



ST8

Multi-function servo tester User Manual



Read this entire manual carefully before first use, in particular the safety precautions in Chapter 1. Keep the manual for future reference.

Manufacturer: ToolkitRC Technology (Shenzhen) Co., Ltd. · Importer: Rotorama, s.r.o., Třebíč · www.rotorama.cz

Contents

1. Safety Precautions

- 1.1 Intended use
- 1.2 Manufacturer's instructions
- 1.3 General rules

2. Product Description

- 2.1 Product overview
- 2.2 In the box
- 2.3 ST8 layout

3. Getting Started

- 3.1 First start
- 3.2 Operation
- 3.3 Connecting servos

4. Main and Pause Interface

5. Channel Setting

- 5.1–5.7 Signal sources and output

6. System Setting

7. Other Information

- 7.1 Firmware upgrade
- 7.2 Care and storage
- 7.3 Specifications

8. Information for the EU and Czech Market

9. Warranty and rights arising from defective performance

1. Safety Precautions

Read this entire manual carefully before first use. Failure to follow the instructions may result in damage to the tester, the connected servo or the power supply, or in injury.

1.1 Intended use

The ST8 is a multi-function servo tester for testing, adjusting and endurance testing of servos in RC models. It is intended for adult users experienced with model electronics. The product is not a toy – keep it out of the reach of children.

1.2 Manufacturer's instructions

- ① The ST8 allows an input voltage of **7-28 V**. Use a power supply with a matching voltage and pay attention to the **correct polarity** (+/-) when connecting.
- ② The S1-S4 and S4 Ext. signal ports only support a maximum current of **2 A**. For a servo with a larger current, use the **main output port** (Output) to prevent the internal circuit from being burned out.
- ③ The S1-S4 signal ports can only output up to **8.4 V**. For a higher voltage, use the main port.
- ④ Do not use this product in heat, humidity, or in a flammable or explosive atmosphere.
- ⑤ Do not leave this product unattended while in use.
- ⑥ Unplug the input power when the product is not in use.

1.3 General rules

- The servo starts moving once the test is started. Before starting, keep hands, tools and loose objects away from the servo, linkages and horns.
- The power supply must be rated for the current draw of all connected servos. When powering from a Li-Po battery, follow the rules for the safe handling of Li-Po batteries.
- Connect and disconnect servos only with the power switched off or in pause mode.
- Do not connect damaged cables, connectors or servos to the tester.
- Do not cover the tester or place it on a flammable surface. It may heat up under load and at high voltage.

2. Product Description

2.1 Product overview

The ST8 is a product for testing servos, with up to 28 V output voltage, 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 μ s.
- The output voltage can be up to 28 V – suitable for high-voltage servos.
- Multiple measurement modes (speed, count, step, linear).
- Output of PWM signals with a frequency of 33–1000 Hz.
- A variety of signal trigger sources (internal, buttons, knob, external source).
- Measurement of the servo response speed with an accuracy of 1 ms.
- The external input signal supports PWM / PPM / SBUS with an accuracy of 1 μ s.
- Drives a servo with a maximum load of 100 W.
- Multi-language system – the language you need can be added by an upgrade.
- The device appears as a USB flash drive; the firmware is upgraded by copying the upgrade file.

2.2 In the box

- 1× ST8 servo tester
- 1× USB cable
- 1× quick manual

The power supply and servos are not included.

2.3 ST8 layout



Front



Back

No.	Part	No.	Part
①	Display	⑥	P1 knob (press to lock)
②	Exit button	⑦	S4 Ext. port
③	S5 port (signal input)	⑧	Power input (Input)
④	Knob (OK)	⑨	Main output port (Output)
⑤	USB port	⑩	S1-S4 signal ports

3. Getting Started

3.1 First start

- ① Connect a 7–28 V power supply to the input port on the back of the ST8.
- ② The display shows the boot logo for 2 seconds.
- ③ The boot sound plays.
- ④ When booting is completed, the display enters the main interface.
- ⑤ Press **Exit** to start the PWM signal output and the test.
- ⑥ Rotate the knob to move the cursor to the desired channel. Press **OK** to confirm – the setting options of the selected channel pop up, where you set the input and output signal 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.

3.2 Operation

- ① Short press the knob – confirm the function.
- ② Press and hold the knob for 2 seconds – enter the system settings.
- ③ Short press Exit – pause, start, exit.
- ④ Every successful key operation is confirmed by a short beep.

