

Introduction

This application note describes the various methods of tuning the **CLOSED LOOP LAMBDA** signal.

Purpose

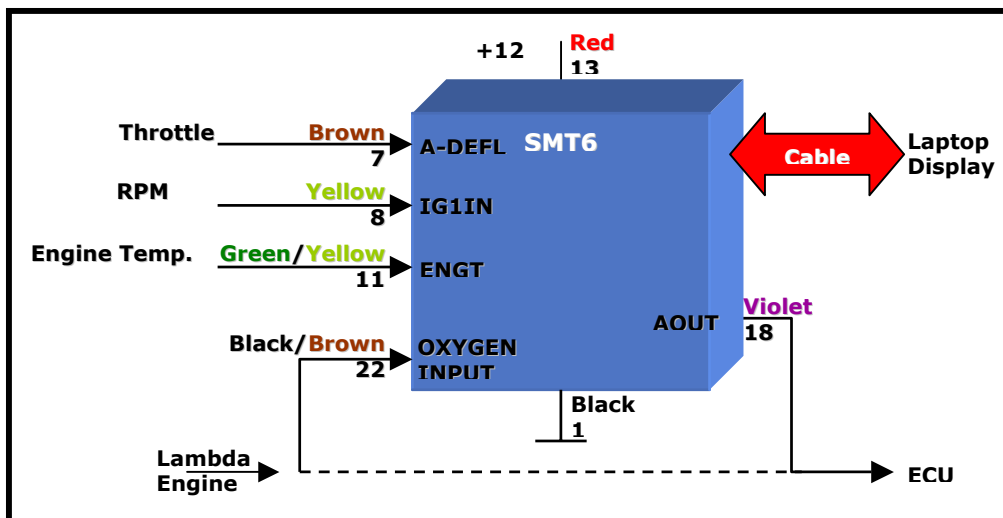
Why would you want to tune closed loop lambda? Due to the ongoing emission problems, the demand for manufacturers to run permanent closed loop is increasing. What this means is that when you select settings for the engine, for example: tuning fuel, the lambda sensor will recognise these changes and correct them back to what they were previously.

Using the SMT6, you can now tune lambda. This means you would run the lambda signal through the SMT6. When you make a change, the ECU looks at the lambda and changes itself to your new settings. The standard ECU still sees lambda as correct but in actual fact the fuel settings have changed.

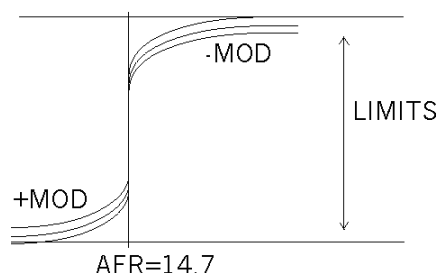
SMT6 Features and Wiring

The SMT6 has a 128 site ANALOG map, which is multiplied by a 16-step engine temperature map. The analog map sites are selected by the throttle position (or any other load signal) and the RPM. The 16 engine temperature sites are selected by the engine or air temperature.

The SMT6 also has a LAMBDA INPUT, which is usually displayed only. This aids in the tuning process. The wiring of the SMT6 for the LAMBDA INPUT is shown in the diagram above.



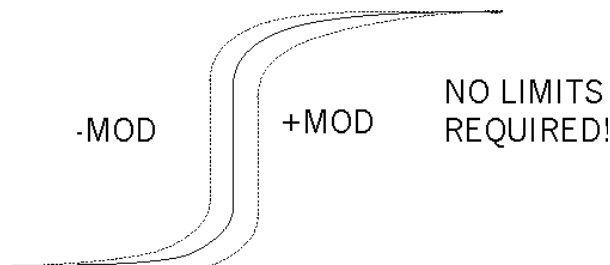
Linear Modifications



A linear modification is best for small lambda modifications. The analog limits need to be set correctly. The following drawing shows the **linear** analog modification.

Un-linear Modifications

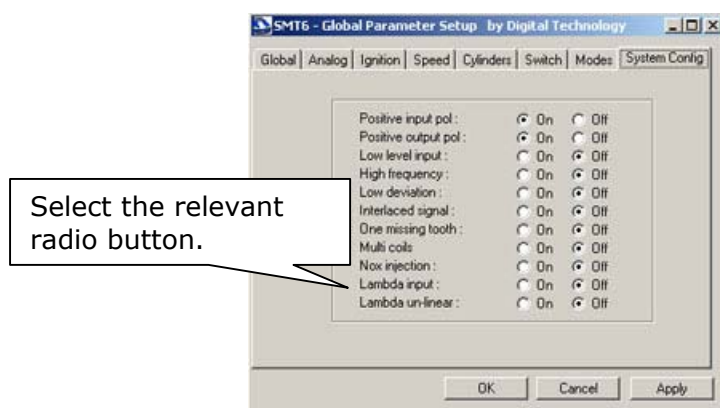
An un-linear modification is best for larger lambda modifications. The following drawing shows the **un-linear** analog modification.



SMT6 Windows Tuning Software

Using the SMT6 Windows tuning software, select "Global Settings" from the main Menu bar. Then select the tab "System Config". The following parameters apply to LAMBDA:

Lambda input	:	"On"	=	To select lambda input as source
Lambda un-linear	:	"On"	=	To select un-linear process for modification



The ANALOG screen contains the maps. If the engine temperature is not connected then the values in the A_ENGT map must be set to 1.00 (or any other constant value!).

Conclusion

Most of us spend 90% of the time while driving a car "cruising" due to speed and traffic restrictions. The SMT6 is the ideal tool to improve the cruising performance, while enhancing the power output at full throttle when overtaking. This can be done by intercepting the "CLOSED LOOP LAMBDA".