

Real Performance Product By GIZZMO

MS-IBC Boost Controller GIZZMO ELECTRONICS

Thank you for purchasing the Gizmo
MS-IBC Multi-Scramble Boost Controller.
This manual contains operating instructions
and installation procedures that are needed
for the fitting and operation of this product



取扱説明書 Instruction Manual

GIZZMO
ELECTRONICS

www.gizmoelectronics.com

Gizzmo**MS-IBC MultiScramble Boost Controller****What can and can't the MS-IBC do?**

The MS-IBC will control and bring on boost as fast and as accurately as mechanically possible on a turbocharged vehicle. The MS-IBC, like all boost controllers, will not overcome mechanical short comings. By this we mean that if your turbo is not capable of sustaining the boost that you wish to run, the MS-IBC cannot substitute a larger turbo. Likewise, if your waste-gate is too small and you are therefore getting boost creep, the MS-IBC will not substitute a bigger waste-gate. The better your turbo/waste-gate/manifold combination is, the better your boost control will be.

About the memory boost display

When you select a memory setting the MS-IBC will display a boost setting for the new memory option selected. This displayed boost setting is the MAXIMUM STABLE BOOST that the MS-IBC has seen on the memory setting you have selected. This means that if you have a boost control issue such as a boost surge or boost creep that is stable for over half a second, the MS-IBC will recognise this as the maximum stable boost.

Technical Diagram**Processing Power**

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

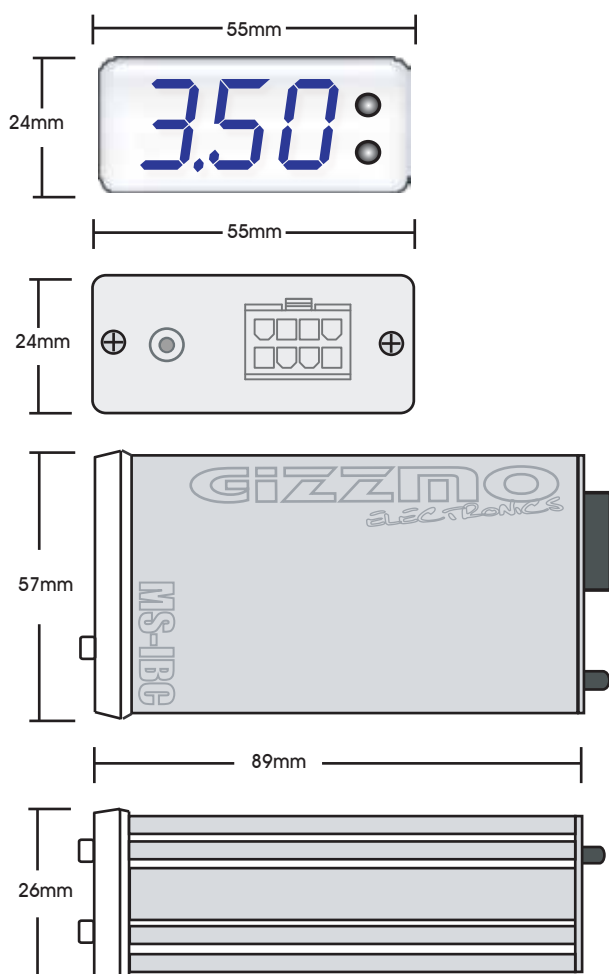
Extruded Aluminium Case

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

Functions/Specifications

- Adjustable up to 3.5bar/50lb
- Remote Scramble/Memory change Facility
- Selectable Open/Closed loop boost control per memory
- Multi-Scramble™ Boost Facility
- Active Over boost warning
- 6 Memories
- Simple 2-wire installation
- Real-time boost gauge
- 64mhz High Speed Processor
- Suits internal and External Wastegates
- Comes with all Installation accessories and remote button

