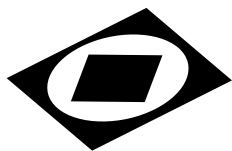


Instruction Manual

GM-Racing V12



Features:

- ◇ Adjustable torque control
- ◇ Turbo function
- ◇ Minimum brake
- ◇ Maximum brake
- ◇ Automatic brake
- ◇ Adjustable operating frequency
- ◇ Quick start circuitry
- ◇ Easy-Set System
- ◇ Re-regenerative braking system
- ◇ BEC voltage supervision
- ◇ LED function control light

Installation

Securely mount the speedo to the chassis of your car using double sided (servo) tape. Position the unit as low as possible in the car to maintain a low centre of gravity, and keep all power wires at least 3cm (1.5") from the radio receiver.

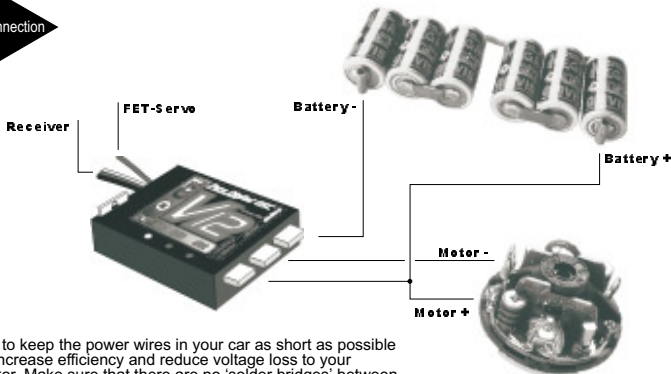
V12

Connect the soldering post marked '-Battery' to the negative (-ve) terminal of your Ni-Cad pack. Connect the soldering post marked '- Motor' to the negative (-ve) terminal of your motor. Connect the soldering post marked '+ Battery/+ Motor' to the positive terminal of your Ni-Cad pack and the (+ve) terminal of your motor.

Mini Vorward Series

Connect the black wire to the negative (-ve) terminal of your Ni-Cad pack. Connect the blue wire to the negative (-ve) terminal of your motor. Connect the red wire to the positive terminal of your Ni-Cad pack and the (+ve) terminal of your motor.

Connection



Try to keep the power wires in your car as short as possible to increase efficiency and reduce voltage loss to your motor. Make sure that there are no 'solder bridges' between the three soldering posts on your speedo, as this will destroy the unit and void your warranty.

Installation

V12 reverse

Connect the soldering post marked '- Battery' and the one below to the negative (-ve) terminal of your Ni-Cad pack.

Connect the soldering post marked '- Motor' to the negative (-ve) terminal of your motor.

Connect the soldering post marked '+ Battery' and the one below to the positive (+ve) terminal of your Ni-Cad pack.

Connect the lower middle soldering post to the positive (+ve) terminal of your motor.

Mini Reverse Series

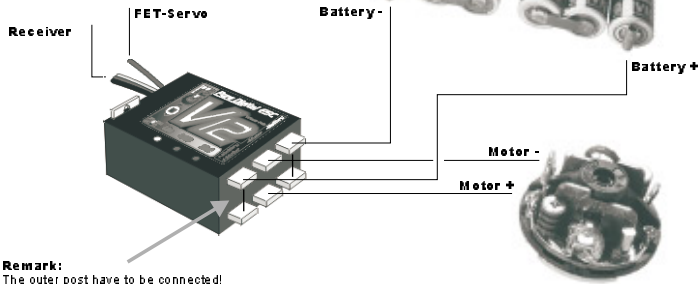
Connect the black wire to the negative (-ve) terminal of your Ni-Cad pack.

Connect the blue wire to the negative (-ve) terminal of your motor.

Connect the red wire to the positive (+ve) terminal of your Ni-Cad pack.

Connect the yellow wire to the positive (+ve) terminal of your motor.

Connection

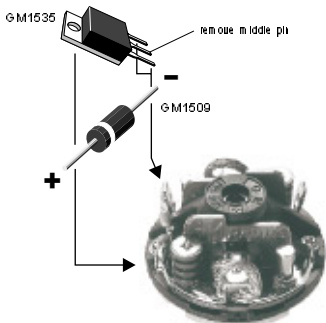


Schottky diode

Always use a Schottky diode between the motor -ve and the motor +ve power wires or directly to the motor. to increase efficiency and protect the braking FETs. You can do this by soldering a Schottky diode between the power wire to the motor or direct to the motor.

