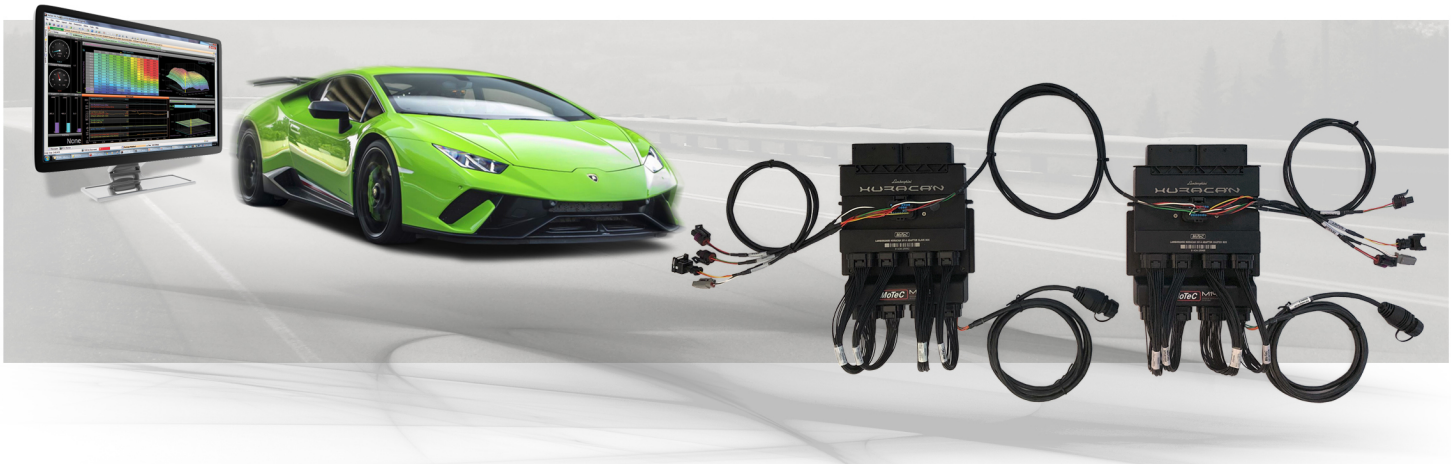
M142 LAMBORGHINI HURACAN 2014 KIT



This Plug-In Kit provides a complete replacement for the factory OE (original equipment) ECUs for the Lamborghini Huracan or Audi R8 engine. Using existing wiring, the original fuel system and sensors, it delivers convenient installation with fully programmable control.

Two M142 ECUs are supplied, one acting as a Master ECU, in which all common tuning adjustments are made, the other as a Slave ECU that takes commands from the Master, together providing full functionality plus Engine Torque Control and additional features unique to these vehicles.

Along with fuel, ignition, throttle and camshaft control, this Kit also supports other OE ECU features, including:

- **Push button start**
- **7-Speed DSG transmission integration with tunable shift cuts and blips**
- **Direct injector with high pressure fuel pump control, and secondary port injector control.**
- **Optional boost control via wastegate solenoids or servos**
- **Air conditioner control**
- **Variable speed fan control**
- **Map switching from driving modes (Strada, Sport, Corsa) and from cruise control buttons / stalk**
- **Fuel lift pump and coolant pump control**
- **Cruise control**
- **Integrated electronics for OE Lambda sensors**
- **All OE dash functionality including warnings**

The Package contains the base calibration and all settings for the sensors, direct fuel injectors, port fuel injectors, ignition coils, knock control, throttle servos and camshafts. They have also been calibrated to match the OE factory fuelling, ignition and camshaft phasing. This saves a significant amount of time by shortcutting the setup process. Users can begin tuning to their desired power level right away with the assurance of a safe base tune that is equivalent to the original vehicle.

Included are many ancillary features commonly found on race cars, such as anti-lag, driver switches (e.g. pit switch, launch enable, boost trim), gearbox control, knock control, intercooler sprays, launch control, coolant pumps and traction control.

The product fully integrates with other MoTeC devices, providing pre-defined CAN messaging for all current Displays/Loggers, LTCs, E888, Video Capture Systems, GPS, ADR, BR2, PDMs and SLMs.

