Timpdon Marine

Radio Servo Switch
Model MRSS4

Controlled rotation between two servo positions, with Limit Switch.

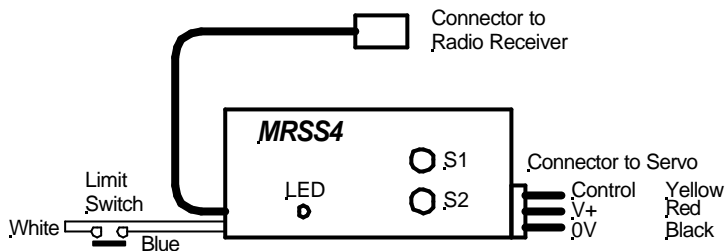*Programmable servo positions and rotation rate.*

Inline adaptor - fitted between RC receiver and servo.

Powered from RC receiver.

Features

- Switched control of a standard servo between two end points, at a controlled rate. Can use any joystick or switched digital transmitter channel.

- Limit Switch input to stop rotation when switch closed.

- User programmable servo positions, with programmable rotation speed.

- Can be re-programmed in-situ at any time, using built-in push button switches.

- Programmed settings retained when power removed.

- Accommodates servo position and transmitter pulse widths in range 0.6 ms to 2.4 ms. Auto zero with centre neutral joysticks.

- Digital microprocessor controlled.

- Small size – 45mm x 18mm x 12mm.

- Mounted inline between RC receiver and servo – powered from receiver.

Timpdon Marine   Tel **0161 - 980 8054**   Issue 1 – June 2011
Web www.timpdon.co.uk
EMail marine@timpdon.co.uk

Installation and Wiring

1   Connect the flying lead to the selected channel of your radio receiver.

2   Connect your servo to the 3 pin plug on the **MRSS4**, with the black servo lead adjacent to edge of unit, and the yellow or white data lead towards the middle.

3   Connect one or more **normally open** limit switches [not supplied] between the **white** and **blue** wires,

4   Power up the transmitter. Then power up the receiver.

5   Check that, once the receiver has bound to the transmitter, the **LED** on the **MRSS4** illuminates continuously. This indicates that the **MRSS4** is receiving valid RC pulses. The **MRSS4** has a in-built start up delay of 4.5 seconds to permit binding. During this period, the **LED** will flash. At the end of the start up delay, the servo will automatically set initially to the **reset** position.

6   Check that, when you set the joystick to **maximum**, the servo rotates at a controlled rate to the **set** position, when you set the joystick to **minimum**, the servo rotates back to the **reset** position, and when you set the joystick to the **centre neutral** position, there is no change to the previous action.

7   Check that, if a limit switch is **closed** while the servo is rotating, motion immediately stops, and no further motion in the same direction is possible until the limit switch is **opened**.

      However, if the joystick is set to the opposite direction while the limit switch is **closed** and motion is stopped, reverse rotation operates normally.

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                                 Web www.timpdon.co.uk
                            EMail marine@timpdon.co.uk

8   If, at any time, radio communication is lost, the **LED** will extinguish and the servo will maintain its last setting. Once communication is re-established, normal operation will start again automatically.

9   Now program the *MRSS4*, as described below, for the required servo positions and rotation rate for your system.

     On completion of programming, the programmed settings will be saved in non-volatile memory, and the system will automatically re-boot in normal operation mode.

10   Your system is now ready for use.

Principles of Operation
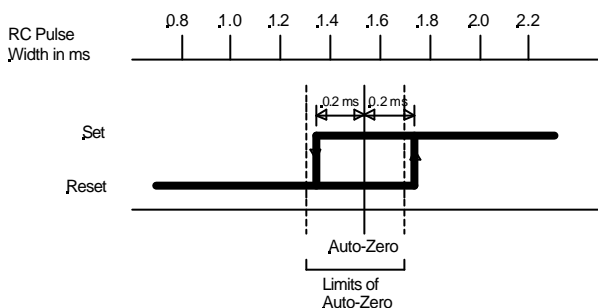
1   In a standard RC system, the output from each receiver channel is a variable width pulse, nominally between 1.0 ms and 2.0 ms in width, repeated at intervals of approximately 20 ms. A pulse width of 1.0 ms corresponds to the transmitter joystick at **minimum**, 2.0 ms to **maximum** and 1.5 ms to **centre**.

