ST8

Manual V1.0
2019.09

ToolkitRC

www.toolkitrc.com

ToolkitRC Technology (Shenzhen) Co.. Ltd.

Thanks

Thank you for purchasing the ST8 Multi-function servo tester. Please read this manual carefully before use.

Key Points

🔆 Tips ⚠️ Important 📋 Information

Further Information

To ensure you have a more enjoyable experience, please use WeChat to scan the QR code below and use it to get the usage details, video teaching and latest information. Or visit www.toolkitrc.com.

Applications

Video teaching

Product purchase

WeChat QR Code

⚠ Safety Precautions

1, The ST8 allows input voltage of 7-28V. To ensure that the power supply voltage is consistent, pay attention to the positive and negative polarity of the power supply when connecting.

2, The S1-S4,S4 Ext. signal ports only support a maximum of 2A current. For a larger current servo, connect the output main port to prevent the internal circuit from being burned out.

3, The S1-S4 signal port can only output up to 8.4V, for higher voltage uses the main port.

4, Do not use this product in heat, humidity, flammable or explosive atmosphere.

5, Do not leave this product unattended while in use to prevent accidents.

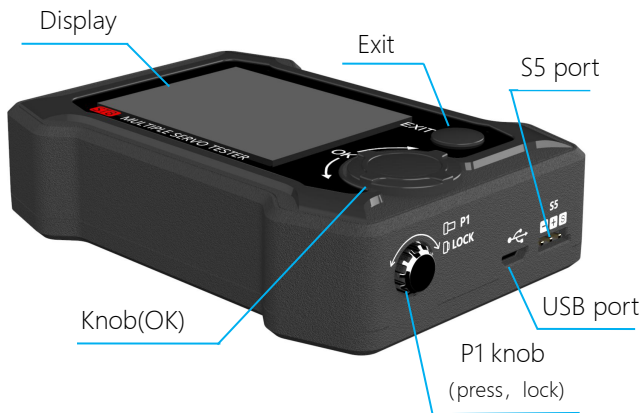6, Please unplug the input power when not use this product.
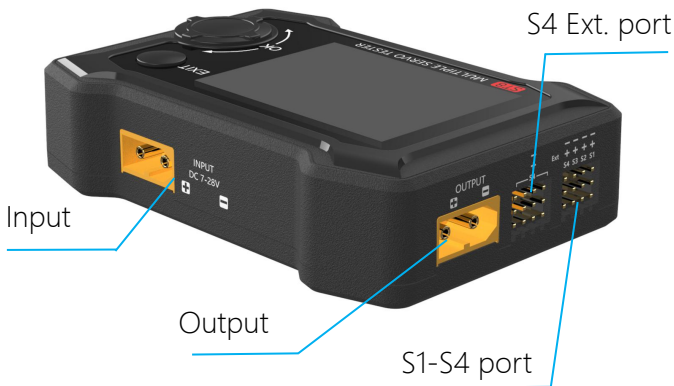
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Product overview

The ST8 is a product for testing servos, with up to 28V voltage output, 8-channel signal output, current measurement, curve display and other functions.

- 4 channels of programmable independent signal, 8 channels of signal output, accuracy of 1 ms.
- 4 independent current acquisition, respectively, curve display.
- Multiple measurement modes (speed, count, step, linear).
- output PWM signals with a period of 33 to 1000 Hz.
- A variety of signal trigger sources (internal, buttons, knobs, external sources).
- Measure the response speed of the steering gear with an accuracy of 1 millisecond.
- The external input signal supports PWM/ PPM/ SBUS with an accuracy of 1 ms.
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- Drive the servo with a maximum load of 100W.
- Multi-language system, you can upgrade the language you need.
- The device is simulated as a USB flash drive, and the upgrade file is copied to implement product firmware upgrade.

