

Real Performance Product By GIZZMO



Thank you for purchasing the Gizzmo IBC-R RPM dependent Boost Controller. This manual contains operating instructions and installation procedures that are needed for the fitting and operation of this product



Instruction Manual

GIZZMO
ELECTRONICS

www.gizzmoelectronics.com

GIZZMO **IBC-R Boost Controller**

THE COMPETITION GRADE BOOST CONTROLLER WITH EVERYDAY FUNCTIONALITY.
TAKING WHAT WE KNOW FROM A DECADE OF DEVELOPMENT, AND FROM LISTENING TO WHAT
YOU END USERS WANT WE SET ABOUT PRODUCING THE IBC-R.

THE INGREDIENTS ARE SIMPLE. TAKE AN MS-IBC AND MAKE IT BETTER, FASTER AND EASIER
TO USE.

BETTER: WE HAVE ADDED THE ABILITY TO EASILY ADJUST BOOST DEPENDING ON RPM (RPM
DUTY OFFSET)

IF YOU WANT A HARD HIT OF BOOST, THEN FOR IT TO LEVEL OUT, THEN RISE AT THE TOP
END? NO PROBLEM

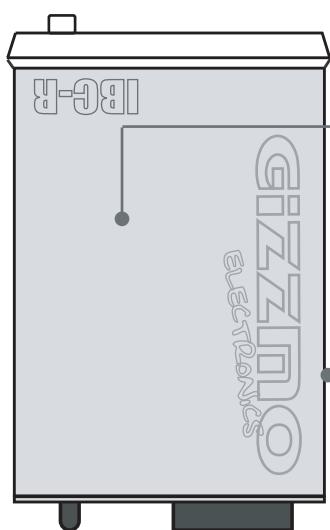
IF YOU HAVE BOOST CREEP THAT YOU WANT TO MINIMISE BY OPENING THE WASTEGATE AS
YOUR RPM'S RISE? NO PROBLEM

IF YOU HAVE BOOST DROP OFF THAT YOU WANT TO MINIMISE BY SHUTTING YOUR WASTEGATE
AT HIGH RPM? NO PROBLEM

FASTER: 64MHZ PROCESSOR. USING THE LATEST PROCESSOR TECHNOLOGY MEANS THAT
THIS UNIT WILL NEVER BE WANTING FOR MORE PROCESSING POWER!
THIS MEANS YOU WILL ALWAYS HAVE THE BEST, MOST ACCURATE BOOST CONTROL

EASE OF USE: SOMETIMES YOU JUST WANT TO KNOW WHAT THE UNIT IS DOING... NOW YOU
CAN! WE HAVE ENABLED THE DISPLAY TO SHOW NOT ONLY THECONVENTIONAL BOOST BUT
HAVE ALSO ADDED THE ABILITY TO SEE DUTY OR RPM DUTY OFFSET

Technical Diagram



Processing Power

Gizzmo's IBC-R is over engineered
with a 64mhz RISC Processor
capable of processing almost one
billion instructions per min.

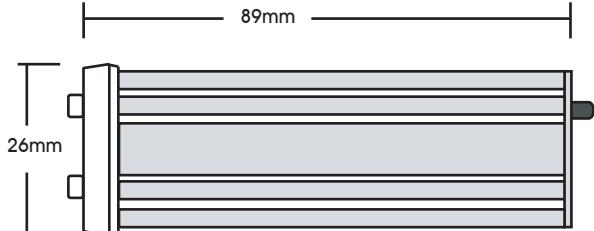
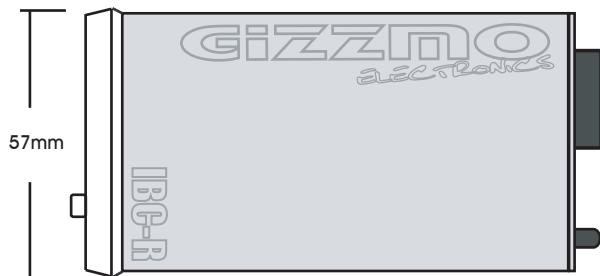
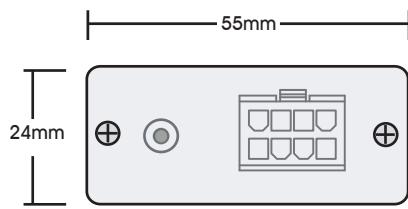
Extruded Aluminium Case

By utilising a rugged Extruded
Aluminium case you can be assured
that your IBC-R will keep its look for
years to come. Because the IBC-R is
so deceptively small, you can mount it
virtually anywhere.