KIT CONTENTS

Hardware

- **13142** - M142 ECU x 2
- **61432** - M142 LAMBORGH HURACAN 2014 ADAPTOR KIT
  - **61404** - M1 ADAPTOR 250MM 26W KEY 1 STUB LOOM x 2
  - **61405** - M1 ADAPTOR 250MM 26W KEY 3 STUB LOOM x 2
  - **61406** - M1 ADAPTOR 250MM 34W KEY 1 STUB LOOM x 2
  - **61407** - M1 ADAPTOR 250MM 34W KEY 2 STUB LOOM x 2
  - **61433** - M142 LAMBO HURACAN 2014 BREAKOUT LOOM
  - **61434** - M142 LAMBO HURACAN 2014 ADAPT MASTER BOX
  - **61436** - M142 LAMBO HURACAN 2014 ADAPT SLAVE BOX

Licence

- **23390** – M1 LIC - LAMBORGHINI HURACAN 2014 MASTER
- **23391** – M1 LIC - LAMBORGHINI HURACAN 2014 SLAVE

These Licences are required to run the Lamborghini Huracan 2014 Master and Slave M1 Packages in the M142 ECUs.

VEHICLE COMPATIBILITY

This product includes CAN messaging for full OE vehicle integration. The Package caters for OE vehicle systems such as power steering, ABS, starting systems and dashboards.

The following table shows compatible vehicles.

Vehicle	Year starting	Badge	Comment
Lamborghini Huracan	2014	LP610-4	Including Spyder
Lamborghini Huracan	2017	LP640-4 Performante	Including Spyder
Lamborghini Huracan	2016	LP580-2	Rear wheel drive. Including Spyder.
Lamborghini Huracan	2019	EVO	AWD, RWD and Spyder
Audi R8	2015	(no badge)	Including Spyder
Audi R8	2016	V10 Plus	Including Spyder
Audi R8	2017	RWS	Rear wheel drive. Including Spyder.

New models will be added to the list once testing is complete. Contact MoTeC if your model is not on the list.

This product is not suitable for Audi R8 2008-2015 (first generation) models.

FEATURES

- M142 ECU hardware, two ECUs configured as master and slave, combined -
  - 64 outputs
  - 90 inputs
  - 6 x CAN, 2 x RS232, 2 x LIN, 2 x Ethernet
- Traction control
  - Controls front to rear wheel slip closed loop to an aim value.
  - Torque reduction by throttle control, ignition timing or cut for fast response.
  - Tunable and dynamically adjustable aim slip.
- Traction Model system
  - Controls the maximum wheel torque via throttle reduction.
  - Dynamically adjustable for downforce and G force (lateral and vertical).
  - This open loop system works in conjunction with the closed loop slip based control.
- Flex Fuel and Dual Fuel control
  - Model based fuel type selection, reduces tuning time.
  - Comprehensive tunability.
  - Ethanol sensor support.
- Boost dual control
  - Two separate closed loop control systems with respective boost control solenoid outputs and boost pressure sensors.
  - Comprehensive tuning including influences for barometric pressure and gear.
  - Allows for multiple intercooler configurations including water-to-air with pump and fan control.
  - Integrates with torque control system.
- Nitrous control
  - For wet or dry nitrous oxide systems.
  - Two stage with multiple trigger conditions and time limits.
  - Nitrous transport delay for dry systems.
  - Fuel pump triggers.
- Boost Servo control
  - Controls dual servo operated wastegates or blow-off valves.
  - Multiple sources for aim position.
  - Use for boost control, blow-off valve or turbo surge prevention.

