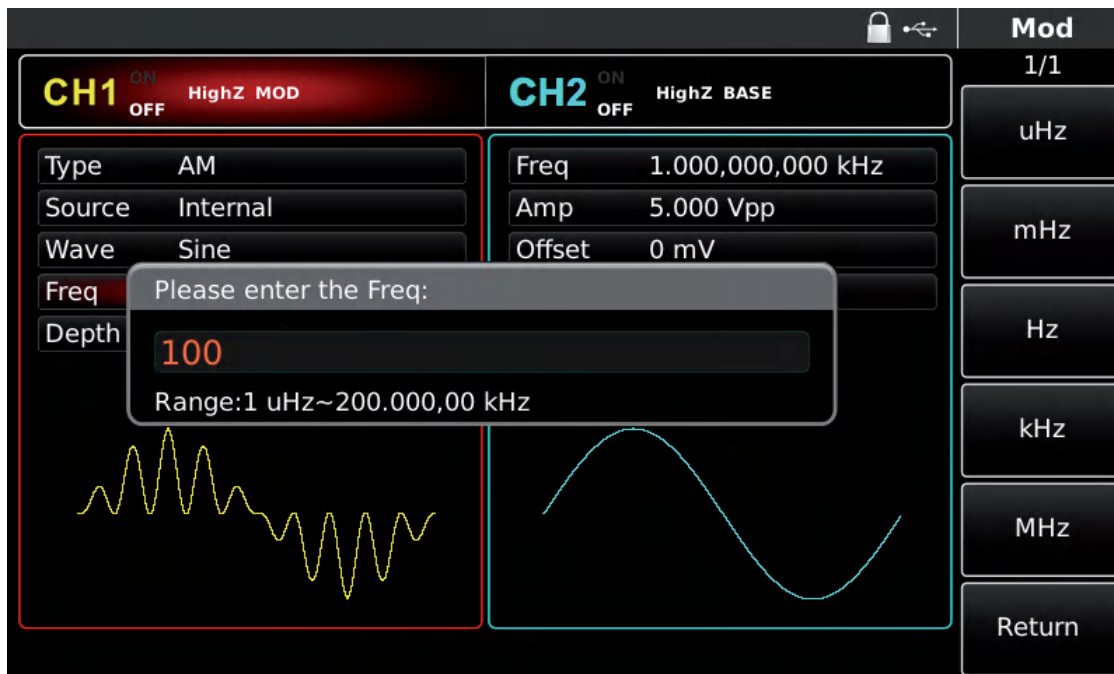


Figure 3-6 Set frequency of modulation source

### 3) Set carrier signal parameters

Select type of basic waveform in modulation mode. Press Square to select carrier signal as square wave.

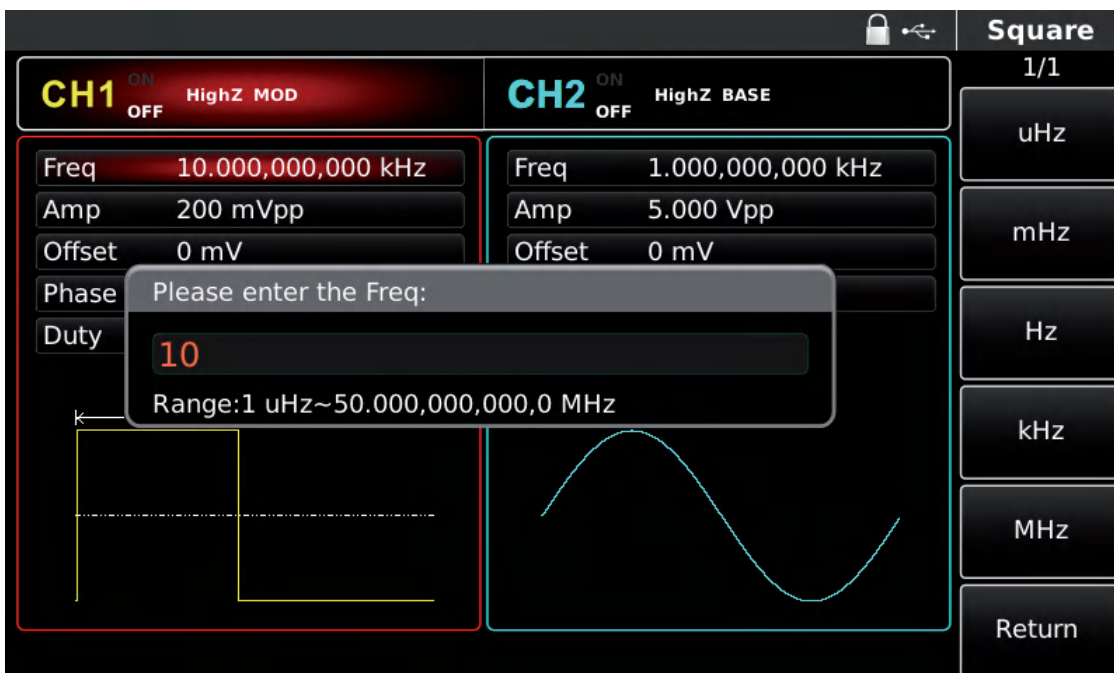


Figure 3-7 Set carrier frequency

You can set with multi-functional knob and direction key, or press corresponding soft function keys.

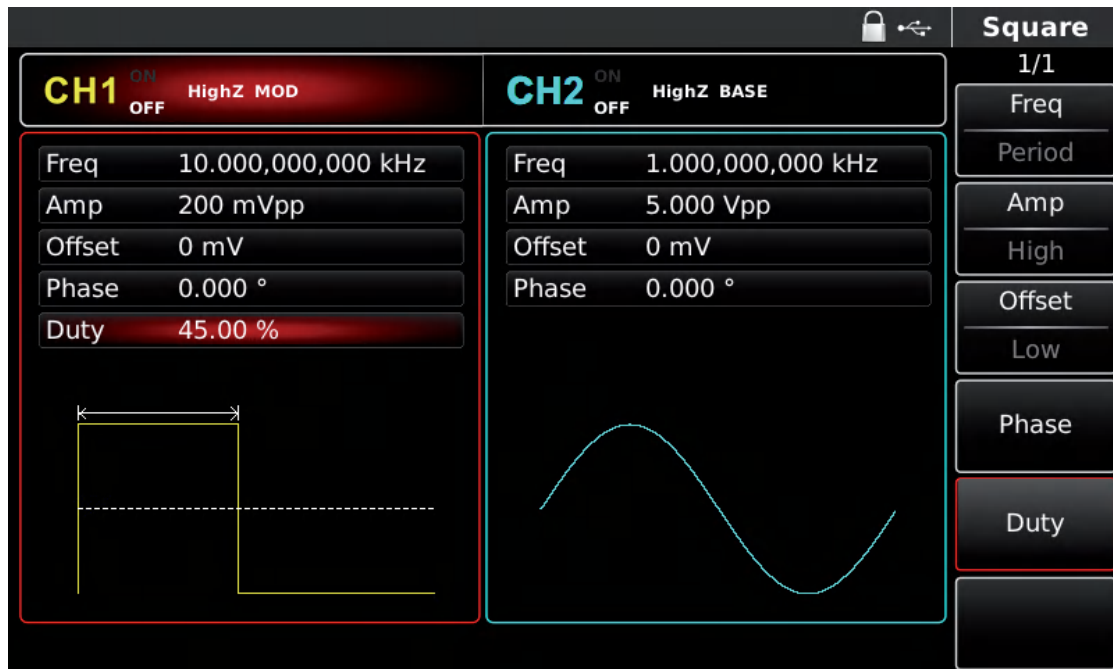


Figure 3-8 Select carrier duty ratio

To set parameters, press corresponding soft key, input the required value and select the unit.