Functions/Specifications

Number of boost memories	6 with individual gain settings
Maximum boost	50psi (3.5bar)
Processing Power	64 mhz RISC
Active Over Boost	5psi to 50psi
Boost Control	Closed loop
Boost Offset RPM Range	2000rpm ~ 9000 rpm
Boost Offset Duty	-50% ~ +50%
IBC-R size	117mm * 57mm * 26mm
Operating Voltage (v)	11.8V - 21V
Operating Current	Less than 0.5A
Reverse Battery Protection	Yes
Overcharging Protection	Yes
Case Material	Anodised Extruded Aluminium
Display	3 * 7seg BLUE LED display
Pressure display options	KPA, PSI, BAR, DC, DUTY OFFSET
Wastegate Compatibility	Internal and External
Solenoid	High Performance Single

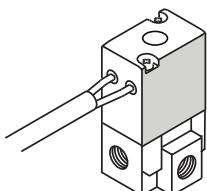
IBC-R Specifications



IBC-R Parts List



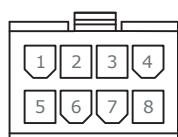
IBC-R Module
x1



Solenoid Valve
x1



Instruction Manual
x1



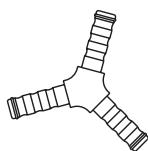
IBC-R Harness
x1



1mx5mm Nitrile
Tubing x1



1.2mx2.8mm
Vacuum Tubing x1



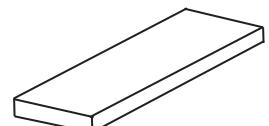
5mm 'Y' Piece
Connector x1



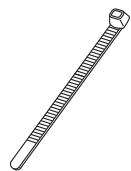
3mm 'Y' Piece
Connector x1



Tail 5mm
x2



Double sided Tape
Pad For Mounting
MS-2 x1



Cable Tie
x8



3mm Flat
Washer x2



3mm Nut
x2

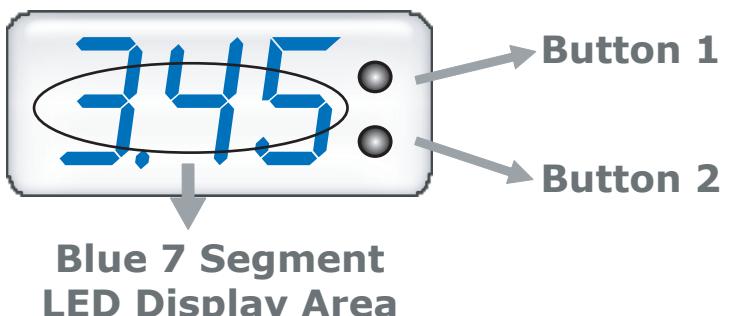


3mm Bolt
x2

Warning/Caution

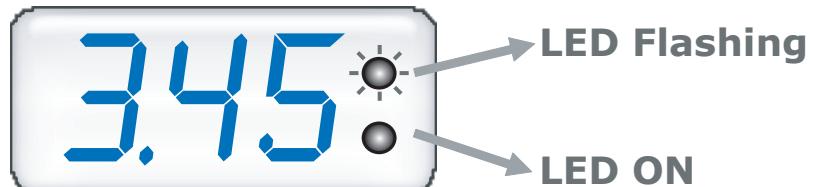
Always connect the wiring exactly as described in the instruction manual.
Disconnect the negative terminal of the battery before proceeding with installation.
Do not drop or expose this unit to excessive shock.
Installation should only be performed by an experienced automotive electrician.
Keep this unit away from moisture.
Never disassemble, modify, or tamper with this unit.
Never operate this unit while driving.
Securely mount this unit away from any area that may effect driving.
This unit is only designed for 12V DC type vehicles with a negative ground supply.

Operating Instructions



Notes:

By pressing both buttons at the same time you can toggle between bright and dim display settings.



Glossary of terms:

Hold: Push Button down for over 1 sec.

Activate: Push Button down for less than 0.5 sec.

Units of Pressure

e.g:

BAR Display

1.00:

LB Display

145:

KPA Display

100:

Caution:

All readings in this Manual are in BAR unless otherwise stated.

Start Up Sequence

Every time the ignition is turned on the Solenoid will click briefly and Display Area will:

1. Display the memory option that was last in use.
2. Display the boost pressure for the memory option.

Then will go to the real time boost display. (Running Mode)

e.g:

Memory Option

/ :



Boost Pressure

1.00:

Running Mode

0.00:



To Change Boost Memories

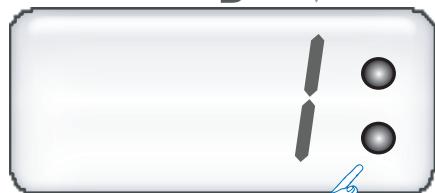
The screen will display ' **1:**' which stands for Memory1 Option and then it will display the boost pressure for that memory option e.g: ' **1.20:**'.

