

User manual JINHAN JDS2022Q



CATALOGUE

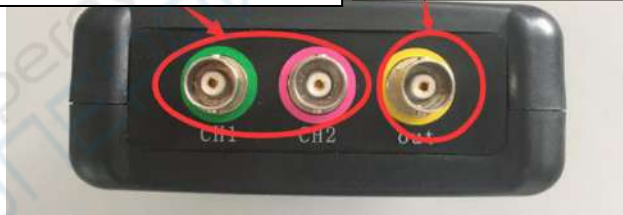
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Special note:	Error! Bookmark not defined.
The solenoid valve box does not work for more than 10 minute	Error! Bookmark not defined.
defined.	
The 18650 lithium batteries used for the power supply of this instrumnet do not have a protective plate	Error! Bookmark not defined.

Exterior:



Oscilloscope CH1, CH2 input

Automotive signal source output

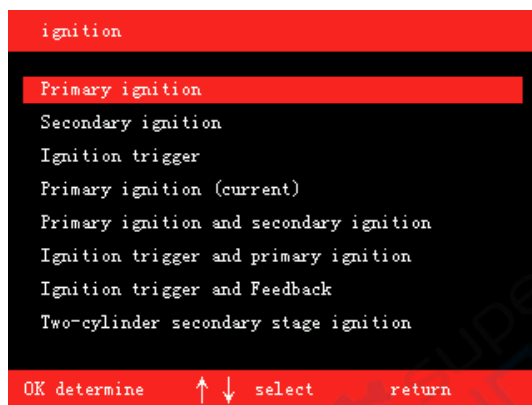


Main interface:



Boot into the main interface, you can use different functions through each submenu.

Ignition:



The main function of the ignition menu is to help customers quickly set the commonly used ignition signal parameters of the oscilloscope.

Key functions under the ignition menu:

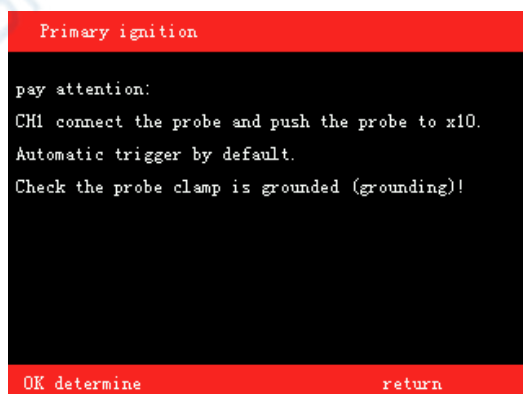
OK determine

↑↓select

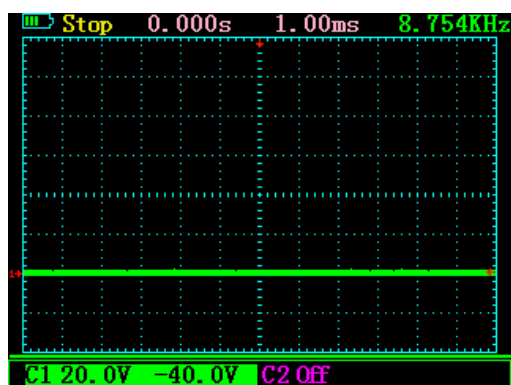
return return to the preview menu

Routine 1:

After selecting the primary ignition, after the OK button is confirmed, there will be corresponding notices:

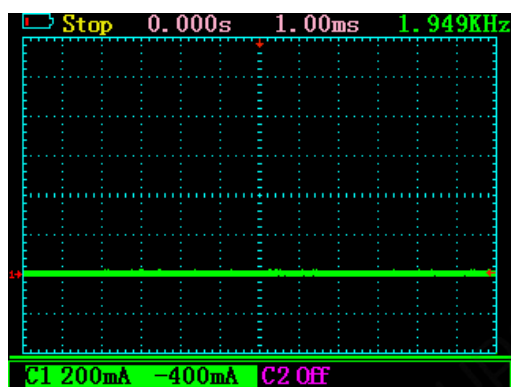


At this time, press the OK key again to enter the waveform test (you can also press the return key to return to the previous menu)



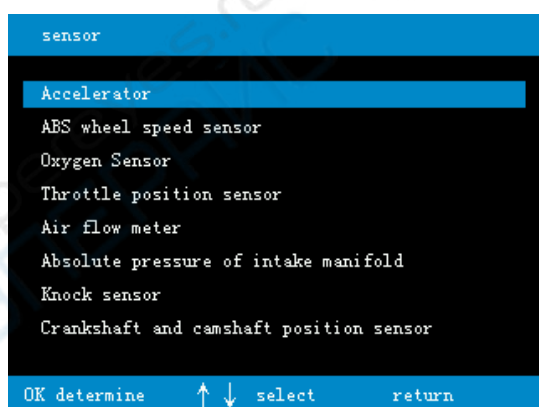
Example 2 (use of current clamp):

Select primary ignition (current), OK key to confirm after entering the oscilloscope:



Note: At this time, the relevant parameter values of the oscilloscope interface have been adjusted to the current unit A, and all current parameters can be read directly.

Sensor:



The main function of the sensor menu is to help customers quickly set the commonly used sensor signal parameters of the oscilloscope.

Button functions under the sensor menu:

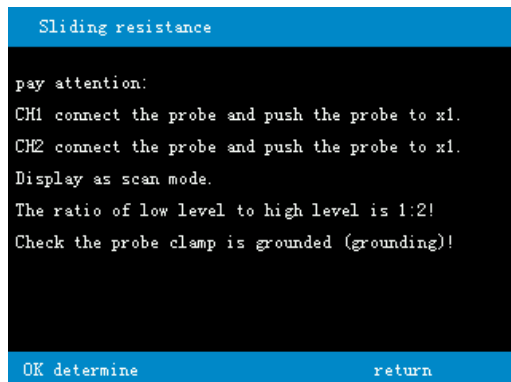
OK determine

↑ ↓ select

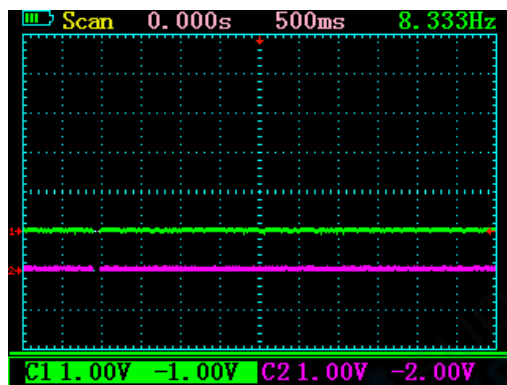
return return to the preview menu

Routine:

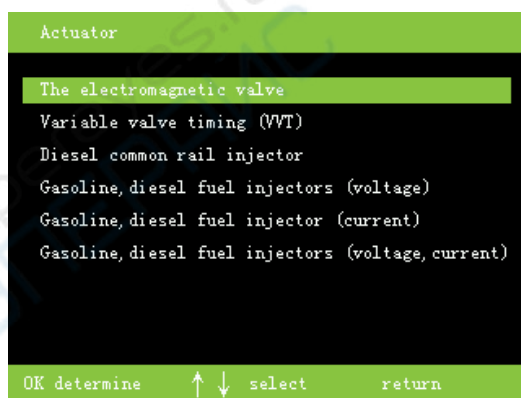
Select the sliding resistance type of the accelerator pedal, after the OK button is confirmed, there will be corresponding notices:



At this time, press the OK key again to enter the waveform test (you can also press the return key to return to the previous menu)



Actuator:



The main function of the actuator menu is to help customers quickly set the commonly used actuator signal parameters of the oscilloscope.

