WAVE FACTORY

MULTIFUNCTION GENERATOR

WF198x series

Quick start guide

NF Corporation

DA00102221-003

MULTIFUNCTION GENERATOR

WF198x series

Quick start guide

1. Introduction

This manual describes the Connection method and Power Supply for the instrument, as well as its functions, controls, and Basic Operations. For details, please refer to the detailed version of the Instruction Manual.

1.1 Check accessories

Check the packing list included with the instrument to ensure that all standard accessories and order items are present.

Main unit	1
accessory	
Power Supply cord set (2m, with 3-pole plug)	1
Safety Information	1
Qcuick start guide (this manual)	1

1.2 Download

For the latest versions of detailed instruction manuals (operations, etc.), firmware, and application software, please visit the support/product support page at the URL below.

Please download from the Document library and Software Downloads.

https://www.nfcorp.co.jp/english

This instrument has many useful functions that cannot be explained in this manual. Please also refer to the instruction manual (operation) above.

2. Setup

2.1 Environmental condition

- **This product uses forced air cooling by a fan.**
  There are air intake and exhaust vents on the sides and rear panel. Install the instrument with its sides and rear panel at least 10cm away from walls and other obstructions to so that the air circulation will not be blocked.
- **The temperature and humidity range should be installed in a location that meets the following conditions.**
  Operating: 0 to 40℃, 5 to 85%RH Storage: −10 to 50℃, 5 to 95%RH
  However, use the device under non-condensing conditions.
- **Altitude of 2,000m or less.**
- **Power Supply**

  Voltage/frequency range: AC 100V to 240V 50Hz / 60Hz ±2Hz
  Power consumption: WF1981/WF1983: 50VA or less, WF1982/WF1984: 75VA or less

2.2 Power Supply to instrument

Connect to AC Power Supply using the included power cord.

a) Connect the power cord to the power connector on the back of the device.

b) Connect the Power Supply cord to an appropriate AC mains power source.

Leave enough space around the inlet and outlet so that utility power can be shut off in an emergency.

3. Panel at a Glance

3.1 Front panel

In the following text, the keys on the panel will be expressed as [ENTER], [0] ... [9].