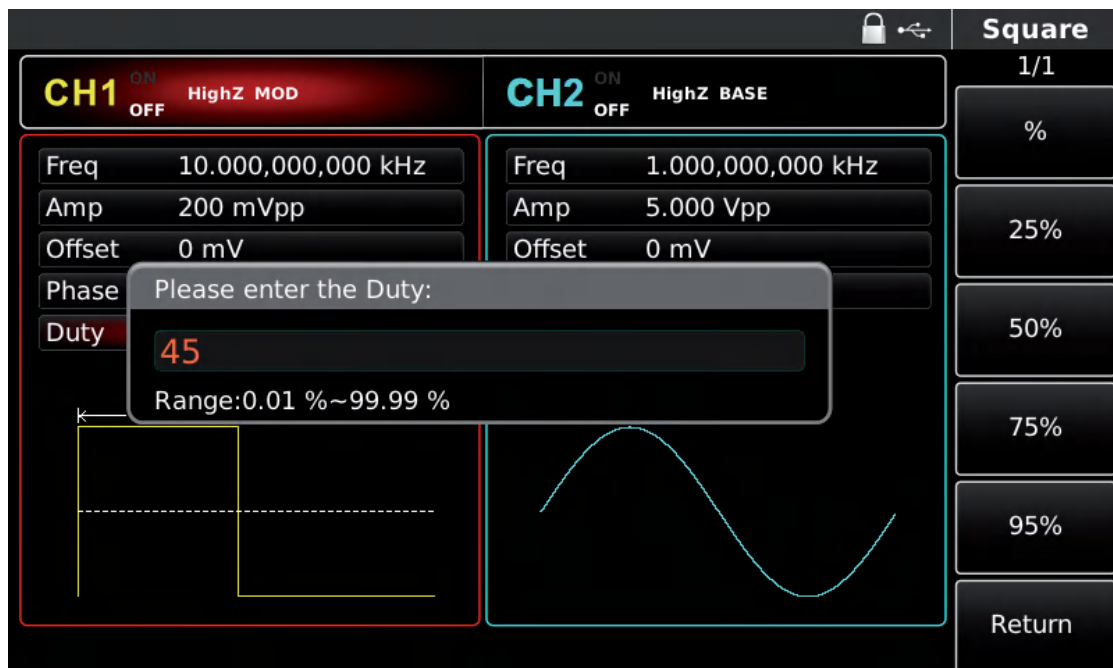


Figure 3-9 Set carrier duty ratio

#### 4) Set modulation depth

Press soft key **MOD** to return to the interface below to set modulation depth after setting carrier parameters.

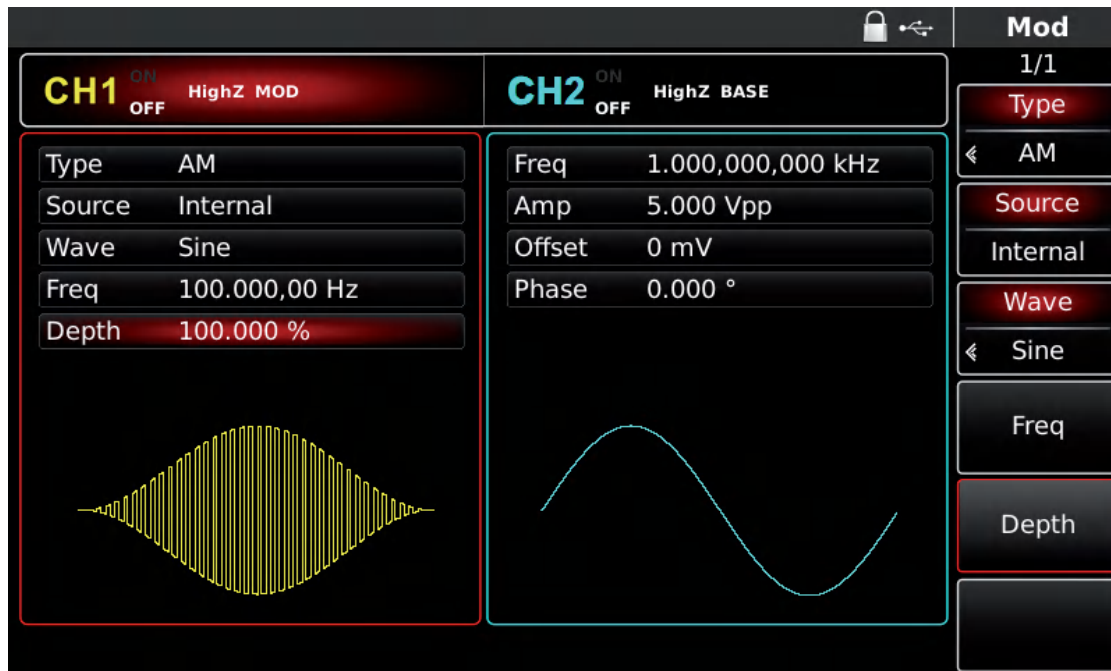


Figure 4- 10 Select modulation depth

You can set with multi-functional knob and direction key. You can also press soft key Depth again, input number 80 through numeric keyboard and press soft key % to set the modulation depth.

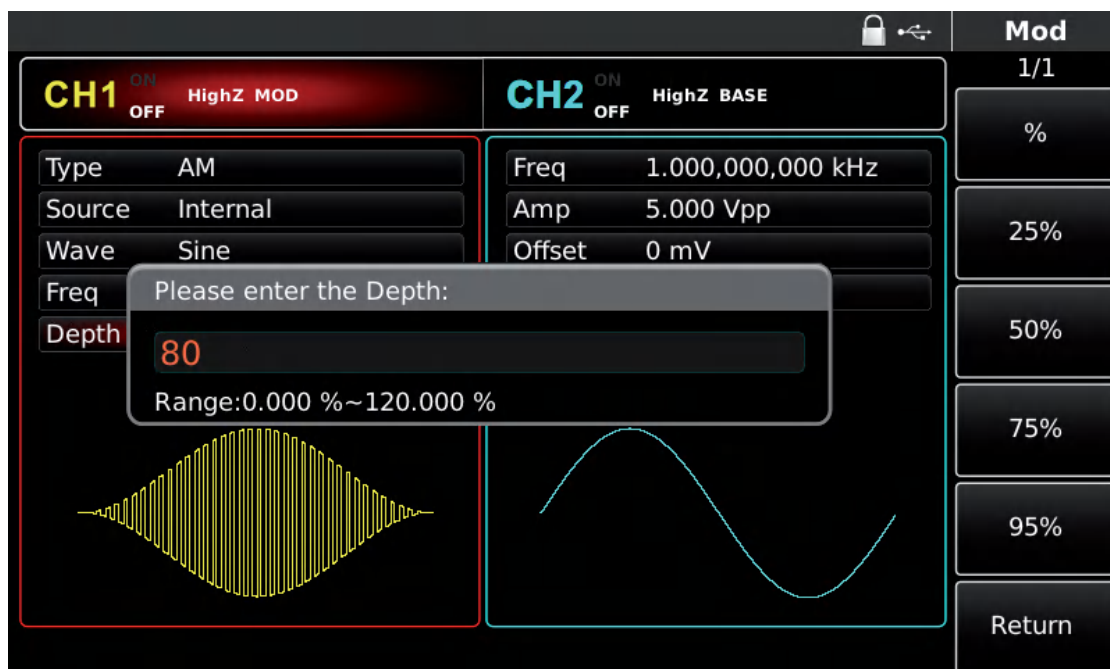


Figure 4- 10 Select modulation depth

### 5) Use channel output

Press CH1 on the front panel to quickly turn on output of channel 1. Backlight of CH1 is on after channel output is turned on, "OFF" on the right of CH1 information tag turns gray from white, and "ON" turns white from gray, indicating that output of channel 1 is turned on.

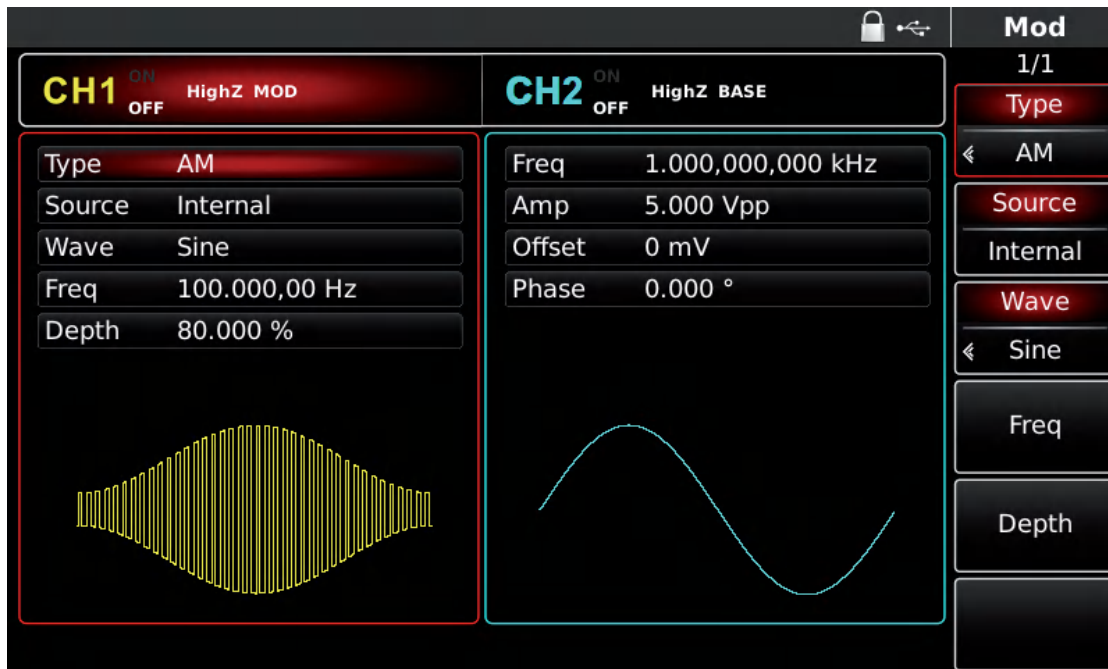


Figure 3-12 Use channel output

Check the shape of AM modulation waveform through oscilloscope, which is shown in the figure below:

