



Quick Guide

UTG2000B Series Function/Arbitrary Waveform Generator

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UNI-T Technologies, Inc.

Preface

Dear Users:

Hello! Thank you for choosing this brand new Uni-Trend device. In order to use this instrument safely and correctly, 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.

Copyright Information

UNI-T is Uni-Trend Technology (China) Co., Limited. All rights reserved.

UNI-T products are protected by patent rights in China and other countries, including issued and pending patents.

Uni-Trend reserves the rights to any product specification and pricing changes.

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UNI-T is the registered trademark of Uni-Trend Technology (China)Co., Limited.

Uni-Trend warrants that this product will be free from defects for a three-year period. If the product is re- sold, the warranty period will be from the date of the original purchase from an authorized UNI-T

distributor. Probes, other accessories, and fuses are not included in this warranty.

If the product is proved to be defective within the warranty period, Uni-Trend reserves the rights to either repair the defective product without charging any parts or 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 are the property of Uni-Trend.

The "customer" refers to the individual or entity that is declared in the guarantee. In order to obtain the warranty service, "customer" must inform the defects within the applicable warranty period to UNI-T, and to perform appropriate arrangements for the warranty service. The customer shall be responsible for packing and shipping the defective products to the designated maintenance center of UNI-T, pay the shipping cost, and provide a copy of the purchase receipt of the original purchaser . If the product is shipped domestically to the location of the UNI-T service center, UNI-T shall pay the return shipping fee. If the product is sent to any other location, the customer shall be responsible for all shipping, duties, taxes, and any other expenses.

This warranty shall not apply to any defects or damages caused by accidental, machine parts' wear and tear, improper use, and improper or lack of maintenance. UNI-T under the provisions of this warranty has no obligation to provide the following services:

- a) Repair any damage caused by the installation, repair, or maintenance of the product by non UNI-T service representatives.
- b) Repair any damage caused by improper use or connection to an incompatible device.
- c) Repair 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).

This warranty written by UNI-T for this product, and it is used to substitute any other expressed or

implied warranties. UNI-T and its distributors do not offer any implied warranties for merchantability or applicability purposes.

For violation of this guarantee, UNI-T is responsible for the repair or replacement of defective products is the only remedy available to customers. Regardless of whether UNI-T and its distributors are informed that any indirect, special, incidental, or consequential damage may occur, the UNI-T and its distributors shall not be responsible for any of the damages.

Introduction

This device is economical, high-performance, multi-functional single channel waveform generators. It uses direct digital synthesis (DDS) technology to produce accurate and stable waveforms. It can generate accurate, stable, pure and low distortion output signals; also can provide high-frequency vertical edge square waves. UTG2000B's convenient interface, superior technical indexes and user-friendly graphical display style can help users to complete tasks quickly and improve work efficiency.

Main Features

- Dual-channel with independent output mode
- Sampling rate of 1.28GSa/s and vertical resolution of 16bit
- Sine wave output of 120MHz/80MHz/60MHz, full-band resolution of 1 μ Hz
- Square wave of 30MHz/25MHz/25MHz, minimum margin time can reach to 11ns and its rising, falling, and duty ratio time are adjustable
- Pulse waveform of 30MHz/25MHz/25MHz, adjustable time of rising, falling and duty ratio 2~16 independent harmonic waves in phase position
- Support 18 expressions of function, maximum length:160 characters
- Arbitrary wave storage of 8~16M points, 160 groups non-volatile waveform storage
- Storage up to 20MB (.bsv or.csv) or 7GB(optional)
- Rich modulation types: AM、FM、PM、ASK、FSK、PSK、BPSK、QPSK、OSK、SUM、DSBAM、QAM、PWM
- Support frequency scanning and burst output
- Dual channel can respectively or simultaneously: internal/external modulation, internal/external/manual trigger
- Compatible 7 digits TTL level signal
- 4.3 inches TFT color screen with USB Host(max.32G), USB Device, LAN, 10MHz clock source input, 10MHz clock source output
- Powerful upper computer software
- Easy-to-use multi-functional knob and numeric keypad

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Chapter 1 Safety Information

1.1 Safety Terms and Symbols


The following terms may appear in this manual:

Warning: The conditions and behaviors may endanger life.