Running Mode



【Activate
Button2】

Memory 1



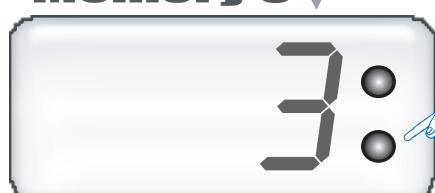
【Activate
Button2】

Memory 2



【Activate
Button2】

Memory 3



【Activate
Button2】

Memory 4

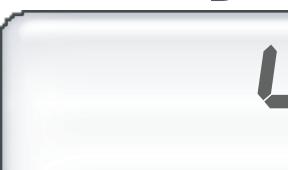
Memory 5

Memory 6



【Activate
Button2】

Memory 7



【Activate
Button2】

Memory 8



【Activate
Button2】

Quick Setup Page I

Setting up the boost must be done in the following order of boost and then gain.

Quick Boost Setup

1. Fit Unit as per these instructions.
2. Start car and allow engine to warm up thoroughly whilst doing the next few steps.
3. Set the memory (using the top OR bottom button) to the memory number you want to set.
4. Press the bottom button on the IBC-R until the IBC-R scrolls 'CLOSED' or 'OPEN'.
5. If the display reads 'OPEN', press the bottom button once so that the display reads 'CLOSED'.
6. Press and hold both buttons until the duty cycle (a number between '10' and '90') displays.
7. If this is greater than '10' press and hold the bottom button until the number comes down to '10'
8. Press and hold both buttons until the gain (a number between '0' and '100') displays.
9. If this is greater than '0' press and hold the bottom button until the number comes down to '0'.
10. Press and hold both buttons to exit to the normal display
11. Drive the car on full throttle in 3rd or 4th gear to achieve a stable boost reading.
12. Bring the vehicle to a halt and then either turn off the ignition then turn it back on again, OR, Press the top button once, then the bottom button once (this will put the controller into boost level 2, then back to 1 again to read the recorded boost setting). This displayed pressure is the new "Target" boost. Let us say that this was 12.5psi and you would like to achieve 16psi.
13. Repeat steps 4 – 11 replacing instruction 7 with...
7b using the top button to increase the duty cycle by 5 – 10 using a lower number as you get closer to your desired pressure
...until the boost level you require is achieved.

NOTE: If you get duty cycle over 50 and the boost level is not increasing, then you have either not plugged in the solenoid, not plumbed it in correctly or have a mechanical setup not able to achieve the desired pressure.

Quick Setup Page II

Quick Gain Setup

1. When you are happy with the boost pressure press the bottom button on the IBC-R until the IBC-R scrolls 'CLOSED'
2. Press and hold both buttons until the duty cycle you set previously displays.
3. Press and hold both buttons again until the gain (a number between '0' and '100') displays.
4. Press the top (to increase) OR bottom button (to decrease) the displayed gain setting.

NOTE: This number will take some trial and error to set however typically it should NEVER be higher than duty cycle, in fact we have found the best setting is below '20'. If gain is too high the boost will either overshoot, or the maximum stable (Target) boost will fluctuate or increase every time you drive it!

5. Press and hold both buttons to exit to the normal display
6. Drive the car on full throttle in 3rd or 4th gear to achieve a stable boost reading noting the manner in which the vehicle comes on boost and the stability of the boost.
7. If you believe there is room for improvement repeat steps 2-6 until you are satisfied with the boost characteristics.

Adjusting the Duty Cycle Setting

Adjusting the Duty Cycle Setting

Running Mode

Hold down the bottom button2 until the screen displays '0.00' and then release the button.

[Hold down Button2 for two seconds]

The display will scroll '0.00' which stand for the running mode.



[Light Off]

Use Button1/Button2 to set the Duty Cycle Percentage. The Setting Range is from 10%~90% in 1% increments.



e.g: "duty" <-!> "duty"



Use Button1/Button2 to set the Gain Percentage. The Setting Range is from 0%~100% in 1% increments.