- Gear Up Shift Torque reduction
  - Fully tunable gear shift torque reduction amount based on current torque and clutch slip.
  - Ignition retard and/or ignition/fuel cut methods.
  - Integrates with TCM based torque reduction control.
- Clutch Slip control
  - Reduce torque by throttle control to protect the clutch from damage (overheat).
  - Reduce torque by ignition retard, closed loop to an aim slip, which allows safe operation to the limits of the clutch.
- Knock control system
  - Engine knock detected by DSP to filter out noise.
  - Individual cylinder control; only act on the cylinder that is knocking.
  - Control successive knock events by:
    - Reducing ignition timing
    - Adding fuel
    - Adding ignition cut
  - Control filtering based on single event, transient conditions or gear shift.
- Launch control
  - Closed loop engine speed control using ignition timing and cut.
  - Builds boost without loading the engine, giving very consistent engine speed and torque available for take off.
  - Fast boost building using higher engine speed, reducing to desired launch engine speed as boost rises to the aim pressure.
- Driver Map switch
  - Multiple toggle, latching or 10 position switch inputs.
  - Link switches to one or multiple subsystem controls.
  - Map switching and/or enable control for useful subsystems, e.g. Throttle Pedal, Traction control, Gear Shift, Anti Lag.
- Throttle pedal damper, filters the throttle pedal at low opening for improved drive-ability.
- Warning system
  - Light output and OE check engine lamp.
  - Solid or flashing at 0.5 Hz, 1 Hz or 5 Hz depending on severity of the warning.
  - Threshold limits with time delays all configurable.
  - Warnings for diagnostic conditions and subsystem active.
  - Additional OE telltales, low oil level, coolant hot, and more.
- Integrated 250 Mb of logging memory.
- Includes Level 2 Data Logging: 200 channels at up to 200Hz.
  - Upgradable to Level 3 Logging: 2000 channels at up to 1000Hz.
- Data analysis via MoTeC's renowned **i2** software.
- OE TCM (DSG transmission) integration
  - Obeys commands from the TCM as per OE.
  - Down shift throttle blip with rev matching.
  - Up shift torque reduction by ignition retard and fuel cut.
  - Torque limit for shift blending and transmission limp home.
  - Tunable for take off, shift feel, shift points, launch and more.
- OE VDC (ABS) integration
  - VDC system operates as per OE.
  - Obeys torque reduction commands for traction control, ESP and limp home (tunable).
  - Reads ABS data, wheel speeds, acceleration lateral and longitudinal, etc.
- Bosch Motorsport ABS M4 and M5 support.
- Bosch CAN inertial sensor MM5.10 support.
- Torque modelling
  - Based on normal engine tuning, e.g. the tuning process is no more difficult or time consuming than tuning an M1 ECU without torque modelling.
  - Limits torque accurately using the throttles, compensates for any boost pressure.
  - Integrates with ignition timing and ignition/fuel cut systems for seamless blending between torque reduction methods.
- Engine Load (fuelling) calculation from different sources
  - Inlet manifold pressure sensors.
  - Mass air flow sensors.
  - Throttle position and boost pressure.
  - Combination of the above.
- Cruise Control
  - Functionality exactly like the OE ECU.
  - Set speed adjustable in configurable increments in km/h or mph.
  - Fully tunable control.
  - Speed limiter mode.
  - Preset speed settings.
- Driver Steering Wheel map switching
  - Displays the setting on the OE dash, overrides the tacho and red line display.
  - Three setting with 10 positions.
  - M button in Corsa mode used for momentary (hold down) functions like rolling launch.
- Control for 5 separate fuel pumps
  - Multi speed pump control.
  - Sub fuel pump switch control.
  - PWM closed loop fuel pressure control system.
  - Options for many fuel pump and system configurations.