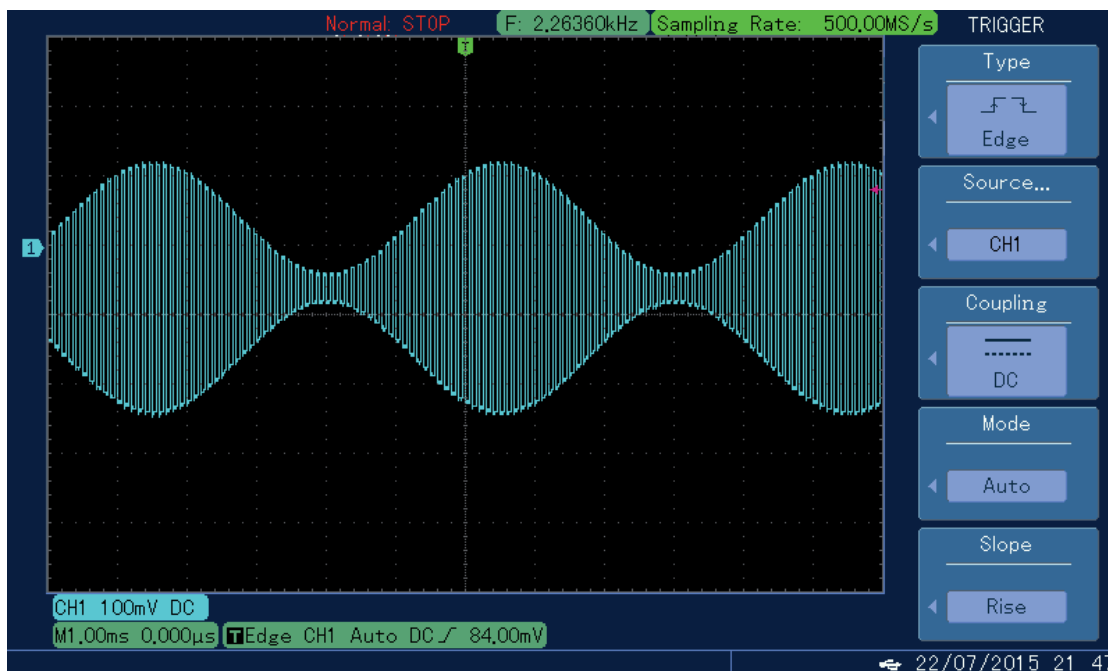


Figure 3-13 Observe AM waveform with oscilloscope



## 3.2 Output Arbitrary Wave

UTG4000A can store 160 types of standard waveform in nonvolatile storage. The instrument creates and edits arbitrary waveform through computer software. The corresponding formatted file is stored in the external storage device (U disk) so that the instrument reads arbitrary waveform data file stored in U disk through USB interface of front panel and outputs arbitrary wave.

### 3.2.1 Use Arbitrary Wave Function

Press Arb to use arbitrary wave function. After the function is used, UTG4000A function/arbitrary waveform generator will output arbitrary waveform with the current setting.

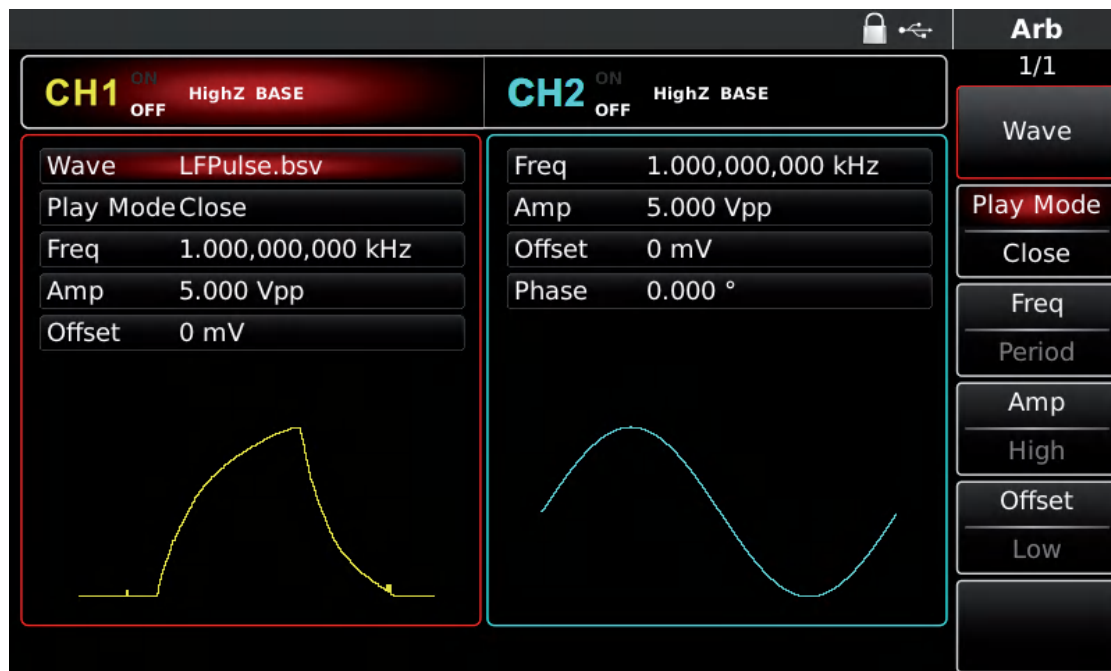


Figure 3-14 Select Arb function

### 3.2.2 Point-by-point Output/Play Mode

UTG4000A supports point-by-point output of arbitrary waveform. In point-by-point output mode, signal generator automatically calculates frequency of output signal ( 7.629394531kHz) according to waveform length (e.g. 65536 points) and sampling rate. The signal generator outputs waveform points one by one with this frequency. Point-by-point output mode can prevent loss of important waveform point. The default is “No”. In such case, arbitrary waveform outputs with fixed length and frequency in parameter list through automatic interpolation of software or test count. To change it, you can use multi-functional knob and direction key on the interface for using arbitrary wave function or press Play Mode. When play mode is “Yes”, frequency and phase will be displayed in parameter list.

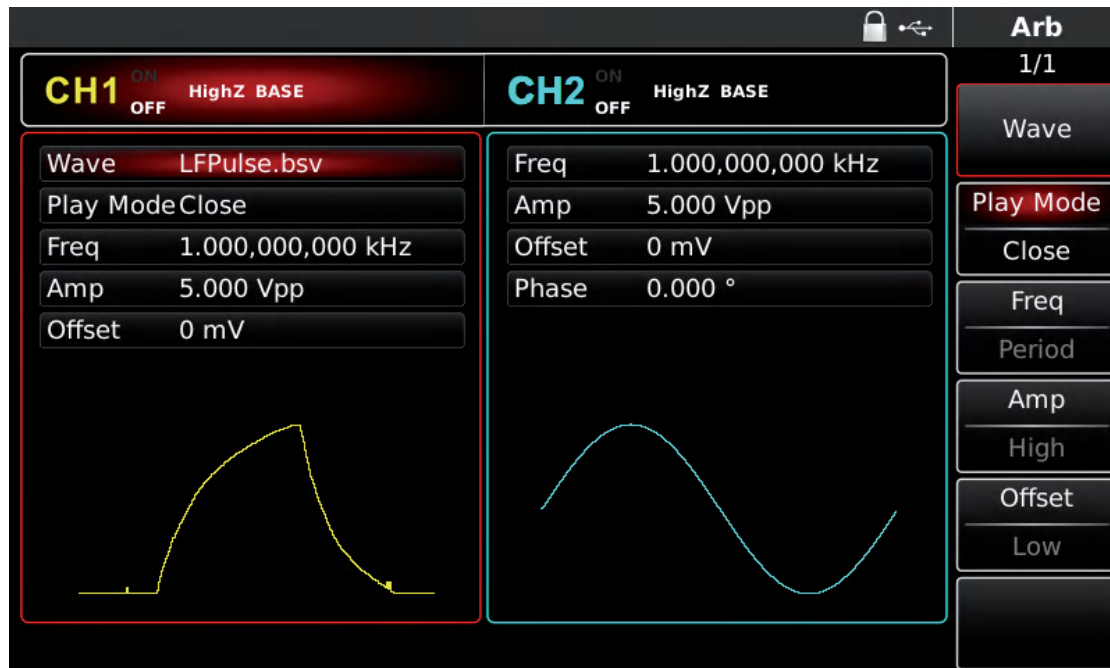


Figure 3- 15 Set point-by-point output function

### 3.2.3 Select Arbitrary Wave

UTG4000A allows users to output arbitrary waveform in internal or external storage of the instrument. You can select the arbitrary wave you need with multi-functional knob and direction key on the interface for using arbitrary wave function or by pressing soft keys Arb and Wave successively.