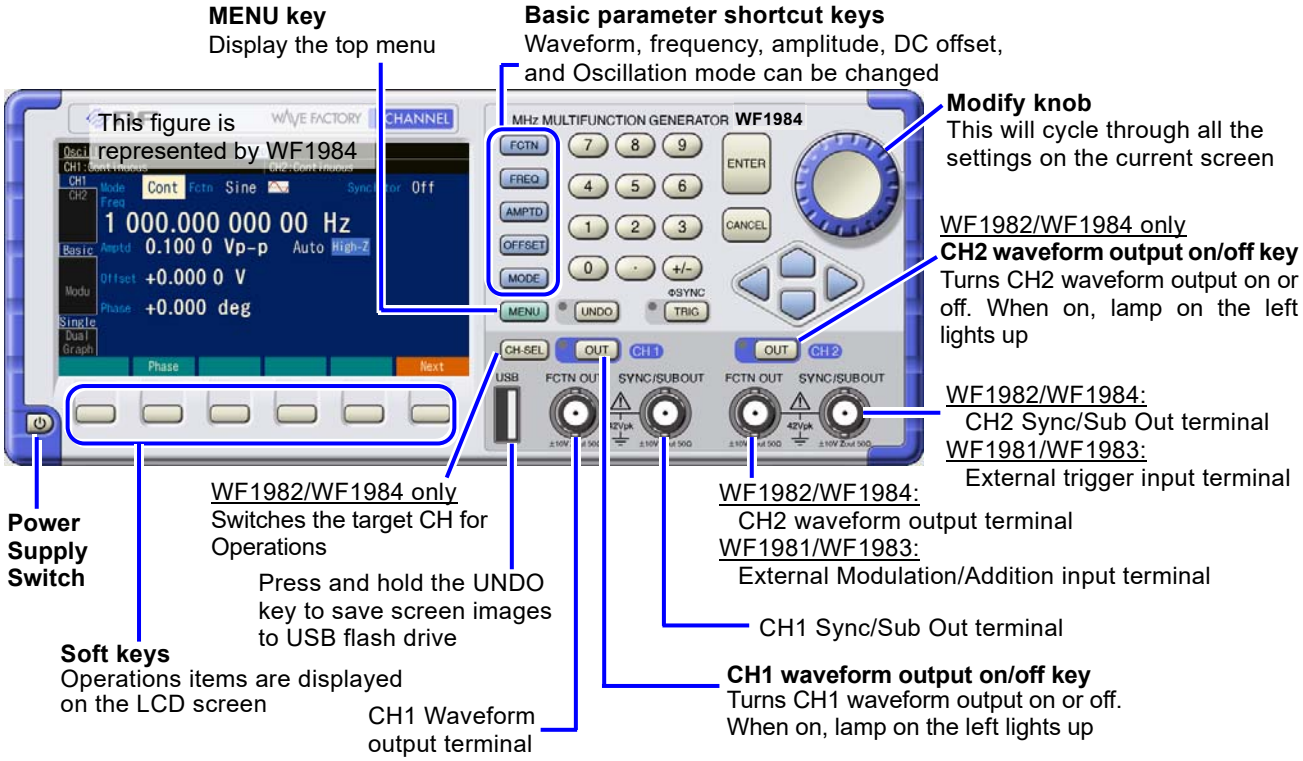


Figure 3-1 Front panel

3.2 Rear panle

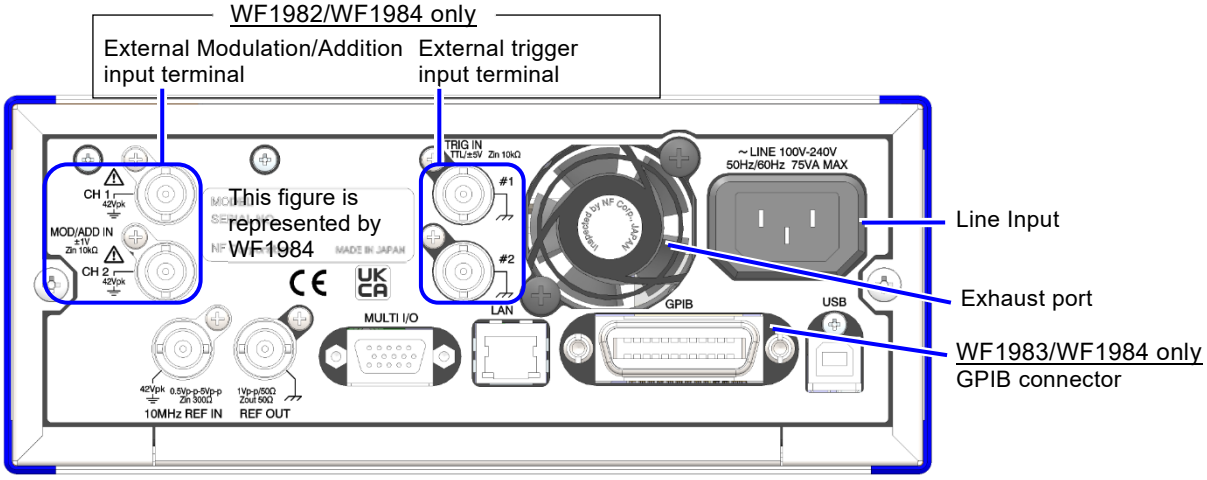


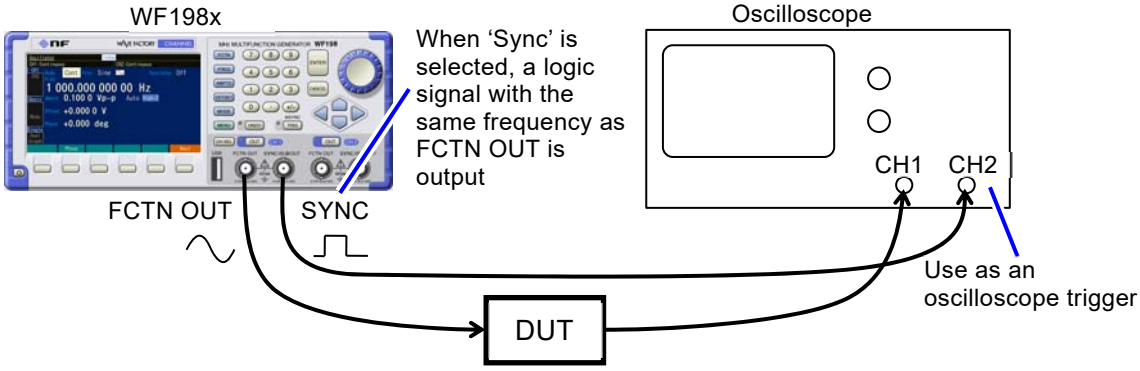
Figure 3-2 Rear panel

3.3 SYNC/SUB OUT terminal Connection

Below is a typical connection example.

