

Dingo Servo Mounts

Multi Servo Control Board

Note: All PCB's supplied in Anti-static bags for protection!

Safety Precautions.

Before installing this product, make sure that you have read the full instruction guide and are comfortable with the requirements.

Make sure that all parts, especially plastic packets, are kept away from young children.

Only use certified power supplies for your region and **DO NOT** interfere with the Mains side of the power supply.

If you are unsure as to how to do the electrical connections, please consult with someone who has the required expertise or contact Dingo Servo Mounts for more information.

These units are not toys, but serious modelling parts.

Description and Origin

There are many servo control boards on the market to-day which can be used for model railway point and signal operation.

Most are for multiple servos and offer all sorts of bells and whistles.

There are also a range of excellent kits available to members of the MERG group which offer a variety of control options.

I believe there is a need for a very simple board that offers easy setup and operation for model railway points or semaphore signals.

This is the reason behind the development of this particular board.

The Multi Servo Control Board has been designed to control up to 4 servos individually while still using the same firmware as the now well established other Servo Control Boards.

The Plug in modules are available in **Red** for simple point operation or **Yellow** which contains the "Bouncy" Signal firmware.

Any combination of boards is possible and not all slots have to be filled. This allows for expansion and or change as the layout progresses.

The Multi Servo Control Board is designed for use with standard 9g servos like the TowerPro SG90 Hobby King HK15178 or similar. You may also use the Power HD series servos HD1900A and HD1370A servos. In fact any of the servos sold by us. (Will not work with 360deg Servos)

The Multi Servo Control Board modules have a preset slow speed to simulate real life point or signal movement and there is no provision for adjusting the speed.

The two end positions are set very simply by means of a plug in setting box.

A simple single pole on/off switch is all that is required to move the servo from one position to the other. (Note you will need 4 switches to control the complete board.)

Wiring up.

You will need a smoothed and regulated DC power supply of 9 – 12 V DC with a capacity of at least 2Amp for a single board.

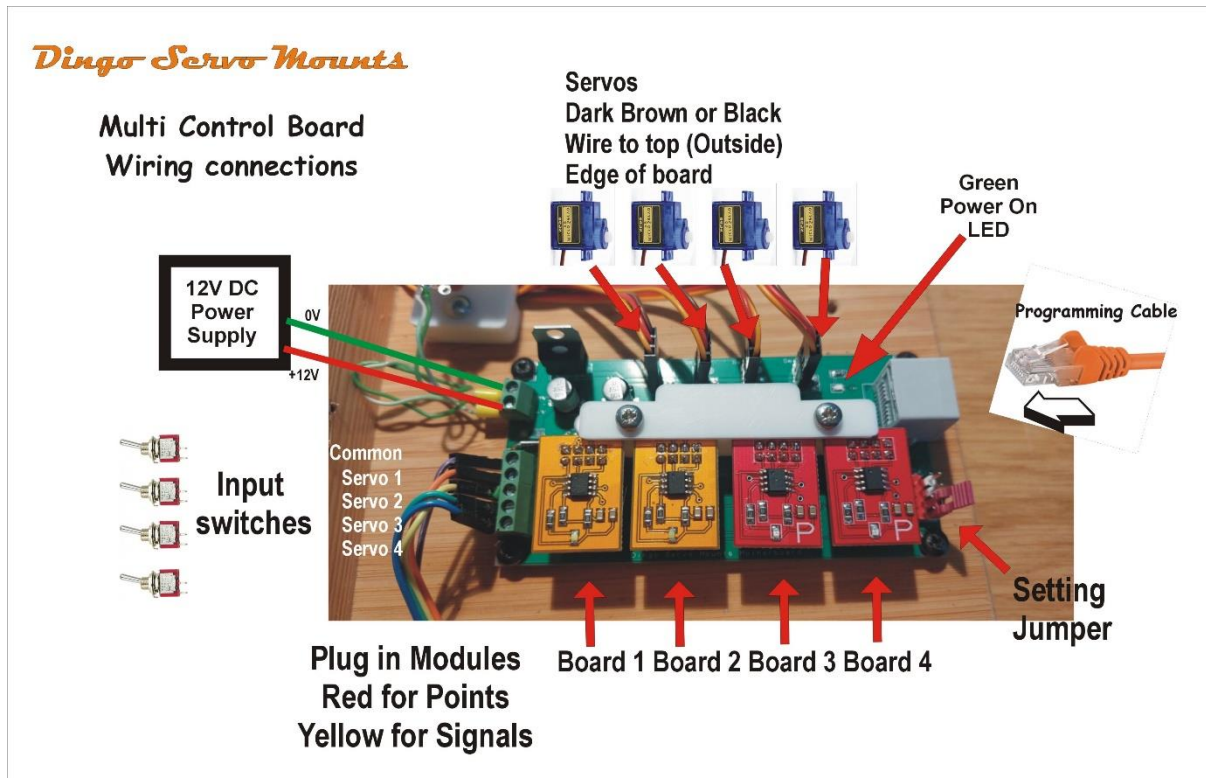
A standard 2A wall wart will be sufficient to drive the unit as long as not more than 2 modules are actuated at the same time.