MS-IBC Specifications

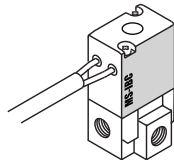


| | |
|----------------------------|--|
| Number of boost memories | 6 with individual gain settings |
| Maximum boost | 50lb (3.5bar) |
| Scramble time | 1 to 100 seconds |
| Scramble duty | 1% to 100% |
| Over boost range | 5lb to 50lb |
| Processor | 64mhz RISC |
| MS-IBC size | 117mm * 57mm * 26mm |
| MS-IBC weight | 105g |
| Packaged size | 185mm * 145mm * 60mm |
| Package Weight (g) | 600g |
| 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, LB or BAR |
| Wastegate Compatibility | Internal and External |
| Solenoid | High Performance Single |
| Features | Gizzmo's Multi Scramble™ Adjustable gain settings Open/Closed loop boost setting White LED backlit buttons Remote Scramble button or Fast Memory button |

MS-IBC Parts List



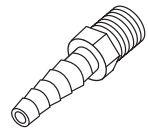
MS-IBC Module
x1



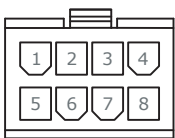
Solenoid Valve
x1



Instruction Manual
x1



Tail 5mm
x2



MS-IBC Harness
x1



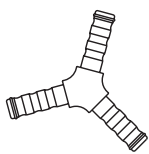
Remote Trigger
Button with
Loom x1



1mx5mm Nitrile
Tubing x1



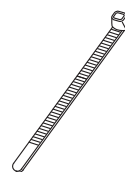
1.2mx2.8mm
Vacuum Tubing x1



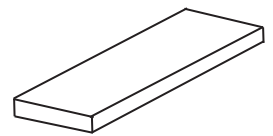
5mm 'Y' Piece
Connector x1



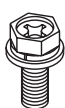
3mm 'Y' Piece
Connector x1



Cable Tie
x8



Double sided Tape
Pad For Mounting
MS-IBC x1



3mm Bolt
x2



3mm Flat
Washer x2



3mm Nut
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.

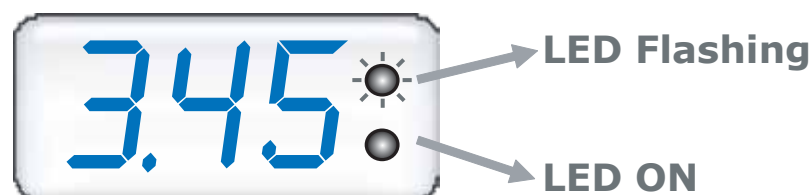
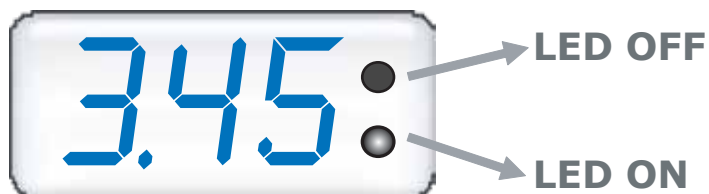
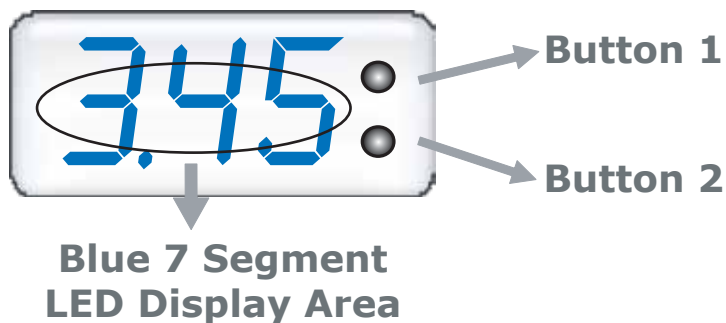
Never disassemble, modify, or tamper with this unit.