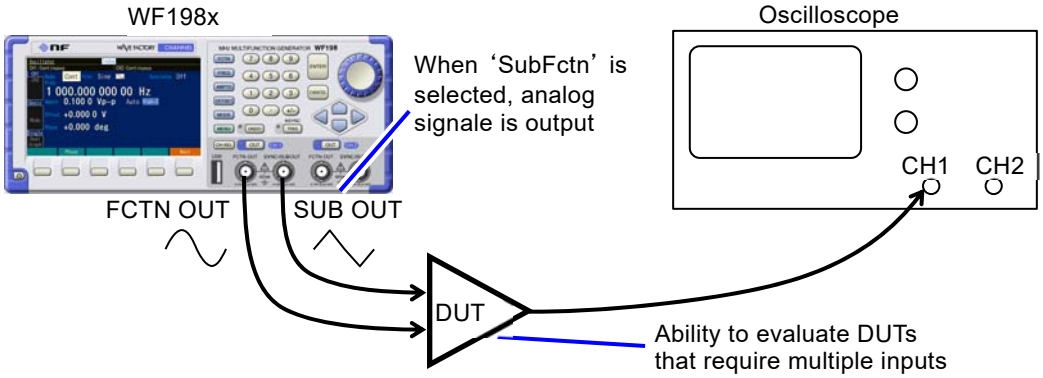
3.3.1 Output a synchronization signal

Press the [Next] soft key several times to switch to the “Modu” screen and set the “SubOut” field to ‘Sync’.



3.3.2 Output an analog signal

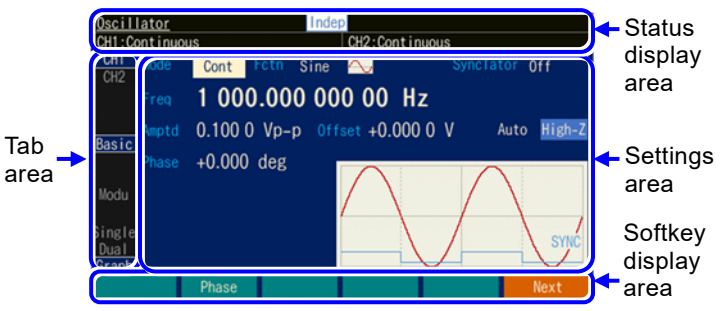
Press the [Next] soft key several times to switch to the “Modu” screen and set the “SubOut” field to ‘SubFctn’. You can change the frequency/phase/waveform/amplitude/DC offset using “SubFreq”, “SubPhase”, “SubFctn”, “SubAmp”, and “SubOffs” fields on that screen.



4. Screen layout and Operation

4.1 Screen layout

The LCD screen display consists of four areas as shown in the following figure.



■ Status display area

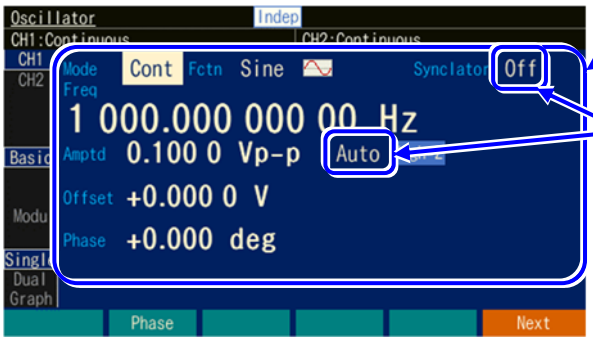
Displays the status of the device

- Channel mode: Indep, Phas, Tone, Ratio, Diff, Diff2, CH1,2
- Remote status: USB, LAN, GPIB
- External frequency reference status: Ref
- Oscillation mode, Operation / Mouduration status

etc. will be displayed.