The new Schottky diode GM1535 is 6x stronger than old type GM1509.

NEVER connect a Schottky diode to a reverse speed control!



Connection to receiver

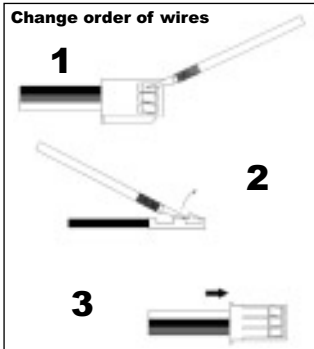
GM-Racing speedos are fitted with a Futaba radio plug. If you use a different radio system you may have to change the order of the wires to coincide with your radio equipment.

red = receiver positive
black or brown = receiver negative
white or orange = receiver impulse

Connection of a FET servo

The single, thin, red wire is for FET servos. It should be connected in series to an inductor coil (GM1538) and the blue wire of the servo. If you do not use a FET servo, you can cut the thin red wire away. Do not let it come into contact with any of the power wires or soldering posts as this will destroy the speedo and void your warranty.

Change order of wires



Quick Tune

Connect motor and battery to your speedo as described earlier in this manual.

Turn on your transmitter and set all throttle rates to 100%.

Turn on your speedo at the switch. The LED will come on.

Press the set button once. The speedo will beep as you press it. Do not move the throttle on your transmitter. After 2 secs the speedo will beep and the LED will go out (neutral saved). In the next 4 secs give full throttle, full reverse and then back to neutral on your transmitter.

The speedo is now tuned to your transmitter.

To check you have tuned it properly, the LED will only come on at neutral, full speed and full brake.

If it does not, repeat the above section.

Torque control

The SPORT Series do not feature torque control!

The pot. marked 'LIM' controls the torque of the motor. By turning this pot. the current supplied to your motor can be adjusted to limit wheelspin and increase runtime. Turning the pot. anti-clockwise will reduce the current (min. 10A). Turning the pot. clockwise will increase it (max. 100A). If you turn the pot. fully clockwise, you will have no current limit.

These current limits are suggested starting points for different surfaces and classes of racing.

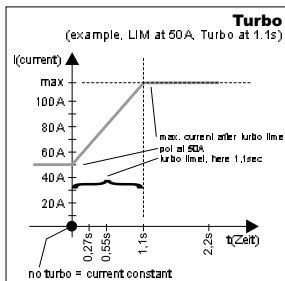
| | |
|----------------------|--------|
| 1/12th (carpet) | 40-50A |
| PRO 10 (tarmac) | 60-70 |
| Touring car (tarmac) | 70-80A |
| Off-Road (clay) | 50-70A |
| Off-Road (grass) | 70-90A |

Programming the additional functions

All GM-Racing Speed Controllers are fully programmable. The new 'Easy-Set-System' enables precise programming within a few seconds.

Program Nr. Function

- 1 Turbo (0 = no turbo, current stays constant, 0.27s, 0.55s, 1.1s, 2.2s (default))
- 2 Minimum Brake (0 = default to 100%)
- 3 Maximum Brake (0 to 100% = default)
- 4 Operating Frequency (2kHz = default or 4kHz)
- 4 Quick Start Circuitry (disabled = default, enabled)
- 4 Automatik brake (disabled = default, enabled)



Functions

Turbo

When Torque Control / Current Limiting Technology was first used in electronic speed controllers, divers noticed that the top speed of their cars was also being limited. Ralf Helbing, GM-Racing's chief engineer, was the first to incorporate the new TURBO function to his range of speedos to return the lost speed drivers suffered from. The adjustable turbo function will override your initial Torque Control once you have used full throttle, and provides you with full power for the main straight on your track. As soon as you release full power, the speedo will return to your original Torque Control until you reach full speed again. See graph above. (default 2.2s)

BRKMIN

Short for Brake Minimum. This is the percentage of brake that you require for the first stage of brake travel on your transmitter. This is also the amount of brake the speedo automatically uses when using BRKAUTO. By setting this value at 20-40% you will immediately notice the braking effect for the smallest movement on your transmitter. (default 0%)

BRKMAX

Short for Brake Maximum. This is the percentage of brake that you require for maximum brake level on your transmitter. When racing on slippery surfaces or in wet conditions reduce this value to stop the wheels from blocking. (default 100%)