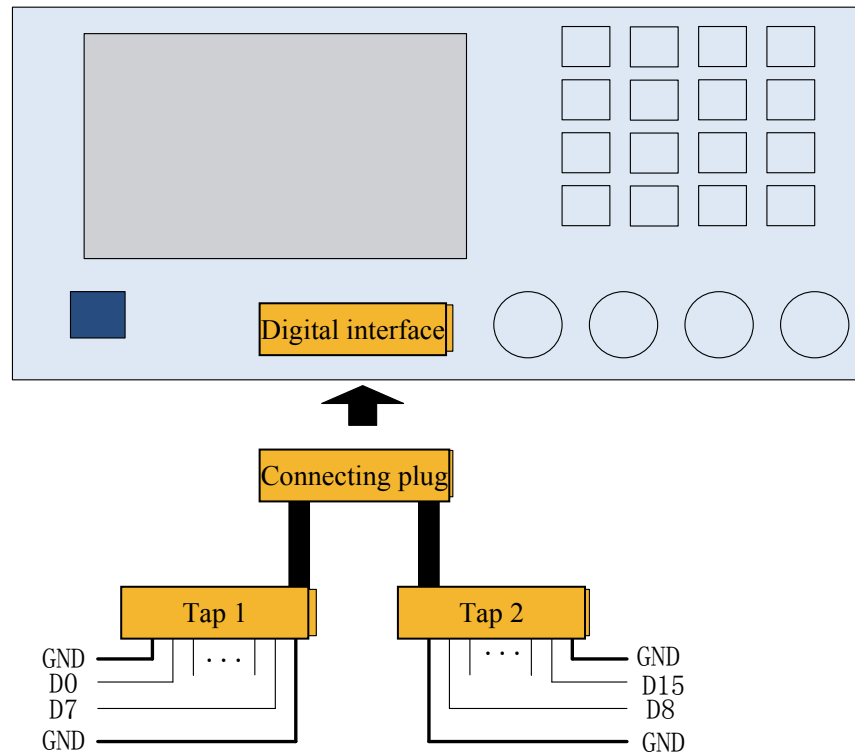
Note: use multi-functional knob and direction key or press soft keys Arb and Wave successively to select storage after inserting U disk into USB interface of front panel, and then select the arbitrary waveform you need. UTG4000A supports \*.csv or \*.bsv files with waveform 8~32M points long.

### 3.2.4 Create and Edit Arbitrary Waveform

UTG4000A creates and edits complicated arbitrary waveform (of any amplitude and shape) through powerful upper computer software. Please see Operation Manual of UTG4000A Arbitrary Waveform Editing Software for specific operation.

### 3.2.5 Output Digital Protocol Coding

Digital interface of front panel is shown in the figure below



See the table below for correspondence of signal

Table 3- 1

Pin name	Function description
GND	Ground pin
D15	NC
D14	NC
D13	NC
D12	RS232_TXD, serial data sending end
D11	NC
D10	SPI_CS, SPI enable
D9	SPI_SDO, SPI data sending end
D8	SPI_CLK, SPI clock
D7	NC
D6	NC
D5	I2C_SDA, SPI data terminal
D4	I2C_SCL, SPI clock terminal
D3	NC
D2	NC
D1	NC
D0	NC

Signal generator can output three types of protocol coding: I2C, SPI and UART. (TTL), and support sending of continuous time and manual sending. Corresponding protocol parameters can be set in different protocol modes. Corresponding signal can be output through protocol output interface of front panel. The followings introduce relative parameter settings of UART protocol. Other protocols introductions can refer to the user manual.

Function/arbitrary waveform generator can generate serial port protocol signal for parameters and output through digital interface of front panel in UART protocol mode.

### Select UART

Press DIGITAL, Type and Uart successively to use UART function (if Type is not highlighted, press soft key Type to select). After UART function is used, UTG4000A function/arbitrary waveform generator will output protocol signal with the current setting.



Figure 3- 16 Select UART function

### Select Baud rate

The Baud rate of UART can be 110, 300, 1200, 4800, 9600, 19200, 38400, 56700, 115200, 230400, 460800, 921600 and Clock speed. After UART is selected, the default Baud rate is 9600. To set Baud rate, please use multi-functional knob and direction key after selecting protocol or press soft function key Baud Rate to select the required setting.

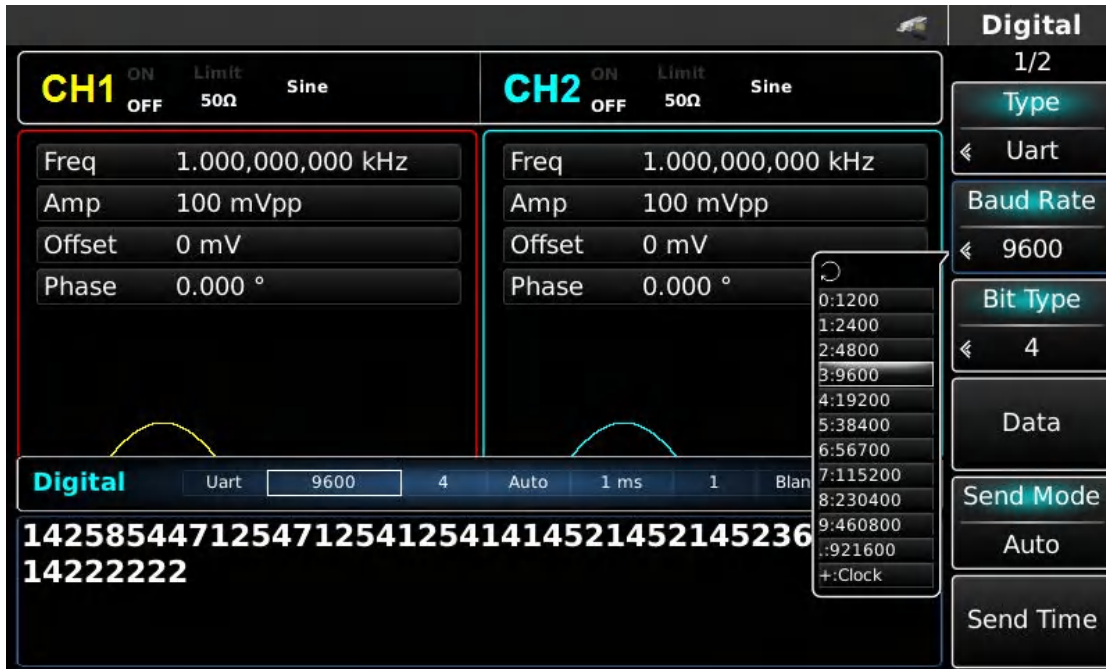


Figure 3- 17 Select Baud rate

### Set bit

Different bit number can be set as required. In UART mode, there are five different modes, 4, 5, 6, 7 and 8. The default is 4. To set Baud rate, please use multi-functional knob and direction key after selecting protocol or press soft function key Bit Type to select the required setting.