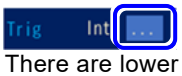
■ Settings area

Display and Settings for various parameters. The contents displayed in the settings area change depending on the tab selected in the tab area.



Settings area: The display contents of this area changes depending on the selected tab

For such areas, select this area and press the ENTER key to display options

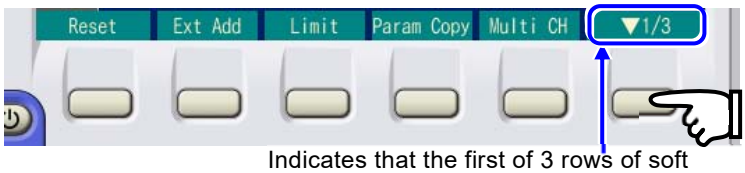


There are lower settings items here, select and Press ENTER to move to another screen

In the example on the left, the basic parameters of CH1 are displayed in "Single" text display format. If you select "Graph" display format, you can get an image of the output waveform as a graph in exchange for the font size.

■ Soft key display area

This area displays the functions (names) of the soft keys which are allocated according to the situation. In the following text, when the soft keys are named "Reset" or "Limit", they will be expressed as [Reset] or [Limit]. If more than 6 soft keys are allocated, [▼n/m] is displayed on the right-most soft key. This indicates that the set of soft keys belonging to the current setting screen consists of m rows in total, and that the set for the nth row is currently displayed. When you press this key, the soft key set for the next row is displayed.

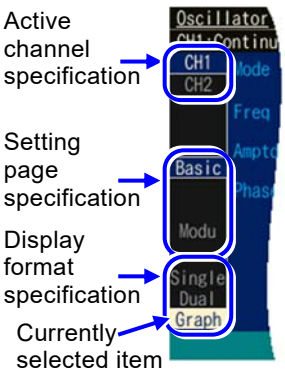


Indicates that the first of 3 rows of soft keys are displayed. The soft keys for the next row are displayed with each press

■ Tab area

This tab is used to switch the content displayed in the settings area. To switch tabs, select the tab you want to switch and press the ENTER key.

- Specifying active channels (WF1984/WF1982 only)
  Indicates the channel to be operated on. Switch with the CH SEL key.
- Setting screen page (Basic/Sweep/Burst/Modu) specification
  Switch the page displayed in the setting area. You can also switch using the [Next] soft key.
- Display format (Single/Dual/Graph) switching
  Switches the format displayed in the settings area.
  The settings displayed are the same regardless of the display format.



4.2 Main Settings Parameters

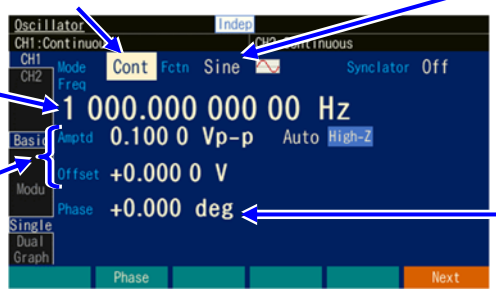
The settings parameters are as follows. Select with the modify knob/arrow keys and open with the ENTER key.

Oscillation mode selection button
Select from Continuous/Sweep/Burst (Currently selected)

Waveform selection button
Select from sine/square/pulse/ramp/ parameter variable waveform/ noise/DC/arbitrary waveform

Frequency
The settable range varies depending on the oscillation mode, waveform, and setting range limit function

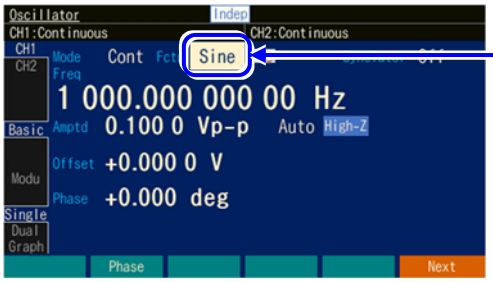
Amplitude and DC offset
The range that can be set changes depending on the setting range limit function.