Button functions under the actuator menu:

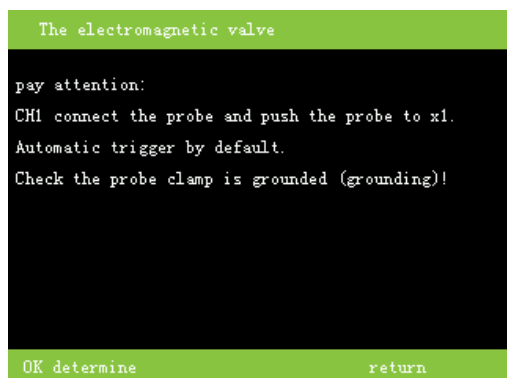
OK determine

↑ ↓ select

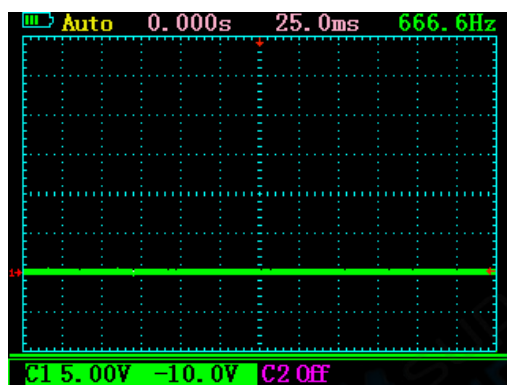
return return to the preview menu

Routine:

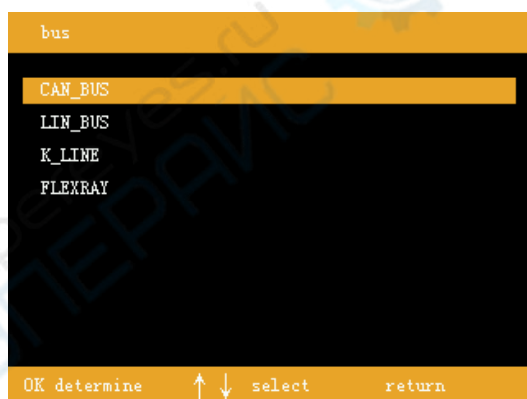
After selecting the solenoid valve and confirming the OK button, there will be corresponding notices:



At this time, press the OK key again to enter the waveform test (you can also press the return key to return to the previous menu)



Bus:



The main function of the bus menu is to help customers quickly set the commonly used bus signal parameters of the oscilloscope.

Button function under bus menu:

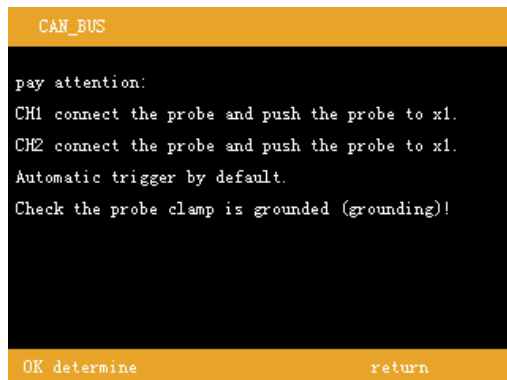
OK determine

↑ ↓ select

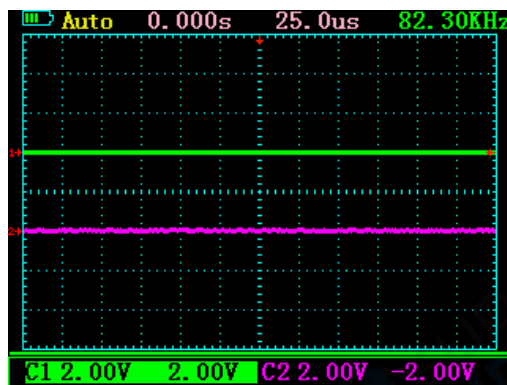
return return to the preview menu

Routine:

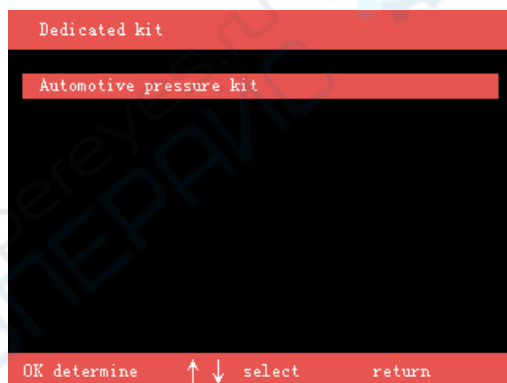
After selecting the can bus and confirming with the OK button, there will be corresponding notices:

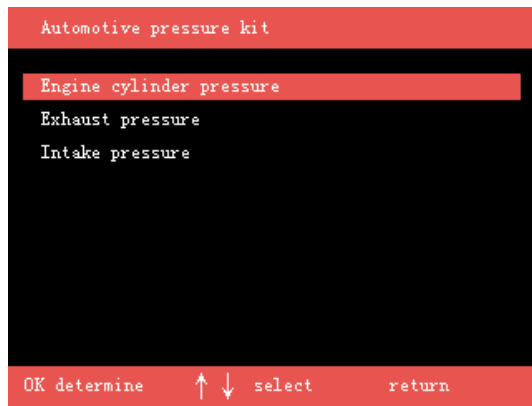


At this time, press the OK key again to enter the waveform test (you can also press the return key to return to the previous menu).



Auto repair kit:





The main function of the car kit menu is to help customers quickly set the relevant parameters of the oscilloscope when using the specified accessories.