Note: The conditions and behaviors may cause damage to the product and other properties. The following terms may appear on the product:


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

Note: This operation may cause damage to the product and devices connected to the product. The following symbols may appear on the product:

 Alternating Current

 Ground Terminal for Testing


 Ground Terminal for Chassis

 On/Off Button

 High Voltage

 Caution

 Protective Ground Terminal

 CE marking

 CSA International

 N10149 Spectrum Management Agency of Australia

 Environmental Protection Use Period (EPUP)

1SM1-A: This instrument belongs to SM Group1 Class A according to CISPR Article 4 ICES/NMB-001:
This instrument complies with ICES-001

1.2 General Safety Overview

This instrument strictly complies with the GB4793 safety requirements for electrical equipment and EN61010-1/2 safety standard during design and manufacturing. It complies with the safety standards for over voltage CAT II and pollution level II.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by

the equipment may be impaired.

Please read the following safety preventative measures:

To avoid electric shock and fire, please use the dedicated UNI-T power supply appointed to the local region or country for this product.

This product is grounded through the power supply ground wire. To avoid electric shock, grounding conductors must be connected to the ground. Please be sure that the product is properly grounded before connecting to the input or output of the product.

To avoid personal injury and prevent damaging the product, only trained personnel can perform the maintenance program.

To avoid fire or electric shock, please notice rated operating range and product marks. Do not use the product outside the rated range.

Please check the accessories for any mechanical damage before usage. Only use accessories that came with this product.

Please do not put metal objects into the input and output terminals of this product.

Do not operate the product if you suspect it is faulty, and please contact UNI-T authorized service personnel for inspection.

Please do not operate the product when the instrument box opens. Please do not operate the product in humid conditions.

Please keep the product surface clean and dry.

Chapter 2 Quick Start

2.1 General Inspection

It is recommended to follow the steps below to check the instrument before using this device for the first time.

2.1.1 Check for Damages Caused by Transport

If the packaging carton or the foam plastic cushions are severely damaged, please contact the UNI-T distributor of this product immediately.

If the instrument is damaged by transport, please keep the package and contact the transport department and the UNI-T distributor, the distributor will arrange for repair or replacement.

2.1.2 Check Accessories

- Power cord-----1PCS
- USB data cable-----1PCS
- BNC cable (1 meter)-----1PCS
- BNC+red and black alligator clip connection cable(1 meter)---1PCS
- User CD-----1PCS
- User manual-----1PCS
- Warranty-----1PCS

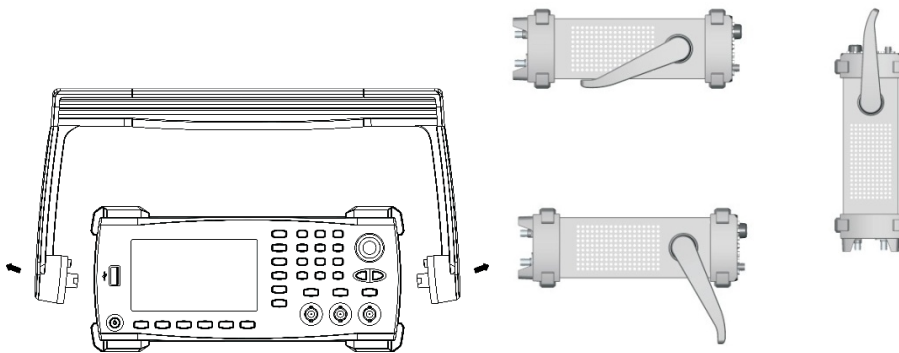
If any of the accessories are missing or damaged, please contact UNI-T or local distributors of this product.

2.1.3 Machine Inspection

If the instrument appears to be damaged, not working properly, or has failed the functionality test, please contact UNI-T or local distributors of this product.