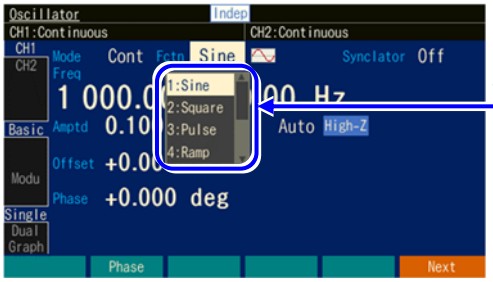
Phase
Settings can be made in the range of ±1800°

5. Basic Settings and Operations

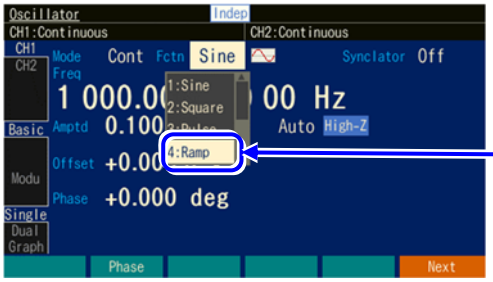
5.1 To change the waveform, Oscillation mode, and other choices



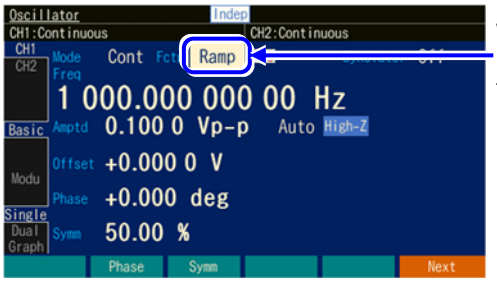
The waveform has been selected. Current waveform is displayed



The list of options is now open.

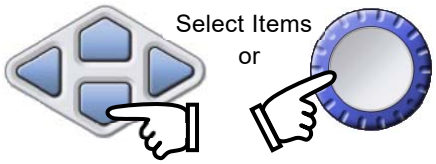


Selected Ramp



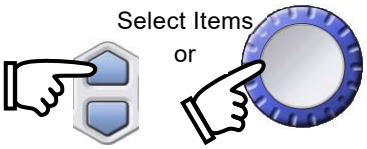
Waveform has been set to Ramp

1. Select items with the arrow keys or modify knob.
In the example on the left, the Waveform “Fctn” field is selected.



2. Press ENTER to open the list of choices.
(In this example, options after “4:Ramp” are hidden.)

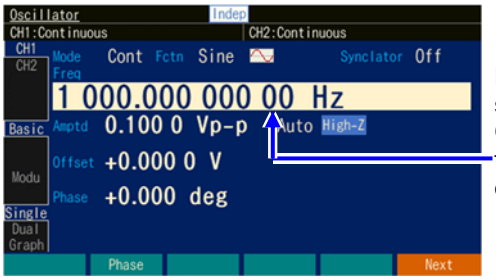
3. Use the up/down keys or the modify knob to move through the list of choices.
In this state, you can also specify items by entering their numbers using the numeric keypad.



4. Pressing the ENTER key sets the selected items and reflects them in the output. The list of choices is closed.

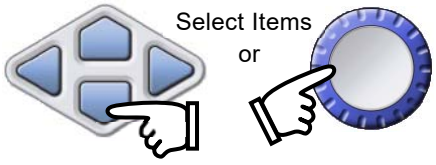
5.2 Change the values of frequency, amplitude, etc. In case of

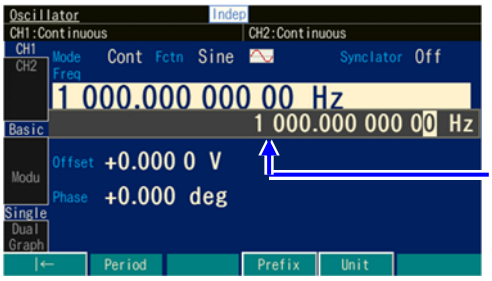
a) Settings are made with the up/down keys (or modify knob)



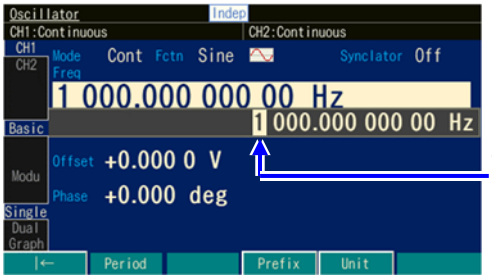
Frequency selected. Current frequency is displayed

1. Select items using the arrow keys or the modify knob.
In the example on the left, the frequency “Freq” field is selected.