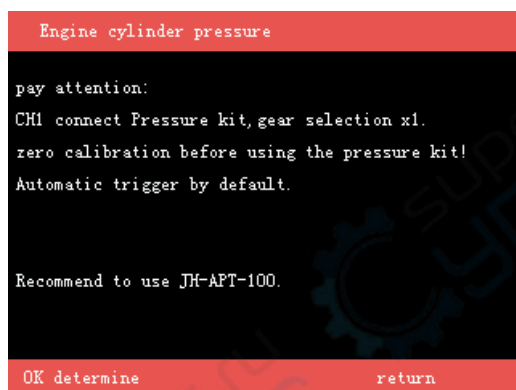
OK determine

↑↓ select

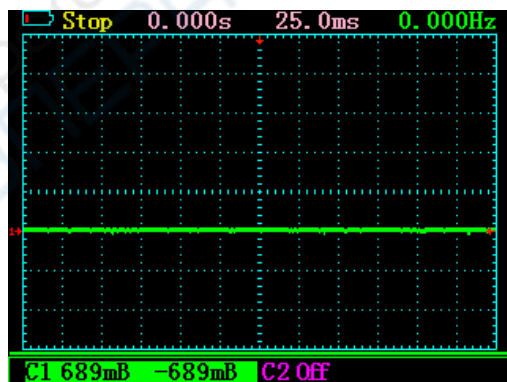
return return to the preview menu

Routine:

Select the engine cylinder pressure and confirm with the OK button, there will be corresponding notices:

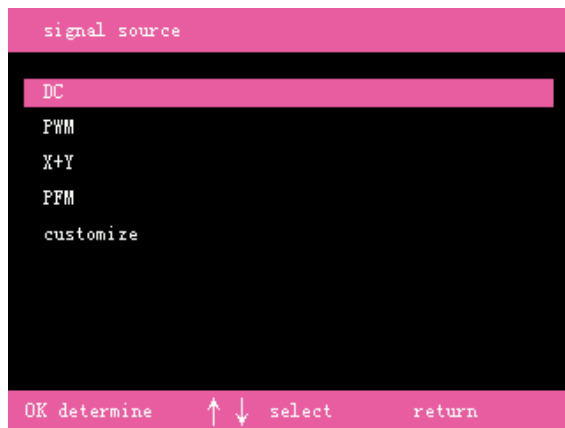


At this time, press the OK key again to enter the waveform test (you can also press the return key to return to the previous menu).



Note: At this time, the relevant parameter values of the oscilloscope interface have been adjusted to the pressure unit Bar, and all pressure parameters can be directly read

Car signal source:

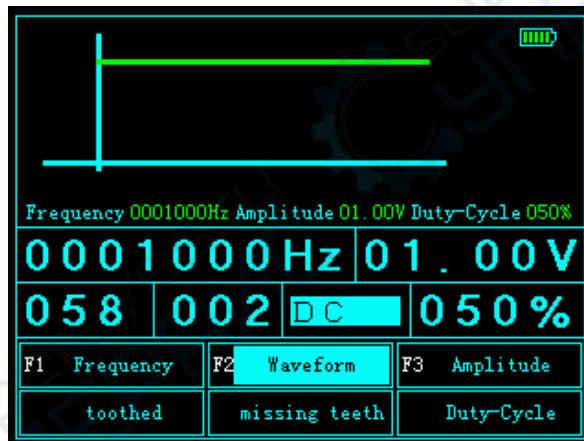


The main function of the car signal source is to simulate common car signals, such as water temperature, intake pressure, crankshaft, etc., and simulate ecu to control and drive actuators, such as ERG solenoid valves, canister solenoid valves, fuel injectors, etc.

DC

The DC option enters the signal source, which is the analog output DC level (0-5V) to drive various sensors with a voltage of 0-5V or 0-3V, such as water temperature sensors, intake air pressure sensors, etc.

Select the signal output after entering, the operation interface is as follows:



Key function of signal output interface under DC:

F1 Select frequency - X-Toothed (DC Down frequency, X-Ineffective tooth adjustment)
F2 Select waveform- Y-Missing teeth (DC Lower waveform, Y-Ineffective adjustment of missing teeth)

F3 Select range - Duty cycle (DC Down duty cycle adjustment is invalid)

↑ Modify the output voltage (amplitude is the voltage value)

↓ Modify the output voltage (amplitude is the voltage value)

← Modify carry value

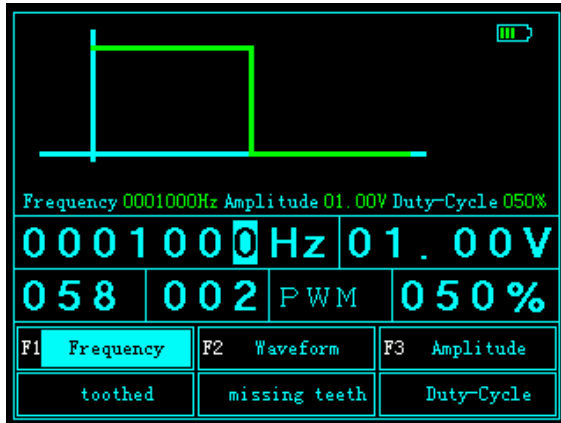
→ Modify carry value

PWM

The PWM option enters the signal source, which is the analog output duty cycle signal to drive the corresponding solenoid valve, such as ERG solenoid valve, carbon canister solenoid valve, fuel injector, etc.

(Note: The drive solenoid valve must be connected to an external drive box, and the external drive box needs to be connected to a 12V power supply. For specific connection methods, see the hardware connection diagram)

Select the signal output after entering, the operation interface is as follows



Button function of signal output interface under PWM:

F1 select frequency-X-with gear (X-with gear adjustment is invalid under PWM)

F2 select waveform-Y-missing tooth (waveform under PWM, Y-missing tooth adjustment is invalid)

F3 select range-duty cycle

↑ Modify output values (voltage, frequency, duty cycle)

↓ Modify the output value (voltage, frequency, duty cycle)

← Modify carry value

→ Modify the carry value

(Note: The square wave voltage that drives the external drive box should be controlled between 3V-5V, and the power-on time of the whole set of equipment and the solenoid valve peripheral should be less than 10 minutes.)

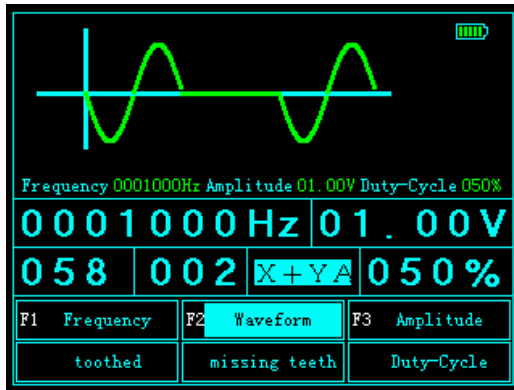
X+Y

The X+Y option enters the signal source, which is the analog output of the crankshaft signal. The crankshaft signal is divided into magnetolectric and Hall, and must be distinguished before use.