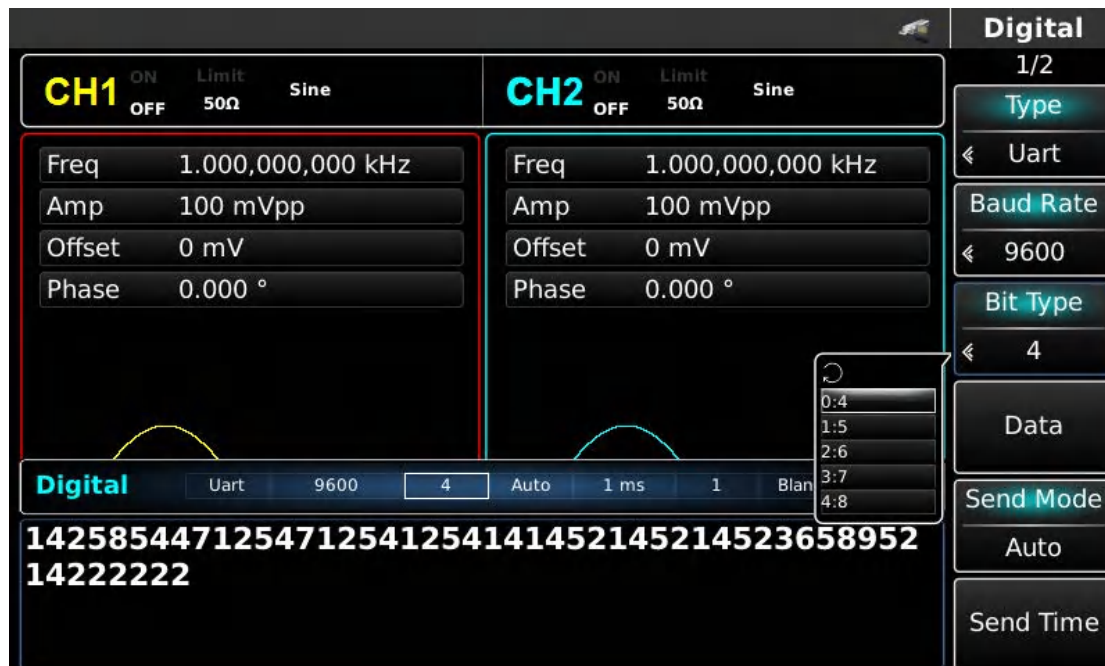


Figure 3- 18 Set bit

### Set data sent

UTG4000A function/arbitrary waveform generator can set protocol data coding to be sent. After you use UART function, you can see that data is empty by default. You can set with

multi-functional knob on interface for using protocol function or by pressing Data. The data can be sent with multiple numerical systems, including decimal system, hexadecimal system and character, as shown in the figure below.



Figure 3- 19 Set data sent

Multibyte sending can be set. The number of bytes is 8. The numeric string should be divided into digital sections not more than 255 when setting value sent. Numbers of each section are divided with Space. Press Clear to clear wrong input and press A/a to switch between capital and small letter. Press Ok after setting is finished. See the figure below.

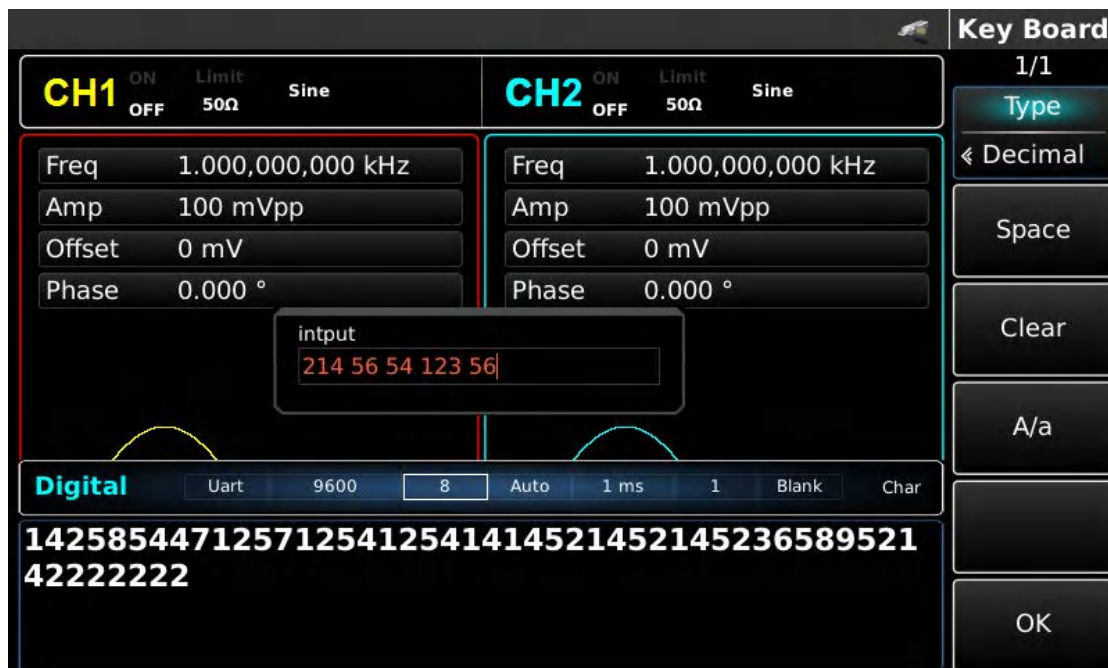


Figure 3- 20 Set data sent

## Set sending mode

Automatic and manual sending can be set. In the state of automatic sending, the instrument sends the set protocol coding in certain time; in manual mode, the instrument sends the set protocol signal when users press the send key.

### 1)Automatic sending mode

Press soft function key SendMode to adjust to “AUTO” to set automatic sending mode of the instrument. You can set the send time. Press soft function key Send Time to set send time with numeric key.



Figure 3- 21 Set automatic sending

### 2)Manual sending mode

Press soft function key SendMode to adjust to “Manual” to set manual sending mode of the instrument. Press soft function key Send, the instrument will output the set waveform.

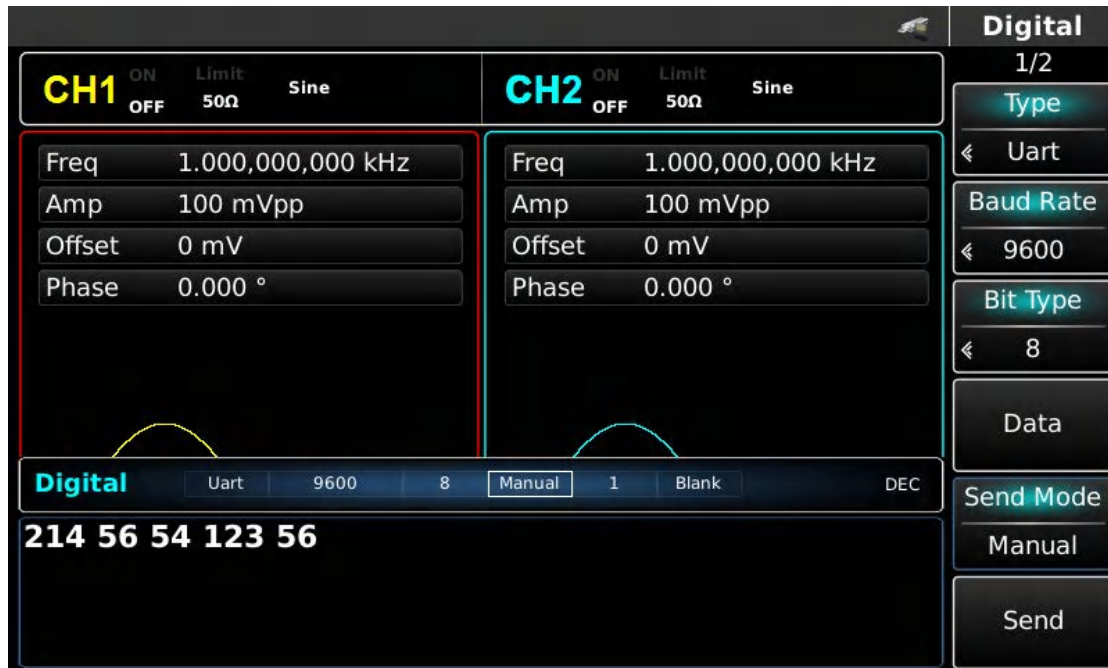


Figure 3- 22 Set manual sending

### Set stop bit

Different stop bit width can be set in UART protocol. Press soft function key Stop Bit to set different stop bit width, which can be 1 or 2 and is 1 by default.



Figure 3- 23 Set stop bit



## Set check bit

Check mode can be set in UART protocol. Press soft function key Parity to set different check mode, which can be no, odd and even and is no by default.