- Fuel Closed Loop mixture control for individual banks.
- Fallback and limp home strategies
  - If a sensor fails (e.g. MAP), alternate load sensors are used.
- Easy wiring of additional sensors via the 'breakout' connector: multiple EGTs (via TCA Thermocouple Amplifier or up to 8 via E888), GPS.
- Gear Automatic Shift control, allows fully tunable gear shift points.
- Injector outputs for 20 individual injectors: 10 x direct injectors and 10 x port (saturated drive)
  - Tunable balance table, injection timing.
  - Comprehensive blending and transport delay compensations for secondary (port) injectors.
- Ignition output pin for each cylinder (coil on plug).
- Inlet and exhaust camshaft timing control.
- Dual bank Lambda sensor control with LTC modules fitted inside the ECU adaptor boxes, using OE Lambda sensors.
- Engine physical settings for fast setup and minor re-tuning for many modifications.
- Engine pumping efficiency, air flow and load modelling based on inlet manifold pressure.
- Dual bank fuelling
  - Each bank can be fuelled from its respective set of sensors, MAF, Boost, MAP, TP, AT.
  - Redundant sensor support; if one sensor fails the other bank's sensor is automatically substituted.
- Sensor calibrations available for many common automotive sensors.
- Transient fuelling compensation using physical modelling of fuel film remaining in the inlet manifold.
- Support of MoTeC devices: ADR, E8XX, PDM, SLM, VCS, C1xx dashes.
- Test settings for most outputs, including injection and ignition outputs, for easier setup.
- Wastegate Pressure closed loop control, e.g. for CO2 systems.
- Anti Lag system
  - Controls ignition timing, fuel volume, ignition cut, engine speed limit, boost aim and torque (opens throttle).
  - Setup for circuit, rally or roll racing (rolling launch).
- Turbocharger Bypass Valve control (electric blow-off valve).
- Air Conditioner control
  - Conditional clutch activation.
  - Fan control.
- Coolant Temperature compensations for engine speed limit, ignition timing, fuel mixture and boost limit.
- Coolant Pump output with PWM control.
- Coolant Pump After Run functionality, optionally with additional pump output.
- Engine Speed Limiting with ignition cut and/or fuel cut.
- Fuel Flow Supply and Fuel Flow Return sensor inputs.
- Exhaust Sound control.
- Charcoal canister purge valve control.
- GPS data via CAN or RS232.
- Intercooler Temperature and spray control.
- Differential Oil Temperature control with dedicated temperature sensor and pump output.
- Engine Charge air temperature calculation, allows for correction of inlet air temperature (compensation of heat soak effect etc.).
- Lap distance, time and number via BR2, GPS or switched input, with split and sector options.
- Race Time system
  - Trim tables for ignition timing, fuel mixture, boost limit and torque limit.
  - Integrates with launch and traction control.
- Idle control system using ignition timing and throttle control.
- Engine Load Average, allows trims to be applied with persistent high engine load.
- Dedicated fuel, ignition and throttle setting for cranking and post start.
- Alternator closed loop control.
- Engine hours, odometer and trip meter.
- Configurable security for multiple users.
- Brake State configuration using a switch or a pressure sensor.
- Brake Vacuum system with pump control.
- ECU internal G-force (acceleration) – longitudinal, lateral and vertical.
- ECU CAN receive from a defined CAN ID for data reception from MoTeC devices. Support of 3 CAN buses.
- ECU CAN transmit of the most common channels using standard MoTeC CAN templates, ideal for MoTeC dash displays.
- Drive by Wire / Throttle Servo dual bank control.
- Throttle Pedal sensor with translation table commanding engine torque.
- Transmission Pump output with transmission temperature threshold and hysteresis control.
- Vehicle Speed measurement using wheel speed sensors, estimation or GPS.
- Auxiliary Time system with tables for ignition timing compensation, fuel volume trim and fuel mixture aim.
- Vehicle Pitch control to prevent wheel stands on drag cars.
- Clutch actual and commanded pressures for logging.

- Auxiliary Outputs x 5, for PWM control of added actuators:
  - Duty cycle tables using engine speed and throttle or manifold pressure axis.
  - Activation based on inlet manifold pressure or throttle position.
  - Auxiliary Output 1 and 5 include tables for ignition timing compensation, fuel volume trim and fuel mixture aim.
  - Auxiliary Output 5 includes external sensor input.
- Turbo Speed limiting.
- Driver Counter Switch allows push buttons to be used as up/down counting for driver switches.
- Optional channels for additional sensors via input pin and/or CAN message, including:
  - Vehicle Yaw, Pitch and Roll rate
  - Airbox Mass Flow, Pressure and Temperature
  - Ambient Temperature
  - Brake Pressure Front and Rear
  - Brake Switch
  - Coolant Pressure and Temperature
  - Engine Oil Pressure and Temperature
  - Engine Crankcase Pressure
  - Exhaust Pressure Bank 1 and Bank 2
  - Exhaust Temperature (EGT) via TCA Thermocouple Amplifier, Generic CAN or E888 for Bank 1 and 2 Collector, and Cylinders 1 to 6.
  - Exhaust Lambda via LTC, LTCN or PLM for Bank 1 and 2 Collector, and Cylinders 1 to 10.
  - Fuel Pressure and Temperature
  - Fuel Tank Level
  - Gear Neutral Switch
  - Gear Shift Request
  - Intercooler Temperature
  - Steering Angle and Pressure
  - Transmission Pressure and Temperature
  - Turbocharger Speed
  - Turbocharger Inlet/Outlet Temperature
  - Turbocharger Wastegate Position
  - G-Force (Acceleration) – Longitudinal, Lateral, Vertical
  - Wheel Speed sensors front/rear left/right, wired or CAN input
  - Auxiliary Fuel Pressure

M142 ECU AND BREAK OUT PINOUT

M142 Connector A - 34 Way

Mating Connector: Tyco Superseal 34 Position Keying 2 (MoTeC #65067)

