DR.SERVO（S1）Multifunctional Tester Manual

Thanks very much for choosing AEO DR.SERVO, it's the first integrated servo tester in the market，which can accurately measures the servo speed and helps you to understand the overall performance of servos.

Function:

1. Accurate measurement of servo speed.
2. Measurement of a servo useful life.
3. Measurement of servo travel linear and range.
4. Measurement of receiver output signal and frequency.

Specifications:

Operating temperature: -10 ℃ to 50 ℃
Weight: 21grams
Size: 33x 69x 11mm
Input voltage: 8V-12V (2S lipo battery or 9V 2A DC power supply)
Output voltage: 5V
Output current: 1A
Accuracy: 1us +/-10%

Include:

Servo tester*1   Gyro sensor *1   Voltage regulator（4.8V）multifunctional servo extension wire *1
Receiver signal measuring wire *1   3M double side sticky tape *1   Key chain*1   Instruction manual *1

Features:

◎ The first multifunctional accurate tester to measure servo speed.
◎ Integrated with high performance gyro sensor and processor, giving an overall measuring for servo synthesis performance.
◎ Transducer Isolation design, works perfect with any kinds servos.
◎ Ultra small and portable.
◎ With BEC built-in, it can work with lipo battery, you don't need to connect it with extra receiver battery.

How to use:

Connection:

Right picture: as per the order on packing case, connect S1 to BATTERY, gyro sensor to GYRO, multifunctional servo extension wire to SERVO, and finally connect the test servo with servo extension wire.

For more accurate measurement, you need to connect the servo voltage regulator wire with S1 SERVO plug. First,to lower and keep the voltage to 4.8V, second, for the voltage stabilization when you measure the servo.

If the test servo is a high voltage one, such as 6V or 7.2V, you need to connect the battery to one of the three connectors on the servo extension wire (a Y harness needed if the connector is not enough), then the measuring voltage is the battery voltage.
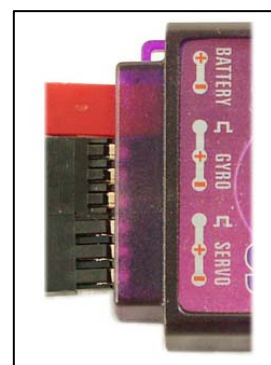
Measurement of servo travel linear and range:

Long press on the button of S1 to adjust and switch the display, now switch the display to " servo travel measurement---PWM output " （short press on the button is to turn on the back light）

On the S1 button, "up" and "down" is to adjust step-length, "left" and "right" is to adjust output impulse signal range, servo will work. The bigger the step-length, the servo works faster. We can measure the travel range and know the servo dead band.

Measurement of servo speed:

Servo speed is indicated by the needed time for the servo arm move 60°.But the impulse signal range from different manufacturers are different. So before measuring a servo, we need to first measure the 60°impulse signal range, you need to manual finish this step.

First, to make the measurement of servo 60° travel impulse signal by the protractor printed in the manual.

Long press on the button of S1 to adjust and switch the display, now switch the display to " servo travel measurement---PWM output " （short press on the button is to turn on the back light）

"up" and "down" is to adjust step-length, "left" and "right" is to adjust output impulse signal range, servo will work. The bigger the step-length, the servo moves faster.

Before measuring, fix the servo on the protractor center, record the angle of the servo arm, imagine it's 40°, the signal output is 1.000ms, enlarge angle of the servo arm to 100°by adjusting the impulse range, record the current range, if it's 1.450ms after adjusted, then the impulse range is 1.450ms-1.000ms-0.450ms, record the data. For avoiding the impulse range exceed the servo travel, we suggest the measuring impulse setting is 0.8-1ms.