Figure 3- 24 Set check bit

## Comprehensive example

First make the instrument run in UART mode, and then set Baud rate of the instrument to be 4800, data to be decimal 5, 20, 13 or 14, check to be odd, stop bit to be 1 and sending interval to be 2ms. The specific steps are as follows:

1)Use UART function

Press DIGITAL, Type and Uart successively (press soft key Type to select if Type is not highlighted) to use UART function.



Figure 3- 25 Select UART function

2)Set Baud rate to be 4800

Press soft function key Baud Rate to set Baud rate in UART mode. You can set with multi-functional knob and direction key. You can also press corresponding soft function keys again, when the interface below will pop up. Select accordingly.

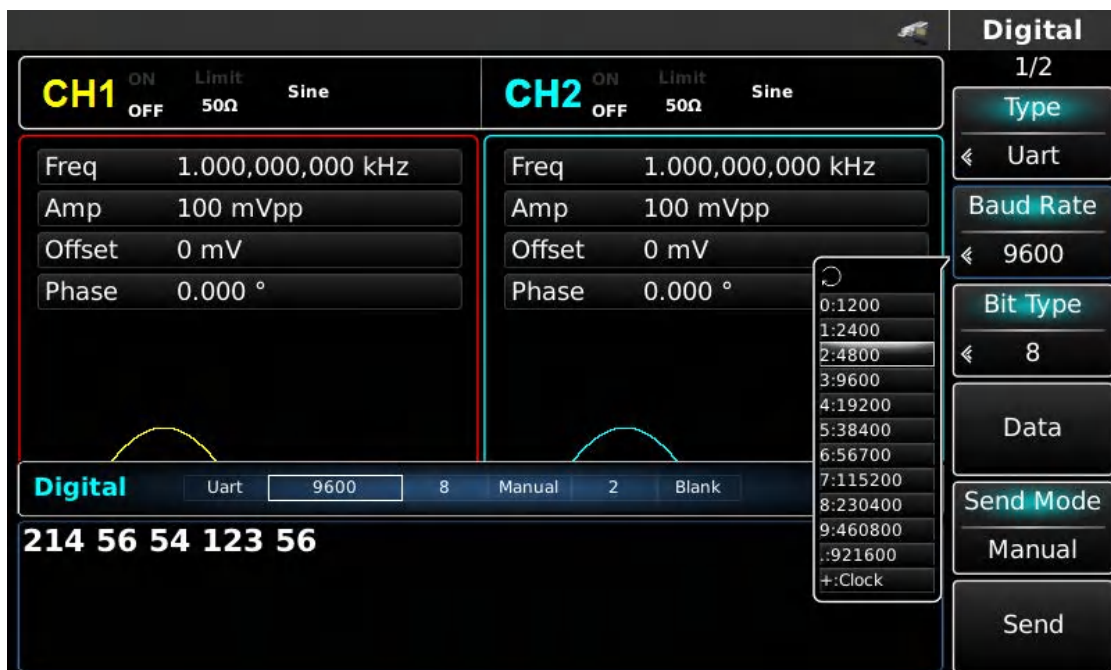


Figure 3- 26 Select Baud rate

3)Set bit

To set Baud rate, please use multi-functional knob and direction key after selecting protocol or press soft function key Bit Type to select the required setting. The bit number is 8 here.

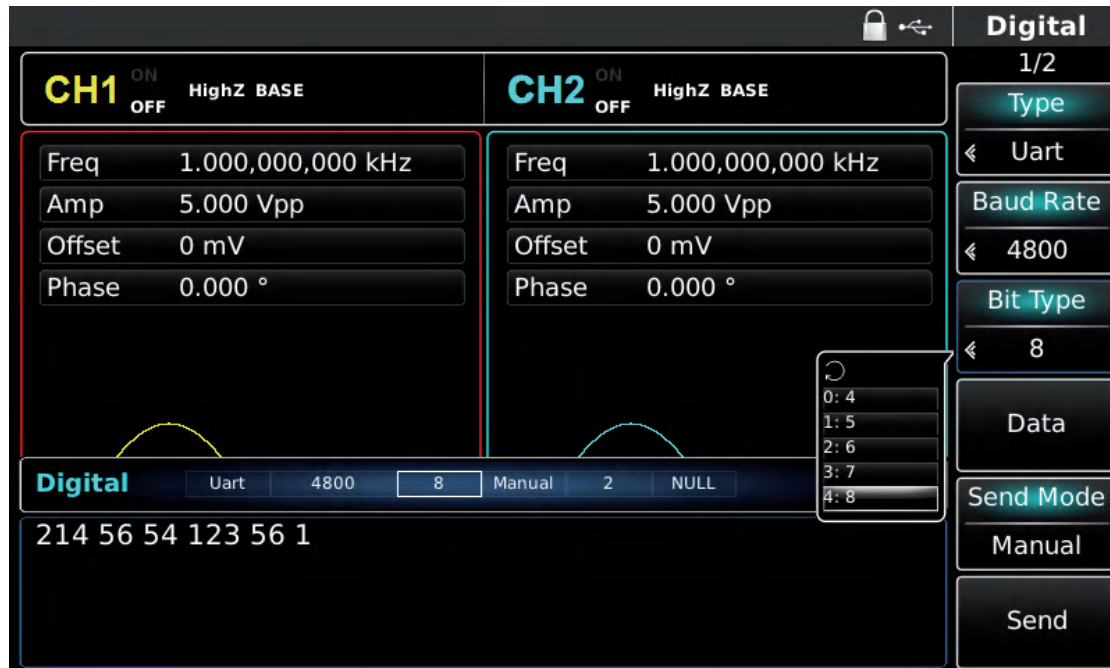


Figure 3- 27 Select bit

#### 4)Set data sent

Press soft function key Data for data setting in UART mode. You can set with multi-functional knob and direction key. You can also press corresponding soft function keys again, when the interface below will pop up. Select accordingly.

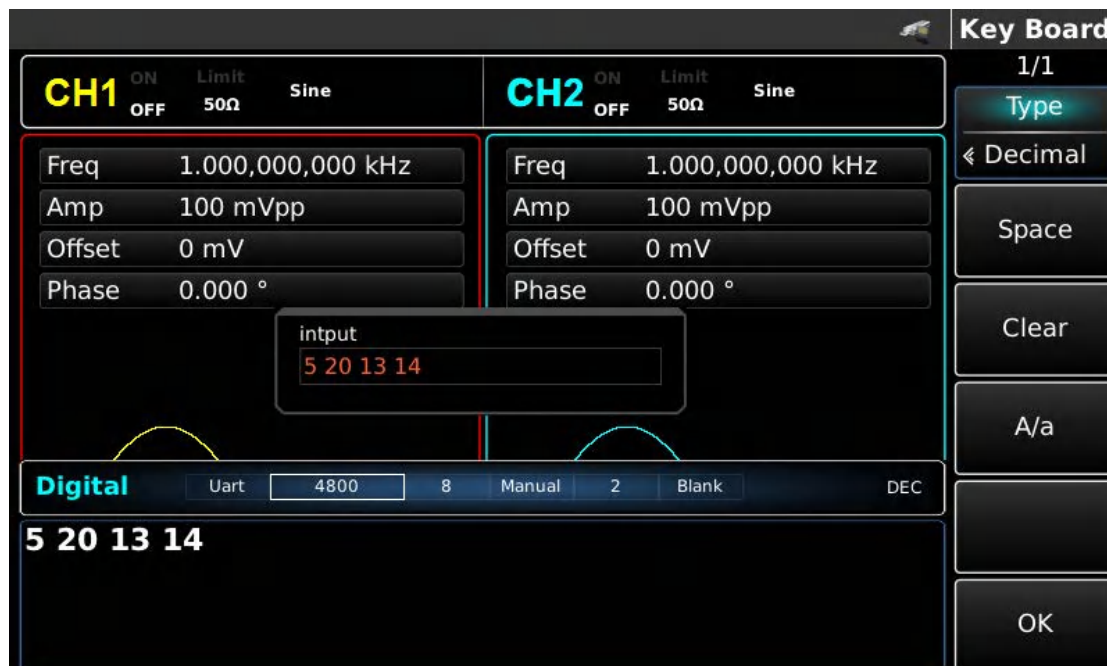


Figure 3- 28 Set data sent

#### 5)Set send time

Press soft function key Send Mode to set sending mode to be "AUTO" in UART mode. Press soft function key Send Time to set sending interval to be 2ms. You can set with numeric key.