Pin	Designation	Full Name	Master / Slave Pin*	Master / Slave Function*
A01	AT5	Analogue Temperature Input 5	105-39	Oil Pressure Switch / not used
A02	AT6	Analogue Temperature Input 6	E19	Inlet Air Temperature Bank 1 / Bank 2
A03	AV15	Analogue Voltage Input 15		
A04	AV16	Analogue Voltage Input 16		
A05	AV17	Analogue Voltage Input 17	91-21	Fuel Tank Pressure Sensor / not used
A06	INJ_D1A_NEG	Direct Injector 1A -	105-24	Injector 1 Low / Injector 6 Low
A07	INJ_D1A_POS	Direct Injector 1A +	105-44	Injector 1 Low / Injector 6 High
A08	INJ_D1B_POS	Direct Injector 1B +		Injector operation compromised if connected
A09	INJ_D1B_NEG	Direct Injector 1B -		Injector operation compromised if connected
A10	SEN_5V0_C1	Sensor 5.0V C		
A11	LA_NB1	Lambda Narrow Input 1		
A12	LA_NB2	Lambda Narrow Input 2		
A13	KNOCK3	Knock Input 3	105-101	Knock Sensor 2 / Knock Sensor 4 pin 1
A14	KNOCK4	Knock Input 4	105-80	Knock Sensor 2 / Knock Sensor 4 pin 2
A15	DIG2	Digital Input 2	91-15	Airbox Mass Flow Sensor Bank 1 / Bank 2
A16	DIG3	Digital Input 3	E23	Spare DIG3 Input
A17	DIG4	Digital Input 4	E24	Spare DIG4 Input
A18	SEN_5V0_C2	Sensor 5.0V C		
A19	SEN_5V0_B2	Sensor 5.0V B	91-66	Throttle Pedal Tracking 5V / not used
A20	LIN	LIN Bus		
A21	RS232_RX	RS232 Receive	E16	GPS Receive (optional)
A22	RS232_TX	RS232 Transmit		
A23	DIG1	Digital Input 1	105-16	Exhaust Temperature Bank1 / Bank 2
A24	BAT_NEG3	Battery Negative	91-01, 91-02, 91-04	Chassis Ground
A25	BAT_NEG4	Battery Negative	91-01, 91-02, 91-04	Chassis Ground
A26	SEN_0V_C1	Sensor 0V C		
A27	SEN_0V_C2	Sensor 0V C		
A28	CAN3_HI	CAN Bus 3 High	91-60	Inter-ECU CAN High, Internal LTC
A29	CAN3_LO	CAN Bus 3 Low	91-77	Inter-ECU CAN Low, Internal LTC
A30	CAN2_HI	CAN Bus 2 High	91-79, E28	CAN Powertrain High
A31	CAN2_LO	CAN Bus 2 Low	91-80, E27	CAN Powertrain Low
A32	BAT_NEG5	Battery Negative	91-01, 91-02, 91-04	Chassis Ground
A33	SEN_0V_B2	Sensor 0V B	91-45, 91-46, 91-64, 91-69	0V Fuel Tank Pressure, Lift Pressure, Air Temp, Pedal Tracking, Oil Temp, Airbox Mass Flow / 0V Lift Pressure, Air Temp, Airbox Mass Flow
A34	SEN_0V_A2	Sensor 0V A	91-81	0V Pedal Main

** Master and Slave ECU pins and functions are largely the same. Slave pins and functionality is only listed if different from Master pin or functionality.*

M142 Connector B - 26 Way

Mating Connector: Tyco Superseal 26 Position Keying 3 (MoTeC #65068)

