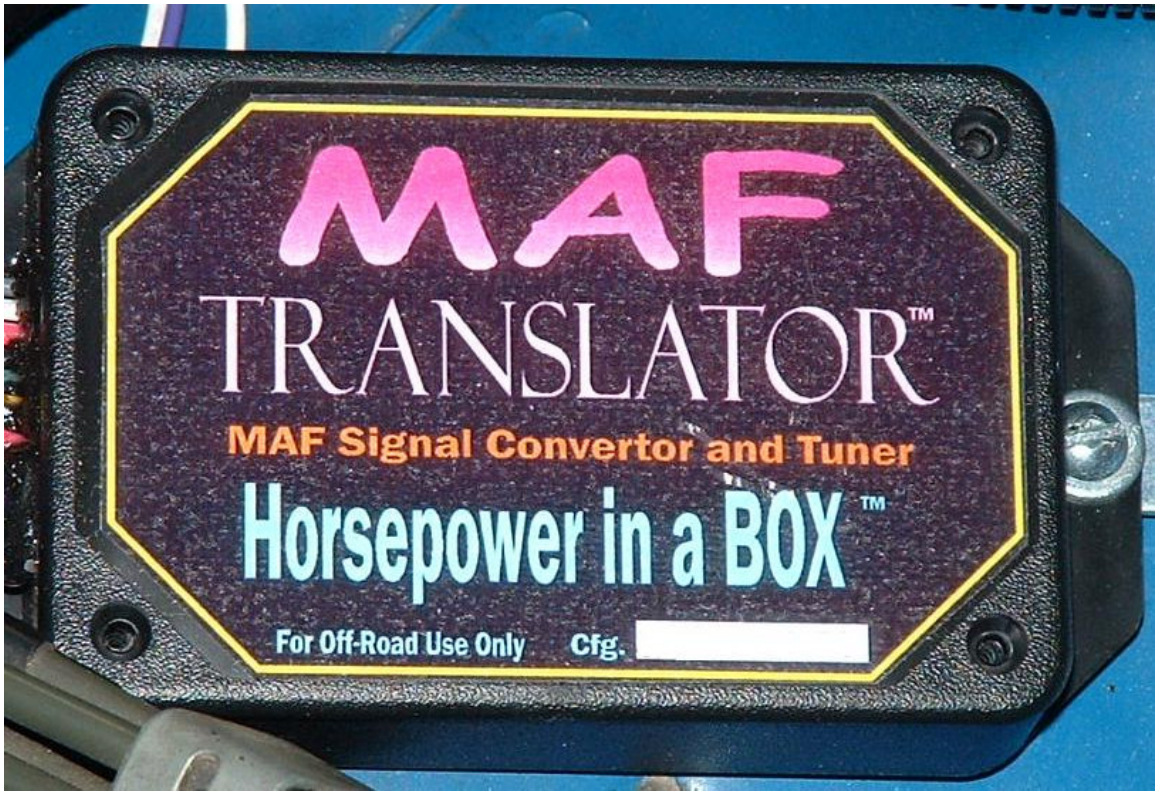

MAF
TRANSLATOR™
MAF Signal Convertor and Tuner
Horsepower in a BOX™
For Off-Road Use Only
Cfg.