ST8 Layout

Display

Exit

S5 port

OK

EXIT

P1
LOCK

S5

Knob(OK)

USB port

P1 knob
(press，lock)

Front

S4 Ext. port

EXIT

OK

INPUT
DC 7-28V

OUTPUT

Ext
S4 S3 S2 S1

Input

Output

S1-S4 port

Back

First start

1, the 7-28V power supply is connected to the input port on the back of the ST8

2, the display shows the boot logo and stays for 2 seconds

3, accompanied by do-re-mi boot sound

4, the boot is completed, the display enters the main interface as shown below:
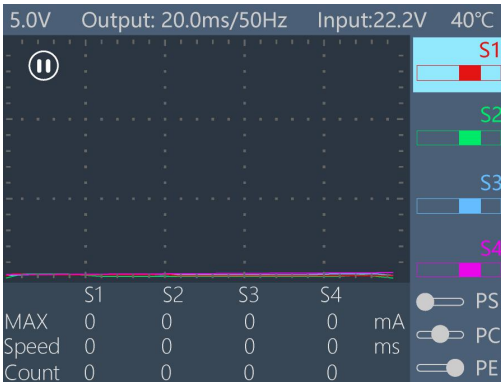
5, Press [Exit] to start the PWM signal output and test.

6, Rotate [Knob], move the cursor to select different channels, press [OK] to confirm, pop up the setting options of the selected channel, and set the input and output signals of the channel.

7, Press and hold [OK] to enter the system setup menu.

8, Press [Exit] to end the modification or return to the main interface.

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Main interface

After pressing the [Exit] button after powering on, the system shows the main interface, as shown below:
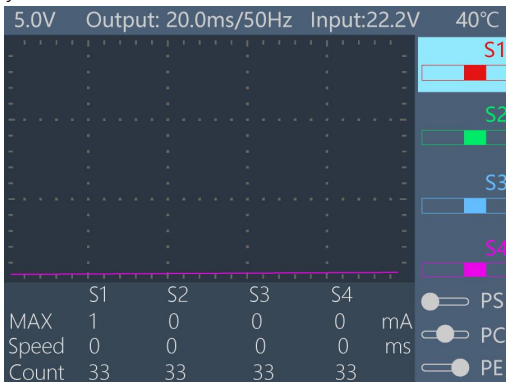
The top 5.0V is the output voltage of the main port or PWM output port. When the main port voltage is off, the voltage of the PWM output port will be displayed in black. When the main port voltage is turned on, the main port voltage will be displayed in red. The output 20.0ms/50Hz is the PWM output frequency and period. Input 9.7V is the input voltage. Below the minimum input voltage set by the system, it will alarm and flash

red. 41 ° C is the motherboard temperature, higher than the safe temperature set by the system will alarm and flash red.

The right side S1, S2, S3, and S4 are independent 4-channel PWM signals, which are distinguished by different colors and graphically display the pulse width value.

The middle grid is a curve display of 4 PWM output current, which is easily distinguished by the corresponding color display on the right side.

Below is the output bar, which outputs the maximum current, speed, and count of each channel in real time.

The PS, PC and PE buttons are in the lower right corner. When the button source mode is selected, the buttons will become selectable.

Pause interface

After booting up or pressing [Exit] on the main interface, you can enter the pause interface, as shown below:
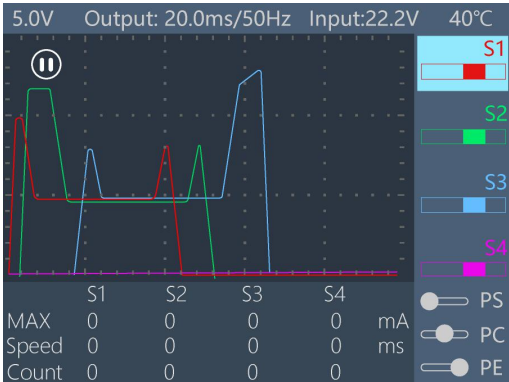
When paused, the current curve is paused and the PWM signal is maintained at a fixed value. Rotate [Knob] to adjust the timeline to view the saved current curve. Press [Exit] to exit the pause interface.