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You will also need four SPST switches to control your board. (This may also be a set of relay contacts or similar from your layout control panel.)

Note a push button switch will not work unless it is self latching.



Wire up as per this diagram.

Note the polarity of the power supply is important. (If connected the wrong way around, the board will not work but will not be damaged.)

The servos need to be connected with the black or dark brown lead towards the outside edge of the board. (There is a small white dot on the PCB markings)

The switch simply shorts the two switch contacts together.

Note that the bottom 4 terminals are the "Live" contacts and the top one is common and is connected internally to earth. (0v) All switches need to be connected to this terminal.

In operation Switch 1 (Input 1) operates Servo 1 and so on up to Input 4

LED's for each module are located on the modules

It is advisable to test the servo and board before fitting the servo to the layout and advisable to use a setting box as outlined in the following section to centre the servo.

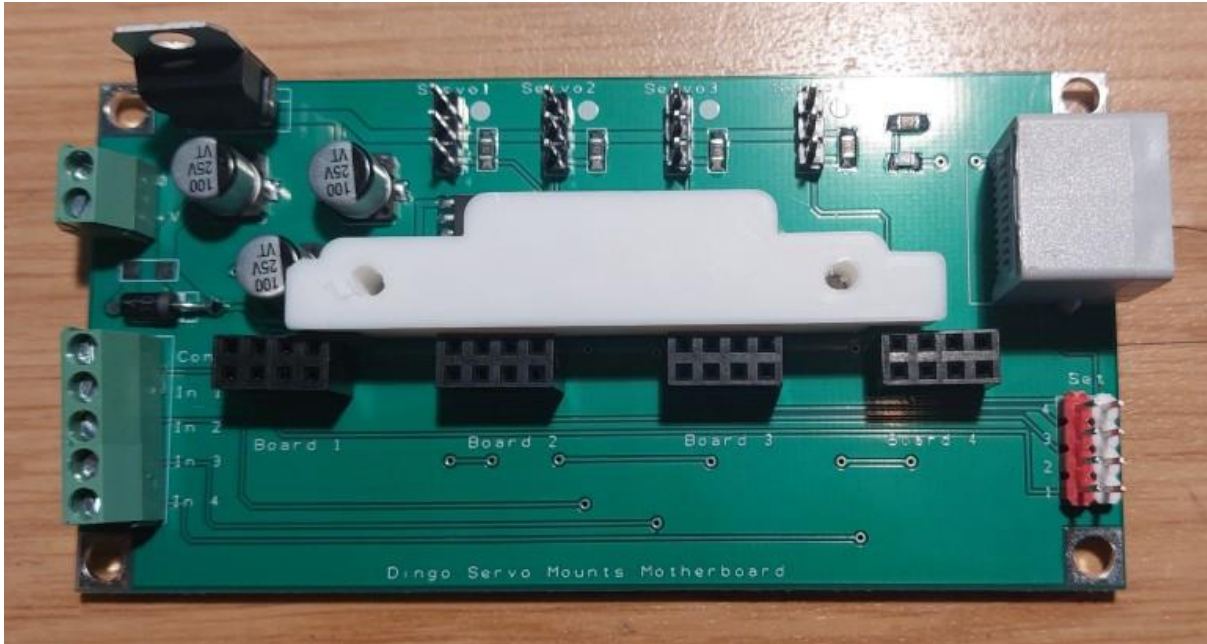
We always recommend using one of our Dingo Servo Mounts to get optimum performance from your servo on your layout.

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Adding the modules

This is the bare motherboard showing the 4 sockets where the modules fit into.



The modules plug into the board with the pins to the White plastic Clamp
Make sure that the modules are plugged in correctly with all 8 pins in their respective holes.