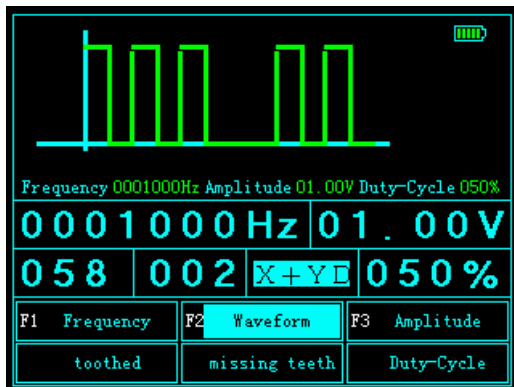
(Note: X represents the number of teeth on the crankshaft disk, and Y represents the number of missing teeth on the crankshaft disk)

Select the signal output after entering, the operation interface is as follows:

X+YA (magnetolectric crankshaft)



X+YD (Hall crankshaft)



Button function of signal output interface under X+Y:

F1 select frequency-X-with tooth

F2 select waveform-Y- missing tooth (waveform under X+Y, adjustment is invalid)

F3 select amplitude-duty cycle (duty cycle under X+Y, amplitude is not adjustable)

↑ Modify the output value (X-tooth, Y- missing tooth, frequency)

↓ Modify the output value (X-tooth, Y-missing tooth, frequency)

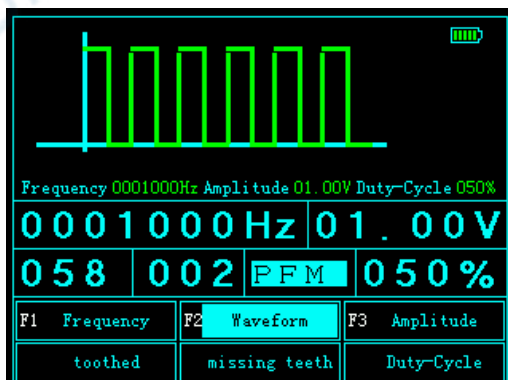
← Modify carry value

→ Modify the carry value

PFM

The PFM option enters the signal source, which is the analog output digital signal (usually square wave), which is used to simulate digital sensors, such as digital air flow meters, etc.

Select the signal output after entering, the operation interface is as follows:



Key functions of signal output interface under PFM:

F1 select frequency-X-with tooth (X-with tooth adjustment is invalid under PFM)

F2 select waveform-Y-missing tooth (waveform under PFM, Y-missing tooth adjustment is invalid)

F3 select amplitude-duty cycle (duty cycle under PFM, amplitude is not adjustable)

↑ Modify output value (frequency, amplitude)

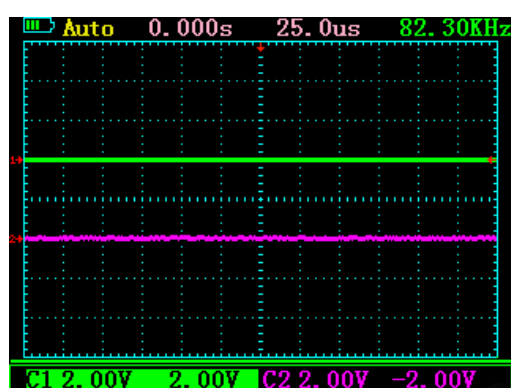
↓ Modify the output value (frequency, amplitude)

← Modify carry value

→ Modify the carry value

Oscilloscope

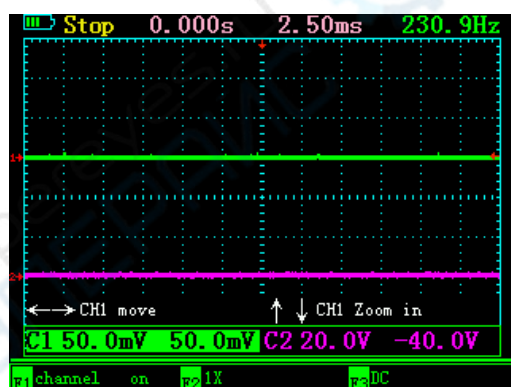
After selecting the oscilloscope in the main menu, you will enter the custom oscilloscope interface.



The function buttons of the oscilloscope are classified as follows:

Channel 1

Press the channel 1 button to enter the channel menu.



Under the channel 1 button, the function keys have the following functions:

F1 Channel 1 display switch

F2 unit number x1, x10, x100 selection

F3 AC/DC coupling selection

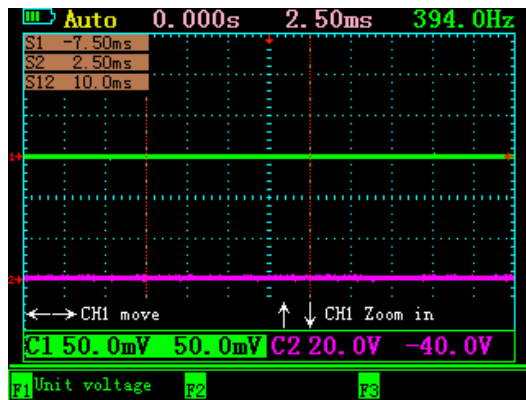
OK Save the reference waveform when reference waveform A and B are open

← CH1 move

→ CH1 move

- ↑ CH1 gear adjustment
- ↓ CH1 gear adjustment

Press the channel 1 button again to enter the channel unit display menu.



Under the channel 1 button, the function keys have the following functions:

F1 channel 1 unit selection (voltage, current, pressure)

F2 is invalid

F3 is invalid

OK Save the reference waveform when reference waveform A and B are open

← CH1 move

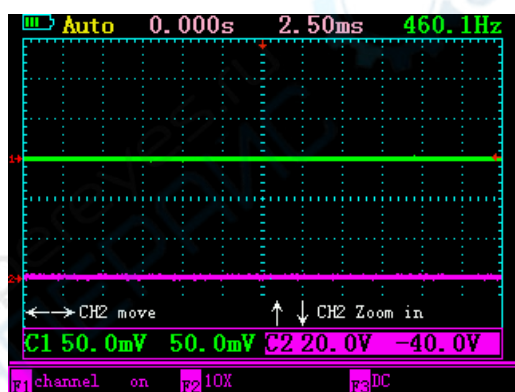
→ CH1 move

↑ CH1 gear adjustment

↓ CH1 gear adjustment

Channel 2

Press channel 2 to enter the channel menu.



In the channel 2 menu, the function keys have the following functions:

F1 Channel 2 display switch

F2 unit number x1, x10, x100 selection

F3 AC/DC coupling selection

OK Save the reference waveform when reference waveform A and B are open

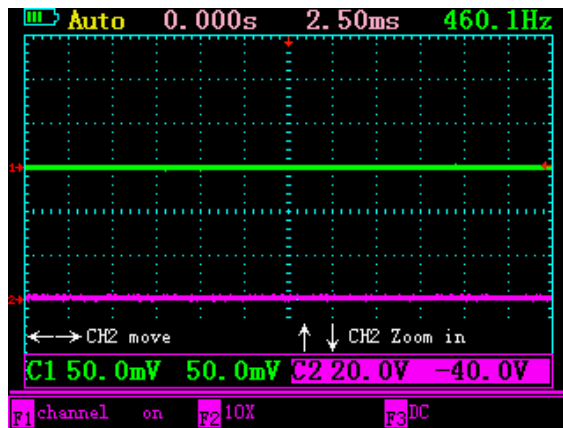
← CH2 move

→ CH2 move

↑ CH2 gear adjustment

↓ CH2 gear adjustment

Press the channel 2 button again to enter the channel unit display menu.