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

Please refer to Display SetUp On Page 11 for more information on how to change between these units.

e.g:

BAR Display



LB Display



KPA Display



Caution:

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

Start Up Sequence

Every time the ignition is turned on the 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



Running Mode



To Change Boost Memories

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

Running Mode



【Activate Button2】

Memory 1



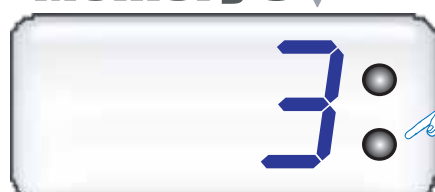
【Activate Button2】

Memory 2



【Activate Button2】

Memory 3



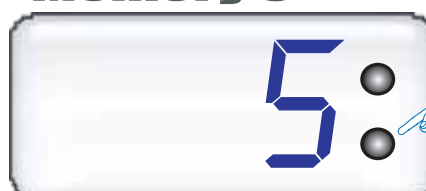
【Activate Button2】

Memory 6



【Activate Button2】

Memory 5




【Activate Button2】

Memory 4



【Activate Button2】

Caution:

If using the Remote Button to change Boost Memories the screen will only display the Memory Option: eg .

Adjusting the Duty Cycle Setting

Running Mode



[Hold down Button2 for two seconds]

Control Menu



[Hold down Button1 or Button2 for two seconds]

[Light Off]

[Activate Both Button1 And Button2]

The display will scroll "CL0SE" which stands for the Closed Loop Setting.

Use either Button1/Button2 to select between Closed Loop and Open Loop Settings.

[Hold down Button1 or Button2 for two seconds]



[Activate Both Button1 And Button2]

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

Open/Closed

This refers to the type of control the MS-IBC will apply to your waste-gate. If you select 'open' the MS-IBC will NOT attempt to correct any fluctuations or boost creep/drop off. If you select 'closed' the MS-IBC 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).

Duty Cycle Menu



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

The display will toggle between scrolling "duty" which stands for duty cycle and the present duty cycle setting.
e.g: "duty" <> "10" <> "duty"

[Activate Both Button1 And Button2]

Gain Menu



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

The display will toggle between scrolling "99.1" and the present gain setting.
e.g: "99.1" <> "10" <> "99.1"

[Activate Both Button1 And Button2]

Note:

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

Overview Of Setup Menu

Running Mode



[Hold down
Button1 for
two seconds]

The display will scroll
"Scr" which stands
for Scramble Setting.

[Hold down
Button1 or Button2
for two seconds]

Setup Menu



[Activate
Button1]

Light Off

[Activate
Button2]

[Activate
Button1]

The display will scroll
"SPIKE St-Op" which
stands for Spike Stop.

Setup Menu



[Activate
Button2]

[Activate
Button1]

[Hold down
Button1 or Button2
for two seconds]

The display will scroll
"dISP" which stands
for Display Setting.

Setup Menu



[Activate
Button2]

[Activate
Button1]

The display will scroll
"OUE-b5F" which stands
for Over boost Setting.

Setup Menu



[Hold down
Button1 or Button2
for two seconds]

[Activate
Button1]

The display will scroll
"iNPU" which stands
for Input Setting.

Setup Menu



[Activate
Button2]

[Hold down
Button1 or Button2
for two seconds]

Note:

Please refer to the
glossary for more
information on
these functions.

Scramble & Spike Stop Setup

Running Mode



[Hold down Button1 for two seconds]

Setup Menu



[Hold down Button1 or Button2 for two seconds]

The display will scroll "SCr" which stands for the Scramble Setting.

[Activate Button2]

[Activate Both Button1 And Button2]
Light Off

Use Button1 or Button2 to select the Scramble seconds. The Setting Range is from 1~100 in 1 second increments.

Scramble Menu



[Activate Both Button1 And Button2]

The display will toggle between scrolling "SECS" which stands for Seconds and the seconds scramble setting. e.g: "SECS" <> 10 <> "SECS"

Use Button1 or Button2 to select the Scramble Percentage. The Setting Range is from 1%~100% in 1% increments.