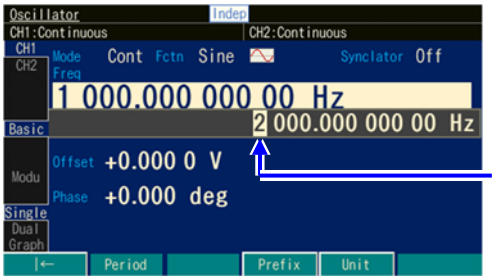




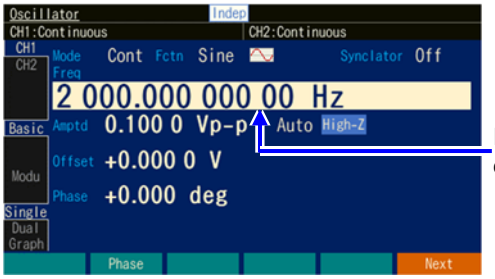
The input field is opened



The change digit is now at 1kHz

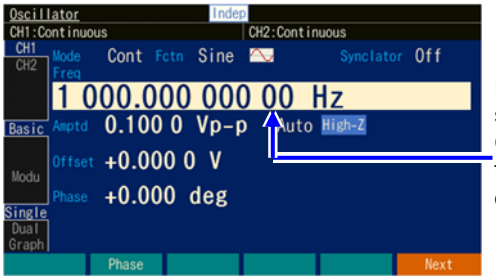


The value of the change digit is now 2



Input field closed

b) Numeric Keypad 0 ... 9 to change value

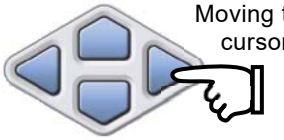


Frequency selected. Current frequency is displayed

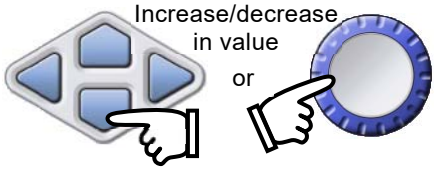
An input field will open and the values will be entered

2. Pressing the ENTER key opens an entry field below or above the selected items, and the current value of the selected items can be changed. In this state, you can also enter a value using the numeric keypad.

3. Press the left and right keys to move the cursor to the digit whose value you want to change. In the example on the left, the cursor is moved to the 1kHz digit.

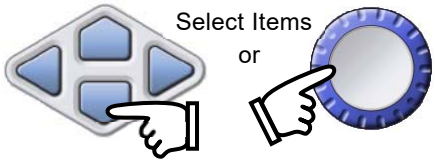


4. Use the up/down keys or modify knob to increase or decrease the value of the change digit. In the example on the left, the value is changed to 2kHz. The change is immediately reflected in the output.

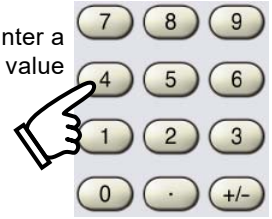


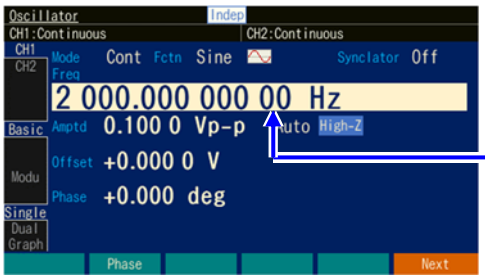
5. Press the ENTER key to close the entry field. You can also use the CANCEL key instead of the ENTER key to discard changed values and return to the original settings.

1. Select items using the arrow keys or the modify knob. In the example on the left, the frequency "Freq" field is selected.



2. Pressing the numeric keypad opens an entry field below or above the selected items, and the numbers are entered.





Settings have been changed and the input field has been closed

3. Pressing the ENTER key or the Units key (soft key) sets the entered value and reflects it in the output.

or

If the ENTER key is pressed, the value is set in Units without a prefix such as k or m.