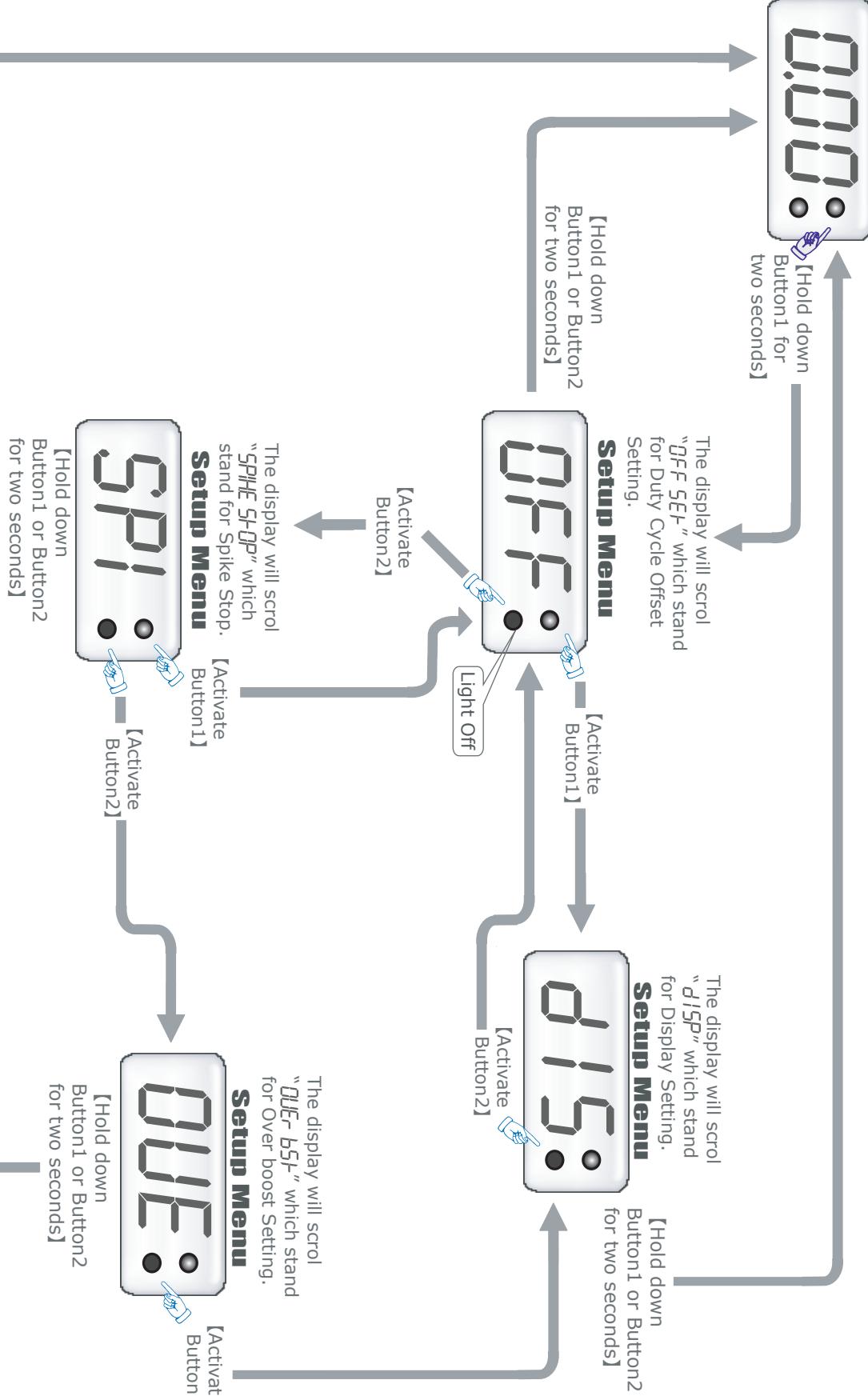
The display will scroll "OPEN" which stand for the Open Loop Setting

[Activate Both Button1 And Button2]

This refers to the type of control the IBC-R will apply to your waste-gate.

If you select 'open' the IBC-R will NOT attempt to correct any fluctuations or boost creep/drop off. If you select 'closed' the IBC-R will continually monitor and make minor offsets to the duty cycle in an attempt to stabilise the boost. (refer to the glossary for more information on these 2 functions).

Setup Menu



Note:
Please refer to the glossary for more information on this function.

RPM/DUTY OFF SET Menu

Running Mode
0.00 :

[Hold down
Button1 for
two seconds]

OFFSET Mode
Adj :

The Screen will display
"Adj" which stands for
Adjust Offset Duty

[Activate Both
Button1 And
Button2]

Use either
Button1/Button2
to select
between Adjust
Offset Duty and
IBC-R Calibra-
tion Settings.

OFFSET Mode
Cal :

The Screen will display
"Cal" which stands for
IBC-R Calibration

CAUTIONS A:

Before utilizing the offset features of the IBC-R you must calibrate the IBC-R's RPM to the engine RPM. This is a simple procedure...

1. Hold down the top button until the display reads 'OFFSET'
2. Push both buttons to enter. The display should now read 'ADJUST'
3. Push the bottom button once. The display should now read 'CAL'
4. Bring your engine to 2000RPM and push both buttons to enter
5. The display should now return to normal running mode and you IBC-R is now calibrated

Brief description of the OFFSET adjustment process:

When entering the 'OFFSET > ADJUST' mode you will be presented with your RPM zones from '2000 - 9000' in addition to a 'SET' and 'ESC' option. At any of the RPM zones you can push both buttons to enter these to adjust the offset. When you enter a zone the display will show the offset for that zone and may be adjusted from -50 to +50. The IBC-R will interpolate (average out) from between zones e.g. if you set +5 at 6500RPM and 0 at 6000RPM the duty will be +2 at 6200RPM. Upon having set your offset duty you must again press both buttons to exit out back to the RPM zones. This process can be repeated to make whatever adjustment you need to do prior to saving. Having finished making your adjustments you must press the top button to scroll up to either 'SAVE' (should you wish to make your adjustments permanent) or 'ESC' (should you wish to abort without saving the adjustments you have just made).