Scramble Menu



[Activate Both Button1 And Button2]

The display will toggle between scrolling "PER" which stands for Percentage and the percentage scramble setting. e.g: "PER" <> 10 <> "PER"

The display will scroll "SPIE St-OP" which stands for Spike Stop.

Setup Menu



[Hold down Button1 or Button2 for two seconds]

[Activate Both Button1 And Button2]

Use Button1 or Button2 to select the Spike Stop Level. The Setting Range is from 0~100 in increments of 1.

Spike Stop Menu



[Activate Both Button1 And Button2]

The display will toggle between scrolling "SPIE St-OP" which stands for Spike Stop, and the Spike Stop Value setting. e.g: "SPIE St-OP" <> 0 <> "SPIE St-OP"

Note:
Please refer to the glossary for more information on these 2 functions.

Over Boost Warning Setup

Running Mode



[Hold down Button1 for two seconds]

Setup Menu



[Hold down Button1 or Button2 for two seconds]

The display will scroll "5C" which stands for the Scramble Setting.

Light Off

[Activate Button2]

Setup Menu



[Hold down Button1 or Button2 for two seconds]

[Activate Button2]

Setup Menu



The display will scroll "0UE-65F" which stands for Over boost Setting.

[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 .

[Activate Both Button1 And Button2]

Caution:

The over boost pressure will be display in the same format as the display pressure.

Setup Menu



[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]

[Hold down
Button1 or Button2
for two seconds]

The display will scroll
"d15P" which stands
for Display Setting.



[Activate Both
Button1 And
Button2]
Light Off

[Activate Both
Button1 And
Button2]

[Activate Both
Button1 And
Button2]

The Screen will display "LB"
which stands for pounds.



[Activate
Button1]

[Activate
Button2]

[Activate
Button1]

Display Menu



The Screen will
display "bAr"
which stands
for BAR.

[Activate
Button2]

[Activate
Button1]

Display Menu



The Screen will display
"hPPa" which stands for KPA.

[Activate
Button2]

Setup Menu



The display will scroll
"SCr" which stands for
Scramble Setting.