MAF Translator 2G3S

Software Rev 2.X8

Kit Contents

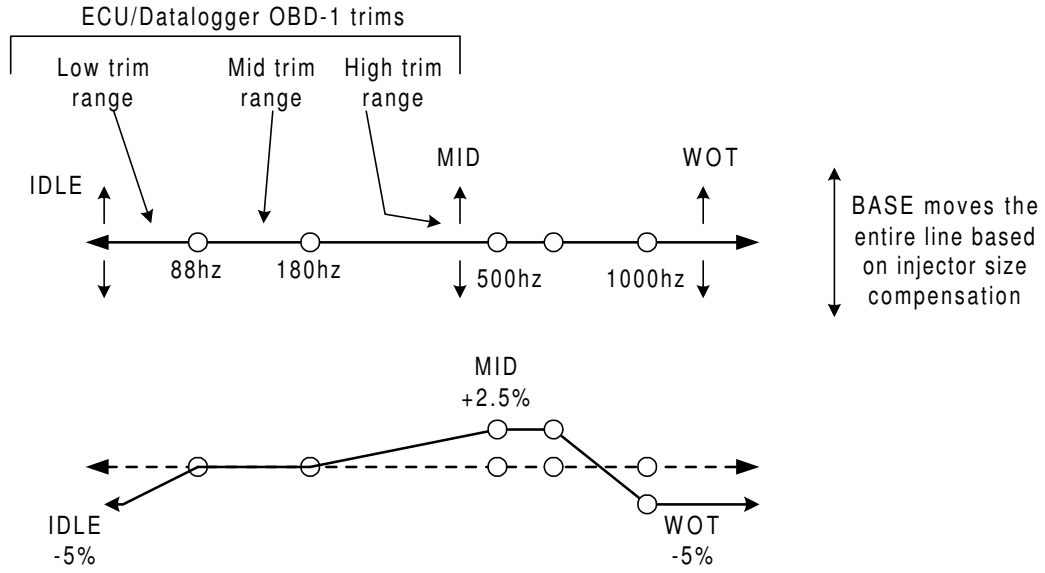
1-MAF Translator
1-Male spade terminal
1-TAP connector
1-instruction manual

Introduction:

The MAF Translator is a conversion interface to allow the use of late model GM Mass Airflow (MAF) sensors on Second Generation Mitsubishi DSM (Eclipse, Talon, Laser) and "3S" (3000GT/Stealth) vehicles. The late model GM MAF sensors offer lower intake restriction than stock which boosts horsepower and improves turbo response. Inside the Translator, there are several user adjustments which permit tuning of the airflow signal to the ECU (Engine Control Unit). Increasing or decreasing the airflow signal sent to the ECU will cause the ECU to deliver more or less fuel to the engine. The controls in the Translator allow adjustments under different operating conditions (idle, cruise, boost, and rpm) to allow the user to tune for optimum fuel efficiency or performance. The Translator also has an AUX adjustment for controlling fuel differently when a trigger wire is energized (to compensate for other fueling equipment such as N2O, Propane, or Alcohol injection)

What's New from v1.3

1 MAF based tuning and RPM based tuning modes are split based on Mode 4 switch
2 Adjustment steps for base setup now in 64 steps of 10 cc (injector size ratio)
3 MID is now a MAF slope tune and is used to match the high trim to the mid trim.
4 BASE mode (Mode 4 off) has airflow breakpoints, see below.



MAFT BASE tuning

Installation on a 2G DSM and 3S

The Translator is a straightforward plug-in installation. Follow these steps:

1. Remove the factory air filter/MAS, unplugging the wiring harness.
2. Install the new air filter on the new MAF.
3. Install the MAF+filter in place of the original air filter/MAS. Some MAFs will require an adapter or a different pipe to the turbo. Orient the new MAF such that the internal divider is vertical (e.g. on the LS6 MAF the connector will be at 8 o'clock when looking at the inlet).
4. Plug the Translator MAF plug into the new MAF making sure the latch engages correctly.
5. Use the supplied TAP and SPADE connectors to connect the white Translator wire to a TACH signal.