RPM/DUTY OFF SET Menu II

Running Mode

0.00°

[Hold down
Button1 for
two seconds]

Setup Menu

OFF

[Activate Both
Button1 And
Button2]

Light Off

OFFSET MODE

Ad

[Activate Both
Button1 And
Button2]

[Activates Both Button1 And Button2]

SET = To Return to Running Mode
& Save the new Changes.
ESC = To Return to Running
Mode and Abort Changes.

[Activate Both Button1 And Button2]

ESC

[Activate
Button2]

RPM Menu

200°

[Activate
Button1]

Use Button1
or Button2
to select the
Engine RPM.

The Setting
Range is from
2000~9000
in 500 Steps.

[Activate Both
Button1 And
Button2]

900°

[Activate
Button2]
↓
[Activate
Button1]

[Activate Both
Button1 And
Button2]

+50°

Use Button1 or
Button2 to select
the RPM/DUTY
Offset. The
Setting Range is
from -50 ~ +50
in 1% steps.

If holding down
button1 or
button2 the
display will
increment or
decrement
automatically.

0°

Activate both
Button1 and
Button2 to go
back to the RPM
Menu after
making
altesations.

-50°

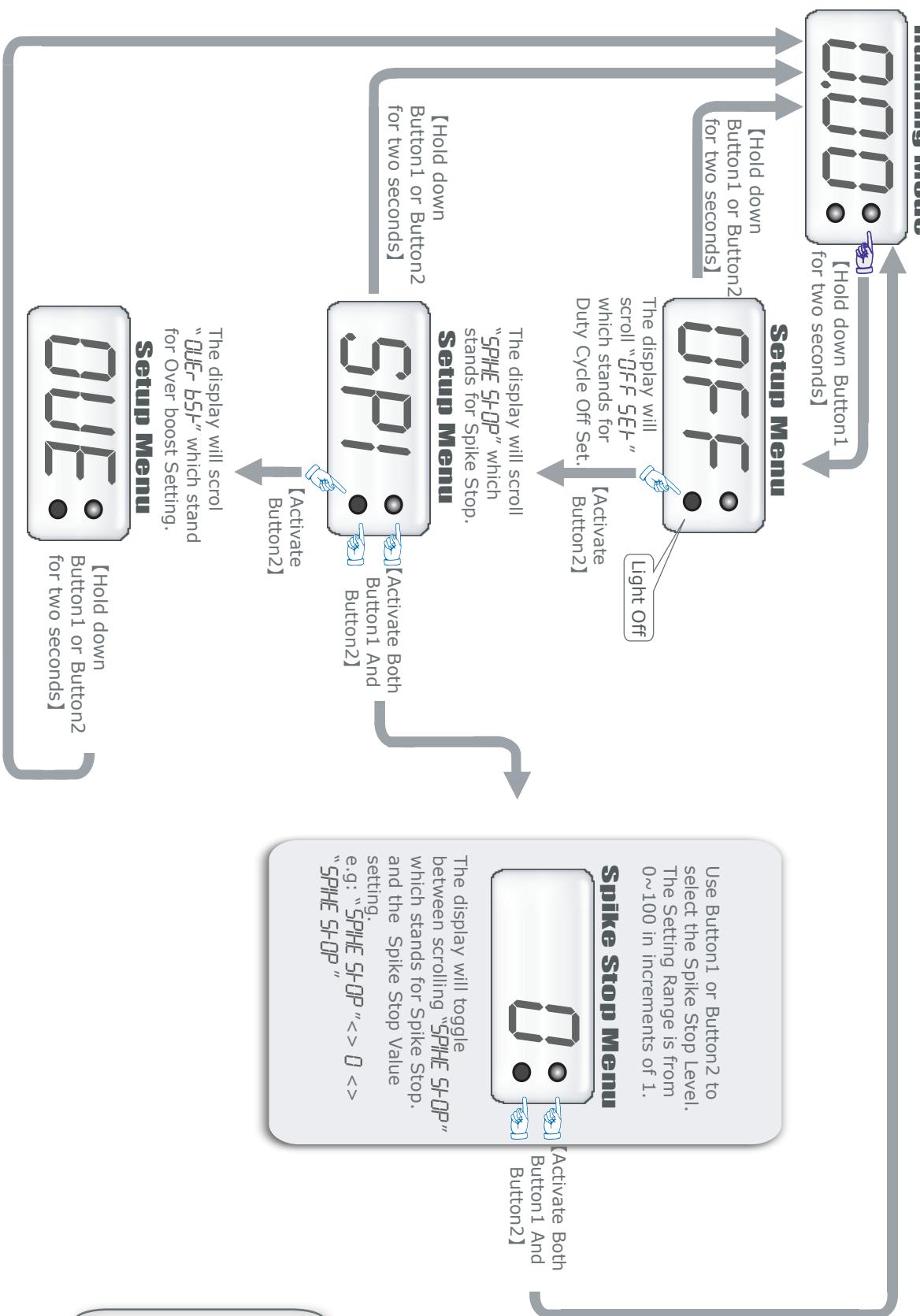
Please note that offset will not be active until a memory has been set. This means that until a memory has been locked (refer to Memory Lock in glossary) the offsets will be inactive. They can still be set and will still display on the 'OFFSET' display screen but will NOT be added/subtracted from the final duty.