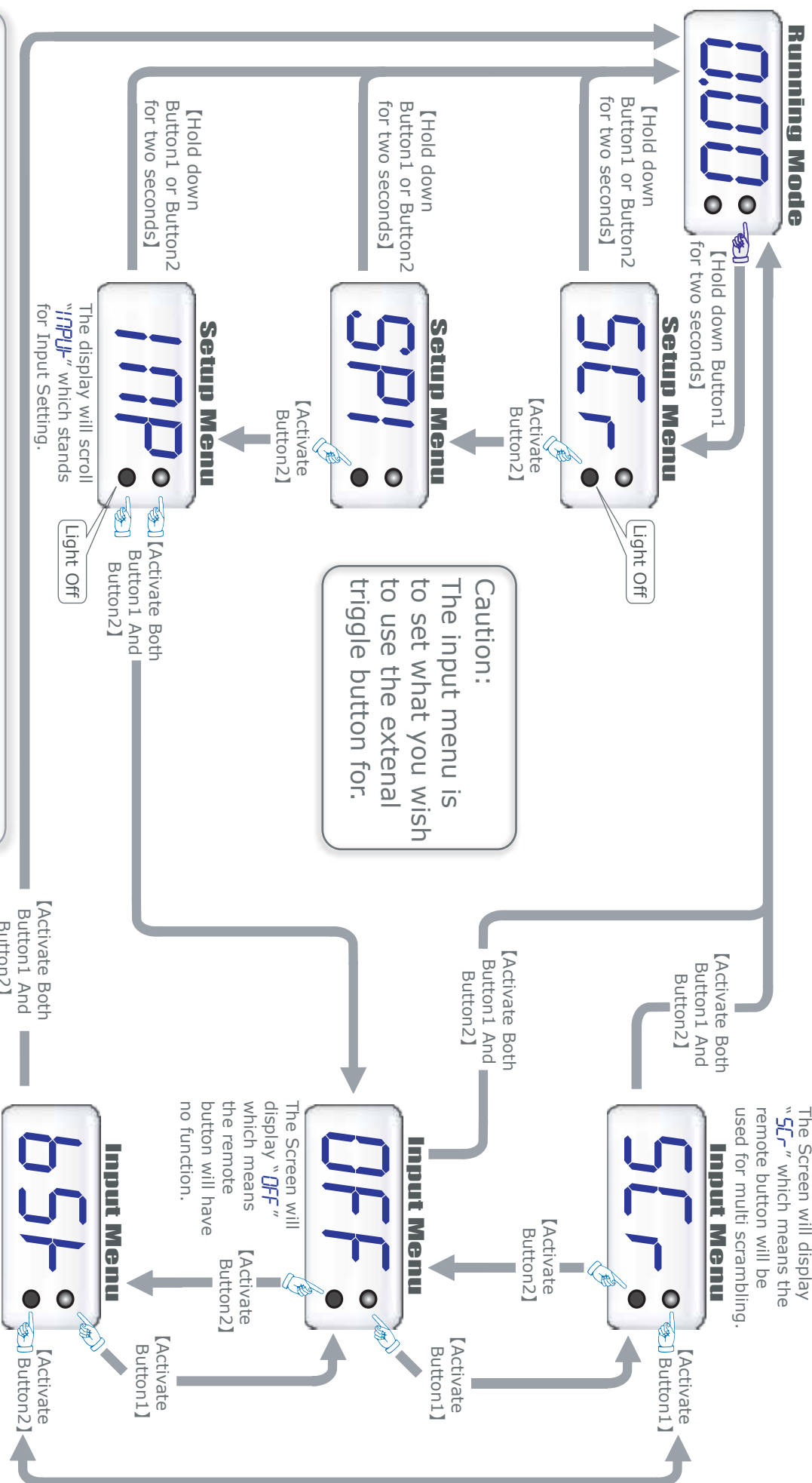
[Activate
Button1]
Light Off

[Hold down
Button1 or Button2
for two seconds]

Note:

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

Input Setup



Note:

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

Operating Multi-Scramble™

Running Mode

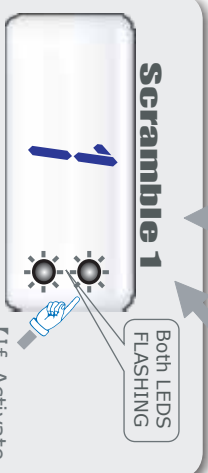


[Activate Button1 or Remote Button]



[Remote Button]

Note:
During the Scramble Mode the Boost Pressure will increase by the Preset Percentage for the Preset Timeframe. (Please refer to Scramble setup Page for more information on how to set the Timeframe and Percentage)



[After One Second]

[If Activate Button1 or Remote Button Before the scramble times out]



[After Preset Scramble Timeframe]

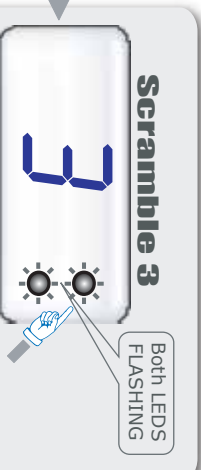


[After One Second]

[If Activate Button1 or Remote Button Before the scramble times out]



[After Preset Scramble Timeframe]