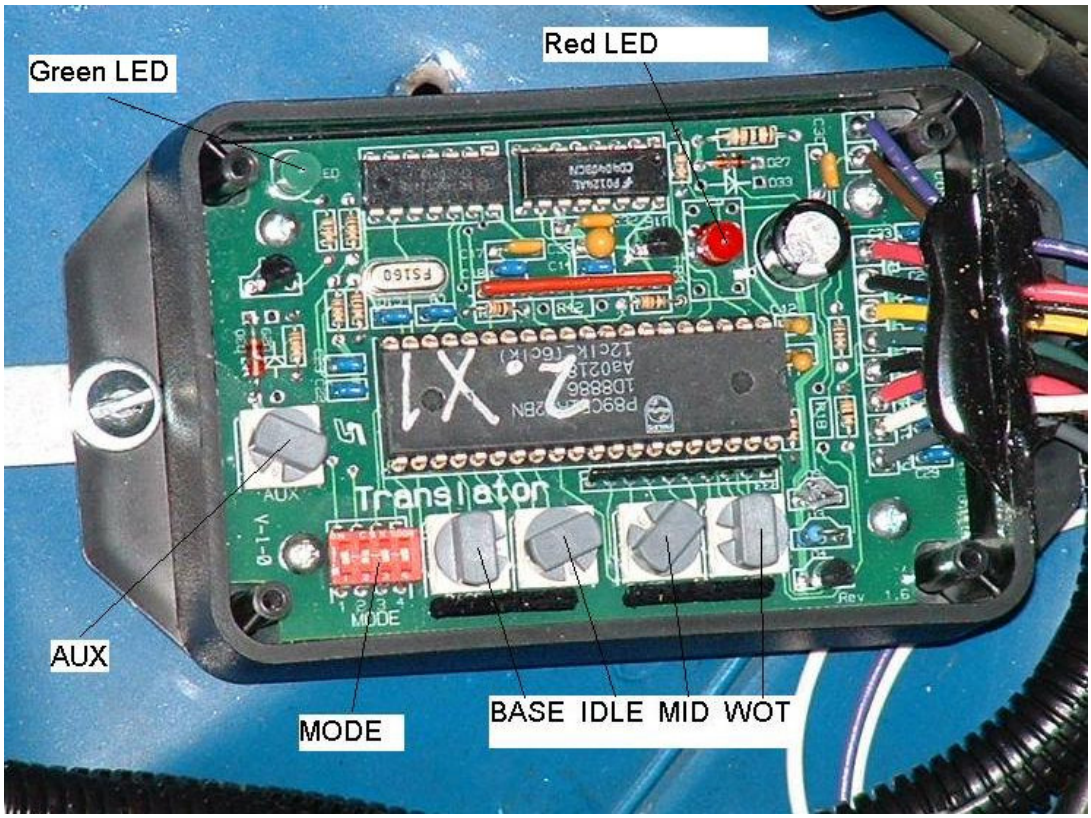
The best place to get this signal is the white wire found at:

3K/ Stealth ECU 91-93 pin 101, 94-95 pin 58, 96-97 pin 51, 98-99 pin 45 , Power transistor pin 5, Crank Angle Sensor pin 2.

2G DSM ECU pin 58 or Power Transistor pin 4.

Route this wire AWAY from spark plug and injector wires.

6. Plug the Translator into the vehicle wiring harness. This plug is not a perfect fit so some patience is required to ensure that the plug mates correctly and no pins are pushed out. Ensure the connectors mate fully. Ensure the PINK wire from the Translator lines up with the RED wire in the vehicle harness.
7. Locate the Translator box in a location that is away from direct heat or water spray/splash/drip. Wrapping the plugs in electrical tape is suggested. Vehicle harness tape (high temperature) is the best for this.
8. Remove the Translator cover (4 screws), When the vehicle is Keyed-On, the 2 LEDs in the Translator will turn on for about 1 sec then go back off.



Controls:

The Translator has the following controls:

MODE SWITCH - a 4 section "dip switch" for setting the basic vehicle/translator parameters. Turn the engine off when making changes to the MODE switch.

BASE - this 16 position (0-F) dial is used to set the general airflow scaling. This adjustment affects the entire operating range and is generally used to match the Translator and MAF to the selected injector size.

