ecutek

ProECU EVO X

Live Data Guide

2008-onward Model Year

v1.7

Live Data

The following EVO X live data parameters are available:

RPM

Engine speed. (Revolutions Per Minute)

Injector Opening Time

Fuel injector open time in milliseconds.

Injector Duty Cycle

Percentage of time that the injector is open vs. closed (the time available changes as Engine speed increases (becomes less)).

Values approaching 100% are generally not good. Note that it is possible to see injector duty cycles of in excess of 100%. This means that the ECU is unable to make the injectors supply the desired amount of fuel. I.e. a value of 110% means that the injectors are only able to supply 91% of the fuel intended.

Frequently seeing values of 100% or more indicate that larger injectors should be installed, and the injector calibration data modified accordingly.

Ignition Timing

This displays the actual ignition timing that the ECU is currently using. It is measured in degrees before "Top Dead Centre".

Knock Retard

Knock retard is the amount of Ignition timing removed by the ECU because of knock. It is not unusual to see this parameter active.

Learnt Retard

This shows the bias between the High and Low Octane Ignition maps.

If knock retard is consistently removing Ignition timing, the Learnt Retard value will start to decrease, therefore reducing the whole ignition map as it bias towards the Low Octane Ignition map.

Fuel Trim Short Term – Long Term

This is the percentage of fuel trim that the ECU adds or subtracts to obtain stoichiometric AFR. This is useful to determine when the ECU is running in open/closed loop mode i.e. when the value is zero, the ECU is running in open loop mode. High values of AFC (especially at idle) in closed loop operation indicate poor mapping. They can also be indicative of faulty air flow meters or dubious induction kits that alter measured air flow.

Turbo Boost Pressure

This is the current boost pressure as measured by the 3 BAR MAP sensor. Pressure is shown as Relative.

Battery Voltage

The Battery Voltage as supplied to the ECU.

Turbo Wastegate Duty Cycle #1 (Primary) and #2 (Secondary)

The Primary Wastegate Duty is shown as *Wastegate 1* and is normally set to 100%. Wastegate 1 has the biggest effect on boost control. Secondary wastegate duty is shown as *Wastegate 2* and is used for 'overboost' and a finer boost control.

Only Wastegate Duty 1 is used by Turbo Dynamics for error correction.

Atmospheric Pressure

The current atmospheric pressure, displayed in BAR.

Engine Load

For many maps, the x axis is labelled engine load. On many older ECUs and aftermarket ECUs this would be manifold pressure. However, the Mitsubishi ECUs meters mass air flow to determine load by calculation against RPM.

This method of metering load is very useful, since it is highly resilient to changes to other components in the system, such as exhausts, turbos & intercoolers, as well as changes in air density.

However, its weakness shown when induction kits are fitted, if airflow through the sensor element is changed (for example: lead length of tubing before sensor or open filter element), then the MAF calibration is typically no longer accurate. This will cause the ECU to apply inappropriate fuel and timing changes that are based off of a (now) incorrect airflow measurement (The uncalibrated sensor can either read high or low or both across the entire voltage range). This issue can be fixed by modifying the MAF sensor scaling map.

Air Intake Temperature

The current Air Intake temperature as measured after the Air filter in the Mass Airflow Sensor assembly.

Charge Air Temperature

Located in the Inlet Manifold and shows the TRUE air temperature entering the engine. Only used by the ECU for light throttle fuel trim but an extremely useful parameter to analyse Intercooler efficiency and possible knock problems due to a high Charge Air Temps.

Intake VVT and Exhaust VVT Angle

Shows the Inlet and Exhaust (Variable Valve Timing) angle in degrees. Inlet VVT values are negative (larger the negative number the earlier the inlet valve will open). Exhaust VVT values are positive (larger the positive number the later the exhaust valve will open).

Coolant Temperature

Current coolant temperature, value is shown in °C.

Air Flow (mV)

Shows the reading from the Mass Airflow sensor in millivolt (mV).

Air Flow (g/s)

Shows the calculation from millivolt to airflow in Grams per Second (g/s).

Throttle Angle

Throttle plate opening angle (0-100%).