2.2 Handle Adjustment

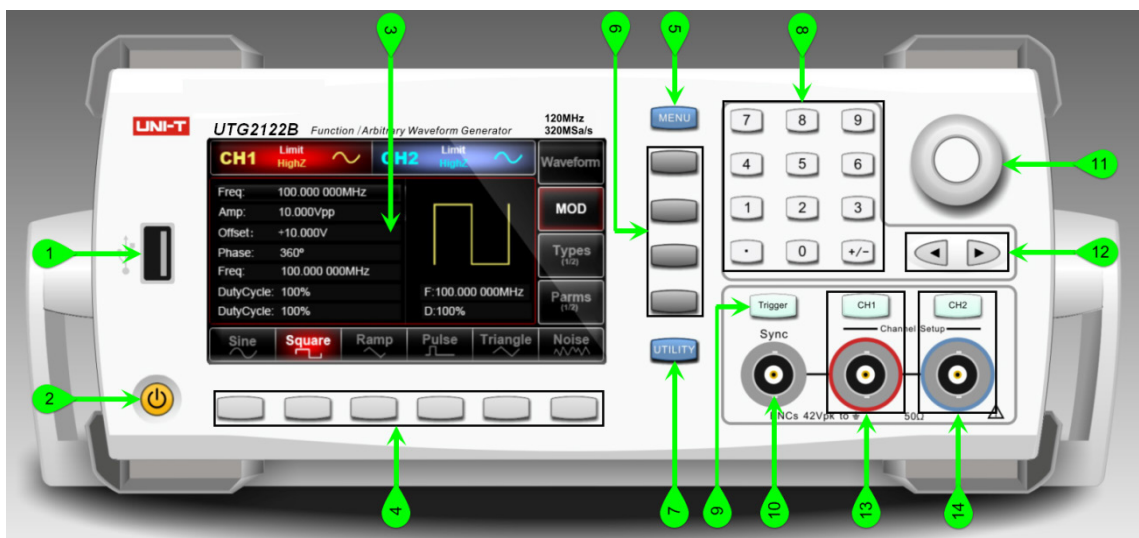
UTG2000B series handle can be adjusted freely. If the handle position needs to be changed, please hold the



2.3 Panels and Buttons

2.3.1 Front Panel

UTG2000B series provides users with a simple, intuitive, and easy to operate front panel. The front panel is shown in figure 2-1:



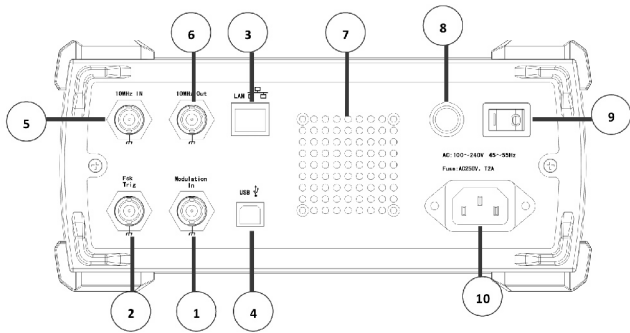
1. USB port
2. ON/OFF
3. Display Screen
4. Main Menu Button
5. Secondary Menu Button
6. Utility and setting
7. Number buttons
8. Manual trigger
9. Sync output terminal
10. Functional knob
11. Arrow button
12. CH1 output terminal
13. CH2 output terminal

Note: there is over voltage protection for each output terminal in case of the following condition:

- Setting amplitude $>100\text{mVpp}$, input voltage $>\pm 12.0\text{V}$, frequency $<10\text{ kHz}$.
- Setting amplitude $\leq 100\text{mVpp}$, input voltage $>\pm 2.0\text{V}$, frequency $<10\text{ kHz}$. “Overload protection, output off” appears when the protection is valid.