IDLE - This 16 position (0-F) dial is used to adjust the airflow signal during engine idle conditions. It can also be used to compensate for modified PCV (crankcase vent) and fuel pressure setups.

MID - This 16 position (0-F) dial is used to adjust the airflow signal during moderate acceleration conditions.

WOT - (WOT=Wide Open Throttle) This 16 position (0-F) dial is used to adjust the airflow signal during heavy acceleration conditions.

AUX - This 16 position (0-F) dial is used to adjust the airflow signal during heavy acceleration conditions when the purple TRIGGER wire is activated. This mode is active above 8 psi boost (approximate) (The AUX dial is also used for selecting the base settings)

Green LED

OFF = idle
DIM = Part throttle/cruise (In RPM mode, the green LED turns on at 1000 RPM)
ON = MID

Red LED

OFF = No WOT modes are operating
DIM= WOT mode
ON = WOT mode **and** AUX Trigger is activated.

The Red LED will blink when the controls are adjusted to indicate the unit accepted the adjustment.

Initial MAF Mode Setup:
(Turn the car off when making changes to the MODE switch)

MODE SWITCH: set as follows

1 - See Table below
2 - See Table below
3 - turn ON to enable startup enrichment.
4 - OFF = MAF mode, ON = RPM mode

MAF Selection		
Mode Switch:		
1	2	
OFF	OFF	3" MAF
ON	OFF	3.5" MAF
OFF	ON	85mm MAF
ON	ON	Extreme MAF

1 Set the Mode switch per the vehicle configuration above, ensure Mode 4 is OFF
2 Select the injector size from tables in Appendix A at end of manual and set the AUX and BASE knobs accordingly
3 Ensure the ECU is reset (disconnect the vehicle battery for a minute or so)
4 Connect any datalogging equipment and start the vehicle.
5 The vehicle will enter closed loop within a minute of starting.
6 Make sure that the idle O2 sensor is not overly lean as indicated by a constant low voltage signal or overly rich as indicated by a constant high voltage at warm idle. If needed, adjust the idle knob as shown in the Idle, Mid, and WOT tables further below
7 Make a test drive and log the fuel and O2 trims
8 Adjust the BASE knob to keep the total trim between 80% and 100% during steady state driving (35-45

mph). To lean out the fuel curve, set the AUX/BASE to a larger injector size. To richen the fuel curve, set the AUX/BASE to a smaller injector size.

9 You will need to readjust idle if you make changes to the base setting

10 Perform some light accelerations in 4th gear starting at about 2000 RPM and watch what the total trim does as the airflow value climbs. Adjust the MID control if the total trim value at moderate flows (300-400hz, high trim) is significantly different than the low flow (100-150hz mid trim) total trim.

11 Increase the acceleration to half throttle or so and watch to be sure you stay rich before trying WOT.

12 Make some WOT runs and watch the O2 readings on a datalogger, O2 monitor, EGT gauge, or Wideband AF Monitor. Use the WOT knob to adjust the fuel delivery. A little too rich is better than a little too lean.

13 Each change in these settings of stored in Flash memory so the dials can be used for RPM mode below.

Note: on light decels the ECU will do some manipulations of the O2 trim. Do not tune by decel trims.

MAF Mode Idle, Mid, and WOT all follow the following table

Dial Setting	% flow change		Dial Setting	% flow change
0	**0**		**8**	**35%**
1	**5%**		**9**	**-35%**
2	**10%**		**A**	**-30%**
3	**15%**		**B**	**-25%**
4	**20%**		**C**	**-20%**
5	**25%**		**D**	**-15%**
6	**30%**		**E**	**-10%**
7	**35%**		**F**	**-5%**

RPM Mode, WOT Fine Tuning setup:

1 Once the BASE settings are done, switch MODE 4 ON. This will save the base settings and allow the use of the dials for RPM/WOT tuning. ***(wait at least 10 seconds after your last base adjustment, then turn the ignition off before making changes to the MODE 4 switch)***

2 The dials are now 2% steps of the scaled airflow. Refer to the picture below to see how the settings are the "breakpoints" or "corners" of the flow correction graph. Base adjusts 3000rpm and lower, idle is 4000, mid is 5500, and WOT is 6500 and greater.