Pin	Designation	Full Name	Master / Slave Pin*	Master / Slave Function*
B01	OUT_HB9	Half Bridge Output 9	91-91 / 105-50	Fuel Pump Control / Piston Cooling Spray Control
B02	OUT_HB10	Half Bridge Output 10	105-8 / 91-73	Coolant Pump Control / Exhaust Flap Control
B03	UDIG8	Universal Digital Input 8	91-48	Crank Request / not used
B04	UDIG9	Universal Digital Input 9	91-51	Starter Solenoid Feedback / not used
B05	UDIG10	Universal Digital Input 10	91-50	Ignition Switch Sense
B06	UDIG11	Universal Digital Input 11	91-30	Brake Switch 2 / not used
B07	UDIG12	Universal Digital Input 12	91-29	Brake Switch 1 / not used
B08	INJ_LS5	Low Side Injector 5	105-32	Port Injector 5 / Port Injector 10
B09	INJ_LS3	Low Side Injector 3	105-6	Port Injector 3 / Port Injector 8
B10	AV9	Analogue Voltage Input 9	E11	Inlet Manifold Pressure Sensor Bank 1 / Bank 2
B11	AV10	Analogue Voltage Input 10	E12	Boost Pressure Sensor Bank 1 / Bank 2
B12	AV11	Analogue Voltage Input 11		
B13	BAT_POS	Battery Positive	91-3, 91-5, 91-6	Switched Power Source
B14	INJ_LS6	Low Side Injector 6	/ E18, 91-71	not used / Break Vacuum Pump Relay
B15	INJ_LS4	Low Side Injector 4	105-11	Port Injector 4 / Port Injector 9
B16	AV12	Analogue Voltage Input 12		
B17	AV13	Analogue Voltage Input 13		
B18	AV14	Analogue Voltage Input 14		
B19	BAT_POS	Battery Positive	91-3, 91-5, 91-6	Switched Power Source
B20	OUT_HB7	Half Bridge Output 7	91-36 / E10, 105-12	Radiator Fan Control Unit 2 / Engine Mount Solenoid Bank 1 and 2
B21	OUT_HB8	Half Bridge Output 8		
B22	INJ_D2A_NEG	Direct Injector 2A -	105-2	Injector 2 / Injector 7 Low
B23	INJ_D2A_POS	Direct Injector 2A +	105-65	Injector 2 / Injector 7 High
B24	INJ_D2B_POS	Direct Injector 2B +		Injector operation compromised if connected
B25	INJ_D2B_NEG	Direct Injector 2B -		Injector operation compromised if connected
B26	SEN_5V0_A	Sensor 5.0V A	91-83	5V Throttle Pedal Main

** Master and Slave ECU pins and functions are largely the same. Slave pins and functionality is only listed if different from Master pin or functionality.*

M142 Connector C - 34 Way

Mating Connector C: Tyco Superseal 34 Position Keying 1 (MoTeC #65044)

Pin	Designation	Full Name	Master / Slave Pin*	Master / Slave Function*
C01	OUT_HB2	Half Bridge Output 2	105-66	Throttle Servo Motor + Bank 1 / Bank 2
C02	SEN_5V0_A	Sensor 5.0V A	105-20, 105-41	5V Cam 1,3, Fuel Pressure Direct, Secondary Air Pressure / Cam 2,4, Crank, Secondary Air Pressure
C03	IGN_LS1	Low Side Ignition 1	105-93	Ignition 1 / Ignition 6
C04	IGN_LS2	Low Side Ignition 2	105-94	Ignition 2 / Ignition 8
C05	IGN_LS3	Low Side Ignition 3	105-73	Ignition 3 / Ignition 7
C06	IGN_LS4	Low Side Ignition 4	105-91	Ignition 4 / Ignition 9
C07	IGN_LS5	Low Side Ignition 5	105-72	Ignition 5 / Ignition 10
C08	IGN_LS6	Low Side Ignition 6	105-86	Fuel Pressure Direct Bank 1 Pump A / Bank 2 Pump A
C09	SEN_5V0_B	Sensor 5.0V B	105-42	5V Throttle Servo Position Bank 1 / Bank 2
C10	BAT_NEG1	Battery Negative	91-01, 91-02, 91-04	Chassis Ground
C11	BAT_NEG2	Battery Negative	91-01, 91-02, 91-04	Chassis Ground
C12	IGN_LS7	Low Side Ignition 7	91-52, 91-70 / E14	Starter Relay 1, Starter Relay 2 / Gear Shift Up
C13	IGN_LS8	Low Side Ignition 8	91-40 / E15	Air Filter Bypass Solenoid / Gear Shift Down
C14	AV1	Analogue Voltage Input 1	105-103	Throttle Servo Position Sensor - Main Bank 1 / Bank 2
C15	AV2	Analogue Voltage Input 2	105-82	Throttle Servo Position Sensor - Tracking Bank 1 / Bank 2
C16	AV3	Analogue Voltage Input 3	91-82	Throttle Pedal Sensor - Main / not used
C17	AV4	Analogue Voltage Input 4	91-65	Throttle Pedal Sensor - Tracking / not used
C18	OUT_HB1	Half Bridge Output 1	105-88	Throttle Servo Motor - Bank 1 / Bank 2
C19	INJ_D3A_POS	Direct Injector 3A +	105-64	Injector 3 High / Injector 8 High
C20	INJ_D3B_POS	Direct Injector 3B +		Injector operation compromised if connected
C21	INJ_D4A_POS	Direct Injector 4A +	105-43	Injector 4 & 5 High / Injector 9 & 10 High
C22	INJ_D4B_POS	Direct Injector 4B +		Injector operation compromised if connected
C23	INJ_LS1	Low Side Injector 1	105-74	Port Injector 1 / Port Injector 6
C24	INJ_LS2	Low Side Injector 2	105-95	Port Injector 2 / Port Injector 7
C25	AV5	Analogue Voltage Input 5	105-59	Fuel Pressure Direct Bank 1 / Bank 2 Sensor
C26	BAT_POS	Battery Positive	91-3, 91-5, 91-6	Switched Power Source
C27	INJ_D3A_NEG	Direct Injector 3A -	105-46	Injector 3 Low / Injector 8 Low
C28	INJ_D3B_NEG	Direct Injector 3B -		Injector operation compromised if connected
C29	INJ_D4A_NEG	Direct Injector 4A -	105-23	Injector 4 Low / Injector 9 Low
C30	INJ_D4B_NEG	Direct Injector 4B -	105-22	Injector 5 Low / Injector 10 Low
C31	OUT_HB3	Half Bridge Output 3	E34	Turbo Wastegate Solenoid Bank 1 / Bank 2
C32	OUT_HB4	Half Bridge Output 4	91-37 / E17, 91-23, 91-88	Radiator Fan Control Unit 1 / Purge Solenoid Bank 1 and 2
C33	OUT_HB5	Half Bridge Output 5	105-53	Inlet Camshaft Control Solenoid Bank 1 / Bank 2
C34	OUT_HB6	Half Bridge Output 6	105-9	Exhaust Camshaft Control Solenoid Bank 1 / Bank 2