Then fasten the gyro sensor on the servo arm center with the double side sticky tape.
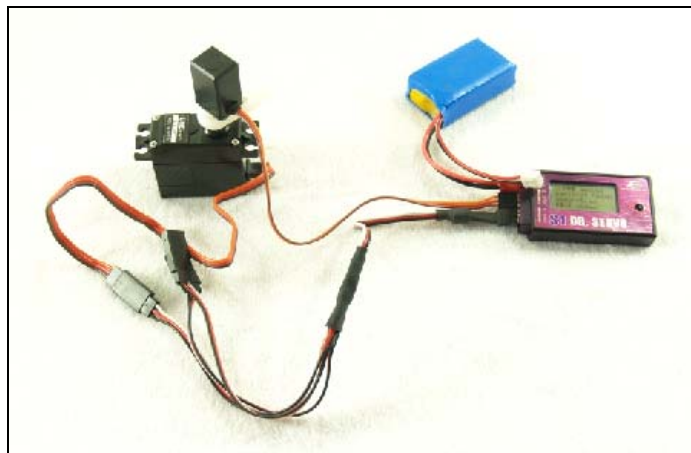
Finally, switch the S1 display to speed measurement , press "left" and "right" button to adjust step to the value of servo 60°impulse, for instance, the previous impulse range is 0.450ms, so STEP is 450us, then press the button, we will see the servo works twice left-right. It shows servo measurement succeed, T(time)=***ms.

As different brands servos don't run similarly, if you see the test servo runs more than twice, it indicates the servo need to reverse run, please press the "up" button until "R" appears on the display.

Measurement of servo travel linearity:

For this function, it helps us to know the travels of several servos and the linearity differences, so we can choose some good linearity servos for better helicopter flight.

1、With PWM signal output mode, connect 2 or more servos ("Y" harness needed) with the multifunctional extension wire. Adjust suitable STEP, let the servos work, and watch the consistence of the movement.

2、In the servo speed measuring display, set travel impulse width, after you measure the travel of the helicopter plate. Connecting with several servos, don't connect to gyro sensor. Then you can know the travels of servos and the linearity differences.

3、When measuring bigger servos, it needs a connector to power with, or use Y harness.

Measurement of times of use of servos:

For this function, the connection is same as above introduced. Adjust the display to ---Aging test.

In the display, speed is measuring speed, IN is the number that gyro sensor receives and records the servo runs, it's actually the times of use of the servo. OUT is the number that DR.SERVO sending running signal to servo.

"left" and "right" button is to adjust the servo measuring speed, max 100%, but if too fast, the servo doesn't have enough time to deal with input signal. "up" and "down" is to reset the parameters. Make sure to adjust a reasonable servo measuring speed.

When you find the servo doesn't work, it shows the servo is broken and the IN number is the times of use.
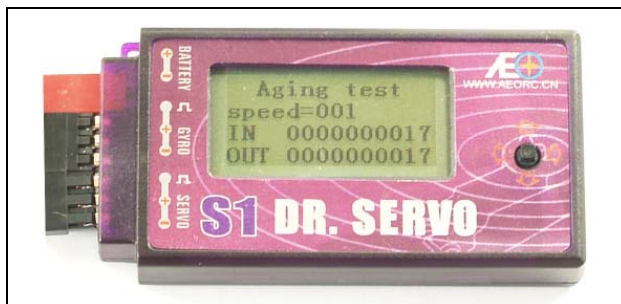
Measurement of receiver output signal and frequency:

Normal connection with your RX and TX, use the receiver signal measuring wire connect the gyro to the test channel of the receiver(extra power supply) such as the throttle channel.

Low throttle displays the lowest signal value, full throttle displays the max signal value.

Attention:

1. Gyro sensor is a high-precision device, any serious shock may cause damage.
2. The built-in BEC 1A current (input 8V), for those high torque, big servos test, please use extra battery to power.
3. 1S=1000ms=1000000us
4. Each time the speed of operation will be inevitably different, it's highly recommended to get an average measuring value.
5. Make sure to fix well the servo and the connection of the gyro sensor.
6. 4.8V is the standard working voltage of servos, If you measure the high torque servo, please use 4.8V voltage regulator extension wire to connect with servo.
7. Only one servo can be connected when doing speed measuring.
8. We recorded some 60° impulse range value of some popular servos for your reference.

Protractor