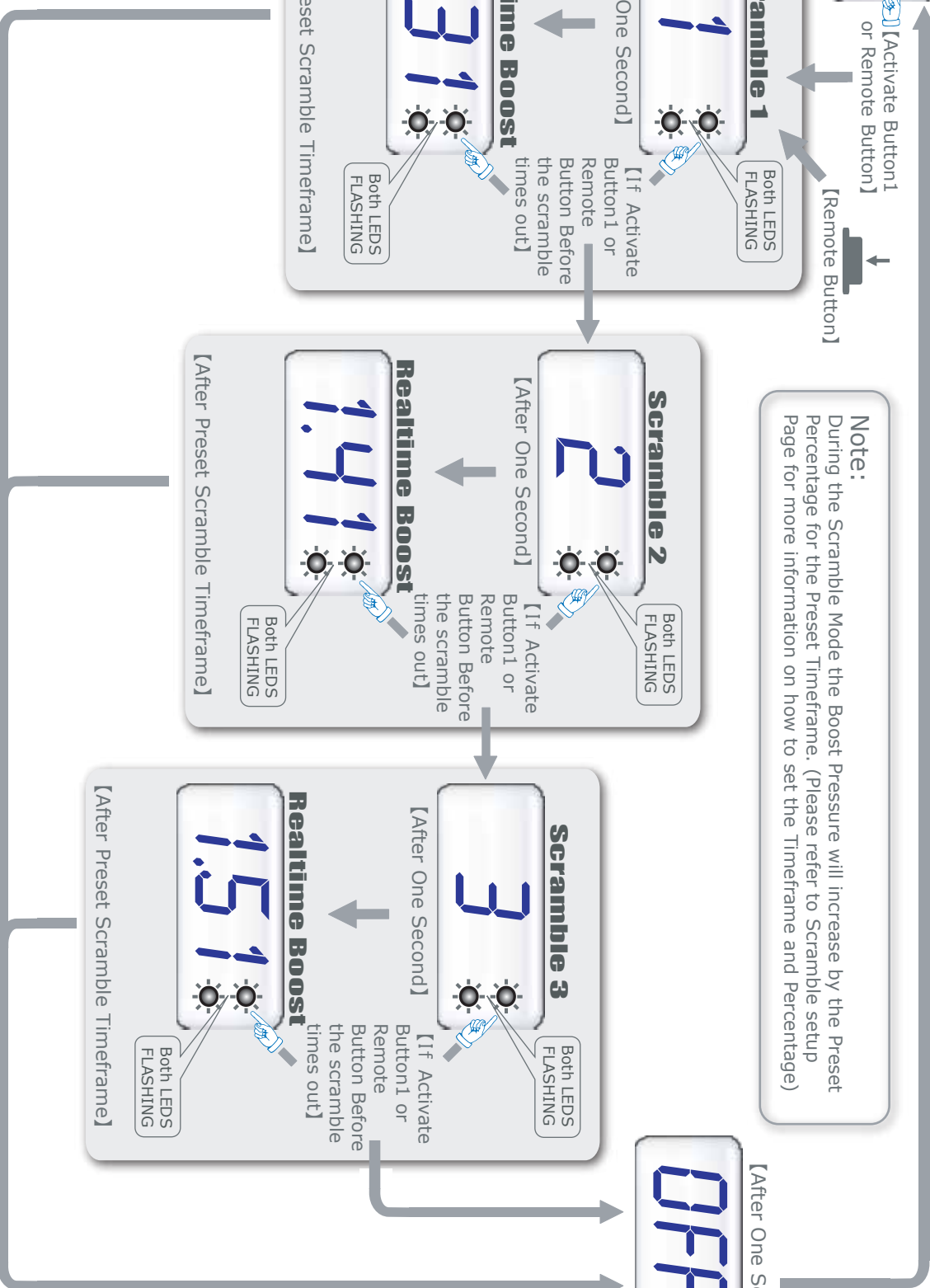


[After One Second]

[If Activate Button1 or Remote Button Before the scramble times out]