Warning: Do not plug or unplug modules with the power connected.

Select modules according to the operation desired.

Use Red Modules for points, crossing gates and animations



Use Yellow boards for semaphore signals only.

Any combination of boards can be fitted as the firmware associated with the module in-s in the chip on the module.

Once the modules are firmly in place add the second part of the white plastic clamp making sure that the boards are secured within the slot provided and then gently tighten the 2 M3x 8mm screws to hold it all together.

Apply power to the unit and all 4 boards should light up after a second or 2 as well as the green Led on the motherboard.

The Red boards have a **RED LED** and the Yellow boards have a **YELLOW LED**.

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Setting up the end positions.

Please note that all settings are stored in the chip on the board or module so you need to use the board or module that you are using for the particular servo to do the setting up.

Once the unit is connected as described above, switch on the power and after a second or so the LED's should light to show that the board is in working order.

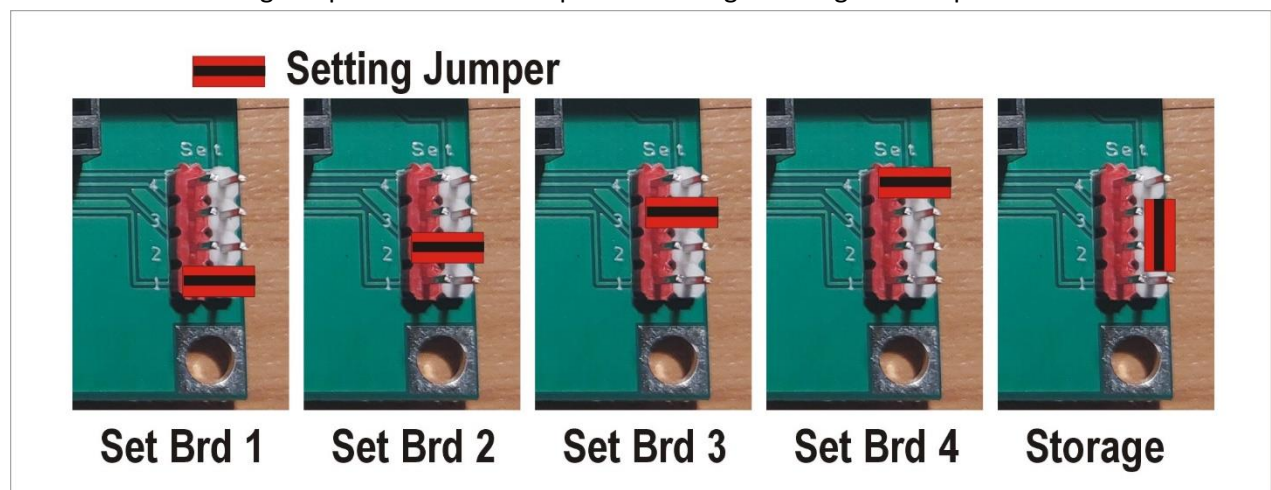
Now plug in setting box into the RJ45 connector on the board.

Before connecting the setting box make sure that both controls are in the mid position. Arrows or markers pointing straight up.

WARNING!
Do NOT use Crossover cables
Use cables supplied by Dingo Servo Mounts
or Cat5e straight cables only
Use of crossover cables
can lead to permanent damage



Now move the setting Jumper to the relevant position to begin setting the end points.



When not in use move the jumper to any 2 WHITE pins – Do NOT leave it on the RED pins.

This is for storage only and will not affect the settings but will prevent it from getting lost.

Setting up the end positions – RED Boards.

With setting Jumper moved to relevant position you can set corresponding Servo Immediately the RED LED will flash twice and then go out indicating that the board is now in setting mode.

Set the position by means of VR1 on the setting box.

Now operate the switch to the "CLOSED" position

Now set the opposite position by means of VR2 on the setting box.

Once this is done remove the setting Jumper and the values will be written to the Chip.

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The end positions are now set and the unit should operate when the switch is toggled.

When you are happy with the setting, remove the setting jumper and place it on the next position you want to set up

Once all modules are set, remove the setting jumper and return to any 2 WHITE pins for storage. Now unplug the setting box and check to make sure that everything is functioning as required.

At anytime the settings can be changed by plugging the setting box in again, setting the required jumper and repeating the above procedure. (Note you don't have to set all units again as they work totally independently.)