2.3.2 Rear Panel

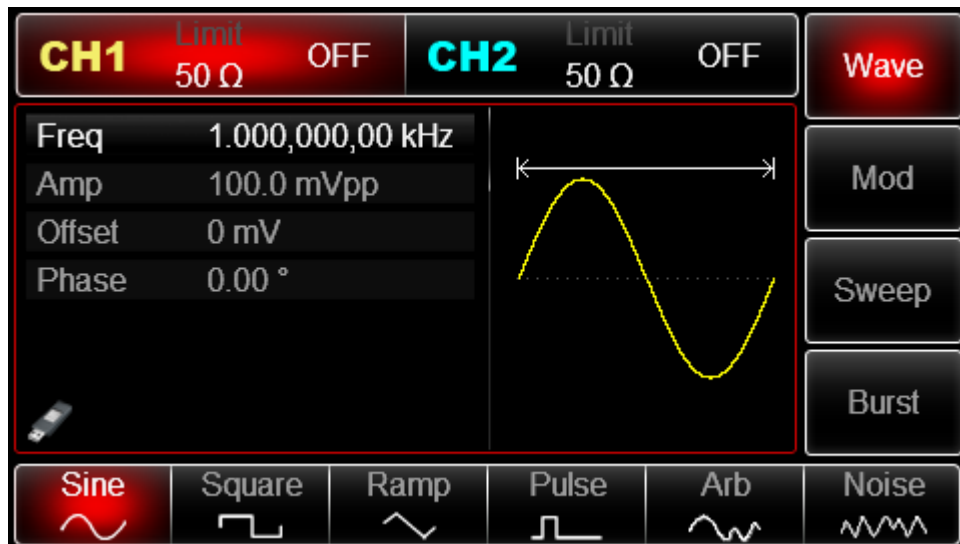
The rear panel is shown in figure 2-2:





1. External analog modulation input connector
2. External digital modulation/ frequency meter connector
3. LAN port
4. USB port
5. External 10MHz input connector
6. Internal 10MHz output connector
7. Ventilation vent
8. Fuse
9. Power switch
10. AC power supply

2.3.3 Function Interface

Function interface is shown in figure 2-3:



Description:

- CH1/CH2: the selected channel will be highlighted.
 - 1) Limit indicates output range is at limit. White color: valid; Grey color: invalid.
 - 2) 50Ω indicates the matched impedance of output terminal (1Ω to 10KΩ adjustable, or high resistance; default:50Ω)
 - 3) : sine wave. Different modes have different menu.
 - Bezel menu on the right: corresponding buttons for different function. Highlighted display indicates that the function is selected.
 - Bezel menu on the bottom: sub menu belonging to the right menu. Highlighted display indicates that the function is selected.
- If the submenu has over 6 labels, use  button to flip over.
- 1) Labels on the right of screen: Highlighted display indicates that the label is selected. If not, press corresponding soft key to select.
 - 2) Labels at the bottom of screen: Sub label belongs to the next category of Type label. Press corresponding button to select sub labels.

2.4 Basic Waveform Output

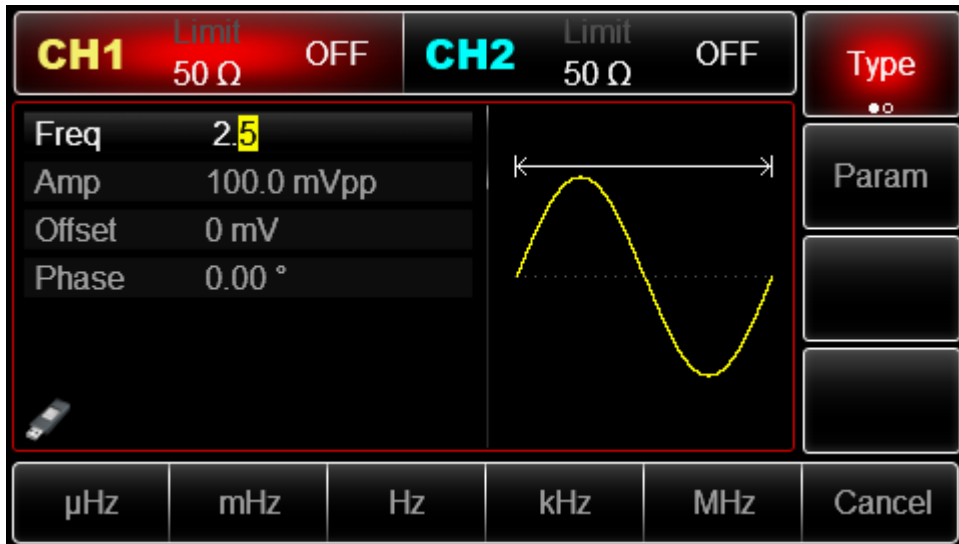
This chapter introduces how to output different waveforms. Default waveform: sine wave with 1 kHz and 100mVpp.