3 If the RPM signal is not connected, the correction dials will be selected based on airflow.

4 These corrections are enabled as long as the airflow Hz is over 600 at RPMs below 3000, and always when the RPMs are above 3000.

5 These corrections are added to the BASE adjustments set in the initial MAF mode setup.

Idle, Mid, WOT, and AUX all follow the following table.

Dial Setting	% flow change		Dial Setting	% flow change
0	**0**		**8**	**14%**
1	**2%**		**9**	**-14%**
2	**4%**		**A**	**-12%**
3	**6%**		**B**	**-10%**
4	**8%**		**C**	**-8%**
5	**10%**		**D**	**-6%**
6	**12%**		**E**	**-4%**
7	**14%**		**F**	**-2%**

The AUX knob only follows these tables when you are in RPM mode and, when activated, adjusts the entire fuel curve across all rpm bands.

Additional Comments on Tuning and Adjustment

The user must have access to some feedback tools. Although rough tuning can be accomplished by the seat-of-the-pants method, a Scantool is extremely valuable in determining the best settings of the Translator. The ECU does not update its learned fuel trim values all the time and a perceived change could be learned out once the fuel trim updates activate. Some amount of drive-time must be allowed so the ECU can adjust to the changes.

Begin with the AUX/BASE setting selected for the vehicle configuration. The AUX/BASE setting must be accomplished first since this correction factor is always active. Check the total trim at steady road-load cruise (35-45 mph) once the ECU has had some time to adjust. The total trim (active fuel trim * O2 trim) should be between 80% and 100%. Once the AUX/BASE setting is correct, leave it alone and adjust the other dials to accomplish your desired tuning.

Most cars will run very well with the AUX/BASE tuned correctly and no other changes. If there are vacuum leaks, the IDLE dial may need adjustment to bring the idle fuel trim into the center of its range. Conversely, a rich idle caused by injectors can be tuned out with the IDLE dial. If the fuel trim is 'low' (less than 90%) turn the IDLE dial counter-clockwise to correct it. The dial adjusts about 5% per 'click'.

The MID dial is adjusted to tune the fuel delivery during mid-throttle operation, 1-8 psi boost. By turning the dial counter clockwise the fuel mixture can be leaned out to enhance turbo spool-up. Leaning the fuel mixture can lead to detonation if octane is insufficient. Turning the dial so lean that the O2 sensor shows less than .500 volts will result in reduced performance. The optimum, setting is somewhat car/configuration/octane dependent. Running the highest octane available is the best way to ensure optimum performance.

The WOT dial is used to adjust the fuel delivery at full throttle. . By turning the dial counter-clockwise the fuel mixture can be leaned out to increase horsepower. Leaning the fuel mixture can lead to detonation if octane is insufficient. Turning the dial so lean that the O2 sensor shows less than .800 volts can cause excessive detonation. The optimum, setting is somewhat car/configuration/octane dependent. Running the highest octane available is the best way to ensure optimum performance.

In RPM mode, the AUX dial is used to tune fuel delivery when the AUX Trigger wire is energized. The AUX setting is ADDED TO the entire fuel curve. For Alcohol and Propane, the AUX dial should be set in the lean range to compensate for the 'fuel' being added. Connect the purple wire so it will be energized when the Alcohol/Propane system is activating. For Nitrous Oxide, the AUX dial should be set in the rich range and leaned out only as the tuning progresses to ensure no detonation occurs. Connect the purple wire so it will be energized when the Nitrous system is activating.