In the channel 2 menu, the function keys have the following functions:

F1 channel 2 unit selection (voltage, current, pressure)

F2 is invalid

F3 is invalid

OK Save the reference waveform when reference waveform A and B are open

← CH2 move

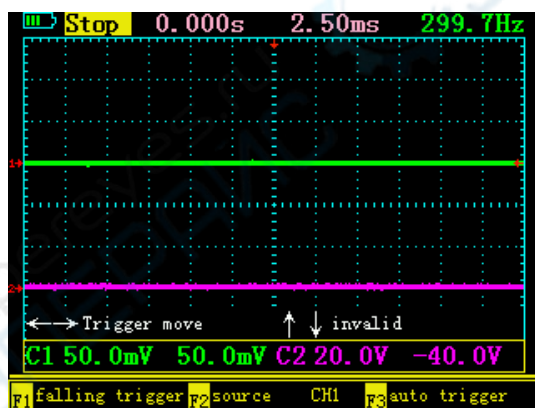
→ CH2 move

↑ CH2 gear adjustment

↓ CH2 gear adjustment

Trigger (TRIG)

Press the TRIG-MATH key for the first time to enter the trigger menu.



In the trigger menu, the function keys have the following functions:

F1 Rising edge and falling edge trigger selection

F2 select trigger CH1 or CH2

F3 select auto trigger, normal trigger or single trigger

OK Save the reference waveform when reference waveform A and B are open

← Trigger movement (when smart trigger is off)

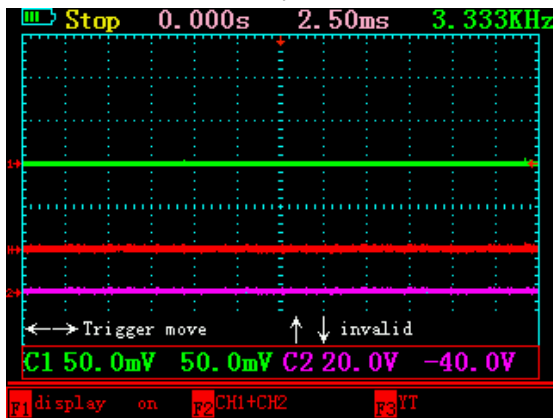
→ Trigger movement (when smart trigger is off)

↑ invalid

↓ invalid

MATH

Press the TRIG-MATH key for the second time to enter the MATH menu.



In the MATH menu, the function keys have the following functions:

F1 M waveform is displayed

F2 select calculation type

F3 select display mode XY or YT

OK Save the reference waveform when reference waveform A and B are open

← Trigger movement (when smart trigger is off)

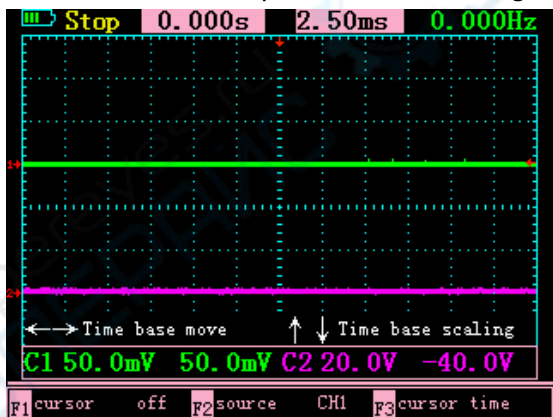
→ Trigger movement (when smart trigger is off)

↑ invalid

↓ invalid

Toki (HORI)

Press the time base key to enter the following menu:



In the time base menu, the function keys have the following functions:

F1 scale displayed or not

The object of the F2 scale is CH1 or CH2

F3 scale unit (time, voltage or current or pressure)

OK Save the reference waveform when reference waveform A and B are open

← Trigger reference point movement

→ Trigger reference point movement

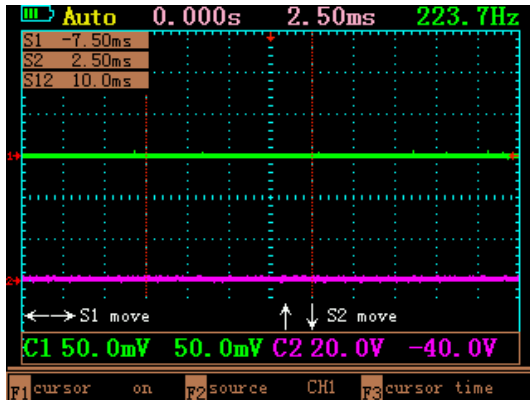
↑ Time base adjustment

↓ Time base adjustment

Ruler

In the time base menu, choose to open the cursor, and you will enter the ruler menu:

The upper foot of the interface will display the parameters of scale 1, 2.



In the time base menu, the function keys have the following functions:

F1 scale displayed or not

The object of the F2 scale is CH1 or CH2

F3 scale unit (time, voltage or current or pressure)

OK Save the reference waveform when reference waveform A and B are open

← Ruler 1 move

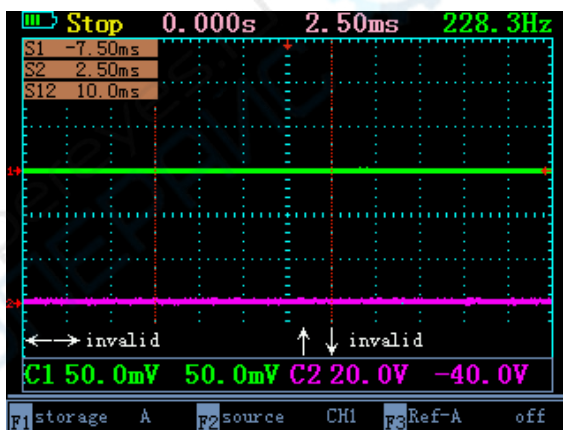
→ Ruler 1 moves

↑ Ruler 2 moves

↓ Ruler 2 moves

Menu (MENU)

Press the menu key for the first time to enter the following interface.



Under the menu, the function keys have the following functions:

F1 reference waveform A or B

F2 Save CH1 or CH2 with reference to the waveform

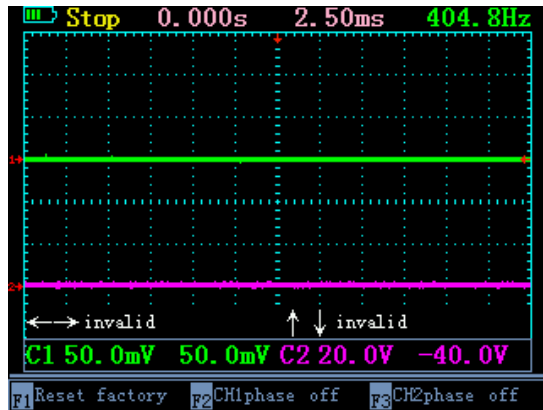
F3 Whether reference waveform A or B is turned on

OK Save the reference waveform when reference waveform A and B are open

← invalid

- invalid
- ↑ invalid
- ↓ invalid

Press the menu button for the second time to enter the following interface.