2   Within the *MRSS4*, the servo output is limited to one of two actions, depending on the setting of the transmitter joystick:

Joystick	**Action**
Maximum	Rotate to programmed **set** position
Minimum	Rotate to programmed **reset** position

     The rotation rate of the servo, at all times, is constant.

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3   The servo output pulse widths corresponding to the **maximum** and **minimum** joystick positions [**set** and **reset**] are user programmable, as is the **rotation rate** of the servo between these positions. The available range of servo output pulse widths is 0.6 ms to 2.4 ms.

4   On power up, provided that the transmitter is on, the **MRSS4** will auto zero within an input pulse width range of 1.3 to 1.7 ms. The **maximum** and **minimum** switch levels will then be set at +/- 0.2 ms around the auto zero position. The last valid auto zero setting is retained in non-volatile memory.

If the transmitter is off at power up, or the pulse widths are outside the permitted limits for auto zero, the unit will retain the last valid auto zero level, if available, or set the zero position to 1.5 ms, if not.

Programming

Programming or re-programming may be performed at any time, using push button switches **S1** and **S2**, with indication provided by the **LED.**

Programming is performed in three steps, in order – **Servo Reset Position, Servo Set Position** and **Servo Rotation Rate**

The **set** and **reset** limit positions of the servo may be set anywhere within its operating range, subject to a limitation of RC pulse widths of 0.6 ms to 2.4 ms, as described above.

Programming Procedure

Programming may be undertaken with the transmitter either on or off.

Press and hold both switches **S1** and **S2** together.
The **LED** will flash rapidly for about 5 seconds, and then go on continuously. Then release both switches.

If you release either switch before the LED stops flashing, the unit will remain in normal operation.

1   You are now in **Step 1 – Servo Reset Position**

The **LED** will flash with **single short** flashes, and the servo will move to the current **reset** position.

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Adjust the required **reset** position using either **S1** to increase the servo position or **S2** to decrease it. The actual rotation direction is servo dependent.

When satisfied, press and hold both switches **S1** and **S2** together.

The **LED** will flash rapidly for about 2 seconds, and then go on continuously. Then release both switches.

If you release either switch before the LED stops flashing, the unit will remain in program Step 1.

The unit will then proceed automatically proceed to program **Step 2**.

2   You are now in **Step 2 – Servo Set Position**

The **LED** will flash with **double short** flashes, and the servo will move to the current **set** position.

Adjust the required **set** position using either **S1** to increase the servo position or **S2** to decrease it. The actual rotation direction is servo dependent.

When satisfied, press and hold both switches **S1** and **S2** together.
The **LED** will flash rapidly for about 2 seconds, and then go on continuously. Then release both switches.

If you release either switch before the LED stops flashing, the unit will remain in program Step 2.

The unit will then proceed automatically to program **Step 3**

3   You are now in **Step 3 – Servo Rotation Rate**

The **LED** will flash with **single long** flashes, and the servo will rotate continuously between the current **set** and **reset** positions at the current **rotation rate**.

There are sixteen separate **rotation rates**, between 0.25 and 20 seconds for 90° rotation. Select the required **rotation rate** using either **S1** to increase the rate or **S2** to decrease it. After the last step, the rate will revert to the other end of the scale.

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When satisfied, press and hold both switches **S1** and **S2** together. The **LED** will flash rapidly for about 2 seconds, and then go on continuously. Then release both switches.

If you release either switch before the LED stops flashing, the unit will remain in program Step 3.

The unit will then save all programmed values to non-volatile memory.

The **LED** will then flash rapidly for about 4 seconds to indicate completion of programming, and then the *MRSS4* will automatically reboot in normal operation mode, with the new programmed settings operational.

The *MRSS4* is now ready for use.

Notes on Programming

1   Once you have entered programming mode, there is no exit until all programming steps have been completed. If you enter programming mode inadvertently, and you do not wish to re-program the unit, remove and re-apply power, to restart in normal operation mode.

2   Remember that no new programmed settings are saved until the end of programming **Step 3**. All steps must therefore be completed for programming to be valid.

3   If you make an error during programming, simply repeat the programming procedure after the unit has re-booted in normal operation mode.

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