CAUTIONS B:

Note:

Please refer to the glossary for more information on this function.

Spike Stop Setup



Note: Please refer to the glossary for more information on this function.

Over Boost Waring Setup

Running Mode

0.00:

[Hold down
Button1 for
two seconds]

OFF:

[Activate
Button1]

[Hold down
Button1 or Button2
for two seconds]

●

The display will
scroll “OFF SER”
which stands for
Duty Cycle Off Set.

Setup Menu

OUE:

[Activate Both
Button1 And
Button2]

Setup Menu

OFF:

[Activate Both
Button1 And
Button2]

Warning Menu

Use Button1 or Button2 to
select the over Boost Level.
The Setting Range is from
0~3.5 Bar .

Caution:

The over boost pressure will be
display in the same format as
the display pressure, and if the
overboost limit is exceeded the
MS-2 will attempt to reduce
the boost level.

d!5:

[Activate
Button1]

[Hold down
Button1 or Button2
for two seconds]

Note:
Please refer to the glossary for more
information on the functions on this page.

Pressure Display Setup

Running Mode



[Hold down
Button1 for
two seconds]

[Activate Both
Button1 And
Button2]

Display Menu



[Activate
Button2]

The Screen will display
"LB" which stands for LB

Setup Menu



[Hold down
Button1 or Button2
for two seconds]

Setup Menu

The display will scrolling
"d15P" which stand for
Display Setting.



[Activate
Button2]

[Activate Both
Button1 And
Button2]

[Light Off]



The display will scroll
"dFF5EF" which stand
for Duty Cycle Offset



[Activate
Button1]

[Activate
Button2]



The Screen will
display "bFr"

[Activate
Button2]



[Activate Both
Button1 And
Button2]

[Light Off]

The display will scroll
"OFF 5EF" which stand
for Duty Cycle Offset
Setting.



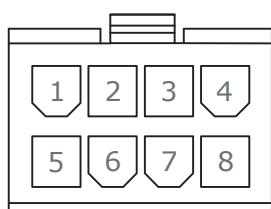
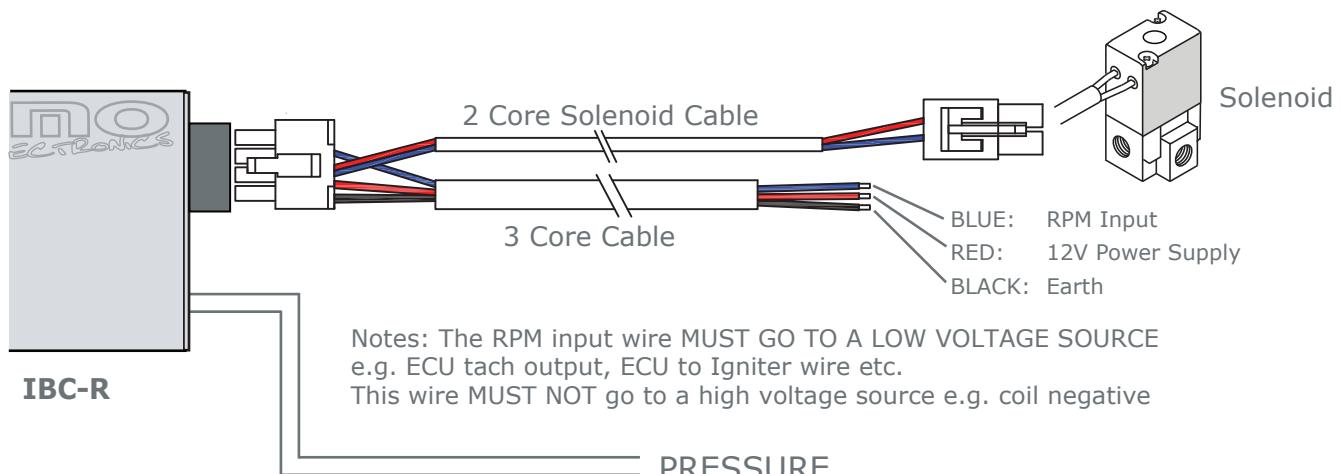
[Activate Both
Button1 And
Button2]

[Activate Both
Button1 And
Button2]

Note:
Please refer to the glossary for more information on this function.

Wiring Diagram

Disconnect the negative terminal of the battery
BEFORE proceeding with the installation.