A note about tuning WOT fuel delivery

Detonation (ping or spark knock) is the enemy of every engine. This is ESPECIALLY true of turbocharged and supercharged engines. Occasional detonation on pump gas is not unusual. Heavy detonation on pump gas, or any detonation on race gas, indicates a problem. Continued operation under these conditions will result in broken parts. Head gaskets, pistons, and bearings all take a tremendous beating when a boosted engine detonates. Avoid detonation under all circumstances.

The Translator is a tool to adjust fuel delivery and increase the performance of your vehicle. Like any tool it can be misused and can cause damage. Proper use of the Translator (using a scantool for tuning) will enhance the vehicle performance and owner enjoyment. The selling agent and manufacturer are not liable for misuse of the Translator and any engine damage caused by its use or misuse.

Troubleshooting

If the installation and tuning does not progress as the steps indicate, the translator signals can be checked according to the following table.

Wires to MAF sensor:
Pink - +12 volts
Yellow - MAF frequency signal
Black - ground (0 volts)

Wires to Vehicle:
Pink - +12
Green - Translator frequency signal
Black - Ground (0 volts)
Brown - ATS (Air temperature signal, fixed at 80 degrees)
Gray - BARO (Barometric pressure signal, fixed at 3.9 volts)
White - RPM signal, connected to CAS sensor.

No LED blink at key on: check power feed to Translator, check connections, check fuse.

RED LED is blinking: The MAF Translator has internal trouble codes that are blinked out using the RED LED. The codes are as follows.

1 blink - in RPM mode, No RPM signal
2 blinks - no MAF signal
3 blinks - Internal Flash memory problem.
4 blinks - dial or switch problem
5 blinks - internal program problem
6 blinks - problem with saved settings.
7 blinks - unit detected a reset while the engine was running.
8 blinks - internal Flash memory reset.

Appendix A

Injector size setup table:

1G DSM	AUX = 0	AUX = 1	AUX = 2	AUX = 3
2G DSM	AUX = 4	AUX = 5	AUX = 6	AUX = 7
BASE = 0	430	580	730	880
BASE = 1	440	590	740	890
BASE = 2	450	600	750	900
BASE = 3	460	610	760	910
BASE = 4	470	620	770	920
BASE = 5	480	630	780	930
BASE = 6	490	640	790	940
BASE = 7	500	650	800	950
BASE = 8	510	660	810	960
BASE = 9	520	670	820	970
BASE = A	530	680	830	980
BASE = B	540	690	840	990
BASE = C	550	700	850	1000
BASE = D	560	710	860	1010
BASE = E	570	720	870	1020
BASE = F	580	730	880	1030

3/S	AUX = 8	AUX =9	AUX = A	AUX = B
BASE = 0	340	490	640	790
BASE = 1	350	500	650	800
BASE = 2	360	510	660	810
BASE = 3	370	520	670	820
BASE = 4	380	530	680	830
BASE = 5	390	540	690	840
BASE = 6	400	550	700	850
BASE = 7	410	560	710	860
BASE = 8	420	570	720	870
BASE = 9	430	580	730	880
BASE = A	440	590	740	890
BASE = B	450	600	750	900
BASE = C	460	610	760	910
BASE = D	470	620	770	920
BASE = E	480	630	780	930
BASE = F	490	640	790	940

Supra	AUX = C	AUX =D	AUX = E	AUX = F
BASE = 0	420	570	720	870
BASE = 1	430	580	730	880
BASE = 2	440	590	740	890
BASE = 3	450	600	750	900
BASE = 4	460	610	760	910
BASE = 5	470	620	770	920
BASE = 6	480	630	780	930
BASE = 7	490	640	790	940
BASE = 8	500	650	800	950
BASE = 9	510	660	810	960
BASE = A	520	670	820	970
BASE = B	530	680	830	980
BASE = C	540	690	840	990
BASE = D	550	700	850	1000
BASE = E	560	710	860	1010
BASE = F	570	720	870	1020