Quick Start

For use in finals. When enabled the speedo applies max. torque for the first time you give full throttle on your transmitter. The speedo then returns to normal torque control when you go to neutral the first time (usually the first corner). (default disabled)

BRKAUTO

Short for Automatic Brake. When enabled the speedo will apply BRKMIN to the car when you return to the throttle neutral point on your transmitter. This is useful on tight, twisty tracks, that require quick use of the brake and throttle to negotiate hairpin turns. (default disabled)

Frequency

This is the Operating Frequency of the speedo. Adjustable from 2 to 4kHz. (default 2kHz)

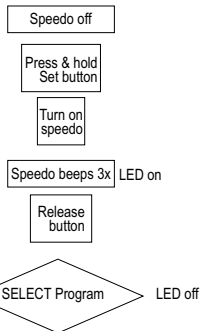
Programming the additional functions

All GM-Racing speed controllers are fully programmable. The new 'Easy-Set-System' enables precise programming within a few seconds.

Program Nr. Function

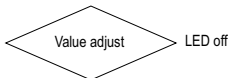
- 1 Turbo (0 = no turbo, current stays constant, 0.27s, 0.55s, 1.1s, 2.2s (default) (Not SPORT series)
- 2 Minimum Brake (0 = default to 100%)
- 3 Maximum Brake (0 to 100% = default)
- 4 Operating Frequency (2kHz = default or 4kHz)
- 4 Quick Start Circuitry (disabled = default, enabled)
- 4 Automatik brake (disabled = default, enabled)

Procedure



begin selection within the next four secs by pressing button LED comes on at each button press and beeps for 1sec

speedo beeps after another 4 sec
3 short beeps - LED off (quit select program)
3 short beeps - LED on (start value program)

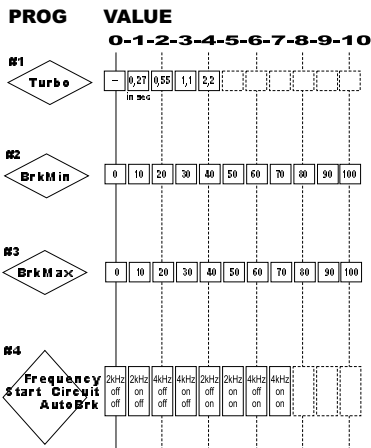


begin selection within the next four secs by pressing button LED comes on at each button press and beeps for 1sec

speedo beeps after another 4 sec
3 short beeps - LED off (quit value adjust)

End of procedure
back to driving mode

Programm Chart



GM-Racing Reverse Speed Controls

GM-Racing's reverse speed controls feature proportional brake and proportional reverse.

Function:

- Brake normally by simply hitting the control stick or trigger backwards.
- If you want to drive backwards, hit full brake once, return to the neutral position and then press stick backwards again to drive in reverse. In order to protect the FETs from overheating, GM-Racing incorporated a reverse time limit of approx. 6s.

This time limit can be disabled by following this procedure:

- Turn on radio, turn on speedo
- Press button until LED turns off.
- Repeat quick tune
- You're done!

Enable time limit by repeating this procedure.

Installing a Power Capacitor

Using a power capacitor will allow a speed controller to run cooler and improve overall performance, by smoothing any power spikes that may be generated by a speed controller operating at ultra high frequencies.

The power capacitor is polarized. The negative (short) lead is marked with a white band and minus on the body of the capacitor. Solder the capacitor between the positive power wire and the negative power wire ensuring correct polarisation. Use servo tape to secure the capacitor to the side of the speed controller or use heat shrink to secure it to the power wires.

Warning

- Do not allow water or moisture into the unit
- Never run motor on external battery when hooked up on speedo
- Never short unit, no reverse voltage
- Not suitable for children under 14yrs, no toy

Warranty

GM-Racing guarantees this speed control to be free from factory defects in material and workmanship for a period of 6 months from date of purchase, verified by sales receipt.

This warranty does not cover: components worn by use, application of reverse or improper voltage or misuse. Our warranty liability shall be limited to repairing unit to our original specifications. Because we have no control over the installation of this product, in no case shall our liability exceed the original cost of the product. Additionally, these items void the warranty:

- allowing water or moisture into the unit
- incorrect wiring
- use inconsistent with the instruction

By the act of using this speed control, the user accepts all resulting liabilities.