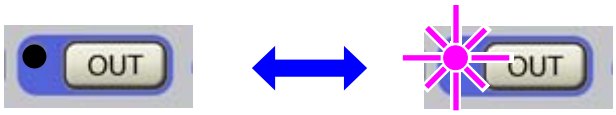
> **Check**
> If a Settings item is displayed on a soft key, the soft key can be used to display the entry field for that item.

5.3 Output On/Off Operations

Each time the waveform output on/off key (OUT key) is pressed, the waveform output is switched on or off. When the output is on, the lamp on the left side of the key lights up.

Output On/Off key

When the output is off, the output terminal is open. When the output is on, the output impedance is 50Ω. Sync/Sub output is always on regardless of Sync output signal Settings. (It is possible to fix the sync/sub output to 0V by setting.)



> **Check**
> A mechanical relay is used to turn waveform output on and off. Therefore, chattering may occur when switching waveform output on and off. Please use the Trigger Burst or Gate Oscillation mode when connecting to instruments that may malfunction due to chattering.

> **Check**
> The relay inside the instrument that switches the output on and off is a serviceable component. Frequent repetition of turning them on and off may cause them to fail prematurely or even within the warranty period of the product. The life of a relay is approximately 100,000 cycles.
> Consider using Trigger Burst or Gated Oscillation mode instead of on/off.

5.4 ENTER, CANCEL, and UNDO keys

■ ENTER key ENTER

The following decision action is taken

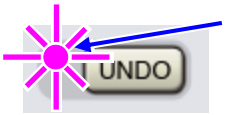
- Open the entry field for the selected items or the list of choices.
- Settings are made for values entered using the numeric keypad.
- Execute the function of the button displayed on the screen.

■ CANCEL key (CANCEL)

The following cancel operation is performed. However, once Settings have been changed, they cannot be undone with this key (to undo, use the (UNDO) key described in the next section).

- Closes the input field and the list of choices.
- Discard the numeric value entered on the numeric keypad.
- Undo the value changed by the Modify knob.
- Close the Settings window or dialog box.

■ UNDO key (UNDO)



When the LED lamp is lit, UNDO is available

Undo any Settings changes made by the (ENTER) key or Modify knob. Settings that were automatically changed as a result of the previous Operations can also be undone.

Pressing the (UNDO) key again immediately after undo operations returns to the Settings before undoing. However, there are some operations that cannot be undone. When undo is possible, the LED will light up.

You can also press and hold this key to save the screen image to a USB flash drive.

5.5 CH1/CH2 switching key and active channel (WF1982/WF1984 only)

Each time the CH1/CH2 selection key (CH SEL) is pressed, the channel for Settings items is switched. This key is invalid for the channel-independent Settings screen.

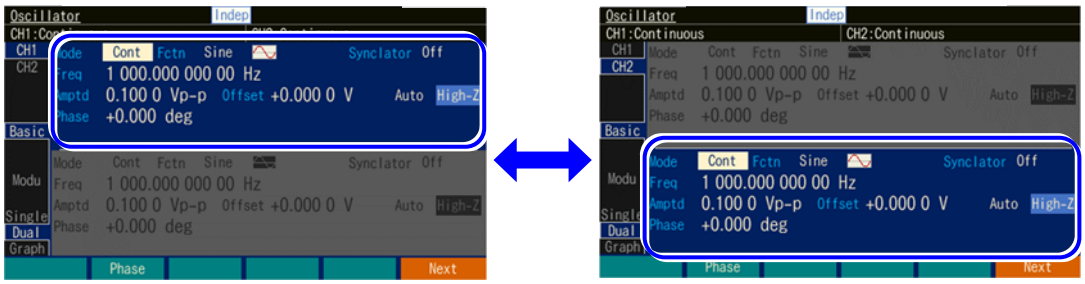
The channel that is the Setting items is called the "active channel" in this product. In Burst mode, the (TRIG) key works on the active channel. Even if you move to the Settings screen independent of the channel, the previously active channel is saved.

