AUTRONIC SM4 USER GUIDE

Thank you for your purchase of an Autronic SM4 Engine Control Unit. Normal operation of the ECU (Engine Control Unit) does not require any user intervention. The ECU can provide engine control based on engine speed, manifold pressure, throttle position, engine temperature, intake air temperature, battery voltage, barometric pressure and other inputs as configured in the calibration.

In the event the ECU detects abnormal sensor values or engine operation the ECU will apply Limp Home values for sensors or limit engine operation to avoid possible engine damage. The ECU is equipped with a Diagnostic light on the connector face to allow the user to check the ECU if non-normal operation is suspected. The ECU has the capability to operate an external Diagnostic light however even if this is not configured the Diagnostic light on the ECU case always operates. The diagnostic light operates every time the ignition is turned on, no other procedure is required to extract diagnostic codes. Refer to the list on the next page for details of the codes.

Stored Historic codes are displayed first and then Current codes (sensors still in error) are displayed. Historic codes do not affect engine operation but are provided for reference or rectification purposes. Note that Current codes relating to Cylinder, Sync, Throttle position sensor, HSI and feedback (control) functions will not display until the engine is running or starting is attempted.

If the ECU detects the Coolant sensor value is out of range it will turn all Coolant fan outputs on. If the ECU detects the MAP sensor value out of range it will inhibit boost control operation. If the ECU detects engine Overboost it will fully cut fuel and ignition until the boost reduces. If a CMOS loss error occurs then any ECU logging, Error codes and Auto Throttle limits will be cleared. The ECU logger configuration must be re-entered for logger operation. The Auto Throttle limits will re-learn when closed and full throttle next occur however engine operation may be affected until this occurs. Alternatively, the Throttle limits can be reset by the procedure below.

In the event that the throttle position sensor is changed the new throttle limits are required to be defined in the ECU or learned by the ECU otherwise the ECU may not operate correctly. SM4 ECU's with v1.09 or later firmware have the option to set Fixed throttle limits or Auto throttle limits. All firmware versions prior to SM4 v1.09 have Auto throttle limit learning. If the Throttle limit learning is set to Fixed the new limits must be defined in the ECU calibration with a PC. If the Throttle limit learning is set to Auto the new limits are set with the following procedure.

AUTRONIC SM4 ECU AUTO THROTTLE LIMIT LEARNING

When enabled the ECU has an automatic adaptive learning function for throttle position. Internal ECU functions ensure that throttle stop and sensor wear are compensated for during engine operation.

This procedure should be performed when the throttle butterfly / sensor assembly is serviced or replaced or the throttle stop position is changed significantly. When positioning a new sensor the minimum closed throttle voltage must be greater than 0.2v and the maximum open throttle voltage must be less than 4.8v otherwise a Throttle error will occur when the engine is running.

1. Disconnect throttle position electrical connector.
2. Turn Ignition switch ON, do NOT start engine.
3. Wait 5 seconds then reconnect throttle position electrical connector.
4. Ensure that throttle is closed for at least 5 seconds.
5. Fully open the throttle for at least 5 seconds then return throttle to closed position.

AUTRONIC SM4 ECU ERROR CODES

Codes flash on ECU diagnostic light each time the Ignition is turned on
Codes are 2 digit with a short gap between digits and a long gap between codes
Historic codes display first, then Current codes (Current Throttle, Cylinder, Sync, Sync loss, HSI and feedback codes only display when cranking is attempted or engine is running)
Historic codes display for 20 warm-up cycles after last occurrence unless cleared by PC software

On continuously	Internal error – Return to factory (www.autronic.com.au / +61 3 9754 4333)
Fast flashing	Internal error – Return to factory

11	No Errors
12	O2 Sensor 2 (Spare) out of range
13	Throttle sensor out of range
14	O2 Sensor 1 (Main) out of range
15	High Speed Input 1 missing for cam control
16	Fuel temperature sensor out of range
21	Air temperature sensor out of range
22	Coolant temperature sensor out of range
23	Barometric pressure sensor out of range
24	Knock sensor or Knock control hardware error
25	High speed input 2 missing for cam control
26	Over boost detected
31	Manifold pressure sensor out of range
32	Knock control limit reached
33	Cylinder (Crank) input signal missing
34	Sync (Cam) input signal missing
35	Oil pressure sensor out of range
41	Exhaust backpressure sensor out of range
42	Sync loss – Too few Cylinder pulses or Extra Sync pulses
43	Sync loss – Extra Cylinder pulses or Too few Sync pulses
44	Oil temperature sensor out of range
45	Analogue input 2 out of range
51	Cam 1 position error tolerance and time exceeded
52	Cam 2 position error tolerance and time exceeded
53	ECU supply over voltage
54	Analogue input 3 out of range
61	Fuel pressure sensor out of range
62	Analogue input 1 out of range
63	Analogue input 4 out of range
71	Lambda feedback error
73	ECU power down error
82	CMOS RAM memory loss
99	EEROM error – Return to factory