Channel setting

After selecting a channel in the main interface, press [OK] to pop up the setting options of the selected channel, and the following interface is displayed.
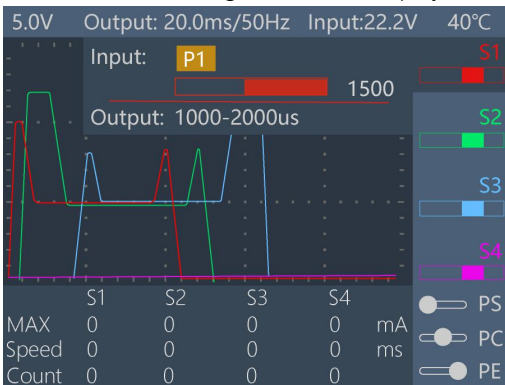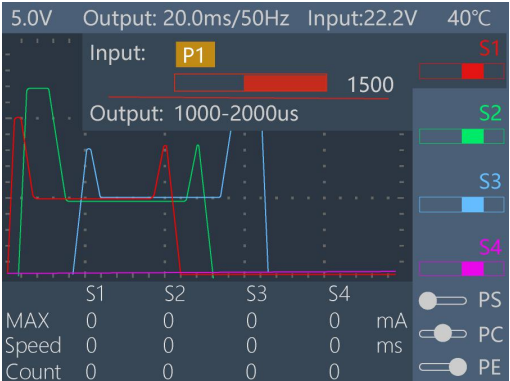

1, Signal source setting

Rotate the [Knob], move the cursor to the [Input] [P1] position, press [OK] to modify the source setting. Channel 1 can be set to P1, S5, internal signal, button, and 4 sources. Channels 2-4 can be set to P1, S5, internal signals, buttons, channels 1, and 5 sources. After selecting the appropriate source. Short press [OK] and [Exit] to take effect.
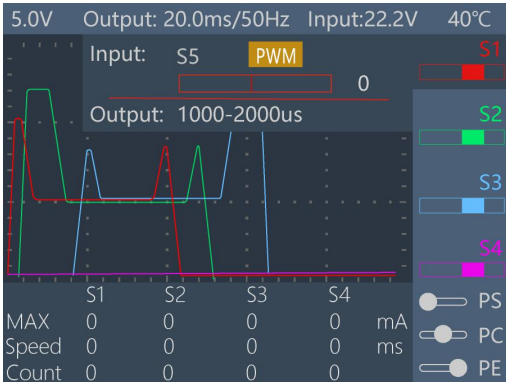
2, P1 source setting

When the P1 source is selected, the PWM output can be controlled by the P1 knob and the position of the knob can be displayed. As shown below:
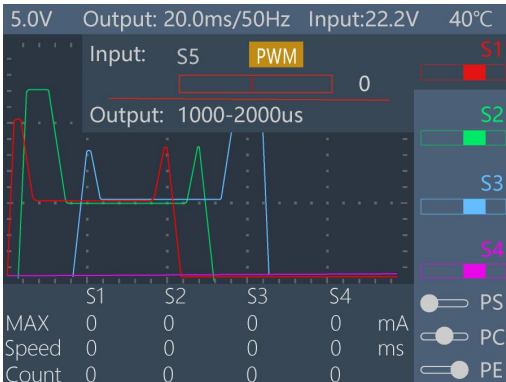

3，S5 source setting

When S5 is selected as the signal source, PWM, PPM, and SBUS signals can be selected. By inputting the corresponding signal on the S5 interface, the received signal value can be displayed and the PWM output can be controlled.
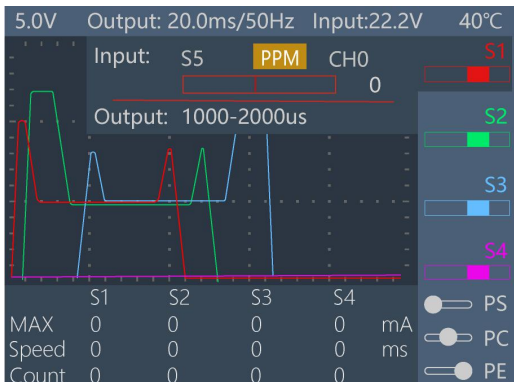
When the PWM signal is selected, as shown below:

When the PPM signal is selected, the channel can be set from CH0 to CH7, as shown below:

When the SBUS signal is selected, the channel can be set from CH0 to CH15. As showed below:

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4，Internal source setting

When the signal source selects the internal signal, it can be set to linear and phase modes. These two modes are mainly used for the aging servo test, which will generate a count and will stop working when the set value is reached. It can be turned off in the system settings.