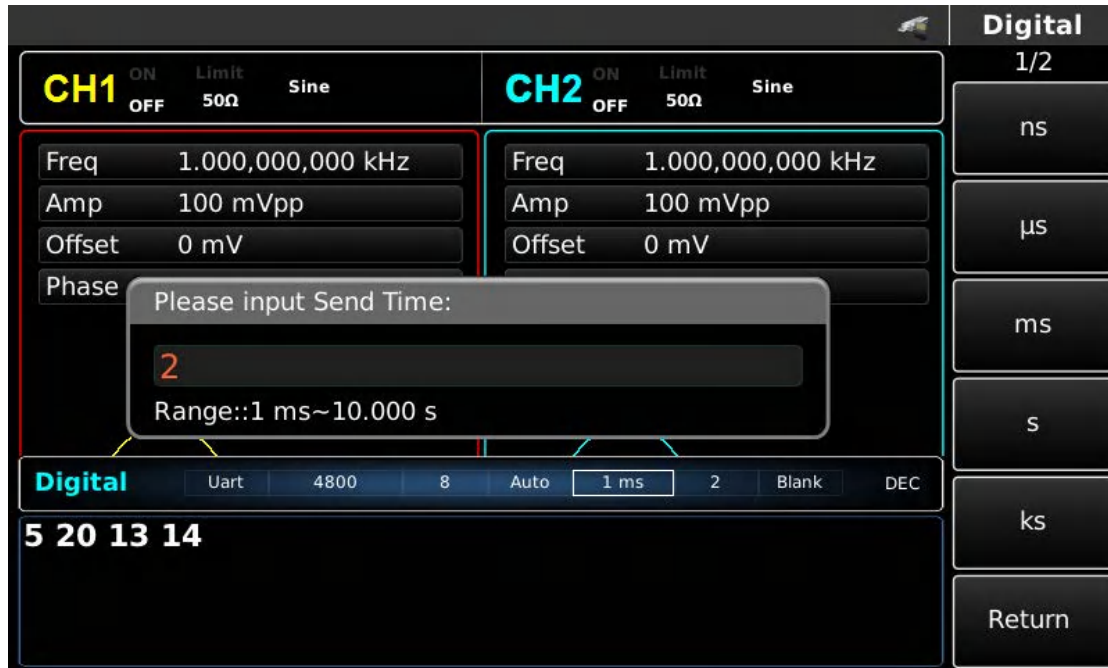


Figure 3- 29 Set send time

### 6)Set stop bit

Press soft function key Stop Bit to set sending mode and set stop bit to be 1 in UART mode.



Figure 3- 30 Set stop bit

### 7)Set check bit

8)Press soft function key Parity to set check bit to be "Odd" in UART mode.



Figure 3- 31 Set check bit

### 3.3 Function of Digital Arbitrary Wave

Function /arbitrary waveform generator can generate any digital signal and corresponding clock signal for parameters and output through digital interface of front panel in mode of digital arbitrary wave

Select digital arbitrary wave

Press DIGITAL, Type and DArb successively to use function of digital arbitrary wave (if Type is not highlighted, press soft key Type to select). After function of digital arbitrary wave is used, UTG4000A function/arbitrary waveform generator will output signal of digital arbitrary wave with the current setting.

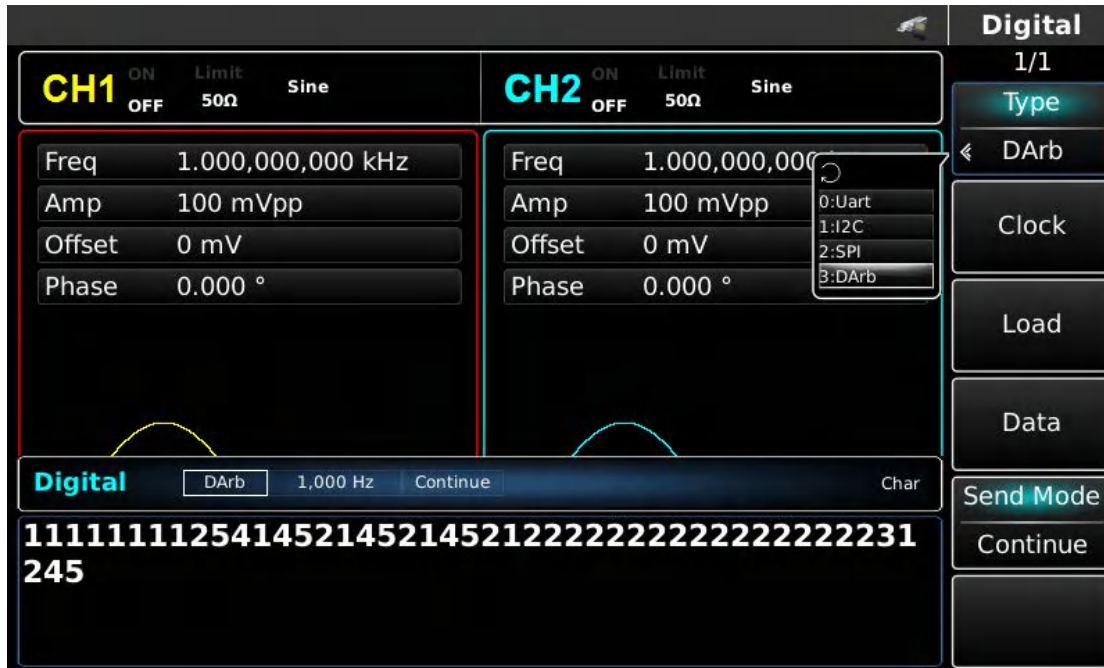


Figure 3- 32 Select function of digital arbitrary wave

## Set Clock

The sending clock of digital arbitrary wave can be set as required by users. Press function key Clock in mode of digital arbitrary wave to set sending clock with numeric key in the range of 1kHz~40MHz.

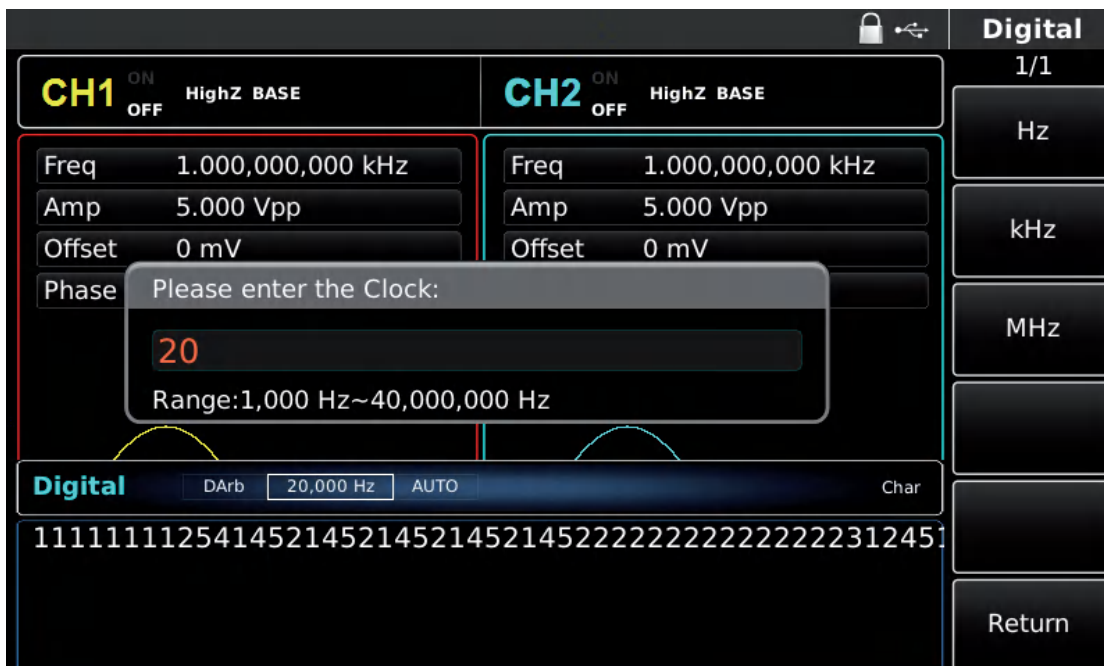


Figure 3- 33 Set clock

## Set data sent

Different bit number can be set as required. Set with multi-functional knob and direction key after selecting protocol or by pressing soft function key Data and using numeric key. The data can be sent with multiple numerical systems, including decimal system, hexadecimal system and character, which is shown in the figure below.