2.4.1 Set output frequency

Default waveform: A sine wave of 1 kHz frequency and 100mV amplitude (with 50Ω termination).

Steps for setting the frequency to 2.5MHz:

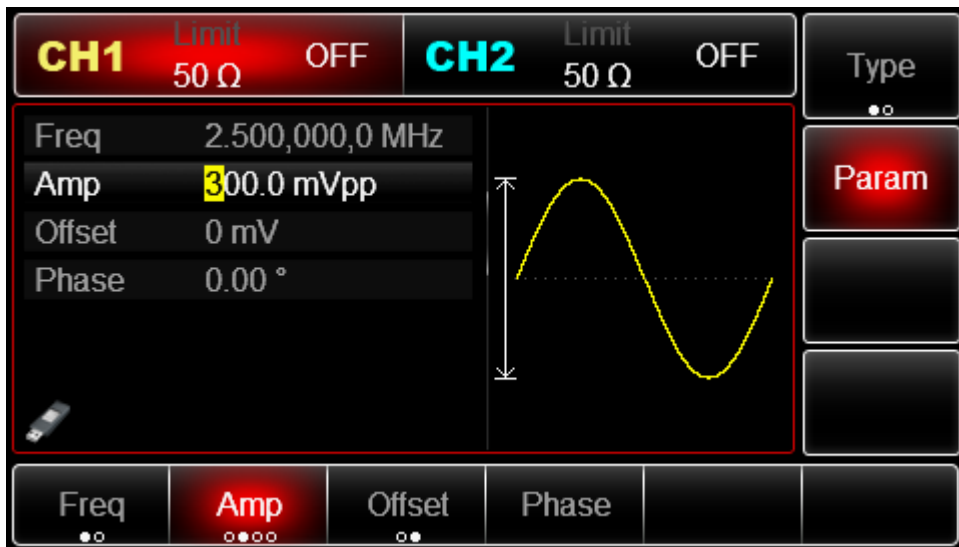
- 1) Press **Menu** → **Wave** → **Param** → **Freq** in turn to set the frequency. Pressing Freq to edit frequency or period.
- 2) Press the number keyboard to input 2.5.
- 3) Select corresponding unit on the bottom bezel menu: MHz



2.4.2 Set output amplitude

Default waveform: A sine wave of 100mV peak-peak value with 50Ω termination. Steps for setting the amplitude to 300mV:

1. Press **Menu** → **Wave** → **Param** → **Amp** in turn. Press Vpp, Vrms, and dBm.
2. Press number button to input 300.
3. Press unit mVpp.