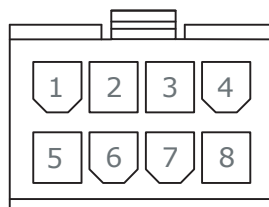
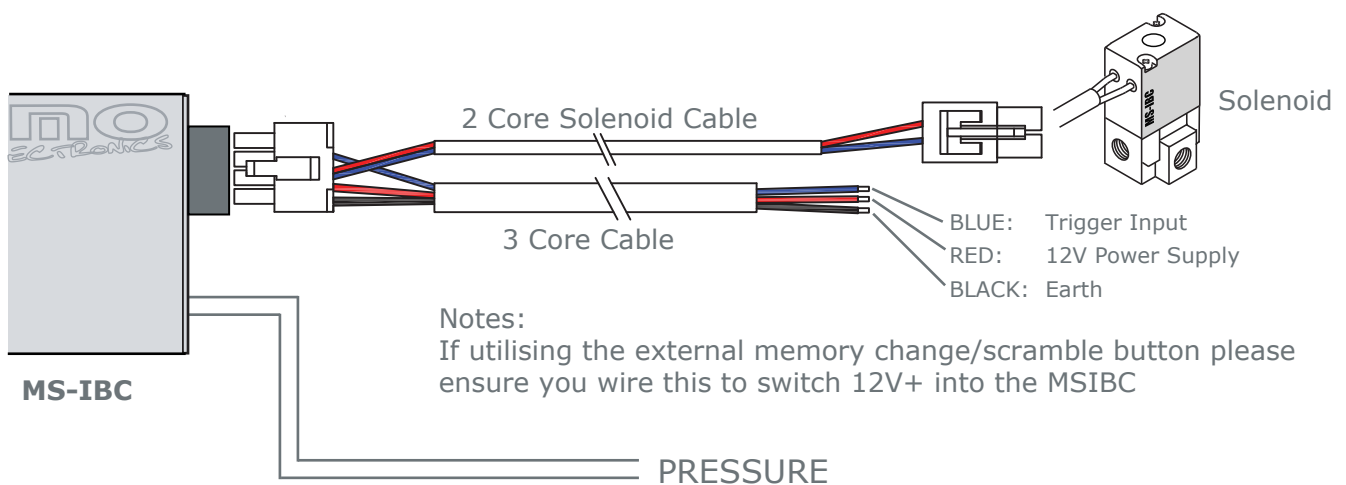


[After Preset Scramble Timeframe]



Wiring Diagram

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



Loom side
of MS-IBC Plug

- | | |
|-------------------------|------------------------|
| 1: Red 12V Power Supply | 5: Black Earth |
| 2: Red Solenoid Power | 6: Blue Solenoid Earth |
| 3: N / A | 7: Blue Trigger 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.

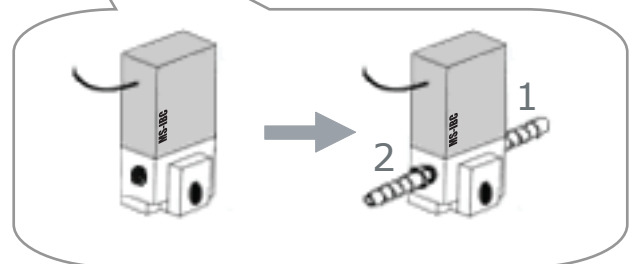
Installation for an Internal Wastegate

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

Closed/Open

Refer to Open/Closed in this glossary

Display

The MS-IBC can display boost in Pounds, Bar or Kpa, this can be set in the display menu. 1bar equals 14.5lb which equals 100kpa.

Duty

There are 2 different duty settings on the MSIBC...

Boost 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%.

Scramble Duty: This duty cycle is the additional duty that will be added to the Boost Duty (as explained above) every time the Scramble is energised for example...

Boost Duty = 25% and the Scramble duty = 3%. When the vehicle is first Scrambled the duty total duty cycle will be 28% as if you had set your memory setting to 28%. So, if you scrambled a second time the duty would be 31% (25% base setting + 3% first scramble + 3% second scramble), again resulting in the same boost as if you had set your boost memory to 31%.

Glossary

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.

Input

This is the option in the setup menu that dedicates the remote button to either fast change memories (see Memories Page 19) or MultiScramble (see Multi-Scramble below).