CH1/CH2 toggle key

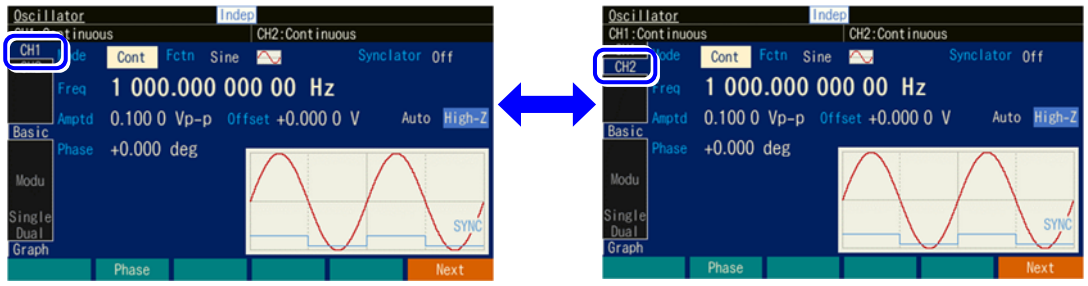
CH1 is active
(CH1 is the target for setting)

Display format: Dual

CH2 is active
(CH2 is the target for setting)



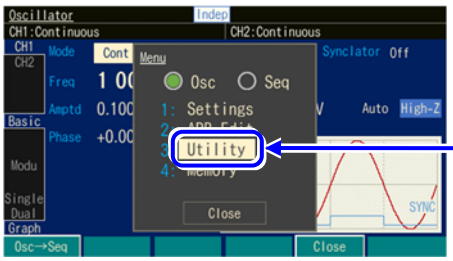
Display format: Graph



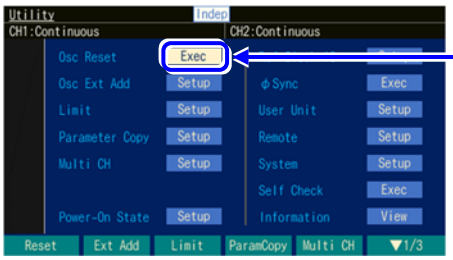
Current active channel is displayed at the top of the tab area of the Oscillator screen

5.6 To Restore Initial ettings

To restore the Initial Settings, perform Operations on the Utility screen. If the operation mode is sequence oscillation (the first line of the top menu is “Seq”), first press the soft key [Seq→Osc] and the soft key [OK] to switch to the oscillator mode.



Select “Utility” from the top menu and press ENTER key



On the Utility screen select “Osc Reset” and press ENTER key

1. Press the MENU key to open the top menu in the Settings area. Select “Utility” and then press the ENTER key. The Utility menu opens. You can also use the numeric keypad 3 after the top menu is displayed.
2. Select “Osc Reset” and then press the ENTER key. This initializes the settings. You can also use [Reset] soft key.
3. Confirmation dialog will appear. Press [OK] soft key or select [OK] in the dialog and press the ENTER key to initializes the settings. If you wish to cancel initialization, press the CANCEL key to close the dialog.

To return to the normal oscillator screen from the Utility screen, press the MENU key and then the numeric keypad 1.

5.7 To set waveforms

This device can easily generate a wide variety of waveforms such as the ones below.

Pressing the FCTN key opens the waveform selection. Choose from the following 8 options:

- Sin wave ‘Sine’
- Square wave (Variable duty) ‘Square’
- Ramp wave (Variable symmetry) ‘Ramp’
- Gaussian distribution Noise (Variable equivalent bandwidth) ‘Noise’
- Direct current component only ‘DC’
- Pulse wave (Variable LE/TE/Duty/Transition waveform) ‘Pulse’
  Transition waveform can be selected from cosine ‘COS’, liner ‘LIN’, ‘PWF’, and ‘ARB’
- Parameter variable waveform ‘PWF’
  26 types of PWF types and up to 6 variables for each waveform
- Arbitrary waveform ‘ARB’ (Control point/array format)

LE: leading edge time
TE: trailing edge time

5.8 Oscillation mode and modulation function

Pressing the MODE key opens the oscillation mode selection. Choose from the following 3 options:

- 1 Continuous mode ‘Cont’
- 2 Sweep mode ‘Sweep’
- 3 Burst mode ‘Burst’

Modulation (non-competitive) is possible even in cases other than continuous mode.

To set modulation, use the [Next] softkey to move to the Modu page.

Set the “ModTyp” field to anything other than ‘Off’ (‘FM’, ‘FSK’, ‘PSK’, ‘AM’, ‘AM(SC)’, ‘OFSM’, ‘PWM’) to perform the specified modulation.

Double Side Band - Suppressed Carrier

DC offset moduration

NOTES

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