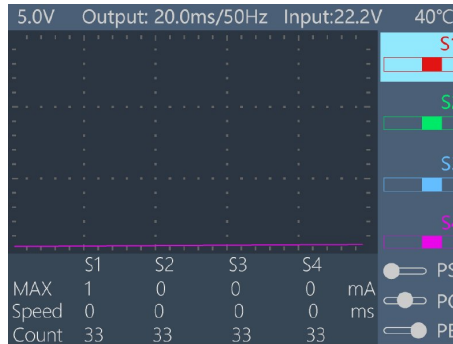
3.3 Connecting servos

At an output voltage of 5.0–8.4 V, the S1–S4 and S4 Ext. signal ports supply the servo with both power and signal. Power a servo with a larger current or a higher voltage from the **main output port** (Output). When the main port is set to 12–28 V, the signal ports stay at 5 V – see Chapter 6 for details.

4. Main and Pause Interface

4.1 Main interface

After pressing the **Exit** button after powering on, the system shows the main interface:

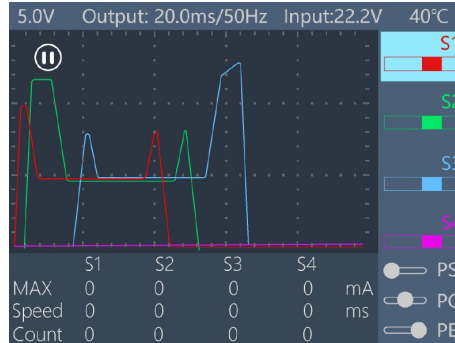


Main interface

- **Top left (e.g. 5.0V)** – output voltage of the main port or of the PWM output ports. When the main port is off, the voltage of the PWM output ports is displayed in black. When the main port is on, the main port voltage is displayed in red.
- **Output (e.g. 20.0ms/50Hz)** – period and frequency of the PWM output.
- **Input** – input voltage. Below the minimum input voltage set in the system, an alarm sounds and the value flashes red.
- **Temperature (e.g. 40 °C)** – motherboard temperature. Above the safe temperature set in the system, an alarm sounds and the value flashes red.
- **S1, S2, S3, S4 on the right** – four independent PWM channels, distinguished by colour, with a graphical display of the pulse width.
- **Middle grid** – current curves of the four PWM outputs, in colours matching the channels on the right.
- **Bottom bar** – real-time maximum current (*MAX*, mA), speed (*Speed*, ms) and count (*Count*) of each channel.
- **PS, PC, PE in the lower right corner** – buttons that become selectable when the Key source is selected (Chapter 5.5).

4.2 Pause interface

After booting up or pressing **Exit** on the main interface, the tester enters the pause interface.

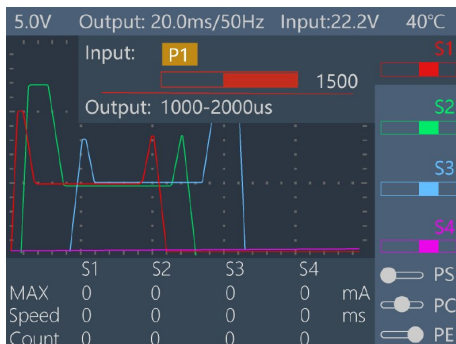


Pause interface

When paused, the current curve is paused and the PWM signal is held at a fixed value. Rotate the knob to move along the timeline and view the saved current curve. Press **Exit** to leave the pause interface.

5. Channel Setting

Select a channel on the main interface and press **OK** to pop up its setting options:



Channel setting

5.1 Signal source setting

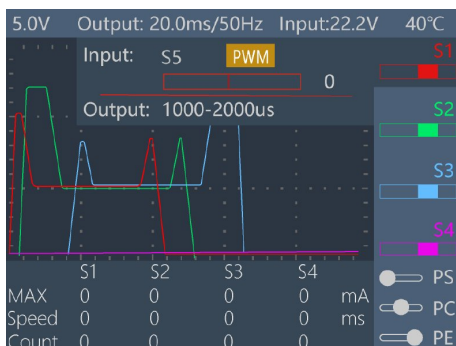
Rotate the knob to move the cursor to the *Input* position and press **OK** to change the source. Channel 1 can be set to 4 sources: P1, S5, internal signal and buttons. Channels 2-4 can be set to 5 sources: P1, S5, internal signal, buttons and channel 1. After selecting the source, short press **OK** and **Exit** to apply it.

5.2 P1 source

When the P1 source is selected, the PWM output is controlled by the P1 knob and the knob position is displayed (see the figure above). The P1 rotation range is 1000-2000 μ s.