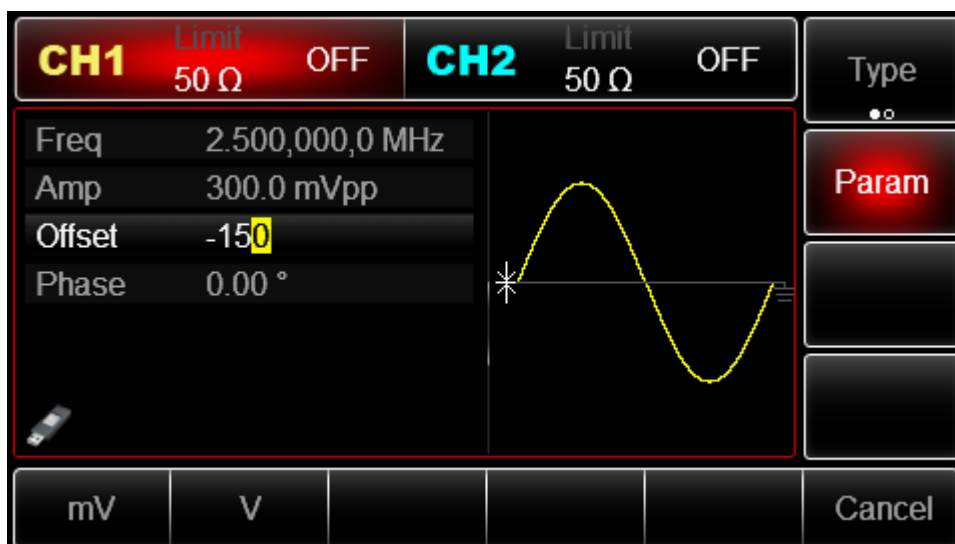
2.4.3 Set DC offset voltage

Default waveform: sine wave with 0V DC offset voltage (with 50Ω termination).Steps for setting DC offset voltage to -150mV:

1. Press **Menu** → **Wave** → **Param** → **Offset**
2. Use number keys to input the required number of -150.
3. Select corresponding unit mV.

Note: if the current DC offset value is valid, use this value. Press offset again, the parameters

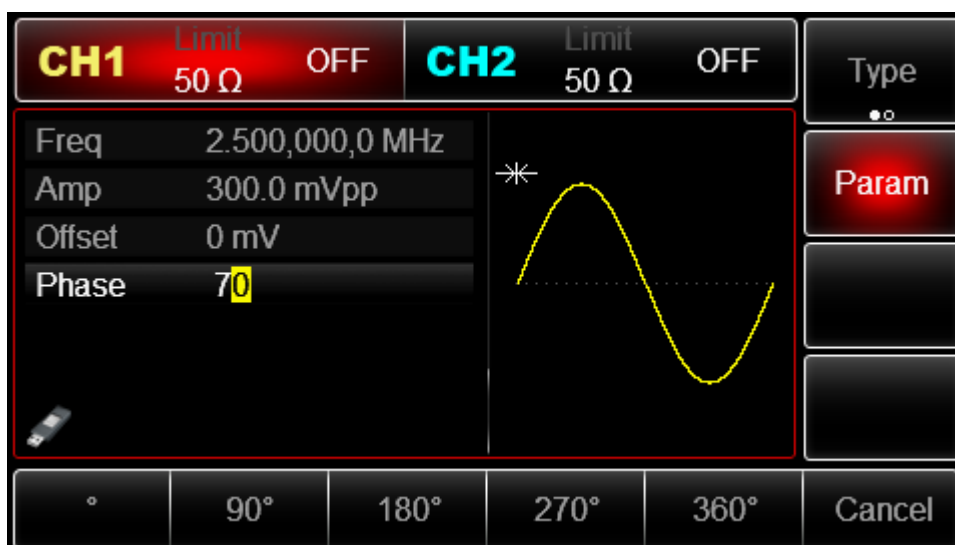
become high level (MAX) and low level (MIN).