Under the menu, the function keys have the following functions:

F1 to enter the factory reset menu

F2 CH1 waveform is inverted

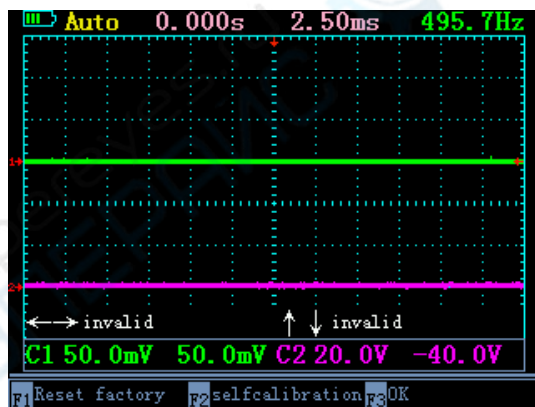
F3 CH2 waveform is inverted

OK Save the reference waveform when reference waveform A and B are open

- ← invalid
- invalid
- ↑ invalid
- ↓ invalid

Factory reset and self-calibration

Select factory reset in the menu and enter the following menu



Under the menu, the function keys have the following functions:

F1 is invalid

F2 self-calibration

F3 Confirm to restore factory settings

OK Save the reference waveform when reference waveform A and B are open

- ← invalid
- invalid

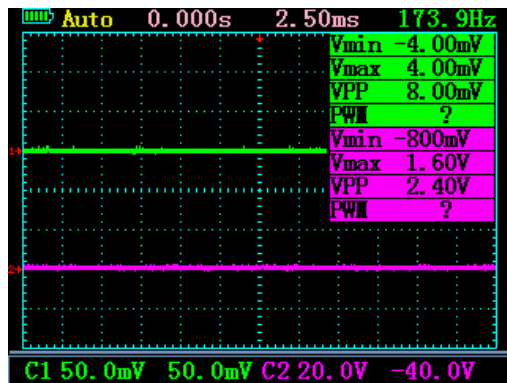
↑ invalid

↓ invalid

(Note: Do not connect to any external equipment during self-calibration, make sure the channel is disconnected!)

Parameter display

Press the parameter key to display the parameters of each channel in the upper right corner of the screen:



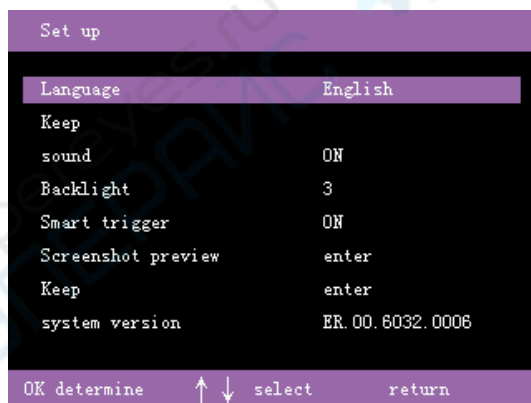
Vmin minimum voltage (will be displayed as the unit of the relevant channel changes, current, pressure)

Vmax maximum voltage (will be displayed as the unit of the relevant channel changes, current, pressure)

VPP amplitude value (will be displayed as the unit of the relevant channel changes, current, pressure)

PWM duty cycle

Set up



Setting option description:

Language Currently supports 5 languages (Chinese, English, Russian, Spanish, Portuguese)

Sound Choose to turn on or off the key sound

Backlight screen brightness adjustment 1-5 levels

Smart trigger Turn smart trigger on or off

Screenshot preview View previous screenshots locally

Waveform browse local view previously saved waveform

Smart trigger

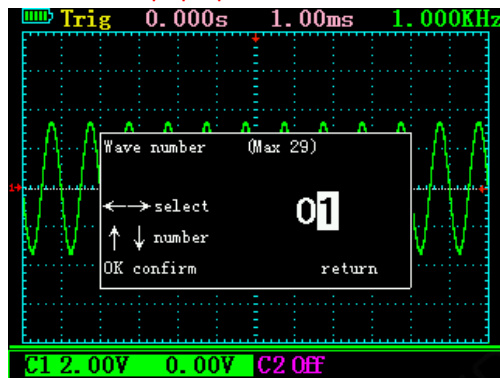
When the smart trigger is turned on, in the oscilloscope, when the waveform meets the trigger condition, the trigger arrow will automatically find the appropriate trigger point and trigger. It saves the manual adjustment step.

This function is only valid in automatic trigger mode, normal trigger and single trigger do not support this function!

Screenshot preview

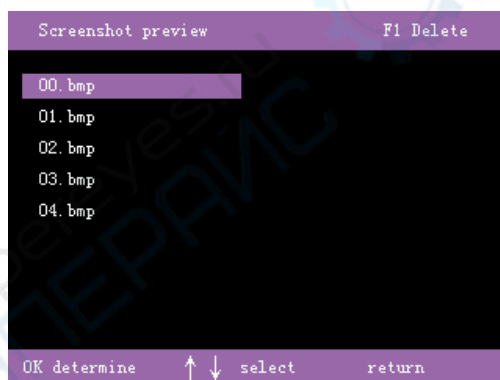
This device supports one-click capture of the current screen.

Long press the parameter key for 2 seconds, you will hear 2 beeps, and the screenshot will start in the background. After the screenshot is completed, a dialog box for customizing the screenshot number will pop up.



After editing the number (currently supports 0-7 up to 8 pictures), press ok to save.

After the screenshot is completed, select the screenshot preview in the settings, and enter to see the current screenshot.

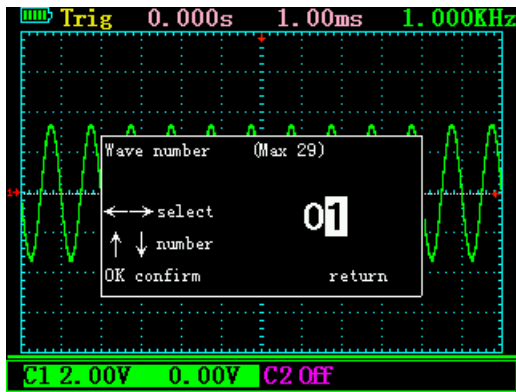


In this interface, you can use the ok key to view the screenshots locally, or use the F1 key to delete the pictures.

Waveform browsing

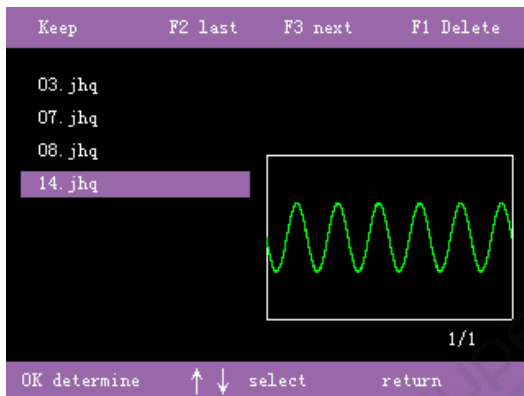
In oscilloscope mode, the device supports the function of saving the current waveform with one key.