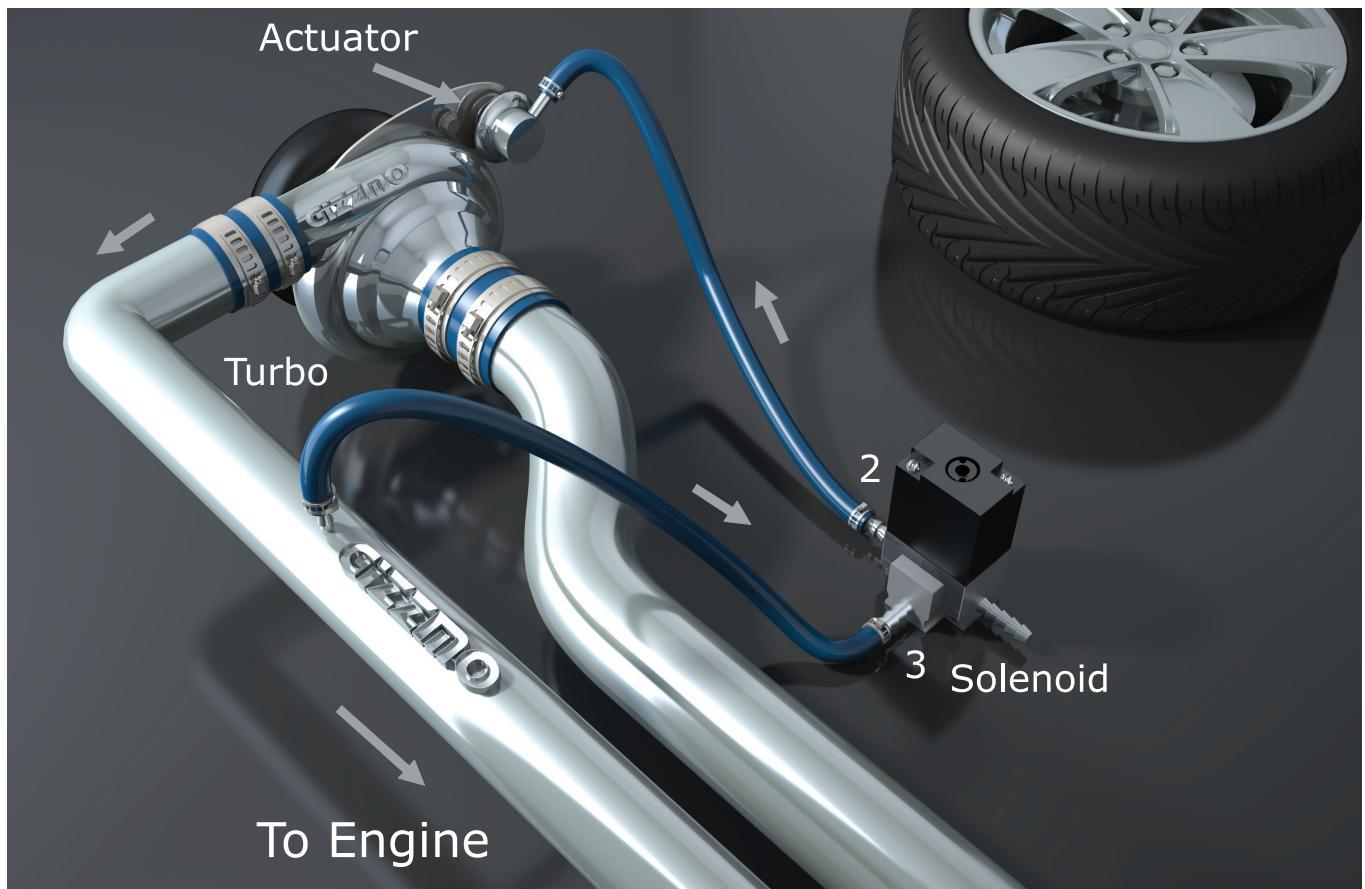
Loom side
of IBC-R Plug

- | | |
|-------------------------|------------------------|
| 1: Red 12V Power Supply | 5: Black Earth |
| 2: Red Solenoid Power | 6: Blue Solenoid Earth |
| 3: N / A | 7: Blue RPM Input |
| 4: N / A | 8: N / A |

1. The Pressure port is to be connected to a direct pressure source at an inlet manifold e.g. Fuel Press Regulator. Do not connect this to any other device such as a solenoid valve or blow off valve. A 3mm Y connector is provided to assist plumbing.
2. Mount the solenoid with the un-used port facing downwards. Connect the hoses as per the correct application (actuator or external wastegate).
3. Connect the Red wire to a good fused power source that is live only when the ignition switch is in the on position.
4. Connected the Black wire to a good clean chassis earth.

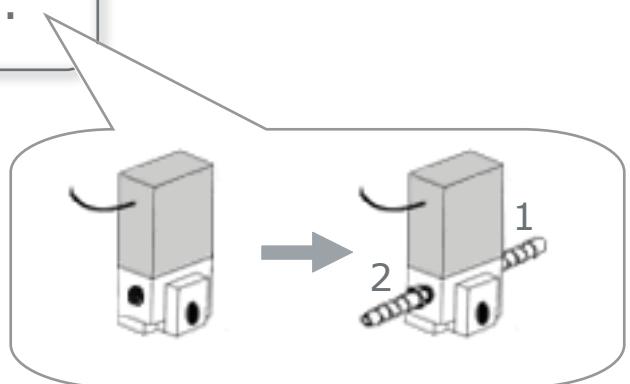
Installation for an Internal Wastegate

Connect the tails to Port 2 and Port 3 of the Solenoid Valve.