When the linear mode is selected, you need to set the step value and speed value. The step value ranges from 1 microsecond to 10 microseconds, and the speed value ranges from 1 millisecond to 10 milliseconds.

Taking 1 respectively means adding 1 microsecond or 1 microsecond each time in the range of the PWM signal output at a speed of 1 ms. As showed below:
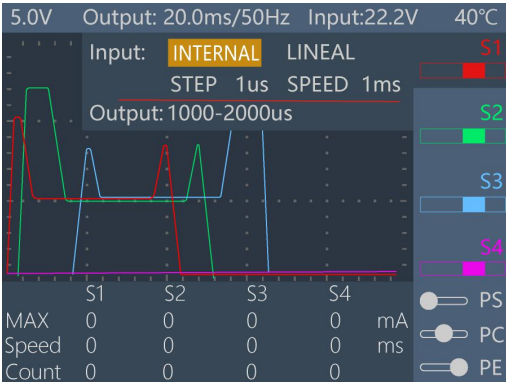
When the phase mode is selected, if the PC point is not enabled, it is the second-order mode, which jumps between the two values of PS and PE at 1 second. If the PC point is enabled, it is the third-order mode, which jumps between the three values of PS, PC and PE at 1 second. This mode allows you to measure the response speed of the steering gear. As shown below:

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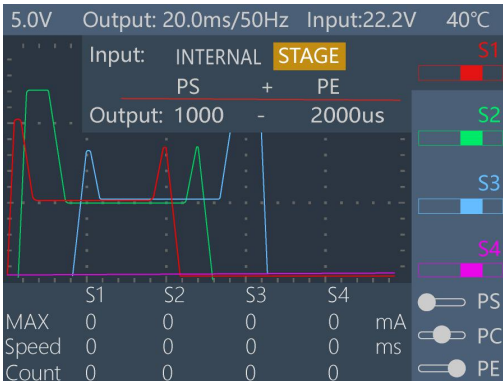
5，Key setting

When the signal source selects the button, the main interface will display PS, PC, PE buttons, you can move the cursor to the buttons on the main interface and short press [OK] to output the corresponding PWM value. The time to turn the angle can be measured and displayed. As shown below:
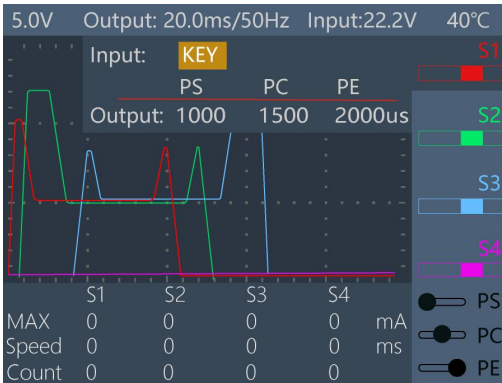
6，S1 source setting

When S2, S3, S4 signal source selects S1, it will follow the S1 setting and output S1 with the same PWM value.As shown below:

	S1	S2	S3	S4	
MAX	0	0	4	1	mA
Speed	0	0	0	0	ms
Count	581	581	581	581	
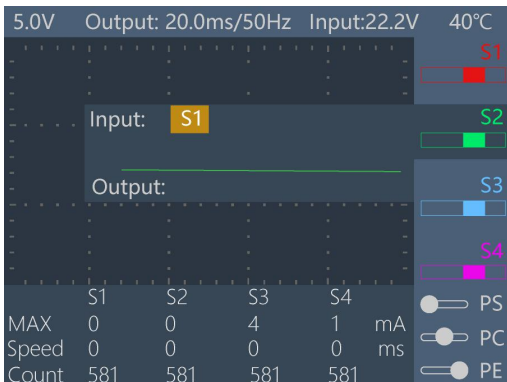
7，Output source setting

Move the cursor to the [Output] position to set the range of the PWM output signal with an accuracy of 1 microsecond. If you are in the button source and internal source stage modes, you need to set the PC value.