Multi-Scramble™

This is Gizzmo's variation of the traditional scramble feature outlined above. Having activated the scramble feature via the MS-IBC's top button or remote switch, it is possible to activate the scramble up to two more times to increase the boost again. In order to do this you must energise the scramble again before the scramble time has run out e.g. If you have set the scramble for a 3% increase in duty cycle for 5 seconds and you have just initiated your first scramble, in order to scramble again (add another 3% duty cycle hence a total increase of 6% to your Base duty cycle) you must again press the scramble before the 5 second scramble completes.

Glossary

Memories

The MS-IBC 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).

Open/Closed

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

If you select 'open' the MS-IBC will not attempt to correct any fluctuations or boost creep/drop off. This may be your preferred method in a turbo/waste-gate/manifold combination where any change in the boost controller's solenoid duty may have an undesirable effect re boost stability.

If you select 'closed' the MS-IBC will continually monitor and make minor offsets to the duty cycle in an attempt to stabilise the boost. This setting is recommended for vehicles with boost control issues such as boost creep/drop off and vehicles with boost harmonics due to turbo/waste-gate/manifold design or tune.

Over Boost warning

Via the menus, you can set an over boost pressure to flash the display and cut back the duty to ZERO should your vehicle exceed this set pressure limit.

Glossary

Seconds

This refers to one of the two Scramble parameters that require setting for the Scramble to operate. Seconds refers to the amount of time that the 'Scramble Duty' (refer glossary under 'Duty') will be added to the base duty cycle for.

Spike Stop

A unique feature of the MS-IBC 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.

Trigger

Supplied with the MS-IBC is a remote loom and button which you may mount in a convenient position. Via the 'Input' menu you can make this button either fast change the memories or trigger the multi-scramble™ (refer to 'Input' in this glossary).

Features

Multi-Scramble™

A 'scramble' feature of a boost controller increases the boost period of time e.g. an additional 3lb for 5 seconds before returning to the previous boost setting. This can be beneficial when you need a slight edge towards the end of a close race or if you are racing and wish to run higher boost in your later gears.

Multi-Scramble...

Traction is often a real issue for at least the first 1/8 mile due to many cars power vs traction ratio; this is often evident with front wheel drive turbocharged vehicles. The MS-IBC offers two possible solutions to this. Solution one is to use the MS-IBC's fast toggle memories to start on a low setting e.g. 8lb in memory number 1 when taking off from the line and work your way through the memories as you go through the gears. Using this method gives you the advantage of tailoring different boost steps throughout the race e.g. 8lb in 1st, 12lb in 2nd, 20lb in 3rd etc. Solution two would be to use multi-scramble. With multi scramble you could start the race on a low boost setting and once, having gained reasonable traction, can start progressively increasing the boost with the multi-scramble. If you again start to lose traction, you can cancel the scramble and again start scrambling the boost once you have regained traction.

Features

Memories

The MS-IBC has 6 memories in total and can fast switch between these meaning that when you select the next memory, the boost will change immediately. The advantage of this feature is explained under the Multi-Scramble paragraph on the previous page. Each memory also has its own gain setting and control strategy.

Display

The MS-IBC can display boost in Pounds, Bar or Kpa, this can be set in the display menu.

Trigger

Supplied with the MS-IBC is a remote loom and button which you may mount in a convenient position. Via the menus you can make this button either fast toggle the memories or trigger the multi-scramble.

Over Boost warning

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

Solenoid Supervisor

The MS-IBC V2 constantly monitors the boost controller solenoid output channel to ensure that there are no malfunctions and should anything go wrong the MS-IBC V2 IMMEDIATELY displays 'SOL' to warn you of a fault with your solenoid, solenoid loom or output driver.

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 of 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 purpose, Warranties of Description, Warranties of Merchantability, Trade Usage or Warranties of Trade Usage. The above warranty is valid in New Zealand, Australia and the Americas only as Gizzmo Electronics does not offer an international warranty outside of these regions.