Installation for an External Wastegate

Connect the tails to Port 1 and Port 2 of the Solenoid Valve.



Glossary

Display Settings

The IBC-R can display real time boost in Pounds, Bar, Kpa or can display the real time Offset Duty OR Solenoid Duty Cycle. All this can be set in the display menu. Example: 1bar equals 14.5lb which equals 100kpa.

Duty

This duty cycle, also referred to as the 'Base duty' can be adjusted from 10% to 90% to adjust the boost level. Every vehicle has a different response to duty cycle and essentially the only way to work out your duty cycle vs boost relationship is via trial and error starting from a low duty cycle. A lower duty cycle equals lower boost and typically your boost won't start to rise till at least 20%.

Duty Offset

Offsets are expressed as a percentage and are offset from the final duty. As an example let's assume your duty is set to 20% and you are achieving 16lb and at 25% you have 18lb. If you have '+5' as an offset at the 6500 RPM zone you should have 18lb at 6500RPM. It is also worth noting that at 6250RPM and 6750RPM you should have 17lb as the IBC-R will interpolate (average out) from 6000RPM to 7000RPM.

Gain

Gain effects how quickly the turbo comes on boost. Ideally this would be set as high as possible; however, if this is set too high overshooting and boost instability can occur so there will be an ideal setting for this that will be different from vehicle to vehicle.

Glossary II

Memories

The IBC-R has 6 memories in total and can fast switch between these. This means that when you select the next memory the boost will change immediately which is an advantage when changing memories whilst racing. Each memory has its own gain setting (refer to 'gain' in this glossary) and control strategy setting (refer to Open/Closed in this glossary).

Memory Lock

This is a new and important feature for the IBC-R. Once you have adjusted a memory setting be it duty or gain and have then driven the car under load for the IBC-R to record the boost to associate to that duty, the memory will not be locked until you either change the memory or turn off and restart the vehicle. The memory lock is important as until it is locked the duty offset will not become active. The reasoning behind this is that if the duty offset was set to '+10' for example, the boost will be higher and as such we do not want the IBC-R to associate this higher boost setting to the lower duty that the +10 offset was added to.

Closed Loop

This refers to the type of control strategy that the IBC-R will have on your waste-gate.

Closed loop means that the IBC-R will continually monitor and make minor offsets to the duty cycle in an attempt to stabilise the boost.

Glossary III

Over Boost warning

Via the menus, you can set an over boost pressure to flash the display and attempt to drop the boost should your vehicle exceed this set pressure limit.

Spike Stop

A unique feature of the IBC-R is 'Spike stop'.

As with everything, wastegates take time to open and in a situation where they are required to react quickly (flat shifting gears at high revs, off/on throttle quickly whilst on boost at high rpm) this sometimes results in a boost spike. Spike stop largely eliminates this and can be adjusted from 0 to 100 with 100 being suitable for vehicles with a large amount of boost spiking and 0 suiting cars with no spiking issues. Ideally you want to keep this setting as low as possible because the higher this is, the longer it will take to return to your desired boost setting.

Solenoid Supervisor

The IBC-R constantly monitors the boost controller solenoid output channel to ensure that there are no malfunctions and should anything go wrong the IBC-R IMMEDIATELY displays 'SOL' to warn you of a fault with your solenoid, solenoid loom or output driver. The IBC-R will also briefly pulse the solenoid whenever the key is turned on in order to ensure it is fully operational.

About The Warranty

Gizzmo Electronics Limited
Limited Warranties Statement
Effective 1 January 2003

All Products manufactured or distributed by Gizzmo Electronics are subject to the following Limited Express Warranties, and no others:

For a period of one year from and after the date of purchase of a new Gizzmo Electronics product, Gizzmo Electronics warranties and guarantees only to the original purchase/user that such a product will be free from defects of material and workmanship in the manufacturing process. Gizzmo Electronics, at its sole option, shall replace the defective product. This express warranty shall be inapplicable to any product not properly installed and properly used by the purchaser/user or to any product damaged or impaired by external forces. This is the extent of Warranties available on this product. Gizzmo Electronics shall have no liability whatsoever for consequential damages following from the use of any defective product or by reason the failure of any product. Gizzmo Electronics specifically disclaims and disavows all other warranties, express or implied including, without limitation, all Warranties of fitness for a particular propose, Warranties of Description, Warranties of Merchantability, Trade Usage or Warranties of Trade Usage, The above warranty is valid in New Zealand, Australia and the America's only as Gizzmo Electronics does not offer an international warranty outside of these regions.