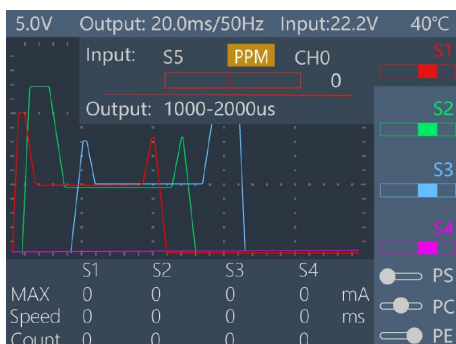
5.3 S5 source

When S5 is selected as the signal source, PWM, PPM or SBUS can be selected. The signal fed to the S5 port is displayed and controls the PWM output. When PWM is selected:



S5 source - PWM signal

When PPM is selected, the channel can be set from CH0 to CH7:



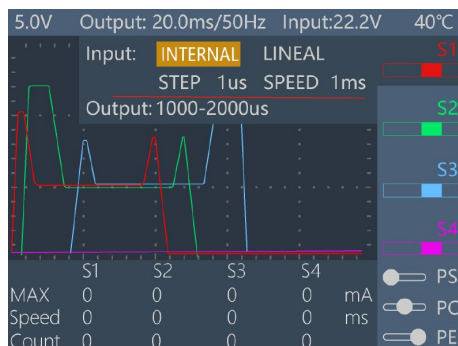
S5 source - PPM signal

When SBUS is selected, the channel can be set from CH0 to CH15.

5.4 Internal source

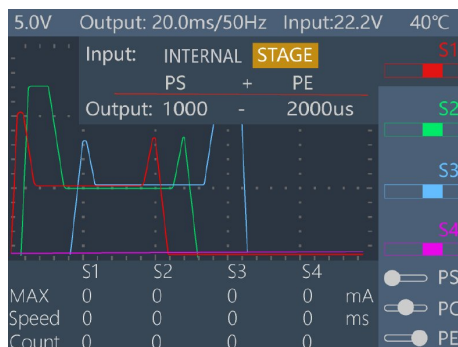
When the internal signal is selected as the source, it can be set to linear (*LINEAL*) or stage (*STAGE*) mode. These two modes are mainly used for servo aging tests: a count is generated and the test stops when the set value is reached. This can be turned off in the system settings.

In linear mode, set the step value (*STEP*) and the speed value (*SPEED*). The step ranges from 1 to 10 μ s and the speed from 1 to 10 ms. Values of 1 and 1 mean that the PWM signal changes by 1 μ s every 1 ms within the set output range.



Internal source - linear mode

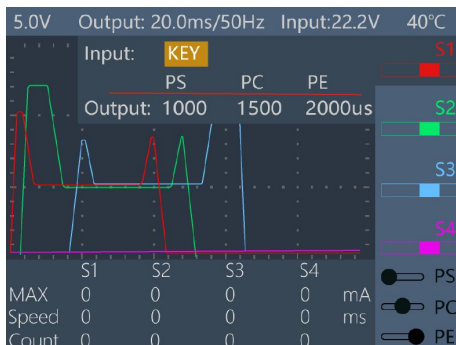
In stage mode without the PC point enabled, the second-order mode is used - the signal jumps between the PS and PE values every 1 second. With the PC point enabled, the third-order mode is used - the signal jumps between the PS, PC and PE values every 1 second. This mode allows you to measure the servo response speed.



Internal source - stage mode

5.5 Key source

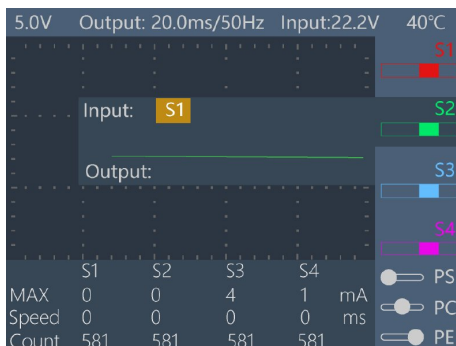
When the buttons (**KEY**) are selected as the source, the PS, PC and PE buttons appear on the main interface. Move the cursor to a button and short press **OK** to output the corresponding PWM value. The time the servo needs to reach the new position is measured and displayed.



Key source

5.6 S1 source

When S2, S3 or S4 selects S1 as the signal source, it follows the S1 setting and outputs the same PWM value as S1.



S1 source

5.7 Output setting

Move the cursor to the *Output* position to set the range of the PWM output signal with an accuracy of 1 μ s. With the Key source and the stage mode of the internal source, the PC value must be set as well.

6. System Setting

Press and hold **OK** on the main interface for 2 seconds to enter the system settings. Rotate the knob to switch between the items.