2.4.4 Set square wave

Default duty ratio: 50% limited by minimum pulse width 6.5ns. Steps to set a square wave with 1Hz, 1.5Vpp, DC offset 0V, duty ratio 70%:

1. Press **Menu** → **Wave** → **Type** → **Square** → **Param**
2. Enter required numerical value and select the unit.

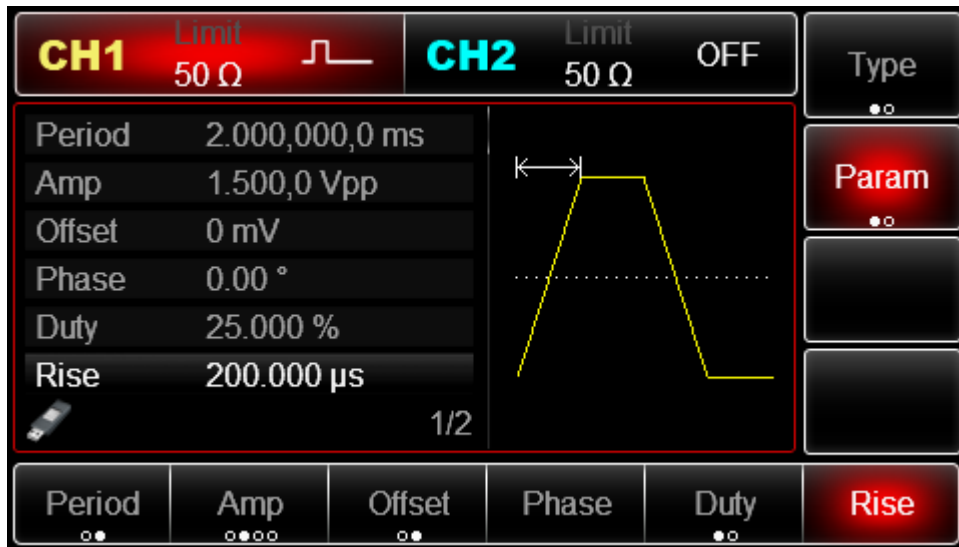


2.4.5 Set pulse wave

Example: period=2ms, amplitude=1.5Vpp, offset=0V, duty=25%, rising time=200us and falling time=200us:

1. Press **Menu** → **Wave** → **Type** → **Pulse** → **Param**, and then press Freq to switch to Period. Enter required number value and select the unit. When entering duty ratio value, there is a label at the bottom of display, and select 25%.
2. Press Param to enter sub menu to set falling edge time, then press Fall to enter required

number and select unit.



Note: This parameter can be set by multifunctional knob and direction buttons.

Chapter 3 Service and Support

3.1 Program Upgrade of Product

Users upgrade the current program of function/arbitrary waveform generator with built-in program upgrade system after getting program upgrade package through Market Department or website of UNI-T to ensure that the program of function /arbitrary waveform generator is the latest version released by UNI-T.

1. Own a UTG2000B function /arbitrary waveform generator of UNI-T, and get model,hardware and software version by pressing soft keys **Utility** → **System** → **About** successively.
2. Get program file and supporting file of upgrade of model the same as that of function/arbitrary waveform generator to be upgraded through website or Market Department of UNI-T, and upgrade according to steps in the supporting file.

3.2 Outline of Warranty

UNI-T (Uni-Trend Technology (China) Limited) guarantees that the products it produces and sells are free from any defects of material and process within 3 years from authorizing the dealer to deliver them. If the product is proven to be defective during warranty period, UNI-T will repair and replace according to provisions of warranty.

To arrange repair or ask for the whole warranty, please contact with the nearest sales or maintenance department of UNI-T.

Except warranties provided in the outline or other applicable warranties, UNI-T does not provide any other express or implied warranties, including but not limited to any implied warranties about tradability and applicability to special purpose of the product. In any case, UNI-T assumes no responsibility for indirect, special or consequent loss.

3.3 Contact Us

You can directly contact with Uni-Trend Technology (China)Co.,Limited (UNI-T,Inc.) in mainland China if you have any inconvenience in use of the product:

Beijing time 8:00 -17:30, Monday-Friday or e-mail us. Our e-mail address: infosh@uni-trend.com.cn

Please contact with local dealer or sales center of UNI-T for products outside the mainland China.

Service support, many products of UNI-T are equipped with plans for extending warranty period and calibration period. Please contact with local dealer or sales center of UNI-T. Please visit our website to get list of addresses of service centers in various regions.

Website: <http://www.uni-trend.com>

This user manual may be revised without prior notice

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