** Master and Slave ECU pins and functions are largely the same. Slave pins and functionality is only listed if different from Master pin or functionality.*

M142 Connector D - 26 Way

Mating Connector D: Tyco Superseal 26 Position Keying 1 (MoTeC #65045)

Pin	Designation	Full Name	Master / Slave Pin*	Master / Slave Function*
D01	UDIG1	Universal Digital Input 1	105-18	Crank Reference Position Sensor
D02	UDIG2	Universal Digital Input 2	105-36	Inlet Camshaft Position Sensor Bank 1 / Bank 2
D03	AT1	Analogue Temperature Input 1	105-105	Coolant Temperature Sensor / not used
D04	AT2	Analogue Temperature Input 2	E13	Spare temperature or switch
D05	AT3	Analogue Temperature Input 3	91-11	Airbox Mass Flow Temperature Sensor Bank 1 / Bank 2
D06	AT4	Analogue Temperature Input 4	91-12	Oil Temperature Sensor 2 / not used
D07	KNOCK1	Knock Input 1	105-79	Knock Sensor 1 / Knock Sensor 3 pin 1
D08	UDIG3	Universal Digital Input 3	105-15	Exhaust Camshaft Position Sensor Bank 1 / Bank 2
D09	UDIG4	Universal Digital Input 4	105-13	Engine Oil Level and Temperature Sensor / not used
D10	UDIG5	Universal Digital Input 5	91-17	Park Neutral Switch / not used
D11	UDIG6	Universal Digital Input 6	105-38	Reduced Oil Pressure Switch / not used
D12	BAT_BAK	Battery Backup	91-86	Permanent Power
D13	KNOCK2	Knock Input 2	105-100	Knock Sensor 1 / Knock Sensor 3 pin 2
D14	UDIG7	Universal Digital Input 7	91-34	Cruise Cancel Switch / not used
D15	SEN_0V_A	Sensor 0V A	105-55, 105-76, 105-97	0V Cam Pos, Fuel Pressure Direct, Secondary Air Pressure, Coolant Temperature / 0V Crank, Cam Pos, Fuel Pressure Direct, Secondary Air Pressure
D16	SEN_0V_B	Sensor 0V B	105-102	0V Throttle Servo Position Bank 1 / Bank 2
D17	CAN1_HI	CAN Bus 1 High	E33	Spare CAN High
D18	CAN1_LO	CAN Bus 1 Low	E32	Spare CAN Low
D19	SEN_6V3	Sensor 6.3V	E3	6.3V Sensor Supply
D20	AV6	Analogue Voltage Input 6	105-104	SecondaryAir Pressure 1 / 2 Sensor
D21	AV7	Analogue Voltage Input 7	Internal	Barometric Pressure Sensor Bank 1 Bank 1
D22	AV8	Analogue Voltage Input 8	91-47	Fuel Port Rail Pressure / Fuel Direct Injector Pump Lift Pressure
D23	ETH_TX+	Ethernet Transmit+		
D24	ETH_TX-	Ethernet Transmit-		
D25	ETH_RX+	Ethernet Receive+		
D26	ETH_RX-	Ethernet Receive-		