Press and hold the OK key for 2 seconds, and a dialog box for customizing the waveform number will pop up.



After editing the number (currently supports up to 30 groups of waveforms from 0-29), press ok to save.

After the waveform is saved, you can view the currently saved waveform in the set waveform browser.



In this interface, you can see the preview of the saved waveform, and at the same time, you can choose to view the waveform with the OK key. All the data of the waveform will be reproduced in the oscilloscope, and the oscilloscope can perform arbitrary operations on the waveform.

Parameter Description

Oscilloscope parameters	
Number of channels	2
Maximum real-time sampling rate	CH1 200MSa/s for single channel CH1, CH2 100MSa/s for dual channel
Bandwidth	50M for single channel, 25M for dual channel
Vertical resolution	8 bits
Vertical range	10mV-5V (probe x1) 100mV-50V (probe x10) 1,2,5 step
Impedance	1M Ω , 25pF
Coupling	DC, AC
Display mode	Y-T / X-Y
Input voltage	40V (probe x1); 400V (probe x10); Use high-voltage probes, the maximum voltage is determined by the quality of the probe.
Time base range	12.5ns-5s, 100ms-5s is the scan mode (scan)

Storage depth	3K per channel
Trigger mode	automatic, normal and single
Trigger type	rising edge, falling edge
Auto detection	50Hz-20MHz
Cursor measurement	time, voltage, current, pressure (manual mode)
Recordable contrast waveform	2
Screenshot function	support
Mathematical calculation	CH1+CH2, CH1-CH2, CH2-CH1
Self-calibration	support
Number of screenshots available	7
Number of waveforms that can be saved	30
Car signal generator parameters	
Number of channels	1
Frequency	Custom mode maximum 1MHz. Auto repair mode maximum 1Hz.
Amplitude	0V-12V
Duty cycle	0%-100%; X,Y 0-99
Output waveform types	DC waveform, square wave, profound wave, duty cycle waveform, xy missing tooth wave

Car signal source drive solenoid valve module connection:

Our 2022Q accessories include 1 drive box for driving electromagnetic car modules and 1 battery clip



Note: When the output frequency is high, the indicator light is always on; when the output frequency is small, the indicator light flashes. The maximum current of the box is 2A. When the

drive exceeds 2A, it will automatically cut off the power to protect the equipment; if it is used again, it needs to be powered on again.

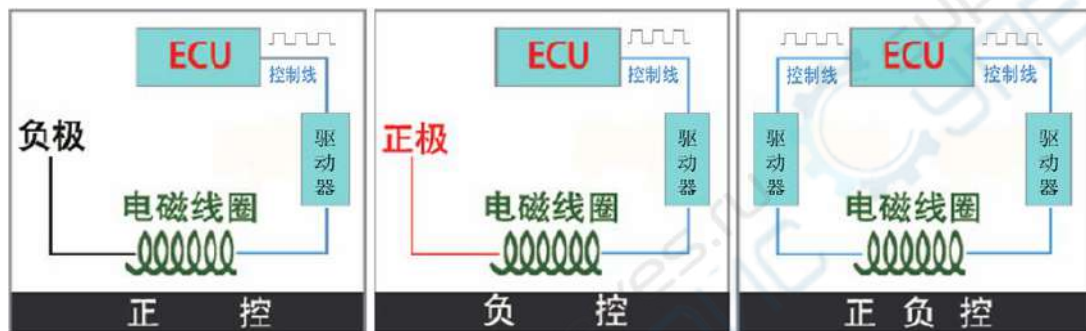
Equipment introduction

The signal generator can drive 2-wire solenoids, solenoid valves or low-power motors, including injector solenoid valves, hydraulic control valves, metering valves, SCV valves, PCV valves, VVT valves, canister solenoid valves, transmission oil pressure valves, Ignition coil, idle speed motor, throttle motor, etc. The 2-wire solenoid valve control method is generally divided into:

Positive control: One wire is the normal ground wire, and the other one controls the positive pole of the solenoid valve.

Negative control: 1 line for normal power supply, the other 1 control solenoid valve negative.

Positive and negative control: Both lines are control pins, and the positive and negative poles are alternately controlled



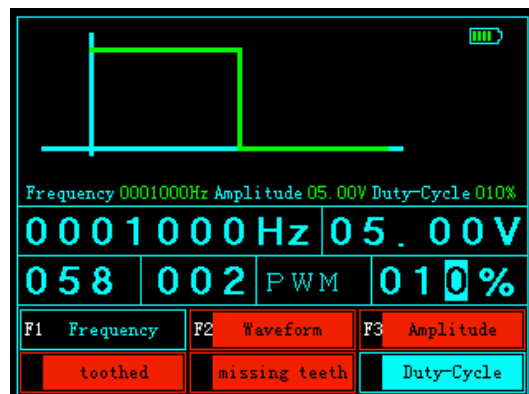
First set the frequency and duty cycle; (Frequency is the speed of the solenoid valve vibration, the lower the frequency, the greater the drive current, the higher the frequency, the smaller the drive current. If you don't know the actual operating frequency of the solenoid valve, set it to 100 Between -200HZ. The duty cycle is the working time of the solenoid valve. Under positive PWM control, the smaller the duty cycle, the shorter the working time and the smaller the working current. The larger the duty cycle, the longer the working time and the higher the working current. Large; however, the opposite is true under negative PWM control.)

When driving solenoid valve high-power devices, we use equipment: signal generator and solenoid valve drive box.

Injector drive

Now set the signal generator channel to output a "amplitude 5V (default no need to modify), frequency 10Hz, duty cycle 10%, square wave (default no need to modify)". The specific operations are as follows:

Enter the signal generator setting interface, select the waveform PWM, amplitude 10V, frequency 10Hz, and duty cycle adjustment to 10%, as shown in the right figure.



1. Measure the power supply of the original equipment to be 12V, connect our drive box power supply line to a 12V battery or DC power supply, and then directly connect it to the drive box power supply port, and the power indicator light is on;

2. Connect the set signal generator output to the box input, such as channel 1, and you can see the output indicator flashing;

3. Connect one end of the fuel injector wire to the box "positive +", and the other end to the output "channel 1". At this time, the motor can be observed to work;

4. Increase the frequency and duty cycle to observe that the injector becomes faster and stronger. When the duty cycle is adjusted upward, the current may exceed 2A, and the box is powered off and needs to be restarted. However, it is still possible to preliminarily judge whether the injector is damaged under a small duty cycle.

The fuel injector drive wiring is shown in the figure below

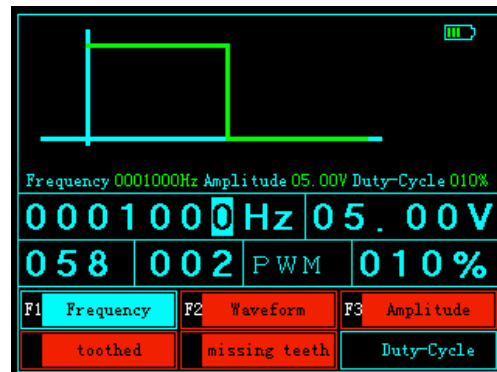


Note: The wiring of this type of fuel injector is irrelevant. Each fuel injector model may not be exactly the same, it needs to be based on the original power supply measured during the actual period, and then determine how many volts to supply the box.