Figure 3- 34 Set data sent

Multibyte sending can be set. The number of bytes is 8. The numeric string should be divided into digital sections not more than 255 when setting value sent. Numbers of each section are divided with Space. Press Clear to clear wrong input and press A/a to switch between capital and small letter. Press Ok after setting is finished. See the figure below

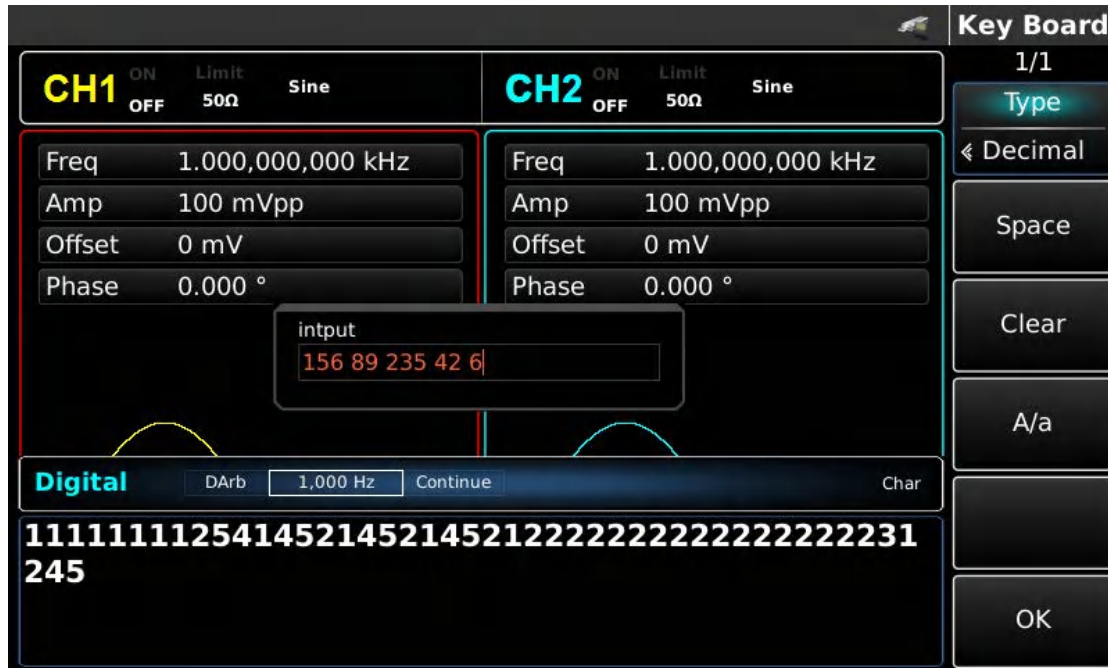


Figure 3- 35 Set data sent

### Set sending mode

Automatic and manual sending can be set. In the state of automatic sending, the instrument sends the set protocol coding in certain time; in manual mode, the instrument sends the set protocol signal when users press the send key.

#### 1)Continue sending mode

Press soft function key SendMode to adjust to “Continue” to set automatic sending mode of the instrument.



Figure 3- 36 Set automatic sending



## 2) Manual sending mode

Press soft function key SendMode to adjust to “Manual” to set manual sending mode of the instrument. Press soft function key Send, the instrument will output the set waveform.



Figure 3- 37 Set manual sending

## Comprehensive example

First make the instrument run in mode of digital arbitrary wave, and then set output data of the instrument to be decimal 27, 131, 9 or 31. The specific steps are as follows:

### 1) Use function of digital arbitrary wave

Press DIGITAL, Type and DArb successively (press soft key Type to select if Type is not highlighted) to use function of digital arbitrary wave.



Figure 3- 38 Select function of digital arbitrary wave

### 2)Set Clock

Press soft function key Clock for data setting in mode of digital arbitrary wave. You can set with multi-functional knob and direction key. You can also press corresponding soft function keys again and set corresponding data to be 200kHz with numeric key.



Figure 3- 39 Set clock

### 3)Set data sent

Press soft function key Data for data setting in mode of digital arbitrary wave. You can set with multi-functional knob and direction key. You can also press corresponding soft function keys again and set corresponding data with numeric key.

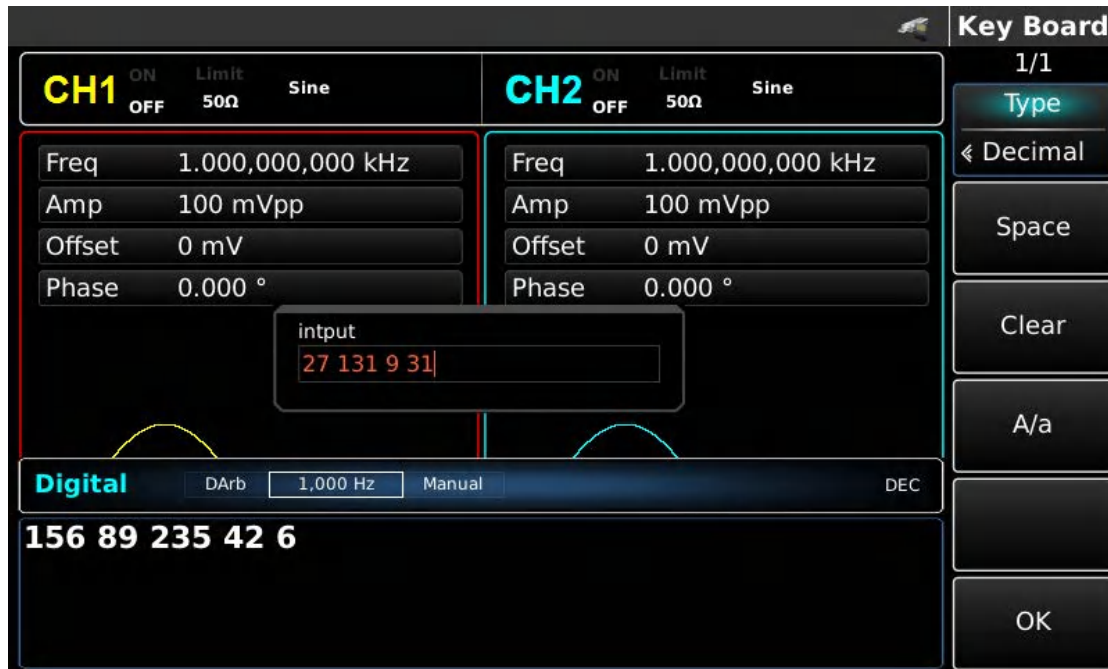


Figure 3- 40 Set data sent

#### 4) Set sending mode

Press soft function key Send Mode in digital arbitrary wave mode to set sending mode to be "Continue".



Figure 3- 41 Set sending mode

## Chapter 4 Fault Handling

Possible faults in use of UTG4000A and troubleshooting methods are listed below. If these faults occur, please handle them according to corresponding steps. If they cannot be handled, please contact with the dealer or local office, and provide the information about your machine (method: press Utility and System successively).

### 4.1 No Display on Screen (Blank Screen)

If the signal generator still does not display after pressing power switch on front panel

- 1) Inspect whether power source is connected well.
- 2) Inspect whether power switch on back panel is connected well at "I".
- 3) Whether power switch on front panel is connected well.
- 4) Restart the instrument.

5) If the product still cannot be used normally, please contact with the dealer or local office and let us serve you.

### 4.2 No Waveform Output

Setting is correct but no waveform is output

- 1) Inspect whether BNC cable and channel output terminal are connected correctly.
- 2) Inspect whether CH1 or CH2 is turned on.
- 3) If the product still cannot be used normally, please contact with the dealer or local office and let us serve you.

### 4.3 Fail to Correctly Recognize U Disk

- 1) Inspect whether U disk works normally.
- 2) Ensure that Flash U disk is used. The instrument does not support hard disk.
- 3) Restart the instrument, and insert U disk again to see whether it works normally.

4) If U disk still cannot be correctly recognized, please contact with the dealer or local office and let us serve you.

This user manual may be revised without prior notice





REV.0  
DATE:2016/06/30



说明书菲林做货要求：

序号	项目	内容	
1	尺寸	尺寸210*297MM±1MM	
2	材质	用60g书纸	
3	颜色	黑色，双面印刷	
4	外观要求	印刷完整清晰、版面整洁，无斑墨、残损、毛边、刀线错位等缺陷	
5	装订方式	胶装	
6	表面处理	无	
7	折叠方式	无	
版本		0	
DWH 设计	武广英16/06/30	MODEL 机型：UTG4000A系列说明书	Part NO. 物料编号：
CHK 审核		 优利德科技(中国)有限公司 UNI-TREND TECHNOLOGY (CHINA) LIMITED	
APPRO. 批准			

Remark: 不需要印刷在说明书中