** Master and Slave ECU pins and functions are largely the same. Slave pins and functionality is only listed if different from Master pin or functionality.*

Breakout Connector E - 34 Way

Mating Connector: Tyco Superseal 34 Position Keying 2 (MoTeC #65044)

Pin	Designation	Full Name	M142 Pin#	Function
E01	BAT_POS	Battery Positive	B13, B19, C26	
E02	BAT_POS	Battery Positive	B13, B19, C26	Boost Solenoid Supply (optional)
E03	SENS_6V3	SEN_6V3	D19	
E04	SENS_5V0_B2	Sensor 5.0V B	A19	5V Supply MAP Sensor
E05	SENS_5V0_B2	Sensor 5.0V B	A19	5V Supply Boost Sensor
E06	SENS_5V0_B2	Sensor 5.0V B	A19	
E07	SENS_5V0_B2	Sensor 5.0V B	A19	
E08	BAT_NEG	Battery Negative	A24, A25, A32, C10, C11	
E09	BAT_NEG	Battery Negative	A24, A25, A32, C10, C11	
E10*	SHARE_ENGMT	Slave ECU Half Bridge Output 7	B20 (Slave ECU Only)	Shared wiring between ECUs.
E11	AV9	Analogue Voltage Input 9	B10	MAP Sensor Signal
E12	AV10	Analogue Voltage Input 10	B11	Boost Sensor Signal
E13	AT2	Analogue Temperature Input 2	D04	Spare
E14	PADDLE_UP	Slave ECU Low Side Ignition 7	C12 (Slave only)	Gear Shift Up (dedicated). Do not connect on Master.
E15	PADDLE_DN	Slave ECU Low Side Ignition 8	C13 (Slave only)	Gear Shift Down (dedicated). Do not connect on Master.
E16	RS232RX	RS232 Receive	A21	Usually for GPS.
E17*	SHARE_PURGE	Slave ECU Half Bridge Output 4	C32 (Slave only)	Shared wiring between ECUs
E18*	SHARE_BRK_REL	Slave ECU Injector Low Side 6	B14 (Slave only)	Shared wiring between ECUs
E19	AT6	Analogue Temperature Input 6	A02	Inlet Air Temperature Sensor Signal
E20	SENS_0V_B2	Sensor 0V B	D16	0V Inlet Air Temperature Sensor
E21	SENS_0V_B2	Sensor 0V B	D16	0V MAP Sensor
E22	SENS_0V_B2	Sensor 0V B	D16	0V Boost Sensor
E23	DIG3	Digital Input 3	A16	Spare
E24	DIG4	Digital Input 4	A17	Spare
E25*	SHARE_PIST_COOL	Slave ECU Half Bridge Output 9	B01 (Slave only)	Shared wiring between ECUs
E26*	SHARE_EXH_FLAP	Slave ECU Half Bridge Output 10	B02 (Slave only)	Shared wiring between ECUs
E27	CAN2LO	CAN Bus 2 Low	A31	OE Powertrain CAN Bus Low
E28	CAN2HI	CAN Bus 2 High	A30	OE Powertrain CAN Bus High
E29	SENS_0V_B2	Sensor 0V B	D16	
E30	SENS_0V_B2	Sensor 0V B	D16	
E31	SENS_0V_B2	Sensor 0V B	D16	
E32	CAN1LO	CAN Bus 1 Low	D18	Spare CAN Bus Low
E33	CAN1HI	CAN Bus 1 High	D17	Spare CAN Bus High
E34	OUT_HB3	Half Bridge Output 3	C31	Boost Solenoid (optional)

** These pins allow sharing of control functions from one ECU to the harness connector of the other ECU. Do not change this wiring.*