NOTE! The unit will not set if the servo is pushing hard against a stop as the board won't be able to reach the setting point and will thus not set. Back off slightly before removing the setting jumper.

The board is now set and should continue to operate to the same endstops until reprogrammed.

Preparing the Signal Mount

In order to get this board working correctly it is necessary to remove any play in the servo mount. You may remember that all our mounts come with a bit of play (hysteresis), but sadly this needs to be removed for good "bouncy" action. **NOTE: Newer version "B" mounts do not need this mod.** This needs to be done to either the single or dual signal mounts. (The Multisignal and Omni mount should be OK as they are.)

Note: If using the new "Mini" mount range this step is not required.

This can be done in 2 ways.

1. Slide a short length of 1.5mm Heatshrink tubing over the drive screw (that's the tiny self-tapper that you insert into the servo horn to drive the slider up and down). Make sure that you leave enough thread on the screw to screw into the horn. Shrink the tubing so that it forms a "Plastic" washer at the head end of the screw which should now fit more snugly into the slot on the Slider.
2. Remove the servo from the mount and drill the hole in the servo horn out to 1.8mm and then insert a M2 x 6mm screw from the back.

Now reassemble the motor and refit from the back of the mount so that the screw engages into the slot on the slider.



Once modified check that the mount operates correctly and that there is minimal play in the mechanism.

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Setting up the end positions – YELLOW Boards.

UPDATE – If your board has an “S” on indicating a new firmware please go to the updated setting instructions further down this page.

Make sure that the Input Switch is in the “Open” position.

With setting Jumper moved to relevant position you can set corresponding Servo

Immediately the Yellow LED will flash twice and then go out indicating that the board is now in setting mode.

For a lower Quadrant signal this will be Horizontal and for an Upper Quadrant this will be the up or off position.

Set the position by means of VR1 on the setting box.

Now operate the switch to the “CLOSED” position – the LED will come on momentarily and then go out.

Now set the Lower position by means of VR2 on the setting box.

Once this is done remove the setting Jumper and the values will be written to the Chip.

The end positions are now set and the unit should operate when the switch is toggled.

If the “Bounce and double Pull” are inverted, then reprogram changing the “OPEN” and “CLOSED” positions of the switch around.

When you are happy with the setting, move the setting jumper to the next position to set and once all modules have been set remove jumper and place it on the Storage position any 2 of the WHITE pins

DO NOT STORE ON THE RED PINS>

Now unplug the setting box and check to make sure that everything is functioning as required.

At anytime the settings can be changed by plugging the setting box in again, setting the required jumper and repeating the above procedure. (Note you don't have to set all units again as they work totally independently.)

UPDATED setting instructions for Signal “Yellow” Modules with “S” on them.

In an attempt to make the signals safer – ie. Go to danger (ON) when the switch is open circuit, the firmware has been updated and is set as follows.

The boards should be marked as follows.

There will be an “S” on the top of the board

If you have bought the boards from us after the 2nd of April 2024 then they should be at the new firmware level.



Use the setting jumper as described previously and set each servo according to these instructions.

Note: This board can still be set with the older De Lux Setting Box but you will need to remove the jumper to finalise setting instead of moving the switch to “run”

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For the “ON” or danger position make sure that the switch is in the open position (You can test this with a multimeter)

Now move the switch on the Setting box to “SET”

Immediately the LED will flash twice and the go out indicating that the board is now in setting mode.

Now adjust the board with the “Yellow” knob (VR2) until the signal is in the horizontal position.

Now operate the switch to the “CLOSED” position – the LED will come on momentarily and then go out.

Now set the Upper or lower position depending on the quadrant you are modelling by using the white knob (VR1)

If using upper quadrant (LMS style) signals this will be above the horizontal and if using lower quadrant (GWR style) signals this will be below the horizontal.

Once this is done, switch the setting box to “RUN” and the values will be written to the Chip.

The end positions are now set and the unit should operate when the switch is toggled.

You Should get a double pull going “UP” or “DOWN” and it should bounce when returning to horizontal.

The settings are generated randomly and will be different each time to add some semblance of realism.

At anytime the settings can be changed by plugging the setting box in again and repeating the above procedure. (Note you don’t have to set all units again as they work totally independently.)