VVT Solenoid valve drive

Now set the signal generator channel to output a "amplitude 5V (default no need to modify), frequency 10Hz, duty cycle 10%, square wave (default no need to modify)". The specific operations are as follows:

Enter the signal generator setting interface, select the waveform PWM, amplitude 5V, frequency 10Hz, and duty cycle adjustment to 10%, as shown in the right figure.



1. Measure the power supply of the original equipment to be 12V, connect our drive box power supply line to a 12V battery or DC power supply, and then directly connect it to the drive box

- power supply port, and the power indicator light is on;
- Connect the set signal generator output to the box input, such as channel 1, and you can see the output indicator flashing;
- Connect one end of the VVT solenoid valve wire to the box "positive +", and the other end to the output "channel 1". At this time, the motor can be observed to work;
- Adjust the frequency and duty cycle to observe that the VVT solenoid valve becomes faster and stronger.

The VVT solenoid valve drive wiring is shown in the following figure:

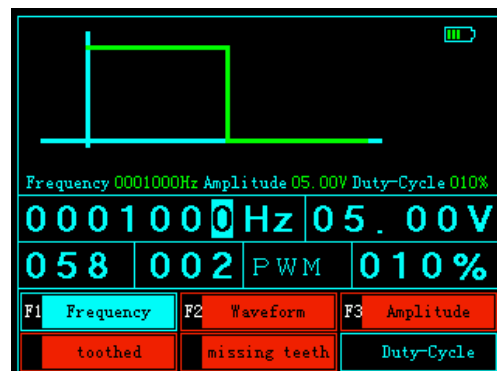


Note: No distinction is made between positive and negative. It is necessary to determine how many volts to supply the box based on the measured original power supply.

Coil type idling motor drive

Now set the signal generator channel to output a "amplitude 5V (default no need to modify), frequency 10Hz, duty cycle 10%, square wave (default no need to modify)". The specific operations are as follows:

Enter the signal generator setting interface, select the waveform PWM, amplitude 5V, frequency 10Hz, and duty cycle adjustment to 10%, as shown in the right figure.



- Measure the power supply of the original equipment to be 12V, connect our drive box power supply line to a 12V battery or DC power supply, and then directly connect it to the drive box power supply port, and the power indicator light is on;
- Connect the set signal generator output to the box input, such as channel 1, and you can see

the output indicator flashing;

3. Connect one end of the idle speed motor cable to the box "positive +" and the other end to the output "channel 1". At this time, the motor can be observed to work;
4. Adjust the duty cycle to observe that the motor movement becomes stronger.

The wiring of the coil type idling motor is shown in the figure below:

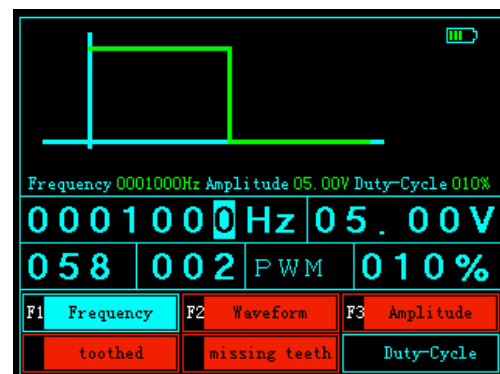


Note: This kind of motor does not distinguish between positive and negative. Each motor model may not be exactly the same. It needs to be based on the measured original power supply before determining how many volts to supply to the box.

Modular ignition coil driver

Now set the signal generator channel to output a "amplitude 5V (no need to modify by default), frequency 100Hz, duty cycle 70%, square wave (no need to modify by default)". The specific operations are as follows:

Enter the signal generator setting interface, select the waveform PWM, amplitude 5V, frequency 10Hz, and duty cycle adjustment to 10%, as shown in the right figure.



1. Measure the power supply of the original equipment to be 12V, and the voltage of the drive pin is about 5V. Connect the power supply line of our drive box to a 12V battery or a DC power supply, and then directly connect it to the power supply port of the drive box, and the power indicator light is on;
2. Connect the positive pole of the ignition coil to the box "positive +" and the negative pole to the box "negative -".
3. Connect the "ground" of the signal generator output port to the "negative -" output of the box,

and connect the output pin to the drive port of the urea pump motor. At this time, you can see the urea pump rotating. To adjust the frequency, you can observe that the ignition coil ignites faster.

The ignition coil wiring is shown in the figure below:



Note: 1. Positive PWM control: the greater the duty cycle, the greater the current and the faster the speed.

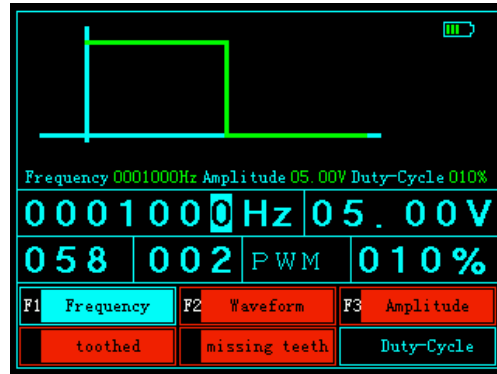
2. Negative PWM control: the larger the duty cycle, the smaller the current and the fuller the speed.

The urea pump motor is controlled by a negative duty cycle. When the duty cycle is adjusted downward, the speed becomes faster and faster.

Drive urea pump motor

Now set the signal generator channel 1/2 so that it outputs a "amplitude 5V (no modification by default), frequency 100Hz, duty cycle 70%, square wave (no modification by default)". The specific operations are as follows:

Enter the signal generator setting interface, select waveform PWM, amplitude 5V, set frequency 100Hz, and adjust the duty cycle to 70%, as shown in the right figure.



1. Measure the power supply of the original equipment to be 12V, and the voltage of the drive pin is about 5V. Connect the power supply line of our drive box to a 12V battery or a DC power supply, and then directly connect it to the power supply port of the drive box, and the power indicator light is on;

2. Connect the positive terminal of the urea pump motor to the box "positive +" and the negative terminal to the box "negative -".

3. Connect the "ground" of the signal generator channel 2 output port to the "negative -" output of the box, and the output pin to the drive port of the urea pump motor. At this time, you can see the urea pump rotating. Adjust the duty cycle down to observe that the motor speed becomes faster.

The wiring of the urea pump motor is shown in the figure below:



Note: 1. Positive PWM control: the greater the duty cycle, the greater the current and the faster the speed.

2. Negative PWM control: the larger the duty cycle, the smaller the current and the fuller the speed.

The urea pump motor is controlled by a negative duty cycle. When the duty cycle is adjusted downward, the speed becomes faster and faster.

Special Note:

The solenoid valve box cannot work for a long time.

The 18650 lithium batteries used for the power supply of this instrument do not have a protective plate.