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

System settings

Item	Description
<i>Cycle</i>	Period of the PWM output signal, 1-30 ms.
<i>VoltageOutput</i>	Output voltage of the main port: off (OFF), 5 V, 6 V, 7.4 V, 8.4 V, 12 V, 14 V, 15 V, 16 V, 18 V, 24 V, 28 V.
<i>CycleCount</i>	Number of cycles of the internal source. When it is reached, operation stops.
<i>LowestInput</i>	Minimum input voltage. Below this voltage, the device stops the main port output.
<i>SafeTemperature</i>	Safe temperature. Above this temperature, the device stops the main port output.
<i>Backlight</i>	Display backlight brightness, 1-10.
<i>Buzzer</i>	Buzzer tone, can be set to off.
<i>Language</i>	Menu language – English or Chinese.
<i>ThemeStyle</i>	Colour theme – bright or dark.
<i>KNOB Calibration</i>	Calibration of the P1 knob end positions.
<i>CycleCountClear</i>	Clears the count of the internal source.
<i>Default</i>	Restores all settings to factory defaults.

► Output voltage (VoltageOutput)

- **Off (OFF):** the main port does not output voltage, the PWM output ports are at 5 V and the load power is 15 W. If the load exceeds this, the prompt *Please turn on the main port power* appears.
- **5.0-8.4 V:** the main port and the PWM output ports are at the set voltage of 5.0-8.4 V.
- **12-28 V:** the main port outputs the set voltage of 12-28 V and the PWM output ports are at 5 V, which can drive large servos.

7. Other Information

7.1 Firmware upgrade

Connect the ST8 to the computer with the supplied USB cable. The computer recognises a USB flash drive named *Toolkit*. Download the upgrade file *app.upg* from the official website www.toolkitrc.com and copy it to the drive, overwriting the existing file, to upgrade the firmware.

7.2 Care and storage

- Disconnect the power before cleaning. Clean the tester with a dry soft cloth; do not use solvents.
- Store in a dry place, away from direct sunlight and heat sources.
- Protect the display from impacts and scratches.

7.3 Specifications

Parameter	Value
Input voltage	7–28 V, max. 10 A
Main output port	5.0–28.0 V, max. 10 A
Signal ports S1–S4	5.0–8.4 V, max. 4 A ※
S4 Ext. port	5.0–8.4 V, max. 4 A ※
Output signal S1–S4	PWM 100–2900 µs, 33–1000 Hz
Input signal S5	PWM 500–2500 µs, PPM 8 channels, SBUS 16 channels
P1 rotation range	1000–2000 µs
Maximum load	100 W
MicroUSB	firmware upgrade
Display	2.4" TFT RGB, 320 × 240 px
Product size	99 × 68 × 26 mm
Product weight	120 g
Package size	105 × 80 × 45 mm
Package weight	200 g

※ The manufacturer's safety precautions state a maximum current of 2 A for the signal ports. Power servos with a larger current from the main output port.

8. Information for the EU and Czech Market

8.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorاما.cz
Phone	+420 252 252 098
Website	www.rotorاما.cz
Manufacturer	ToolkitRC Technology (Shenzhen) Co., Ltd.
Address	South of 5F, B2 Building, Shanghe Industrial Park, Nanchang Road, Hangcheng Street, Bao'an District, Shenzhen, China
E-mail	sales@toolkitrc.com
Web	www.toolkitrc.com

8.2 Product conformity



- The product bears the **CE** marking and complies with the requirements of the applicable European Union harmonisation legislation.
- A copy of the **EU Declaration of Conformity** is available from the importer at the address stated above or at the e-mail address info@rotorاما.cz.
- **Product identification:** the type designation (ST8) is given on the device.

8.3 Disposal of electrical equipment



- The crossed-out wheeled bin symbol on the product, its packaging or in the documentation means that at the end of its service life the product **must not be disposed of together with mixed municipal waste**.
- Hand it over at a take-back point for electrical equipment – at a collection yard, at a take-back point of a collective system, or at the retailer when purchasing a new equivalent product. Take-back is free of charge for the end user.
- The obligations under Act No. 542/2020 Coll., on end-of-life products, are fulfilled by the importer through a collective take-back system.
- Proper disposal helps prevent negative impacts on the environment and human health and contributes to the reuse of secondary raw materials.

Through its contractual partner **ASEKOL a.s.**, the company ensures the take-back of waste electrical equipment from households and the separate collection of waste electrical equipment, batteries and accumulators in accordance with the applicable legislation. The customer is entitled to hand over old electrical equipment or a battery or accumulator at any collection point of the above contractual partner. The addresses of these take-back points are listed at www.asekol.cz, www.ecobat.cz and also <https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu>.

9. Warranty and rights arising from defective performance

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 8.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.