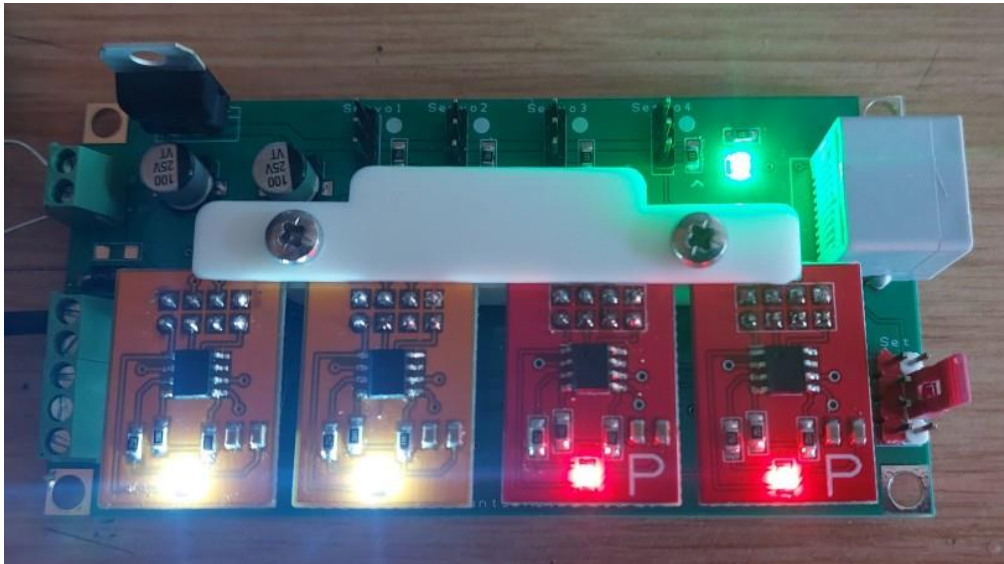
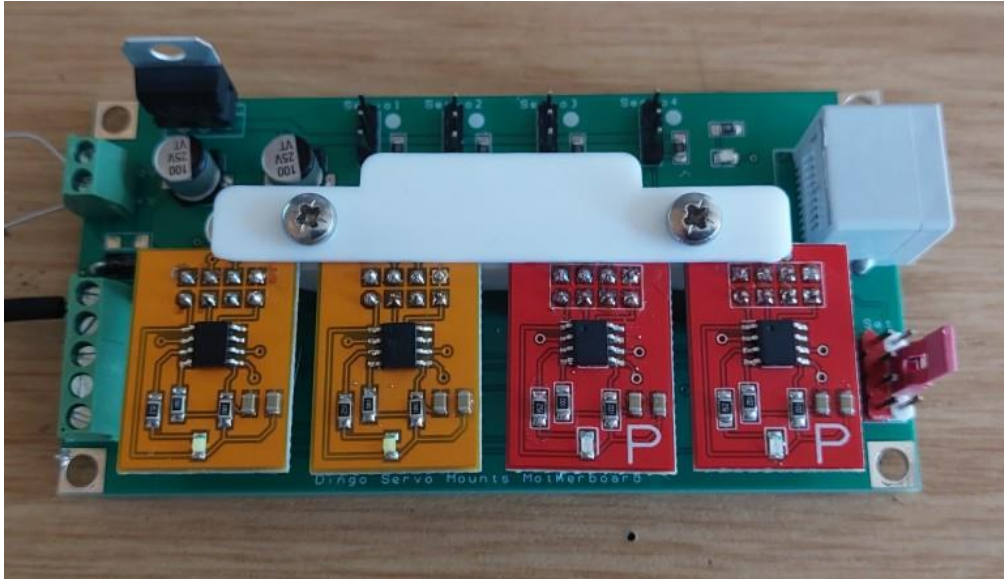
NOTE! The unit will not set if the servo is pushing hard against a stop as the board won’t be able to reach the setting point and will thus not set. Back off slightly before removing the setting jumper.

The board is now set and should continue to operate to the same endstops until reprogrammed.

ONE FINAL NOTE! Sometimes at switch-on the servos may move to the mid position before going back to the set positions. This is a software protection device to make sure that the servos don’t go the wrong way with a bad switch on spike or bad shutdown. It is therefore important that the midpoint of travel is within the 2 set points of the servo.

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I hope that you will find this unit useful and as always I welcome any feedback, especially as these boards are still in test production so that I can modify if required to make this a really good servo controller board.

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If you haven't already seen our amazing servo mounts in action, please check out the Video Links Page on our website.