	S1	S2	S3	S4	
MAX	0	0	0	0	mA
Speed	0	0	0	0	ms
Count	0	0	0	0	
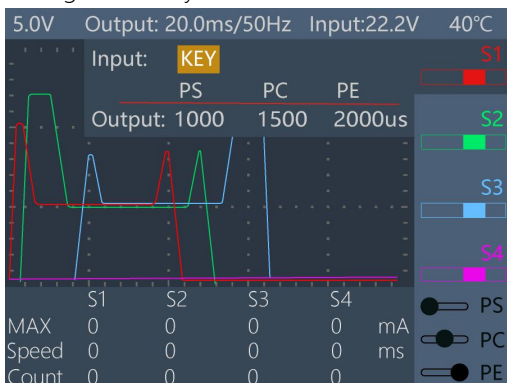
System setting

Press [OK] on the main interface for 2 seconds to

enter the system setting interface, and rotate [Knob] to switch the corresponding settings, as shown below:

Settings	
Cycle	20.0ms/50HZ
VoltageOutput	OFF
CycleCount	5000
LowestInput	7.0V
SafeTemperature	70℃
Backlight	6
Buzzer	6
Language	English
ThemeStyle	Light

Cycle: Output the period of the PWM signal, ranging from 1 millisecond to 30 milliseconds.

VoltageOutput : The output voltage of the main port has 11 gears, including turnoff, 5V, 6V, 7.4V, 8.4V, 12V, 14V, 15V, 16V, 18V, 24V, 28V. When it is turnoff, the main port does not output voltage, the PWM output port voltage is 5V, and the load power is 15W. If the load power exceeds the load, it will prompt "Please turn on the main port power". For 5.0V-8.4V, the main port and PWM output ports are 5.0V-8.4V. For 12V-28V, the main port output voltage is 12V-28V, and the PWM output port is 5V, which can drive large servos.

CycleCount: When using the internal signal source, a count will be generated, and when the set number of work times is reached, the operation will stop.

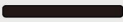**LowestInput:** Below this voltage, the device will stop the

main port output.

SafeTemperature: Above this temperature, the device will stop the main port output.

Backlight: The backlight brightness level of the display can be set to 1-10.

Buzzer: The tone of the buzzer can be set to off.

Language: The system displays the language. English and Chinese can be selected.

ThemeStyle: The color style displayed by the system interface. It is divided into bright and dark colors.

Settings	
LowestInput	7.0V
SafeTemperature	70℃
Backlight	6
Buzzer	6
Language	English
ThemeStyle	Light
KNOBCalibrate	▅▅▅▅▅▅
CycleCountClear	
Default	

KNOB Calibration: Jump the P1 knob to the calibration of the maximum and minimum implementation knobs.

CycleCountClear: Clear the count under the internal source.

Default : Restore all settings to factory defaults.

Other functions

Firmware upgrade:

After connecting the ST8 to the computer via the USB cable in the box. the computer will recognize the USB flash drive named Toolkit. Download the upgrade file app.upg on the official website to overwrite the files in the USB flash drive to upgrade the firmware.

Specification

Input voltage		7-28V@MAX 10A
Main output port		5.0V-28.0V@MAX 10A
Signal port		5.0V-8.4V@MAX 4A/S1-S4
Output voltage		5.0V-8.4V@MAX 4A/S4 Ext.
Output signal		100us-2900us@33-1000Hz @S1-S4
		PWM 500us-2500us@S5
		PPM 8CH@S5 SBUS 16CH@S5
P1 rotation range		1000us-2000us@P1
MicroUSB		Upgrade@USB3.0
LCD display		2.4 inch TFT RGB 320*240 resolution
Product	Size	99mm*68mm*26mm
	Weight	120g
packing	Size	105mm*80mm*45mm
	Weight	200g